Majors Field Amateur Radio Club
Greenville, TX

Volume 3, Issue 2
February 2015

AIRWAVES

INSIDE THIS ISSUE:

Special points of interest:

- Amateur Radio License lessons are being planned. Page 1
- Hunt County S.E.T. needs your help. Page 1
- K1N DxPedition report by KD5PXU. Did you make a QSO?

Club Sets Goals For 2015 and Off to a Good Start

Greenville TX - The Majors Field Amateur Club has met for the first time in 2015 and installed new officers. John Nelson Jr – NØDFW has been installed as the new Secretary Treasurer for the club. John has already received the bank records and has signature authority for the Bank Account. Stephen Denison – WD5SMD has been installed as the club's new Vice President. So far, he has been handy setting up several members as VE (Volunteer Examiners) with LARC, the VEC (VE Coordinator). Finally, Michael Ketchum – K5MDK will continue to preside as President of the club a little longer.

The club discussed three goals for the year 2015. (1) Provide Technician License class here at L-3. (2) Organize a hamfest within another local event, such as a Technology Fair or some other publically open event in order to provide more public visibility to Amateur Radio as well as provide a venue for local ham operators to participate in a local hamfest. (3) Setup a remote HF station to be access by club members locally here at L-3, initially targeting 10 meters.

Some good news has already become of the goals that were set. On February 11, 2015 five of our club volunteers have been established as VE (Volunteer Examiners) through the Laurel Amateur Radio Club VEC organization. LARC VEC is a no-cost VEC, which means we can provide Amateur Radio License testing at no cost to the candidates.

The three volunteers that have been approved are Stephen Denison – W5SMD, Jae Stutzman – K5JAE, Scott Davis – KK7JS, Michael Ketchum – K5MDK and Mark Rice – KK5MR, as an alternate VE.

The five VEs are now working out the schedule for three VE test sessions as well as two possible classes this year.

With the good progress of the first goal so far, we'll have to now pay attention to the other two goals soon and make plans for accomplishing them this year.❖

Hunt County SET Scheduled for Tuesday, March 17th to Simulate an Airplane Crash at Majors Field

Greenville TX – Hunt County ARES, along with many other agencies, is planning a SET (Simulated Emergency Test) on Tuesday, March 17th. This SET will require many ham operators to participate in order to pass traffic and also volunteer to participate in the test itself. Several positions are open for the day, which should start at 10:00am and go until after 3pm or so. If you are able to help, or you wish to join as a member of Hunt County ARES, please contact Chris Vaughan – AF5O at (903) 366-6913.

More information about the SET will be sent via E-Mail as details come. Also the Hunt County ARES has a Yahoo Group, in which information and updates are posted. The Yahoo Group is called: hunt_county_texas_ares

You can sign up at: hunt_county_texas_ares-subscribe@yahoogroups.com

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Club Meeting Minutes
January 29, 2015

Majors Field Amateur Radio Club
January 29, 2015

1. INTRODUCTION
   a. Meeting opened informally at 11:48am
2. ANNOUNCEMENTS:
   a. Various Announcements of events, activities and meetings.
3. OFFICER INSTALLATION
4. NEW BUSINESS
   a. Remote HF station Project
      i. Need to determine a location with LAN access:
         1. Internet Café
         2. Greenville Network
      ii. Goals were discussed
      iii. Motion made by Victor Paul to create a committee to investigate LAN access and location. Seconded by Mark Bushnell. Unanimous vote. Michael will setup a meeting in about two weeks to allow us to get some facts together.
      iv. Committee volunteers:
         1. Victor Paul
         2. Jae Stutzman
         3. Mark Stites
         4. Stephen Denison
   b. VE Technician Class Lessons Onsite
      i. Stephen Denison contacted Laurel VEC. They require a minimum of 3 Extra/Advanced class to create new VE group.
      ii. Volunteers to be VEs were asked:
         1. Scott Davis
         2. Jae Stutzman
         3. Stephen Denison
         4. Mark Rice – alternate
      iii. With this list, Stephen will contact Laurel VEC and get us certified.
      iv. SVARA will be holding Technician classes 1st Saturday in March at Hospital 1-day.
   c. Technology Fair / Hamfest locally.
5. PRESENTATION
   a. Presenter, Chris Vaughan – AF5O, was not present. Michael Ketchum presented ARES and announced the S.E.T. this Feb 5th.
6. ADJOURNMENT
   a. Scott Davis – KK7JS made a motion to adjourn, seconded by Tim Serbin – W3LS.

