W6VIO Calling

JPL

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

Volume 39, Issue 8 w6vio@arrl.net; http://jplarc.ampr.org Aug 2016

President (2016):	Jonathan Cameron, KF6RTA	4-1189	EmComm. Mgr:	Christopher Carson, KE6ABQ	3-3888
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Newsletter editor:	Jim Marr, AA6QI, email: aa6qi at arrl.net (your articles for the newsletter are requested, please)				

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. **NOTE: This month (August) it will be in 310-109**. 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 Aug 26th: speaker is: Ian Pinkham KE6RFV discussing "Great Shakeout Planning".**
- **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 Sep 9th**. 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 July 15th

By Jim Marr AA6QI

Present were: Jon Bell KA6JON, Mat Bennett† KF6RTB, Jonathan Cameron†* KF6RTA, Chris Gaylord†* W6YTB, Alexis Larson (no call), Merv Macmedan N6NO, Josh Miller†* KB3UUS, Eric Shalor† KJ6ARC, Lew Soloway† AC6LS (formerly KK6QJE), Steve Townes†* WB4ILW, Gary Wong W6GSW. On the Phone/JPLWebex: Chris Carson†* KE6ABQ, Jim Marr† AA6QI, Chuck Sarture†* KG6NF.

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 6 BOD members, 4 other regular members and 4 non-members (total of 14 attendees), so we **did not** have a quorum.

There were no club officer reports or general discussion due to the length of the talk by our guest speakers.

Guest Speakers: Gary Wong W6GSW and Jon Bell KA6JON (Figure 1) gave a great talk on Winlink Messaging, which provides radio-based email useable on HF, VHF and UHF, with or without connection to the internet.

Winlink 2000 (WL2K) is a world-wide system of volunteer resources supporting email by radio, with non-commercial links to internet email. Internet connectivity is not required but might be desirable.

Uses for Winlink: Amateur radio; Because we can!; Regular email; Email from remote locations, such as maritime mobiles; National Traffic System (NTS);

Emergency communications; & ARESLAX.

Winlink advantages for EmComm: 100% accurate message transmission; Accessible at reasonable cost to both agencies and amateur radio operators; Able to provide both local and long-haul communication; Seamless bridge between HF, VHF, UHF & Telnet.

Figure 1: Guest speakers Gary Wong W6GSW (left) and Jon Bell KA6JON (right)

Winlink supports non-internet messaging using a hybrid radio-only network that can handle email with or without the internet. The hybrid network uses the efficiency of the internet if it is available but resorts to radio-only message forwarding if the internet is not available. The hybrid network uses standard Winlink clients that can handle messages with attachments. Message routing is dynamic and fully automatic, with Radio Message Servers (RMSs) automatically switching to radio-only mode for radio-only messages. While Pactor is used for backbone communications between RMSs, users can connect using Pactor, Winmor, Packet or Robust Packet.

End-users use standard Winlink Express or Packlink client programs. Users register multiple "Message Pickup Stations" (MPS) where mail will be held for pickup. Copies of messages are sent to each MPS using callsigns (no routing information is required from the sender). All standard features of email are supported, with the path through the network shown in the message header.

Today, there is increasing concern about the vulnerability of the internet, leading the Department of Defense to mandate that the Military Affiliate Radio System (MARS) communicate without using the internet. Winlink satisfies this requirement and currently provides nationwide email support for MARS and its civil agency clients.

For further information, contact Gary Wong: w6gsw at arrl.net.

Field Day 2016

By Jim Marr AA6QI

Pasadena Radio Club's (PRC's) Paul Gordon N6LL assembled and submitted the Field Day Entry Form for our three-club's combined Field Day effort (PRC, JPLARC, CITARC). Following are our claimed results, though these still need to be verified by the ARRL Field Day scoring team, the results of which won't be available until about roughly September.

Total Score: Overall, we had 40 participants in this year's Field Day, with this number including setup, operations and take-down. Our total claimed Field Day score consists of 1,390 Bonus Points, 908 CW QSO points (for 454 CW QSOs that count 2-points each) and 552 Phone QSO points, yielding a total claimed score of 2,290 points.

Bonus Points were claimed for: 100% emergency power; media publicity; public location; public information table; formal message to ARRL SM/SEC; copying the W1AW Field Day Message; ten formal messages handled via the National Traffic System (NTS); satellite QSO completed; two youth participants and operators; claimed results submitted via the web; use of social media; and having a safety officer.

