



ROUNDTABLE

PRESIDENT'S MESSAGE

By Bryan Steinberg – KB0A

This being my first column for the RoundTable as your club President, I would like to get some thanks out of the way. First, a big thanks to Robert White, K0RCW, our outgoing President for his great work in leading the club during his term. Robert has also left the board, but he will remain as the VE Team lead for the club. Another thanks to Joe Delwiche, AC7SX, for his service to the board over the past few years. Joe's position on the board has been filled by Paul Meenach, KD0CXX. So, welcome Paul who I look forward to serving with on the board. A really big thanks to Bob Proctor, KC0OUQ, who is stepping down after a very long term as our Membership Chairman. Bob has also been a club board member. The Membership Chair will be picked up by Bob Wilson, KC0CZ. I especially appreciate Bob's willingness to step into this position which is so important to the health of our club. And, one last change, Bill Hester, N0LAJ, will be taking over the role of Webmaster for the club. Bill and I expect to make some exciting changes to the website over the winter.

Our September meeting involved the election/re-election of board members and the club officers. After that club business was completed Bill, W6OAV, stepped in to hold an impromptu Q&A session on antennas. As usual, Bill did a great job of enlightening us on his deep knowledge of antennas. This month we will have a presentation by Doug, N4ATA, to explain those new QR Codes that you scan with your phone that are popping up everywhere. Look for more info on the September meeting and the upcoming October meeting elsewhere in this issue of the RoundTable.

One of the things that we have been doing in the newsletter is welcoming new members. With both Bob's and my transitions I don't have that information yet, but I expect to resume making those acknowledgements in next month's issue.

All in all I don't expect to be making any big changes in how the club operates. I have always subscribed to the motto; "If it ain't broke, don't fix it!" I hear many other clubs talking about how their membership is shrinking. They don't have any new, young members. By contrast the DRC is a very dynamic and diverse club with a growing membership roster, which is great. Overall, I think we have a great club with exceptional members. I am very proud to say I am a member of the Denver Radio Club and honored to be your new president. I look forward to seeing all of you at the next meeting on October 19th at the El Jebel Shrine Center one block west of the intersection of 50th Avenue and Tennyson Street. Proceed to the second floor in the East Room. Please remember to always check our web site at <http://www.w0tx.org> for important information about the DRC. The Elmer Session and Tech Meeting begin at 6:30 pm immediately followed by the regular program at 7:30 pm.

Until next month...

Bryan – KB0A
President

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SEPTEMBER MEETING - WHAT'D I MISS

By Bill – W6OAV

There were 48 attendees this month. After introductions, Robert, K0RCW, presented awards to several club members thanking them for their contributions in various areas Recipients were:

W6OAV - Bill - Roundtable Contributing Editor
 AG0S - George - Roundtable Editor
 K0MEL - Mel - VE Team Liaison
 KD0AOE - Rebecca - Learning Net
 KB0BZZ - Bob - EmComm Coordinator
 KB0A - Bryan - Hamfest Chair
 K0SSE - Oscar - Emcomm Coordinator
 WW0LF - Orlen - Club Repeater Trustee
 KC0OUQ - Bob - Membership Chair



Robert presenting an award to our club trustee Orlen, WW0LF.

After the awards ceremony, the annual club officer and board member elections took place. See the president's message elsewhere in this issue for details. A big THANK YOU to the all the present members, the new members and the outgoing members.

After the elections were completed, Bill, W6OAV, conducted a Q and A session on antennas. Most of the session covered questions about HF magnetic loops and J Poles.



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OCTOBER CLUB MEETING

By Bill – W6OAV

Want to learn these mysterious patterns called QR Tags which are appearing all over the place?



If so, plan to attend the October Denver Radio Club meeting. Doug, N4ATA, will not only tell us all about QR Tags but will demonstrate creating and scanning them. The presentation will cover the following areas:

- QR Tag history, types and uses.
- Examples of Common use QR Tags.
- Security Issues when scanning.
- Installing and using QR Tag scanning applications.
- Installing and creating QR Tags.

