Good WX for Field Day Fun

Field Day 2016 dawned sunny and hot. Set up began on June 25th at noon, with the erection of a 250 ft. loop multi-band antenna. Operation of K8TIH began at 1400. Several other operations swung into action at the same time, including W8AN, NM8W and KE8CVA, who was also operating under the Club call. W8AN operated CW using a vertical, while NM8W ran a QRP rig to a dipole antenna. The KE8CVA operation utilized a multi-band trap dipole.

At 1730 or so, the burgers, pulled pork and brats were grilled and everyone dug in to a fine pot-luck meal. Approximately 25 people attended.

For the first time in many years, several operators stayed and operated overnight. Over 700 QSOs were made. Thanks to all who made this fun event possible. ∎

Digital Communications in Amateur Radio III

by Jeff Kopcak, K8JTK

My favorite digital mode has to be the "JTs" otherwise known as JT65 and JT9. Many have equated them to watching paint dry. Others call it the musical mode. I call it my ADD mode. Whatever you call 'em, JT65 has become one of the most popular digital modes, second only to PSK. I call it my ADD mode because I can browse the web, watch TV, or write this article during the 7-minute exchange. But you'd better pay attention because it can still keep you on your toes!

JT65 and JT9 began with Nobel Prize Winner, Dr. Joe Taylor – K1JT. One of Dr. Taylor's passions was weak signal communications and moon bounce (EME). A signal is sent toward the moon at about 1.5

NET CHECK INS

Jun 28   Traffic: 0
- N1RB   (NCS)
- W8PSK
- WD8JWJ
- WD8LEI
- KD8NJW
- K8JU
- KD8RNO
- WB8NQW
- KD8VWU
- KD8ZYJ
- K8OVO
- KE8CVA
- KD8WZK/P
- N8YAE   (14)

Jul 5   Traffic: 1
- KD8VWU   (NCS)
- N8VNT
- KC8EKT
- KD8RNO
- KD8NJW
- N1RB
- WB8NQW
- NM8W
- WD8JWJ
- KE8CVA
- K8JU
- N8YAE   (12)

Jul 12   Traffic: 0
- KD8NJW   (NCS)
- WD8LEI
- WB8NQW
- K8OVO
- KG8FH

BRAIN TEASERS

1. What is the half-power bandwidth of a parallel resonant circuit that has a resonant frequency of 7.1 MHz and a Q of 150?

   a.) 211 kHz

   b.) 16.5 kHz

   c.) 47.3 kHz

   d.) 21.1 kHz

2. Why is an RF attenuator desirable in a receiver used for direction finding?

   a.) it narrows the bandwidth of the received signal

   b.) it eliminates the effects of isotropic radiation

   c.) it reduces loss of received signals caused by antenna pattern nulls

   d.) it prevents receiver overload from extremely strong signals

3. What system matches an unbalanced feed line to an antenna by feeding the driven element both at the center and at a fraction of a wavelength to one side of the center?

   a.) gamma match

   b.) delta match

   c.) omega match

   d.) stub match

August Contests

The contest lineup for the month of August is given below. Please note that the WARC bands (60, 30, 17 and 12 m) are <u>never</u> open to contest-ing.

Aug 6-7	*1800 to 0559 Z*	160 m to 10 m
North American QSO Party		**CW**
Aug 13-14	*0000 to 2359 Z*	80 m to 10 m
WA(Europe) DX 'test		**CW**
Aug 13-14	*1600 to 2359 Z*	160 m to 10 m
Maryland-DC QSO Party		**all modes**
Aug 20-21	*0800 to 0800 Z*	160 m to 10 m
Russian District 'test		**CW-SSB**
Aug 20-21	*1800 to 0559 Z*	160 m to 10 m
North American QSO Party		**SSB**
Aug 21	*1800 to 2359 Z*	80 m to 6 m
ARRL Rookie Roundup		**RTTY**
Aug 27-29	*0400 to 0400 Z*	160 m to 10 m
Hawaii QSO Party		**all modes**
Aug 27-28	*1200 to 0300 Z*	160 m to 6 m
W/VE Islands QSO Party		**all modes**
Aug 27-28	*1200 to 1200 Z*	80 m to 10 m
YO (Romania) DX 'test		**CW-SSB**
Aug 27-28	*11200 to 1200 Z*	160 m to 6 m
Keyman's Club (JA) 'test		**CW**
Aug 27-28	*1400 to 2000 Z*	80 m to 6 m
Kansas QSO Party		**all modes**
Aug 27-28	*1600 to 0400 Z*	80 m to 10 m
Ohio QSO Party		**all modes**

