Majors Field Amateur Radio Club
Greenville, TX

Volume 2, Issue 7
August 2014

AIRWAVES

Special Meeting Announcement

Thursday, Augist 13th –

There will be a special club meeting in order to facilitate a presentation by Wurth Elektronik/Midcom as Daniel Gammill and David Tompkins gives a short presentation entitled ***"SMD and Cable Ferrites for EMI Suppression"*** during lunch. This presentation will give an overview of the some of the common mode chokes that are available, as well as understanding of how they work. They will discuss the difference between Common Mode and Differential Mode chokes as well as what the various uses are for Common Mode chokes in application. This topic would be beneficial to Amateur Radio operators in order to help understand RFI and ways to eliminate various sources, whether for yourself or your neighbors.

So, please add the calendar entry for **August 13th at 11:30am at the PD North Conference room.** Feel free to bring your lunch, like any other club meeting. There will be no business meeting portion to this, so that your time is maximized. There will be a question and answer session immediately following the presentation. This meeting does not replace our normally scheduled club meeting.

Also, if you are involved with any technical kind of meeting with a representative outside of our organization that could be of interested to hams, please consider scheduling a separate time to have them speak to our ham club on ham related topics.

INSIDE THIS ISSUE:

DX On The High Seas

July 13, 2014 – Gulf of Mexico

A member of the Majors Field Amateur Radio Club in Greenville, Texas had one extraordinary time on the high seas. No, he was not shipwrecked. He was DXing while on a cruise! **Mark Rice – KK5MR** had a blast during a week long voyage on the Carnival Magic cruise ship while voyaging in the Caribbean Sea. When on a ship in the middle of a wide ocean without any power lines or noise sources crowding you, using the ocean as a super ground plane, what else could a Ham POSSIBLY think of doing except working HF! Mark did exactly that. During the IARU world-wide contest, Mark voyaged on the Carnival Magic in the Gulf of Mexico. He had his trusty ICOM 703+ (10watts HF), a 72AH 12 volt battery and a home-made vertical tuned for 14MHz and another one tuned for 21MHz.

Before embarking on his trip, Mark investigated what he would need in order to bring his rig and equipment on board. First, he consulted the ARRL in order to get the latest information. The link to this information is at http://www.arrl.org/maritime-mobile-operation-in-international-waters. Because the ship was under Panama flag and registration, Mark had to obtain a Reciprocal Permit from Panama in order to operate. This was accomplished by obtaining an International Amateur Radio Permit (IARP), which he also obtained from the ARRL web site at: http://www.arrl.org/iarp. Once all of that was accomplished, Mark had one more

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Special points of interest:

- Special presentation meeting on Thursday, August 13th at 11:45am in the PD North Conference Room on SMD and Cable Ferrites for EMI Suppression.
- Web site updated with past AirWaves newsletters on a new TAB.

Understanding Antennas For The Non-Technical Ham – Part 1

Each month for the next year or so, I'll be printing excerpts of a book by Jim Abercrombie – N4JA on antenna design. This was a splendid suggestion by David Hunter – KC7CXI. The book is available on-line for free and can be located by googling the title and the author's last name. Now, part 1…

Understanding Antennas
For The Non-Technical Ham

A Book By Jim Abercrombie, N4JA (SK)

Illustrations by Frank Wamsley, K4EFW

Edited by Judy Haynes, KC4NOR

Edited for the web , N4UJW

PREFACE

One reason for writing this book is to educate you so you can make an informed choice concerning the best antenna for you. Another reason is to dispel the many antenna myths that circulate in the amateur community. The third reason is a desire to teach basic antenna theory to the average ham. Therefore, to achieve that goal, you should read this book from cover to cover. It was written primarily for the newcomer and the non-technical old-timer.

This book is about common medium wave and high frequency (short wave) antennas, but the theory presented here relates to antennas of any frequency. It is in a condensed form and the antenna theory is explained so most hams can understand it. Realizing many hams are mathematically challenged, only simple mathematics procedures are used. If you can add, subtract, and divide using a calculator, you will not have trouble with this book.

A few principles in here are based on conclusions drawn from the Laws of Physics. Everything else in this book can be found scattered through The A.R.R.L. Antenna Book and nothing in here contradicts what is written there.

I. WHY ALL THE FUSS ABOUT ANTENNAS

Definition: An antenna is a piece of metal, a conductor of electricity, to which you connect the radio. It radiates your signal and receives the signals you want to hear.

