

Spurious Emissions



The Newsletter of the South Bay Amateur Radio Society



Volume 5 Number 2

Spring 2016

New Members

Welcome to the following new members of SOBARS:

Curtis Price, K6IBP

Thomas Mackle, KE6IB

Harold Pappas, KK6ZML

Editor's Notes

We have another full issue ahead of us. Of primary importance is recent storm damage to the building that houses our repeater. Fortunately, the damage has been repaired and the repeater was not affected. Other changes to the building have been made that make it more efficient for us.

We also have some information about station grounding, how to modify a Belkin battery box for amateur use and an article about how to renew your license very simply.

Once again, Dan Romanchik, KB6NU, provides us with a column. For this issue, he's giving us good reasons to upgrade to the Amateur Extra license.

Additionally, We have learned of a new threat to amateur radio antennas and I have included an article on the topic. ⚡



One of the storms we experienced in January tore part of the roof off the repeater building.

John Wright, K6CPO

President's Report

By John Wright, K6CPO

It's been three months since our last issue of *Spurious Emissions* and a lot has happened in that time. The most important item is the repeater building. It suffered some roof damage during the January storms and for a time was leaking quite profusely. The damage has been repaired and the building has a completely new roof on it. A full report follows later in this issue.

During February I spent 16 days in Shenzhen, China visiting relatives. I had never been to mainland China before and it was an eye-opening

experience. The trip dispelled some of the preconceptions I had about the country and I think I would like to go back again.

Field day is only 80 days away (at the time of this writing) and preparations are underway. This is the club's big event for the year and anyone that wishes to participate or help out should contact Derrick Dudley, K7SVN, the club Field Day Chairman. This can be done through the sign-up page on the SOBARS website.

As of this writing, I have contacted



**SOUTH BAY
AMATEUR RADIO
SOCIETY
(SOBARS)**

K6QM

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SOBARS is an ARRL-affiliated ham radio club with members from San Diego, National City, La Mesa, Chula Vista, Bonita, Imperial Beach, and San Ysidro, California.

OFFICERS

President: John Wright, K6CPO
president@sobars.org

Vice-President: Nestor Puñales
K6JTT
vp@sobars.org

Secretary/Treasurer:
Fred Curtis, K16GRO

secretary_treasurer@sobars.org

Call-Sign Trustee:

Jim Beckman, N6RSL

Emergency Coordinator:

Ramon Dueñas, KJ6QQK

Property Trustee:

Louie Vignapiano, K16SRR

SOBARS meetings are held at the Chula Vista RV Resort, 460 Sandpiper Way, Chula Vista, CA 91910
See the website for dates & times.

Club Repeater: 146.085 (+)

PL: 100.0

Yaesu System Fusion®

CLUB NETS

Club nets are held every Tuesday evening on the following bands:

1830: (PT) 449.980 (-) PL 88.5

223.840 (-) PL 107.2

1900: (PT) 146.085 (+) PL 100.0

1930: (PT) 28.480 USB

7.240 LSB

the Chula Vista Parks and Recreation Department about the club volunteering for a 5K Fun Run they are sponsoring on May 14th at the Olympic Training Center. So far, I have had no response.

Congratulations to our own Dave

Kaltenborn, N8KBC, on his election as San Diego Section Manager. I see good things ahead for the section.

That's about all I have for this issue.

73, everyone! ✈

An Easy Way to Renew Your Amateur License

Fred Curtis, K16GRO

One is never too old to learn. So the saying goes. Learning new things is one aspect of amateur radio that I really enjoy. Not only learning new things, but gaining knowledge from other hams, is a great thing. I bring this up because while helping a fellow ham and SOBARS member, I learned something new in the area of renewing one's amateur radio license.

I was assisting a fellow ham renew her amateur license. She had filled a form from the FCC and mailed it in to get her renewal. Instead of receiving her renewal, she received a form letter indicating she had not signed the form, which resulted in her licensed becoming expired. She had to start all over again. I went to the FCC web site and found a 10 page form that I thought could be used to renew a license. This form and its explanation on what was required, was clear as mud. The FCC is a government agency; need I say anything more?

