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# SIGNALS

**Rockwell  
Collins**

Monthly Newsletter of the

**Amateur Radio Club**

**Volume 38 Issue 06**

Web Site <http://www.w5rok.us>

**March 2017**

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## **RCARC Membership Meeting**

**Tuesday 28 March 2017  
1700 Social      1730 Meeting  
1800 Program**

**Methodist Richardson Medical Center  
At Bush/Renner/Shiloh Intersection  
Conference Room A in Hospital Building**

**Subject:  
To Be Announced**

Department Training, patrol their neighborhoods and report all suspicious activities to the Police Department.

### **April Meeting Program Heads-Up**

#### ***The Outernet's Ham Radio Connection***

*To be presented by Frank Krizan, K5HS*

Most of us take the Internet for granted, but around 4.3 billion people around the world don't have access to the Internet. Recognizing an opportunity, entrepreneurs are seeking ways to provide a solution.

One of those is Outernet [www.outernet.is](http://www.outernet.is). The Outernet makes use of the existing world-wide satellite coverage offered by INMARSAT satellites.

Frank will describe the Outernet, what you need to receive the Outernet signals and the amateur radio (APRS) "channel" that's been included. You'll learn about resources and how to send messages via the Outernet.

A native Texan, Frank was first licensed as a Novice in 1961. He enjoys operating, DXing, contesting and trying new concepts in Ham Radio. Frank and his lovely bride, Nancy, K5NCK, live in Garland.

### **Digital Modes Handout**

***Multimode programs for QSOs (PSK variants, Fax variants, MFSK variants, etc)***

FLDigi: <http://www.w1hkj.com/> - Free, part of NBEMS (Narrow Band Emergency Messaging System), RSID capable, can run on Mac, Linux, and Windows. Run on Raspberry-Pi. Suite includes logger and message handling linked applications.

#### ***Very popular***

MultiPSK: [http://f6cte.free.fr/index\\_anglais.htm](http://f6cte.free.fr/index_anglais.htm) - Free version without professional modes. Has ALE400, RSID capable, harder to use graphical interface, Windows only

HRD/DM: <http://www.hrdsoftwarellc.com/index.html> - \$, Digital modes companion is DM780, can copy different modes and QSOs simultaneously, Windows only. Popular for rig control (Continued on page 6)

## **Local Club News**

### **Meeting Notice**

The program for this month's meeting was still being planned at the time of publication. So come to the meeting on Tuesday, 28 March and expect to be surprised.

### **RCARC Community Service Activities**

**Siren Testing** Dennis Cobb WA8ZBT, John McFadden K5TIP, Frank Krizan K5HS and Jim Skinner WB0UNI participated in the Richardson emergency siren testing. The testing on 1 March 2017 went well with almost all sirens operating normally. The siren testing is performed at 12:00 on the first Wednesday of each month. The sirens are monitored by amateur radio operators and reports made using the Richardson Wireless Klub (RWK) repeater at 147.120 MHz. Siren testing occasionally uses the University of Texas at Dallas (UTD) repeater at 145.430 MHz, which is designated as the backup repeater.

**Crime Watch Patrol** Jim Skinner WB0UNI participated in Richardson Duck Creek Crime Watch Patrol (CWP). CWP members, after successful completion of Richardson Police

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church building. For further information contact Dave Russell W2DMR, at 972.690.9894 or E-mail [warhog4@tx,rr.com](mailto:warhog4@tx,rr.com).

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## President and VP Messages

Well I hope March finds everyone well and ready for the spring. I know winter this year was a big dud, with not much cold weather, and actually seemed more like spring and early summer. I hope you are taking advantage of this good weather to work on your station and get it ready for summer operating. I am wanting to get my antenna up, but other things keep getting in the way, so I am looking for a break so I can get this done.

It is also time for the club to start thinking about Field Day, so we need to start planning for this. We also have a bunch of Hamfests, and Dayton (Not actually in Dayton this year as they will be in the new location) coming up. I am thinking of going to Dayton this year and check out the new facilities.

