W6VIO Calling

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

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Upcoming Events:

- Every Monday: Emergency Communications Net: Noon, on WR6JPL 224.08/(-)/156.7 & 445.20/(-)/103.5, or WR6AZN 223.96/(-)/156.7 on Table Mountain.
- JPLARC Board of Directors (BOD) meetings: Normally, the first working Friday, every month, from Noon to 1pm in 180-703C. Call-in: 818-354-3434 ID 7373. **Next is October 10th.**
- **QST, QST, QST**: JPLARC Regular Membership meetings: Second working Friday every month from Noon to 1pm in 180-703C. Call-in: 818-354-3434 ID 7373. Slides (if any) broadcast via meetingplace.jpl.nasa.gov, ID=7373. **Next is September 26th. Guest speaker: Dr. Doug Millar, EdD, K6JEY, "Sidewalk EME" (rescheduled from May).**

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President's Message:

By Steve Townes WB4ILW

We are now in the last quarter of calendar year 2014 and should begin thinking about calendar year 2015. Probably the two most pressing procedural items that we need to work in advance of the new year are Club officers and the speaker program. I will be introducing the Nominating Committee (minimum of one person) in the October meeting. At this point I don't have any volunteers for the committee so if anyone is interested, please contact me. Just as important, we need Club members who are interested in being officers, so please consider volunteering for that also. I must say that I have enjoyed my year as President and highly recommend it. Having a good set of officers and Board of Directors makes it go much smoother.

With regard to speakers, we have a good list of potential topics for next year's meetings but would appreciate recommendations from the Club. Have you heard a talk at one of the other local clubs that you think would be of interest? Are you working on something that you could share with our members? Do you have suggested topics that interest you for which we might be able to find speakers? We've had a great set of talks this year and look forward to an equally interesting set next year. As always, this is your Club and your participation helps make it valuable to you and everyone.

August 15th Regular Membership Meeting:

By Jim Marr AA6QI

Present were: Jon Bell KA6LQP (LAECT), Bob Cesarone WA9JIB, Walt Ciszczon† KK6DUL, Courtney Duncan†* N5BF, Dayton Jones† K6DJ, Mark Lysek† AG6TD, Jim Marr†* AA6QI, Steve Noland† WA6KLC, Charles Rhoades† WB6KZE, Phil Smith WB6LQP, Mike Tope† W5EF, Steve Townes†* WB5ILW, Gary Wong W6GSW (guest speaker). On the phone: Walt Mushagian† K6DNS.

Note: † indicates a regular member, and * Indicates 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 three BOD

members, five other regular members and four non-members, so a quorum was NOT present.

Steve Townes opened the meeting with introductions around the room. He then briefly presented the Treasury balance (just under $4k) and a list of upcoming speakers for the rest of this year.

Satellite Communications Anyone?
Jim Marr mentioned that Andy Klesh KD0DLH has a satellite station with a Kenwood TS-2000 in building 125 that is used for cubsat communications but which can also be used by JPLARC members after prior arrangement with and a little instruction from either Andy or with K. Scott Tripp KD8IPK. If you'd like to work some amateur satellites, contact Andy or Scott.

Guest Presentation:
Gary Wong W6GSW (Figure-1) with ARES and the LAECT, and Jon Bell KA6JON, also with LAECT, gave a presentation on the Broadband-Hamnet (formerly known as the Ham Meshnet or HSMM-Mesh).

Gary is an active user of the Broadband-Hamnet within the ARES community and has experience with multiple types of Broadband-Hamnet implementations (all described in his presentation). He has been a strong advocate for the use of the Broadband-Hamnet for emergency communications and is very interested in working with anyone with similar interests. Gary can be contacted at "w6gsw at arrl.net".

