Test Equipment for an Amateur Laboratory

With a flood of off-shore modern equipment and older equipment available, deciding which test equipment to get for home use can be confusing. Choices are usually driven by low price and fortunate trades or swap meet deals. This talk will survey the best cost vs value equipment commonly available, and will be sorted from cheaper to more expensive. The focus of one's choices has to be on what the most common measurements will be, what level of accuracy is desired and the desire for "legacy" equipment. It is hoped that the talk will help attendees make more informed choices about equipment they may need.

At the talk I will also have available a voltage source and a resistance source. Members can bring their own equipment to check their calibration. Both have .002% accuracy.

Looking forward to being with you.

Doug Millar K6JEY

Doug Millar K6JEY was first licensed in 1957 as KN6JEY. He has always been interested in CW and microwave communications. Starting in 1978 he became interested in metrology (calibration and repair of test equipment) and built his first DMM. Since then he has specialized in RF power measurements and DMM's and equipment repair; consulting until recently. Doug has DXCC (270w) WAS Oscar, and worked about 25 countries on EME. He has been active on EME on 144,432,1296,2306 and 10GHz EME and has microwave stations up through 122GHz. He was one of the three designers of the 40m EME effort at Owens Valley Radio Observatory.

Doug is a semi retired college professor in Education and holds an EdD from Pepperdine.
**Board Meeting Minutes**

The September 2017 FRC Board meeting was called to order at 7:30pm by President Bob Houghton AD6QF. Others present: Vice President Walter Clark, Treasurer Gene Thorpe KB6CMO and Secretary Linda Endsley KJ6IHB. Directors: Paul Broden K6MHD, Richard Belansky KG6UDD, and Robert Gimbel KG6WTQ. Member: Cheryl Thorpe KE6TZU.

Treasurer’s report: Savings - $2,607.14; Checking- $4,043.01

Minutes from the August Board Meeting were read and approved.

**Old Business:**

Need speakers for the general meetings.

The Holiday Dinner will be Friday, December 15.

Ham Con will be September 15th, 16th, and 17th in Torrance.

**New Business:**

The August general meeting was a swap meet. Did make some money. Sold some things from the Kohlenberger and Vigus items. Need to decide how to use these funds.

Pre-general meeting dinner alternate for September will be at Black Bear Diner on Harbor.

The speaker for the September general meeting will be Doug Millar; topic will be instruments that are affordable for both beginning and advanced hams.

Paul has leftover items and will bring to a general meeting. He has some old radios and books to sell; will decide how to let members be aware of these.

Discussed having a variety for general meetings; swap meets, speakers

Next board meeting: 4 OCT 2017

Adjourned at 8:20 pm

Submitted by Linda Endsley KJ6IHB

**Special Note**

Our club President will be appointing a nominating committee for selection of candidates for next year’s officers. He may be asking you to be a committee member!
It’s déjà vu all over again
Some of us have been radioactive long enough to have discovered a new mode or technique, learned and enjoyed it and then let it fade into disuse, only to rediscover it years later. I have recently had that experience with APRS.

As I’m sure many of you know, APRS, or Automatic Packet Reporting System was developed by Bob Bruninga, WB4APR, at the United States Naval Academy in the 1980s. Over the years, APRS continued to be refined, and with the advent of affordable GPS units, became quite popular in the 1990s.

I first discovered APRS about twenty years ago, when I was given the task of keeping track of our team’s runners in the Baker to Vegas relay race. Using a Garmin GPS-12, Kantronics KPC-3 TNC, and Kenwood TM-231A 2 meter mobile, I put together an APRS tracker that would beacon the position of our “chase car” every few minutes. At the receiving end, I had another radio and TNC as well as a laptop running dosAPRS, the next year WinAPRS, and the year after that, MacAPRS - the latter two written by the Sproul Brothers. I remember getting an immense amount of enjoyment from wiring the serial cables, learning to parse NMEA sentences, and getting all the various settings right in the TNC.