See you at the meeting & 73's,  
Gene, K1GD  
RCARC Vice President

## VE SESSIONS

**Dallas** tests are held on the fourth Saturday of each month at 1000 hrs. 13350 Floyd Rd. (Old Credit Union) Contact Bob West, WA8YCD 972.917.6362

**Irving** tests are held on the third Saturday of each month at 0900. Fifth and Main St. Contact Bill Revis, KF5BL 252-8015

**McKinney** VE test sessions are held at the Heard Museum the first Sunday of the month. The address is 1 Nature Place, McKinney TX. The time of the testing is 1430, ending no later than 1645. **Note: no tests given on holiday weekends.**

**Garland** testing is held on the fourth Thursday of each month, excluding November, and begins at 1930 sharp. Location is Freeman Heights Baptist. Church, 1120 N Garland Ave, Garland (between W Walnut and Buckingham Rd). Enter via the north driveway. A HUGE parking lot is located behind the church. Both the parking lot and the Fellowship Hall are located on the east side of the church building, with big signs by the entrance door. Contact Janet Crenshaw, WB9ZPH at 972.302.9992.

**Plano** testing is on the third Saturday of each month, 1300 hrs at Williams High School, 1717 17<sup>th</sup> St. East Plano. Check Repeater 147.180+ for announcements.

**Richardson** The Richardson Wireless Klub (RWK) VE team hold license testing on the third Thursday of each month at St. Barnabas Presbyterian Church, 1220 West Beltline Rd. Testing begins at 1900 hrs in room 12. Enter through the Northern most door on the east side of the

## Secretary's Report

28 Feb 2017

President Mike Schmitt WA9WCC called the meeting to order by Jim Skinner at 1740.

The following were present at the meeting:

Jim Brown	AF5MA
Dennis Cobb	WA8ZBT
Gene Duprey	K1GD
Mike Schmit	WA9WCC
Jim Skinner	WB0UNI
Rohan Thomas	KG5RCN
Joe Wolf	N5UIC

### Officers and Committee Reports:

There were no formal reports other than the Secretary's Report, which is contained in this newsletter.

### Old Business:

Mike Schmit WA9WCC reported that Bob Kirby K3NT had the club's newly-purchased Elecraft K3S transceiver up and running. It will be integrated into the W5ROK ham shack soon.

### New Business:

Joe Wolf N5UIC announced that a Kenwood TH-D74A transceiver will be awarded as a door prize at the Irving ARC Hamfest on 4 March 2017.

Dennis Cobb WA8ZBT provided an informal Treasurer's Report indicating club finances were in order.

Mike Schmit announced that Field Day would be held on 24-25 June 2017. He encouraged advanced planning to assure club success.

New club member Rohan Thomas KG5RCN was welcomed into the organization.

### Adjournment:

The meeting was adjourned at 1809.

## Decibel Hell—Reign of Antenna Gain Pain

*A short history of antenna gain terminology and some guidance to muddle your way through some of the nefarious alternative facts you may encounter.*

### Antenna gain in decibels

A relatively simple concept, antenna gain has proven to be problematic in certain circles of the radio world with a few distinct groups: antenna professionals, antenna aficionados and most everyone else. Everyone understands the general idea, but when decibels enter the picture we have trouble. The problem centers around the notion of what reference to use so that everyone is on the same channel. Fortunately, the established antenna community has things well in hand. Let's step our way through the topic and see what we can learn from the pros.

### Antenna gain definition

I've gathered together some details discussing the [definitions of Directivity and Gain](#) and placed it in a new technical topic portion of this web site always available on the right sidebar...

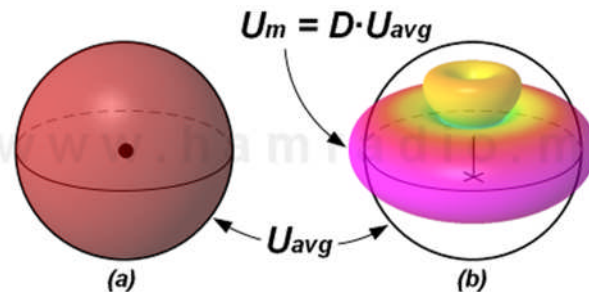


Fig. 1 – Learn about antenna directivity and gain [here](#)

There is a difference between Directivity and Gain, but for the remainder of this article I will assume antenna efficiency is perfect and assume they are the same.

### Isotropic reference

A key feature of professional antenna folks is the reliance on the isotropic radiator, itself based on the very definition of directivity [1], as the rock solid reference from which we measure all antennas. Looking at *figure 1a* above we see radiation of power equally in all directions. This is impossible to achieve with any practical antenna, but because it is based on a solid definition, it is unwavering as a reference. *Figure 1b* shows a Diamond CP22E antenna revealing how the power intensity is taken from some directions and added towards the waistline.

