



From our Club President...

The Year Ahead

By Ivy Nelson-Groves WA7IVY, President

I feel very honored, and more than a little surprised, to have been elected President at our last General meeting. To those who voted for me, thank you. To those who voted against me, thank you too!

I've been quite happy serving as Secretary on the board for the past two years and I think the Board has done a great job. I'd like to thank the past Board for their service, and look forward to working with the great people you've selected for this year's Board and the new Chairman, George Thornton, AE7G. President is a new role for me, and I hope that at the end of the year ya'll are still happy with me.

Years ago I was interested in Ham Radio because of a neighbor couple who were Hams. I let that interest slip a few decades, and found out that not only was Ham Radio still alive and well, but there were so many things one could do with a radio which I had never imagined.

That diversity really appealed to me.

What I love most about this Club is all the different ways to get involved in activities. If you're interested in Public Service, there are many who would point you in the right direction and show opportunities for service. Like technical stuff?? The Technical committee would love your help! Are you a closet parliamentarian? We have a committee who would really like to take a look at revising our Bylaws. The new Elmer program is still getting off the ground, but it promises to help a lot of our new members, and some not-so-new members.

When ya'll elected me President, the first thing that went through my mind was an old video from EDS about herding cats - I suppose that applies even more to Field Day. The next few months I'll be talking a lot about Field Day.

There is a lot to do to get this event off the ground, and I am so appreciative of the skilled and knowledgeable people who have already stepped up to help. But there is a place at Field Day for people of all skill levels, as well as non-Hams, just as there is in our Club in general.

See ya'll on the 17th. -Ivy, WA7IVY

Mike & Key Sells Flea Market Operations

(April Fools Article)

By Michael Dinkelman N7WA

In a major announcement this month, Hal N7NW, the Flea Market Chair, has stated that the Puyallup Flea Market has been sold to the Radio Club of Tacoma for an undisclosed amount, plus other future considerations.

Hal indicated that the popular Amateur Radio event had simply become "increasingly difficult to organize" each year and "our members are getting older with many leaving town at that time of year". The Radio Club of Tacoma, which has always felt that the Mike & Key was intruding in their territory (Puyallup), was happy to get control of the much bigger March event which will replace their smallish event normally held in August. *[Continued on Page 3]*

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The *K7LED Relay*, published monthly, is the official newsletter of the Mike & Key Amateur Radio Club. Mike & Key ARC is an ARRL-affiliated club dedicated to the growth and betterment of Amateur Radio.

The club meets at 10 A.M. the third Saturday of every month at Salvation Army Headquarters, 720 S. Tobin Street, in Renton (near the southeast corner of Renton Airport). Anyone interested in Amateur Radio is invited to participate in the Mike & Key ARC and its activities. Annual dues are \$12 for individuals and \$18 for families.



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K7LED Repeaters:
146.82 output / 146.22 input
(PL 103.5)
Tiger Mountain
224.120 output / 222.520 input
(PL 103.5)
Tiger Mountain

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Mike & Key Online -- Several Club resources are available online:

On the Web — The Club's site at 'www.mikeandkey.org' includes extensive information about Club activities and events, such as: VE testing, membership, past editions of the *Relay* and more.

Reflector — The Club's public message board offers an easy and free way to converse with Club members. To sign up, surf to: <http://groups.yahoo.com/groups/mkarc> .

E-Relay — Want the newsletter in color and a day or two before the print edition arrives by regular mail? You will also save the Club some money in printing and postage costs. To sign up, send a message to the *Relay* Editor: kg7ku @ arrl.net.

April 2010

M&K March Meeting & Activities

By Jim Aigner N7MU, Activity Chair

With the Flea Market in the books for 2010 and warmer weather in the wings, Club activities are accelerating. In March we elected officers. Some new blood was added to the board; some Club veterans were re-elected; and a few contributors returned to roles as active members. Don't forget to thank them all for their time and energy in making this such a fun Club. At their April meeting, the new board selected George Thornton AE7G as chairman. 2010 should be another good year.

Our annual Awards Banquet was held on March 27th at HD Hotspurs in Kent. Co-chairs Linda Jordan and Mike Dinkelman N7WA did a terrific job of keeping this long-standing tradition alive. The turnout was great as was the music, food, and companionship.

During our April meeting Hal Goodell N7NW will talk about the history and current status of the K7LED 2 meter Repeater. If you didn't catch him at the Awards Banquet, here's your chance to learn more about our Repeater.

Our May meeting will probably feature an outside speaker, as yet not committed. June, of course, is the final preparation for our Fort Flagler Field Day, ably chaired by Ivy Nelson-Groves WA7IVY. If you are new to this group or have never participated, you owe it to yourself to join Mike and Key for Field Day. It's considered the primary member benefit and our premier group experience.



**Photos: These door prizes await you
At the Club's April 17th General meeting.**

And, oh yes, we have door prizes too. They include another 5 watt solar panel suitable for charging 12-volt batteries, the ARRL Antenna Handbook 21st

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Edition compliments of the ARRL, an assortment of 15A and 30A Anderson Power pole connectors, a Bernzomatic Micro Torch Kit with six tips including large and fine soldering tips, a 100mm folding magnifier, a TRICrimp tool for Power pole connectors, a Five LED Magnetic Head Lamp, and MFJ communications headphones with dual volume controls. Remember, the door prize tickets you purchase each month are eligible for the grand end-of-year drawing in December. I need your continued feedback for door prizes, either past prizes to be repeated or new ones, as well as ideas for the end-of-year drawing... see you Saturday.

M&K Field Day: Barracks Mom

By Rita Danielson KD7CNU

Time to touch base with my kids. Hope all is well with you. As for me...busy with wedding plans and field day preparations. The barracks are filling up fast. We even have some first timers staying with us this year. We will have a great time again this year.

The deposit is \$10.00 per person, per night. So if there are two of you and you're planning on staying two nights, it will be a \$40.00 deposit. Make the check payable to the Club, Mike & Key ARC, and when you check in, I'll give you your check back.

Where else can you go for a weekend and get your deposit back and not pay for your lodging, breakfast or entertainment. Yes, entertainment.

There's never a dull moment in the barracks. I'm looking forward to another fun year at beautiful Fort Flagler. I hope you can join us.

--88's and I'll see you at the meeting.

Rita (aka Barracks Mom) KD7CNU

gamatoad24@comcast.net

Rita Danielson, 9311 11th Ave W, Everett, WA 98204

(You can mail me your deposit if necessary)

Or please phone: 425-359-3764.