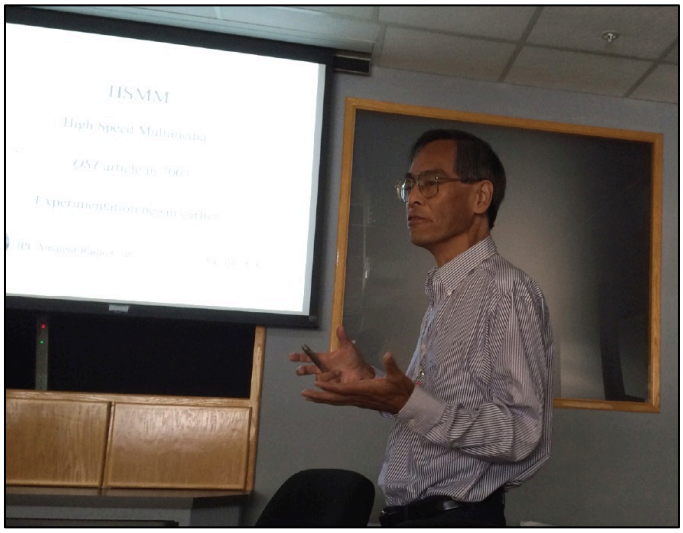

Figure 1: Gary Wong W6GSW giving his talk on the Broadband-Hamnet

Topics covered in Gary's talk included:
- HSMM: High-speed multimedia radio, the implementation of wireless data networks over amateur radio frequencies (2.4 GHz & 5.8 GHz bands).
- Mesh Networking: a type of networking where each node must not only capture and disseminate its own data, but also serve as a relay for other nodes, that is, it must collaborate to propagate the data in the network.
- Self-healing capability – more than one path between a source and a destination in the network.
- BBHN (Broadband Ham Net) – Gary covered the characteristics of the BBHN, software versions, node types (Linksys, Ubiquiti, Raspberry Pi, all of which he brought with him), how to select the appropriate device for what you want to do, how to use BBHN nodes, how to configure BBHN nodes.
- BBHN uses: virtually anything available from a wired network (email- Winlink, file transfer, digital voice, streaming video).
- BBHN, how to get started: Which routers to start with, downloading software image, uploading software to router, and configuring the node.
- BBHN range: Antennas!
- Large BBHN implementations (Texas, Florida, Oregon, Southern California?)
- Internet links: Developer web site: www.broadband-hamnet.org; HSMM-Pi: hsmmpi.wordpress.com and github.com/ulgrey/hsmm-pi.

The slide presentation from this talk was sent out via email to all of those on the jplarc email reflector. If you didn't receive a copy but would like one, please contact Jim Marr and he can send you a copy.

BOD Meeting Aug 29th

By Rob Smith W6GRV; edited by Jim Marr AA6QI

Present were: Bob Dengler† NO6B, Courtney Duncan†* N5BF, Jim Marr†* AA6QI, Rob Smith†* W6GRV, Jan Tarsala† WB6VRN. On the phone: Chris Carson†* KE6ABQ, Walt Mushagian† K6DNS.

Note: † indicates a regular member, and * indicates BOD member. For a BOD meeting quorum, the JPLARC Bylaws require a majority of the BOD (four or more). We had four BOD members so we DID have a quorum.

President Steve Townes was not able to make the meeting today so Vice President Courtney Duncan presided.

Discussed options for EmComm year-end equipment purchases should Will Michael still have funds remaining for such purchases. Jim Marr took an action to discuss with Will Michael next week [ed. We missed the year-end opportunity].

There was a discussion about the performance of the 445.20 repeater. Bob Dengler reported that measurements show that radiated signal strength is within 1 dB of what it has usually been so Bob attributes the reduced signal strength in some locations as being to the location change from Cerro Negro to the JPL Mesa enclosure 35A.

