Majors Field Amateur Radio Club
Greenville, TX

Volume 3, Issue 5
May 2015

AIRWAVES

INSIDE THIS ISSUE:

Special points of interest:

- Repeater Upgrade Pictures.
- Please welcome our new HAMs.

License Classes & New Hams

The Major's Field ARC VE Team conducted a test session at the Greenville Hospital on May 19th. A total of 3 examinees attempted to take the test to upgrade or obtain an Amateur Radio license. Congratulations to Arturo Yanez, KP4YP, for upgrading his license to Extra and Paul Smith, KG5HPM, for passing the Technician and General tests. Honorable mention goes to Michael Ketchum for spontaneously attempting to upgrade his license to Extra. VE's in attendance were Scott Davis, Stephen Denison, David Hunter, and Jae Stutzman.

This test session was the culmination of a multi-week technician class, which used PowerPoint slides based on the Gordon West technician book. The class met on Tuesday nights for approximately 2 hours. Instructors for the class included Michael Ketchum, Stephen Denison, Jae Stutzman, and David Hunter. The next scheduled class will be a Friday Night/ Saturday Technician class in November.

If anyone would like to become a VE, schedule a test session to upgrade their license, or is interested in license classes, please email classes@wd5gsl.com.

Contributed by Stephen Denison – WB5SMD

Remote HF Station Update

Several members of the Majors Field Amateur Radio Club assembled at the Majors Field Fire Station to assemble the Vertical HF Antenna for the club's Remote HF Station.

The first item on the agenda, after assembling all of the people, tools, and boxes, was to inventory the parts that came with the antenna, in order to verify we have everything we need. Upon inspection, it was determined that we were missing one critical component, a 6.5" tube.

The antenna build party was abruptly halted and we stood around and chatted for a while before heading home. Immediately, DX Engineering was contacted and they have assured us that a new part will be shipped to us. However, they did warn us that things might be a bit slow to resolve, due to the Hamvention and HamCom conventions going on at this time.

As soon as the missing part arrives, we will be scheduling another Antenna Build Party at the Fire Station. So, stay tuned for more announcements.

Contributed by Michael Ketchum – K5MDK

Repeater Upgrade Photos

Last month, we reported on the Club's repeater upgrade project. We finally got some photos released through Security to show you what it looked like.

If you would like to take a tour of the Ham Shack trailer, please contact the club president, president@wd5gsl.org, to make arrangements.

In the mean time, here are the photos from Mark Bushnell – AF5FG:

Repeater Upgrade Photos (continued)

L-R: Peter VanHorn – KA5YDC, Michael Ketchum – K5MDK, Jon Brown – WB5KSD, Jim Brown – W5ZIT (behind door)

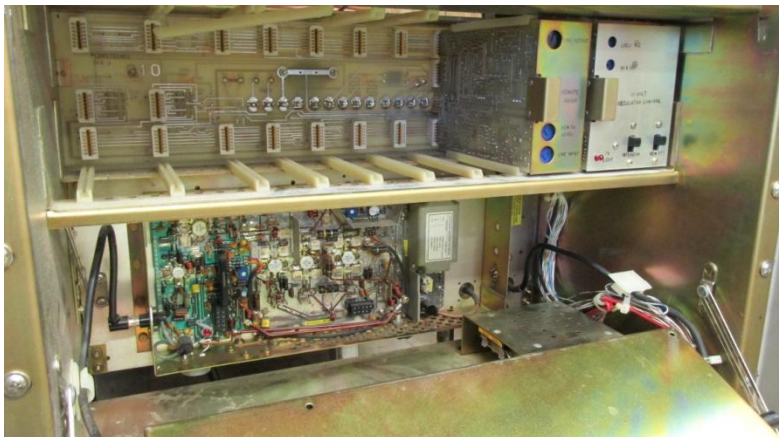
L-R: Jim Brown – W5ZIT, Michael Ketchum – K5MDK, and Peter VanHorn – KA5YDC taking a break from supervising.

Jon Brown – WB5KSD and Scott Davis – KK7JS getting coax cables in order to tie the new transmitter to existing duplexers.

Jon Brown – WB5KSD, removing the old GE Mastr II Mobile and controller.

The new GE Mastr II is in the small cabinet on the Right of the existing cabinet.

Repeater Upgrade Photos (continued)



Inside the transmitter of the new GE Mastr II Base Station.

