

August 2002

Volume 2

Issue 8

SMARCalling



Southwest Missouri Amateur Radio Club <http://www.smarc.org>

P.O. Box 11363 Springfield, MO 65808 PH: 417-886-4152

Ham equipment for sale...

Hello everyone,

We have a number of items up for sale for one reason or another. Take a look and contact the appropriate party should you be interested.

Mosley Classic Triband Beam
Hygain TH6DXX Triband Beam

Both beams are in very good condition, contact:
Sonny Jarvis, 15208 Malberg Rd., Elk Creek, MO 65464
417-962-5425

- 1- Yaesu FT101E transceiver
- 2- Monitor Scope YO-101
- 3- Land Liner
- 4- Misc equipment?? Part No FB101B
- 5- Power Supply FI2100B
- 6- Digital Display YC-601
- 7- Tokyo High Power/ HF Antenna coupler
- 8- 10c 2591 2 mtr FM transceiver
- 9- Morse code keys
- 10- One 20ft antenna
- 11- 5 misc. antennas, a few being mobile
- 12- Large antenna wire
- 13- Several power supplies
- 14- Lots more misc things, too many to list.

A steal at \$400.00 for all! Worth well over \$1000.00. Would prefer cash only!
Kenneth Theda, Bolivar, MO, 417-777-3985

-- 73's Erik Weaver, n0ew (n0ew@arrl.net, 869-4947)

Next Meeting
Monday, the
19th at 7 PM, at
the American
Red Cross 1835
E. Chestnut Exp.
Just East of
Glenstone

*Hope to see you
and a friend there!*

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HAMFEST, Nov 9th  
Bass Country Inn

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Battery Lecture
By Chris Smith
Kc0gox

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Board Members

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Visitors Always
Welcome!

SMARC Net Worth Report – As Of 7-31-02

Assets		Funds set aside for	
Checking	\$ 539.78	communication trailer	\$2,375.00
Savings	<u>\$3,698.27</u>		
Total	\$4,238.05	Total Discretionary Funds	\$1,863.05
Income		Expenses	
SMARC Dues	\$210.00	Hamfest Expense	
		Facility Rental	(\$1,488.90)
Other Income	<u>\$5.00</u>	146.640 Phone Line	(\$28.23)
Total Income	\$215.00	Total Expenses	(\$1,517.13)
Overall Total (Income – Expenses) =		(\$1,302.13)	

SMARC Meeting Minutes for July 15th 2002...

Members & Visitors Present:

WØKRB, BAREMORE, KEN;

W2RRX, HAVEL, JERRY;

KCØKBL, RIFFLE, LANCE;

NØEHV, SMITH, TIM;

NØMBW, CHAMBERS, BILL;

KØEOD, CHARLES DAILY;

(others were present but not everyone signed-in)

WØSUE, BAREMORE, SUE;

WØODY, MOORE, WOODIE;

WØTLS, SHAFER, LEE;

KØGL, HIGINBOTHAM, DICK;

KBØVKV, LOUISE BUCK;

ERIC GANN (FIRST TIME GUEST & WANTS TO BECOME A HAM)

WBØOVC, RON SCHANDA;

NØEW, WEAVER, ERIK;

WBØOVV, NANCY SCHANDA;

WØLBH, HIGINBOTHAM, LARRY;

KCØGOX, CHRIS SMITH;

June minutes were approved.July Minutes:

Lee Shafer, w0tIs, presented us with the information he collected regarding the proposed Hamfest site. This location is just north of the North Town Mall, with the entrance off N. Glenstone. Enter near the Subway business and you'll come to the facility. It is the old Bass Country Inn. Lee's presentation was complete with a slide show which allowed us to all see the images he had taken. Lee and Ken Baremore are going over the table arrangements as soon as they meet there to take accurate measurements. We anticipate having approximately 70 to 75 tables available. The room rental will be about \$1500. There are naturally some adders to this figure depending upon such things as using their phone lines, and if we clean up after ourselves or pay them (about \$200) to clean up after us.