JPLARC Repeater White Paper:

Bob Dengler had distributed a white paper titled "*The JET Propulsion Laboratory Amateur Radio Club/Emergency Amateur Radio Service Repeaters, a brief history & where we need to be now*." Key points from this white paper:
- The 220 repeater moved from the JPL Mesa to Cerro

Negro in ~1979 and the 440 repeater followed it in ~1998 due to inadequate coverage of JPL and in the immediate surrounding community. The 2m repeater was not moved to the mesa for a number of reasons, chief among which was avoiding a direct line of sight with an adjacent channel repeater on Santa Anita Ridge that would have resulted in significant mutual interference due to the narrow channel spacing on 2m.
- Since moving these two repeaters back to the Mesa in 2013, we are now experiencing the same problems that motivated the original move to Cerro Negro.
- We have a limited window of opportunity to move back to a site with more suitable coverage for JPL EmComm needs before the 220SMA and SCRRBA repeater coordination committees fill the coverage area vacated by our move back to the Mesa.
- Challenges: Finding a site that is willing to host us; Rent; JPL Safety and NMO approvals (if NASA funded).
- Mesa enclosure 35A would still be used for the 2m repeater and backup 220 (the 224.70 repeater) and 440 (our new Kenwood NXR-810) repeaters.
Jim Marr took an action to discuss these points with Will Michael and to provide Will with a copy of Bob's white paper. [ed. Done].

IRLP/Echolink:

Bob Dengler agreed to put together a proposal for moving IRLP/Echolink to a Raspberry Pi (as Randy Hammock KC6HUR had suggested some time ago).

Open Work Items:

The Board discussed a list of open work items. These included:
- Building 310 HF noise source identification (Marr to coordinate).
- 2015 Guest Speaker list.
- Rack mount PC in enclosure 35A on the Mesa.
- Shack move (list of requirements for the facility at the new site; Deciding what to take and what to move from 173 to the new shack and what to move elsewhere; and what to do with old club records).
- Emergency power at 35A and 180-R6.
- Request by NASA Armstrong (NFRC) to install an RMS Packet Gateway at Table-Mountain that was previously referred to the repeater committee.
- Communication Van repairs and upgrades.

MeetingPlace to WebEx Migration:

JPL is changing from MeetingPlace to Webex sometime in late September. There will be an overlap period so we should be ok for the September Regular Meeting but we will need to make the transition to WebEx shortly thereafter for all Board and Regular Membership meetings.

Additional Equipment Sales:

Jim Marr went through a presentation for discussion about what additional equipment the Club should considering selling. Those present suggested the following:
- Sell the three 2m-only rigs (ICOM IC-27H, ICOM IC-281H; Kenwood TR-9130).
- Sell the two 70cm all mode ICOM radios (IC-471A w/ PS-30 external power supply, and IC-471H w/ internal power supply).
- Marr to talk to Phil Smith WB6LQP about whether the three ATV radios should be kept or sold (PC Electronics TC70-20S ATV transceiver; ATVR-4 426.25 MHz ATV receiver; and ATVR-12 1265.25 MHz receiver).
- Sell the ICOM AG-35 70cm preamp.
- Sell the packet station (AEA PK-232MBX TNC and MFJ-8621A Data Radio).
- E-waste the video modulators & demodulators in the cabinets in 180-R6.

July Treasurer's Report:

Beginning Balance:		$	**$ 4,338.14**		
Deposits:	+	$	$ 10.00	–	2014 Membership Dues
	+	$	$ 15.00	–	commissions on ARRL individual memberships
	+	$		-	Used Equipment Sales
Subtotal:			$ 25.00		
Payments:	-	$	$ 54.17	–	AA6QI - Field Day Prep
			$ 183.82		AA6QI - Equipment maintenance and repair - other
			$ 98.01		AA6QI - Equipment maintenance and repair - HF
			$ 36.95		AA6QI - Equipment maintenance and repair - Antennas
Subtotal:			$ 372.95		
Ending Balance:		$	**$ 3,990.19**		

Per the Bylaws, any decisions for disposition of JPLARC equipment must be taken to the Regular Membership for approval prior to such disposition.

BOD Meeting Sep 12th

By Rob Smith W6GRV; edited by Jim Marr AA6QI

Present (or on the Phone) were: Jim Marr†* AA6QI, Jim Lux† W6RMK, Rob Smith†* W6GRV, Jan Tarsala† WB6VRN, Steve Townes†* WB4ILW. On the phone: Chris Carson†* KE56ABQ and Walt Mushagian† K6DNS.