M&K Sells FM Operations...(Cont'd from Page 1)

When asked about the selling price, Hal simply stated that it was sufficient enough to keep dues at \$12 for the foreseeable future. Carolyn WV7Q, the Club Treasurer, simply had a grin from ear to ear and made no statements.

When the subject of future considerations was brought up, Hal indicated that Mike & Key members would never have to pay more than \$5 to attend the event when run by the Radio Club of Tacoma and it included access to the Hospitality Suite normally reserved for workers.

With Carolyn still grinning like the Cheshire cat, Hal stated "all in all, this was an excellent deal we just couldn't pass up." He also indicated that next March, he would be vacationing in Hawaii...HI-HI. There was no comment from the Radio Club of Tacoma.

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Amateur Radio Public Service Event Organization

By Gene W7AKA & Fran N7FWZ Underwood

The proper organization of any special event, supported by Amateur Radio, can be what makes it appear, to the public, as something professionally planned. Good organization can also make the Hams working the event feel that their time is well utilized, which raises the return rate of the Hams, year after year.

The most important part of good organization is that the participants and the sponsors of the special event will be as well supported as is possible. Emergency responders will be properly identified, notified, and can become active participants, in the protection of those taking part in the event.

Fran and I have been the Ham coordinators of many events for the last 36 years. During this time, we have supported Sports Car Club of America high speed road races held in the forests and run at night. We have also supported bicycle rides with as few as 20 to as many as 4500 cyclists. These rides have lasted for 1, 2, 3, 6, 7, 26, and as many as 48 days.

We figured that we have supported at least 380,000 bicyclists. We also have been the Ham coordinators for the Seattle Marathon and helped organize the Hams from Whidbey Island to give Ham radio support to their Marathon. Also, we have worked under the direction of other Hams on SEAFAIR, the Tour de Cure, the MS150 and several other special events.

In the support of these many events, we have generated many tools (computer files) and radio hardware, to make it easier and quicker to plan, train the Hams involved, and to operate the event's Ham Radio support.

For your use, we will put these files on the Club's web site, with the support of George Thornton, AE7G, the new Mike and Key Club Board of Directors Chairman, and the web director, Jim Etwiler, KD7BAT.

We hope to make it easier for many other Hams to work as "Special Event Ham Radio coordinators". It is really fun and on a regular basis, it gives the community the best possible view of Ham Radio.

PSK Party

By Andy Lengenfelder KE7ZGR

I am hosting a PSK viewing event in my Shack. If you are new to the digital modes or are just curious about all of the fuss about PSK and want to see what it looks like, I will demonstrate my setup and talk about how to set yours up. I will be running DM780 software on my FT450 and tuning in to 20 meters, which usually is active during the day.

Date is Saturday May 1, 2010. Time from 10am to 3-4pm, depending on turnout. As space is

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limited, please call or email for a time slot. Address is: 14205 180th Ave Se, Renton, WA in the Renton Highlands just East of Liberty High School.

Contact: Andy Lengenfelder

Phone: 425-430-1804

Email: KE7ZGR @arrl.net

7th District QSO Party at K7LED

By Michael Dinkelman N7WA

The 7th District QSO Party is being held May 1-3 2010 (UTC). That's the first weekend in May. You can find the rules and other info at:

<http://www.codxc.com/new/Page.asp?Content=DRYLA ND7S&Page=3>.

The past couple of years I have sponsored a K7LED operation at my station and invited anybody who wants to get on and help contribute some points to come on over. Last year, we even won a plaque and all the calls of the operators are on that plaque.

I only run the first day (Saturday May 1). The contest runs from 6AM to midnight local time. The idea is that Hams all over the country will be trying to work as many stations and counties in the 7th FCC District. That includes Washington, Oregon, Idaho, Nevada, Montana, Wyoming, Utah, and Arizona. The exchange consists of a signal report and a 5 letter STATE/COUNTY designator (there are 259 of them and they are all indicated in the rules).

My station will be open to all who want to give this a try from a shack where you will have no problems being heard. Good radios and good antennas. No HF or contest experience you say? That's what this is for; I'll be happy to mentor you. You can come over and try it for 10 minutes or for 10 hours.

It'll be good practice for Field Day (though it will disqualify you from doing the GOTA station). I'll be doing the CW throughout the day and everybody else is welcome to doing Phone. (You are welcome to try the CW too if you feel up to it.) You don't even have to have a license as we'll be using the Club Call and I'll be the control operator.

Give me a heads up if you want to come over and maybe a time period. A couple years ago, we had 5 people all show up at the same time (which was fun too) but we can spread you out if you prefer. Then again, there is that safety in numbers belief. If you suddenly find you can make it at the last minute, feel free to drop by even if you can't let me know ahead of time. You can get in touch with me at n7wa@arrl.net. The station is located at 22222 148th Ave SE Kent, 98042. Phone: 253-631-3756.

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Mike & Key Annual Awards Banquet

By Michael Dinkelman N7WA

On April 27th, about 80 of your fellow members and loved ones gathered at HD Hotspurs in Kent for some good food and some good fun. The evening started out with a Jazz Duo in the restaurant lounge. Arranged by our hostess Linda Jordan, the consensus of many of the attendees was that was a nice touch. (Compared to the thumpaa-thumpaa playing in the lounge after the Banquet, they were fantastic).

About 6pm, we started moving to the Banquet room which had some rather interesting posters and placemats of a radio theme. It was a squeeze. While the room is rumored to be able to handle 100 people, I think we came close to a reasonable capacity at 80. It made setting up the projector screen and podium a challenge but I think everyone managed to fit ok.

A fine dinner was had at 6:30. My wife Diane, who doesn't care much for BBQ, actually thought was pretty good and the vegetarians among us seemed to get some pretty nice alternatives as well. Then it was time for the festivities.

We spent some time talking about the Silent Keys who had left us in the past year. Then Pete K7WTG and Chuck WA7EBH (the only two original members left) gave us some Club history and walked us through some Club pictures from the mid-70's. There was plenty of kibitzing from the crowd.

Following the history, the group was serenaded by the CW Tones with a newly released ditty titled *How Do You Run A Great Flea Market?* Many thanks go to Scott AG7T, Hal N7NW, and Guy N7ZG for standing up with me to sing. Pretty good for a buncha CW ops.

Hal N7NW then presented a program on the Club Repeater system including some history, maps, and pictures of the Tiger Mountain site inside and out. If you missed it, you'll get another chance to see it at the next Club meeting.