Ham Radio Operators assist with Nepal Earthquake disaster relief

Mark Stites - AC0AZ suggested this article to the AirWaves. However, we could not afford the $50.00 republishing fee. So, you can read about it online at :

http://www.itworld.com/article/2916375/ham-radio-attempts-to-fill-communication-gaps-in-nepal-rescue-effort.html

Club Meeting Minutes

Majors Field Amateur Radio Club
April 30, 2015

I. Meeting opened at 11:45
II. Announcements:
III. Officer Reports
  a. Vice-President - Stephen Denison - W5SMD
  b. President - Michael Ketchum - K5MDK
IV. Old Business
  a. Club Projects - Remote HF Station.
    Antenna is purchased. Will plan a project day when it arrives.
  b. Club Projects - License Classes and VE session
    First VE session on 3/31 at 5:00pm without any tests given.
    Classes are going well with two students.
    Second VE session May 19th 5:30pm at the hospital.
c. Club Membership Drive
    We have 13 paid members and 5 non-paid members.
d. Repeater Upgrade - 2meters
    Upgrade Complete
    Need to replace two coax cables.
    Need a key to open cabinet.
    Need to program controller to control announcements.
V. New Business
  a. "Radio Frequency" Communications Series - Mark Bushnell - AE5FG
  b. Green-Tag your HT for use at L-3 site
VI. Remote HF Station Project discussion
  a. USB - CAT Cable
    We agreed to purchase this item.
  b. Vertical HF Antenna Build
    We agreed on May 9th at 3:00pm to meet at the Fire Station to build the antenna.
VII. Adjournment
    Meeting adjourned at 12:30.
VIII. Attendance
- Michael Ketchum K5MDK
- Mark Bushnell AE5FG
- Scott Davis KK7JS
- Will Sanitate
- Jae Stutzman K5JAE
- Jim Harper KK5Y
- Robert Yakel
- Peter Van Horn KA5YDC
- Russ Harper KF5WBI
- Stephen Denison W55MD

Understanding Antennas For The Non-Technical Ham

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 – KC7CEX. The book is available on-line for free and can be located by Googling the title and the author's last name. Now, part 8…

Another folded dipole type is the three wire folded dipole. We have seen this dipole only in books and do not know anyone who uses one. The feed-point impedance is 600 ohms resistive and is fed with homebuilt 600 ohm open wire feeders.

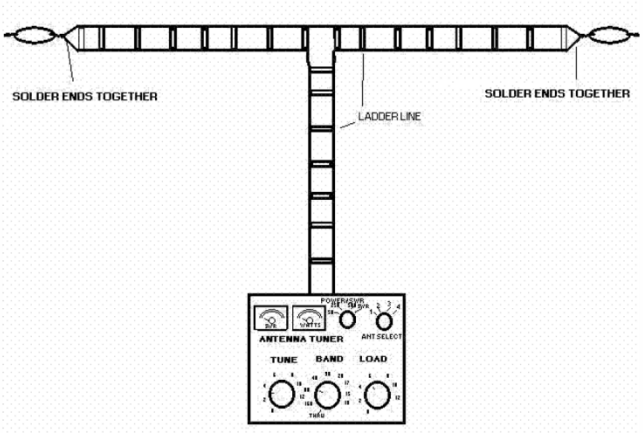


Figure 8. Folded Dipole

5. The Double Bazooka Dipole

The double bazooka is claimed by its users to be broad-banded, a quality especially interesting for those hams operating on 75/80 meters. Tests done at the A.R.R.L. have shown the double bazooka is only slightly more broad-banded than a regular dipole, probably due to the use of a large conductor (coax) for the center part of the antenna. The double bazooka will not transmit its second harmonic, and its users say it does not need a balun. Other users say it is quieter than a regular dipole.

The center of the antenna is made from RG-58 coax. To find the length of coax needed, divide 325 by the frequency in MHz. The coax forms the center part of the double bazooka and a piece of number 12 wire on each end completes the antenna. The length of each of the end wires is found by dividing 67.5 by the frequency in MHz. To increase the bandwidth some builders use shorted ladder-line in place of the number 12 wire, which makes the end pieces to be electrically larger.

The feed-point of the double bazooka is unique. At the center of the coax dipole, remove about 3 inches of the plastic covering, exposing the shield. Cut the shield in the center and separate it into two parts. Do not cut the dielectric or the center conductor. Leave the center conductor with its insulation exposed. On the feed-line strip off about 3 inches of outer insulation, separate the shield from the center conductor, and strip about 1 inches of the insulation from the center conductor. To attach the feed-line, solder the two exposed feed-line conductors to the two pieces of the separated exposed shield of the dipole center. It goes without saying: seal the feed-point to prevent water from getting in. At each of the two ends of the coax forming the center of the antenna, the coax is stripped back and the center conductor and shield are shorted together and soldered. The end wires are soldered to the shorted coax ends, run to insulators at the end of the antenna, and the soldered joints are sealed against the weather.