kW on VHF using large directional antenna arrays. The signal is reflected off the moon and received by an equally powerful station with large arrays. After the signal makes the 500,000 mile round trip, there isn't much left. CW was the only effective mode. In 2001, K1JT came up with JT65, which allowed hams to make Earth-Moon-Earth contacts with 150 W and 11-element beam antennas. Still not exactly easy but it made EME a possibility for many more hams. Years later, it was discovered that JT65 works great on the HF bands too. It allows stations to make contacts without high power or gain antennas. This is perfect for hams who cannot have large or visible antennas. Over time, JT9 was added specifically for the LF, MF, and HF bands ("Work the World with JT65 and JT9").

It's not my intention to dive into the technicals of any mode, but to give hams practical operating information. When talking about JT65 almost all information applies to JT9 as well. Both are highly time-synchronized. The computer's clock must be as accurate as possible and within 2 seconds of other stations. One minute transmit and receive sequences are utilized. Transmitting happens within a one-minute window, then the roles are reversed for the following minute. Stations begin transmitting 1 second after the beginning of the minute and stop 47.7 seconds later. In the remaining 11.3 seconds, applications decode received signals, display them on screen, and receiving stations get their message ready to transmit. The total exchange takes about 7 minutes, more if the message is lost or not decoded. Being such a robust protocol doesn't leave room for long messages, meaning it's not a conversational mode. The maximum message length is 13 characters with the intent of limiting the exchange to call signs and signal reports. Below is an actual exchange. The first column is the time, second is the exchange, third is the exchange translation. Exchange begins at 01:00 UTC and completes at 01:07. In messages with two call signs, the receiving station is to the left and the transmitting station to the right.

0100   CQ K8JTK EN91
I'm calling CQ from grid square EN91.

0101   K8JTK K5ND EM12
K5ND is returning my CQ from grid square EM12.

0102   K5ND K8JTK -01
I reply to K5ND with his signal report of -1 db (RST Sent).

0103   K8JTK K5ND R-05
K5ND responds with my signal report of -5 db (RST "R"eceived).

0104   K5ND K8JTK RRR
I respond with "roger-roger-roger."

0105   K8JTK K5ND 73
K5ND responds with best wishes.

0106   K5ND K8JTK 73

4

WCARC Weekly Net

Tuesdays at 2100 all year
147.18 MHz 67 Hz PL

Net Control Roster

Jul	26	K8OVO
Aug	2	WB8NQW
Aug	9	N1RB
Aug	16	KD8VWU
Aug	23	KD8NJW
Aug	30	NM8W
Sep	6	W8PSK

NEXT MEETING

Business Meeting

Monday, Aug. 8th
TIME: 7:30 pm/EB 7:00
PLACE:
Sheriff's Training Room
E. Gypsy Lane
& Dunbridge Rds.
Bowling Green, OH

---

digital---from p.4

I respond with best wishes.

Differences between JT65 & JT9 are bandwidth and signal reports. JT65 takes up just under 180 Hz and about 16 Hz for JT9. JT9 is much better for spectrum efficiency and uses less power due to narrower bandwidth. The JT65 subband can often be seen with multiple overlapping signals and they usually decode correctly. JT9 can have ten-times the signals but decoding of overlapping signals is much less likely to happen. Signal reports range from -1 to -30 dB signal-to-noise in JT65. The lowest I've seen is -27. They are capped at a -1 dB upper limit to keep somewhat consistent with EME re-

ports. JT9 is extended to give more accurate signal reports with a range from -50 to +49 dB. The limits I've seen are -27 and +15. Propagation is comparable between the two modes. JT65 is the overwhelming favorite of operators.

