PRINTED CIRCUIT

JANUARY 2003 Newsletter of the Joplin Amateur Radio Club Vol. 13 Issue No. 1

EMERGENCY PREPAREDNESS PAYS

While many hams (myself included) were snugly tucked away in our beds, there were several amateurs that were providing assistance to the Red Cross while the tornado filled skies posed threats to the area. Not only were they storm spotting and supplying assistance to the National Weather Service and Red Cross, they also demonstrated the use of Slow Scan to provide real time images for damage assessment.

Actual Slow Scan Image which shows the damage at one of the homes - courtesy WD6FIC

Tuesday evening, both Ray Brown, KBØSTN, and Dwayne Beaver, NØSZP maintained storm nets. Jason Mitchell, WØJWX, was on the air, providing help with Barton County stormspotting. Both Ray and Dwayne kept the Springfield National Weather Service office advised to weather conditions. Reports were received from Newton County as well.

This is a list of the communications volunteers that were present along with their assigned tasks.

NET CONTROL:
Andy Gabbert, KAØTUD
SHELTER:
David Mills, KCØBUP
ASSESSMENT:

(Continued on page 3)

NEW ARES SECTION EC

Reprinted from the ARRL Missouri Monthly Section Newsletter
ARRL Missouri Section
Section Manager: Dale C. Bagley, K0KY
k0ky@arrl.org

Don Moore, KMØR, of Columbia, MO has been selected as the new Section Emergency Coordinator. Don brings his experience as an EC and DEC to the position. I know that he will do a great job as SEC and will continue to build on the excellent foundation developed under Patrick Boyle, KØJPB, the outgoing SEC. I want to thank all of those that made themselves available for the position and those that contacted me expressing support for each of the candidates. EC and DEC need to send their monthly reports to Don Moore, KMØR at km0r@arrl.net. The most recent EC for MO are Dennis Kimrey, W0HL, of Nevada, MO the EC for Vernon County and Glen Briggs, KB0RPJ, of Trenton, MO the EC for Grundy County. Gene Bass, WØGAB, of St Roberts, MO the DEC for District I has changed his call to one that fits his initials. That will be a lot easier to remember than KCØIUO.

John Cline, NØGX, will continue to serve as the Net Manager for the Missouri Emergency Services Net. Following the MESN, on sunday night, Joe Counsil, Digital Communications Coordinator for the MO ARES and EC for Phelps County, host a weekly PSK31 net on 80 meters. The net is conducted on 3.580 mhz. For more information about the procedures for checking in and making comments, please look at http://www.qsl.net/kb0emb webpage put together by Larry, KBØEMB. ¶

inside...

QRP FOR THE RADIO AMATEUR

TASTE OF NOSTALGIA

I received my January 2003 QST in the mail today, and it was full of articles and pictures of QRP rigs made with vacuum tubes. Today, many QRP rigs constructed today are solid state. They take up less space, draw less current to operate, etc. There are however, advantages to building or restoring tube type transmitters and receivers. For a newcomer, it is probably easier to construct, since used parts and tubes are available at low cost.

The question is often asked why are we are unable to get young people interested in ham radio these days? Sure, their parents can spend a $1000 and buy them a nice transceiver so they can work the world, but a year later the novelty has worn off and they are seldom on the air.

The best thing that ever happened to Amateur radio was the creation of the Novice license in 1951. A new ham had one year to upgrade to Tech or General, or lose their license. The new ham in the 50's usually had something like a low cost receiver and a one-tube home built transmitter (a novice rig had to be crystal controlled). The antenna often was just an end fed quarter wave wire, or perhaps a folded dipole using 300 ohm twin lead. Coax was expensive, so most hams used other types of transmission line (and even lamp cord) to feed an antenna. Many new hams were thrilled when they made their first contact 1000 miles away using the small transmitter they built themselves. I can remember the radio club I belonged to in St. Louis where we had a meeting once a month a each other's home. One of real thrills was to see an old time ham's "home built" rig, usually in a six foot rack, full of meters and the mercury vapor rectifier tubes glowing blue. The transformers would hum, and relays would click when they hit the switch. These "boat anchor" rigs were not the type you would take out on field day! A new ham could look

(Continued on page 3)

A PRIMER ON TRANSMISSION LINES AND SWR - PART 2

Today I pick up by restating something from the first part of this primer. Transmission lines that are flat can be of **any length** and not affect the SWR. If standing waves appear on a transmission line that should be flat, then it is necessary to change either the antenna impedance or the transmission-line impedance until one matches the other. This is important if *optimum* reception or transmission performance is needed.