SEPTEMBER TECH COMMITTEE REPORT

By Bill – W6OAV

This report provides an overview of items discussed during the July Technical Committee meeting.

Voter System

Goal: Design, build and test a 147.33 MHz voter system consisting of a central voter site and one remote site (Phase 1):

- Review the Phase 1 installation project:
 - Items not completed:
 - Adjust UHF link transmit antenna - KB0A will use his analyzer to check the receive antenna system.
 - Sync the hang times of Station 4 and the remote - KB0A will email commends to N1ETV so he can change the remote's hang time.
 - Calibrate the local and remote audio levels and responses - KB0A will use the IFR to set levels.
 - The above items will be completed as time permits.
- Discuss Phase 2 possibilities:
 - K0RCW will run Splat, an application that profiles a transmitter's coverage areas, to determine Station 4's dead zones. The Tech Committee will then look for possible remote receiver sites in these zones.

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ST. Anthony Repeater

Goal: Improve coverage:

- The present antenna will be replaced with the X30 omni vertical.
- WW0LF will make up a coax jumper for the new antenna.
- K0HTX will supply the necessary ladder when the antenna is replaced.
- Tech committee members will record the present signal strength for benchmarking after the antenna is replaced.

Noise at Station 4

Goal: Reduce the power line noise affecting all systems:

- W0WLF will get Xcel to generate a work order to resolve the noise issue.

Upgrade 448.625 Repeater

Goal: Replace FM transceiver with a MotoTRBO:

- Replace S Com 7k with S Com 7330 and write a program for the 7330.
- The project has been rescheduled for next spring.

TS-940 Failure

Goal: Determine if re-soldering and cleaning connectors will fix radio:

- K0TOR has re-soldered many bad connections and replaced several bad solid state devices. He is now troubleshooting the built in automatic tuner.

SAFE WI-FI COMPUTING – PART 1

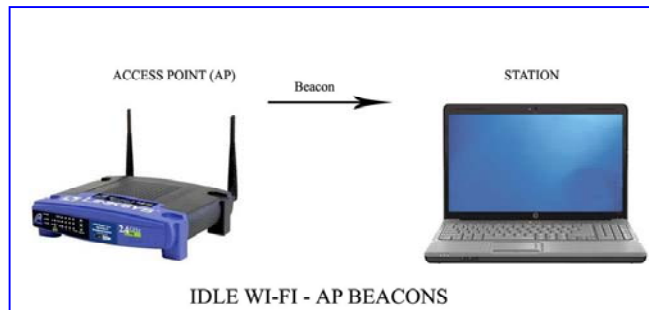
By Bill – W6OAV

Part 1 of this document describes how Wi-Fi works. Why understand how Wi-Fi works? Understanding how Wi-Fi works will make it easier to understand why and how to configure Wi-Fi systems and how to operate safely, especially in Wi-Fi hotspots (hotels, airports, coffee shops etc). Wi-Fi hotspots must be considered as war zones where operating is very dangerous, as will be discussed later in this document.

A high level overview of Wi-Fi setup process

The discussion below is a high level overview of the Wi-Fi setup process. It is based on a station using standard Windows Wi-Fi drivers. If 3rd party Wi-Fi drivers are used there may be some small variation in the process described below. Before continuing, the reader might want to review the acronym definitions contained in the introduction to this document.

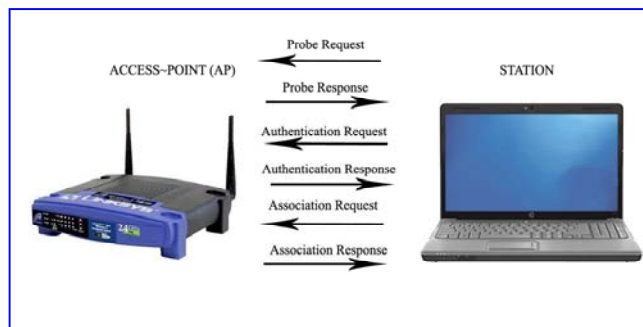
AP Beacons



Definition: A *beacon* is a Wi-Fi management data frame which an Access Point (AP), usually a router, transmits to announce its presence.

