August 2012 Volume 08-2012

Nacogdoches Amateur Radio Club

2012 CLUB OFFICERS

Pres: Rusty Sanders – KD5GEN

VP: Mike Brown – KF5KEY

Sec/Treas: Army Curtis - AE5P

MISSION STATEMENT

The Mission of the Nacogdoches Amateur Radio Club is to support and promote Amateur Radio by public service, offering training to unlicensed interested parties and licensed Amateurs, mutual support of other Amateurs, engaging events that promote Amateur radio to the general public and other Amateur radio operators, and continuing fellowship by regularly scheduled organized meetings and events.

AUGUST MINUTES

The August meeting of the Nacogdoches Amateur Radio Club (NARC) was held as scheduled on August 1st. **President Rusty KD5GEN**, opened the meeting at 7:00 p.m. in the Parish Hall of Christ Episcopal Church. Seventeen members and five guests were present. Each person present introduced himself. Minutes of the previous meeting were approved as published. The Treasurer's report was read.

Old Business:
The IARU HF contest was held on July 14. Both phone and CW modes were allowed. K5ME and AE5P both entered working CW only.

Lufkin Hamfest is scheduled for October 20 at the Lufkin Church of the Nazarene on the East Loop. Check out their website at http://lufkinhamfest.com/

Contests coming up include the ARRL UHF contest on August 4-5, and the NAQP CW on August 4.

Skywarn training will be held in Lufkin on November 1st. More information to follow.

Jerry K5JLW reported a new repeater being installed by DETARC just south of Alto.

Meeting adjourned at 7:35.

Program: **Army AE5P** presented a program he called Repeaters 101.

OSCILLATIONS FROM THE CHAIR

Hello to all NARC members and readers.

Summer is coming to a close shortly. The temperatures have been much lower than last year at this time. The hurricane corridor in the Atlantic and Caribbean waters has been active but not really threatening to our area. It sure would be nice to have some tropical rains for our area.

Something that I have been thinking about and mentioned during the Skywarn net the other night is something called "talk-around" frequency. Public service agencies utilize the "talk-around" frequency many times as a Channel 2. Channel 1 is the primary frequency where everything goes through the agency repeater. Should the repeater 'go down', the unit's in the field must communicate on some other channel. Channel 2 or the "talk-around" channel is where all units communicate on a simplex channel and that channel is the frequency of the repeater output.

Way back when I was gainfully employed, the Nacogdoches Fire Department was using UHF frequency for their communication. Each and every base, mobile, and portable had a Channel 1 that was the repeater frequency. Each and every base, mobile and portable had a Channel 2 frequency that was the "Talk-Around" channel and that was the frequency of the repeater output. Several times, we would have the repeater go down and when that was recognized; the dispatcher would tone out all units to switch to Channel 2 for communications. The dispatch center had a gain antenna mounted on a tower with sufficient wattage to cover the entire city. All substations could receive alerts and communicate to dispatch. All mobile units had complete coverage with dispatch inside the city and into the county for a short distance. Portable coverage was much more limited but they could normally receive.

In regards to our amateur radio repeaters, we transmit on 600 khz lower or higher than our repeater output. We utilize standard simplex channels of 146.520, 146.46 and 147.47 depending on our local options. If we were operating during a weather emergency and you were monitoring/operating on the Sky Warn repeater in Nacogdoches, you would be monitoring 147.320. If the repeater were to quit operating, you would have no way of knowing that unless you attempted to key up the repeater. Once someone realizes the repeater is down, how would one notify others that were monitoring the frequency? You would need to have a talk-around frequency in your radio.

In addition, to reach others, you would really need to have a good antenna location or height and some power. In an emergency event, should the repeater go down, not everyone would be able to make contact with all operators but could possibly receive messages.

I suppose that we cannot plan for every possible failure that might come along, but communication during a repeater failure event is something that can be handled with preplanning. I have entered talk-around frequencies for the "32" and "84" repeaters in both my portable and mobile units. I next have to tackle the programming of my Icom 2720 which at times can be a challenge. I also have the ability to xmit at around 170 watts on the 32 or 84 repeaters. I have no idea of what my coverage area would be with my current set up.

It would be interesting to test the talk-around frequency during the nets in the upcoming weeks. Maybe if we test such a system and are really prepared for such an event, it will never happen.

Hope to see you at the Wednesday meeting.