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Secretary Rob Smith reported that we are up to 48 members for 2014.

Jim Lux W6RMK reported that we now have a network drop at the repeater site on the Mesa at enclosure 35A, so we are now ready to acquire the rack mount PC that the Board approved back in May.

Steve Townes discussed our current budget status (still based upon the July Treasurer's report since the August CITCU statement isn't yet ready). We are currently under-spending relative to our approved 2014 budget.
- FD was under due to sharing with PRC;
- Have not spent on internet services; and
- Have not spent on acquisition of equipment.

Steve Townes, Courtney Duncan, and Eric Archer have had multiple conversations with Bob Deville & Will Michael regarding our shack move necessitated by the new parking structure. Steve Townes suggested one of

our meetings next year be an open house at the new shack when it is becomes available.

The Station Facilities chair position was discussed and it was agreed that Steve Townes will approach Eric Archer regarding assuming the chair. Other committees discussed briefly included Field-Day-2015 chair and the Nominating Committee chair (volunteers needed).

Discussed upcoming guest speakers.

Discussed open work items:
- Bldg. 310 HF noise source identification;
- Speaker list for 2015;
- Rack mount PC for Mesa enclosure 35A;
- Repeater coverage improvement proposal;
- MeetingPlace transition to WebEx;
- Internet services: 1) Marr sent out his summary of the current state of knowledge about our internet services; 2) IRLP/Echo Link migration to Raspberry Pi (Bob Dengler). Jim Lux has a Raspberry Pi that he will give to Bob Dengler to use for this project; and 3) Rob Smith to meet with Bob Dengler to become familiar with how to access the computers in 180-R6.
- Shack move: 1) Steve Townes, Courtney Duncan, Eric Archer to develop requirements for new shack as soon as possible and get to Will Michael; 2) Bill wood has a significant amount of club historical records for archive that he would like to hand off to someone.
- NASA Armstrong's (NFRC)'s request to install an RMC gateway at Table Mountain – Jim Lux reported that it was determined by the Repeater Committee that we are unable to support their request but still need to follow up with them.
- Communications Van: 1) There is a fix-it list prepared by Jim Marr following the 'Say HI to Juno' event last year; 2) Concern about Kenwood TM-D710A rig did not seem to work on 440 when tested during the 'Say HI to Juno' event; 3) Need to obtain a better 80m/40m antenna with an antenna tuner for the Comm Van (the ATAS-120 doesn't work well at these frequencies); and 4) it was suggested that we consider getting a 500 watt amp that would be helpful in an emergency though, should we want to do this, it will impact the selection of the antenna tuner.
- Steve Townes needs a shack key and will follow up with Rob Smith.

Discussed the great shake out Oct. 16th (about 10 to Noon):
- Will Michael intends to activate JEARS;
- Plans a 2-hour building collapse drill with USAR and JEARS participation;
- Need one person from the Club serve as a POC for Will Michael to work with;
- Need person to act as net control (Chris Carson will be there if possible);
- Jan offered to get on the Wednesday morning California Governor's net once we solve the building 310 HF noise problem;
- We were reminded that Will Michael wants all JEARS members to have taken NIMS courses: IS-700, IS-100, IS-200, and IS-800 and to have sent him their completion certificates.

Additional Equipment Sales discussion:
- At the last Board meeting, we considered what is needed only for JPL but Jan Tarsala suggested that we should consider what might be needed at Goldstone before we sell any further equipment;
- Jim Marr presented a list of equipment to keep, sell, or e-waste based upon the previous Board meeting discussion;
- Motion was made to transfer to Goldstone, sell or excess the equipment as proposed in the presentation;
- Board agreed unanimously to bring this to a vote with the general membership at the next meeting as required by the JPLARC Bylaws.

