

WRTC 2014 Station Test Report

Before any big public performance, the director always calls for a dress rehearsal — a last chance to make sure everything works, the actors know their lines, and the stagehands have the right sets in place.

Much like the Olympics or World Cup, the World Radiosport Team Championship (WRTC) only occurs every 4 years. Competing teams travel from around the world seeking one thing — a level playing field that removes the geographical and station disparities that typically play so large a role in winning and losing in contesting. Next July 59 teams, each with two very serious competitors, will be expecting a shot at the gold.

Fifty-nine teams doesn't sound like a big deal. If we were playing chess or tidlywinks, it wouldn't be. But WRTC requires 59 complete station kits, each with a tower, antennas, coax, tent, tables, toilet, generator, food. The list goes on. The logistics can be mindboggling, especially when

you consider that the 59 locations are on farms, in public fields, in parks, and even at an airport. The sites are available only for a few days around the competition, so the stations need to be assembled and tested all within about 36 hours!

Given such a high-stakes performance, the director of WRTC-2014 called for a large scale dress rehearsal. The goals of the 2013 Station Test were to

- Expand the pool of experienced teams for station set up.
- Evaluate proposed site locations for radio quietness and equality.
- Confirm logistics and procedures to set up and tear down a large number of stations.
- Gather log data under competition

conditions to share with WRTC 2014 competitors.

The plan was to assemble stations on 25 planned WRTC sites and have them on the air for the full contest period. This would test equipment distribution, assembly times, team skills, and site suitability, and it would let the property owners evaluate us with respect to following their rules.

Setup

The morning of Friday, July 12, dawned clear, sunny, and cool. It was a relief to see seasonable temperatures that were almost 30° cooler than those experienced in 2012. Teams loaded up their station and antenna kits from two distribution centers — one near Nashua, New Hampshire,



Figure 1 — The operating site of K1BG [K1BG photo]

and the other in Milford, Massachusetts. Steve, KB1ST, and Joe, KM1P, managed the Nashua site, while Dennis, W1UE, coordinated Milford.

Assembly teams were divided into Beam Teams and Site Teams. The Beam Teams were groups of 5 or 6 people who had the job of assembling and raising the antennas. This consisted of a triband Yagi, two inverted Vs, rotator, and 40 foot tower. Everything was assembled on the ground and raised in one piece, using a falling-derrick method. This eliminated any need to climb the towers — an important safety consideration.

A Beam Team was expected to assemble anywhere from two to four systems. Part of the test was to evaluate if this assembly rate was possible. In some cases, it was. In those where it was not, the value of having full teams of volunteers was reinforced. Yes, it really does take six people working in a coordinated fashion to get an antenna system unpacked, assembled, and installed in about 2½ to 3 hours. This was dramatically better than the 4 or 5 hours needed in 2012.

Site Teams had the responsibility for setting up tents and generators. They also stayed with each station for the duration of the event to provide logistical support to the operators and field questions from occasional curious passersby.

With oversight from the Site Teams, the Operating Teams could focus on driving the stations. Many of the operating groups took a relaxed attitude. They had more than two operators, used packet, and generally had a fun time enjoying radio. Other teams were playing the game in full competition mode and according to the WRTC-2014 rules. Regardless of intensity, all operating teams provided valuable data to gauge the relative equivalence of the sites.

In the months leading up to the test, a call went out for operating teams that wanted to try the “WRTC experience.” Visiting operators from outside the area included K9ES and AD4ES from Florida, VA2WA and VE2TZZ from Quebec, N2MG from Western New York, K3ZJ from West Virginia, and Frankford Radio Club members AA3K, K3FT, W13Y, N3AD, W1GD, N2MM, N2NT, and N2NC from the Middle Atlantic States. Having these visiting ops on hand freed up more volunteers to help with setup.

Of course, there was nothing that said you couldn't try to do it all. Dennis, W1UE, served as the Dispatch Manager at the Milford warehouse. He then joined Greg, W1KM, to help the Beam Teams set up four stations at Myles Standish State Park. Greg and Dennis then teamed up and did a very serious effort in the contest.

The Contest

The contest began at 1200 UTC Saturday. With some last-minute heroics, the final stations were all assembled and on the air within a few minutes of the start time. We learned a few lessons about site management, team deployment, and the need for checklists (*lots* more checklists).

The weather was fantastic, but conditions were not. Summertime conditions are difficult. Sporadic E can make close-in signals loud, but there is lots of absorption. This made it difficult for the WRTC stations with 100 W to break through the loud E-skip contacts being made within Europe. The first 6 hours of the contest were frustrating for the operators and will surely challenge the competitors next year.