QSOs: On CW, there were 285 QSOs on 40m, 127 QSOs on 20m and 42 QSOs on 15m, for a total of 454 QSOs at 2-points each for a total of 908 points. On phone, there were 71 QSOs on 80m, 107 QSOs on 40m, 263 QSOs on 20m, 75 QSOs on 15m, and 22 QSOs on 10m. On Satellite, there were 14 phone QSOs. Total phone QSOs: 552.

Contact analysis: Matt Bennett KF6RTB did some analysis using the integrated logs from two of the three SSB stations (the Comm Van FT-897 & the FT-991 in the tent). His remarks follow but keep in mind that none of the stations were operated for the full 24 hours of the contest period:

"Looks my best twenty minutes was 43 contacts and my best hour was ~80 contacts from the logs. That was a really fun hour :-)

*As for "hot spots", we were hot on 20 meter phone from 7-8 PM. I believe the success was due to strong gray line propagation. East Coast and eastern Canadian stations were *booming* during that hour (even louder than midwest). One hour later, East Coast dropped off and Midwestern stations came in loud. I'm sure we had good performance out of 20 meters all day, but at least we know for the future that we're still good on 20 meters through sunset.*

15 meters had a "hot" hour from 1:30-2:30 PM. I was able to

nab 53 stations that hour -- most in the Midwest. About 30 minutes after that, 15 meters really died. We made only 14 more contacts as a club for the next 2 hours after that.

80 meters had the best hour from 4-5 AM! Jim (AA6QI) nabbed 14 contacts in that hour. Only 71 total contacts were made on 80 meters, which is not totally surprising. Band conditions were pretty awful that night, and I noticed the wire didn't perform as well on 80 meters as it did on the other bands (SWR > 1.5:1 in general). Might be worth trying digital modes on 80 meters next year. Looking at past Field Day logs of my old club (K6UCI), it looks like we bagged a ton of contacts with PSK31 on 40 meters in the evening. Not sure if that plays nice with 40 meter phone, but if it did, I think that could be a huge point maker!

As for the FT-991, I can't say enough about that radio. Lightweight (easy to move for Field Day, other contests, or emergencies), incredible frequency coverage (160 m thru 440 MHz!), MUCH easier to navigate than the FT-897, nice DSP filters, very handy spectrum scope feature, nice touch screen display, SUPER clear audio (could not believe some of the stations I pulled off the noise floor!), built-in auto tuner, and a USB interface that would make digital modes a snap. In short, I think this is a great radio for the club. It not only was great for HF contesting, but it could easily be used for VHF/UHF contesting or emergency comms on a wide range of bands."

Logging Issues: The most significant logging issue that we had this year was that the IC-7410 (40m phone) and FT-991 (20m & 15m phone) transceivers lost communications with their logging computers periodically during the operational period. From looking at the logs, it appears that these were mostly related to when the radios were power cycled for generator refueling or during the night. Both of these transceivers have internal sound cards that can come up with different PC computer I/O driver assignments at turn-on and operators were not instructed on how to go into the N3FJP software to select the correct I/O driver when re-powering the radios (my bad, since I knew about this issue from my experience with my own FT-991). This is only an issue with radios that have an internal sound card that is powered from the radio's power supply, as evidenced by the fact that this didn't happen with either the Comm Van's FT-897 or CW station's FT-1000D, both of which do not have internal sound cards so use interface cables with the FTDI interface chip set that is powered from the laptop computer's USB port.

The other issue that we had was the usual operator error of failing to enter their call and initials when beginning their operating time. I, myself, forgot to do this several times even though I knew better, so it's pretty easy to forget to do. I'll need to think of a better way next year to remind all of us to remember to do this before starting our operation periods.

Overall: For me, Field Day this year had a very relaxed feel, perhaps because things were somewhat similar to what we'd done for the previous two years so there weren't as many new things to try to figure out. Unlike the previous two years, none of the stations this year were actively operated for the full 24-hour period, giving new operators lots of time to try their own hand at Field Day operating without performance pressure. Overall it was lots of fun. Hope you can join us next year if you weren't able to make it this time.

BOD Meeting July 29th

By Jim Marr AA6QI

Present were: Jonathan Cameron†* KF6RTA, Bob Dengler† NO6B, Chris Gaylord†* W6YTB, Josh Miller†* KB3UUS, Lew Soloway AC6LS, Jan Tarsala† WB6VRN. On the Phone: 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 (and four other regular members) so we **did** have a quorum.