### Linear gain math

One can easily get by handling antenna gain using only multiplication. For example, the classic dipole has a gain factor of about 1.64 over an isotropic radiator. The Diamond CP22E of *figure 1b* has a gain factor of about 3.16 over an isotropic radiator. If you want to know the gain of the CP22E over a dipole you can simply divide one by the other...

Gain of Diamond CP22E over dipole =  $3.16 / 1.64 = 1.93$

...or about twice the power radiated towards the horizon.

### The bel and decibel

In honor of [Alexander Graham Bell](#), the unit bel represents the base 10 logarithm of a ratio between two power quantities of 10:1. There is a similar unit called the neper, where one neper is the change in the level of a field quantity when the field quantity changes by a factor of  $e$ , that is  $1 \text{ Np} = \ln(e) = 1$ . The shorthand identifier for bel and neper are B and Np respectively. The bel and neper have the following relationship...

One bel (B) is  $1/2 \ln(10)$  nepers :  $1 \text{ B} = 1/2 \ln(10) \text{ Np}$

The bel is rather large in scope prompting the popularity of adding an SI prefix to create a smaller, more pragmatic unit. SI fractional prefixes include deci, centi, milli, micro, etc.

making decibel, centibel, millibel, microbel, etc. all valid forms. One tenth was deemed a handy value in the 1930s so decibel has been the go-to unit for logarithmic voltage and power gain representation since.[5]

$$1 \text{ bel} = 10 \text{ decibels}$$

The abbreviation for the decibel is...

- d = deci
- B = bel
- dB = decibel

The “d” is always lowercase. The “B” is always upper case.

**Logarithmic gain math**

The nature of the decibel is such that instead of multiplying linear values of gain you can, instead, add logarithmic values of gain. Let’s redo the above example.

One manifestation of the classic dipole antenna has a gain factor of about 1.64 (or  $10 \cdot \log(1.64/1) = 2.15 \text{ dB}$ ) over an isotropic radiator. The Diamond CP22E of *figure 1b* has a gain factor of about 3.16 (or  $10 \cdot \log(3.16/1) = 5 \text{ dB}$ ) over an isotropic radiator. If you want to know the gain of the CP22E over a dipole you can simply subtract one from the other...

**Gain of Diamond CP22E over dipole = 5.00 dB – 2.15 dB = 2.85 dB**

...or about twice the power radiated towards the horizon. Checking our math we can convert the 2.85 dB back to linear thus...

$$10^{(2.85 \text{ dB}/10)} = 1.93$$

Linear and log – six one way, half-dozen the other.

**dB<sub>i</sub> and dB<sub>d</sub>**

The proper way to express decibel values in the International System of Units (SI) units is...

$$\text{Gain of dipole} = 2.14 \text{ dB (re isotropic)} [2]$$

...or for those looking to pad their documentation with lots of words...

$$\text{Gain of dipole with respect to an isotropic antenna} = 2.14 \text{ dB [2]}$$

Thankfully the professional antenna field coined the abbreviation **dB<sub>i</sub>** by at least 1968 [3] making...

$$\text{Gain of dipole} = 2.14 \text{ dB<sub>i</sub>}$$

...perfectly fine. For cases where one desires to compare gain to a dipole instead of the isotropic radiator, the proper expression will be...

$$\text{Gain of dipole} = 0 \text{ dB (re dipole)} = 0 \text{ dB<sub>d</sub>}$$

...where dB<sub>d</sub> is another well-known shorthand notation for gain with respect to a dipole.

Note the reference dipole is always about 2.14 dB higher (or exactly 2.15 dB higher if you are the FCC [4]) than isotropic so the two are merely a constant value from each other... always.

**In the antenna community, dB<sub>i</sub> and dB<sub>d</sub> mean nothing else!**

**Gain pain – alternative expressions for dB<sub>d</sub>?!?!?**

Chillingly many folks (hams mostly) believe dB<sub>d</sub> has alternative definitions where, for example, an antenna is above ground. Nothing in professional antenna engineering circles suggest that. While it is true comparing and contrasting antenna gains over ground makes some sense, this doesn’t give anyone carte blanche to rewrite the dictionary. Changing terminology due to misunderstanding is careless at best and possibly fraudulent at worst.