JT65 & JT9 have their own subbands. Below is a listing of those frequencies. JT9 is typically 2 kHz above the JT65 frequency. USB is the mode regardless of band.

Software is available on all major platforms. Ham Radio Deluxe is expected to include JT65 in the very near future.

Windows:

JT65-HF
(http://jt65-hf.sourceforge.net/). It's very reliable and I've only no-

digital---from p.5

ticed one issue where free hand text doesn't always transmit. This is the old standard but no longer in development. JT65-HF-HB9HQX-Edition (http://jt65hfhb9hqxedi.sourceforge.net/). This is the replacement for the above. It's built on the same code-base so look and feel are similar. The developer has implemented many new useful features. I recommend using this one for newcomers.

WSJT-X application showing K8JTK in QSO with XE1SAX

JT65	JT9
1838	1840
3576	3578
7076	7078
14076	14078
10138	10140
18102	18104
21076	21078
24917	24919
28076	28078
50276	50278

Windows/Mac/Linux:

WSJT-X Software released by K1JT. This seems to give the most accurate signal reports. It's the only program that currently implements JT9. WSJT-X is the program that I use. Application setup is fairly straight forward. In the setup, enter your call sign and grid square.
(http://physics.princeton.edu/pulsar/k1jt/wsjtx.html)

If you don't know your grid square, check QRZ or enter your address on: http://www.levinecentral.com/ham/grid_square.php. Choose the correct sound input/output devices. Configure Rig Control/PTT if needed. Rig Control is not required but helpful when using the internal logging methods.

Before starting any of the applications, ALWAYS sync your computer's clock with the Internet. In Windows, go to the Control Panel, Date and Time, Internet Time tab, Change settings, click Update now. Most Linux distributions need to invoke 'ntpdate.' One feature of the HB9HQX version is automatic time syncing every 15 minutes.

All programs have the same general layout and operate in the same manner. They have a waterfall showing signals received and display markers indicating active transmit and receive windows. These can be moved by clicking on the waterfall. Conversational buttons and boxes are often labeled **Calling CQ** and **Answering CQ**. These buttons automatically generate text during the conversation (following the standard exchange format). **Free Text/Message** is for free hand text. Other buttons will enable and disable transmitting. **Halt** will interrupt the transmission midway through. **Even/odd** indicates which minute you will transmit (only applies to calling CQ). It has no effect when answering a CQ because the software will transmit in the next minute.

The Signal Decoding window is the most important because this is where all conversation exchanges are displayed. A couple labels are seen: **UTC** – time the signal was decoded, **Sync** – measurement of the sync signal -- higher the better, **DT** – time difference between decoded station and yours -- should be less than 2 seconds, **DF** – frequency de-

viation above or below the center point in Hz, and finally the **Exchange** or **Message** text. Colors are frequently used to distinguish items of importance. Green is a station calling CQ, red is a message/exchange intended for your station (contains your call sign), gray is exchanges between other stations. Luckily the software takes care of much of the exchange. It generates response messages by double-clicking a received line. Stations that don't follow the standard format can easily confuse the software. This is where it will keep you on your toes. If you're not careful you can end up sending a message twice or not properly advancing to the next message in the exchange. The software does not automatically advance the conversation for you. If things go off the rails, use the appropriate conversational button to get things back on track.

The **Free Text** field can be used for noting your power, antenna, or sending holiday greetings. These messages are often in place of the 73's and will not show up in red because no call signs are included. You may see "30W DPL" (I'm running 30 watts into a dipole antenna), "50W LOOP" (I'm running 50 watts into a loop antenna), "THX 4 NM" (we've worked before, thanks for the contact using a new mode from previous contacts), "THX 4NB" (we've worked before, thanks for the contact on a new band), "SRY/SRI NO DECODE" (I see a signal on the waterfall but it did not decode) you'll see this one but it's not commonly used, "MERRY XMAS" --you get the idea. It's only 13 characters. Be careful not to baffle the user and you have to be quick. There are some I've received that I still have no idea what they mean.

