

CARS CARRIER

Charleston Amateur Radio Society

September 2014 Newsletter

CARS Web Site --- <http://www.wa4usn.org>

CARS meets the second Monday of each month at Ryan's Steak House on Highway 61.

Our next meeting will be held at 7:00 PM, Monday, Sept. 8, 2014



DUES FOR THE YEAR

**AUGUST 1, 2014 – JULY 31, 2015
ARE PAST DUE**

\$20.00/Year, \$10.00 for each additional member in the same household. Please make check payable to CARS. You may pay at the meeting or mail to membership chairman: **Bryce Myers, K4LXF, 2630 Dellwood Ave., North Charleston, SC 29405-6814**

JULY FINANCIAL REPORT

Beginning Checking Balance - 7/1/14	\$4,410.90
Cash Receipts:	
Memberships	80.00
Dues	550.00
Raffle Proceeds	36.00
Refund from Field Day Advance	126.91
Cash Disbursements:	
John Meyers - July CARS Carrier	(33.20)
AT&T - July	(73.68)
3 Years Domain Name (wa4usn.org)	(44.85)
2 Butternut Antennas	(879.90)
Bryce - Roster Copies, Receipt Book	(31.24)
ARRL - 4 Memberships	(135.00)
Ending Checking Balance - 7/31/14	\$4,005.94

Charlotte, KJ4PLX

ANNUAL FINANCIAL REPORT

Beginning Checking Balance - 8/1/13	\$3,323.70
Cash Receipts:	
Memberships	520.00
Dues	3,760.00
Raffle Proceeds	416.00
Cash Disbursements:	
CARS Carrier	(337.59)
AT&T (Autopatch)	(862.44)
ARRL Memberships	(368.00)
Misc.Expenses (printing, stamps, etc.)	(194.05)

Christmas Party	(256.24)
Pinckney Carter Co. (Gen. Liab. Ins.)	(277.00)
US Postmaster, 12 Mo PO Box Rental	(80.00)
Memorials & Flowers for Members	(50.00)
Field Day food and gas	(373.09)
Website Hosting	(83.40)
CARS Business Cards	(73.45)
3 Years Domain Name (wa4usn.org)	(44.85)
Postage for QSL cards for DuBose	(133.75)
2 Butternut Antennas	(879.90)
Ending Checking Balance - 7/31/14	\$4,005.94
Savings Account Balance	\$27.39

Charlotte, KJ4PLX

MINUTES of AUGUST MEETING

Charleston Amateur Radio Society

Club Meeting at Ryan's Steak House on Hwy.61
Monday, August 11, 2014 at 7:00 PM

MINUTES:

The Charleston Amateur Radio Society Meeting was called to order by President Gregory Amirault, KI4TVA, at 7:00 PM on Monday, August 11, 2014 at Ryan's Steak House in Charleston, SC.

Introductions: There were 38 people present.

Secretary's Minutes: Warren, KK4EVI

The July 2014 meeting minutes were published in the August 2014 CARS Carrier. A motion was made to accept the minutes as published, the motion was seconded, and passed.

Treasurer's Report: Charlotte, KJ4PLX

The June 2014 Financial Report was published in the August 2014 newsletter and accepted as information.

Races: Doug, KU4OC

There will be a 5K Fire Department Run on 9-6-2014 and the IOP connector Run will be on 10-4-2014.

Hamfest Report: Greg, KI4TVA

There has been no final word yet on Convention approval. A contract has been signed and money paid for the Armory Park venue. We need to get flyers printed for distribution to other Hamfests.

Repeater Report: Bryce, K4LXF

Everything is running normal except for the Trident Digipeater. Had to reset the call sign from W4HRS-5 to W4HRS-15. W4HRS-5 was needed for a portable APRS station Call sign.

Membership: Bryce, K4LXF

Dues are past due for club membership.