KD5GEN- Rusty

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FROM THE VICE PRESIDENT

Hello all. Another month has passed; it seems that it is newsletter time again. Scratching my head over what to write about, it seems that I only come up with questions, so that's what I'll write about. I've only been a ham for a little over a year now, and though I am on the air quite a bit and enjoy it tremendously, I am constantly reminded of how little I truly know about our wonderful hobby and how very much there is to learn. It seems like I am constantly encountering things that I need to know in order to really be an effective ham, but owing to time constraints, "must-do-nows" and let's face it, sheer laziness, I never seem to get around to researching these things, so I continue to operate in ignorance.

I know that the vast majority of you folks have been hams for years and years, and you've probably forgotten more about amateur radio than I'll ever know. Also, since most of these questions are so basic to you pros, you've probably forgotten what it is to be a new ham facing all the numerous questions that arise in the establishment and operation of you station. That being the case, let me refresh you about some of the puzzles and problems of the new ham.

1. How to effectively ground your antenna. Yes, I have eight feet of copper-coated steel in the ground and supposedly have grounded my antenna correctly, but everything that I read makes me doubt the effectiveness of my grounding setup. Also, I live at the top of a

sand hill and understand that sand affords a poor ground. What to do?

2. How to ground your station (to both antenna and house wiring). Army came over one day to help me with some problem and when he saw my ground setup, said, "We really need to have a talk about how to ground your station."

3. Counterpoise - What is it? Why have it?

4. Your first antenna - a dipole cut to a specific frequency or a multi-band type such as a G5RV?

5. A beam antenna or a power amplifier? Which is best? Or should you have both?

6. Lightening protection - do I have enough? Is there ever enough? Should I just unplug my antenna during a thunderstorm and don't worry about it?

7. 6 meters - it's almost always quiet - is it my station, my antenna, my radio?

8. DC to daylight transceivers - are these a good deal or should you get separate units?

9. Setting up a mobile - What's best? Which antenna system? Do you have to have a tuner? Power amp? Noise suppression?

10. Talking within a 100 miles. Which band(s)? How much power? What equipment?

11. Used vs New equipment - Which is best? What used equipment should you NOT consider?

12. How to QSL - What's a bureau? What are "green stamps?" What are IRCs?

13. Uses of 2 meters and higher? Seems like there is nothing going on to speak of; am I missing something? Should I invest in UHF equipment when it seems like there is so little going on?

Wow!! Enough, but I could go on forever. About the only thing that I can truly say that I know is that I know so very little about a great hobby. Nonetheless, I keep plugging away, and I can say that a lot of the things that I could have put on my question list a year ago no longer are questions. You really do learn as you go in this hobby.

Finally, I would like to say one thing about the idea of being an "Elmer." There is a great tendency to sit quietly and assume that the poor dweeb just starting out in radio either already knows what he needs to know in order to operate, or the poor guy is so hopelessly lost that anything that you could say would probably be a waste anyway. PLEASE! Please give us any information that you can, no matter how basic that it may seem to you. Is it something that has already been covered and might be repetitive? Very possibly, but we new guys can use it! There is never too much information for us. Please spread your

knowledge....it is greatly appreciated. You are not "bothering" us or interfering where you're not wanted. You are wanted. I appreciate so very much all those hams who have taken the time to help me learn just a bit more about ham radio. Please continue! You guys are a godsend to us. Please keep up the good work and know that your efforts are truly appreciated.

Thanks you guys.

73 to all....

KF5KEY – Mike
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VE TESTING

Our next VE testing is scheduled for Wednesday, September 19th at 7:00 p.m. in the Parish Hall of Christ Episcopal Church. Applicants should bring a picture ID, the original and a copy of their current Amateur license, the original of any CSCE's and $15 to cover the cost of the exam(s). Correct change is always very much appreciated. 73 de AE5P

email: ae5p@arrl.net

CLUB NETS

Remember to join us each week for the 2-meter nets sponsored by NARC. Each **MONDAY** is the **NARC ARES/RACES** net, at 8:00 p.m. on the club's 146.84 repeater (PL 141.3). Second, on **THURSDAY** evenings at 8:00 p.m. is the **Deep East Texas Skywarn Emergency Weather Net** on the 147.32 repeater (PL 141.3). Please join us for one or both. We are always looking for folks who would like to become net control operators. If you are interested, please contact any of the existing net controls. We will be pleased to help you in any way we can.