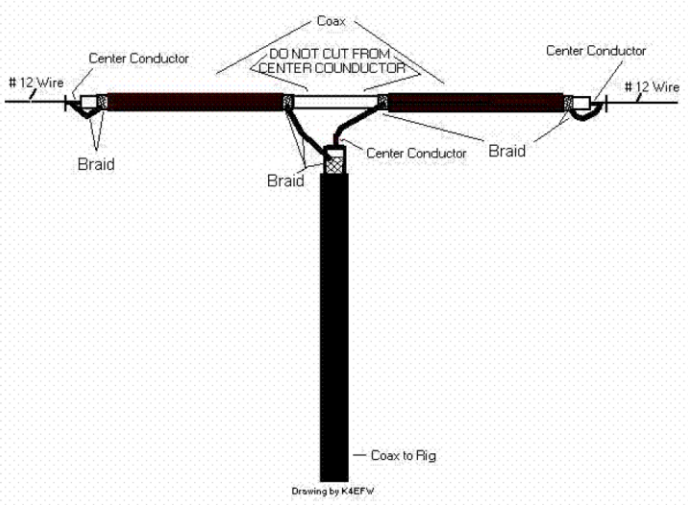


Figure 9. Double Bazooka Dipole

Understanding Antennas For The Non-Technical Ham – continued

6. Broad-Banded Coax-Fed Fan Dipole

A broad-banded dipole for 75/80 meters can be constructed by attaching two equal length dipoles to the center feed-point and spreading the ends about 3 feet apart using PVC water pipe to separate them. The completed dipole looks like a bow tie. This makes the antenna to appear electrically to have that of a large diameter conductor. Because of this, the overall length will need to be shorter than a single wire alone. When we used the antenna, we found a length of 110 feet would cover most of the 75/80-meter band without a tuner. It is fed with 50-ohm coax. The use of a balun is optional. The antennas for most of the higher bands have enough bandwidth so they do not need broad banding.

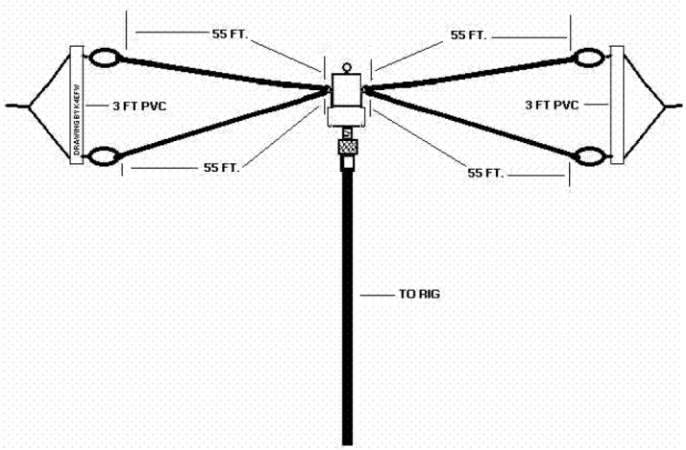


Figure 10. Broad-Banded Fan Dipole for 80 Meters

7. Two-Element Collinear Dipole

The two-element collinear dipole is an antenna that is a full-wavelength antenna having a two-dBd gain. It can be fed with ladder-line and a tuner and used as a multiband antenna, or it can be fed with a quarter-wave-matching stub with 50-ohm coax cable to make it a single band array. In the stub matching system, a quarter wavelength of ladder-line is connected across the center insulator, and the opposite end of the ladder-line is shorted. A shorted quarter-wave piece of feed-line acts like an open circuit. Going from the shorted end of the ladder-line toward the dipole, there will be a point where a piece of 50-ohm cable will find a perfect match. The 50-ohm feed-point will have to be found empirically (trial and error).

