Majors Field Amateur Radio Club
Greenville, TX

Volume 3, Issue 3
March 2015

AIRWAVES

Upgrade Your License

Greenville TX - The Majors Field Amateur Club will be offering a VE session to either take your Technician Element or upgrade to a new Element. The exam has been set for Tuesday, March 31st at 5:30pm and will be held at the Rec Hall here at L-3.

Candidates taking exams must R.S.V.P. by contacting Stephen Denison – W5SMD at classes@wd5gsl.org or by calling him at (903) 457-4127.

This will be the first of three VE sessions sponsored by our club this year. The next exam date will be held following the five weeks of classes and a review on May 19th at 5:30pm at the Hunt Regional Medical Center Conference Room I. The final VE session for the year will also be held at the Hospital on Saturday, November 21st at 5:30pm.

For information about the next VE session, check out the calendar on the club web site at www.wd5gsl.org. ❖

Each of the classes will begin early with a "Practice Test" and will cover all of the areas needed to pass Amateur Radio Licensing Element 2 (the Technician Class) FCC exam. The classes will go until 7:30pm each night.

Instructors are needed for this effort. If you can volunteer to teach a class one night, please consider contacting Stephen Denison – W5SMD at classes@wd5gsl.org or calling him directly at (903) 457-4127.

A special tab has been setup on the club web site to help advertise the classes at:

http://wd5gsl.org/index.php/get-your-ham-license

We are also placing announcements in the E-Trader newsletter that is sent out each week.

Did we mention that we need instructors? All teaching materials will be supplied to anyone wishing to help out in this area. ❖

INSIDE THIS ISSUE:

Special points of interest:

- Teaching volunteers needed for classes to start April 7th.
- VE Session March 31st to get your upgrade.
- Disaster Drill in Greenville involving many Hams from different associations.

Technician Classes to begin in April.

The Majors Field Amateur Radio Club is in full swing in preparations for holding Technician License Classes here at L-3. The classes begin Tuesday, April 7th at 5:30pm at the Product Development North Conference Room in Bldg 136-A on each Tuesday of the week until May 12th. The last class will be a "Review" session and will also allow for Q&A.

After the classes are completed, there will be a VE session at the Hunt Regional Medical Center on the 2nd floor Conference Room I at 5:30pm.

Unusual Radio Propagation due to Solar Flares

Ottawa, Canada – The sun provides our planet the necessary energy we need to sustain life. But when it comes to radio propagation, the sun can be both a blessing and a curse when solar flares erupt in our direction. Radio frequencies below 10MHz are strongly attenuated with higher levels of natural noise. Communications on 10 meters can be difficult even just getting down the block! But the blessing comes from our ionosphere, as it reacts to the solar radiation by increasing its ability to reflect radio waves. This reflectivity can cause great propagation for weak signals.

Unusual Radio Propagation due to Solar Flares

(Continued)

Take Bob MacKenzie – VA3RKM of Ottawa, Ontario, for example. He shares: "Only minutes after the M9 flare on March 7th, I was able to work three amateur stations in Japan using just 5 watts of single-sideband power and a single-element vertical antenna in my backyard. It's a rare event to work Japan so easily with such little power on phone and not Morse code. The annual ARRL International DX Phone contest was on at the time so there were plenty of DX stations on the air, making this observation of unusual propagation possible."

Keep watching for more solar events and you too may be making some great DX QSOs! ❖