The ratio of current (or voltage) delivered to an antenna to that reflected back down the line is the *reflection coefficient* β. It is equivalent to

$$\beta=(SWR-1)\div(SWR+1)$$

As an example, an impedance mismatch of a 70 Ohm feedline to a 35 Ohm antenna produces a SWR of 2:1 and a reflection coefficient of 1/3. Since power is proportional to I^2 (or E^2), the power reflected will be the square of ß, or in this case 1/9. This means that only 8/9 of the power is actually delivered to the antenna, and the other 1/9th is reactive power.

Mismatching a transmission line to an antenna causes the line at the transmitter to appear reactive, and will have an inductive X_L, or capacitive X_C. This has the effect of detuning the LC output circuit to which it is coupled, whereas a matched antenna system may lower its Q but will not detune the final amplifier.

Open wire lines can be constructed to have impedances from 150 Ohms to over 800 Ohms. These are made by keeping the line evenly spaced with insulators called spreaders, along its length. A very common transmission line that can be used with modest power transmitters is 300 Ohm twin lead.

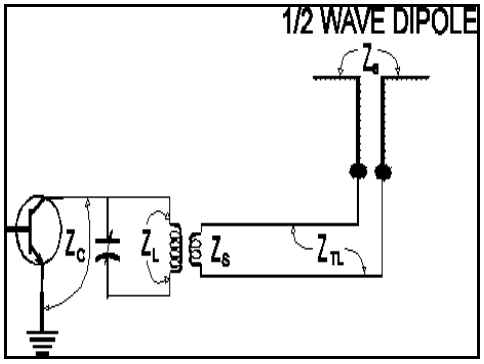
When lower impedance lines are required, **coaxial cable** is often used. In essence, this is a single conductor, centered within a conducting tube used as a shield. The center conducter is often separated from the outer conductor and held in place by foam or plastic insulators. Standard coaxial cables are manufactured in a variety of impedances such as 50, 52, 72, 75, 93, and 125 Ohm. It needs to be noted that the **working** surfaces of coaxial cables are the **inside** of the outer conductor, and the **outside** of the inner conductor, and oxidized surfaces are undesirable.

The surge impedance of an air-dielectric coaxial transmission line is approximately

$$Z= 138 \log (d1\div d2)$$

Where:
Z = surge impedance in Ohms
d1 = inside diameter of the hollow tube
d2 = outside diameter of the center conductor

SWR of a coaxial transmission line can be measured with an SWR meter. Such a device will consist of a short length of coaxial line with a short piece of wire parallel to the center conductor within the hollow tube. This is fed through a diode to a low current meter calibrated for SWR readings. When the SWR is 1:1, the



meter will not deflect. The same kind of device calibrated in Watts and with some means of indicating a reference level can act as a RF Wattmeter. SWR can also be measured by using two direction RF Wattmeters to form a *reflectometer*.

Although not apparent on short runs, long transmission lines, even though flat, will attenuate energy due to skin effect, dielectric losses, and conductor resistance. As a result, the current delivered to the

(Continued on page 4)

(Continued from page 1)
Dave Ferguson, NØKMP;
Dave Hill, KIØPP;
Jack Purdum, KGØVR
CHAPTER:
J C Alexander, K5DMI;
Jim Johannes, NØZSQ
STAND-BY:
Martin Matarazzo, WD6FIC;
Mark Mitchelson, NØZPD;
John Tudenham, WØJRP
DAMAGE REPORT:
Dwayne Beaver, NØSZP

Severe late fall storms had started passing through the area late Tuesday evening, but the worst part wasn't over. Early Wednesday morning around 2 a.m., the threat of tornados in the area gave cause for Andy to activate the Storm Watch teams. It became apparent that Jasper and Barton Counties were in harms way when David Mills sited a funnel cloud at his home passing overhead. He reported this to both Dwayne and to the National Weather Service in Springfield.