If you have an account on the FCC web site, you can renew your license there. The person I was helping did not have an account and I could not create the account for her. What to do now? Remember that gaining knowledge thing? I contacted fellow ham and club member, Mike Todd, K6WD and explained the situation to him. He said, "You know she can renew her license using a NCVEC 605 form. Have her fill it out, check the "Renewal of my license grant" box, sign and date it. Bring the completed form to any VE session and it

will get processed along with all of the exams for that day. She will most likely have her renewal by the following Monday." I am embarrassed to say that I am a VE and had totally forgotten about that. I could had a v-8!

I took the form to our fellow member's house and had her complete it. I took it to the next SANDARC VE session which I participated in and gave it to Team Leader, John Wright, K6CPO. He told me there was no charge to submit this form because it was a renewal only. Great! He submitted her form with the other test forms for that day and low and behold, her license was renewed by the middle of the following week! One simple form was all it took.

The issue of renewing an amateur license was timely and of interest to me. My license expires in November of this year and I was wondering what I needed to do. Now I know of another easy method to renew my license. Per FCC rules, you may renew your license up to 90 days in advance of expiration. To get a copy of the NCVEC 605 form, go to <http://www.ncvec.org/ncvec605.pdf> and download it. Complete the top portion and bring it to any SANDARC VE session for submission. Simple, easy!

Thanks to fellow hams and SOBARS members Mike Todd, K6WD and John Wright, K6CPO for their assistance! No one knows everything, but as the song goes, "I get by with a little help from my friends (and hams)." Sing it! ✈

Some Notes on Station Grounding

Lionel Mordecai, K6CEQ

Good grounding is the key to an efficient station

A station ground should be at the house. Mine is #6 each of 3 foot copper rods wired together and electrically connected to all station equipment at the equipment ground.

Between copper stakes, and from external stakes into the house, I use 3/4 inch braid. The 5 foot distance from physical ground to the equipment ground, is covered by means of the flat braid in order to reduce inductance. Plain wire would keep your RF Ground above earth potential.

The braid connects to quarter inch diameter copper pipe run in the shack. Ham equipment and some lab equipment are connected to the pipe with ordinary 16 gauge wire, cut to shortest length practical. All radio equipment is grounded to the copper tube at as close to a single point on the pipe as possible. The lab stuff is distanced unavoidably, separated by 4 or 5 feet from the

radios. The thing for me to keep in mind is that if test equipment is connected to ham equipment, there may be microvolt potential difference between their grounds.

There is no special ground to the coax cables. The coax connects to the equipment as is normally done. Since the equipment is RF grounded at a single point, the cable is effectively grounded at that same point by the radios. "Single point" is an engineering approximation, an ideal, but we are talking about microscopic differences in RF potential. The error to avoid is having multiple ground potentials for your various equipment.

The ARRL Manual has a good write up on the subject of grounding the station equipment. Some material in it is not relevant to my situation, as for example, ground fault interrupters. Some may not be relevant to yours. But having a good RF and DC ground is universal, whatever antennas you use. ✎

Termite Mutation Threatens Ham Antennas

Craig Williams, W6CAW

Ham Radio BEWARE of aluminum antenna failures!

The revelation (below) about 'Animites' has now been linked to numerous Ham Radio aluminum antenna failures. High winds and weather related element loading can cause antenna failures. Only mitigation known is to annually apply anti-Animite mitigation coatings that will preserve your aluminum antennas. Elements have been known to break off elevated antennas becoming fatal to ground persons and radio communications.

Termite Mutation Threatens Aircraft

Recently-declassified government documents and photos reveal the rumors of aluminum eating termites (aka almites) are true. The aluminum termite is a mutation of a common termite seen all around the world. Bacteria in the digestive tract of the almite live off of aluminum oxides and secrete enzymes and nutrients essential to the almites survival.

Almites were first discovered in the 1920's as aircraft manufacturers were changing from the venerable 4130 chromoly tubing to the 20 series aluminum. Quick to discover the problem, scientists at the NACA and industry quickly developed coated aluminum (Alclad) that was resistant to almite attack. The development of alclad would prove essential to the Allied success in WWII.