Then, it was time for awards. There was some Good, some Bad, and some Ugly. We started with the Bad and the Ugly. Ivy WA7IVY received some new weaponry for her personal collection. Steve KD7IQL received some special footwear that will help him run like the FLASH.

Gary KG7KU and Rusty Etwiler received some licorice while Jim KD7BAT received a special quart sized allocation of Beano (out of my personal stash). Dave our new Treasurer got some money to practice with (before getting his hands on the real thing) along with some special jewelry. Finally, Hal (it was a busy night for Hal) was made to look quite Angelic.

The Good awards were handed out by the Awards Committee (Brendan KD7IKV, Steve KD7IQL, and Scott AG7T). Outgoing President Dick WA7NIW was given the Presidents Award. Ivy WA7IVY and Guy N7ZG received MVP awards for Field Day.

Brett Traicoff was awarded MVP for the Flea Market. There was no 'Pop Brown' Award given, as the

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committee felt that no one met the requirements for the past year. Then it was time to call it an evening after distributing the door prizes.

This Banquet was a great success and larger than I have ever seen. My many thanks to **Linda Jordan** who jumped in and volunteered to help run this event the same day she was voted in as a member. She brought fresh and creative ideas and did 99% of the work. I appreciate her husband helping out as well during setup and as part of the Jazz Duo. I hope all that attended had fun. If you didn't make it, you missed a great one.

Membership Anniversaries

Contributed by Michael Dinkelman N7WA

The following members will be awarded anniversary certificates. Please accept my apologies for not announcing these at the Banquet. I had them there but it simply slipped my mind (and I remembered just after the room cleared).

35 years: Don Rembaugh WA7KKBK Aug 1974

30 Years: Raleigh Elkins WB7WNF Dec 1979

25 Years (Life Member Plaque):

Wayne Moddison K6DOW Feb 1985
Hap King W7QCV Jul 1984

20 Years:

Eric Snyder N7DLV May 1989
Dick Vance K7NEX Jul 1989
Rick Antes KF7VG Aug 1989
Dean Holtan N7NKO Feb 1990
John Black W7HIL Jan 1990

15 Years:

Marilyn Olson KB7WSH Dec 1994
Joe Langjahr KJ7DG Nov 1994
Mike Foster KM7F Sep 1994

10 years:

Dorothy Lowell KB7WSO Mar 2000
Brendan Burget KD7IKV Feb 2000
Curtis Hanner N7MWC Feb 2000
Dawn Hanner N7VWH Feb 2000
Barry Wolborsky KC7YB Aug 1999
Kimberly Wolborsky KD7FYD Aug 1999
Atsushi Sasaki W7KN May 1999

5 Years:

Gail Richardson KI4JVM Mar 2005
Chuck Richardson N7LMT Feb 2005
Stephen Kangas W9SK Jan 2005
David Dow W7DOW Sep 2004
John Saunders KD7UI Sep 2004
Tom Johnson K7GOA Jul 2004
Ross W. Laine W0RWL Jun 2004
Mark Huffstutter KB7WAL May 2004
Frank Tate NA7O May 2004
Michelle Baskett WA7PVE Apr 2004
Joyce Baskett KA7VXN Apr 2004
Douglas Johnson KD7RIK Apr 2004

April 2010

Past President – Afterword

By Dick Radford WA7NIW

I feel very honored at having been your President for the past two years. At this time I want to congratulate the incoming officers, and thank the outgoing officers for their service to the Club. I feel that we have a great Board that will lead this Club effectively through the next year.

We have both opportunities and challenges ahead of us this year. There's still work to do on the Club's Repeater and I'm sure that our Radio Officer can use your help in some way. There are opportunities for Field Day also. Speaking of Field Day, the budget pressures still are working against the state parks so please make sure that you contact the State regarding the ongoing need to keep Fort Flagler open.

So thanks to all of you for the support you have given me as your President over the past two years, and also for the support you will give your incoming officers as they adapt to their new roles within the Club.

-Dick, WA7NIW

Let's Celebrate our April Members!

By Dave Smith KB7PSN, Treasurer

As of April 2010, these folks have been Mike & Key members for the number of years stated.

Congratulations to all of you, and thanks for your participation and service.

Each of you makes us who we are:

Jan Hart	WA7HWX	38 Years
Tim Schneebeck	K7QMI	33 Years
Carolyn Pasquier	WV7Q	23 Years
Earl Swiney	WZ7H	22 Years
Jean Swiney	KB7CLF	20 Years
Ryan Martin	N7TNI	19 Years
Darla Harris	KC7SIT	14 Years
Claire Navarre	KD7FMP	11 Years
Mitch Gill	NA7US	10 Years
Tyler Gill	KD7MJO	10 Years
Gary Bryan	KG7KU	9 Years
Stephen Luke	KB7FGV	7 Years
Rachel Martin	(NoCall)	7 Years
Terry Martin	(NoCall)	7 Years
Douglas Johnson	KD7RIK	6 Years
Michelle Baskett	WA7PVE	6 Years
Joyce Baskett	KA7VXN	6 Years
Elliott Neyme	W7OVP	4 Years
Mark Sandler	K7MAS	4 Years
Phil Sheridan III	KE7HAV	4 Years
David Greene	KE7RDD	2 Years
Frank Qualls	AB7HA	2 Years

K7LED Relay

Another QRP Story (Revisited)

de Fred Roberts W6TKV

Oops, I forgot to fill in the blanks in last month's article – did anyone wonder about my QRP QSO with 4W on SSB?

1) Working a fellow on xxxxx, xxxx", should have read,
1) Working a fellow on Kerguelen Isle - that's 1,566 miles per watt."

Comm Academy 2010 Portable Radio Contest - K7RFH Radio in a Box Entry

By Rich Hand K7RFH



Today I attended for the first time, the Communications Academy 2010. Having my Amateur Radio License since December 2009, it was a real challenge to come up to speed fast enough so that I was able to create a "radio in a box". Just finishing the radio only about 2 weeks prior to the Comm Academy's start. All in all, I am very proud of the outcome. The following information was provided to the contest organizers.

Purpose of Project:

The original purpose was to provide a radio system that could go anywhere, yet be stored easily in a compact space. This project morphed into a portable radio shack to be used for EMCOMM, Field Days or home base station. Requirements were to be able to run using any adequate power source in fixed, mobile or portable modes.