Club Meeting Minutes

Majors Field Amateur Radio Club

February 26, 2015

I. Meeting opened informally at 11:45 am.
II. Announcements:
 a. Introduction of New Officers.
 b. Skywarn Training will be 2/26 (tonight) at 6:30 at Greenville Civic Center.
 c. SVARA Tech Class & VE Session - 1 Day on 3/7 (Hunt Regional Hospital).
 d. Irving Hamfest on 3/7 (www.irvingarc.org).
 e. Work Study Group forming for Software Defined Radios (SDR).
 f. Hunt County ARES S.E.T. 3/17 (Aircraft Crash Scenario) - volunteers needed.
 g. Next Sabine Valley Amateur Radio Association meeting 3/19. (Hunt Regional Hospital 7:00pm second floor training room).
 h. Weatherford Hamfest 3/21 (http://w5pc.org).
 i. Next MFARC meeting on 3/26 11:45am. Presentation by Mark Rice (KK5MR) on WSPR.
 j. Ham-Con 6/12 (www.hamcon.org).
III. Officer Reports
 a. Secretary / Treasurer - John Nelson - N0DFW
  i. Minutes of last meeting presented.
  ii. Bank Statement Report balance presented ($769.05).
  iii. Cash-on-hand transfer ($98.00) pending (Total: $867.05)
  iv. No expenditures this month (~$50 rack on order).
  v. Dues Collection discussed.
 b. Vice-President - Stephen Denison - W55MD
  i. VEC team has been setup through Laurel.
  ii. Need to setup 3 public assessable sessions during the year.
  iii. VE applications are available from Vice-President.
  iv. We found a USB cable that would work for the remote station.
 c. President - Michael Ketchum - K5MDK
  i. Rack has been ordered for new repeater.
  ii. Dues will be discussed later in today's meeting.
IV. Old Business
 a. Remote HF Station - 10 meters initially.
 b. Sub-committee formed. Need chairman to organize meeting. Sub-committee will meet next Thursday 3/5 at 11:45 in this conference room. Sub-committee members are Victor Paul, Jae Stutzman, Mark Stites, and Stephen Denison.
 c. We now have 5 new VEs registered with Laurel VEC. Thanks to Stephen Denison (W5SMD) for setting this up!
 d. Need three VE sessions for the year to be added to the Laurel website.
 e. Classes to meet in PD North conference Room.
 f. Need to check with Greenville Library as location for local VE.
 g. We will set up dates via e-mail.
V. New Business
 a. 147.16 Repeater Upgrade was discussed.
 b. Jim Brown (W5ZIT) has another repeater that is a slight upgrade.
 c. Rack enclosure for this repeater has been ordered.
 d. Volunteers will be needed to install new equipment once rack has arrived.
 e. Still need duplexer, antenna, coax, and cabinet.
VI. Presentation
 a. Chris Vaughn (AF50 - L3 Visitor) made a presentation about the upcoming Simulated Emergency Test (SET)to be held on 3/17.
 b. He also discussed Hunt County ARES membership possibilities, answered questions about S.E.T / ARES, and passed out membership forms.
 c. Mr. Vaughn is a retired officer with Commerce PD, Hunt County EOC for Commerce, and ARES EC District 3 for Hunt County.
VII. Adjournment
Meeting adjourned at 11:35am.

Meeting Minutes *(continued)*

The following were in attendance:

1. Michael Ketchum K5MDK
2. Stephen Denison W5SMD
3. John Nelson N0DFW
4. Jae Stutzman K5JAE
5. Mark Bushnell AE5FG
6. Victor Paul WB0TEV
7. Scott Davis KK7JS
8. Chris Vaughan AF5O

Eight in attendance.❖

Local Disaster Drill in Greenville

March 17th GREENVILLE, TX Local disaster drill in Greenville was the largest one done at a local level. With 25 agencies and government offices, 150 volunteer crash victims and many volunteers including amateur radio operators from the Majors Field Amateur Radio club. The disaster scenario was a commercial aircraft that crashed at the Hunt County Fairgrounds, across the highway from Majors Field. Over 36 L-3 employees, including fire, nurses, safety officers, etc. responded to the scene. After this, the Greenville Fire Department arrived on the scene and set up an Incident Command, using the ICS (Incident Command System) protocol.

The exercise was supported by members of the East Texas Regional CERT (Citizens Emergency Response Team), who assisted with victim search, victim transport, and also secured landing zones for the helicopters. Members of Hunt County ARES included members of both SVARA (Sabine Valley Amateur Radio Association) and MFARC (Majors Field Amateur Radio Club).

CERT team briefing

Left: H.S. Students are setup as “victims” of a plane crash, while Mark – AE5FG readies his gear. Right: Nurses and EMTs bring victims through Decontamination after arrival to Armory triage site.