During WWII, Germany was working on a Large Strategic Bomber (LSB) similar in size to the B-29. British commandos, working with the French Resistance, were able to place almites in the tails of the two LSB prototypes. The resulting unexplained crashes caused Hitler to kill the program (along with the company's chief engineer). Almites were also placed on several HE-111's, to devastatingly good effect.

In the US, fears that the almites would mutate further and attack alclad caused the military to consider the development of a large transport to be made completely out of wood. Contrary to popular belief, the Spruce Goose was not built because of a lack of aluminum, but because of the fear of contaminated aluminum. Only Howard Hughes and a small number of chief engineers were fully aware of the real reason behind the Dash 1 project.

Almites appear to have a sinister side in industrial espionage. Some of the US servicemen that worked with the British were rumored to be working for Boeing at the time that the two early Comets crashed. Rather than admit to the existence of the almites, the British agreed to drop the issue in exchange for US propulsion technologies.

In practice almites are easily taken care of. The feared mutation of alclad-almites has never happened, and in fact, there is DNA evidence that it never will. While almites can provide a source of common corrosion, it is typically found during the required annual inspection.

On the rare occasion that almites are discovered, they are dismissed as harmless bugs. The FAA is reportedly about to publish an INFO to address the issue.

April 1 2016 ✈

Why You Should Get Your Extra Class License

By Dan Romanchik, KB6NU

The Amateur Extra Class license is the highest class of license in the United States, and perhaps the world. Many hams—even hams that live outside the U.S.—aspire to pass the test and be awarded one.

There wasn't always an Amateur Extra Class license. The Extra class license, as we know it today, was created as part of the 1951 license restructuring, that also created the Novice and Technician Class licenses. (In 1951, the Novice license was the "beginner's license." To get a Technician Class license, you had to pass the written test that General Class operators had to pass.)

Although it gave an operator no additional privileges, to get an Extra Class license, one had to:

- Pass a 20 wpm code test (Generals had to pass only a 13 wpm code test).
- Pass a longer and more difficult written examination than the General Class exam.
- Have at least two years of experience as a licensed radio amateur.

Today, without the code test and the experience requirement, many hams upgrade to Extra Class as soon as they can. Some even pass the Technician Class, General Class, and the Amateur Extra Class exams in a single test session.

So, what's the attraction? Why should you upgrade to Extra?

One of the reasons that you should upgrade to Extra is that you get use of the entire 80 m, 40 m, 20 m, and 15 m bands. Portions of those bands, such as 3.6 – 3.7 MHz in the 75m band and 14.150 – 14.175 MHz in the 20m phone band, are reserved exclusively for Extra Class licensees. Extra Class operators also have exclusive privileges in the CW portions of the 80 m, 40 m, 20 m, and 15 m bands. These are the frequencies where the DX stations hang out.

Another reason to get your Extra Class license is that only Extra Class licensees can administer General Class and Extra Class license exams. General Class operators can become Volunteer Examiners (VES), but they are only allowed to administer Technician Class exams.

Another reason you might want to get an Extra Class license is to get a fancy vanity callsign. Only Extra Class operators can apply for 1×2 or 2×1 callsigns, such as W8RP or KT8K. A short, snappy callsign can help you work more DX or improve your contest scores.

Whatever your reason, studying for the Extra Class exam will open your eyes to many aspects of the hobby that you may not be familiar with. And, as you work your way through the material, you'll learn things that make you a better amateur radio operator and enable you to enjoy the hobby more. It's not easy, but in the end, an Extra Class license will help you have more fun with amateur radio. ✈

Dan, KB6NU is the author of the "No Nonsense" line of amateur radio license study guides, a prolific blogger (www.kb6nu.com), and an active CW operator in the Extra Class portion of the HF bands. If you have any comments, questions, compliments, or complaints, email him at cwgeek@kb6nu.com.

Editor's Note: Another reason to upgrade your license is that the club offers a one-time one year free membership for upgrading your license class. This can be used for either the upgrade from Technician to General or General to Extra. Again, it can be used only one time and a person must be a SOBARS member for at least one year to be eligible.