Lee is chairing this event, and he is off to a very, very good start. There will be at least two commercial vendors attending. Interested parties should contact Lee and let him know if you desire a table, and to let him know what you can do to help make this a successful event. We all know he will need as much support as we can provide. Those of you who plan to run a table will not likely be able to help out on the date of the event, but there are preemptive support items with which your help would be greatly appreciated. There are always envelopes to be stuffed and supplies to be gathered together, all of which must be done prior to the event date.

Event date is November 9th, a Saturday. There are no conflicting dates scheduled at this time. Please start spreading the word. The general consensus was to move forward with this event, and we'll do so. We are also considering making this an annual hamfest, foregoing the August date.

Field Day 2002 Update

Our CW contacts and bonus point efforts were reported. However, our phone contacts were not. There was some problem with the database and I never received the information from Dennis so I was not able to report our efforts for our primary SSB, 6-Meter, or GOTA stations. Obviously, we'll rank poorly.

I would like all of us to begin considering our plan of attack for 2003. Do we wish to seek a more public site? What stations and modes would we like to feature? Should we offer to the public the ability to send Radiograms? What other organizations do we wish to include in our event next year (Scouts, etc.)? If you have any stations you think you may wish to set up, computers, back-up power, etc., etc., I would like to start hearing from you now. We put this together pretty quickly this year and I'd much rather begin planning now for our 2003 Field Day. Please, contact me with your thoughts and suggestions. -Erik, n0ew

7.263 Every Sunday at 6:15 PM the Missouri Emergency Service Net meets.

Once daylight saving ends, MESN will resume meeting at 3.963

Please join us – it is good practice!

As my work schedule allows I will accept 2-Meter relays on the 146.91 (-) PL 162.2 repeater.

Listen to this frequency on Sunday evenings prior to the Missouri Traffic net (5:45 pm) and the MESN.

Erik, n0ew

Chris Smith, kc0gox, presented us with a very, very interesting lecture on batteries. As some of you know Chris is quite interested in solar battery power and this interest certainly includes his ham radio hobby. He has a number of years of hands-on experience in this area of ham radio and shared some of his insights with us this past meeting. His presentation was filled with vital information. So sit back, grab a cup of java or a pipe and prepare to be filled with useful information!

There are a variety of battery (batt) types available in today's market for use in a 12-volt system. (12v is a nominal figure, as most radios actually are designed to run at 13.8v.) However, primarily for reasons of cost only three are common: Wet ("Flooded") Cell, Gell Cell, and AGM. Wet Cell batts are similar to those found in your car. The acid is in a water solution. Gell Cell batts have the same acid, but it has been gelled so it will adhere to the plates inside the enclosure. AGM (Absorbent Glass Mat) still have the same acid inside, but it has been bonded to fiberglass matting inside the battery, a close cousin to the Gell Cell batt.

Automotive batteries differ from "deep cycle" batteries in that the plates in the auto batts are much thinner. This makes the batt lighter. A word of caution: should you find a so-called deep cycle battery on sale and it is in the neighborhood of 150-200 amp-hours (AH) but weighs significantly less than 50-60 pounds, save your money. There is not enough metal inside to provide the wide plates which defines a deep cycle battery. Marketing people will at times call a regular thin-plated battery a "deep cycle" battery in order to sell it. Remember the plate thickness is the primary difference between your normal car battery and a true deep cycle battery, other than designed use.

Which brings us to designed intent. Your car batt differs from any deep cycle battery in that your car needs a large amount of "cranking amps" delivered in a very brief period of time, whereas your radio (or trolling motor) requires a much smaller amount of energy to be delivered, but over a prolonged period of time, perhaps days or weeks. Car batt: quick hard delivery of power; deep cycle batt: extended delivery of power at low levels.

Relative costs of our three main batt types are: Wet Cell \$0.50/AH; Gell Cell \$1/AH; AGM \$2-\$3/AH. Naturally, this cost can be lowered by watching for sales and other bargain opportunities.