Capabilities Available in Package:

Current total weight of this unit is 27.5 pounds(12.5 kg). The portable shack is designed for use on AC or battery power. Power options include providing power output to charge handhelds, run power inverter or powering a secondary external radio. Power is regulated using the Super Powergate 40S so with battery connected, auto failure is provided and battery is charged when AC is available. System power is provided by the FT-897's FP-30 power supply. Yaesu FT-897D can operate on all Amateur Radio Bands in a variety of modes. Local Emergency frequencies are preprogrammed in the FT-897D. Onboard antenna tuning is provided using an LDG AT-897Plus. Signalink provides soundcard based digital operations capability. [Ed. Note- All the details are at: <http://lrichhand.blogspot.com/2010/04/comm-academy-2010-portable-radio.html>]

Shunts... For the Not-So-Timid

by Jeff Wandling W7BRS

So, you went to the flea market sponsored by the Mike and Key ARC and you found a goodies box. Inside the box there were a couple 1mA meters. You're thinking "Hmm... what am I supposed to do with a meter that reads 0 - 1mA?" You can do a lot with a 1mA meter and you can use it to measure all kinds of signals in your homebrew equipment.

The first thing you need to learn is how to make a metering circuit. To make this simple, let's stick to the measurement of current and the measurement of Voltage.

There are two kinds of current metering that are common in a linear amplifier. Plate current and Grid current. For an AB2 class linear these are the two important metering values to have ready on the front panel.

How do you read plate current? First, write down Ohm's Law: $E = IR$. The way to hook up the metering circuit is to put a shunt resistor in parallel with the meter. The value of the shunt resistor is what determines how much the meter reads for a given maximum current measured.

Let's say you want to measure 0-1A of current. The voltage through the shunt resistor and the meter is the same. The current through the shunt and the current through the meter is inversely proportional to the resistance.

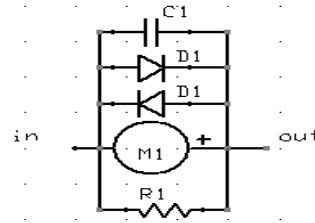
If the internal resistance of the meter is 100 Ohms, and the meter reads full scale at 1mA, then the 1/999th of the internal meter resistance must be the R value of the shunt, (0.001) * (100) Ohms is the meter shunt resistor value, or 0.1 Ohm. Now, when 1A of current is present, the meter will read full scale at 1A.

You will want to make a combination of resistors to get to 0.1 Ohm so that the power dissipated does not exceed the ratings of the resistor. Two 0.5 Ohm resistors in parallel is 0.25 Ohm. Two 0.2 Ohm resistors in parallel is 0.1 Ohm, etc.

In amplifiers, where this example is drawn, it's required to put a bypass capacitor in parallel with the meter. Having a 0.01 uF ceramic disc 1kV rating is fine. In addition, a pair of diodes in parallel with the meter will protect your circuit in case the meter should happen to fail. [1N5408] have a 3A @ 1kV rating.

You might often see metering circuits in ARRL schematics like this: Assume there are shunt resistors, bypass capacitors and protection diodes in the schematic even if they are not shown.

A typical meter circuit for grid or plate current:

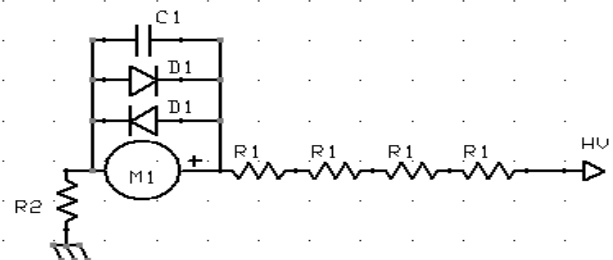


- [C1] 0.01uF 1kV ceramic disc type
- [D1] 1N5408
- [R1] shunt resistor. see text for values
- [M1] 0-1mA meter.

Grid current is handled the same way. One terminal (-) of the meter will go to ground and the (+) terminal will be taken from the (+) terminal of the plate current meter. Usually grid current in a typical 2kW linear is desired to read full scale at 500mA, so the value of the shunt resistor would be 1/499th of the internal meter resistance.

What about Voltage? Yes, you can measure HV with the 1mA meter. Remember Ohm's law. $E = IR$. Let's say you have 4kV of plate voltage and you want to measure it. $4kV = I * R$. If the meter reads 1mA at full scale, then $4kV = 0.001A * R$. $4000 V = 0.001A * R$. What is R? $R = 4 \text{ meg Ohms}$. $4000 V = 0.001 A * 4000000 \text{ Ohms}$.

So, where do you put the string of resistors? Voltage is a potential, so the negative terminal goes to ground. The Positive terminal goes to end of the string of resistors. The resistors are four 1meg Ohm in series. $1M \text{ Ohm} + 1M \text{ Ohm} + 1M \text{ Ohm} + 1M \text{ Ohm} = 4M \text{ Ohm}$, in series. To avoid the kick on the meter, at the last resistor in the string, put a 1k Ohm in series to ground.



The schematic here is how you would wire it up- use:

- 2W 1M Ohm resistors.
- R1 1M Ohm 2W resistor.
- R2 1k Ohm 2W resistor
- D1 1N5408
- C1 0.01uF 1kV ceramic disc type.

So that dusty 1mA meter in the surprise junk box isn't junk after all. Go to **mouser.com** and see what Simp-son meters sell for these days and you'll see that even a flea market meter can yield very useful options for the home brew project on your work bench.

Caution: Remember that HV will not hurt, but rather it will kill you. Be careful and make sure there is no HV present before you work on equipment.

Special Focus: Elmers' Corner... by Jim Aigner, N7MU



Jeff Wandling W7BRS has agreed to take on the responsibility of managing our Wiki site and Elmer coordinators. Even though the site is still under construction, please visit it and contribute to the discussion. Access the Elmer Wiki at <http://k7ledelmerwiki.wikispaces.com/>

Each month we publish one or two of the items from the Wiki. This one is Mike Dinkelman's N7WA reminders about upcoming contests and operating events. These may be of interest to newcomers and those who don't get on the air much.

2010 ARRL Rookie Roundup

For newly-licensed operators in North America (including territories and possessions) to experience competitive Amateur Radio by exchanging information with as many other stations as possible on the 80, 40, 20, 15, 10 and 6 meter bands. Experienced operators are strongly encouraged to participate and help new operators – either on the air or in person.

April 18, 2010 (SSB) -- August 15, 2010 (RTTY) -- December 19, 2010 (CW)
1800 UTC through 2359

UTC Link to rules and Info: <http://www.arrl.org/contests/rules/2010/rr.html>

7th District QSO Party

7th call area stations work everyone, others work 7th area stations only. Work stations once per band/mode. 7th area mobiles (and those participating in other concurrent QSO parties or contests) may be worked again as they enter new counties.