It was mentioned that Jay Holiday is unable to get into the repeater now that it has moved and it was suggested that we offer him the loan of one of our 220MHz Yagi's. Walt Mushagian agreed to ask Jay whether he would be interested [ed., Done. Jay already has a 70cm Yagi that he just hasn't had a chance to put up yet].

Actions: First priority: Steve & Courtney need to meet to develop the list of shack requirements. Second priority is the 310 building HF noise issue that Jim Marr will try to schedule for the next RDO.

JPL ARC EmComm

By Jim Marr AA6QI

Bill Weber N6CI and I were doing some preparations for Field Day and needed to coordinate our arrival times at multiple sites. I immediately assumed that we would use our HTs and Club repeaters to do that coordination, only Bill didn't have an HT with him. I offered to loan him one but he pulled out his iPhone and pointed out that he already had a radio that should work fine (once we exchanged cell phone numbers). This jogged my memory from my ARRL Introduction to Emergency Communication Course, Topic 24, "Alternate Communication Modes", which is this month's topic for this column.

I think that we all tend to forget that just because we have HTs doesn't mean that they or even amateur radio is the only or best method for communicating a message. This is especially true for sensitive information that might be subject to interception and misuse if broadcast over the air. As communicators, our job is to get the message through accurately (and securely, if necessary) to its destination regardless of how we achieve that goal. So, what are some of the alternative methods that we might consider?

As I was reminded by Bill Weber, use of landline phone, fax or cell phone, if they are still functional and not overloaded, are both relatively private and secure. Most cell phones support text messaging and email, both of which also support sending pictures as well as text. The downside is that the originating party needs to know the phone number of the destination party, something that can be facilitated in advance for emergency response teams that know they will be working together.

A developing capability in some brands of cell phones is the capability for cell phones to serve as relays for messages if towers are down and there is a sufficient density of compatible cell phones available nearby. We should see more of this in the future.

There are also a number of apps for smartphones that turn them into two-way radios (check your app store under "walkie talkie"). One example is an app called Zello Walkie-Talkie that works on just about any platform and allows one-to-one or one-to-many connections over any cell network or wifi connection, and it's free with no add's. Some of these apps allow you to see on a map where others in the conversation are located. We might consider standardizing on one for use by the Club as a backup communication capability. Currently, these apps require a working cell or WiFi network so they might not be working if all networks are down (unless peer-to-peer capabilities can support the connectivity). Expect more developments in this area in the future.

Use of digital modes (PSK31, RTTY, AMTOR, digital phone) are somewhat more secure than voice, especially if non-standard frequencies are used (away from the normal frequencies used for these modes). Even CW is a bit more secure than voice modes, since the general public usually isn't proficient with CW (as is also becoming the case with many hams).

Family Radio Service (FRS) radios. These radios are very common now. There are 14 available UHF channels and 38 different CTCSS codes. Output power is from 100 to 500mW, depending on model. REACT recommends using FRS channel 1 (462.5625 MHz) with no CTCSS code as an emergency-calling channel. The first seven FRS channels overlap with the General Mobile Radio Service (GMRS) service and an FCC Report and Order explicitly permits communication between these two services on these channels (while staying within the 500mW power limit). One caution is that FRS radios come with 1 to 14 channels and channel numbers on different radios don't always correspond.

Other radio options that might be available include CB radio, GMRS, marine radio, aviation radio, and others, all of which might be useful modes for getting a message through if there are no other means of doing so.

Then there's always the "sneaker net" where runners carry messages from place to place, perhaps one of the best modes for sensitive or lengthy messages when fax and phone lines are out of service and a runner can get through. Acting as a courier does not eliminate the use of radio, since couriers usually need to be dispatched from place to place.

In summary, stop and think about options for getting your communication through and which might be the most appropriate given the content of the message. Your HT isn't always the only choice or perhaps even the best choice.

Roofing Filters

By Jim Marr AA6QI

Most modern contesting rig advertisements that you see in QST brag about the effectiveness of their roofing filters, but what is a roofing filter and why would you need one?