(Editorial note: Batts are rated in terms of "Amp-Hour" (AH) which simply means if a load draws one amp of power for one hour, you have seen one amp-hour of energy delivered. It is generally recommended you not draw off more than 50% of your batteries available power, and Chris recommends you limit your regular usage to 30-40% of power capacity. This is to extend batt life. As a side note, Erik comments on a series of charts he studied a couple of years ago, in which batt life was stated in terms of the number of "cycles". ("Cycles" means taking a battery from being fully charged to some percentage of being used/discharged (this can be any figure, 10%, 30% 80%, etc). Each such discharge and return to being fully charged is "one cycle". In these charts Erik saw, it is true the battery has a longer life in terms of months or years use when one discharges it to a lessor depth (say, 25% usage). However, if one translates all percentage of cycles to number of 100% discharges, the life was the same. In other words, to totally kill your battery, as measured as a function of number of cycles, there is no difference between discharging your battery one time at 100%, or five times at 20% (5x20=100). This is not to say other factors may influence usable batt life, such as over-charging, which damages the plates inside the batt. It is to say, investigate what misuse causes damage to the interior of the battery, and concentrate on this, as opposed to the percentage of discharge alone. A question which was not raised was whether discharging a batt to very low levels adversely affects its plates. -EW)

Greene County ARES meets the 4th Wednesday of each month, 7 PM, at the Brentwood Library (just east of Glenstone & Seminole; 2214 South Brentwood, in the community room). Questions should be directed to Ken Baremore, Greene County ARES EC (w0krb@arrl.net). It's rewarding and fun too.

WET CELL ADVANTAGES:

May charge at high voltages
 May charge very quickly
 Lower cost
 Does NOT require controlled charging

WET CELL DISADVANTAGES:

Produces hydrogen gas
 (explosive at small concentrations)
 Must add water
 Loses 1-2% of their charge each day
 (shelf-life)

GELL CELL ADVANTAGES:

No hydrogen gas is released
 No water is added
 Compact size
 Long shelf-life
 (low discharge rate when unused)

GELL CELL DISADVANTAGES:

Requires controlled charging
 14.1 volts applied as maximum
 (more causes damage)

AGM ADVANTAGES:

Has all the advantages of both Wet and
 Gell Cell batteries

AGM DISADVANTAGES:

Cost

If you can afford the AGMs, buy them!

BATTERY CHARGING

"Float" charging a batt means maintaining it at its full charge, once it has been fully charged (applying 13.6 to 13.8 volts). Such chargers may be found quite inexpensively, around \$8, but they usually do produce a lot of RF noise and are not appropriate for use while operating your transceiver.

Three-stage charging is required (to ensure proper life) of Gell Cell batts. Also, Chris recommends having a "pile" of batts that total at least 50 to 75AH. Chris points out there are some companies which make such chargers that have very clean power supplies and these may be used while using your transceiver. Also, a properly designed 3-stage charger will actually bring your batts to full charge faster than hitting them with a "bulk" charger (such as regular car batt chargers).

"Arizona Wind Sun" and "Iota Engineering" both make a very good 3-stage charger in both a 30- and 40AH power supply/charger that cost about \$140. Certainly comparable in price to an Alinco or Astron power supply. (Erik is now in the market for one of these!) Chris has one of these and is quite happy with its dual use as a 3-stage charger and power supply. They also will switch "off" once the batt pile is fully charged, thus ceasing to produce unwanted heat (to ensure proper life, do not keep your batts in temperatures exceeding 75-80 degrees (F)).

You "can" use your regular power supply to charge your batts, however, this often causes damage to the plates by applying too high of voltage, which "boils" the interior gelling, which in turn causes air pockets to develop – thus reducing their charge capacity.

HOME EMERGENCY POWER CONSIDERATIONS

Plan to draw only 40-50% of your batt pile's total available AH. Try to recharge after using 30-40% of their total AH capacity. Do not have less than 50AH for home use. Figure about 1-2AH draw while on RX (receive), and whatever your transceiver draws under TX (transmit). Most 100w rigs draw about 18-20 Amps on TX. Calculate your batt pile needs by applying simple math: (1) estimate your % of TX to RX; (2) total your TX and RX time; (3) divide this into your available (required) batt pile. The result is your estimated hours of operation at that rate of power consumption.