During a [particular Zed Thread](#) the commentary drifted into an alt meaning of dB<sub>d</sub> suggesting a dipole over ground was an alternative baseline reference used by professional antenna manufacturers. When challenged to show one example, the poster suggested this impressive [20m beam from M2](#). Let’s examine the specs from their web site...

SPECIFICATIONS:	
Model .....	20M6-125
Frequency Range.....	14.0– 14.350 MHz
*Gain, (FS) / Over gnd.....	11.19dBi / 16.6dBi @70'
Front to back .....	25 dB Typical
Beamwidth .....	E=46° / H=60°
Feed type .....	Hair pin match
Feed Impedance.....	50 Ohms Unbalanced
Maximum VSWR.....	1.2:1
Input Connector.....	SO-239, Others avl.
Power Handling .....	3 Kw, Higher avl.
Boom Length / Dia.....	59' / 3.0 x .125 Wall
Element Length / Dia .....	36.5' / 1 1/4" –1/2"
Turning Radius:.....	40'
Stacking Distance.....	65' -70'
Mast Size.....	2" to 3" Nom.
Wind area / Survival.....	16 Sq. Ft. / 125 MPH
Weight / Ship Wt.....	240 Lbs. / 270 Lbs.

\*Subtract 2.14 from dBi for dB<sub>d</sub>

Fig. 2 – M2 20M6125 20m Beam Specs

**Examining the M2 20M6125 specifications**

It’s clear from the specs...

- Gain (Freespace) = 11.19 dBi ~ 9 dB<sub>d</sub>
- Gain (70’ AGL) = 16.6 dBi ~ 14.5 dB<sub>d</sub>

Another more SI compliant way to put this is...

- Gain = 11.19 dBi ~ 9 dB<sub>d</sub> (based on the [standard definition of Directivity/Gain](#))
- Gain (70’ AGL) = 16.6 dB (re isotropic) ~ 14.5 dB (re isotropic dipole)

M2 never redefines the isotropic meaning of dB<sub>i</sub> or its derivative dB<sub>d</sub> as the poster suggests. M2 has carefully prepared their data to be non-ambiguous so it can pass the smell test of the antenna engineering world. What’s missing, of course, are the characteristics of the ground. To be above board, that really should be part of this data, but hey... an A for effort.

So... M2 verifies for us they see dBi and dBd as both meaning isotropic circumstances, as used by those in the professional antenna community. They make crystal clear where they deviate from these measurement constants. If they did not, they would eventually be flagged for erroneous specifications by purchasing agents in the know. This could become a serious embarrassment especially if they sell to government and corporate customers... which seems likely given their stature in the antenna biz.

M2 correctly avoids using erroneous “sammy the hammy” antenna jargon – they know better. I suspect other major players in the antenna biz do so as well.

### My antenna has X dB gain – oh no!

In a post like this we can't pass up the golden opportunity to highlight the less knowledgeable antenna manufacturers touting mystical properties of their antenna's gain performance. One dead giveaway is stating antenna gain with no implied reference at all such as...

- [SlimJim J antenna with '6db of gain'](#) – This is actually a fine 2-3 dBi antenna, but certainly not 6 dB anything;
- Copper SlimJim antenna with '[Gain: 6 dbi](#)' – They try to pass the idea a 2-3 dBi antenna has twice the gain than is possible. False advertising? Perhaps they don't quite understand how [SlimJims](#) work? You be the judge.

Keeping in mind the relationship between dBi and dBd is a mostly constant value of 2.14-2.15 dB, read this...

- [Low Power FM \(LPFM\) Broadcast Antenna](#) – with a gain claim of “3 dbi (2.5 dbd)” – You do the math and evaluate the antenna knowledge of the author.

The lowercase b in db says something about the authors as well.

### Diamond Antenna does it too

Some notable companies in the antenna biz fall short of “truth in advertising.” Diamond Antenna is, sadly, one such example. Their CP22E dual collinear 2m antenna is actually a very fine piece of engineering. I have researched this model plenty, own two, and is why I use it as a reference in figure 1. One hard rule about obtaining gain is the need to increase the antenna capture area. Two elements arranged collinearly and fed in phase can approximately double your effective gain – two times the power or 3 dB over a dipole. Four elements can double this again – four times the power or 6 dB over a dipole. Let's check the CP22E manual description section...