In the JT's it's ether a clean decode or nothing at all. No in-between. When I see a signal on the waterfall and the message doesn't decode, I always send my last message again. Some stations will not transmit in the following minute. Other stations (wrongly) move on in the conversation. Then I have to use free hand text to send "SIG RPT?" or similarly because I didn't receive my signal report. At minimum, I make sure RSTs (reliability – strength – tone) have been exchanged and won't log the contact until "RRR" has been sent/received. Some QSLs I received go as far to log the DF frequency. I've only logged the center frequency.

After you feel comfortable monitoring activity, double-click a green "CQ." The **Generated Text** field will update with your call sign, their call sign, and your grid square. You're off! Also, refer back to article two for station/DSP/audio setup. I've seen some of the worst over modulated signals on JT65. JT us-

ers are really good about uploading spots to PSK Reporter (https://www.pskreporter.info/pskmap.html).

You can use it as a 'reverse beacon' network to see where your signal is propagating. It's a lot to take in but an extremely fun mode to work. Find out more information:

Web Sites of Interest:

Amateur Logic.TV on JT65:

 https://youtu.be/L7e5NbqhbVU?t=28m10s

QST article:

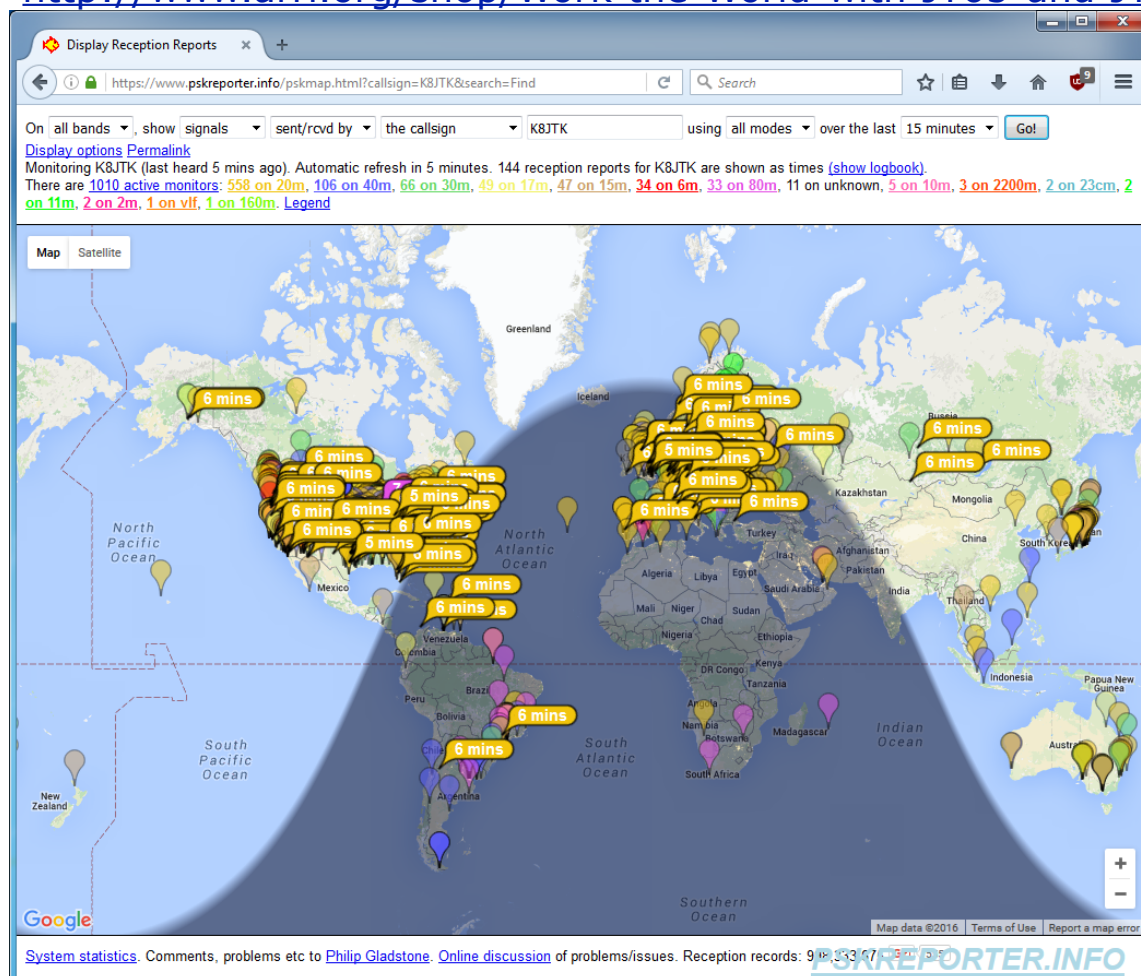http://www.arrl.org/files/file/Get%20on%20the%20Air%20with%20HF%20Digital/FORD%20JT.pdf