During those same years, I also had a habit of monitoring 146.52 MHz whenever I was on long road trips, away from major metropolitan areas. Every summer, I had many pleasant mobile conversations with other hams who were monitoring the frequency.

Fast forward twenty years.

In recent years, I have noticed much less activity on our national two-meter calling frequency. Two summers ago, I was on the road for 11 weeks, through much of western US and Canada. In 11 weeks of monitoring 146.52 MHz, I heard exactly zero hams on the channel. Although I saw a number of cars with antennas, I never managed to raise them when I called.

Last year I stumbled upon an APRS tutorial and discovered that APRS had evolved over the years. In about 2004, something called “Voice Alert” was added to the APRS specs. Voice Alert is one of those simple but clever ideas. It works like this: Hams that are beaconing their location with APRS packets on 144.39 also run a CTCSS of 100 Hz. That way, they can keep their volume turned up on 144.39 MHz yet not hear a constant buzz of packets. When a ham running Voice Alert comes into simplex range, you will hear their packets, since they are also sending the 100 Hz PL. If you hear packets, you know you have encountered a ham using Voice Alert and can give them a quick call on 144.39, saying something like “Voice Alert, listening on 52.” The other station will hear you and everyone quickly QSYs to 146.52. The APRS beaconing acts as a sort of “radar” to announce the presence of another ham who is listening and in simplex range.

This summer, I spent 12 weeks traveling 11,000 miles as I camped across the US and Canada. Rather than listening on 146.52, this year I monitored 144.39 with a 100 Hz tone squelch. Using the technique I just described, I had QSOs with about 20 stations. I did this with a single-band mobile radio that does not have APRS capability. Interestingly, about half of the hams I talked to were driving Jeeps. I guess APRS is really popular in the Jeep community (at least in Canada).

There are modern dual-band radios that have GPS, TNC, and APRS built in. Some of these will allow you to do the QSY part of Voice Alert by pressing a button.

I think we have an interesting guest speaker this month. Let’s reward him with a big turnout! I hope to see you Wednesday!

73, Bob - AD6QF

Books Available

The estate of Vince Vigus W6ZKZ has left us with numerous books that are of interest to Hams. Many are associated with antennas and/or antenna design. Most are on the subject of electronics. Many are historic. They are available to club members if you have sincere interest in the subject. Here’s an abbreviated list:

- Electronics of Radios
- Electronics – lab Experiments
- Cubical Quad Antennas
- Differentia & Difference Equations
- The Principle Underlying Radio Communication (1921)
- Antenna Experimenters’s Guide
- QED – Light and Matter
- The Nature of Space & Time – by S. Hawking
- Antennas – by J Krause (signed by author)