An AP normally transmits a beacon every 100 ms. The beacon contains the AP’s MAC address, SSID, and other communications process information.

A Wi-Fi equipped station, upon hearing a beacon (or beacons if more than one AP in range is beacons), will add the SSID(s) to its “Available Networks” list. The station will then respond either manually or automatically with a Probe Request as discussed below.



Probe Requests and Probe Responses

Definition: *Probe Requests* and *Probe Responses* are used by a station and an AP to exchange communication parameters.

A station transmits a Probe Request to an AP when that station wishes access to the AP’s network. The Probe Request contains the AP’s SSID and the station’s SSID and the station’s communication capabilities.

How a station transmits a Probe Request depends upon whether it is configured for manual or automatic connects:

- A station, configured for **manual connects**, will display on its Wi-Fi screen the newly heard beacon SSID (s) as “Available Networks”. When the station user clicks the Connect Button for a particular SSID, the station will send out a Probe Request for that network.

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- A station, configured for **automatic connects**, and having one of the available networks in its Profile List from a past automatic connection, will automatically send out a Probe Request for that network. More on automatic connects later as this can be a dangerous security issue, especially in Wi-Fi hotspots. Hackers can use this feature to capture and control stations.

The AP responds with a Probe Response if it has been configured to allow that particular station network access. The Probe Response contains the AP's capabilities. **Security Note:** This is an important point where security measures can be implemented. More on this in Part 2 of this document.

Authentication Requests and Authentication Responses

Definition: *Authentication* is the process where the AP verifies and accepts or rejects a station's Probe Request.

The station responds to the AP's Probe Response with an Authentication Request listing the parameters it wishes to use based on its and the AP's capabilities. This includes speed, encryption (Open, WEP, WPA or WPA2) and the encryption key, if encryption is enabled.

If the station meets all the AP's requirements, the AP responds with an Authentication Response allowing the station to continue to the next step of the setup process. If the AP has been programmed to only allow certain station MAC addresses or SSIDs to gain network access, the AP will not authenticate the station. **Security Note:** A security feature called MAC Filtering can be implemented here. More on this in Part 2 of this document.

Association Requests and Association Responses

Definition: *Association* is the process where the AP and the station agree on the parameters to be used when the AP grants the station full access to its network.

The station now sends an Association Request confirming the parameters to be used.

The AP responds with the Association Response. The AP's DHCP assigns an IP address to the station and a gateway address to be used (usually that of the AP). Two way traffic can now begin **Security Note:** Security features called DHCP Disable and Static IP Addressing can be implemented here. More on this in Part 2 of this document.

Station's Beacon Process

In order to operate securely, one must understand the station's beaconing process. When the station's Wi-Fi is enabled it goes through two modes, the *active* scan mode and the *passive* scan mode:

- **Active scan mode** - When the station's Wi-Fi is turned on it immediately begins to transmit Probe Requests on each Wi-Fi channel for each network contained in its Profile List. If an AP returns a Probe Response, the station, if configured for **manual connects**, displays the network(s) in its "Network Availability" list. If the station is configured for **automatic connects**, it begins the Wi-Fi automatic setup process described above. **Security Note:** This is an important area where security measures can be implemented. More on automatic connects later as this can be a dangerous security issue, especially in Wi-Fi hotspots. Hackers use this feature to capture and control stations.
- **Passive scan mode** - If there are no responses in the active scan mode, the station scans each Wi-Fi channel listening for AP beacons. Any beacons heard will be displayed on the station's Wi-Fi screen as "Available Networks". The station user then can manually initiate a connection to one of the networks.