Applications for regular membership:

First Reading: Randy J Cuthbertson W4UNI
John J Curro WB8WBL
Joseph R Ballentine KM4BZV

Second Reading: Grady D. Hulon, KA4HQX

The new member was voted on and accepted.

Emergency Prep: Rick, N8BKN, Charleston; John, W4HNK, Dorchester; Dennis, KG4RUL, Berkeley

The next Charleston ARES meeting is August 16th at the St. Andrews Public Service Building at 09:00 AM.

Nets: George, KI4UIW - Newcomers Net

Newcomers Net meets on Thursdays at 8:00 PM. If you are interested in trying to conduct a net, send George, KI4UIW, a note and he will get you the information.

ARES Net meets at Sunday 8:00 PM. Local area 5 meets from 8:00 - 8:20 PM then joins the statewide link up at 8:20 PM.

QCWA Net meets on Saturday at 9:30 AM. Chapter 89 is now in Charleston.

SKYWARN Net meets on Tuesdays at 9:00 PM on the linked repeater systems.

Lowcountry Digital Nets: meets Sundays at 8:30 PM and Wednesdays at 8:00 PM on **145.700** MHz running Contestia 32/1000.

TARC CW Training Net: meets every Tuesday at 7:30 on linked repeater systems.

SCHEART Net: meets every Thursday morning at 9:00 AM.

ARES HF Net: Meets on 1st and 3rd Monday at 6:00 PM on HF 3.990 MHz primary and 3.9935 MHz alternate. Looking for more HF Logins, to support HF web.

Education & VE Testing: Sheila, KT4YW

The next scheduled exam will be 09:00 AM on October 11th, 2014 at the Trident Hospital.

No Technician classes are scheduled for the near future. The question pool was changed and waiting for revisions to arrive.

School Programs: Alene, KG4NKD - DuBose Middle School Radio Club - K4DMS

No report.

Old Business:

Operating sessions in the Club room aboard the Yorktown, Jim, KK4REM, are going well.

New Business:

1. Ginny, with the Cystic Fibrosis Foundation, has a Bike ride on October 4th would like 6-8 hams for support, there will be a party afterward.
2. Fireman 5K Run on September 6th would like 10 hams for support. Daniel Island from 0800 to about noon.
3. IOP Connector Run on October 4th. IOP from 0800 until...

All runs or rides were voted on and approved.

4. Coastal Carolina Fair coming up in October..
Get ready.

Announcements:

Brian Fletcher, K6NWS, with MUSC Hospital Emergency Operations had 10 APRS units to hand out for testing. Users had to agree to:

Have a Ham License

Take care of the unit

Keep the unit in your vehicle

Give permission to include in formation on travels, in a Paper he is writing up

Drawing:

The drawing for a one year ARRL membership was won by Bob, W4HGW.

There being no further business, a motion was made, seconded and passed to close the meeting. The meeting was adjourned at 7:44 PM.

Respectfully submitted by Warren, KK4EVI

ANTENNAS, TRANSMISSION LINES, AND SWR

As you probably already know, an unmatched transmission line is one in which the terminal impedance (usually the antenna) is different from the characteristic impedance of the line. A typical example might be a tri-band beam with an impedance in the neighborhood of 25 ohms fed by a 50 ohm coaxial cable. If there is no reactive component (which frequently there is) then calculation of the Standing Wave Ratio (SWR) is simply $50/25 = 2.0$. If the terminal impedance were 100 ohms, the SWR would be $100/50 = 2.0$ again. Since SWR is always 1.0 or greater, the calculation is always the larger impedance divided by the smaller. If there is inductive or capacitive reactance at the load, the lowest possible SWR will always be greater than 1.0, sometimes considerably so, and its calculation becomes considerably more complicated and we won't get into that. Suffice it to say that your SWR bridge or other indicator will give you a sufficiently accurate number.