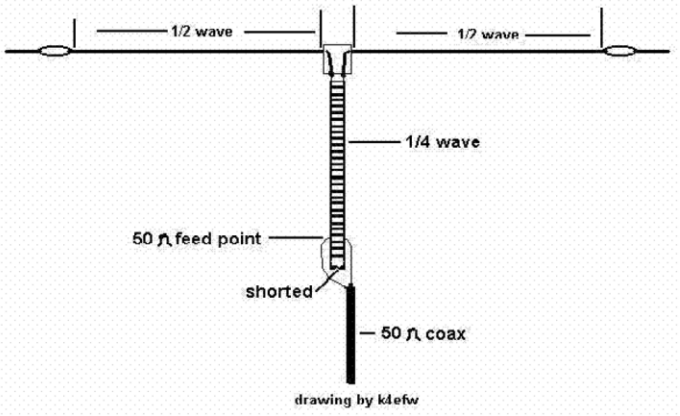


Figure 11. Two Element Collinear Dipole

8. Four-Element Collinear Dipole

The four-element collinear dipole array consists of four half-wave segments connected end-to-end with an insulator between each two adjoining segments. The feed-point is at the center of the array. The antenna is fed with ladder-line through a tuner. A quarter wave shorted ladder-line stub hangs down vertically from the insulators between the inside and the outside half-wave segments. This stub provides a 180-degree phase shift so that all half-wave segments are fed in phase. This antenna has a 6-dBd gain and it radiates bi-directionally at an angle perpendicular or broadside to the plane of the wires.

This antenna is too long for most hams to use on 80 and 40 meters, and the stubs hanging vertically will be too close to the ground. For 20 meters, the four-element collinear array will be 97 feet long and the stubs will be 18 feet. To find the length of each half-wave segment, divide 468 by the frequency in MHz, and for the quarter-wave stubs, divide 246 by the frequency in MHz.

Understanding Antennas For The Non-Technical Ham – continued

MFJ has begun marketing the four-element collinear monoband array. They have them for 20, 17, and 15 meters. This antenna is so easy to build that you can do it yourself. All you need is 5 insulators, antenna wire, and some ladder-line.

It will have no gain if you use it on bands for which it is not designed because the stubs are used as phasing lines. It is definitely not a multiband antenna.

It is possible to add more half-wave segments to the ends of this array to make it have 6, 8, 10, etc half wave segments. Adding more segments will add more gain and make the lobes narrower.

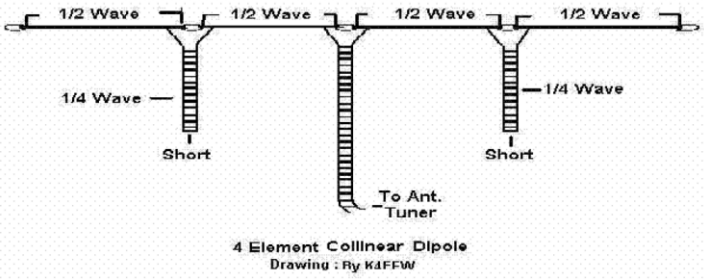


Figure 12. Four-Element Collinear Dipole

9. Coax-Fed Dipoles Operated on Odd Harmonic Frequencies

Antennas fed with 50-ohm coax can be used on other bands for which they are not cut. An 80-meter dipole will have a relatively low SWR and will be resonant at a single frequency on 10 meters and not much power will be lost in the coax even if operated off resonance. A 40-meter dipole will work the same way on 15 meters. Using coax, a dipole will work on its fundamental frequency and on odd-harmonic frequencies and it is not necessary to use ladder-line. The fundamental frequency is the frequency for which the antenna is a half-wavelength long, and the odd harmonics are 3 times, 5 times, 7 times, etc. the fundamental resonant frequency. A frequency of 21 MHz is 3 times or the third harmonic of 7 MHz, and 28 MHz is the seventh harmonic of 4 MHz.

Antennas operated on their odd harmonics will be resonant a little higher in frequency than exact multiples of their fundamental frequencies. Since the odd harmonic antennas input impedance is higher than it is on its fundamental frequency, many amateurs use a series quarter-wave matching section of 70-ohm coax to give it a better match. The 80 meter inverted-V dipole in use here has a 2:1 SWR on 10 meters indicating it has an impedance of around 100 ohms. However, modeling the antenna for 10 meters shows the resonance to be below 28 MHz, probably because the antennas fundamental resonant frequency is 3920 instead of 4000 kHz. A quarter wave 70-ohm matching section should bring the SWR down to a much lower level.

As said earlier, if you try to use coax with a dipole on its even harmonic frequencies, the feed-point impedance will be very high, the SWR will be extremely high, and the coax will absorb most of the power. In addition, when operating a coax-fed antenna on its even harmonics, the tuner may not be able to provide a match. Operating any antenna on any of its harmonic frequencies, odd or even, will work better if it is fed with ladder-line and a tuner.