A roofing filter is a filter that is placed immediately after the first IF mixer to limit the frequencies passed down the IF chain of the transceiver and gets its name because it protects the IF chain from being overloaded by strong nearby (in frequency) stations, much like a roof protects the contents of a building from rain. The roofing filter is installed ahead of the AGC circuit so strong nearby signals don't drive the AGC which might result in burying a weak signal that you're trying to work.

INRAD makes a few roofing filter mod kits for a few older radios that didn't originally come with one (e.g., our FT-1000D's and our TM-850SAT). INRAD investigated developing roofing filter kits for a number of other radios and, in some cases, found that they didn't help the radio much or that there wasn't room to install one (the latter applying to our FT-847) so declined to develop filters for them. INRAD does, however, sell a number of crystal filters for various first IF frequencies and several "experimenter's boards" that might enable you to put together a roofing filter for your radio (e.g., with a little internet surfing, I found two different approaches to implementing an FT-847 roofing filter using the INRAD parts, one internal to the radio and one external to the radio).

So, do you need one? Roofing filters are valuable for contesters who operate with high gain antennas or where there are other strong signals in the immediate area (e.g., Field Day or EmComm operations). Casual operators are unlikely to notice much benefit from them.

To learn more about roofing filters, try: http://www.qth.com/inrad/roofing-filters.pdf.

Yaesu FT-847:

By Jim Marr AA6QI

I recently came across a great deal on a Yaesu FT-847 "Earth Station," just like the one that the JPLARC has up in our 'second shack' in 180-R6. This compact all-mode radio, which was manufactured from 1998 through 2006, covers HF/6m/2m/70cm and includes: a general coverage receiver; satellite tracking modes; cross-band repeat; and 100 memories. After purchasing the radio (a 1998 version; a bit older than our Club's 2000 version), I did some research about the radio and found that it has a number of issues that result in the relatively low resale value for these radios (about 1/3 of original manufacturer's suggested retail price) but that aren't that difficult to fix, so I thought that I'd pass along some of what I've learned about this radio in case others run across a similarly good opportunity to acquire one.

A couple of great sources of information about the FT-847 are: the FT-847 FAQ at http://www.supercontrol.de/cat/ft847faq/ft847faq.htm#p, and the Hampedia page at: http://www.hampedia.net/yaesu/ft-847.php (this second site even has a set of very high-resolution bit-mapped schematics, for this and other radios, which are really handy).

One thing to be aware of is that very early versions of this transceiver had a unidirectional CAT port (computer-to-radio only). This was fixed, along with a number of other things, in all units produced after S/N 8G05xxxx. Yaesu was willing to fix these under warranty, so be sure to check whether that was done if you find a unit with S/N earlier than 8G05xxxx. Both the Club's and my unit have later serial numbers and my CAT port works both ways.

The one serious issue that this radio has is that the power switch on the front panel fails a lot. This switch is a DPDT push-button switch with each pair of contacts rated at 100mA. Yaesu originally only used one side of the switch and owners reported that the switch can briefly experience more than 1A of inrush current at turn on, resulting in arcing at the switch contacts that eventually leads to switch failure. While this amount of current seems unlikely given that the switch only provides power to two voltage regulators and a reverse-current-diode-protected relay coil (the voltage regulators provide power to the microprocessor and the relay provides power to the rest of the radio), the evidence of burnt switch contacts speaks for itself (perhaps there is a failure mode that results in this happening on some units and not others?). Owners of these radios have developed a number of "fixes" for this problem over the years, often after experiencing multiple switch failures that require a painful disassembly of the front panel to get to the switch (BTW, the Yahoo FT847 group has identified a source of replacement switches).