We’ll have them at the September meeting
Eclipse Observation

I realize this posting is off-topic for this Yahoo Group but there has been interest in the recent solar eclipse by our Group members so let me give you my report of my adventure to see the eclipse. I observed a glorious total solar eclipse from near Casper, Wyoming on Monday, August 21. No clouds were seen and the weather was cool and quite pleasant with strong sunlight. At eclipse totality, there were unexpected streamers and unexpected structural detail in the bright white solar corona, three red coronal prominences and a superb diamond ring at third contact. Simply Wow! There were 262 in our eclipse tour group; I've used this tour group for four solar eclipses and know many of the regulars. I was surprised at the pre-eclipse coordination meeting to find that the vast majority of tour members were "eclipse virgins," never before having seen a total solar eclipse. We set up at our primary viewing site at Glendo Airport, Wyoming within 100 meters of the eclipse path centerline, because it was clear weather there early Monday morning. The City of Glendo population is 1500 but had 90,000 visitors on August 21! Glendo "Airport" is a bit of a stretch! In actuality, the airport is quite large but has only one grass runway, is unattended and is used primarily for ultralight aircraft. The proper name is Thomas Memorial Airport. However, the vast (remember, this is Wyoming!) grass fields were a great place to host the huge crowd of eclipse viewers. Fortunately, the entire field had been mowed in preparation for the visitors. We left our hotel at 4:30 am to avoid traffic in the 1 hour drive from Casper to the Glendo airport; that worked well. We had the only reserved area at the airport, a 40 x 120 foot awning for shade, 300 chairs and lots of snacks and drinks. All that was possible because our tour planning for this eclipse event began four years ago. The downside was that everyone at the airport left shortly after fourth contact and there was a monumental traffic jam. We were in five buses and drove northwest to Casper but the folks trying to drive southeast to Denver were projected to be in a traffic jam until the next morning! For miles and miles and miles there was no movement in that traffic after the eclipse! One remaining tour event, a celebratory BBQ dinner, was Monday night. My bus for Denver left the Casper hotel at 8 am Tuesday. I'm bushed! But, I enjoyed an excellent, better than most (for sure), eclipse viewing and I got to watch it with my own eyes because this time I was not tied to a camera/telescope. I did take some cell phone video and got crowd sounds at totality! This was my seventh solar eclipse viewing. Amazingly, my son Matthew and his family (ages 3+ and 5+) drove from Chino, California to Oregon on Saturday night (a 20 hour drive with traffic), stayed at a friend's home in Oregon, then drove 100 miles on Monday morning to park in a pullout area on Hwy 5 exactly on the eclipse centerline! He had no clouds and the whole family watched the eclipse. There were several other families there, including a German couple who shared wine after the eclipse. I took Matt to the 1991 total solar eclipse in Cabo San Lucas when he was age 9. Now it seems he is continuing that tradition! This was one of the most enjoyable of all the eclipses I've viewed! The sky was dark at totality, the solar corona bright and full of detail, there were red solar prominences, a pinpoint, searchlight-bright white diamond ring at third contact and a spectacular 360 degree sunset during totality. The air temperature dropped sharply; that makes you appreciate how much energy we get from the Sun! Some news pundits were saying that if you were already in a location that would get a 99% eclipse there was nothing to be gained by traveling to get to totality! That is absolutely false! If you have never seen a total solar eclipse it is difficult to appreciate or to describe how spectacular totality really is! But, you must go to where the eclipse happens and that has surely sent me to some strange, remote places over many years!

-- Best wishes, Larry McDavid W6FUB
Activity Reports of the Fullerton Radio Club for September 2017

Bob Houghton briefed us on his vacation across Canada. On the many thousand mile trip he had his ham radio tuned pick up APRS (http://www.aprs.org/) and found it quite rewarding. Curiously most were driving jeeps which should be a clue to where future members may be lurking.

Benjamin Yu KK6RMX is a new member of the Hospital Group and last night led a discussion on the role of ham radio in small and large disasters.

Larry McDavid gave an excellent presentation on the August eclipse. He may be the speaker later in the year for the regular club meeting. He brought and demonstrated what might be the new trend in computer speakers. They are connected by way of the USB which means they are digital. He followed up Benjamin’s talk on ham radio and floods to tell his own experience with floods where he grew up in Galveston Texas.

Dan Slater also traveled to where the eclipse was total. He and Sandy stayed with a friend in a more isolated location and had no traffic jams while traveling to the eclipse. A few minor jams afterwards though. He and Sandy mainly watched the eclipse but also made a few photographs (see attached). That’s in contrast to Larry’s experience where there were many hundreds of spectators. Dan will be a presenter at Hamcon this Saturday at 10 AM; speaking on microwave antenna measurements.

Rich Belansky was one of seven people left in America that didn’t go to the path of totality. He made measurements though. He wanted to see if there was any change in the ionosphere as the moon made night in the middle of the day. Or evening anyway. What he did was to measure the S-meter output of his ham receiver tuned to the 10,000 MHz signal from WWV. His data needs to be compared to similar data at another time. He held up the curve and he said it doesn’t look promising.