#### Description

The CP22E is a 2-meter monoband, 2-5/8 wavelength ground plane antenna, optimized for the U.S. amateur band.

Made from heavy-duty aluminum, the CP22E is easily assembled, yielding excellent performance with 6.5 dB gain over a 1/2 wave dipole.

Fig. 3 – Diamond CP22E description

Wow 6.5 dB gain over a dipole... something not even possible with four collinear elements let alone the two in this design. In reality the CP22E achieves about 2.85 dB over a dipole or about 5 dBi gain. This antenna is a very capable performer, approaches the theoretical two-collinear-element 3 dB improvement over a dipole and does so at a very good price. However, those who generate the documentation at Diamond Antenna have totally jumped the shark in the sad attempt at *gainflation*.

### Grammar police?

Yes I admit to being an antenna jargon purist, but am making it clear the above issues reveal some serious lack of knowledge of folks claiming to be in the antenna manufacturing business. They need to step up their game before someone, perhaps from the FTC, calls their hand.

### Conclusion

Half-baked understanding of any discipline is not a sin. We all were beginners once and had to learn. The learning never really ends, but some appear to reach a point of understanding and then the locomotive of their education train stops with a loud bang. Thereafter they base life's decisions on truncated knowledge. The defending of dBd as non-isotropic using backfiring evidence from M2 was humorous. Hammy antenna manufacturers too often blow smoke you know where in some of their product specifications. When hams or any antenna makers contradict the first 30-50 pages of ANY college level antenna book, be very afraid.

### References

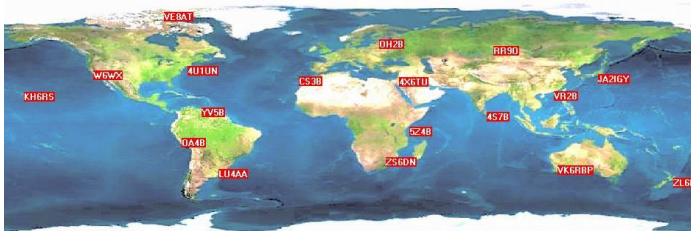
1. Cheng, David K. (1983). Field and Wave Electromagnetics. Addison-Wesley Publishing Company.
2. Thompson Ambler; Barry N. Taylor (2008). Guide for the Use of the International System of Units (SI) – NIST Special Publication 811. National Institute of Standards and Technology
3. Ralph W Campbell. Patent US3491361A.
4. [412172 Determining ERP and ERIP, FCC.](#)
5. William H. Harrison (1931). “Standards for Transmission of Speech”. Standards Yearbook. National Bureau of Standards, U. S. Govt. Printing Office.

### About John Huggins

John is an electrical engineer working in astronomy and aerospace including 33 years in antenna/RF design with experience modeling, manufacturing and measuring past, present and new antenna concepts.

(Contributed by Douglas Kilgore KD5OUG)

## NCDXF/IARU International Beacon Project



The Northern California DX Foundation / International Amateur Radio Union (NCDXF/IARU) International Beacon Project (IBP) is a select number of worldwide HF Stations located throughout the world that conform to a strict GPS time controlled schedule for transmission on the upper HF bands of 20, 17, 15, 12 and 10 meters.

Frequencies are 14.100, 18.110, 21.150, 24.930, and 28.200 Hz.

Each beacon transmits once on each band, once every three minutes, 24 hours a day.

A transmission consists of the call sign of the beacon sent at 22 words per minute followed by four one-second dashes.

The call sign and the first dash are sent at 100 watts. The remaining dashes are sent at 10 watts, 1 watt and 100 milliwatts.

At the end of each 10 second transmission, the beacon steps to the next higher band and the next beacon in the sequence begins transmitting.

My friend Dennis, WA8ZBT introduced me to the IBP years ago at our Rockwell Collins ARC station W5ROK and I had used it as a good simple way to check if a band was open to a DX IBP station location. I have been amazed at how many 10, 1 and .1 watt signals that were perfectly readable. You will also find that this is a good tool to help increase your CW code copy and speed. It is also helpful in selecting antennas and in hearing if short or long path direction is your best choice.

The transmission schedule along with the latest project, station(s) status and frequencies can be found at this URL. <http://www.ncdxf.org/beacon/index.html>

Take the time to look around this well done 'NCDXF' website as it contains extensive propagation tool information.