May 1-2, 2010 -- 1300 UTC Saturday to 0700 UTC Sunday
(6 AM to midnight PDT the first Saturday in May).

Link to rules and Info: <http://www.codxc.com/new/Page.asp?Content=DRYLAND7S&Page=3>

Note: This contest will have participation by the Mike & Key ARC (K7LED) hosted at N7WA. All are welcome to participate. Look for details in another article in this issue of the Relay.

Comment or discussion? Visit Jeff's pages on our Wiki- <http://k7ledelmerwiki.wikispaces.com/> .

-- The Matrix --

Area	Elmer Coordinator	Email	Phone	Also...
Homebrew, DX, antennas	Jeff Wandling, W7BRS	dew7brs@gmail.com	206-605-2278	New Hams, satellite work
Beams and Towers	Alan Hughes, KB7SVU	kb7svu@juno.com	253-840-4947	Beam antennas and towers, safety
Contesting	Mike Dinkelman, N7WA	mwdink@clearwire.net	253-631-3756	Contest operations
CW	Mike Dinkelman, N7WA	mwdink@clearwire.net	253-631-3756	Learn CW, operating proficiency
Digital Modes	Andy Lengenfelder, KE7ZGR	ke7zgr@arrl.net	425-430-1804	All digital modes, software, TNC's
D-STAR	Steve Hatch, WA7DAD	stephen@hatch.net	206-851-8842	D-STAR technology and operation
Emergency Comm	Tim Kane, K7ANE	k7ane@arrl.net	206-251-7467	CERT, ARES, organizations & Eq't
HF Operation	Dale Tongue AC7NP	dale.tongue@gmail.com	425-432-4254	Equipment, Antennas, and best HF operating practices
New Members	Dick Radford, WA7NIW	wa7niw@arrl.net	425-828-9791	Getting started, equipment selection and operation
QRP	Frank Qualls, AB7HA	franklin_qualls@hotmail.com	425-802-1837	Low power operation, design and construction
VHF/UHF Operation	Dave Smith, KB7PSN	kb7psn@yahoo.com	425-235-5095	6 meters and up; radios, antennas, modes

April 2010

M&K General Meeting Minutes

Meeting held March 20, 2010

Meeting was called to order at 1000 hours by the President, Dick WA7NIW.

Pledge of Allegiance.

Announcements:

The Mike & Key ARC is affiliated with the ARRL, which members are encouraged to join. Everyone, including visitors, should sign the rosters. Visitors are reminded not to vote on membership matters.

Quorum present.

Is there a motion to approve the minutes of the previous meeting as printed in the *K7LED Relay*?

Sam N7RHE made a motion to approve the minutes as amended; Steve KD7IQL seconded the motion. Motion passed.

Officer Reports:

President – Dick WA7NIW: This is election month.

Secretary – Ivy WA7IVY: Mail was picked up and delivered to the treasurer. Ivy received a flyer from SCARC for their upcoming flea market. She also brought back the flyers that were left at the announcing table at our Flea Market.

Treasurer – Carolyn WV7Q: The Club's books are in good order.

Activity Manager – Jim N7MU: Elections today. Jim announced a WIKI that is being created by the Club Elmer's. If you have used items in good condition that you wish to donate as a door prize, feel free to talk to Jim.

Chairman of the Board – Robert KD7WNV: Robert encouraged members to get involved by running for office.

Radio Officer – Hal N7NW: Hal will be doing some more testing and will have the Repeater on Tiger soon. Hopefully coverage will be better. Hal is presenting a program on the Repeater at the Banquet. Tone change is up in the air right now.

Vice President – Kathy KB7QMO: Membership applications: Glyn Gardner KF7FZL & Michelle Hammers N7CWV; Gerard Hickey, AD7ZE; Brett Traicoff, no call sign; Brent Woodward, KE7IUG; Deanta Kelly KF7FJL & Laureen Kelly, no call sign. All were voted in by the membership.

Standing Committee Reports:

Strategic Planning – Robert KD7WNV: nothing new to report

Facilities and Publicity –: Dave KB7PSN: Antenna analyzers are available for checkout at our library.

Education and Training –: Tim K7ANE: not present

Public Service – Mike N7WA: Robert KD7WNV: PS Booklet was distributed at the flea market. Public service season is upon us and several events are coming up soon. Please contribute your time and skills if you can. The Communications Academy is coming up in April. The committee will meeting today at the Cedar River Smokehouse after the meeting. Liz Budbill from SeaFair Parade Marshals thanked Club members who have supported SeaFair in the past, and encouraged all members to support their events

Technical and Special Interest – Steve KD7IQL: nothing to report at this time.

Other Committees:

Relay Editor – Gary KG7KU: Gary thanked everyone for their content in the *Relay*.

K7LED Relay

Webmaster – Jim KD7BAT: The website is mainly up to date. An electronic copy of the Public Service booklet will be on the website soon. The link to the WIKI is up.

VE Exams -- Scott AG7T: There were 17 people who attended the testing session in February: 5 Technician; 6 General and 3 Extra. At the Flea Market, 40 people took exams; 20 Technician, 8 General, and 4 Extra licenses were awarded.

By-Laws – Dave KB7PSN: Meeting will be next month before the April General Meeting from 9-9:30am.

Field Day – Ivy WA7IVY: The pins and t-shirts are now available at the ARRL website. Rita will be taking reservations for the barracks (\$10/person/day). WD7HDA is donating a rotor to the Club. Frank AB7HA volunteered to be GOTA Chair. Still looking for an Information Table Chair.

Flea Market – Hal N7NW/Mike N7WA: Tables were sold out at the Flea Market, and attendance was great. Hal thanked the chairs for their assistance at the event. We had 51 people show up at the dinner after the event. Hal and Mike thanked everyone for their help. Michele WB7AYU thanked those who helped her at the hospitality booth. The chairs thanked everyone who helped with their committees.

Banquet – Mike N7WA/Linda Jordan: 66 tickets have been sold so far; today is the last day to purchase a ticket.

Picnic – Hal N7NW: August general membership meeting at Gene Coulon Park. It is a family event, so bring the spouse and kids.

Old Business: no old business

New Business – Elections:

President –

~~Brendan KD7IKV (not present)~~; Robert KD7WNV; Ivy WA7IVY; Alan KB7SVU; Motion to close nominations made by George AE7G, seconded by Steve KD7IQL. Runoff between Robert and Ivy. Ivy WA7IVY was elected President.