NEXT MEETING

The next meeting will be on **Wednesday September 5th** at 7:00 p.m. in the Parish Hall of Christ Episcopal Church. The church is at the corner of Starr and Mound Streets in Nacogdoches.

A program is planned.

Please come join us and bring a friend.

BASIC ANTENNAS

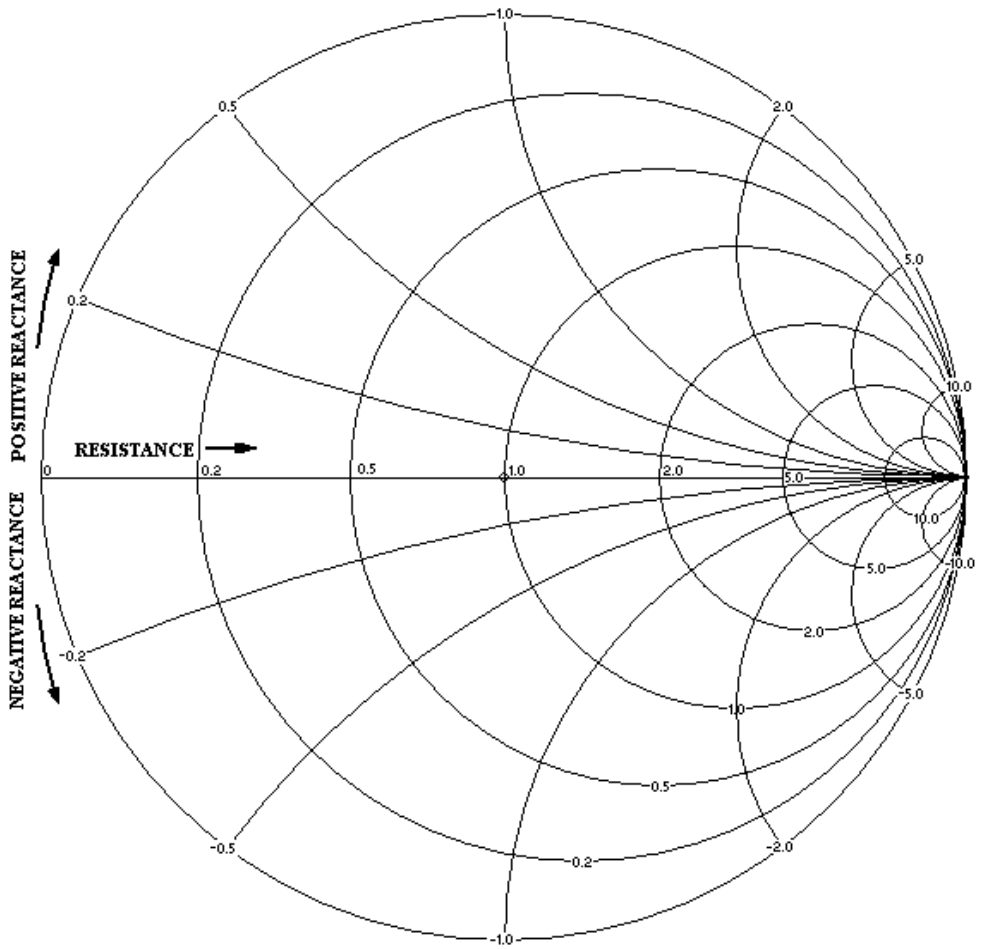
PART 45

by

Thomas Atchison W5TV

I would like to introduce the Smith Chart. After looking at many different WEB sites I found one that seemed to explain how a Smith Chart is constructed and I used the diagrams from that site. The site has modules under the heading Electronics for Radio Amateurs. The module that deals with Smith Charts is called Module C. You can get more information from that site at http://www.ycars.org/EFRA/Module%20C/TLSmith.htm.

In the late 1930s, P. H. Smith introduced a graphical method for representing complex impedances. It was originally described in an article in the publication **Electronics** in January 1939. A basic form of a Smith Chart is shown below.