Beacon security tips

One often hears that on a home network the AP should be configured not to beacon. If it doesn't beacon, then neighbors and hackers won't know that it is present. This isn't true for hackers and certain station Wi-Fi applications.

Hackers can transmit **Broadcast** Probe Requests that will cause most non beaconing APs to return a Probe Response. Also, some stations will transmit a **Broadcast** Probe Request in the active scan mode that will cause an AP to respond with a Probe Response. Disabling AP broadcasts is a good idea but don't hang your hat on being protected when doing this.

Stations also continue active and passive scanning while connected to a network. The reason is for roaming. Should the station lose contact with a network, if configured for automatic connects, the station will establish a connection to another available network if that network is in the station's Profile List and set for automatic connects. Usually, the station user will not be aware of the switch. Hackers can take advantage of this issue as will be discussed later.

Part 2 of this document will discuss properly configuring and monitoring a home Wi-Fi network for maximum security.

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W9UW RESUSCITATES W0TX-7

Last month the Kenwood TS-430, which is on the HF side of the DRC two meter to twenty meter packet gateway, failed. This failure left a big hole in the NET105 twenty meter packet network (Reference QST, Sept 2010). The DRC received quite a few emails asking what had happened to the station as it was sorely missed by NET105 operators.

Ron, W9UW, took the TS-430 home and began performing "brain surgery". He discovered a blown 5 volt regulator. Ron replaced the regulator and the TS-430 came to life. After running it on line for a couple of days to insure it was stable, he announced it "fit for duty".

On September 12 Ron and Bill, W6OAV, met at Station 4 and put the TS-430 back on line. W0TX-7 is working well again. Thank you Ron, for your hard work in resuscitating gateway.



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TWO DRC HAMS WORK THE WORLD WITH VIRTUALLY NO SIGNAL

By Bill – W6OAV

One mission of the Roundtable is to publicize interesting activities involving DRC members. This article features two DRC members, Mark, W0QL, and Doug, N4ATA. Both are doing some amazing things on HF. They are working the world using extremely low power, often so low that their signals can't be heard in the noise. How are they doing it? They're using a new digital mode called JT65.

SO, what is JT65? JT65 is a digital mode that was originally designed to provide two way signal reports via the very weak signal paths of Moon Bounce and Troposcatter. This mode works better in the noise than CW by about 10 dB. It wasn't long before hams discovered JT65's fantastic weak signal capabilities on HF.

JT65, besides providing two way extremely weak signal communications, offers several exciting features.

A JT65 user, accessing a special web site (pskreporter.info/pskmap.html), can see not only what stations around the world are hearing him but he can also see his antenna's radiation pattern and its skip zones.



Let's take a look at these features as demonstrated by W0QL. Mark transmitted several JT65 CQs at 0.7 watts using a Hamstick ground plane on 20 meters. (Conditions were very marginal at the time due to solar flares).

Rcvr	Band	Mode	Distance	Time (UTC)
KJ7A	20m	JT65	788 miles	22:17:00
KF7QGD	20m	JT65	545 miles	22:15:00
AA5FR	20m	JT65	1198 miles	22:15:00
KI4CBF	20m	JT65	1315 miles	22:13:52
N2JDQ	20m	JT65	1423 miles	22:13:50
VE3ODZ	20m	JT65	1336 miles	22:11:55
KJ3L	20m	JT65	1300 miles	22:11:49
W6COZ/4	20m	JT65	1525 miles	22:09:58
VE3DV	20m	JT65	1310 miles	22:09:54
KC2QII	20m	JT65	1448 miles	22:09:49
K6AHQ	20m	JT65	804 miles	22:08:16
K6CLS	20m	JT65	995 miles	22:07:51
N3CAL	20m	JT65	1520 miles	22:07:49
WB3GRC	20m	JT65	1196 miles	22:07:46
K6RF	20m	JT65	876 miles	22:04:53
KI4UMX	20m	JT65	1328 miles	22:02:51

Then, consulting the pskreporter web site, Mark read the list of stations that heard his CQs (Left), the antenna's radiation pattern (Below) and the skip zones. (Bottom).