The following were in attendance:

1.	Michael Ketchum	K5MDK
2.	Peter VanHorn	KA5YDC
3.	Stephen Denison	W5SMD
4.	John Nelson	N0DFW
5.	Mark Bushnell	AE5FG
6.	Mark Stites	AC0AZ
7.	Scott Davis	KK7JS
8.	Jae Stutzman	K5JAE
9.	Mark Rice	KK5MR
10.	Victor Paul	WB0TEV

Ten in attendance.❖

KD5PXU has worked K1N on 1 out of 20 band slots

One of the rare DXPeditions is the Navassa Island K1N DXPedition. Navassa Island is ranked #2 most-needed DXCC entity by The DX Magazine and #1 by ClubLog. The Island, located in the Caribbean Sea, used to be site of a major Guano mining operation. After the Panama Canal was opened in 1914, a light house was established to help with the new shipping traffic. However, in 1996, the U.S. Department of Interior took over the island from the U.S. Coast Guard and established it as a National Wildlife Refuge in 1999. Navassa has one of the most pristine marine habitats in the world, according to the U.S. Department of Fish & Wildlife records. As such, the U.S. Fish & Wildlife Service will not allow any visitors to the island, except under rare and specific terms and then only once in a great while. Negations have been going on since the last operation in 2009 to the Desecheo Island. It almost seemed impossible, when a letter was issued that any subsequent proposals will not be accepted for ten years after the last proposal was reviewed.

The Fish & Wildlife Service accepted the proposal from KP1-5 project team and the schedule set for a DXPedition that will not be repeated for 10 years. On February 1st, K1N went on the air on Navassa Island within hours of receiving the final approval from the Fish & Wildlife Service.

K1N worked split mode, for example: TX:28.495 RX:28.470-28.480. I had been trying to work K1N since they began the DXepedtion. There are times when I thought there was no way to make a QSO with the DXPedition. But alas, I was able to get through. I was told that the key to making a QSO when the station that is calling on one frequency and listening on another is to simply tune just up or down from

KD5PXU has worked K1N on 1 out of 20 band slots

where they are listening and the majority of the time the contact can be made. Even though K1N worked many different bands and modes, I chose to concentrate on 10 meters, since it was open and had a good propagation report.

Propagation suggestions for K1N from **UNITED STATES OF AMERICA (Z4)** or from CQ zone **4** or show on **Geo Propagation Map**

Your search has been made possible thanks to a donation made by DJ4MM Fassl Guenter.

It was worth the wait to make that contact. The best time to work them is when the DXPedition is winding down, because the "Big Guns" are not splattering the near-by frequencies. Furthermore, the last day of the DXPedition operated as A.T.N.O. ONLY, which means ALL TIME NEW ONE only in order to allow anyone who has not been able to work K1N at any time a chance to get a QSO in before they shut down. They requested that anyone who has already made one or more contacts to stay clear.

I made my contact at a most opportune time. I was effectively LOCKED OUT of work for many months due to a labor dispute. The down-time has given me a great opportunity to catch up on some rig and antenna tune-ups as well as plenty of operating time at home. Recently, I received instructions to return to work, so my time on the air will have to wind down a little. But hey, that is ok because I can still make contacts in the mornings!

So if you hear that rare DX and might need them for an Award, hang in there and keep trying and you will eventually get them. That's all for now, 73 and Good DXing.

Article by Barry Griffin – KD5PXU ❖

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 4…

9. Eighty-Meter (3.5 4.0 MHz) Propagation
The CW part of this band is called the 80-meter band and the voice part of the band is known as 75 meters. Like 160 meters, eighty meters suffers from the same QRN in the summertime. Working DX on this band is a popular avocation during the fall and winter. However, 80 meters is used primarily for working nets and ragchewing. Eighty meters is primarily a nighttime band. This band can vary from being open most of the day in years with low sunspot numbers to being closed during the middle of the day in years with many sunspots. Many DX contacts have been made using dipoles and inverted-V antennas, but a vertical with many ground radials will be better.