SIMPLIFIED SMITH SHOWING RESISTANCE AND REACTANCE AXES

One of the applications of a Smith Chart is to determine the feed-point impedance of an antenna, based on an impedance measurement at the input of a random length of transmission line. As we have seen previously, the input impedance of a length of transmission line is dependent upon the SWR, the length of the line, and the characteristic impedance of the line. The SWR, in turn, is dependent upon the load that terminates the line. There are complex mathematical relationships that may be used to calculate the various values of impedances, voltages, currents, and SWR values that exist in the operation of a particular transmission line. These equations can be solved mathematically or the parameters may be determined with a Smith Chart. If the terminating impedance is known, a Smith Chart can be used to determine the input impedance of the line for any length. Conversely, with a given line length and a known (or measured) input impedance, the load impedance may be determined by means of a Smith Chart.

Although the appearance of a Smith Chart may seem very complicated, it is really a specialized type of graph. Consider it a graph having curved, rather than rectangular, coordinate lines. The coordinate system consists simply of two families of circles, a resistance family and a reactance family. The resistance circles in Fig. 1 (below) are centered on the resistance axis, which is the only straight line on the chart. They are all tangent to the outer circle at the right of the chart. Each circle is assigned a value of resistance, which is indicated by the point where the circle crosses the resistance axis. **All points along any one circle have the same resistance value.**

The values assigned to these circles vary from zero at the left of the chart to infinity at the right, and actually represent a ratio with respect to the impedance value assigned to the center point of the chart, indicated 1.0. This center point is called **prime center.** If prime center is assigned a value of 100 ohms, then 200 ohm resistance is represented by the 2.0 circle, 50 ohms by the 0.5 circle, 20 ohms by the 0.2 circle, and so on. If, instead, a value of 50 is assigned to prime center, the 2.0 circle now represents 100 ohms, the 0.5 circle 25 ohms, and the 0.2 circle 10 ohms. In each case, it may be seen that the value on the chart is determined by dividing the actual resistance by the number assigned to prime center. This is called a normalization process.

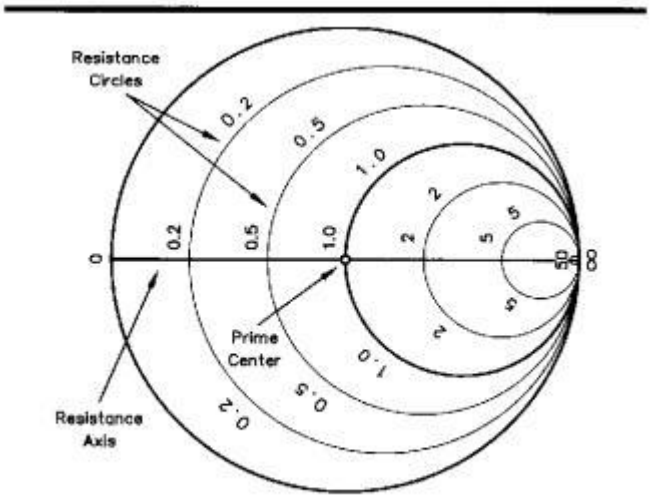


Fig 1—Resistance circles of the Smith Chart coordinate system.

Conversely, values from the chart are converted back to actual resistance values by multiplying the chart value times the value assigned to prime center. This feature permits the use of the Smith Chart for any impedance values, and, therefore, with any type of uniform transmission line, regardless of impedance. As mentioned above,

specialized versions of the Smith Chart may be obtained with a value of 50 ohms at prime center. These are intended for use with 50 ohm lines.

Now consider the reactance circles shown in Fig. 2. These appear as curved lines on the chart because only segments of the complete circles are drawn. These circles are tangent to the resistance axis, which itself is a member of the reactance family (with a radius of infinity). The centers are displaced to the top or bottom on a line tangent to the right of the chart. The large outer circle bounding the coordinate portion of the chart is the reactance axis.

Each reactance circle segment is assigned a value of reactance, indicated near the point where the circle touches the reactance axis. **All points along any one segment have the same reactance value.** As with the resistance circles, the values assigned to each reactance circle are normalized with respect to the value assigned to prime center. Values to the top of the resistance axis are positive (inductive), and those to the bottom of the resistance axis are negative (capacitive).