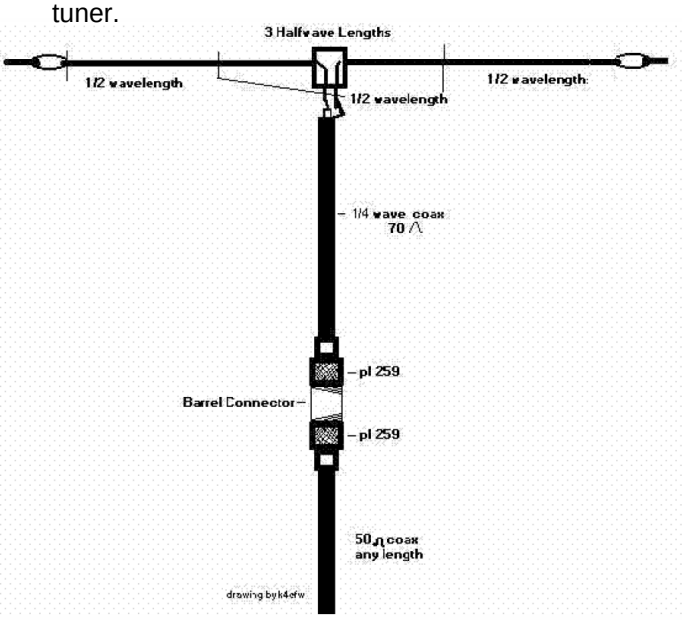


Figure 13. Three Half-wave Dipole

This antenna is matched by a quarter-wave 70-ohm series matching section. Three half waves will resonate higher than you would expect because the center half wave doesnt have to contend with end effects. To calculate the length of a three half-wave dipole, divide 1380.6 by the frequency in MHz. Five half waves is found by dividing 2316.6

Understanding Antennas For The Non-Technical Ham – continued

by the frequency.

To use a 3 half-wave antenna on 15 meters, the 70-ohm matching section needs to be 7 feet 7 inches and the antenna needs to be 64 feet long for a good match. It will be just a little long on 40 meters. When using a 40-meter dipole with a 15-meter quarter-wave matching section, it will still have acceptable SWR on 40 meters.

The pattern shows 6 lobes, 4 major lobes and 2 minor lobes. The vertical radiation pattern shows low angle radiation.

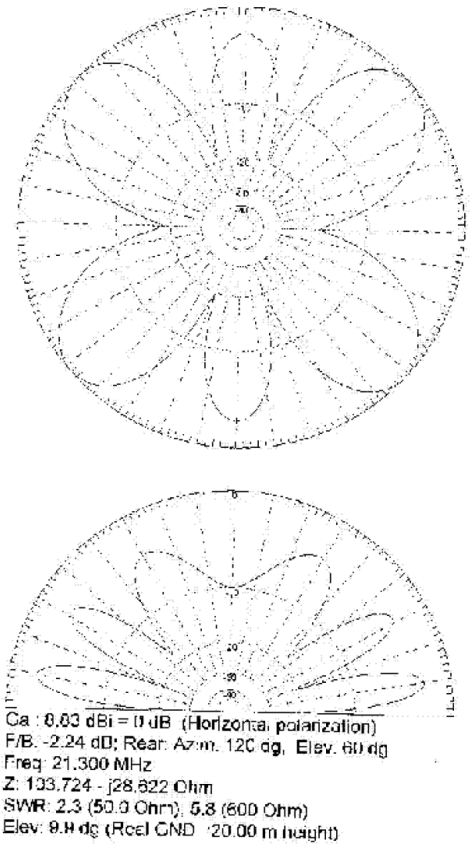


Figure 14. Radiation Pattern of a 15- Meter Three Half-Wave Dipole at 65 Feet

To be continued next month

Calendar

2015

June

12	HamCom (ARRL West Gulf Convention) – Irving, TX www.hamcom.org
13	ARRL June VHF Contest
18	SVARA Meeting at 7:00pm at Hunt Regional Hospital
25	MFARC Meeting PD North Conference Room at 11:45am
27	Field Day 2015

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

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Your article submissions are welcomed. Please submit to editor@wd5gsl.org

Majors Field Amateur Radio Club
Greenville, Texas

Club Officers

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Vice President :	Stephen Denison – W5SMD vice-president@wd5gsl.org (817) 501-5269 cell
Secretary Treasurer:	John C. Nelson, Jr. – NØDFW secretary-treasurer@wd5gsl.org (903) 454-0911 cell

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
444.625 MHz (+) PL 151.4 Hz
Temporary Antenna Position Limits Range Currently

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