From the MFARC, Jae and son Nathan Stutzman – K5JAE and K5NJS both worked at the Hunt County Regional Hospital – Commerce campus, which received a number of victims. Mark Bushnell – AE5FG, worked in the ambulance departure and main triage floor at the National Guard Amory. Finally, Michael Ketchum – K5MDK worked the ambulance intake and Decontamination area also at the armory.

The exercise involved many locations, including the L-3 Recreation Hall, which served as Incident Command center. The Hunt County Fairgrounds served as the main crash site. The National Guard Amory was setup to receive overflow patients that could not be transported to any hospital due to overcrowding. The Emergency Operations Center in Commerce was the center of action for all government agencies. Also, both Hunt County Regional hospital campuses at Greenville and Commerce were involved, taking in patients in a massive surge. An additional Communications Trailer for Hunt County ARES from the SVARA was setup at the Amory in order to help aid communications between various field sites, the scene, EOC, both hospitals as well as the Emergency Operations Center in Commerce. All of the Amateur Radio communications worked very well and were praised for their contributions.

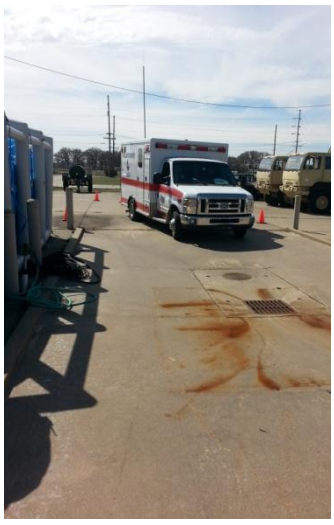
Additional volunteers were involved in the exercise, such as adults acting as family members of victims, news reporters pressing the scene for a story, and several evaluators from outside organizations, assessing the various functions for improvements as well as things that worked well.

The exercise started short before 11:00, when a call was placed from the control tower to L-3 Fire indicating that a plane was in distress. At 11:00, a call was supposed to go

Local Disaster Drill in Greenville

(continued)

out that indicated the plane had crashed. However, there was a mix-up in L-3 Security communications that prevented that call from going out. In spite of the missed call, Incident Command was established quickly and L-3 nursing staff was on the scene working to help triage victims. L-3 Fire teams were on the scene first and shortly thereafter, two parameters were established by Greenville Police. Many EMS teams and their ambulances were called in from several surrounding counties. CERT teams were also activated and were on site, working to help fire officials rescue victims as well as establish a landing zone for the helicopters that arrived later.



Photos provided by Robert Hite III – KF5OLB & Michael Ketchum – K5MDK

The communications aspect of this exercise had various difficulties, with regards to the Police radios. The radios at the Incident Command center had to be moved outside of the Rec Hall, due to the metal walls. Additionally, many of the responding agencies did not have the correct radios or frequency programming in order to interact with local agencies. With two successful disaster drills utilizing amateur radio operators, it is hoped that the government agencies will utilize volunteer communications resources a bit more in future drills.

Overall, the exercise was a success, uncovering many deficiencies that can be addressed now, before a real disaster strikes. ❖

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 6…

In figure 3 below, the top graph shows how the radiation would appear to you, if you were situated above the dipole and you were looking down on it. The plane of the antenna runs from side to side on the top graph, and that graph demonstrates only a 5-dB null off the ends of the antenna. Therefore, it is essentially omnidirectional. The bottom graph shows how the radiation would appear if you were looking at the antenna from the end of the wire. As you can see, the pattern shows no radiation at the horizon and its maximum radiation is at about 40 degrees above the horizon, and the radiation straight up is only down 3 dB from its maximum. This antenna was modeled on 80 meters with the apex at 65 feet above ground and the ends at 35 feet.

It is a myth that a horizontal antenna orientation makes a difference on 80 meters at heights used by most amateurs.