Vice President –

Alan KB7SVU; Steve KD7IQL; Michelle WA7PVE; Motion to close nominations made by Frank NA7O, seconded by John WA7HQG. Steve KD7IQL was elected Vice-President.

Secretary –

Robert KD7WNV; Motion to close nominations made by George AE7G, seconded by Steve KD7IQL. Sam N7RHE moved that we accept Robert as secretary by acclamation, John WA7HQG seconded. Motion passed. Robert KD7WNV is elected Secretary.

Treasurer –

Dave KB7PSN; Motion to close nominations made by Mike NA7O, seconded by Greg W7HRC. Mike N7WA moved that we accept Dave as Treasurer by acclamation, Erik KE7UYC seconded. Dave KB7PSN is elected Treasurer.

Activity Manager –

Jim N7MU; Motion to close nominations made by George AE7G, seconded by Steve KD7IQL. Gil WA7GIL moved that we accept Jim as Activities Manager by acclamation, Ivy WA7IVY seconded. Jim N7MU is elected Activities Manager.

Trustee – #2

George AE7G; Alan KB7SVU; Gerard AD7ZE; Michelle WA7PVE; Jeff W7BRS; Motion to close nominations made by John WA7HQG, seconded by Michelle WA7PVE. Run off between George and Alan; George AE7G is elected.

Trustee – #4

Alan KB7SVU; Gerard AD7ZE; Michelle WA7PVE; Jeff W7BRS; Motion to close nominations made by Ivy WA7IVY, seconded by Vandy N7EAM. Alan KB7SVU is elected Trustee #4.

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K7LED Relay

M&K General Mtg Mins... [Cont'd from Page 9]

Trustee – #5

Gerard AD7ZE; Michelle WA7PVE; Jeff W7BRS; Motion to close nominations made by Scott AG7T, seconded by Vandy N7EAM. Jeff W7BRS is elected Trustee #5

Alligator Award – Michelle WB7AYU still holds the award.

Good of the Order –

- The next Mike & Key Board meeting will be on the first Wednesday of the month, April 7th at 7:00 pm, at the Salvation Army in Renton.
 - The next Mike & Key General Membership meeting is the third Saturday, April 17, 2009.
 - John WA7HQG made a motion to close the meeting. The motion was passed. Meeting adjourned 12:14pm.
- 21 guests; 55 members present.

Attested: Ivy Nelson-Groves WA7IVY – Secretary

M&K Board Meeting Minutes

Held April 7, 2010

Officers present:

X President – Dick Radford (WA7NIW) – attended virtually

X Vice President – Kathy Martin (KB7QMO)

X Secretary – Ivy Nelson-Groves (WA7IVY)

X Treasurer – Carolyn Pasquier (WV7Q)

X Activity Manager – Jim Aigner (N7MU)

X Radio Officer – Hal Goodell (N7NW)

 Relay Editor – Gary Bryan (KG7KU)

Trustees present:

X No. 1 – Tim Kane (K7ANE)

X No. 2 – Steve Cook (KD7IQL)

X No. 3 – Mike Dinkelman (N7WA)

X No. 4 – Robert Grinnell (KD7WNV)

X No. 5 – Dave Smith (KB7PSN)

Chairman of the Board Robert KD7WNV called the meeting to order at 7:14 p.m.

Minutes: A motion to approve the minutes of the previous board meeting was made by Steve KD7IQL and seconded by Dave KB7PSN. Motion passed.

Officer Reports:

Chairman of the Board – Robert KD7WNV: Welcome to the new board members and thanks to the old board members.

President – Dick WA7NIW: nothing to report.

Vice President – Kathy KB7QMO: Kathy is out of membership cards; Robert will print some for the next meeting and give them to Steve. Application for approval: Gene Budbill, N7QLT; Liz Budbill N7ZXH; Jon Budbill, WE7IRD; Gene Underwood, W7AKA; Jim Coen, KD7RIF; Harry Minges, Jr., KF7DNK; Mike Crossley, KF7BIG. All were recommended by the board.

Secretary – Ivy WA7IVY: nothing to report.

Treasurer – Carolyn WV7Q: The books are in order. David KB7PSN, the incoming treasurer, is all set up with the checking account. We went over budget on the Banquet because of the large attendance. There was discussion concerning the Flea Market deposit for 2011.

Activity Manager – Jim N7MU: The Banquet went very well. Hal N7NW reports that the picnic plans are proceeding well. This month's program will be Hal N7NW making a report on the Repeater. A future program will be on EchoLink. June is a program on Field Day. Jim is still looking for more suggestions on door prizes.

Radio Officer – Hal N7NW: There's a lot of snow on Tiger Mountain right now, but he plans to get up there soon; Hal is

still working on the interference problem at Tiger. Hal went to the WWARA meeting and became a member.

Relay Editor – Gary KG7KU: not present.

Webmaster – Jim KD7BAT: Jim corrected a silent key's name and call sign; he received one email that he will forward to our QSL manager; Jim will be putting the Public Service pamphlet to update the website, but needs the information from Brendan KD7IKV first.

Standing Committee Assignments:

Strategic Planning: Robert KD7WNV: nothing to report.

Facilities: Dave KB7PSN: The analyzers are at Toku AD7JA's shop and are working out a new checkout system. Dave is checking on rechargeable batteries for the antenna analyzers.

Education: Tim K7ANE: Tim is looking into getting some DX videos; they cost about \$25 each, but we can rent them for \$2-4. He would like feedback on what the Club would be interested in. We may use them as a program one month. Tim also mentioned that he purchased a biography on Don C. Wallace, W6AM, that he may loan out if someone is interested.

Public Service: Mike N7WA: Robert KD7WNV reported we have one full box left of the Public Service booklet. The ad for SeaFair was the victim of a graphics error; the portion that was printed was part of the graphic that was not printed.

Technical: Steve KD7IQL: Nothing has happened with the Technical committee. Steve talked about the Awards given out at the Banquet. Jim KD7BAT stated that the description on the website for the Pop Brown award is very thin and he would like that information enhanced by the Awards committee.

Field Day: Ivy WA7IVY: Ivy has all the band chairs filled. She has ordered booklets from the ARRL and picked up two boxes of info from ICOM for the information table; Ivy and Alan will take a look at the equipment and tower trailers on April 18th, and will be scheduling a work party; she has thumb drives for all the band chairs with the field day software; she has contacted Rita to see about if the park rangers are still interested in having us help put a permanent BBQ at the Wagon Wheel, otherwise we may wish to purchase a BBQ to keep with the equipment trailer for the Club. Alan KB7SVU may need to find another tower climber for this year.