If your SWR is over 2.0 it is advisable to get it down since most modern transceivers will reduce power

output when the SWR is high. Getting the SWR down is the job of the Antenna Tuner which tunes, or more accurately, matches the antenna and transmission line to the output impedance of the transmitter. Note that everything starts with the very end of the antenna where the initial reflection takes place. In the case of a dipole, that is an un-terminated wire which has a high impedance, approximately 4000 to 5000 ohms in most cases. It would be a lot higher were it not for the fact that there is capacitance between the wire from each leg of the dipole to ground and to the other leg. Since each leg is $\frac{1}{4}$ th wavelength, it acts as a quarter wave transformer. Consult your ARRL Antenna Book for a description of quarter wave transformers or Q-sections. The result of the transformer action is a feed point impedance of about 60 ohms for the average dipole, and if you get the dipole length just right, there will be little or no reactive component, so the SWR will be $60 / 50 = 1.2$.

At every point along the feed line where there is a change in impedance, there will be reflection. Visualize it as a series of mirrors, each with a small hole in it. When the entire system is matched by the antenna tuner, the mirror reflects all the light that hits it, and the hole passes light that has been reflected by the next most distant mirror. Consider the feed point of the dipole. The mirrors at the ends of the dipole reflect all the light that arrives. But some doesn't make it because it was lost from the antenna as radio signal, or heat due to resistance in the wire. The remainder passes through the hole in the next mirror headed back toward the transmitter. If the antenna tuner is properly adjusted, the light passing through the hole will be of exactly the same intensity as the light reflected from that mirror, so it will look like a complete mirror (no hole) to an observer. This will be true at every point of impedance change in the feeder system. In other words, a properly adjusted antenna tuner will match every point of reflection (impedance change) in the entire system, no matter how many there are.

So all you have to do is adjust your antenna tuner for the lowest SWR and everything is great? Unfortunately not. Several years ago while at Handiham Camp near Bemidji Minnesota, I put up a 135 foot Zepp antenna fed with 300 ohm window line. Back in the shack I adjusted my MFJ antenna tuner

for a perfect 1:1 SWR on 20 meters. The band was hot and signals were boiling in, but nobody was answering my calls. Turns out that I had neglected to connect the feed line to the end of the antenna. The insulated support rope was attached and the feed line was close enough to the antenna to provide capacitive coupling—enough for receiving, but not for transmitting. I was loading up an open parallel feed line and essentially all of my 100 watts was being dissipated as heat, some in the feed line, the rest in the antenna tuner.

I see occasional adds for antennas that tout an SWR of 2:1 or less from 1.8 MHz to 30 MHz using a random length wire. Actually, it is very easy to make such an antenna yourself. Just connect the end of your coax to a 50 ohm dummy load and connect a random wire to the center conductor of the coax. Radiation will be most effective if the wire is $\frac{1}{4}$ wavelength long, presenting about 50 ohms impedance to the system after adding in the resistance of the poor (almost non-existent) ground system. The 50 ohm antenna in parallel with the 50 ohm dummy load yields an impedance of 25 ohms resulting in an SWR of 2:1. The only problem is 50% of your signal is wasted in

the dummy load and nearly another 50% of what's left is lost in the ground system, so only about $\frac{1}{4}$ of your power is being radiated. But what the heck, you can make a lot of contacts using QRP.

Compact antennas for HF are frequently advertised. The performance of nearly all of these is grossly substandard. One exception is the MFJ 1788 Super Hi-Q Loop, a tuned loop which will perform well if it is suitably located (way up high where you would put your dipole). It has some disadvantages: very sharp tuning making QSY complicated, a narrow radiation pattern, and it's heavy. It is much simpler to get a significant length of wire high in the air. A good rule of thumb is at least $\frac{3}{8}$ th wavelength of wire at the lowest frequency you will be operating. The exact configuration is not critical. Dipole, inverted V, G5RV, all work well and can be tuned with your automatic antenna tuner.

Try building your own antenna system. It ain't that complicated. The ARRL Antenna Book can help with the details.

73, Doc

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