Soon afterward, David Hill and Jim Johannes arrived at the Red Cross Chapter, supplying cable, rigs, power supplies, and antennas which were set up in less than one hour at that location. Throughout Wednesday morning, both NET CONTROL and the CHAPTER maintained instant contact on **three** separate frequencies: WØIN/R 147.210+; NIØW/R 145.350-; and 147.400 simplex (talkaround).

Throughout the day, Dave and Jack meticulously provided closed circuit quality Slow Scanned images from the field to JC Alexander and Jim Johannes at the Red Cross Chapter for damage assessment. Louis McReynolds, the Disaster Services Manager for the Southwest MO chapter of the Red Cross was **very impressed** with the immediate availability of photos through the amateur communications network and noted that this was an excellent method to help Red Cross personnel in pinpointing their damage assessment

Slow Scan Image of a completely distroyed home - courtesy WD6FIC

The ARRL Missouri Section manager Dale Bagley KØKY has been notified, and a report is being compiled to notify the ARRL section about the fast deployment and effort to assist in damage assessment and shelter-chapter communications.

These hams did a terrific job assisting the Red Cross and National Weather Service in this true life threatening emergency, and are to be commended for all of their efforts. ¶

ARES NEWS AND EVENT SCHEDULE

The next State-wide Tornado Drill is scheduled for March 12th, 2003.

The Jasper County/Tri-States ARES participates in drills regularly with other area agencies in order to supply a coordinated communications backbone in case of an emergency. All area hams are encouraged to join ARES and become familiar with procedures.

You can learn more about ARES by attending JARC meetings where ARES announcements are given. In addition, regular ARES announcements are also made weekly at 19:30 on the JARC Monday night net. Andy can be reached at 417-673-8371, on the air, or email at **ka0tud@arrl.net**

(Continued from page 2)
forward to the day he would upgrade his license and be able to build a rig like that.

Of course all hams didn't build kilowatt rigs, many were satisfied with 50 or 100 watt transmitters using the popular 807 or later the 6146 tube. In the 1950's many commercial kits and wired transmitters came out using a pair of 6146 tubes, notably the Viking 2, B&W 5100, the Heathkit DX 100, and of course the Cadillac of all rigs the Collins 32V2.

Power in those days was measured by input, not the output, as is done today. To measure your power input, you would multiply the plate voltage by the plate current of the final RF stage. Output of a class "C" amp used mostly on AM and CW usually was about 65 to 70%. You could then estimate your output power.

In closing, you might check the January QST, you may want to build the simple "Tuna Tin Tube" transmitter pictured on the front page. It's a great QRP rig!

73 John Tudenham WØJRP

(Continued from page 2)

antenna may be significantly less than supplied by the transmitter into the line. It needs to be noted that as frequencies go higher, attenuation due to losses also increase.

Although standing waves are not desirable on transmission lines, they are **always present** on resonant antennas. A half-wave dipole exhibits high E-points at each end, while always maintaining a low E-point at its center.

Often the importance of matching the antenna system is misunderstood because the easy fix is the use of an antenna tuner at the transmitter end. This device does indeed cause the transmitter to see a matched load, however everything connected to the tuner's output appears as the antenna load itself, including the transmission line. If there is any mismatch, it is hidden, along with all the reactive losses (remember from above). In this case, the feedline has become part of the antenna system, but **does not radiate**, and may only heat up as it devours the wasted energy meant for the antenna.

One could say, that with an antenna tuner, a random wire could even be made to match. At what expense? If the efficiency of the antenna was only 10%, your "on the air" contact will be **six** S-units down. That's food for thought.

In conclusion, if all parts, the antenna, the transmission line, and the transmitter are all matched, then you will not need an antenna tuner. The performance of the antenna system will be well worth the time it takes to do it right.

73
Jim WBØIYC

MY SOURCE: ALMOST ALL OF THIS MATERIAL WAS TAKEN FROM THE FOURTH EDITION OF ELECTRONIC COMMUNICATION, BY ROBERT SCHRADER. McGraw Hill 1980.

CLUB COAX AT COST TO CLUB MEMBERS

RG8X - $0.31/ft. LMR400 - $0.71/ft.
Contact Jim NØZSQ at the meetings.

BUY - SELL - TRADE

NOTE: INDIVIDUAL LISTINGS ARE FREE TO THE AMATEUR COMMUNITY, AND SPACE IS ALLOCATED ON A FIRST COME BASIS. COMMERCIAL AD SPACE IS AVAILABLE AT A NOMINAL CHARGE.