By-Laws: Dave KB7PSN: Dave has a meeting to update the bylaws will be at 9:00 am before the General meeting to prioritize the proposed modifications, timetable for presentation to the board, and to set the next meeting.

Flea Market: Mike N7WA/Hal N7NW: March 12th will be the 2011 Flea Market.

Elmer's: Jim N7MU: Jim KD7BAT has put a link to the Wiki on the website. Jeff is the Elmer Coordinator².

Logo: Jim N7MU: The committee has a draft for the proposal on logo usage for the Club and Jim will send to the next board.

Old Business- No old business

New Business-

George AE7G mentioned that Gene W7AKA has a guide to running public service events that would be very suitable to publishing on the website; George will work with Jim KD7BAT to get it on the website.

Good of the Order-

Nothing for the Good of the Order.

There being no further business, Robert KD7WNV adjourned the meeting at 9:10 pm.

Attested: Ivy Nelson-Groves WA7IVY, Secretary

[Continued on Page 11]

First Aid/CPR training

By Ivy Nelson-Groves WA7IVY

Field day is only 70 days after our April Meeting, and if you haven't already taken a First Aid/CPR class, now would be a great time.

The American Red Cross and American Heart Association teach classes as do various other groups in the community or the work place. There are several coming up at: <http://www.seattleredcross.org/> or you can check the ECC Class Connector at: <http://www.americanheart.org>.

Field Day should be a fun experience, but we should always be ready for the unexpected.

Mike&Key Welcomes New Members

By Jim Etwiler KD7BAT

Meet the new members that joined the Mike and Key at the March 2010 meeting. Thanks go to Laureen Kelly for supplying the camera and taking the pictures for the *Relay*. The pictures were taken while the prospective members were out of the room and the membership was voting on their membership.



Glyn "Gene" Gardner KF7FZL



Michelle Hammers N7CWV

Transition to New Board...

Officers present:

- President – Ivy Nelson-Groves (WA7IVY)
- Vice President – Steve Cook (KD7IQL)
- Secretary – Robert Grinnell (KD7WNV)
- Treasurer – Dave Smith (KB7PSN)
- Activity Manager – Jim Aigner (N7MU)
- Radio Officer – Hal Goodell (N7NW)

Trustees present:

- No. 1 – Tim Kane (K7ANE)
- No. 2 – George Thornton (AE7G)
- No. 3 – Mike Dinkleman (N7WA)
- No. 4 – Alan Hughes (KB7SVU)
- No. 5 – Jeff Wandling (W7BRS)

Other officers (non-voting):

- Relay Editor – Gary Bryan (KG7KU)
- Webmaster – Jim Etwiler (KD7BAT)

Secretary/outgoing Chairman of the Board Robert Grinnell KD7WNV called the meeting to order at 9:15 p.m.

(Abbreviated order of business for first meeting of incoming 2010-2011 Board)

Designation of Trustee Liaisons to Standing Committees:

Strategic Planning: Jeff W7BRS

Facilities: Mike N7WA

Education: Tim K7ANE

Public Service: George AE7G

Technical: Alan KB7SVU

Election of Executive Board Chair: Nominations: Alan KB7SVU, George AE7G. George AE7G was elected Chairman.

There being no further business, George AE7G adjourned the meeting at 9:25 pm.

Attested: Robert Grinnell KD7WNV, Secretary

FCC Announces New Rules

(April Fools Article)

By Michael Dinkelman N7WA

The FCC announced recently that, effective Thursday, April 1st, new rules go into effect that will greatly increase the portions of the HF amateur bands available to SSB and all digital modes used by U. S. amateurs.

At the same time, those few Amateurs who still use A1 (CW) emissions will experience a sharp reduction in bandwidth available to them. Additionally, the new rules provide that Element 1 (CW testing) will be restored for all license classes. Current licensees without Element 1 credit will have until December 31st to comply.

Food Drive - May 8

By Jim Etwiler KD7BAT

The letter carriers' annual food drive is the second Saturday in May. Last year the Mike and Key ARC help process the food at the Renton Food Bank operated by the Salvation Army. In a short 6 hour period the volunteers processed 80,700 pounds of food. Set aside some time on May 8 for some public service. Many hands make light work!

[M&K-New Members Continued on Page 12]



Gerard Hickey, AD7ZE



Deanta Kelly KF7FJL



Brett Traicoff, no call sign



Lauren Kelly, no call sign



Brent Woodward, KE7IUG
[New Members continued, next column]

New Relay Masthead Feature

By Gary Bryan KG7KU, Relay Editor

You may have noticed some changes in the Masthead. New this year, and following a review at one of the M&K Board meetings, there was general consensus that it was considered a well-conceived idea to feature pictures pertinent to current Club activities.

This month is a real treat. Michael Dinkelman N7WA sent me some pictures from the Awards Banquet. They made it onto the Masthead and are on display on Page 1.

Do you recognize the 'Spotlighted' Club members?

On the left is a vintage photo of Mary Lewis W7QGP and Little John WA7HQG from a Holiday Party, circa 1975.

On the right is none other than Hal N7NW, who was given a 'Halo' in honor of the ever-present halo which shines there. And oh, it shines. As if I am one to speak... in any event, if you missed the Awards Banquet this year, then it is like Mike N7WA wrote—you missed a good one!

New Arrivals at the Club Library

Tim Kane – K7ANE



Members have several newly acquired books to check out and enjoy from the Mike & Key library.

As part of our annual efforts to expand and improve our Club library we've just obtained five great new books, suggested by various members:

- **ARRL's Low Power Communications - the Art and Science of QRP**, by Rich Arland K7SZ (2009)
- **The ARRL Handbook for Radio Communications 2010** (including the entire volume on CD-ROM)
- **ARRL's HF Digital Handbook**, by Steve Ford WB8IMY, 4th Edition (2007)
- **ARRL's VHF Digital Handbook**, by Steve Ford, 1st Edition (2008)
- **The ARRL's General Q&A**, 3rd Edition, good through June 30, 2011 (2007)

The Low Power Communications book includes sections on equipment and station accessories, antennas, operating strategies, emergency communications, and surplus military equipment. The complete assembly manual for the MFJ Cub QRP transceiver kit is also included.

This new QRP volume was donated by a member. Donations by members are always welcome, and gratefully appreciated.

The new 2010 Handbook, now over 1,250 pages, has great new sections on digital communications technology, solid state RF power supplies, switch mode power supplies, as well as projects for antennas, solid state amplifiers, and more.