Of the several 'fixes' to this switch issue, the one that I implemented, is to insert a p-channel power MOSFET to switch the power that the front panel power switch formerly handled and use the front panel power switch to just control the MOSFET's gate voltage. This is a really easy and low cost fix to implement and one that results in completely eliminating the switch overcurrent concern. For details see the link: http://www.schray.de/847/DL8UA%20Yaesu%20FT847%20Powerswitch%20MOD%2012.pdf. I implemented the circuit on a small piece of perf board, wrapped it in shrink tubing, and mounted it with Velcro next to the fan at the front of the radio (you can find an example of this being done using a Radio Shack 12V relay (instead of the MOSFET) under [P] in the Supercontrol site link provided earlier in this article).

The second issue is more of an annoyance and, if you get one of these radios, you may or may not choose to do anything about it. The radio has two fans, one inside behind the front panel that runs slowly during receive and fast during transmit and the other is a small muffin fan on the back that runs flat out all of the time. This second fan is the problem in that it is pretty noisy (high pitched whine). Again, owners tried a number of fixes (including just unplugging it) but to me the best option was adding an n-channel power MOSFET-based thermostatic temperature controller with the MOSFET gate voltage controlled by a voltage divider containing a negative temperature coefficient (NTC) thermistor mounted to the chassis next to the small fan. I happened to have some thermistors left over from a project I did over 30 years ago so I adapted the design described at http://www.hampedia.net/yaesu/ft-847-thermostatic-fan-speed-controller.php. I built this controller on a small piece of perf board and wrapped it in a piece of shrink tubing (the first one I built was too big to fit in the radio so I had to build a second, smaller one). One thing that I did differently was to get power for the MOSFET gate voltage-divider from a separate power source than the fan because the fan pulls its power through a 22-ohm resister, which, if I had used the fan voltage for the gate voltage divider, would have introduced a negative feedback loop into the gate voltage control. I liked this solution so much that I built two more for a couple of

MFJ switching power supplies that also had continuously running (i.e., annoying) fans.

Other improvements that I made to my FT-847 include: 1) enclosing the master timing oscillator crystal (X1001) in a piece of Styrofoam to insulate it, improving frequency stability since the radio does not have a temperature compensated crystal oscillator (TCXO); 2) purchasing the optional 500Hz Collins CW mechanical filter from INRAD for the 455kHz IF chain to improve CW selectivity (INRAD also has crystal and mechanical filters with other bandwidths for this radio); and 3) purchasing an LDG AT-100Pro-II automatic antenna tuner so that I can use the CAT interface to my logging program while still having an easy to use automatic antenna tuner, something that you can't do with either the Yaesu FC-20 antenna tuner or the Yaesu ATAS-100 or -120 screwdriver antennas intended for use with this radio (the LDG tuner also shows SWR, which is something else this radio doesn't have built in and it also tunes a much wider range of antenna impedances than the FC-20). An alternative is to buy LDG's YT-847 antenna tuner that is specifically designed for the FT-847 so that it works with the FT-847's Tune button while still allowing you to use the CAT interface at the same time. The YT-847, though, doesn't have an SWR meter like the AT-100Pro-II, so you might need an external SWR meter to go with it. I also chose the AT-100Pro-II so that I could still use the tuner with radios other than just the FT-847.

This radio also doesn't come standard with a DTMF microphone (although we do have one for ours up in 180-R6) and the MH-36D8 DTMF microphone for this radio is exceedingly rare. While it is possible to modify another DTMF mic (e.g., the MH-36EJ8) by changing the cord plug (some have done this), so far I have chosen to instead download a DTMF encoder for my smartphone that allows me to play DTMF tones into the radio's mic to do things like control the Table Mountain link when using the JPLARC's 445.20 MHz repeater.

You might also want to be aware that the radio has a 'clone' feature that allows you to download complete radio configurations to a PC for storage or manipulation and later upload, allowing you to keep multiple configurations on the PC and upload the one you want when you need it. One example of this is FTBasicMMO from http://www.g4hfq.co.uk/ftbasic.html. Another is Supercontrol at the link earlier in this article. Neither is free. While I haven't yet personally used either, I plan to begin exploring them as part of my journey towards learning to communicate through satellites.