Definition: An antenna system consists of the antenna, the feed-line, and any matching unit. Most antennas are made of copper or aluminum, while most mobile antennas are made of stainless steel. A feed-line consists of two conductors that carry the signal to and from the radio and to and from the antenna. A matching unit can be an antenna tuner, a series matching section, or one of several different kinds of matching circuits at the feed-point.

Does the type of antenna make much difference? Here is an example: Once in 1959 two of us were involved in testing two antennas on 15 meters. The late R. Lynn Kalmbach, W4IW, using one antenna received a 30-dB better signal report on his antenna from a station in England than we did on our antenna. (Decibel or dB will be explained later). Thirty dB means his signal appeared that he was running 1000 times more transmitter power than we were. At that time, we didn't live that far apart so we couldn't blame it on propagation. We both were running about equal power. Both antennas were at 50 feet. The comparison proved that a good antenna could make a difference. Lynn used a home-built G4 ZU mini-beam; we were using a 15-meter 2-element Mosely Mini-Beam, which had short loaded elements. Evidently, it had a lot of loss.

Another example: Today we hear people breaking in to our ragchews with signals almost level with the noise. Why is that? The reason is they are using the wrong antennas. Their signals are twenty to thirty decibels below everyone else's. They are making contacts, but just barely. The first question our group asks, "What kind of antenna are you using?" Experienced amateurs know the antenna can make all the difference. The guy with the poor signal sometimes will blame his bad signal report on band conditions or his lack of a linear amplifier. He is just sticking his head in the sand.

What we are trying to prove is next to your radio,

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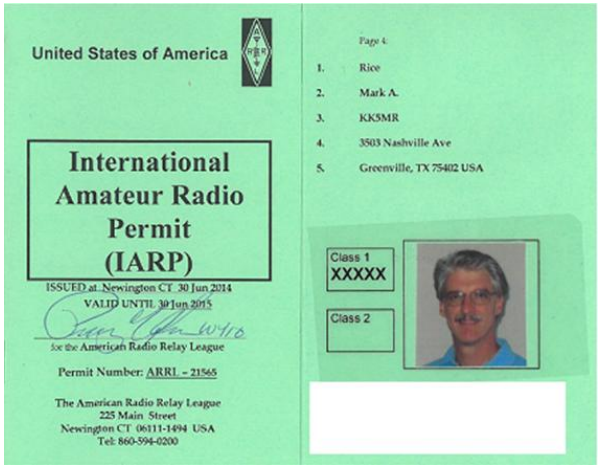
DX On The High Seas – continued

thing to do, write a real nice letter to the captain of the ship, requesting operating privileges while on board. Mark also obtained a sample letter from the ARRL as well.

This is a parenthetical note: you may have noticed that Mark consulted with the ARRL via their web site. Anyone, member or non-member, is able to gain access to valuable information from the ARRL. By being a member, you support the efforts of the ARRL to continue to provide education and information to the Ham community. The ARRL also provides a wide variety of services to its members. If you are not a member of the ARRL, it is easy to join; simply go to http://arrl.org. The dues are not that expensive and provide you with a subscription to the QRZ magazine each month.


United States of America

International Amateur Radio Permit (IARP)

ISSUED at Newington CT 30 Jun 2014
VALID UNTIL 30 Jun 2015

for the American Radio Relay League

Permit Number: ARRL - 21565

The American Radio Relay League
225 Main Street
Newington CT 06111-1494 USA
Tel: 860-594-0200

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1. Rice
2. Mark A.
3. KK5MR
4. 3503 Nashville Ave
5. Greenville, TX 75402 USA

Class 1 XXXXX

Class 2

When Mark arrived at the port, he presented the letter of "Permission To Operate" to the ship's captain, which detailed the bands he planned on using, information about the equipment and his antenna. The letter also had a copy of Mark's passport picture page, a copy of his KK5MR Amateur Radio License as well as his IARP (International Amateur Radio Permit), which is required for Panamanian-flagged ships. The captain granted Mark permission to operate.