Modifying a Belkin Residential Gateway Battery Backup

Article and photos by John Wright, K6CPO

A local San Diego ham obtained a number of used but serviceable Belkin Residential Gateway battery backups. These devices were originally intended a battery backup for AT&T Uverse service but were discarded when customers cancelled their service.

Each unit contains a 7.5AH 12V sealed lead acid battery with associated circuitry to charge the battery from a normal household supply and furnish 12V output to the connected device. As configured, these devices are suitable for powering a cable modem/router in the event of a power failure. (FIGURES 1 & 2)



Figure 1. Belkin Residential Gateway Battery backup, front view.



Figure 2. Belkin Residential Gateway Battery backup, rear view.

Believing this to be a viable means of powering a mobile radio in a home installation in the event of a power failure, I began investigating how they could be used and how long I could expect the battery to last.

In my discussions with other amateur radio operators about the feasibility of utilizing these devices, I was advised not to connect a radio to the existing 12V output but to connect directly to the internal battery.

With this in mind, I had to come up with a way to connect directly to the internal battery, but maintain the connections to the charging circuitry. This was accomplished by using a double-tab spade connector that slid directly onto the battery terminals, but allowed connecting two separate leads to the battery. (FIGURE 3) Because of the tight space within the housing and the fact that the leads attached to the battery in different directions, it was necessary to bend the spade connectors flat when attaching them to the battery. (FIGURE 4)



Figure 3: Double-tab spade connector.



Figure 4: Double-tab spade connectors flattened and installed on battery.

The new harness consisted of black and red wires (length optional) with appropriate spade connectors on one end

and Anderson Powerpoles on the other. Powerpoles are the de facto ARES and ACS (RACES) method of connecting DC power and using them in this application allows a great amount of flexibility. (FIGURES 5 & 6)

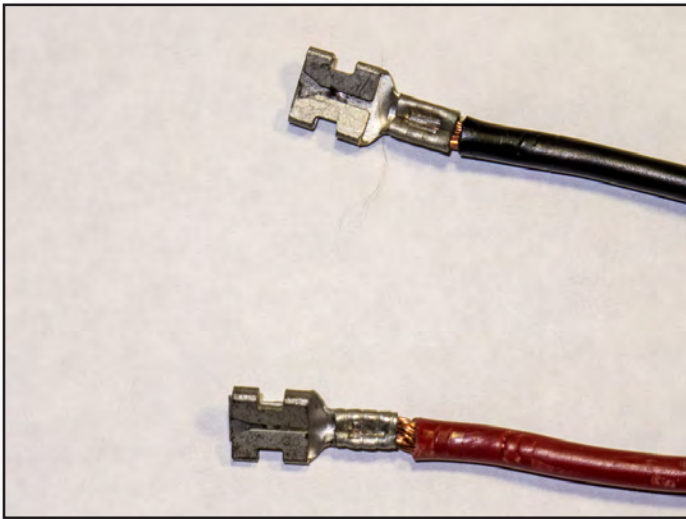


Figure 5: Spade connectors on one end of the harness.



Figure 6: Anderson Powerpoles on the other end of the harness.

All of the connections were made to the battery as shown (FIGURES 7 & 8) and the battery was slid back into the case. The new harness had to have some way to exit the case, so I used a small round file and carefully made two notches, one on each side of the cover for the wires to exit. (FIGURE 9)

This completed the modification and as long as the battery is charged, it should run a mobile radio for a fair amount of time.

Note: Instructions for the operation of the Belkin back-up battery devices can be found at: http://cache-www.belkin.com/support/dl/bu3dco01-12v_en_rev063010.pdf