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Doug has exchanged signal reports all over the world running 20 watts into a Hamstick dipole 20' high. The log below shows one of his contacts. Without going into a lot of details, the partial log shows an exchange between N4ATA and HS1NIV in Thailand. Explanations are given in the right column.

DATE	UTC	FREQ	dB	FROM N4ATA	TO N4ATA	EXPLANATION
4/19/11	15:28	14076000	-14		CQ HS1NIV NK98	N4ATA hears HS1NIV calling CQ.
4/19/11	15:29	-	-	HS1NIV N4ATA DM79		N4ATA answers with Grid DM79
4/19/11	15:30	14076000	-15		N4ATA HS1NIV -22	HS1NIV sends N4ATA's RX level: -22 dB
4/19/11	15:31	-	-	HS1NIV N4ATA R-14		N4ATA sends HS1NIV's RX level: -14 dB
4/19/11	15:32	14076000	-16		N4ATA HS1NIV RRR	HS1NIV sends RRR (short for Roger)
4/19/11	15:33	-	-	HS1NIV N4ATA 73		N4ATA sends 73
4/19/11	15:34	14076000	-17		50W 3EL TU 73	HS1NIV sends station info & 73
4/19/11	15:35	-	-	HS1NIV N4ATA 73		N4ATA sends 73

To learn more about JT65 go to the following web sites:

- <http://iz4czl.ucoz.com/it65-hf-setup.pdf>
- <http://physics.princeton.edu/pulsar/K1JT/>
- <http://hfink.com/jt65/>
- <http://www.arri.org/files/file/18JT65.pdf>

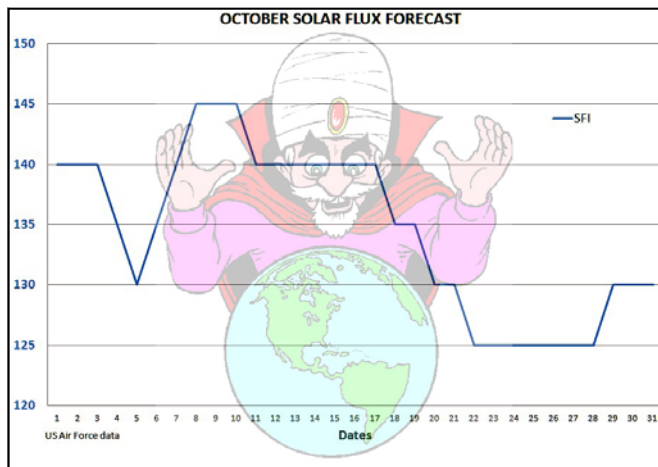
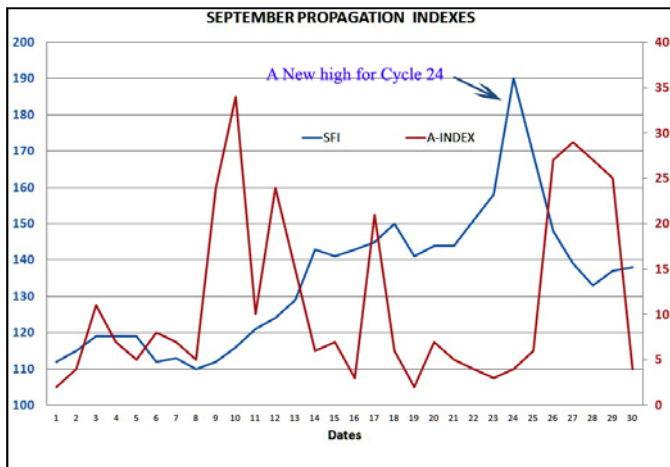
PAST & FUTURE PROPAGATION CONDITIONS

By Bill – W6OAV

This article provides two charts: the propagation conditions for last month and a forecast of next month's propagation conditions.