For the first few days on board, Mark had to find a suitable operating location. There were many factors to take into consideration. First, Mark wanted a wide pattern of horizontal view. This kind of view insures that the ship would not obstruct the radiation pattern. The other challenge was locating a place that would facilitate his antennas. Modern cruise ships are very stream lined, with very little rigging accessible by

PERMISSION FOR AMATEUR RADIO OPERATIONS

Mark A. Rice, Stateroom #10272
FCC Callsign: KK5MR
Home Address:
3503 Nashville Ave.
Greenville, Texas 75402

July 6, 2014

Captain of the Carnival Magic,
Carnival Cruise Lines
3655 NW 87th Avenue
Miami, FL 33178

Dear Captain,

I'm requesting permission to operate low-powered amateur radio in the 14MHz and 21MHz bands during the three days at sea (July 7th, 8th, and 12th). This small radio setup is entirely self-contained (radio, antenna and battery power). It requires no use of ship's power. At a maximum power of 10watts on HF, this radio has very low potential for any interference with on-board communications. Earphones will be used during all operation of this radio.

Attached are copies of my U.S. Passport, Texas Driver's License, FCC Extra Class Amateur Radio License, and International Amateur Radio Permit (provides legal radio operation on Panamanian-flagged ships with permission of the ship's Captain).

Equipment Information:
Radio: ICOM Model 703+, S/N: 1502455, FCCID: AFJ1C-703 (maximum power output: 10 watts).
Antenna: vertical insulated wire antenna (10-feet) with center-loading coil.
Earphones: this will keep the area quiet for others comfort.

Operations Plan:
The 14MHz. & 21MHz. bands provide the best frequency separation from any maritime radio band that the Magic would utilize. I'll connect earphones to prevent disturbing anyone nearby and will ensure only myself has access and control of this radio. Radio operation will only occur while out at sea during the daytime. During any radio contacts, I'll only mention that I'm located in the Caribbean Sea. No specific location will be conveyed. At the 12-mile range to land or closer, and while docked at

passengers. In his research, Mark noted that some ship going Hams used clamping mounts on side rails of the ship. However, Mark did not prefer this method. Finally, while checking out the forward area near the ship's bridge, he found a high cat-walk that would support his vertical antennas. To sweeten the deal, there was a deck bench nearby, from which to operate from. From this position, Mark's system had a 180-degree radiating pattern, not to mention the same for his personal view.

Using this station location, Mark immediately logged stations using only 10-watts. He logged QSOs with Russia, German, Finland, Italy, Portugal, Spain, Serbia, Ukraine, Croatia, France, Denmark, Canary Islands, Hungary, Morocco, and then Cuba, Chile, Columbia, Brazil, Argentina, Guatemala, Mexico, Puerto Rico, US Virgin Islands, Curacao and Hawaii.

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DX on the High Seas – continued

With many of the QSOs, Mark did not need to continue to call CQ. For example, he would send his call and then a foreign station would reply, "call ending in Mike Romeo, come again?" What was amazing about this was that Mark was competing with many state-side stations running more power than Mark could ever muster or even stations with better antenna systems. Oh yeah… Mark worked stations in the mainland USA and Canada too. One fellow in Wyoming on 15 meters (21.230MHz), whose call was N7MZW, commented on how strong Mark's signal was. When Mark informed him of his location and operating gear, the man was quite impressed.

10 watts + Cruise Ships = FUN

The catwalk was located around the bridge above Deck 7 and had enough height (about 13 feet) to attach his vertical antenna. He was able to hoist up the antenna to about 1" from the metal catwalk. Mark also used his Android phone as a ham application to obtain his Maidenhead Grid location for logging purpose. This was quite useful, as the ship continually moved, and he has record of where each QSO was made.

Mark had a fantastic voyage, for sure. What can be better than taking in a cruise with all the comforts of a wonderful ship and making Qs all along the way?

Written by Mark Rice – KK5MR and
Michael Ketchum – K5MDK for the AirWaves newsletter

Understanding Antennas For The Non-Technical Ham – continued

the most important part of your station is the antenna. Many years ago, an old-timer said, "For every dollar you spend on a radio, you should spend two dollars on your antenna." That is also true today. You can do more to improve your signal strength with antennas than you can ever do by increasing your power. Having the ability to make contacts on a particular antenna doesn't mean it works well! Any antenna will make contacts, but your signals will be stronger on some antennas than on others. In addition, some antennas hear better than others.

II. HOW ANTENNAS WORK.

First of all to work properly the antenna system must be matched to the transmitter. That is, all modern transmitters have an output impedance of 50 ohms. Antenna systems range in impedance of a few ohms to several thousand ohms. There are several ways to match them: pruning the length of the antenna, using an antenna tuner, matching the antenna with a length of transmission line called a matching section, or the use one of several matching systems at the antenna feed-point. Antenna matching is beyond the scope of the material found in this book and it is suggested you consult a more comprehensive antenna manual. Simple half-wave dipoles eliminate the need for a matching system because a resonant half-wave dipole has an impedance near 50-ohms.