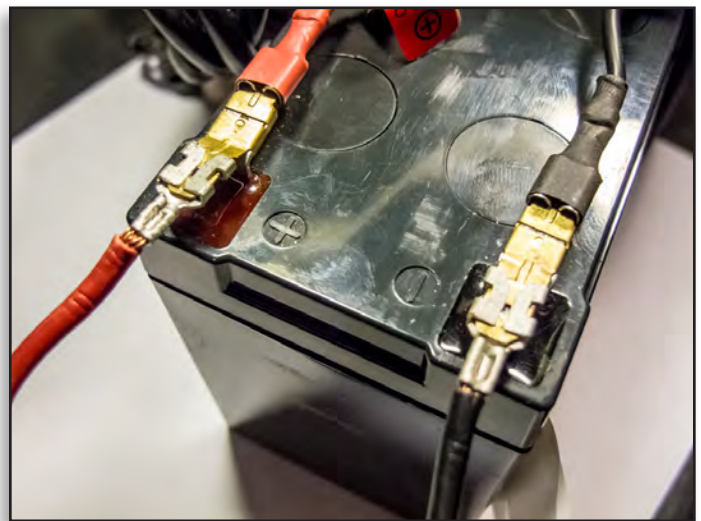


Figure 7: Harness connections made to battery.

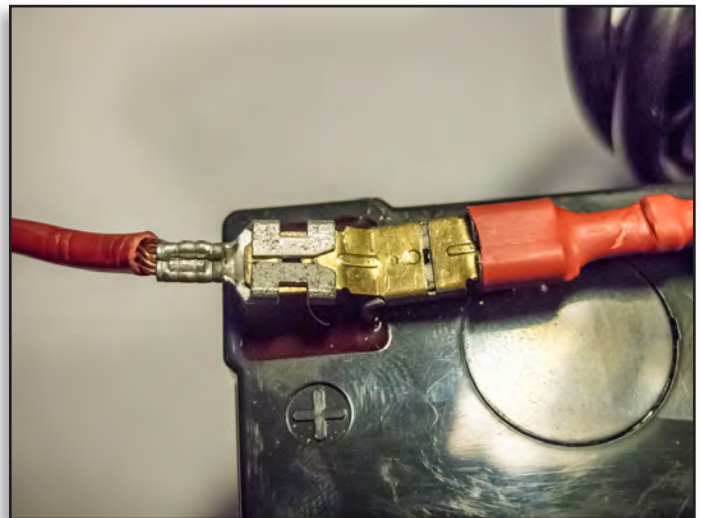


Figure 8: Close-up of connections made to the battery. Output harness to left; charging circuit to right.



Figure 9: Harness wires exiting the case

Repeater Update

John Wright, K6CPO

During the first three months of this year we experienced several issues with the repeater and the city-owned building it's housed in.

After the first major storm in January, Fred Curtis, KI6GRO, discovered that the wind had blown water into the building through the vents and the batteries were soaking wet. He also discovered that part of the shingling on the building roof had been pulled up by the wind.

The batteries were dried off and Fred and I returned a couple of days later to do some previously scheduled work on the building. During that visit we accomplished several things.

First was completing the installation of the attic fan purchased to increase airflow through the building during the hotter months of the year. We had not activated the fan as it vibrated excessively and the back needed to be covered for safety reasons. We installed additional reinforcing straps and a wire mesh cover on the back of the fan.

We also cleared out the old, rickety shelves and replaced them with a new plastic unit. At the same time we cleaned the building. A lot of old, useless junk had been previously removed from the building. We pulled the shingling back into position and threw some rocks on top of it.

To prevent further water intrusion through the vent closest to the batteries we installed a wood cover over the vent, but removed from it by the space of the wall studs. This way any water blown in would be diverted onto the floor and not on the batteries. At the same time we decided we should get all of our equipment up off the floor to prevent any additional water damage.

We planned to return to the site at a later date to accomplish more work, but in the meantime Fred contacted the city to report the condition of the building roof.

When we did return, we found the city had made some repairs to the roof in the form of using roof patch to seal some of the torn places in the shingle. We added more patch of our own in addition to nailing down the edges of the shingles to prevent further lifting.

During our previous visit, I had measured some existing bracketing in the building and cut some plywood shelves to fit the bracketing. We installed these and

moved the batteries up off the floor. This entailed some re-routing of the wiring, but this was accomplished without difficulty.

A couple of days later I went back to the site with a platform constructed of 2 x 4s and plywood and placed it behind the repeater cabinet. This raised the diplexer cans up off the floor and out of any potential water leakage.