10. Forty-Meter (7.0-7.3 MHz) Propagation
The forty-meter band has propagation that can act like either 80 meters or 20 meters. It just depends on the stage of the sunspot cycle. During the years with high sunspot numbers, nearby contacts are possible all day. At night, the skip lengthens making contacts possible to those parts of the world where it is still dark. Working DX on 40 meters is a nighttime or greyline event. When the sunspots are low, forty meters may have long skip during the day, and nearby contacts may be impossible or they may be very weak. During the time when we suffer from low sunspot numbers, many DX contacts are made during early morning, late afternoon, and at night.

If your primary interest on forty meters is SSB, our 40-meter voice band is a broadcast band in Regions 1 and 3. Region 1 is Europe, North Asia, and Africa and Region 3 is the Pacific, Southern Asia, and Australia. The top part of 40 meters is a voice band in Region 2, which is North and South America. To work SSB on forty meters at night, you will have to find a frequency between broadcast stations. Strong broadcast stations heard at night begin to fade out slowly as the morning sun rises and moves higher in the sky. As the suns angle declines in the afternoon, the broadcast stations begin to break through the noise becoming stronger as the sun begins to set. It is only in the middle of the day when no broadcast stations are heard on forty meters.

Since DX stations in region 1 and most of region 3 can only transmit below 7100 kHz, working DX on 40 meter SSB is still possible. Stations in those regions will have to transmit below 7100 kHz. (Australian and New Zealand amateurs can operate up to 7200 kHz.) They call CQ and announce where they are listening in our voice band above 7150 kHz. This is what is called "working split."

11. Thirty-Meter (10.1-10.15) Propagation
This band has such a narrow frequency that the only

Understanding Antennas For The Non-Technical Ham – continued

modes allowed here are CW and digital modes. That means no SSB. Propagation here is much like 40 and 20 meters. Unlike 20 meters, this band stays open longer at night during years with low sunspot numbers. During the daylight hours, it has much shorter skip than 20 meters. In the United States, we are allowed only 250 Watts.

12. Twenty-Meter (14.0-14.35 MHz) Propagation
The twenty-meter band is the best DX band because it is open for long-skip for more hours than any other band and it does not suffer from QRN as the lower bands. In years of high sunspot numbers, short-skip and long-distance DX can be worked at the same time during daylight hours. Although DX is there most of the time, most of the DX worked is at sunrise, sunset, and all night during peak sunspot years. During the years of low sunspots, it is common to work into Europe and Africa during the day and into Asia and the South Pacific during the evening hours and early at night. Low sunspot numbers cause 20 meters to go dead for east to west contacts at night an hour or so after sunset, but there is some TE propagation. During periods of moderate sunspot numbers, the propagation on this band is a blend of propagation of low and high sunspot years.

13. Seventeen-Meter (18.067-18.167 MHz) Propagation
The 17-meter band propagation acts much like 20 meters except it is affected more by low sunspot numbers than 20 meters. In periods of low sunspot numbers, this band does not stay open as late as 20 meters, fading out as the sun begins to set. Yet, the 17-meter band does stay open all night when the sunspot numbers are high. The propagation on this band is like a blend of 20 meters and 15 meters, but it is closer to 20 meters. Most users of this band use dipoles and other simple antennas since triband beam antennas wont work here.

14. Fifteen-Meter (21.0-21.45 MHz) Propagation
Fifteen meters is a fantastic DX band during the high sunspot years. This band may be open for 24 hours, and it is common to work more than 100 countries during a contest weekend on this band. Many have worked more than 300 different countries on 15 meters. In years of low sunspot numbers, 15 meters may be completely dead for several days in a row. When it opens during those years, you may hear only the Caribbean, South America, and on rare occasions the extreme southern part of Africa via TE propagation.

15. Twelve-Meter (24.89-24.99 MHz) Propagation
The 12-meter band is much like 15 meters, but it is affected more by sunspot numbers. Because this band is little used, many hours can pass without hearing any amateur signals. Occasionally you will hear South American Citizen Band "pirates" on lower sideband. It is mostly a daytime band but openings to Asia and the South Pacific are common early at night during peak sunspot years. The reason this band is little used is that triband beam antennas dont cover this band.