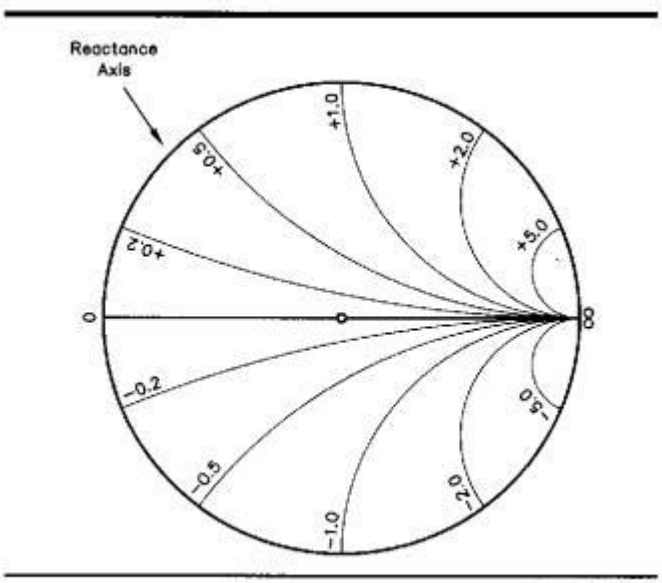


Fig 2—Reactance circles (segments) of the Smith Chart coordinate system.

When the resistance family and the reactance family of circles are combined, the coordinate system of the Smith Chart results, as shown in Fig. 3. Complex impedances (R +jX) can be plotted on this coordinate system.

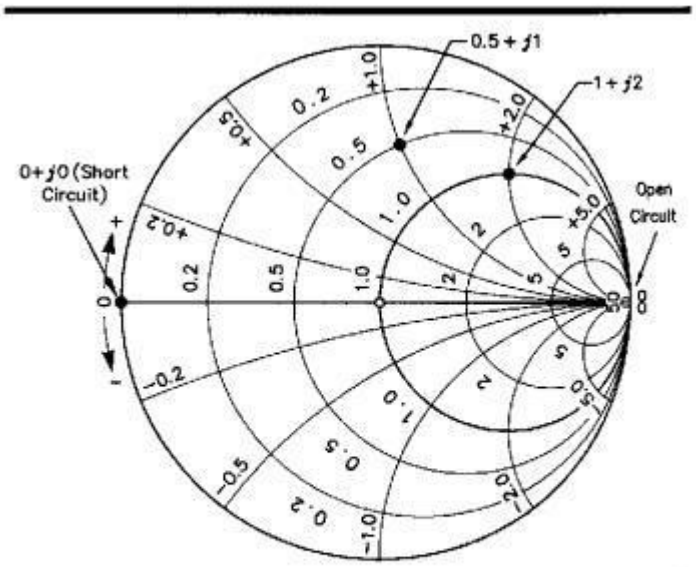
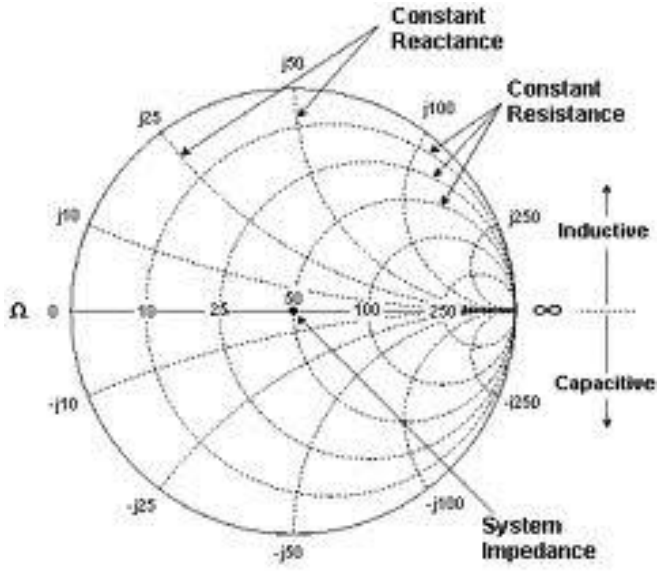


Fig 3—The complete coordinate system of the Smith Chart. For simplicity, only a few divisions are shown for the resistance and reactance values.

It is customary when solving transmission-line problems to assign to prime center a value equal to the characteristic impedance, or Z_0, of the line being used. This value should always be recorded at the start of calculations, to avoid possible confusion later. In using the specialized charts with the value of 50 at prime center, it is not necessary to normalize impedances when working with 50 ohm lines because the resistance and reactance values may be read directly from the chart coordinate system. Here is such an example.



We will continue this discussion in following articles.