Understanding Antennas For The Non-Technical Ham

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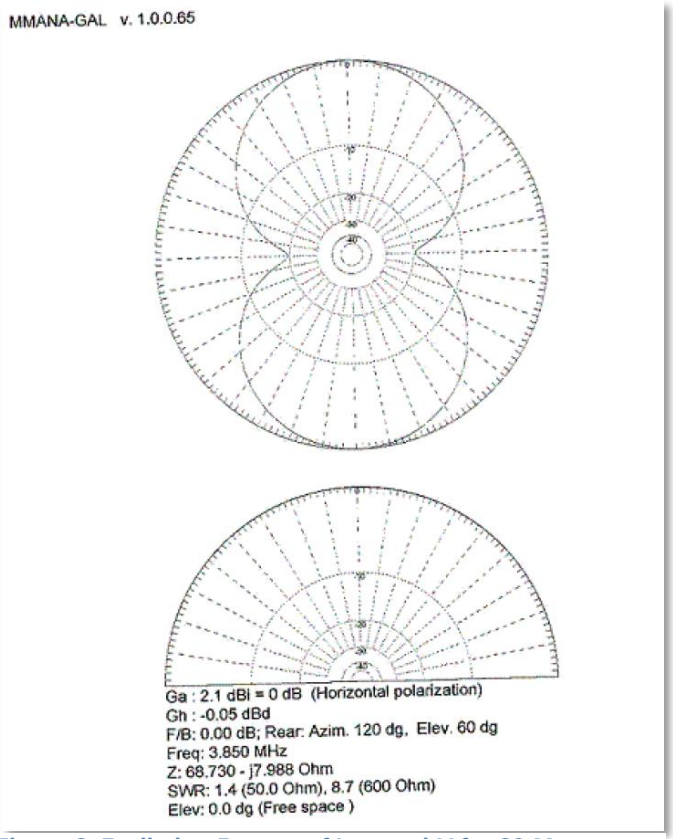

Figure 3 Radiation Pattern of Inverted-V for 80-Meters at 65 Feet

I have heard many amateurs say on 80 meters, "The reason my signal is weak to you is because you are off the end of my dipole." The radiation pattern from a dipole is essentially non-directional until the dipole is elevated more than a half wave, that is about 125 feet on 80 meters, and it is 65 feet on 40 meters. The main reason it makes no difference regarding orientation is because propagation for signals closer than 500 miles (the distance of most 80 meter contacts) is essentially by high angle radiation nearly straight up and down. Only signals radiated and received at low angles make a difference in antenna orientation even at low heights above ground. At low heights, there are nulls about 3 to 4 dB off the dipole ends.

3. Dipole Shape Variations
The wire of a dipole doesn't have to be run in a straight line. A dipole does not have to be perfectly horizontal. That's the way it is usually depicted in books and magazines, but you can bend the legs of the antenna up, down or sideways.

If you make either wire one-half wavelength long and carefully prune it to resonance, you can use it without a tuner on and near its resonant frequency. Both antennas have the current part at the top where most of the radiation

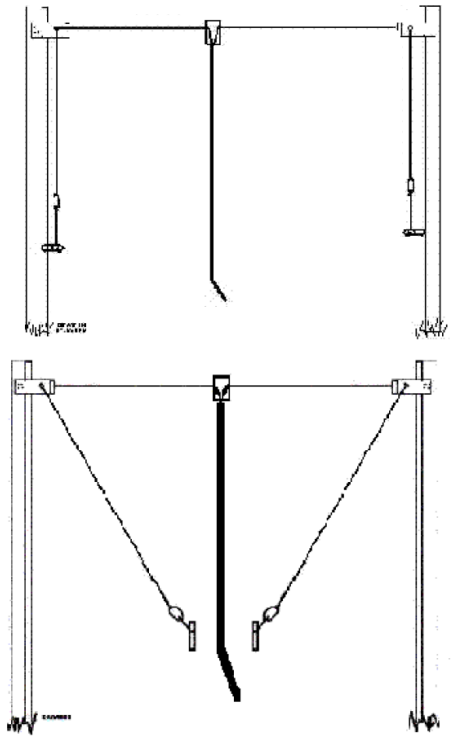

Figure 4 Two Dipole Shape Variations

takes place. The vertical parts of these antennas radiate a weak vertically polarized wave. The only reason these dipoles are contorted this way is to make them full-sized and to fit in the available space. Other shapes are possible, and you can be creative at your location. There are many more dipoles than the ones just described. We will explore the other kinds of dipoles in section "X" of this book.