16. Ten-Meter (28.0-29.7 MHz) Propagation
The band that is most affected by the sunspot numbers is 10 meters. You may have noticed in this discussion, the higher the frequency, the more it is affected by sunspots. During peak sunspot years, 10 meters can be open some days for 24 hours. Mostly it is a daytime band. When they are at the peak, the sunspots enable you to work worldwide with power as low as 5 Watts. A 10-meter confirmed country total of over 250 is common. In the low sunspot years, the band can be closed for days. Ten meters can open for very short skip by sporadic E propagation during the summer months. Very short skip means contacts as close as 200 miles out to 1000 miles. Sporadic E propagation can suddenly occur without regard to the sunspot numbers.

VI. STANDING WAVE RATIO

A standing wave ratio bridge is used to measure the standing wave ratio, or SWR. SWR is an indication of how well the radiating part of an antenna is matched to its feed-line or how well the tuner is matching the antenna system. Most amateurs pay far too much attention to SWR. An SWR reading below 2:1 is acceptable, because the mismatch is so small that the feed-line loss can be ignored. If you are using a modern transceiver, its power may fold back to a lower power output above this SWR level.

When you have mismatch between the feed-line and the antenna, part of the power feeding the antenna system reflects back toward the tuner and the transmitter. The part of the power going toward the radiating part of the antenna system is called forward power. The part reflected back down the feed-line is called reflected power. The larger the mismatch the larger the reflected power will be.

If the feed-line and antenna are not matched, waves traveling toward the radiating part of the antenna system meet the waves being reflected back down the feed-line. The waves interfere with each other, and at certain points along the feed-line, the amplitudes of both waves combine. This will result in a current maximum to be found at that point; and at that point, the current will appear to be standing still. The length of feed-line and the frequency will determine where this point occurs. At another point, the forward and reflected waves interfere, and they subtract from each other. At that point, there will be a current minimum. If you could visualize this phenomenon, you would see a series of current maximums and minimums standing still along the feed-line. This is why we refer to them as standing waves. At different points along the feed-line, where you have high current, you will have low voltage, and where you have low current, you will have high voltage. At any point along the feed-line, multiplying

Understanding Antennas For The Non-Technical Ham – continued

the voltage times the current will equal the power in Watts. When the feed-line is matched to the antenna, current and voltage remain the same all along the feed-line because there is no reflected current to interfere with the forward current.

As happens with the current, the voltage will also appear to be standing still. The voltage maximums and voltage minimums will not be at the same locations as the current maximums and minimums. SWR is the ratio of the maximum voltage to the minimum voltage on the line. It is called "Voltage Standing Wave Ratio" or VSWR, but we shorten it to just SWR. There is also a current SWR or ISWR, and it is the same value as the VSWR. For example, if the standing wave voltage maximum is 200 volts and the minimum voltage is 100 volts, the VSWR will be 2:1. If the voltage maximum and voltage minimum are equal, the SWR will be 1:1. If the voltage minimum is zero, the SWR is infinite.

In measuring SWR at the transmitter, you need to realize that feed-line losses affect the SWR readings. If the feed-line losses are high, much of the power reflecting back from the antenna will be lost, and the SWR reading on the meter will indicate it is lower than it actually is. If a feed-line is so lossy that it consumes all forward and reflected power, it will measure an SWR of 1:1.

When measuring SWR on an antenna having a small amount of reflected power, the length of the feedline between the bridge and the antenna may affect your SWR reading. An example of this is a 70-ohm antenna being fed with 50-ohm coax. Different lengths of feed-line will give you small differences in SWR readings because at certain lengths, the mismatched feed-line starts to act like a series matching section. In the case of a 70-ohm antenna fed with 50-ohm coax, if the feed-line is a half wave long, the SWR will measure 1.4:1. At some particular length of feed-line and on one frequency, the SWR will measure 1:1 because that length of that feed-line transforms the impedance to make a match. Some hams have adjusted their feed line length to get a perfect match. This is called "tuning your antenna by tuning your feed-line." With other feed-line lengths, you will measure something different. Suppose the impedance of the feed-line and the antenna are perfectly matched. Then there is no reflected power. You will get a 1:1 reading on the SWR-bridge with any length of feed-line.

There is a myth that reflected power is burned up as heat in the transmitter. The reflected power coming back down the feed-line sees an impedance mismatch at the transmitter or tuner and it reflects back up again. The reflected power does not get back into the transmitter. Because the reflected power reflects back and forth, the radiating part of the antenna system absorbs most of the power being reflected back up each time. All of it eventually is radiated except for the power lost in the feed-line. The losses in a real feed-line will burn up some of the power on each pass. This is why the feed-line loss increases with SWR.