PowerPoint introduction:

http://www.arrl.org/files/file/Get%20on%20the%20Air%20with%20HF%20Digital/Getting%20Started%20with%20JT65%20on%20the%20HF%20Bands.pps

"Work the World with JT65 and JT9" book:

 http://www.arrl.org/shop/Work-the-World-with-JT65-and-JT9/

PSK Reporter application showing received stations worldwide

August 13 Land of Lakes ARC.   Annual Hamfest.   Cary Boy Scout Camp, Angola, IN.
web: http://w9reg.org

Amateur Electronic Supply Closing after 59 Years

from ARRL Letter

Amateur Electronic Supply (AES) will close its doors at the end of July after 59 years in business. No reason has been given for the decision to close the business. AES has been a premier player among Amateur Radio equipment retailers for decades, as well as a major presence at Dayton Hamvention® and other events. Various media outlets were informed of the closing in a brief e-mail message on July 6, but word of the closing has not yet appeared on the retailer's website or Facebook page.

"It's with great sadness that I have to tell you that Amateur Electronic Supply (AES) will cease operations at the end of this month," AES National Sales Manager Tom Pachner, W9TJP, said in an e-mail. An employee at the Milwaukee headquarters store, who did not wish to be identified, confirmed that the message was legitimate. It's believed that the AES staff was notified before the July 4th holiday weekend. In addition to the Milwaukee store, AES operates outlets in Cleveland (Wickliffe), Las Vegas, and Orlando.

Fond-du-Lac, Wisconsin, native Terry Sterman, W9DIA (SK), founded AES in 1957 when he was just 18, after getting into the radio-TV business by working in his father's TV and electronics parts store. On January 1, 1998, ownership of AES shifted to Amateur Electronic Supply LLC, headed by Phil Majerus, a prominent Wisconsin businessman. Sterman died the following year at the age of 60, after a period of ill health.

For many years, the public face of AES was its Executive Vice President Ray Grenier, K9KHW, who oversaw marketing and advertising for the retailer from 1964 until his retirement in 2013. Grenier nearly singlehandedly produced the famous AES catalog, as well as magazine ads. For about 20 years, he also organized the well-received AES Superfest, a promotional effort begun in 1995 that grew into a hamfest. In April, the AES Superfest hosted the 2016 ARRL Wisconsin Section Convention.   ∎

New Hams Licensed

The most recent Technician level class that was held at the BiG FabLab was completed after about eight weeks of study. Bob Willman, WB8NQW, was the instructor.

As usual, the exercise was completed with VE exams that were held on July 19th. We are happy to report that as a result, there are two new Technician Class hams: Eban Magrum, KE8EUD, (first harmonic of NM8W), and David Jenkins, KE8EUC, of Perrysburg. At this writing their calls are not yet known.

Two others were successful in upgrading from Technician Class to General Class: Terry Halliwill, KE8CVA, and Jeremy Hopkins, KC8GWH, of Toledo.   The VE team included Jim Duggan, KD8CIJ, Bruce Hammond, AA8HS, Linda Boughton, N1LB, and Bob Boughton, N1RB. According to Club bylaws, each of the successful candidates will receive one year's free membership in WCARC. Our heartiest congratulations to all the new licensees! ∎