In addition to listening for international beacons at your station, there are three ways to determine which beacons are being heard in various parts of the world. You can check for spots made manually by amateurs who have heard the beacons and have posted a spot on a local [DX Cluster](#) or directly to [DX Summit](#). Or, you can check with web pages showing automated [reception reports of the beacons by Faros software](#) or the Reverse Beacon Network.

The [Reverse Beacon Network](#) involves hundreds of volunteer monitoring stations using [CW Skimmer](#) to monitor for

CW call signs and report them via the RBN web site. The Reverse Beacon Network can be used to show reception reports of the beacons by users who have added the beacon call signs to their watch list. N4ZR explains how to do that in his [NCDXF Beacon Spotting Redux blog post](#).

For you YouTube fans, an Introduction to the NCDXF IARU Beacons is found at these URL's. Official SWL channel <https://m.youtube.com/watch?v=Lb5fv45pK-A>.

David Casler KE0OG International Beacon Project, AD#31 [https://m.youtube.com/watch?v=6VbE9vU9\\_uY](https://m.youtube.com/watch?v=6VbE9vU9_uY)

Reviewing the above links may lead you to valuable propagation analysis tools for more enjoyable HF operations and also help to increase your CW speed along the way.

References: <http://www.ncdxf.org/beacon/index.html>

(Contributed by Bob Kirby K3NT)

## Presentations for Monthly RCARC Meetings

RCARC has an urgent need for presenters to present a short topic on Ham Radio at our monthly club meetings. 45-60 minute presentations may include, but are not limited to:

- Set-up, Building or Modifying Station Equipment (Antennas, Audio, Dummy Loads, Desks, Lights, ...)
- Operating a Radio Station (Listening & Transmission tips, Ham Logo decrypted, Popular Frequencies, ...)
- My Radio Broke (Possible Alternatives before using the Sledge Hammer, ...)
- Different types of Digital Operation (APRS, Packet, PSK 31-64, RTTY, ...)
- Software Defined Radios (Commercial, Kits, Remote, Internet, ...)
- Software used for Ham Radios (WSPR, PSK-31, ...)
- Emergency Radio Equipment (Go Kits, Batteries, Solar power, Easy-Up Antennas, ...)
- Ham Radio Activities (MARS, RACES, MARC, Contests, Satellites, Mobile, Portable, Remote, Field Day, SWL, ...)
- Radio Reference (On-line manuals, theory, how to books & Videos, ...)
- Social Mingle (With light snacks? Ham and cheese crackers? ...)

If you would like more information on a particular topic, and would like someone to do a presentation on it, you may suggest it as a topic. Please email Bob Kirby K3NT, Jim Skinner WB0UNI or Gene Duprey K1GD to present a topic or to suggest a topic for presentation.

## Digital Modes Handout (Continued from page 1)

MixW: <http://mixw.net/> - \$, the original multimode program for Windows. Under very slow development and supposed to be ported to Linux eventually, does not have RSID, can copy more than one QSO/Mode simultaneously. DigiPAN

was subset with same user interface. Can still download older versions that are free but less capable

Note the multimode programs are to be used with rig in Upper SideBand ( USB) as they properly invert RTTY when needed. Some of the modes, like the psk variants will work either way.

**Single mode programs for QSOs**

FSQ (fast and simple QSO): <http://www.qsl.net/z1bpu/MFSK/FSQweb.htm> - designed for HF and optimized for

should not be used for obvious modes like PSK31 and variants, RTTY, Hellschreiber, etc. Use for odd variants of above or for modes that look and sound the same like Olivia, Contestia, and RTTYM,

<http://www.w1hkj.com/modes/index.htm> shows what water fall looks like and has audio recordings.

<http://www.sigidwiki.com/wiki/Category:HF> has info on many modes beyond ham radio modes

<http://wb8nut.com/digital/> has historical mode descriptions

<http://www.qsl.net/z1bpu/MFSK/FSQweb.htm> has quite interesting history of MFSK modes including MFSK, Thor, and Domino.