By afternoon the bands started to lengthen out, and it became possible for the test stations to work into Europe on 15 and 20 meters. At about the same time a line of showers started to move through the area. The tents all did their job, and the Honda generators worked flawlessly. The rain was heavy at times but did not cause any failures or loss of operating time. Thankfully there was no lightning. Another successful test of the sites and equipment!

Early evening conditions continued to be good. Twenty meters was open to Europe, while 40 and 80 meters both produced DX contacts through European sunrise. After



Figure 2 — An example of the falling derrick method being used to raise the tower and antenna [AE1P photo]

Table 1 — Final Results 2013 WRTC Station Test

Call Sign	Score	QSOs	HQ	DX	Operators
W1UE	2,169,035	1959	157	192	W1UE, W1KM
N2NT	2,115,954	2032	150	192	N2NT, N2NC
AK1W	1,538,226	1708	125	166	VA2WA, VE2TZT
W1SJ	1,370,958	1929	99	147	W1SJ, K1LI
K1BG	1,308,528	1332	136	176	K1BG, NM1C, KB1YJI, NR1G
K1ZD	1,302,125	1528	121	154	K1ZZ, K1CC, K0TG
K6ND	1,228,568	1632	110	143	K3JO, K6ND, K1VR, NB1U, K6NDV
K1GQ	1,172,888	1449	121	150	K1GQ, W2RU, W2CS, K1AR, WA1Z
W1UJ	1,169,805	1406	129	144	KB1H, W1UJ, K1RAX, K1EBY, N1WK, K1ZE, NR1X, NB1U
N3AD	1,130,002	1536	109	142	N3AD, W1GD
KE1J	1,029,436	1399	100	144	KE1J, W1VE
K1RX*	1,010,786	1355	93	145	K1RX, W1CU
N1SV	982,146	1419	122	131	N1SV, KM1P, N2KW
AD1T	946,080	1459	86	130	AE1P, K1QX, K1ZO, N1KWF, W1WWW
W1EQ	918,537	1432	97	126	W1EQ, K1ZE, N3XF, K1RAX
NJ1F	911,212	1519	90	124	NJ1F, K1RQ, WC2L, K1EP, KB1W, WA1ZAM
K9ES	837,536	1323	103	121	K9ES, AD4ES, K1ST
NI1L	703,120	1079	101	119	NI1L, N2MG, K3ZJ
W1MA	671,008	1081	95	113	W1MA, N2MM
NB1N	653,045	1103	96	115	NB1N, K9HI, K1IB, N2JFS
WB1Z	617,874	1064	89	112	AA1YW, KK1W, W1EQO, W1MSW, W3SM, N1SR, NV1Q
AA3K	403,684	830	74	98	AA3K, K3FT, WI3Y
W1CLA*	294,038	639	67	91	K1MBO, K1VR, K5ZD, KB1REQ, N1QD
W1HH*	163,149	493	51	68	W1STT, WO1N, WC1M, KB1ST
N1JD*	134,691	328	68	71	N1JD, N1OXA

*Used one radio

about 0700 UTC activity got very slow until sunrise about 1000 UTC. There just aren't that many stations on the low bands in the US in the middle of the night in the summer. It is sure to be much more active next year, when everyone will be chasing prizes for working the WRTC-2014 stations on all bands and modes.

Stations outside W1 working test stations on the most band modes were WK5T (aka N2IC) with 132 and VY2ZM with 110. Uli, DJ2YA, was the top hunter from the DX side with 105 band modes.

Teardown

Sunday morning was another picture-perfect day. As the operating teams finished the contest at 1200 UTC, Site and Beam teams started disassembling and packing the gear. It is always amazing how fast a station can be dismantled, compared to assembly. Some teams had four stations to take down but were still done by noon. It was great to see the volunteer teams return to the warehouses full of excitement. Everyone had stories to share and thoughts on how things could be improved.

Results

At the end of the contest, each team was asked to put its log on a memory stick and return it to the warehouse. The logs were sent off to Tree, N6TR, for checking. Tree also had access to the IARU HF Contest logs as they came in. This provided plenty

of data for cross-checking. Tree has quite a bit of log-checking experience and was able to use tools he developed for WRTC-2006 in Brazil to quickly produce results. Another system successfully tested.