The HF Digital Handbook covers assembling your digital station, RTTY, PACTOR, PSK 31, Winlink 2000, and other topics. The VHF edition includes packet radio fundamentals, APRS, D-Star, and much more.

The General Q&A will give you the entire Element 3 question pool, to aid in your license upgrade preparation and review.

Some additional volumes, mostly older, were donated by Universal Radio. Included are:

- **Listening to Longwave – the World below 500 KHz**, by Kevin Carey, 1st Edition (2007)
- **Discover DXing!**, John Zondio, 3rd Edition (2006)
- **Joe Carr's Loop Antenna Handbook**, 1st Edition, (1999)
- **RTTY Today**, by Dave Ingram K4TWJ (1983)
- **The RTTY Listener, Issues 1-25**, Editor Fred Osterman, 2nd Edition (1991)
- **Buying a Used Shortwave Receiver**, by Fred Osterman, 4th Edition (1998)

Thanks to the tireless efforts of Toku (AD7JA), who brings the library holdings to each meeting, any of these books can be checked out at any regular Club meeting. Members can retain a book for up to a month at a time.

Or you can check them out any workday at the M&K Club library in Toku's television service shop in the Skyway neighborhood of Seattle, not far from the Club's Renton meeting site.

The library is located in Skyway Radio & TV Service, 11818 Renton Avenue South, Seattle. It's just across from the Skyway Park Bowling center. You can't miss Toku's tower and multi-band HF Yagi!

It was also suggested that the library obtain some video DVD's or tapes of DXpeditions and other Ham events. Research found that most of these videos are available for free short term loan to Clubs, for only the two-way postage.

We'll coordinate with the program chairman, and schedule some for upcoming meetings. Let us know if any DXpedition has especially caught your imagination, and we'll see what we can do.

If you want the Club to obtain other particular books or have some volumes you'd like to donate to the library, contact Tim K7ANE.

2010 -- Ham Nets & Events -- APRIL / MAY

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>11 2000 -- King Co. ARES 147.08 (Weekly) 2200 -- NW Astronomy Net 145.33 (Weekly)</p>	<p>12 0545 & 1645 -- Weather Net 145.33 (M-F) 1730 -- Puget Sound Traffic Sys. 146.82 (Daily) 1900 -- Seattle ACS 146.90 (Weekly)</p>	<p>13 2000 -- Seattle Red Cross Communications Team (includes 'Elmers Corner') 146.82 (Weekly)</p>	<p>14 2000 --General/Tech Info 145.33 (Weekly) 2000 -- Educational Radio Net -- PSRG 146.96 (Weekly) 2000 -- HARC CW Net 28.055 (Weekly)</p>	<p>15 1900 -- M&K Public Service Net 146.82 (Weekly) 2000 -- Computer & Packet Net 145.33 (Weekly)</p>	<p>16 2000 -- Youth Net 145.33 (Weekly)</p>	<p>17 1000 -- M&K Club Meeting, Renton 1230 -- M&K Ham Radio Exams, Renton 2000 -- Amateur TV Net 147.08 (Weekly) 2000 -- HARC CW Net 28.055 (Weekly) Hamfest - Yakima, WA</p>
<p>18 1915 -- Kids Net Net 145.49 (Weekly) 2030 -- Snohomish Co. ARES 146.92 (Weekly)</p>	<p>19 1800 -- WA Emerg. HF 3.985 (Weekly) 1830 -- WA ARES 3.985 (Weekly) 1930 -- PSRG 146.96 (Weekly) 2000 -- YL Net 145.33 (Weekly)</p>	<p>20 2000 -- Snohomish Co. RACES 146.92 (Weekly)</p>	<p>21 2100 -- NWSOAR Net 146.82 (Weekly)</p>	<p>22</p>	<p>23</p>	<p>24 0900 -- WA ARES HF Net 3.985 (Weekly) Public Service: Oak Harbor Parade</p>
<p>25</p>	<p>26</p>	<p>27</p>	<p>28</p>	<p>29</p>	<p>30</p>	<p>01 - MAY -</p>
<p>02 Public Service: YMCA - 8K -- Capitol May, Olympia kits@arrl.net</p>	<p>03</p>	<p>04</p>	<p>05 M&K Board Mtg 7pm- Salvation Army, Renton</p>	<p>06</p>	<p>07 Relay Articles Due 23:59:59</p>	<p>08 Stanwood-Camano Hamfest NWVRS Swap Meet- Aurora, OR- 9am-3pm [Features Antique Radio Show] On the web: www.nwvrs.org</p>

Errata for Shunt Circuit Article W7BRS Jeff Wandling

In the recent Mike and Key Relay article, the information on how to make shunt resistor circuits for metering is technically correct, however there is a better way to do the same thing.

The “better way” is to use whole resistor values and not fractional resistance values.

The schematic changes slightly to do this, but to review: The shunt resistor for a 1mA meter to read 0-1A is based on the formula:

$$R_{\text{shunt}} = \frac{R_{\text{meter}}}{n - 1}$$

Where n is the scale to read. For example, to read 0-1A (0-1000mA), the formula is:

$$R_{\text{shunt}} = \frac{R_{\text{meter}}}{1000 - 1}$$

PROBLEM: Solve for R_{shunt} . The value depends on the meter internal resistance. If the meter internal resistance is less than 999 Ohms, R_{shunt} is less than one - fractional.

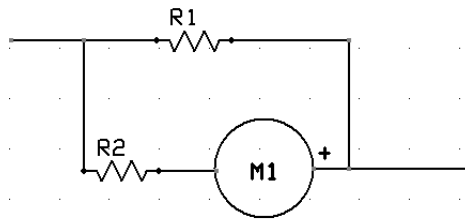
The problem with this is that the value for R_{shunt} can be really small.

SOLUTION: Add a limiting resistor in series with the meter, and shunt the meter and limiting resistor with the shunt resistor.

$$R_{\text{shunt}} = \frac{R_{\text{limit}} + R_{\text{meter}}}{n - 1}$$

For measuring plate current, an ideal meter limit resistor is 1 k Ohms.

$$R_{\text{shunt}} = \frac{1000\text{Ohms} + R_{\text{meter}}}{1000 - 1}$$



R1 is the shunt resistor. **R2** is the limit resistor.

Assume the bypass capacitor and protection diodes are still in the circuit.

Depending on the internal resistance the R_{shunt} becomes a whole number resistance. The ratio is still critical for accuracy.

If the R_{shunt} is not *close enough* to the value in the formula that will cause the meter needle to deflect more or less than it should.