Built-in tuners are found in most modern transceivers. If yours doesnt have one, then you can use an outboard tuner to give the transceiver a proper load. The place you want a 1:1 SWR is between the output of a transceiver and antenna or between the transceiver and the input of a tuner in order for the transmitter to deliver its maximum power. Because built-in tuners are in most modern transceivers, many hams use them to match antenna systems having high loss.

VII. REAL ANTENNA SYSTEMS

In this book, we will be talking about the losses that rob an antenna of its maximum performance. The ideal antenna system will radiate 100% of your transmitter power on all bands without a tuner and in the direction you want to work. Such an antenna system does not exist. Many new hams succumb to antenna advertisements making claims that are exaggerated. No antenna will have low SWR, work all bands without a tuner, and radiate efficiently at the same time. A dummy load has a low SWR and will load up on all bands, but it will not radiate a signal. A resonant coax-fed dipole antenna will have a low SWR and will radiate efficiently on the band for which it is resonant, but it will not work well on all bands. For example, if the tuning range of your tuner has a sufficient range, you will be able to load up any antenna with it, but it will not necessarily radiate a signal efficiently. It may have high tuner and feed-line losses.

When you choose an antenna, you must decide how much loss you can accept. DXers and hams that work weak signals at VHF frequencies try to eliminate as much loss as possible. If your contacts are going to be made under good band conditions and without much interference, you can get by with high losses. In that case, coax-fed antennas used on bands where they are not resonant will allow you to make contacts. You can be greatly surprised by how little radiated power can be used to make contacts under ideal conditions. If you want to make contacts regularly under changing band conditions, you will want to eliminate as much loss as possible and use antennas with gain. Lower loss will enable you to hear weaker signals.

Understanding Antennas For The Non-Technical Ham – continued

Nothing will take the place of resonant half-wave dipoles, not because they radiate more efficiently, but because they dont require lossy tuners and dont have high coax losses. Remember that all antenna systems have compromises

VIII. HALF-WAVE RESONANT DIPOLE ANTENNAS

1. The Half-Wave Flat-Top Dipole
Most dipoles consist of two pieces of wire of equal lengths with one of the two ends connected together through an insulator. The far ends of the wires are also connected to insulators. The two conductors of a feed-line are separated and connected across the gap at the center insulator. The antenna is held up by rope that connects the insulated ends of the antenna to two supports. It is a "balanced" antenna, because equal currents flow on both halves of the antenna. Coax is an unbalanced feed-line. (The possible effect of using an unbalanced feed-line on a balanced antenna like a dipole will be discussed later.) The dipole that is stretched between two high supports is called a flattop dipole, distinguishing it from other configurations.

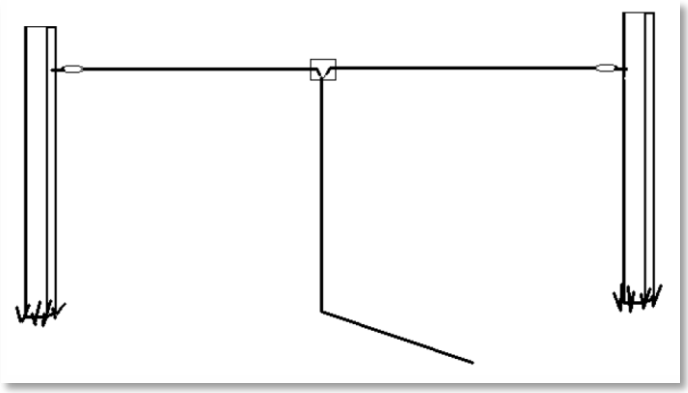

Figure 1 Flat Top Dipole

The simplest antenna system of all is the half-wave resonant dipole fed with coax and no tuner. The only reason for using a half-wave resonant dipole antenna is to eliminate the need for a matching device such as a tuner. The feed-point impedance will be near 50 ohms at ordinary heights and they can be fed directly with 50-ohm coax from the output of todays modern radios. The two halves of a dipole are fed 180 degrees out of phase, meaning when one side is fed positively, the other side is fed negatively. That is why a feed-line has two conductors. Of course, the sides swap polarity on each half cycle.