Dick Palmer for once didn’t talk about QRP. Instead he brought a very specialized piece of HP kind of instrument for measuring the laser light through a fiber optic. He sun, just for fun and it said “no signal.” Of more interest to the rest of us was months experience with the Claremont said it is excellent for buyers but no sellers; of which he’s one.

Tom Gaccione bought pizza for the a bit late, but this was very much all who partook. He too participated in it was only as far as Orange Coast were two professional instruments people to put their cameras up next to. instruments had hydrogen alpha filters prominences to be seen even without eclipsing the sun. In the picture of the can see what appears to be a flame on the upper left.

Tom also passed around the pictures taken on an adventure, he, Bill Preston, Dan Slater, and Walt Clark did in looking for high ground to do microwave hamming. We ended up at the Nike Site where Bill was on National Guard duty there as a young man. We were told to leave by someone pretending to work for the government. We suspect he was a caretaker paid for by the people that own the 6 head of cattle that graze the land.
Tom used the Fieldfox to measure a variable filter Larry gave him. He passed around curves for that and an antenna pattern he did for Joe’s measuring-tape antenna used in T-hunting.

Brea Nike Missile site in the 1950’s Tape

Simulation

Brea Nike Missile site today the way Tom, Bill, Walt and Dan found it.
Walt Clark showed the hood he made for viewing of a laptop. This is essential for defined radios with microwave gear in a process of testing this out he explored many. One was the Nike Site expedition. Another was the hills around Brea Dam interested in spillways of dams. He spent about how they are used to protect the dam. many pictures he took on his adventure. It is antenna support structure which Joe Moell recognized as something the FRC used.

Below is a Brea Dam antenna

Joe Moell was in Ohio for the Championship Radio Foxhunting (http://homingin.com/farsnews.html) but he mostly talked about the Edison 3-phase wiring saga of the air conditioning unit for their church. It was very technical but had something to do with an attempt to steal No 4 gauge copper wire and Edison accusing Joe of miswiring something or other.

Dave Rugh from 23b joined us tonight. Walter knows him also from the local libertarian supper club. His degree is in Economics from Stanford but of course he is programmer not doing much economics. Like most of us his projects pile up on his workbench but not finished. One project he’s worked on has to do with indexing people’s WiFi signals. He used the word “scan” and MAC address. Not sure what you can do with that, but then we don’t need an application to do interesting stuff.
Speaking of interesting stuff not needing an application, **Bill Webb** finally finished getting Alexa to open his garage door from anywhere in the world by just saying: “Alexa, open the garage door.” He demonstrated it for us, but we have to take his word for it that the cat noticed it. Somehow there’s a built-in code so no one else can use those words to bother the cat.

Bill usually shares his experiments with Arduino, Raspberry Pi or ESP-32. Tonight though, he brought his StereoRealist camera and two viewers. He told us some history about stereo viewing. He says these cameras are of excellent quality and plentiful on eBay. The viewers are harder to find. There are digital cameras that do 3D and places to upload your pictures to get slides for 3D viewing. Bill also has the ability to put stereo images on his large screen TV at home. Special glasses are needed of course.

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**FRC Board Meeting**

Open to all Club members
Marie Callender’s Restaurant
126 Yorba Linda Blvd., Placentia
First Wednesday of each month.

**Next Board Meeting**
October 4, 2017

QSO and dinner; 7:00 PM
Meeting: 7:30 PM

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**September Meeting:**

Chapman Activity Center
2515 San Carlos Dr.
Fullerton, CA
March meeting will be:
Wednesday,
September 20, 2017

Meeting time: 7:00 PM
Visitors are welcome

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NOTE!
The pre-meeting dinner for September will relocate from Sizzler to **The Black Bear Diner**, Northwest corner of Harbor Boulevard and Berkley. Dinner time will be 5:00 PM