The race for the top spot was extremely close. This provides an indication of just how exciting the competition may be next year. The team of W1UE/W1KM finished just 2.5 percent ahead of N2NT/N2NC. The latter team had more contacts, but W1UE had more multipliers. With different points for local and DX contacts, competing operating teams will need to have a solid strategy for maximizing their score. Based on the conditions and scores, it will not be a surprise to see teams exceed 3000 contacts next summer.

Online Scoreboard

One goal for WRTC-2014 is to promote Amateur Radio and contesting to the public. Ham radio contesting is not a very visual sport, but if people could see the race unfolding in real time it would make the game more understandable. Dave, KM3T, and Bob, WA1Z, have taken on the job of creating a true real-time scoreboard that will show score updates within seconds as they happen.

All WRTC-2014 teams will log on computer using one of the four major logging software packages. With two complete stations, the computers will be networked for duping and scoring. Dave and Bob wanted

to create a way to capture scores from the network without requiring any changes to the logging software. The solution was a small Raspberry Pi computer that sniffs the network and captures the scores as they are sent between computers. A cellular wireless modem connects the Pi to the Internet and sends the score to the reporting website.

The station test was the first real-world use of the system, and it proved to be quite effective. Ten of the 25 stations were reporting their scores in real time. We discovered some sites where cellular signals weren't the best, but the small amounts of data did get through. The referees will be equipped to report scores by SMS if necessary. True real-time scoring should provide an exciting experience for friends, family, and spectators around the world.

Other Tests

The WRTC-2014 competitors are limited to 100 W. Even a referee will be at each station, there needs to be a way to easily confirm the power limit during the contest. WRTC-2014 will use a power monitor design adapted from WRTC-2010 in Moscow by K1EL. A box with three visible LEDs for each station connects to an RF detector at the output of each transmitter. A green light means less than 100 W. Yellow indicates 100-110 W, and red indicates power greater than 110 W. Dennis, W1UE, hand assembled the power monitors, and they

were used successfully at a number of the stations.

An important component of the station test was to verify the relative equivalence of the operating sites. K1CC has done extensive terrain modeling for the antennas on all bands for all locations. Some proposed sites were eliminated for being *too* good or *too* poor. The remaining sites are all within a narrow band of performance on the computer, but the goal was real-world confirmation. KM3T organized a group of SDR owners from around the world and asked them to install a special version of the VE3NEA *Skimmer* software. This recorded the signal level of every WRTC test station every time it sent its call sign. Thanks to DK9IP, DL2CC, EA4TX, GW8IZR, HB9DCO, N6TV, N7TR, OH6BG, S5ØARX, TF4M, and W3OA for their help as *Skimmer* sites.

Each WRTC station was given a “skimmer schedule” that required them to be on CW on a particular band with the antenna in a specified direction. This provided more than 122,000 data points to use for making apples-to-apples comparisons between stations. According to our preliminary results, all stations appear to be within the desired range. All of this work is being done to make sure that every WRTC-2014 competitor will have an equal chance to win.

Lessons Learned

We did it. We accomplished the goals of the station test. We increased the number of trained volunteers. We proved out important systems that were being used for the first time. We learned what it means to assemble so many stations safely in less than 24 hours. We also discovered some areas for improvement in hardware, logistics, team dynamics, and more.

The big realization is that we need more volunteers. Putting up that much hardware in a day takes people. It's very satisfying and fun to be part of something so big, but it is still work. The more people we have to help, the faster and easier it will go. We want to have all stations completely assembled and ready for the competitors by Friday afternoon.

Every volunteer that participated in the 2013 Station Test received a silver medal in appreciation of their efforts. This goes with the bronze medals awarded in 2012. Of course, that leaves only gold for WRTC-2014 volunteers.

WRTC-2014 is looking for volunteers for a number of different tasks. We offer a special invitation to anyone who can be available on Thursday and Friday, as well as for a few hours on Sunday morning, to help with station setup or competitor transportation. If you want to join the team, visit the volunteer page on the WRTC-2014



Figure 3 — Alan, N3AD, and Gerry, W1GD, were all smiles during their WRTC experience. [KM3T photo]

website, www.wrtc2014.org/volunteer/.

Financial contributions are also needed. Radio clubs, national societies, and individuals are encouraged to consider a Team Village sponsorship. Details are on the WRTC-2014 website too, www.wrtc2014.org/sponsors/team-village-

[sponsors/](http://www.wrtc2014.org/sponsors/). Donors will be recognized on the WRTC website and with a mention in the official WRTC program. The sponsor for the winning team will also receive a plaque in recognition of their contribution to the team's success.