If you could visualize the current flowing on the half-wave dipole, the current will appear to be standing still. The maximum current will be seen at the center of the wire and no current will be at the ends. This occurs because the electrons flowing out to the ends reflect back toward the center where they meet the next wave and the current is reinforced there. The minimum voltage occurs at the center and the maximum voltage occurs at the ends of the half-wave resonant dipole. If you were to measure the voltage and the current at any point on the dipole wire, the voltage times the current will equal the power in Watts.

2. Inverted-V Dipole
Another configuration for the half wave resonant dipole is one having one support in the center and the ends stretched down toward the ground. The single support can be a tree, mast, or tower. The ends of a dipole have high RF voltages on them, and need to be at least 10 feet above ground for safety. This antenna is called an "inverted-V," because the shape of the dipole looks like a "V" turned upside down. Most dipoles illustrated in this book can be put up in the inverted-V configuration.

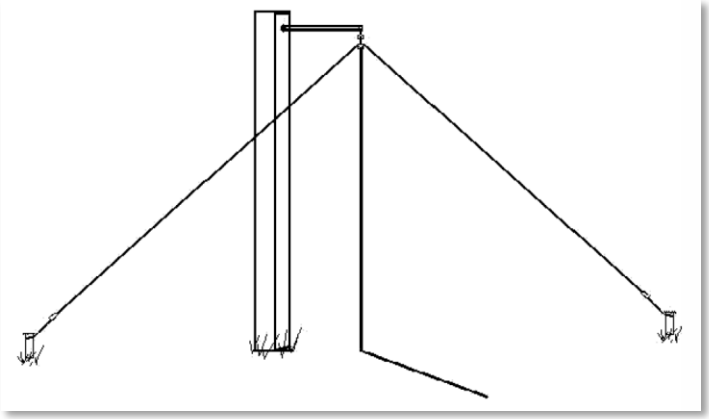

Figure 2 The Inverted-V Dipole

This configuration works well because the current is concentrated on the middle two-thirds of the antenna at the apex. The current in an antenna is what is responsible for the radiation. The ends of the antenna have very little current in them and it doesn't matter if the ends are close to the ground. The middle of the antenna is up high where the radiation is taking place and that is the place you want the radiation to be. An inverted-V has an advantage that the horizontal space required for it is less than what is needed for a flattop dipole. The angle between the wires on an inverted-V needs to be greater than 90 degrees. The gain of an inverted -V is 0.2 dBd and it has a radiation pattern nearly omni-directional. Since it is easy to construct and works so well, the inverted-V is the most commonly used dipole. An explanation of the decibel will come later.

To be continued next month

The Radio Amateur's Code

The Radio Amateur is:

- **CONSIDERATE**...and never operates in such a way as to lessen the pleasure of others.
- **LOYAL**... offers loyalty, courage and support to other amateurs, local clubs and the American Radio Relay League, through which amateur radio is represented nationally and internationally.
- **PROGRESSIVE**... with knowledge abreast of science, a well built efficient station and operation above reproach.
- **FRIENDLY**...slow and patient operating when requested, friendly advice and counsel to the beginner, kindly assistance, cooperation and consideration for the interests of others. These are the hallmarks of the amateur spirit.
- **BALANCED**... radio is an avocation, never interfering with duties owed to family, job, school or community.
- **PATRIOTIC**... station and skills always ready for service to country and community.

1928 by Paul M. Segal, W9EEA

Calendar

2015

February

19	SVARA Meeting at 7:00pm at Hunt Regional Hospital
21	NWS Skywarn Basic/Adv Training Grandville Arts Center Garland at 9:00am
26	MFARC Meeting PD North Conference Room at 11:45am
26	NWS Skywarn Basic Only Training F.Warren Civic Center Greenville at 6:30pm

March

7	Irving Hamfest http://irvingarc.org
19	SVARA Meeting at 7:00pm at Hunt Regional Hospital
21	Weatherford Hamfest http://w5pc.org
26	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
Friday	**Majors Field Amateur Radio Club Talk-In Net** Every Friday morning on your way in to work or on your way home on the WD5GSL/R 147.160 MHz (+) PL 100.0Hz

MAJORS FIELD AMATEUR RADIO CLUB

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We're on the Web!

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

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

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