Because of my trip, I was unable to return to the site for some time and the area experienced another storm accompanied by strong winds. This time the building lost more shingling off the roof and the loose shingling was destroyed in the process. When Fred and I returned to assess the new damage, it started to rain and we noticed water leakage right above the charge controller and wiring. We immediately unplugged the solar panels, the repeater and the batteries from the controller and hung tarps over the controller and the batteries to protect them. The repeater was placed on AC power.

Again, the damage was reported to the City of Chula Vista. When, after a week had passed, we returned to the site with tools and some shingles to attempt a temporary repair to the roof. Much to our surprise and pleasure, we discovered repairs to the roof were already in process. While we were there, a private contractor hired by the city showed up to continue installing a new roof on the building.

Just when we thought everything was right with the building, the repeater itself quit working. Completely... Thankfully we had already purchased a second repeater with the intention of setting up a repeater on the 440 MHz band. Dave Kaltenborn, N8KBC, quickly programmed the newer repeater for 2 meters and replaced the one at the site. After evaluation, it was determined the repeater had to be returned to Yaesu. It was returned to us at the end of March, but no indication was given as to what was wrong with it.

Future plans for the repeater include changing out the antenna for a dual bander and setup of the second repeater on the 440 MHz band, and possibly painting the building. Whether we actually do the painting or see if the city will do it still has to be determined. We also will probably have to look at replacing the batteries at the repeater site soon. ✎



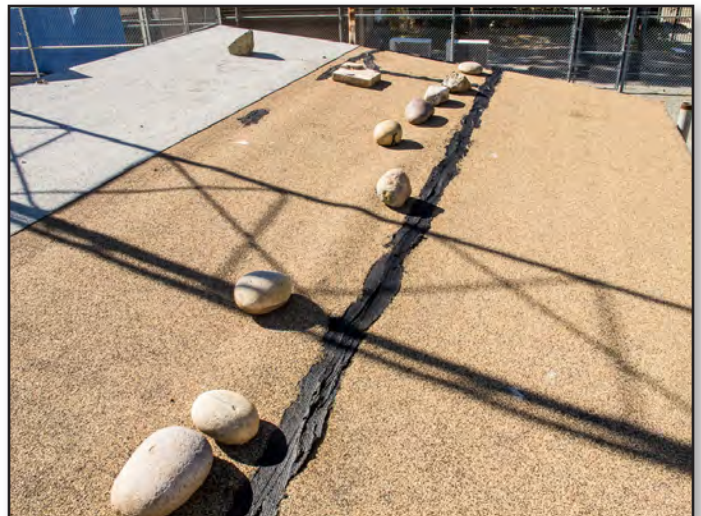
Roof shingling rolled up by the wind. *John Wright, K6CPO*



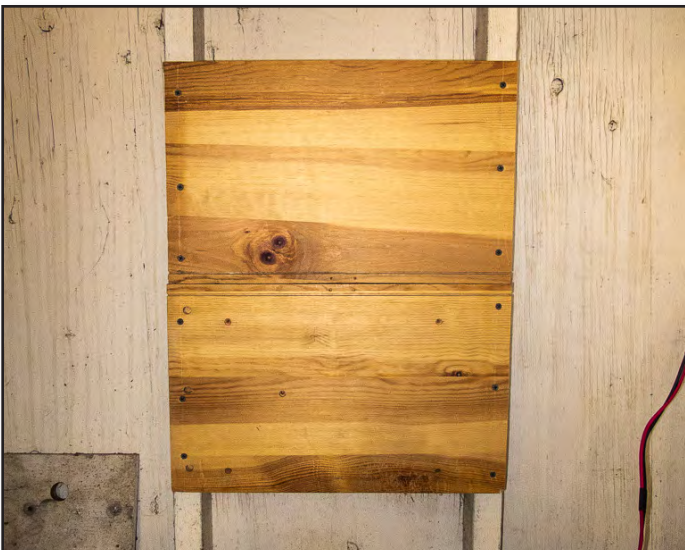
Cleaned up building and new shelving unit. *John Wright, K6CPO*