Amateur 47 GHz Allocation Avoids 5G Juggernaut

from ARRL Letter

There's good news regarding the future of Amateur Radio's primary allocation at 47 GHz in the US. Still a test bed for point-to-point propagation experimentation by dedicated enthusiasts, the 47-47.2 GHz band is among those under consideration at the next World Radiocommunication Conference in 2019 (WRC-19) to accommodate so-called 5G wireless broadband devices. Early this year, some FCC commissioners indicated they would include bands on the WRC-19 agenda in the Commission's "Spectrum Frontiers" 5G initiative. As the Commission put it this week as it made nearly 11 gigahertz of spectrum above 24.25 GHz available for licensed, unlicensed, and shared use: "High-band millimeter wave spectrum is key to unlocking the potential for 5G." The FCC's Spectrum Frontiers included several of the bands set for consideration at WRC-19, but *not* the 47 GHz band -- although it did target 47.2-50.2 GHz. ∎

2016 WCARC MEMBERSHIP ROSTER.rev1

	NAME		CALL	CLASS	ADDRESS			
1	Bob-Linda	Boughton	N1RB-N1LB	E/E	930 Champagne Ave.	Bowling Green	OH	43402
2	Jim	Barnhouse	KD8NJW	G	1919 Hamilton Dr.	Perrysburg	OH	43551
3	Wilkins	Bill	WD8JWJ	E	11065 Linwood Rd.	Bowling Green	OH	43402
4	Adam	Crammond	KE8DNU	G	34 W. Gramercy	Toledo	OH	43612
5	Jim	Davis	K8JU	E	10990 Newton Rd.	Bowling Green	OH	43402
6	James	Elliott	KE8CUZ	G	P. O. Box 1455	Bowling Green	OH	43402
7	Lou	Graue	K8TT	E	1501 Blue Lake Circle	Punta Gorda	FL	33983
8	John S.	Gruber	N8MSU	E	920 Melrose	Bowling Green	OH	43402
9	Terry	Halliwill	KE8CVA	T	13944 Defiance Pike	Rudolph	OH	43462
10	Larry-Ruth	Hasselman	N8VNT-KC8EKT	T/T	8656 Kramer Rd.	Bowling Green	OH	43402
11	Gibson	Hoot	WB8VUL	A	144 Stonegate Blvd.	Bowling Green	OH	43402
12	Greg	Huber	KE8CUX	T	654 Peregrine Dr.	Northwood	OH	43619
13	Bob	Johnson	K3RC	E	P.O. Box 248	Stony Ridge	OH	43463
14	Stan	Klakamp	K8LL	E	415 1/2 N Prospect St	Bowling Green	OH	43402
15	Rex	Klopfenstein	KC8PFP	E	605 S. Main St.	Bowling Green	OH	43402
16	Jeff	Kopcak	K8JTK	E	1497 Canterbury Rd.	Westlake	OH	44145-2440
17	Tom-Gerri	Kopcak	N8ETP-N8GTK	E/T	1497 Canterbury Rd.	Westlake	OH	44145
18	Craig	Magrum	NM8W	E	1100 Christopher St.	Bowling Green	OH	43402
19	Steve	McEwen	K8BBK	E	1053 Pinewood Ct.	Bowling Green	OH	43402
20	Edwin	Nagle	KE8DYA	T	16149 Normandy Rd. S.	Perrysburg	OH	43551
21	Loren	Phillips	W8PSK	E	324 S. Grove St.	Bowling Green	OH	43402
22	Daniel	Pingle	KE8DXZ	T	16826 Hodgman Rd.	Weston	OH	43569
23	Leanna	Shaberly	KB8RT	A	18077 Tuller Rd.	Bowling Green	OH	43402
24	George	Stossel	W8GGS	G	19758 Sand Ridge Rd.	Weston	OH	43569
25	Roger	Swinney	W8CNJ	G	27484 Oregon Rd. #271	Perrysburg	OH	43551
26	Thomas	Tingley	KE8CUY	T	7402 West Lake Rd.	Perrysburg	OH	43551
27	Jerry	Wicks	K7JWW	G	864 Scott Blvd.	Bowling Green	OH	43402
28	Bob	Willman	WB8NQW	E	14118 Bishop Rd.	Bowling Green	OH	43402
29	Eric	Willman	WD8LEI	T	545 W. Poe Rd.	Bowling Green	OH	43402
30	Lynn	Wineland	KD8RNO	T	23 Trafalgar Bend	Bowling Green	OH	43402

WOOD COUNTY ARC
P.O.BOX 534
BOWLING GREEN, OH
43402