4. Calculating the Length of a Half-Wave Resonant Dipole
The approximate length in feet of a half-wave resonant dipole is found by dividing 468 by the frequency in MHz. The actual length of it will be determined by several factors. Using larger diameter wire will make the dipole resonate lower in frequency. Therefore, to make it resonant at the higher desired frequency,

It must be shortened. Raising a dipole higher above ground will make it resonate higher in frequency. An insulated wire will make the dipole resonate lower in frequency than a bare wire.

Using the above formula, cut the antenna a little longer than the calculations say. If the SWR is best at a lower frequency than you desire, the antenna will have to be made shorter by pulling the excess wire through the end insulators, folding the ends of the extra wire back on itself. Then wrap the ends of the overlapped wire on itself so it wont come loose. This causes the excess wire to "short" itself to the rest of the antenna. If you are using insulated wire, you will need to cut off the excess wire. The reverse is true if the antenna resonates too high in frequency. The extra wire can be let out to make it resonate on a lower frequency. This is why you originally cut the wire a little

Understanding Antennas For The Non-Technical Ham

(continued)

longer.

5. The Decibel

The decibel (dB) is a unit of measurement for comparisons of the ratio of power, current, and voltage and is the term we will use in comparing antennas in this book. At one time, antenna comparisons were made using a dipole as a standard, but today most comparisons use the isotropic radiator as a reference. An isotropic radiator is an imaginary antenna that radiates equally well in all directions. It has no gain. The terms "dBi" and "dBd" are used to label which reference is being used. In this book, we will use the dipole as a standard for the most part.

How do you derive decibels from power ratios? The formula for power ratios is dB = 10 log P1/P2. For voltage and current, the values are doubled. Formulas of this type are beyond the scope of this book. Doubling the power will produce a 3 dB stronger signal. Double the power and double it again will equal a 4 times power increase and that gives 3 dB plus 3 dB or 6 dB. Double 4 and that is a power increase of 8 and that adds 3 more dB for a total of 9 dB. Increasing the power from 1 Watt to 10 watts or increasing it 10 times will give a 10-dB increase. Multiply 10-Watts times 10 give us 100 watts, which adds another 10 dB above 1 Watt for 20 dB. Therefore, increasing the power another 10 times to 1000 Watts will produce a signal 30 dB stronger than 1 Watt.

Your receiver, if modern, will have a signal strength meter or "S Meter." That meter is calibrated in "SUnits" from one to nine and decibels over S-9. S-9 is usually calibrated using 50 microvolts (uV) from a signal generator. Each S-unit is approximately a difference of 5 or 6 dB. Therefore, a reading of S-9 is about 6 dB stronger than S-8. Therefore, from S-0 to S-9 is 54 dB. On some low cost transceivers, the Sunits and dB above S-9 are only relative signal readings and actually have nothing to do with decibels.

IX. ANTENNA BASICS

1. Resistances and Reactance

Two factors measurable in antenna impedance are resistance and reactance. When we refer to antenna resistance, we are referring to its radiation resistance. It is neither a resistance like the electronic component called a "resistor," nor is it the same as the resistance found in all conductors. Those types of resistances, called "loss resistances," change electrical energy into heat energy. Heat energy disappears by radiating out into its surroundings and it dissipates away to infinity. When we feed RF into the antenna, the energy put into the radiation resistance disappears from the antenna by radiation of electromagnetic waves, and that makes an antenna appear to have a resistor in it. Loss resistance robs power from the radiation resistance and lowers the efficiency of an antenna system, but the loss resistance in dipoles is very low if the feed-line loss is low. The efficiency of any antenna system is found from a ratio of radiation resistance and loss resistance. We can either calculate the loss resistance by the loss in the feed-line from published tables and by estimating the loss in tuning units. Feed-line loss and tuning unit loss can be measured, but that is beyond the scope of this book.