1000 CFM attic fan installed on building vent. *John Wright, K6CPO*



Temporary repairs to the building roof after the first storm. *John Wright, K6CPO*



Boards installed in front of vent opening to prevent water intrusion. *John Wright, K6CPO*



Repeater batteries moved off the floor. *John Wright, K6CPO*



The platform to get the diplexer cans up off the floor.
John Wright, K6CPO

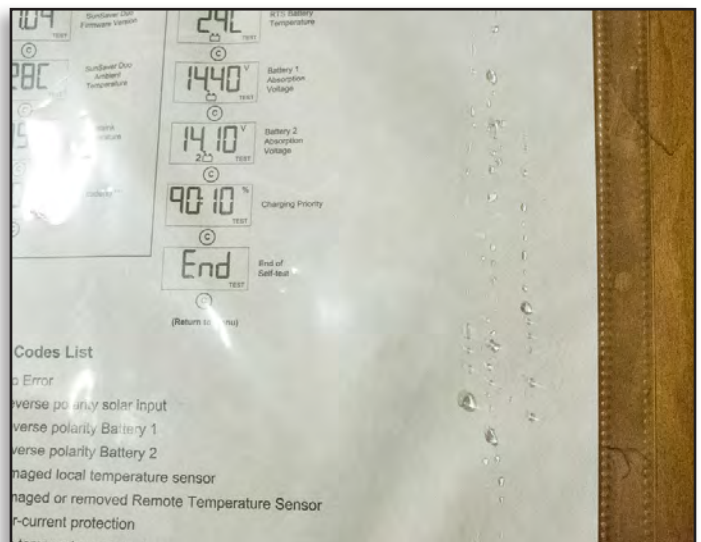


Water intrusion through a seam in the sheathing under the area where the shingles were torn off.

John Wright, K6CPO



Part of the building roof after the second violent storm.
John Wright, K6CPO



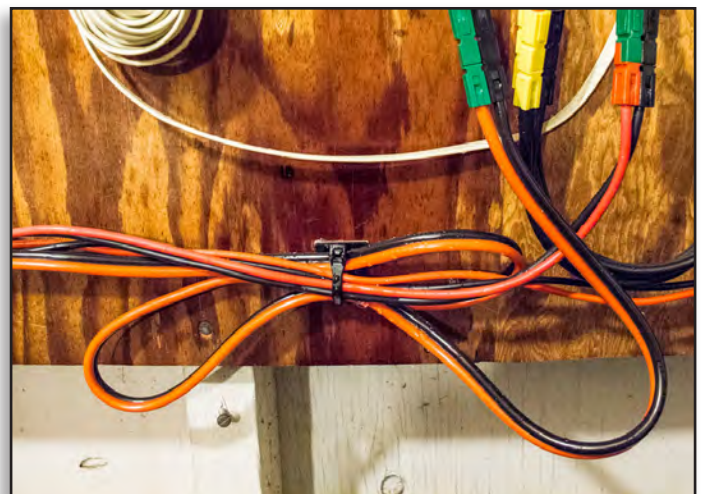
Water running down the posted instructions for the charge controller.

John Wright, K6CPO



And where it came from...

John Wright, K6CPO



Water collecting on the solar charge wiring.

John Wright, K6CPO



Protective measures taken to protect our property in the building.
John Wright, K6CPO



The contractor installing new fascia wood on the repeater building.
John Wright, K6CPO



In addition to disconnecting the batteries, we also covered them with a tarp.
John Wright, K6CPO



Dave Kaltenborn, N8KBC, assisting the contractor with the installation of new wood on the building.
John Wright, K6CPO



Finally! A new roof! The city hired a contractor to come in and replace the entire roof.
Fred Curtis, KI6GRO



The contractor installing roofing felt on the roof prior to installing shingles.
John Wright, K6CPO



The contractor replaced some rotted wood around the edge of the roof, added a new layer of sheathing over the old, installed new drip edge, paper and shingles and added additional flashing on three sides.
Fred Curtis, KI6GRO



Another view of the new roof.
Fred Curtis, KI6GRO



Close up view of the flashing over the high edge of the roof.
Fred Curtis, KI6GRO

QRM