For Sale - Kenwood TS-520 HF Transceiver This was my personal 5 band 80-10m rig that I used for many years. Very Good Rcvr, modest 160W transmitter (6146 Finals). Operates on 120VAC/12VDC. Includes manual. Ask $275 (417) 781-2211, email wb0iyc@arrl.net
12/2002

For Sale - 12V 4.5AH Sealed Batteries - NOS Rechargeable Sealed Lead Acid batteries for use in alarm and lighting systems. Meas. 3-1/2"x2-5/8"x4", perfect for portable use. Warehouse fire stock, good undamaged batteries with at least 80% of their life left. $6.00/ea.
(417) 781-2211, email wb0iyc@arrl.net
11/2002

For Sale - SIGNAL 1404-S 4 BAY DIPOLE Heavy Duty 21ft phased array. 140-160 MHz. Former club repeater antenna. Serious offers only. Contact: Martin WD6FIC (417) 623-6618 email wd6fic@arrl.net
10/2002

For Sale - Kenwood TS-660 All Mode four band transceiver. Cover 15, 12, 10, & 6 meters. 12VDC mobile 10W transmitter. Very good shape, complete w/orig. carton, OP & Service manuals. Asking $450. Ray KBØSTN
(417) 781-4967, email kb0stn@arrl.net
10/2002

For Sale - ALINCO DR-570 2/440 FM 12VDC mobile rig w/20 memories. Good shape w/orig OP manual, mt. bracket, and mic. Asking $150. Ray KBØSTN (417) 781-4967
email kb0stn@arrl.net
10/2002

For Sale - ALINCO DRM-06H 6m 20W FM rig w/100 memories. Will recieve 40-60MHz Very good shape w/orig OP manual, and mic. Asking $150. Ray KBØSTN (417) 781-4967
email kb0stn@arrl.net
10/2002

For Sale - TEN-TEC 1209 2m-6m Transverter. 10W in 10W out, 12VDC. Good Shape. Kit assembled and tested. Operates okay w/kit manual (incl schematics). Asking $100. Ray KBØSTN (417) 781-4967
email kb0stn@arrl.net
10/2002

For Sale - KLM 2000A 2m All Mode Rig. Dual power 120VAC/12VDC, 5W transmitter. Collector's Item, (my second radio). Good shape w/orig. manual and hand mic. Asking $200. Ray KBØSTN (417) 781-4967
email kb0stn@arrl.net
10/2002

AREA HAMFEST

NOTE: LISTINGS ARE PROVIDED FROM THE ARRL.ORG SITE AS THEY BECOME AVAILABLE. TO SUBMIT AN ENTRY, SEE BACK PAGE.

11 Jan 2003 - Willard, MO 49ers Repeater Club - Winterfest 2003
Willard Recreation Center, 108 N. Hwy. L
Contact Mike Blake NØNQW for info.
Email: n0nqw@arrl.net

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18 Jan 2003 - St. Joseph, MO Missouri Valley and Ray-Clay ARCs 13th NW Missouri Winter Hamfest at the Ramada Inn (I-29 and Frederick Ave, Exit 47 on I-29; special hamfest rates); Talk-In 146.85 and 444.925; 8a.m.-2p.m., $3adm. or 2 for $5. FCC exams, major exhibitors, flea market all indoors. For details, write NWMO Winter Hamfest, c/o Neal Makawaski,WBØHNO, 3704 Meadow Oak Lane, St Joseph, MO 64503, 816-279-3406; Email: nem3238@ccp.com

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1 Feb 2003 - La Cygne, KS Mine Creek ARC presents the Mine Creek Hamfest. KS Community Bldg. on Broadway. 9:00 a.m. to 1 p.m. Free Adm., Tables - $10, Hourly drawings.
Contact: Ron Cowan, KBØDTI, PO Box 36, La Cygne, KS 66040, Phone: 913-757-4455
Email: kb0dti@arrl.net

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8 Mar - Harrison, AR Harrison Hamfest 2003
Sponsored by North Arkansas ARS
8:00 a.m. to 2 p.m., North West Arkansas District Fairgrounds. Adm. $5 (16 and under-free). Indoor Tables $10, Outdoor Tailgating (requires admission ticket).
Contact: Bill Carlton, KD5HBM, 7221 Hwy 62 East, Harrison, AR 72601, Ph: 870-743-6211
Email: kd5hbm@alltel.net
http://vistaeng.homeip.net/naars/hamfest/index.html