After making the changes described above, I find the radio a very nice addition to my shack and plan in the near future to build a pair of omnidirectional antennas (2m/70cm) to enable me to explore the world of working satellites.

I perhaps should also point out that at first I was a bit intimidated by the FT-847's menu system (this is my first radio with menus) but, after working with it for a while now, I find that I don't really have to use it very often (most menu items are set-and-forget) and, when I do need to use it, it isn't really that difficult to navigate (especially with the menu summary sheet that either comes with the radio or is available on the aftermarket).

All in all, I'm now quite satisfied with the radio and wouldn't hesitate to purchase it again if I had it to do over. If you should run across one at a good price, I'd encourage you to give it serious consideration.

MFJ-4706 Coax Patch Panel:

By Jim Marr AA6QI

As the number of HF radios and HF antennas in my shack increased, I got tired of climbing behind the radios to change antennas, I decided to buy an MFJ-4706 twelve connector patch panel, the idea being to hook up each antenna to the inside of one of the patch panel connectors and hook up each radio input to the inside of other patch panel connectors, allowing me to connect any antenna to any radio using short patch coax cables. This is basically the same arrangement that we have in the 173 shack (although due to the fire that took out our Mesa antenna feed lines a number of years ago, we now only have one antenna, a Cushcraft R7000 vertical, and one radio, a Yaesu FT-1000D, left hooked up to that panel). Hopefully the patch panel in 173 will be moved to our new shack when it is ready for us.

When the MFJ-4706 arrived, I found that the coax bulkhead connectors used in the panel were completely unsatisfactory for a number of reasons. First, they were too long (2") resulting in tight bends in the coax cables connecting on the inside of the box or excessive protrusion on the outside of the box. Second, the internals of the bulkhead connectors were so loose that every time I disconnected a patch cord, the guts of the connector would come out attached to the patch cord

connector, often resulting in some of the small connector internals falling down behind all of my radio gear. Third, the threads on the connectors and the hex nuts that hold them to the panel were so poorly made that the connectors would not stay tightened to the panel so every time I mated or de-mated a patch cord, the connector would come loose.

I immediately wrote a letter to MFJ complaining about the poor quality of the bulkhead connectors (they acknowledged my complaint but didn't offer any compensation) and ordered replacement set of high quality Davis RF, Inc. part number 7518-A-1125 one-inch long bulkhead connectors from Amateur Radio Supplies at $2.99/each + S&H. The new connectors fit and work perfectly (i.e., they stay together and tight on the panel).

One other issue with the panel was that the edges of the two rectangular coax entry openings to the panel insides were very sharp and might have cut the coax jackets. I rounded them with a file and cut some small plastic tubing lengthwise down one side to fit over the edges of the openings, providing smooth cushioned surfaces for the coax to pass over.

After these fixes and attaching a label across the front of the panel between the rows of bulkhead connectors to tell me what was where, the patch panel works as I had originally expected that it would. I must say that this is the first MFJ product that I've purchased that I was really not happy with just as it came out of the box. So, if you decide to buy one of these (or the smaller 8-connecter version, the MFJ-4704) be aware that you are likely buying it for the box and will probably need to replace all of the connectors (it is a nice looking box, though, and just perhaps MFJ heard my complaint and will use better connectors in the future).

ARRL Membership:

By Jim Marr AA6QI

As an ARRL affiliated club, at least 51% of our membership must be ARRL members. Today, we have 71% as either Life (8) or Regular (26) ARRL members. That leaves fourteen 2014 members who are not ARRL members (a few of which are family members of ARRL 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 Jim Marr 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. Call in is via MeetingPlace 818-354-3434 with ID 7373. Slides, if any, will be broadcast via http://meetingplace.jpl.nasa.gov also with ID 7373. Upcoming talks (subject to change):

October 24th: Steve Townes WB4ILW, Software Defined Radios & introduction to the 2015 Officer Nominating Committee.

November 21st: N5BF, Bicycle Commute APRS & Introduction of 2015 Officer Candidates.

December 19th: Club holiday celebration; currently TBD.

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