Antenna systems having reactance prevent the transmitter from delivering its full power and the reactance needs to be tuned out. There are two kinds of reactance: capacitive and inductive. Antennas have both. In antennas, reactance is a virtual reactance meaning the antenna acts as if there were a capacitor or an inductor in the antenna, but neither is there. You can only measure the sum of both reactances but not a value for either one. Using an antenna analyzer, you can determine whether the sum of the reactance is inductive or capacitive. Inductive reactance is a negative number and capacitive reactance is a positive number.

The reactance of an antenna forms the "J" factor in antenna impedance measurements. The "J" factor is measured in ohms and the reactance is expressed as + or "J" ohms depending on whether it is capacitive or inductive reactance. Capacitive reactance is expressed as +J ohms and inductive reactance is expressed as -J ohms. Capacitive and inductive reactance are opposite factors and one can cancel the other. An antenna having 6 ohms capacitive reactance or + J 6 ohms and an inductive reactance of J 5 ohms will result in an antenna with a reactance of 1 ohm capacitive or + J 1. Since one term is positive and the other term is negative, you subtract smaller value from the larger. The answer has the sign of the larger one. In antennas, the reactance and resistance together determine the overall impedance of the antenna. The J factor is mentioned here only because you may see it in other books and on the extra class examination, but it will not be used further here.

A resonant antenna has equal amounts of inductive and capacitive reactance, and the sum of the reactance equals zero. As an example, when the inductive reactance equals J 5 and the capacitive reactance equals +J 5, their sum equals zero. When the sum of the total reactance of an antenna is tuned to zero, its impedance is totally resistive. The use of an antenna analyzer will tell you if the antenna is too long or too short for resonance. The simplest way to tune out antenna reactance is to change its length. The sum of the reactance of a long antenna will be inductive, and the sum of the reactance of a short antenna will be capacitive. If an antenna is short because it wont fit your property, it can be tuned to resonance by putting an inductor (coil of wire) in each leg. These coils are called "loading coils." An equal amount of inductive reactance will cancel the excessive amount of capacitive reactance. An antenna with loading coils is described in section "X." When an antenna is too long, the sum of its reactance will be inductive, and a variable capacitor can be inserted in each leg to tune out the inductive reactance. This is

To be continued next month

Amateur Radio Entry-Level FCC License

5-Classes 1-Review and License Exam Sessions

Work with RADIO - Hobby - Public Service - Disaster Preparations – F·U·N

Consider getting your

FCC Amateur Radio License

Classes each Tuesday, April 7th through May 19th at 5:30pm

These classes and the FCC License Exam are provided FREE of charge by the Majors Field Amateur Radio Club

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Go to www.wd5gsl.org for more info

If interested, e-mail classes@wd5gsl.org or call (903) 457-4127

Calendar

2015

March

21	Weatherford Hamfest http://w5pc.org
26	MFARC Meeting PD North Conference Room at 11:45am
31	VE Session at Rec Hall at 5:00pm

April

7	Technician License Class 5:30pm @ PD North Conf Rm
14	Technician License Class 5:30pm @ PD North Conf Rm
16	SVARA Meeting at 7:00pm at Hunt Regional Hospital
21	Technician License Class 5:30pm @ PD North Conf Rm
28	Technician License Class 5:30pm @ PD North Conf Rm
30	MFARC Meeting PD North Conference Room at 11:45am

May

5	Technician License Class 5:30pm @ PD North Conf Rm
12	Technician License Class 5:30pm @ PD North Conf Rm
19	VE Session @ HCR Hospital Conf Rm at 5:30pm.
21	SVARA Meeting at 7:00pm at Hunt Regional Hospital
28	MFARC Meeting PD North Conference Room at 11:45am

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

MAJORS FIELD AMATEUR RADIO CLUB

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We're on the Web!

See us at:

www.w5gsl.org

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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