USING THE PROPAGATION INDEX CHART

Note two things on the chart: the trend of the SFI and A indexes and the date of largest SFI peak. The trend of the SFI shows the progress of the solar cycle during the past month. The SFI peak allows the rough forecasting of the reoccurrence of SFI peak in the next month. In order to "forecast" the next SFI peak, note the date when the SFI peak occurred and project out to about 28 days. Due to the sun's 28 day rotation, the SFI peak will often reoccur in about 28 days. The reason is because the sun spots causing the SFI peak move with the sun's rotation and face the earth every 28 days. This 28 day repetition will become more pronounced as the solar cycle improves. Refer to the September 2010 *Roundtable* for more complete information on the "SFI" and "A" indexes.



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UP COMING EVENTS


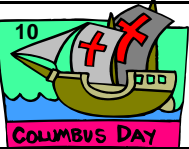




NAØTC – 285 TechConnect Radio Club 2011 Fall TechFest November 5, 2011

The 285 TechConnect Radio Club (NAØTC) is pleased to announce its 4th annual Fall TechFest on Saturday, November 5, 2011:

TOPICS
Amateur Digital TV – Dr. Glenn Adams, NØGNR
DX-pedition : Zimbabwe – Roger Krautkremer, KØYY
VHF Contesting – Bob Witte, KØNR
SDRs as Panadapters – Frank Ivan, KØFEI
Antenna Tuners - Larry Benko, WØQE

As in the past three TechFests, you can plan on meeting and talking with other hams along with learning about something about ham radio! The 285 TechConnect Radio Club won the ARRL Colorado Section Awards Technical Service Award for 2010.

Information is available on our website www.na0tc.org. Please pre-register by e-mail - k0nnc@arri.net. Payment (\$10) will be due at the door. As space is limited, please register early. Questions can also be directed to k0nnc@arri.net.

OCTOBER 2011							<i>DRC Net Sunday 8:30pm Local</i>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
						1	
2	3	4 	5 Learning Net 7:30pm	6	7	8	
9	10  COLUMBUS DAY	11	12 Learning Net 7:30pm 	13	14	15	
16	17 ARRL School Club Roundup Begins	18	19 DRC Meeting Elmer 6:30pm General 7:30pm	20 	21 ARRL School Club Roundup Ends	22 ARRL Int'l EME Competition Round 1 Begins 0000 UTC	
23/30 ARRL Int'l EME Competition Round 1 Ends 2359 UTC	24/31 	25	26 Learning Net 7:30pm 	27	28	29	

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Salvation Army Liaison	KB0BZZ	Bob Zimprich	303-400-3400	bobzz@comcast.net

DRC REPEATERS

BAND	Freq / Shift / PL Tone	Additional Information
6m	53.090mHz (-1mHz)	
Packet	145.05mHz<>14.105mHz	
2m	145.490mHz (-) 100Hz PL	Linked to the 70cm - 448.625mHz machine.
2m	147.330mHz (-) 100Hz PL	Local Area, Members Auto-Patch Does Not TX a PL!
2m	147.330mHz (-) 131.8Hz PL	NE Area Remote Does Not TX a PL!
1.25m	224.380mHz (-) 100Hz PL	
70cm	448.625mHz (-) 100Hz PL	Linked to the 2m - 145.490mHz machine.
70cm	449.350mHz (-) 100Hz PL	Wide area coverage with Echolink Node # 4140.

EDITOR'S NOTE

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DRC members - this is your newsletter. If there is something which is club or amateur radio related that you'd like to see as a regular feature, email suggestions to the editor. Members are the heart and sole of The Denver Radio Club, if you have an expertise or an interest in a particular segment of ham radio that you'd like to write about, you may email your submissions to AG0S@arrl.net. Submission deadline is the 25th of the Month. **Editor**