(Editorial Note:

As net control (NC) you may expect your TX:RX to be 50%, as non-NC you may expect this to be closer to 10-25%. For contesting over a weekend consider how often (% of time) you are calling CQ.

Example #1 (home): Given 100AH batt pile (and targeting the use of only 50% of this value (50AH)), 10% TX time, 20-Amp TX, 2-A RX. Each hour of use you will draw $(20A \times 0.10) + (2A \times 0.90) = (2A) + (1.8A) = 3.8A/\text{Hour}$. Divide 3.8 into $(100AH/2) = 50/3.8 = 13.16$ hours usage.

Example #2 (ARES, field deployment): Given 3, 35AH (=105AH) batt pile (targeting full discharge), 25% TX time, 20-A TX, 2-A RX. Each hour you will draw $(20A \times 0.25) + (2A \times 0.75) = (5A) + (1.5A) = 6.5A/\text{Hour}$; $105/6.5 = 16.15$ hours usage.

Therefore, to enable a 72-hour service period you'd require a batt pile of 468AH. That's a lot of weight! My 35Ah batt weighs right at 26 lbs. which is 13.37 batts, which is nearly 340 lbs of batteries! -EW)

OTHER CONSIDERATIONS

Use appropriately sized wire. Generally DC requires twice the diameter wire as does AC. Use the **SHORTEST** runs of wire possible. You will experience less power loss. For lighting needs you may use "Thinlight" compact fluorescent bulbs (RV/camping store) or the newer white LEDs. The white LEDs are great for this use, and while more expensive you will get literally hundred of thousands of hours usage from them. Expect them to out-live you! They also draw very, very small amounts of power. For emergency lighting, supplied with 12VDC they are a great choice.

Most rigs run erratically when given less than 13.0 volts. Most rigs are designed to consume 13.5 to 13.8 volts. Chris has experienced very erratic behavior when supply voltage drops below 12.8 to 12.6-volts.

With Gell Cell batts do not apply more than 14.1v while charging or allow them to fall below 12.0v in use. Dropping below 11.5v is severely damaging to Gell Cell batts. You may safely mix batt types while charging them (although certainly not the best treatment for extending batt life) but discharging mixed batt types is a very bad idea. Don't do it. The best solution to extending batt life is to regulate their usage at 13.8 volts.

A 24-volt charging system can be employed. It is almost always more expensive (there are far fewer of them) but is sometime a requirement when you have long runs of wire. It is very important to regulate the voltage down to 13.8 volts however.

Thank you Chris, this was a very, very good lecture! -Erik

USEFUL LINKS / SOURCES

Arizona Wind & Sun:

<http://www.windsun.com/>

<http://www.solar-electric.com/>

<http://www.Mrsolar.com/>

<http://www.Sierrasolar.com>

<http://www.Gotsolar.com>

<http://www.Bigfrogmountain.com>

<http://www.altenergystore.com>

Iota Engineering

<http://www.iotaengineering.com/>

<http://www.iotaengineering.com/dls.htm> (power supply)

<http://www.iotaengineering.com/dls30.htm> (30-amp PS)

Modifying an Astron power supply to be hooked up to your batt pile all the time:

http://www.ntc.cap.gov/comm/ntc/RS_Battmod.htm

Switching diodes in a charging system, by Leo Lehner, w4rry, 90% efficient:

<http://www.fastq.com/~w4rry/index.html>

2002 Board Members ...

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Note: All board members may be reached by email at: ["theircall"@smarc.org](mailto:theircall@smarc.org) , except for Louise Buck.

Public Welcome!
Please, join us!

Hamfest, Nov. 9th
Bass Country Inn
yards north of the
North Town Mall

SMARCalling is a monthly newsletter published by and for the Southwest Missouri Amateur Radio Club, Inc. All submissions for publication must be received by the last day of the previous month. SMARCalling reserves the right to edit all submissions for spelling and, when necessary, length. All comments on SMARCalling may be made to editor@smarc.org or by direct mail.

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