You must understand electromagnetism to understand how antennas work. If you attach the two poles of a direct current (DC) voltage source to the two ends of a coil of wire, current will flow through the coil of wire and it will become magnetized. The magnetized coil is known as an electromagnet. Its magnetism will extend out to infinity becoming weaker with distance. Remove the voltage and the magnetic field collapses back into the coil. If an alternating current (AC) is connected to the coil, the magnetism moves out and collapses into the coil in step with the frequency of the alternating current source. The north and south poles of the electromagnet reverse on each half-cycle of the AC voltage.

If voltage and current can cause a coil to become magnetized, the reverse is true: A magnetic field can produce a voltage and a current in a coil. This is known as Faradays Principle of Magnetic Induction. A voltage will be produced at the ends of the coil of wire as you move any permanent magnet close to and parallel to the coil. The difference in this case is the magnet must be kept moving. Move the magnet in one direction, and current will flow in one direction. Reverse the direction the magnet is moving and the current will flow in the opposite direction. Moving the magnet back and forth produces alternating current. An AC generator spins a coil of wire between the two poles of a magnetic field. It doesn't matter which one is moving. The coil or the magnet can be moving. Any moving magnetic field can induce current in anther coil. It doesn't have to be a piece of metal we call a magnet. Imagine a moving magnetic field produced by AC circulating in and out of a coil. If that moving magnetic field passes through a second nearby coil, it will induce an alternating current in the second coil. A transformer uses this method to work. Transformers have a continuous iron core running from the inside of one

Understanding Antennas For The Non-Technical Ham – continued

coil through the inside of the second coil to confine the magnetism inside the iron core. This makes the transformer nearly 100% efficient since only a little of the magnetic energy escapes.

A straight wire that has an AC current flowing through it also has a magnetic field surrounding it. But it is a weaker field than is produced by a coil. The magnetic field from the wire radiates out into space and becomes weaker with distance. The radiating magnetic field from a wire is known as "electromagnetic radiation" and a radio wave is one type of it. The wire that radiates becomes the transmitting antenna. Some distance away, a second wire in the path of these waves has current induced into it by the passing electromagnetic waves. This second wire will be the receiving antenna. The voltage in the receiving antenna is many times weaker than the voltage in the transmitting antenna. It may be as weak as one millionth of a volt or less and still be useful. The receiving antenna feeds that voltage to the amplifiers in the receiver front-end where it is amplified many thousands or millions of times.

To be continued next month

Calendar

2014

1/1 ~ 12/31 ARRL Centennial QSO Party. W1AW WAS portable operations and points contest. http://www.arrl.org/centennial-qso-party for more info.

August

16~17 10 GHz and Up Contest

21 SVARA Meeting

28 MFARC MEETING.
11:45 in the PD North Conference Room (LOCATION CHANGE). 30 minutes.

September

1 Black Land Triathalon

13~15 September VHF Contest

REGULAR ACTIVITIES

Daily DFW Early Traffic Net (NTS) at 6:30pm 146.88 – PL 110.9Hz

Daily DFW Late Traffic Net (NTS) at 8:30pm 146.72 – PL 110.9Hz

Daily DFW CW Traffic Net (NTS) at 7:00pm and at 10pm on 3541 KHz www.k6jt.com

Thurs Sabine Valley Amateur Radio Association Net Every Thursday night at 7:00pm on the K5GVL/R 146.780 MHz (+) PL 114.8Hz

Friday **Majors Field Amateur Radio Club Talk-In Net** Every Friday morning on your way in to work on the WD5GSL/R 147.160 MHz (+) PL 100.0Hz

MAJORS FIELD AMATEUR RADIO CLUB

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We're on the Web!

See us at:

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Your article submissions are welcomed. Please submit to Michael@Ketchums.info

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Greenville, Texas

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Club Station

Club Station: TBD

VHF Repeater: WD5GSL/R
147.160 MHz (+) PL 100.0 Hz
Friday Morning Talk-In Net

UHF Repeater: WD5GSL/R **(CURRENTLY OFF AIR)**
444.625 MHz (-) PL 151.4 Hz

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