4-5 April - Joplin, MO Joplin Hamfest 2003
Don't miss this one! John Q. Hammons Convention Center, Exit 8B & I-44
Fri. April 4th 6-9 pm., Sat. 8 a.m. - 3 pm.
Have breakfast at 7 a.m. with Midwest Director Wade Walstrom, WØEJ.
Keynote luncheon with ARRL Int'l Affairs VP Rod Stafford, W6ROD.
Hourly forums and drawings, ARRL/VEC testing, XYL events, Grand Prize - a complete HF Station. Adm. $5 adv., $6 at the door. Tables $10/$20, see website for more information or contact
J C Alexander K5DMI, 417-206-2339.

JANUARY 2003

Joplin Amateur Radio Club Meetings and Events

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
			1	**2** 17:30 Thursday Nite Out -	**3**	**4** 09:00 Breakfast -
5 14:30 -16:00 JARC Slow Scan Net	**6** 19:30 JARC Mon Nite Net Net Control - WØJRP	**7**	**8**	**9** 17:30 Thursday Nite Out -	**10**	**11** 09:00 Breakfast -
12 14:30 -16:00 JARC Slow Scan Net	**13** 19:30 JARC Mon. Nite Net Net Control - NØZPD	**14** 19:30 JARC Business Meeting	**15**	**16** 17:30 Thursday Nite Out -	**17**	**18** 09:00 Breakfast -
19 14:30 -16:00 JARC Slow Scan Net	**20** 18:30 VE Testing @ St. Pauls Methodist Church 19:30 JARC Mon Nite Net Net Control - NØKMP	**21**	**22**	**23** 17:30 Thursday Nite Out -	**24**	**25** 09:00 Breakfast -
26 14:30 -16:00 JARC Slow Scan Net	**27** 19:30 JARC Mon Nite Net Net Control - WD6FIC	**28** 19:30 JARC Program Meeting	**29**	**30** 17:30 Thursday Nite Out -	**31**	

Meeting Times, Testing, and other Club Information

The **Joplin Amateur Radio Club, Inc.,** a Missouri *not-for-profit* organization, meets on the second and fourth Tuesdays of each month at the Joplin Municipal Building, on the lower level, in the Civil Defense dining room at 7:30 PM. The facility is accessible to the handicapped.

The club supports and promotes annual operating events, assists area agencies with communications when requested, and offers training classes for advancement in amateur radio. It also sponsors the JARC Hamfest each year in April, and maintains a wide area coverage OPEN 2m repeater on 147.21 MHz (+).

Some club members can be found weekday mornings around 8:30 a.m. meeting for coffee at the Ramada Inn at 34th and Rangeline Road. On Saturday mornings, area Hams also gather for breakfast around 9:00 a.m. at the restaurant next to Smitty's Grocery located at 1820 Maiden Lane in west Joplin.
For details contact Martin, WD6FIC at (417) 623-6618

2003 CLUB OFFICERS:

President: Dave Ferguson	NØKMP
V. P. JC Alexander	K5DMI
Treasurer: Jim Johannes	NØZSQ
Secretary: Mark Mitchelson	NØZPD

Amateur Radio VE Testing

License testing by volunteer examiners takes place on the 3rd Monday of each month at the St. Paul's Methodist Church located at 2423 West 26th St. in Joplin. Sign up at 6:30 PM, testing begins promptly at 7 PM.

ABOUT THE NEWSLETTER

This club newsletter offers an open forum for the Four-State area amateur radio community, and ***your*** comments and contributions are always invited. Items for publication, including classified ads and amateur radio related articles, may be sent to the **JARC Printed Circuit**, P.O. Box 2983, Joplin, MO 64803-2983, or send email to: **wb0iyc@arrl.net**

Deadline for submissions is the 20th of the month preceding the month of publication. Non-Commercial Classified ads are free and will be run on a space available basis whenever requested. Submissions may be typed, handwritten, ASCII text files attached with email, or on disks formatted for IBM. *All items* are subject to editing for spelling, content, and space limitations as required.

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Joplin Amateur Radio Club, Inc.
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