Treasurer's Report: Treasurer Chuck Sarture KG6NF preented the current budget status: Previous balance of $4,434.06; No income; Expenses of $72.31 for the CommVan FT-897 repair; Ending balance $4,361.75

Membership Report: We had one new member, Eric Shalov KJ6ARC, bringing membership to 52 total members, of which 43 are voting members and 67.4% are ARRL members.

Great Shakeout planning: Chris Gaylord discussed what was being planned for the upcoming October Great Shakeout exercise. The plan is to do something similar to what we've done in the past but to formalize it a bit more so that it's not quite so 'seat-of-the-pants'. Will be developing a check-in assignment sheet so that we will be able to keep track of who's being assigned where. Will plan to develop some assignments for the JEARS personnel for them to actually have them pass messages. The plan is to use B329 as the JEARS command post to coordinate with someone in the EOC, so will use B329 instead of B310-106 for JEARS net control as a way to hopefully reduce some of the confusion that has existed in B310-106 in the past.

Guest speaker update: Now have a speaker lined up for October but November is still open. Our October speakers are Don Hill KE6BXT and Joe Ayers AE6XE, who are both active in Orange County Mesh Networking (see http://ocmesh.org).

Figure 2: Test Mesh network setup at JPL to support the October Guest Speaker.

A temporary (loaner) Mesh network has been set up at JPL as shown in Figure 2. Coverage of the temporary mesh network is shown in Figure 3.

Figure 3: Temporary JPL mesh network coverage map

Jonathan Cameron recently purchased five routers from eBay at $50/each and would be willing to loan/sell one to anyone interested in trying out the system.

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. Steve showed the suggested poster template and his proposed alternate. He would like help in putting together both. Contact Steve to help.

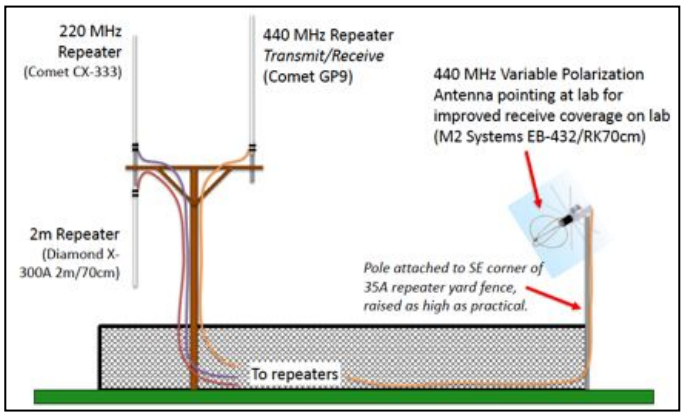

Figure 4: Proposed repeater antenna installation

Mesa Repeater Antenna Upgrades: Jonathan presented the results of planning by the repeater committee (Figure 4). Note that proposed 70 cm "eggbeater" receive antenna that would provide circular polarization coverage of the JPL campus.

The repeater committee met on July 12th to discuss details of the proposed installation and to start scheduling the implementation work.