<http://www.qsl.net/z1bpu/> is good site for history of many of these modes

(Contributed by Bob Kirby K3NT)

**Upcoming Events**



**Greater Houston Hamfest**  
ARRL Texas State Convention  
March 24 and 25  
Ft. Bend County Fairgrounds  
Rosenberg, Tx

**Free Friday!**  
**Build One of These!**  
**Reserve your spot now!**  
[www.houstonhamfest.org](http://www.houstonhamfest.org)  
DEADLINE FOR RESERVATIONS  
March 11, 2017

**Tuna Tin 2-40 Meter Transmitter**  
Just bring your own Tuna Fish Can!  
Hosted by Joe Eisenberg, K0NEB, CQ Mag Kit Editor.  
Reserve your kit today!  
Cost \$30.00  
- - - - -

**Digital Hotspot for DSTAR or DMR Radio**  
Hosted by Hal Fuglaar, N5BXP and Grapevine Amateur Radio  
Watch the Website for details  
- - - - -

NVIS net operations. Common frequencies are in the automated sub-bands on 80, 60, and 30m. Some 20m activity. FSQ uses Incremental Frequency Keying (IFK). Fldigi also supports this mode. Has sentence based chat mode, file and message transfer, etc. Can be compared to an old telephone party line and is used that way.

**Special Purpose digital modes**

WSJT (Weak Signal Communications by K1JT): <http://physics.princeton.edu/pulsar/k1jt/index.html> - multiple programs for JT65/JT9 (moon bounce, ionospheric or meteor scatter, HF weak signal, propagation testing, etc.), reverse beacon networks for WSPR ( weak signal propagation reporter)

<http://jt65-hf.com/> is alternate for JT65

<http://dev.wsprnet.org/drupal/> is for propagation reporting

**Mode Identification**

The Reed Solomon ID code is used to identify modes. TxID and RxID, Some applications can switch modes to follow a received RS-ID and can transmit RS-ID. Fldigi has this capability and is used in many Eastern traffic nets. RS-ID

<b>MARCH</b>	
<b>24-25</b>	<b>Greater Houston Hamfest and ARRL Texas State Convention</b> Ft Bend County Fairgrounds, Rosenberg TX. <a href="http://www.houstonhamfest.org">www.houstonhamfest.org</a> . See flyer in this newsletter.
<b>APRIL</b>	
<b>16</b>	<b>Rookie Roundup—Phone</b> Mission: To encourage newly-licensed operators (“Rookies”) in North America (including territories and possessions) to operate on the HF bands and experience competitive Amateur Radio operating. Experienced operators (“Non-Rookies”) are strongly encouraged to participate and help new operators – either on the air or in person.  Objective: Rookies exchange information with as many other stations as possible on the 80, 40, 20, 15, and 10 meter HF bands. Rookie entrants are encouraged to read “HF Contesting – Good Practices, Interpretations and Suggestions.”  The event runs from 1800 UTC through 2359 UTC. Details at <a href="http://www.arrl.org/rookie-roundup">http://www.arrl.org/rookie-roundup</a> .
<b>Daily</b>	DFW Early Traffic Net (NTS) at 6:30pm 146.88 – PL 110.9Hz
<b>Daily</b>	DFW Late Traffic Net (NTS) at 10:30pm 146.72 – PL 110.9Hz
<b>Daily</b>	Texas CW Traffic Net at 7:00pm on 3541 KHz and at 10pm on 3541 KHz <a href="http://www.k6jt.com">www.k6jt.com</a>
<b>1<sup>st</sup> Wednesday</b>	Richardson Emergency Siren Test. At noon using the Richardson Wireless Klub (RWK) repeater at 147.120 MHz.
<b>2<sup>nd</sup> Wednesday</b>	ARES North Texas HF Net Every month—3860 KHz at 8:30 pm—9:30pm

# Rockwell-Collins

Amateur Radio Club

Mail Station 461-290

P.O. Box 833807

Richardson, TX 75083-3807

TO:



**CLUB STATIONS**  
 (972) 705-1349

**W5ROK REPEATER**  
 441.875 MHz +5 MHz Input  
 131.8 Hz PL - RX and TX

**W5ROK-1 PACKET BBS ROK Node**  
 145.05 MHz

**W5ROK-N1, W5ROK-N2 & W5ROK-N3 HSMM-MESHNET Nodes 2.4 GHz**

**Tuesday 28 March 2017**

**1700 Social      1730 Meeting**

**Methodist Richardson Medical Ctr**  
**At Bush/Renner/Shiloh Intersection**

*Conference Room A in Hospital Building*

**NEXT SIGNALS INPUTS DEADLINE:**  
**→→→ 14 April 2017 ←←←**