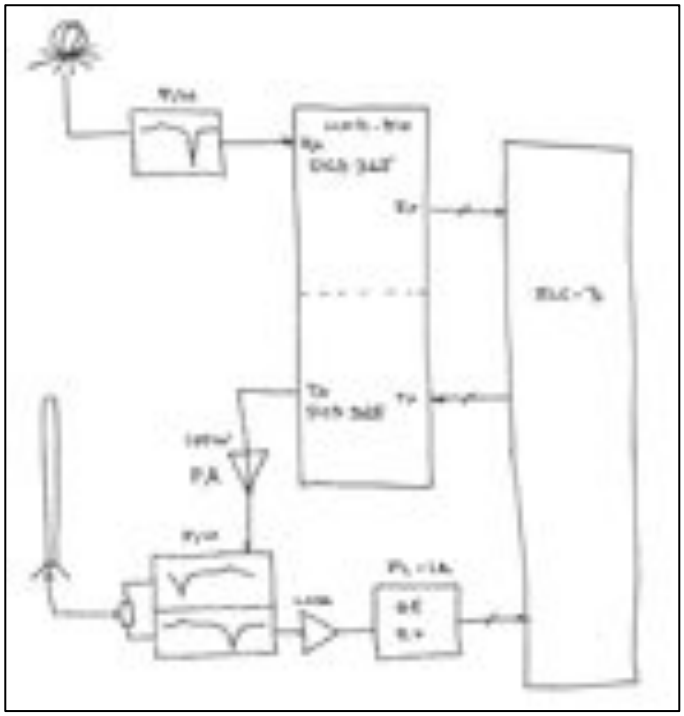

Figure 5: Proposed 445.20 repeater re-configuration

Jan Tarsala presntend a proposed configuration for the 70cm repeater that uses equipment that we already have in order to improve both on-Lab coverage and broader area coverage (Figure 5). This proposal uses a circular polarization antenna to provide on-Lab coverage through our NXR-810 repeater and uses our existing 70cm GE repeater for receive from our vertical antenna.

Both are routed through the repeater's RLC-3 repeater controller.

Bob Dengler NO6B also discussed a repeater that he has set up in 180-R6 using a pair of Kenwood mobile radios a six-section mobile duplexer and the existing GP-9 antenna already up there. PL for this repeater is 82.5 or DPL 365. Coverage on lab from this repeater is better than from the Mesa.

BOD Meeting Aug 12th

By Jim Marr AA6QI

Present were: Jonathan Cameron†* KF6RTA, Chris Gaylord†* W6YTB, Josh Miller†* KB3UUS, Philip Southam, Steve Townes†* WB4ILW. On the Phone: Chris Carson†* KE6ABQ, Jim Marr† AA6QI, Chuck Sarture†* KG6NF.

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 five BOD members present so we **did** have a quorum.

Most of the meeting was taken up with a discussion of three radios as possible replacements for our aging HF radios. The radios discussed were: Yaesu FT-450D, Yaesu FT-991 and Icom IC-7300. Jim Lux had suggested that we consider commercial radios but no data on them yet. During the discussion, the FT-450D was eliminated from further consideration. The decision made for board members to read the manuals for the FT-991 and IC-7300, and then for a group to go out to HRO Burbank and actually operate the two radios side-by-side to gain a better understanding of the radio's capabilities. Finally, it was suggested that there are higher priority items to deal with (repeater antennas, HF antennas, etc.) that should be dealt with before pursuing new radios, a suggestion that the Board agreed with, so the HF radio selection was tabled until next year some time.

Jonathan Cameron discussed his plans for a work party on RDO Friday 8/19/16. Chris Gaylord reported that Will Michael has approved a number of items for purchase this year that include: (1) a junction box for the Mesa HF antenna tower; (2) grounding rods for the Mesa and the Mesa repeater site; (3) a new ATAS -120 antenna for the Comm Van; (4) a Comm Van antenna setup that includes a Chameleon antenna, antenna tuner, Heil headset plus adaptor for the FT-897, and footswitch (just like we used at Field Day); (5) block and tackle to lift up on the Comm Van mast; (6) an M2 circularly polarized satellite antenna for the 445.20 repeater; and (7) the ARRL manuals for the EM Comm class; all of which should be here in September.

Jonathan also discussed his plans to permanently replace the temporary mesh network equipment that is on loan to us so that we can keep a JPL mesh network on line.

JEARS

By Chris Gaylord W6YTB

JEARS had its first official meeting on Tuesday, July 19. At this time, 11 people have completed the FEMA training. Approval has been received to use the ARRL EC-001 Introduction to Emergency Communication class as the primary training course for JEARS and the Emergency & Continuity Management Group will pay for the course books and the exam fee. A schedule is currently being developed. As a reminder, the Great ShakeOut exercise is on Thursday, October 20 and the August 26 Club meeting will focus on preparation for this.

Club members who work on-Lab and are interested in providing communications support during emergency situations are encouraged to join the JPL Emergency Amateur Radio Service (JEARS), a volunteer team co-sponsored by the Club and the PSD Emergency & Continuity Management Group (203A).

Prospective JEARS members must be currently licensed (any class) and complete the FEMA IS-100, IS-200, IS-700 & IS-800 courses. An online application and links to the courses are available at http://goto/jears (only accessible from on-Lab). Emergency credentials and additional training will be provided by 203A after joining.

For more information, please contact Chris Gaylord W6YTB at christopher.gaylord@jpl.nasa.gov or (818) 354-5584.

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):

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: