NCJ

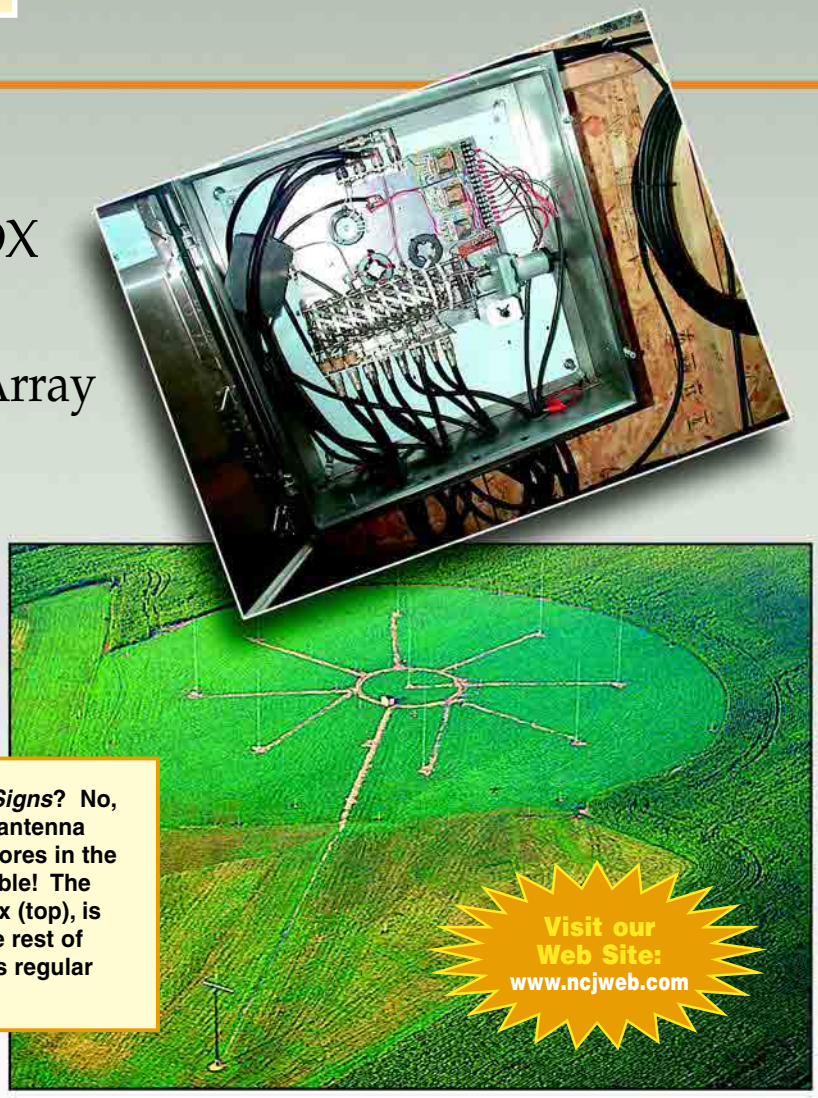
NATIONAL CONTEST JOURNAL

$4

March / April 2003

Volume 31 Number 2

- Station Profile: K9DX
- In Depth: K9DX's Monster 160 Meter Array
- A Contester Asks: Which 'MP?
- Results: October 2002 RTTY Sprint



Is it a crop circle out of the movie *Signs*? No, it's an aerial shot of the 160-meter antenna system at K9DX, whose claimed scores in the late 2002 160 contests are remarkable! The system, including the switching box (top), is described by the owner inside. The rest of K9DX's station is profiled in N5OT's regular column.

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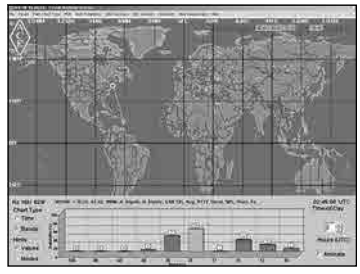

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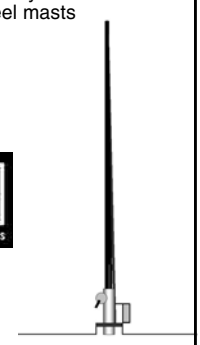

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Editorial

Carl Luetzelschwab, K9LA

RTTY Sprints

We inadvertently put the 2002 version of the Sprint Rules in the January/February issue, so check out the correct rules in this issue. You can tell they're the right ones because the events have 2003 dates!

Also note that Doug, W4OX, has assumed the responsibility of RTTY Sprint contest manager. I like the reason he gave when he volunteered to take over: "It's about time I gave something back to the hobby (and mode) that I care deeply about." Welcome aboard, Doug. And thanks to Jay, WS7I, for his tour of duty in that position.

Minnesota Wireless Association

I am pleased to have a great article in this issue by Al, K0AD, about the revitalization of the Minnesota Wireless Association in contesting activities. This article came out of one of the responses to the Op Ed piece by Ken, WM5R, in the November/December *NCJ*.

As a side note, I've known K0AD for a number of years. We first met on the air on December 9, 1961, when I was WN9AVT and he was K9DHN. He lived a couple miles away, and he was instrumental in getting me involved in traffic handling and Field Day.

Reflector Ramblings

Dave, NT1N, passed along a couple Yankee Clipper Contest Club reflector postings, and they're good knowledge for all to read. They, along with some other reflector postings, will be running periodically in *NCJ*. Thanks, Dave.

New Contesters

The February 2003 issue of *Sky & Telescope* had an interesting article about a guy who likes to set up a telescope at night on the sidewalk of a public place. His goal is not to convert those who pass by into astronomers. All he wants to do is expose them to astronomy and hopefully ignite a spark that will bring them back for more.

There's a parallel in contesting. Although it would be nice to have someone immediately jump into contesting after being exposed to it, it's probably more realistic to expect what our astronomer expects—that an exposure to contesting will generate an interest later on to pursue it further.

This Month on the Cover

No, it's not one of those mysterious crop circles. It's K9DX's implementation of W0UN's 9-element circular 160m array. Read about it elsewhere in this issue. NCJ

Building Contesting Enthusiasm: Revitalizing the MWA

Alan Dewey, K0AD
aldewey@aol.com

Ideas for Re-invigorating Your Contest Club

Up here in the Northland, an amazing thing is happening. We are seeing a dramatic increase in contest participation that is beginning to be noticed nationwide. After every major contest, we hear comments like, "Where did all those Minnesota stations come from?" or, "Is every zero from Minnesota?" In the recent ARRL 160-meter contest, a prominent Midwest contester (not from Minnesota) said he actually worked more Minnesota than Illinois stations. Carl, K9LA, recently contacted me and asked if I might be interested in sharing with the *NCJ* readership some of the ways in which we have increased participation in Minnesota and Western Wisconsin. At the risk of exposing some of our "secrets," I thought it would be a great idea to do this in the hope it will be helpful to other contest clubs around the country. Many of these ideas will not be new to the more established contest clubs.

The Minnesota Wireless Association (MWA) has a long, proud history, which I will not go into here. The very publication you are reading was first published by MWA with K0TO as its editor. Like many organizations, however, MWA has gone through some up times and down times. For years, Jim, K0FVF, had kept the group together. With Jim's death in 1996, MWA fell into a period of relative inactivity. I remember very well the day I ran into a number of MWAers at a hamfest in 1998, and we all got to saying, "You know, we ought to really get MWA going again!" The first thing we did was work with the then club secretary (K3WT) to update the club roster. We verified all the addresses and then went through the last two years of Minnesota line scores in *QST* and added any new calls. We set a meeting date, sent out a mailer, and crossed our fingers. Close to 60 contesters showed up at this first meeting from all over the state, and MWA was off and running again.

Setting Up a Reflector and a Web Site

Although there is nothing new about e-mail reflectors, I think the establishment of one for MWA was an important part of our growth. Besides a place to share scores and stories during the contest season, it was a source of encouragement and information, particularly for those who were just getting started in Amateur Radio contesting. Our approach in MWA is that no score is too small or question too stupid to post on the reflector. To hear a veteran MWAer publicly encourage a new contester who just posted his first score has really helped to give these new guys the confidence they need. Shortly after we got going again, WB0TRA stepped forward and offered to set up a Web site for MWA, which he did at **www.w0aa.org**. It has provided a convenient place to keep our roster, scores for the season, state contesting records, etc. Realizing that visitors will happen by our site, we put a big "JOIN MWA" link on the front page in bold red letters to give visitors a short, crisp description of what MWA is and what our membership criteria are. We consistently pick up one or two members a month via this link.

Special recognition is given to all MWA Members who make a significant contribution to the overall MWA Club Competition Score for the entire contest season.

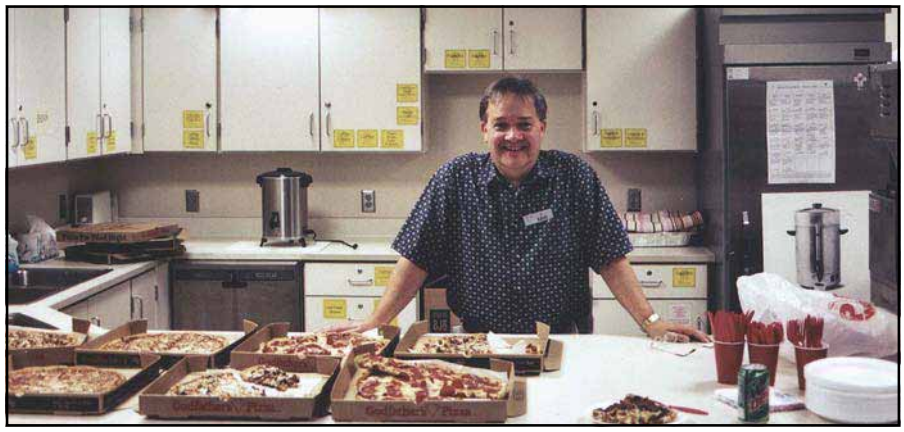
Competition and Membership Criteria

Being a club that has typically submitted somewhere between 50 and 75 logs for contests like Sweepstakes, an important topic of discussion at our first meeting was whether we should compete in the Medium or Unlimited category. It wasn't very long before we reached consensus that Unlimited was the way to go. Our reasoning was quite simple. MWA does not want to ever be in a situation where we have to tell a member that their log is not going to be included in the club score. With our population density, it may be a while before we can challenge SMC, PVRC, etc in terms of numbers, but I feel that this was definitely the right decision for our club.

Another issue that came to a head a couple years ago was the criteria for MWA membership. MWA had always been a very informal group with members spread out all over the state. The old "attend two meetings a year" criterion was just not practical for us. We believe the CAC did the right thing when it let contest clubs set their own membership criteria. The MWA Board discussed this at length. Our CAC representative, N0IJ, does a great job of keeping us informed of how other clubs are dealing with issues like this. We wanted something that was simple, encouraged new members, yet retained a certain level of accountability. Here is what we came up with. "To BECOME an MWA member, you must submit a total of one score OR attend one meeting during the contest season. To RETAIN your MWA membership, you must either submit two scores, attend two meetings, or do one of each during the contest season." Members that fail to meet these criteria are added to the "inactive" list and not registered for the next season. We have a number of members outside the 175-mile circle, but only those living within the circle are included in our club score submissions.

Playing for Pizza!

If you ask an MWAer what really fires them up for the contests season, you might very likely get the answer: "It's the Pizza!" To spur some internal rivalry within MWA, we decided to form two teams within MWA and compete against each other. Initially, we competed only in Sweepstakes. The team with the high-



K0AD (a member of MWA's losing Team Purple) serves up pizza to the winning MWA Team Gold during the club's fall meeting.

est total SS score (CW and phone) was treated to a pizza dinner at the next fall MWA meeting by the losing team. This idea became so fun that we ultimately expanded it to other contests. The competition now goes on all season and includes CQWW, SS, ARRL 10, ARRL 160, ARRL DX, and MNQP. We simply add the team member's scores for each contest and keep a running total over the season. There are three things that make this work. First of all, we achieve a level of parity by assuring that each team has an equal number of serious and casual contests. This is easy to do by just looking at the results from the previous season. Second, our club secretary, N0HJZ, does an excellent job gathering and posting the team scores during the contest season with frequent words of encouragement like "Team Purple and Team Gold are neck and neck going into ARRL DX SSB weekend. Get on the air and win that pizza for your team!" We have so much fun with this that we have recently expanded to four teams and some of these teams even have their own reflector. The net result, of course, is more MWA points in the ARRL and CQ Club Competition.

Recruiting and Recognition

It goes without saying that increasing the number of active contesters on your club's roster is key to moving up the Club Competition list. After each major contest, we share our lists of Minnesota stations worked with each other. We then compare a composite list and compare it to our roster. Any new call signs that we see are sent a letter and/or an E-mail inviting them to join. Multi-op events are also a great way to find new members. While W0AIH (see *NCJ* Mar/Apr 2002) has been the main Multi-op station for MWA, a number of members throughout the state are now hosting multi-op operations. K0IR, WB0TRA, and W0EF in particular have been very active in hosting multi-ops with the sole purpose of mentoring new contesters. Another thing we do is to keep an eye out for that guy at Field Day whose eyes light up when he experiences his first run.

As important as it is to find new members, it's equally important to keep our current membership motivated. During our fall meeting, we spend a significant amount of time on recognition of what was accomplished during the previous contest season. Besides reviewing where MWA placed in the various contests, we look at some of the significant individual accomplishments that were made. For example, anyone having made a top ten list in a major contest is duly recognized. Plaques for winners of the Minnesota QSO Party are handed out. But, and perhaps most important, we recognize those contesters that consistently put in a solid effort during the contest season even though they did not win anything. For example, any member scoring over 100K in SS CW or Phone (or 150K combined) is awarded a certificate. We then award a series of certificates to members that have accumulated 1 million, 2 million, etc. points over the entire contest season. This leads up to Diamond Level Certificate to the one MWA member that has contributed the most overall points to the MWA score for the contest season. Doing this costs us less than $25 and goes a long way in helping our membership feel appreciated for the efforts they make during the contest season.

As I mentioned earlier, many of the above ideas are not new. I am sure that other major contest clubs in the country may be doing similar things. But taken collectively, they have resulted in a level of enthusiasm and contest participation in Minnesota and Western Wisconsin that has not been seen for many years. NCJ

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Choosing a New Radio: Which 'MP Would it Be?

Scott Nichols, VE1OP
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CANADA

It was early December last year when the urge to fill that empty spot on my shack's desk got the better of me. I guess I was caught up in the pre-Christmas buying frenzy, and I suppose the recent arrival of an advertising supplement from my favorite ham supply store had something to do with it. I had made up my mind—it was time to look into getting a second radio and join the SO2R contesting world.

I have been a satisfied Yaesu user for 26 years and really couldn't see myself changing to anything else. I purchased an FT-1000MP in 2000, and with countless hours and over 100,000 QSOs now under its belt, I have never even had the slightest bit of trouble with it. The decision was easy: another FT-1000MP.

Now the hard part. Which 'MP would it be? The original FT-1000MP, the FT-1000MP MARK-V or the FT-1000MP MARK-V Field? (I think Yaesu must be looking for a spot in the Book of World Records for the longest transceiver names in history.) Armed only with what I had read about these new MARK-Vs, I decided more information was required. Going into this, I was of the opinion that, aside from the obvious power output and power supply issues, these radios were essentially the same. At least they sure looked the same. Most of the published reviews I read seemed to agree. It's 100 W with an internal power supply, or 200 W with an external power supply. By the way, if you want to browse a great Web site devoted to the FT-1000MP and its successors, go to **www.va3cr.net**. It's full of useful information.

So, out went a posting to a popular Internet contesting reflector and some private e-mails to contester-friends who have MARK-Vs. Questions: What are the differences in these radios, and how do you like them? This was by no means an in-depth, organized scientific study. I had already read all the reviews, articles and specs I could find, and now I simply wanted to get a feel for what actual users of these radios thought about them.

I must admit I was pleasantly surprised at the number of informative responses I received. Over 50 have hit my inbox, some with one or two follow-ups. It seems that others too were wrestling with this same decision. Most of the comments focused on the obvious power output and power supply issues and, as expected, opinions were varied. Bottom line? The general consensus, again, was that there aren't a whole lot of differences between these radios. In fact, there was a sense of disappointment from some at the lack of revisions, new features or improvements in the MARK-V series compared to the original 'MP's. Most of the hams who had upgraded from an original 'MP to a MARK-V said they really didn't notice any significant difference or improvement, except for the increase in power output with the 200-W MARK-V. One thing was clear, though. Almost everyone loved them, whichever one they had. All but one of the responses reported having no problems with their radio.

So, that answered my "How do you like them?" question. Now for the "What are the differences?" aspect of my little survey. Four distinct issues emerged from all the responses I received:

1) 100 vs. 200-Wpower output
2) External vs. internal power supply
3) Filter selection
4) Price

Here is a brief summary of what people had to say.

Power Output

The original 'MP and the MARK-V Field each are capable of 100 W, while the MARK-V will give you 200 W. Opinions were mixed on this one. The extra power of the MARK-V was the biggest selling point for those who chose that radio, and the general consensus was that it makes a big difference in signal quality for day-to-day operating. For contesting though, some thought this was a waste of money and potentially dangerous. 100 W is plenty to drive any amplifier, and if you're going to run in the high-power category, you generally would want more than 200 W. Therefore, some thought, a contesting radio capable of more than 100 W barefoot watts is overkill.

Some expressed concern about the possibility of accidentally "tickling" their amps with a full 200 W and ending up having to make a call to the Ameritron store. I've done this with 100 W on occasion and have been greeted with some less-than-pleasant noises from the general direction of my amplifier.

Power Supply

The original 'MP and the MARK-V Field each have a built-in power supply, while the MARK-V requires an external power supply. Again, opinions were all over the spectrum on this one. Overall, the requirement for the external supply was the most prevalent complaint against the MARK-V, and the internal supply of the Field and original 'MP models was the largest selling point for those radios over the MARK-V. I guess we live in a plug-and-play world. Although nobody said they actually experienced any problems with the MARK-V's external supply, it was of some concern to those who researched it, because the actual Yaesu FP-29 30 volt supply ($500 to $550) would be required if it ever had to be replaced. There are no cheaper off-the-shelf supplies that will work properly.

If portable operations are on your agenda, the 30-V requirement of the MARK-V could make things difficult, where the original 'MP and the Field models can easily be run off of 12 V. This was a concern for some. Personally, I don't think I would ever take my 'MP into the boonies for portable operations, but I have run it in my house with 12 V for a few Field Days.

Still, it was pointed out to me that the external supply would be required anyway if you ever chose to use the Yaesu 6-meter transverter that goes with these rigs.

Filter Selection

Perhaps one of the least known features (or lack thereof) of the new MARK-V and MARK-V Field models seemed to be the requirement to enter the radio's internal menu system to change filter settings. Opinions were NOT mixed on this one. Two thumbs down from everyone. Why Yaesu did this is beyond me. If you have ever used one of the original 'MPs you know that two banks of filters are readily available on the front panel of the radio. A simple push of a button or two will quickly give you any combination of available filters in the 455KHz and 8.215MHz IF stages. The MARK-V series, instead, has only three push button filter selections, each predefined by the user via the internal menu system. This is not nearly as flexible as the original 'MP's system. I had to closely take a second look at a picture of the new MARK-Vs to see that, although the panel looks the same as the original 'MPs, the filter buttons have been replaced with the EDSP contour and noise reduction selection buttons. This was a disappointing surprise to some, as it's certainly not very well documented in Yaesu's literature.

Price

The price differential between these radios wasn't much of a deterrent. The

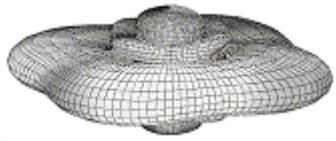
200-watt MARK-V, overall, was the most popular choice amongst the hams that responded to my questions. The majority said it was well worth the extra bucks for the extra power. Prices for these rigs are obviously different everywhere you go, but at the outlets I checked, the MARK-V will run you, on average, 20% to 25% more than the MARK-V Field.

Several people said they were going to take advantage of the bargain basement prices currently available on used original 'MPs, and hope that eventually the MARK-VI (or VII or whatever they call that one) will come out with some real improvements and/or new features. Something to think about if you don't mind buying used gear.

There you have it. A little food for thought from your peers if you're considering one of these great radios. Initially, I had myself convinced that a shiny new 200-watt MARK-V would be filling that hole on my desk. Now I'm not so sure. My trusty old original 'MP has served me well, so another one may be the practical choice to practice SO2R with, until I see if the eventual successor to the MARK-V actually brings anything substantially new or improved to the table.

My thanks go out to the many hams who took the time to offer their opinions, suggestions and advice. NCJ

A picture is worth a thousand words...



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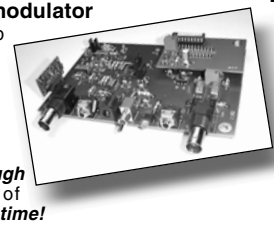

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Responses to November/December Op Ed

Ken, WM5R's, Op Ed piece in the Nov/Dec 2002 issue (titled "Club Competition Considered Harmful") brought forth many responses. The following comments pretty much sum up the range of responses.

From Doug, W9WI

I am of mixed mind on Ken's suggestions.

The "175-mile-circle-or-ARRL-section" rule appears to be intended to keep clubs on a more or less even keel—to prevent a 500-member club in New York City from swamping a 10-member club in Grand Junction. Problem is, population densities vary wildly. A 175-mile circle centered on New York City still has ten times the population of a 175-mile circle centered on Nashville. The "-or-ARRL-section" change is an improvement, but it doesn't come anywhere near filling the gap.

Team competition directly forces competing groups to be of identical size. No automatic East Coast advantage. On the other hand, doesn't it also force lower-scoring entrants out the window? Even in the TCG, when we prepare for team-competition events, we do put the highest-scoring-potential folks on the top teams. We do field plenty of teams—everyone who wants to participate does get on a team. But it's reminiscent of the softball games in grade school. "Everyone plays," but the kid with bad depth perception who can't catch or hit worth a darn always ends up picked last, playing right field, and batting 9th. Said kid doesn't feel any better just for having played.

When you have teams of unlimited size—which is essentially what a club is under ARRL rules, provided you actually obey them—everyone actually does participate. Even the guy whose rig blows up after only two QSOs has made a real contribution to the club's effort.

I worry to some degree about the necessity of pre-registering teams. The operator who decides to operate at the last minute is left out. On the other hand, why should it be necessary to pre-register? I suppose the reason was probably to prevent clubs from fielding several teams' worth of entrants, and then sorting the highest scores onto the top teams after the contest.

I'm not so sure allowing post-contest team massaging is a bad thing. Best of both worlds? Allow everyone to participate, use every score, but still create the most competitive score possible?

From Mike, N2MG

I just finished reading your article in the *NCJ*. You touched on several valid issues. Good show. I want to correct one aspect, though: the club competition in ARRL no longer requires meeting attendance; this is as of the current contest season. *(That rule change occurred after Ken wrote his Op Ed article.—Ed.)*

There is pretty much only a 175-mile circle limitation, and that the member be in "good standing," where "good standing" is defined by the club in question, NOT by the ARRL. If a club doesn't REQUIRE dues (as is the case with FRC, I believe) then a contester can still remain a score-contributing member even without attending ANY meetings or paying ANY dues.

This subject is near and dear to me, as I am a member of YCCC who lives about 225 miles from its usual meeting place. I am but a few miles inside their 175-mile circle.

I also wish you had said something regarding the Clubs' very pro-Assisted stances—in general, it seems the clubs are trying to convince everyone (especially more casual members) to operate Assisted in order to maximize points. In the long run, I think this hurts contesting. Just my opinion.

From Dick, W5TA

Hello, Ken.

Saw your Op Ed letter in the *NCJ*. In 1960's slang, "Right on!!!" I hope the ARRL "hears you."

Thanks again for your contribution.

From Mike, K5NZ

I read Ken's piece in the recent *NCJ* with great interest. He brings up many interesting points. If someone does not feel wanted when it comes time for club competition, then the club sure needs to address it.

From Greg, K0OB

I would like to respond to the Op Ed piece in the Nov/Dec Issue. While I'm sure that the pressure in contest clubs that Ken describes does occur, I would like to tell you a positive contest club story.

The Minnesota Wireless Association (MWA) has been around for years. *(In fact, Tod, K0TO and the MWA started NCJ back in 1973.—Ed.)* When I got back into the hobby over 10 years ago it was a pretty quiet group. People did submit their scores earmarked for the MWA, but the MWA wasn't doing much to promote contesting among the locals.

About four years ago Al, K0AD, headed an effort to unite the contesters of Minnesota and nearby Wisconsin to revitalize the MWA. What has happened since is nothing short of amazing. *(Read this story elsewhere in this issue.—Ed.)* We now have a very active, enthusiastic and large group who turns out in droves to put the MWA on the map. In fact, the just-finished 160-meter contest had over 50 MWA stations active in it. Without fail, in all of the ARRL club contests there is always a large MWA turnout. The fact that the MWA was asked to be part of the WRTC decision makers for the USA shows how far we have come.

I don't think the pressure that was described in the Op Ed exists in the MWA. Sure, we have our standouts, but everyone gets on to boost the MWA team score. All the activities surrounding the MWA get people to enthusiastically turn out and submit scores with no regard to worrying if they are good enough for the club. Our members want to put the MWA on the map with our participation! It's been a joy to be a part of this effort and has peaked my interest in contesting.

Should the club competition be done away with and replaced by team competitions? If you ask the MWA, we would say no way!

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Reflector Ramblings: What's a Good Antenna Analyzer?

From the YCCC E-mail reflector…

From Dick, WC1M

I own an AEA CIA-HF, an MFJ-259, and an Autek RF-1.

I use the AEA almost exclusively. It is far and away the most accurate and reliable device, but is a lot more expensive. I think it's a good long-term investment if you do a lot of antenna work or want to know just about every measurable parameter for your antenna or transmission line. The ability to download data to a PC not only allows more in-depth analysis, but also lets you archive antenna data for later comparisons. This is handy for detecting changes due to mechanical wear or interactions with new antennas. The unit is pretty large, but not heavy. It's a bulky load to take up a tower, but has a nice carrying case with shoulder strap and mini gorilla hook to make that easier. The housing is high-impact plastic, but is probably a little more vulnerable than the MFJ's metal case. The AEA eats batteries, so it's best used with an ac adapter. This isn't very practical in the field, so I use rechargeable batteries. However, I've noticed some anomalous readings with the rechargeable batteries, which run at a lower voltage. For critical work, I insert a fresh set of alkaline or lithium batteries. I think the unit takes eight AA batteries.

My MFJ is the older 259 model, not the 259B, so it's not a fair comparison. The 259B is apparently much improved and has a lot more analytical features. The 259 is not as precise as the AEA, but is adequate for most basic antenna work. The oscillator and bridge are reasonably accurate. I've sometimes gotten inconsistent results, but I think these could be explained by BCI problems (see below). The MFJ is pretty rugged, but it's bulky and heavy to carry up a tower. As far as I know, there's no case available for it. The MFJ eats batteries, too, but not as badly as the AEA. I think it also takes eight AA batteries.

The Autek is incredibly small and light. It was perfect for taking on our 8P contest DXpedition. It's great for tower work because you can just slip it in your shirt pocket. The case is plastic, but it's reasonably rugged. It displays more data than the old MFJ-259 and is probably comparable to the 259B. It's great on batteries (just one 9 V), but the on/off switch is so badly designed that it's real easy to accidentally switch it on and leave it that way. I always remove the battery for transport.

The major difference is ease of use. At first blush, the AEA is the most difficult to use because the frequency and range must be keyed in rather than turning a couple of pots like the MFJ and Autek. With the AEA, you see the dips on a curve and can display text indicating the frequency at which SWR is lowest and the SWR value at that point. It might take a little keypad entry to find the correct range. In contrast, with the MFJ and Autek you just turn a knob and find the SWR or impedance dip at the resonant frequency. This is easier on the MFJ than the Autek: it's a lot easier to spot a dip by tuning back and forth using an analog meter than a digital readout. Also, the Autek coarse/fine tuning knobs are very poorly designed: the coarse tuning is too coarse and the fine tuning is too fine. I have never been able to get the exact same frequency reading at resonance on the Autek twice in a row. The MFJ is somewhat better, but not 100% in this department either. Only the AEA gives consistent and reproducible results. Once I got used to the AEA's different approach, I found it just as easy to use, if not easier. When tuning an antenna with multiple dips, the graphical display shows you all the dips at the same time and the SWR at the lowest point. Unless you tune across the entire band, a dip off the resonant frequency might fool you with MFJ or Autek.

All three units are susceptible to BCI. I've had a lot of problems with this on 40m, but no problems on other bands. I guess it's the EU broadcast stations. You might consider MFJ's external filter unit if you run into this. I haven't tried it. All three analyzers work well on 80 meters here.

BTW, are you in need of an analyzer for tuning the elements or cutting the phasing lines? An analyzer is helpful for tuning the elements because, as I'm sure you know, they will have to be tuned to a frequency below the CW band due to mutual coupling and you can't legally use your transmitter for that. I've never been happy with the SWR analyzer method for cutting phasing lines and stubs because I've gotten inconsistent results and the nulls are not very sharp. I prefer using the traditional noise bridge method, which tends to produce a sharper null. One of these days I'm going to cut some phasing lines using each method and check them on the TDR at a local lab where one of our club members works!

From John, W1FV

I've also noticed that when the batteries run low, the readings on the AEA become flaky. Unfortunately, this happens without warning. However, my MFJ259B is much worse at eating batteries than my AEA. Maybe the MFJ259 (not the "B") which Dick is referring to is different. I never trust taking the MFJ259B out in the field for extended measurements because the batteries are likely to die (especially at inconvenient times, such as when you're high up on the tower with it).

I've compared the AEA and MFJ259B to my General Radio RX bridge, which was a laboratory reference standard for years. The MFJ is generally more accurate in the complex impedance (R+*j*X) mode than the AEA. Neither is what I would call super accurate, however. For simple SWR measurements, both the AEA and MFJ are just fine, however.

Actually there is a case available for the 259B.

The AEA is also very good as a low-power signal source in the field. It puts out a very stable, clean signal (5 mW, I think). It's very useful for setting up as a "remote" CW transmit source for assessing the pattern of directional antennas on receive. On 160 I've found that the signal carries a long way (1000 ft or more) with a simple 15-foot whip inserted in the antenna jack.

The MFJ tends to drift a lot more in frequency and puts out a dirtier signal. It's still usable as a signal source if you're willing to retune your receiver a bit to track it. NCJ

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160-Meter Monster Array

By John Battin, K9DX
jbattin@msn.com

The array described in this article became operational in October 2002. Since then, John, K9DX (in northern Illinois), entered the 2002 ARRL 160m Contest and the 2002 Stew Perry Top Band Distance Contest. His claimed score for these events place him in Third place in SO HP (behind VY2ZM and AA1K) for ARRL 160m and in Second place in SO HP (behind FM5BH) for SP.

This array is patterned after the 80-meter W0UN design shown in the Third Edition of ON4UN's *Low-Band DXing*. Thanks to the effort of my friend Bill Rapshys, K9WR, the antenna was modeled for 160 meters with shortened tapered verticals.

Figure 1 shows the modeled horizontal and vertical patterns of this array. The array has 2.5 dB more gain than a 4-Square and about 8.0 dB more than a single vertical. The antenna is very large:

- Area: Covers 8 acres, including quarter wave radials.
- Antennas: Nine 110-foot Titanex verticals.
- Antenna placement: In a circle 210 ft in radius.
- Feed and phasing lines: One mile of buried 1-5/8 inch heliax.
- Radials: 100 quarter-wave radials on each antenna, 24 miles total.
- Guys: 1 and one half miles of Dacron rope.
- Ground system: Thirty 8-ft ground rods.

In the cover picture, you can see the nine antennas, the shed housing the feed system, and the trenches that were bare dirt at the time the photo was taken. The feed lines from the antennas do not go directly to the shed, but to the circular trench, where they go either clockwise or counterclockwise as required to balance their lengths before going into the shed. The phasing lines are also buried in the circle.

Figure 2 shows one of the nine verticals. Each antenna is a Titanex model 160HD that has been extended from the standard 90-foot length to 110 feet. Both the stock and extended length antennas were previously tried for my 160-meter 4-Square, and the longer antennas performed considerably better because of their higher feed impedance and lower overall Q.

Titanex markets both the 80HD and 160HD (67 and 90 feet respectively) as self-supporting antennas. With the high Chicago area winds, the antennas in this array and those in my 80-meter and 160-meter 4-Squares are guyed. The array

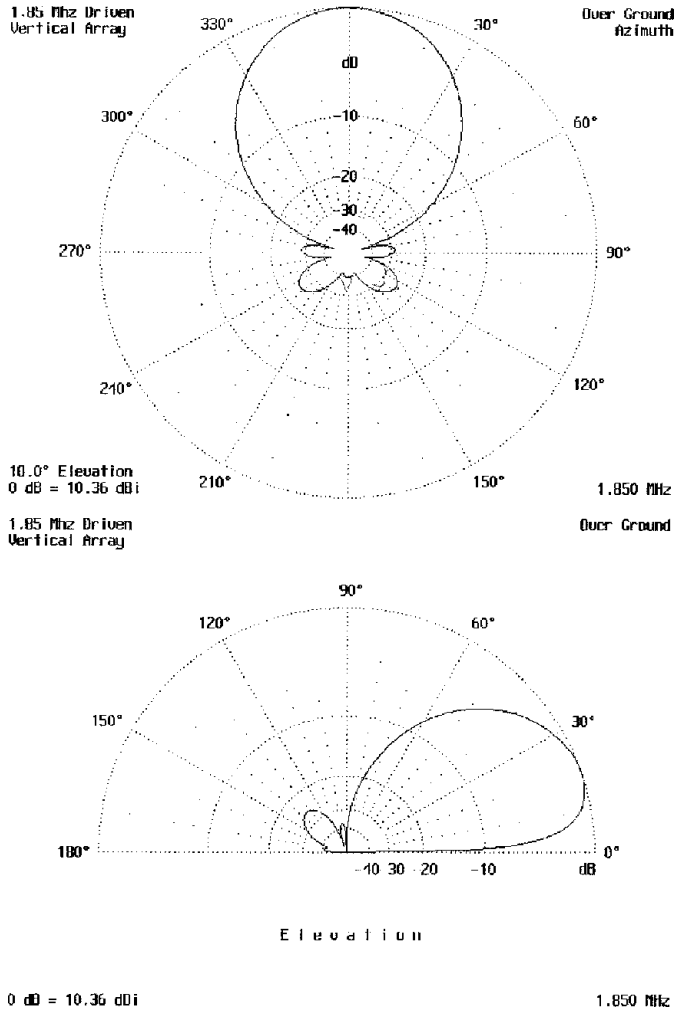

Figure 1—Horizontal and vertical patterns of the array.

Figure 2—Titanex antenna, loading coil, radials and feed line.

Table 1

element	*A (see text)*	*B (see text)*
Dir 1 (element 2)	53.7 – *j*32.2	13.6 – *j*20.54
Dir 2 & Dir 3 (elements 3 & 4)	41.1 – *j*120	60.43 + *j*0
DE 1 (element 1—center)	18.7 – *j*120	128.0 + *j*0
DE 2 & DE 3 (elements 5 & 6)	30.3 – *j*135	66.0 +*j*31.38
Refl 1 (element 9)	-16.6 – *j*121	143.92 + *j*8.2
Refl 2 & Refl 3 (elements 7 & 8)	5.94 – *j*127	179.3 + *j*184.3

antennas are guyed at 40, 60 and 80 feet, leaving almost 30 feet waving in the breeze at the top. At one time this made me nervous, and contrary to advice from Titanex, a set of guys were placed 15 feet from the top. Rather than improving the situation, the downward pressure buckled and broke the tubing. So now they wave in the breeze and I just do not watch them when the wind is blowing hard.

These antennas are amazingly strong. They come with a winch that mounts near the top of the supporting channel iron and the steel cable attaches to the antenna about four feet above the bottom insulator. It is hard to believe that you can raise a 90-foot antenna by lifting it four feet from the bottom, but it works. In the case of these extended antennas, I used a gin pole attached about 20 feet from the bottom.

The radials are attached to a 4-foot diameter ring of copper tubing that is supported by three 8-foot ground rods. The 100-plus radials lay on the ground and are connected six at a time into solder lugs. These solder lugs are attached to the copper tube with self-tapping stainless screws and then soldered. The weight of the insulation on the stranded radial wire tends to make them follow the contour of the ground, and within several weeks the grass seems to absorb the wires.

The loading coils are edge wound, silver plated and about 4 inches in diameter. Most of these are refugees of Dayton and other hamfests.

Figure 3 is a basic schematic showing the feed currents and angles. The Center element is driven with 3 times the current of the other outside driven elements. The two close directors are driven with 1.66 times the current at –90 degrees and the one far director is driven at 1 times the current at –180 degrees.

The reflectors are the same but with the phase angles leading rather than lagging. All of the elements are fed with ¾-wavelength lines to take advantage of their constant current characteristic. The current in the antennas will be I = E/Z. E is the voltage into the feed line, and Z is its characteristic impedance. The W0UN design shown in *Low-Band DXing* makes further use of that characteristic, and adjusts the current to the elements by having two feed lines to each antenna, and switching between one or the other or placing them in parallel. In the design shown here, there is only one coax feed to each antenna, and toroid transformers are used to set the proper voltages (and therefore the currents).

With the elements set up to so that the array fires North per Figure 3, the impedance of each antenna is shown in Column A in Table 1. The negative sign on the far reflector shows that it is delivering power into the system. Column B shows the impedance looking into the 270° feed lines when a loading coil with a reactance of 120 Ω is placed at each antenna.

By paralleling Dir 1 and Refl 1 and shunting them with a 2.5 µH coil, we get an impedance of 65 Ω.

By paralleling Dir 2 & Dir 3, we get an impedance of 30.2 Ω.

By paralleling DE 2 & DE 3 and shunting them with 100 pF, we get an impedance of 40.0 Ω.

By paralleling Refl 2 & Refl 3 and

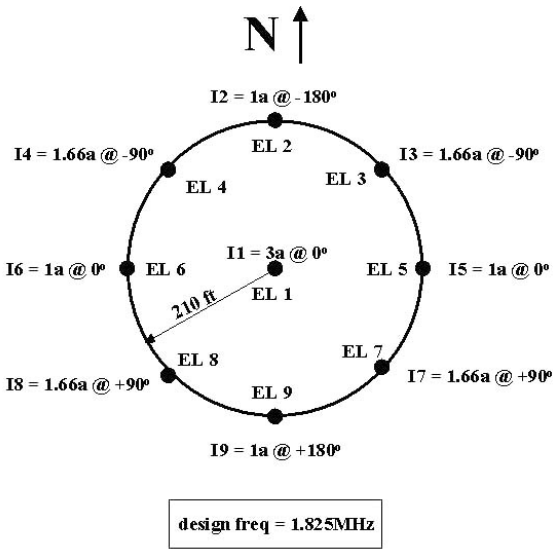

Figure 3—Feed currents and angles.

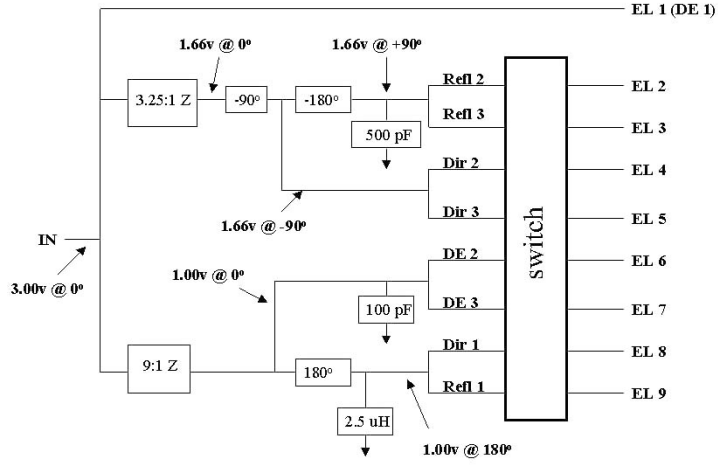

Figure 4—Simplified schematic of switching system.

shunting them with 500 pF, we get an impedance of 184 Ω.

By feeding DE 1 (the center element) directly and the other elements through the transformers, we get an array driving impedance of 36 Ω, which produces an SWR of 1.4:1. An additional matching network or toroid transformer could be added if desired to bring it to 1.0:1.

Figure 4 is a simplified schematic of the switching system (with voltage magnitudes and phase angles shown based on a hypothetical 3 V at 0° at the IN port). The heart of the switching system is a 9-pole, 11-position ceramic switch. This switch was constructed from hamfest and junk box parts, but is available from Multi-tech Industries, Marlboro, New Jersey. Each wafer of the switch is assigned to an antenna, with the antenna connected to the wiper contact. The switch is wired so that as it turns, the antennas are connected to the proper sources to produce the eight directions. One position grounds all of the antennas. The ninth wafer on the switch controls the switch motor.

Figure 5 shows the switching system. The switching system is housed in an enclosure that is then mounted on the wall of the shed. It includes the switch, three relays to control the motor driving the switch, a timer relay to protect against continuous motor operation, the toroid transformers, the shunt capacitors and the shunt inductances. To avoid hot switching, there is a vacuum relay on the input that switches the transmitter to either a dummy load or another antenna whenever power is applied to the motor.

Switching to an alternative antenna (in my case the 4-Square) is nice because it avoids having a dead receiver while the motor is turning. The motor turns one revolution in three seconds, so if the direction change is only 45 or 90 degrees, the switching seems instantaneous. Twelve wires control the system: eight to select direction, one to ground the antennas, one for 24 V dc, one to select motor direction, and one ground. The system can be controlled with a simple rotary switch, or as in my case, by computer.

Notwithstanding its size, this antenna is not the killer that makes 160 meters behave like 20, nor will make a K9 think he is on the East Coast. It is, like most big antennas, an incremental improvement that from time to time makes the difference between making a contact or not. The results do confirm the computer model. It is 3 dB louder than the 4-Square at my home 30 miles away. Most DX stations report a one or two S-unit advantage. Signals from the side and back are consistently attenuated by more than 30 dB. In contest situations when the band is loaded with signals, key clicks, and QRN, weak signals are easier to copy on the array than with either the 4-Square or the Beverages.

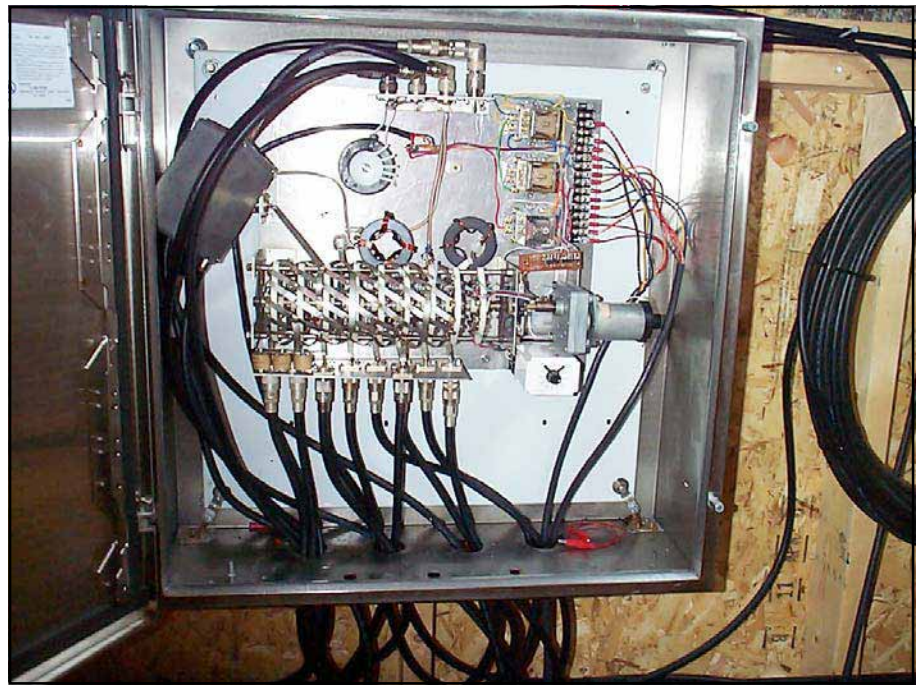

Figure 5—Switching system picture.

If you desire more detailed calculations, schematics, or have other questions, please feel free to contact me at **jbattin@msn.com**. NCJ

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Single Support Gain Antennas for 80 and 160 Meters

Rudy Severns, N6LF
PO Box 589
Cottage Grove, OR 97424

Introduction

On 80 and 160 meters an antenna with modest gain and good front-to-back (F/B) ratio, along with a steerable pattern, can be very effective for contesting. This sounds like your standard HF Yagi, but unfortunately, for most of us at least, full-size rotary Yagis, at the necessary heights (greater than ½ wavelength), are not an option on the low bands. However, many of us do have a single tall support, usually a tower, from which it may be possible to suspend a vertical array.

The family of vertical arrays made with sloping elements from a single central support has many variations. A typical example is the K1WA[1] array shown in Figure 1. In this array each of the elements is a center-fed sloping dipole. One element is driven at a time with the other elements acting as reflectors. The length of the coax from the switch-box on the tower to the center of an element is adjusted so that when open circuited by the relays in the box, that section of feed line provides inductive loading that tunes each element as a reflector. In this example there is one driven element and four reflectors. Multiple reflectors really don't behave very differently from a single reflector (a little better F/B maybe) so the array is basically just a two element Yagi where the pattern is rotated by changing the element driven.

This theme has many variations: 2 or 3-element parasitic or phased array with vertical elements, straight sloping elements, or elements bent back towards the support. The element lengths may be anywhere from one-eighth wavelength to one-half wavelength, with or without loading as required, and center or end fed.

This article shows a number of typical examples to give you some ideas for your own installation. Details of each of the examples can be found in the references at the end of the article. In particular, John Devoldere's *Low Band DXing* [2] is a goldmine of ideas.

Expectations

Before going into the examples, I would like to indicate what performance can reasonably be expected. Even though there are many, many possibilities, in the end the performance will be quite similar between arrays using the same number of active elements. Most of these antennas will take the form of either a 2-element or 3-element array. Many of examples have 3, 4 or even 5 elements but usually only one element is driven (as shown in Figure 1) and the others are either inactive or act collectively as a reflector—ie, basically a 2-element array. In some examples one element will act as a director and another as a reflector—ie, a 3-element array.

Figure 2 is an excerpt from *The ARRL Antenna Book* 2-element phased array pattern diagram.[3] What is shown is the gain over a single element for a 2-element array with various phasings and spacings. The elements are assumed lossless and the ground perfect. The current amplitude is assumed to be equal in both elements and the height of each element is one-quarter wavelength. Note the tradeoff between gain and F/B—you can't maximize both at once! W4RNL has given an extensive discussion of the possibilities and limitations of 2-element arrays in earlier *NCJ* articles[4] and these are recommended reading.

The greatest gain difference (4.5 dB) is for a spacing of one-quarter wavelength and a phase difference of 135 degrees. The gains shown in Figure 2 are of course idealized. In the real world you won't get quite as much due to conductor losses, which can be substantial in the long wire conductors used on the low bands, and imperfections in tuning, spacing, element shapes, ground system, etc. For example, when you go from perfect ground to average ground (conductivity of 0.005 S/m and dielectric constant of 13), the gain difference for

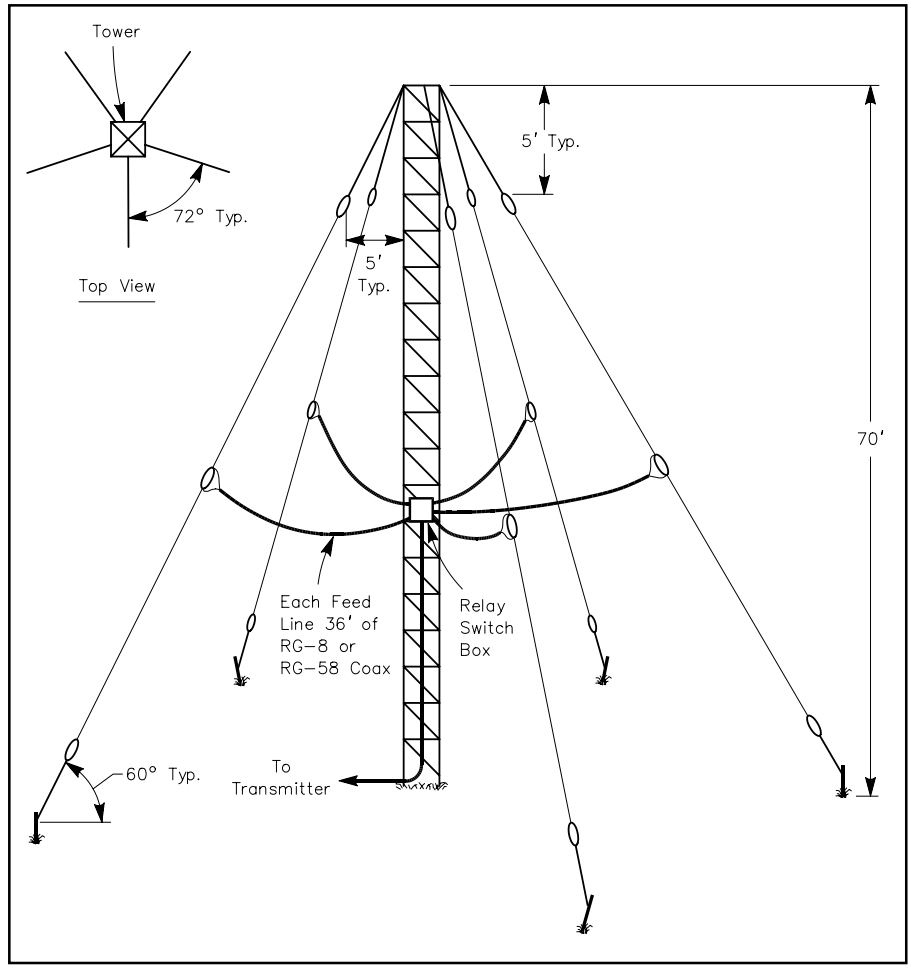

Figure 1—The K1WA Sloper System uses five identical one-half wavelength sloping dipoles spaced uniformly around a tall mast. Each feeder has an electrical length of about 135 degrees.

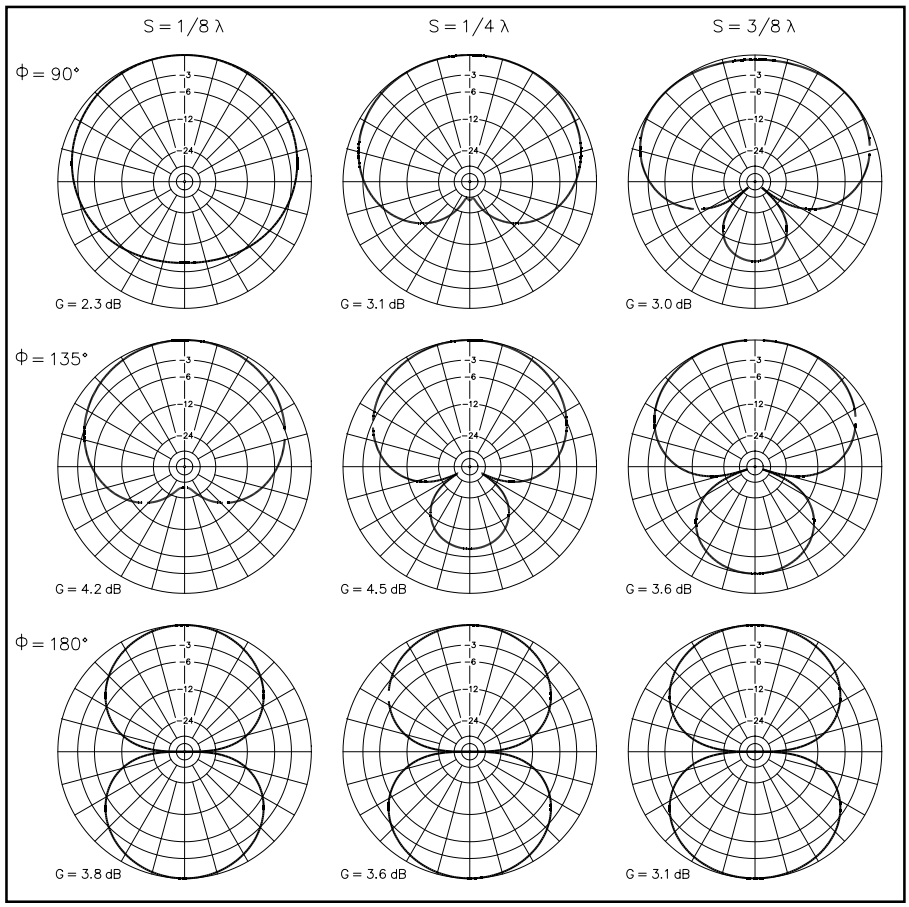

Figure 2—Idealized gain of a 2-element vertical phased array over a single vertical.

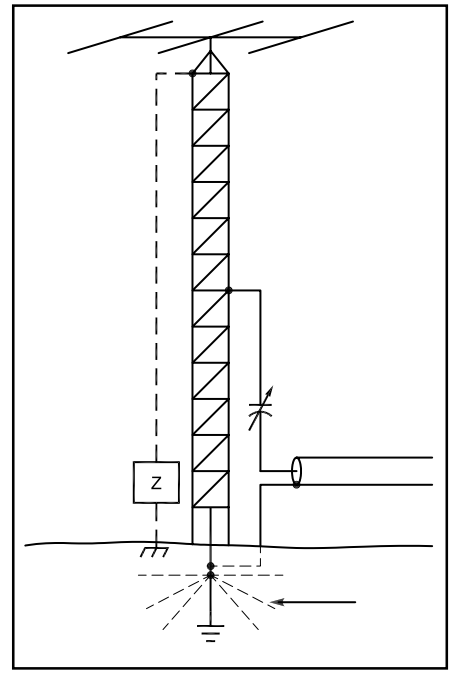

Figure 3—Tower with an HF array and shunt matching and tuning arrangements.

lossless elements drops to 4.3 dB. Adding in a couple of ohms of loss and the gain difference drops another 0.2 dB.

The examples in Figure 2 are for both elements driven. However, driving one element and allowing the other element to be parasitically excited (a Yagi!) is just another way to approximate the correct current amplitude and phasing. In the case of parasitic elements you can't control the phase and amplitude as closely as when both elements are driven independently so again the achievable gains and F/B will be somewhat lower. In exchange, the arrangements for pattern rotation may be considerably simpler in the parasitic array.

For a 2-element parasitic array, a gain of about 3-4 dB over a single vertical would be typical, with a F/B of 10-12 dB for a reflector array. In a 3-element array good F/B (greater than 20 dB) and an additional 1-2 dB of gain are possible. In three element arrays, the element impedance can be low however, especially if short, loaded elements are used. That's okay on 20 meters where the element is made from aluminum tubing, but on 160 meters where the element may be #12 wire and about eight times longer, the losses can be substantial. Wire loss is a basic limiting factor in large wire end-fire arrays. It is perfectly possible to build a 3-element array that has less gain than a 2-element array due to losses. Low impedances also mean that ground loss must be carefully controlled. Care in design and implementation is essential.

General Comments

For most, the available support will be a tower of some height, with probably one or more higher frequency Yagis at the top. Every installation will be different due to different tower heights, top loading due to the HF array, etc. Also, the available space around the tower into which one can stretch sloping elements and support lines will differ. For this reason, each installation becomes a unique design. It is essential to carefully plan and model each installation and then properly adjust it to get the predicted performance. What works great at my place may not be worth much at yours!

Some examples use grounded (or driven against ground) elements in the range of one-quarter wavelength to three-eighths wavelength. It is clear from well-known vertical antenna practice that a good ground system is required to minimize local ground losses. There is the misconception that free floating one-half wavelength elements do not need a ground system. While it is true that these antennas will work relatively well without an extensive ground system, they will work even better with one. The problem is the high electric fields near the ends of the elements that may be close to ground. This leads to losses that can be reduced by the use of a ground screen under the elements.

A key decision is whether to use the tower as an element in the array or just let it be neutral and provide mechanical support only. If you want to excite the tower as part of the array you will usually leave the tower grounded (with a good ground system!) because of the cabling going to the HF antennas, rotors, etc. You can match to the tower using shunt feed as shown in Figure 3. It is not necessary that the tower be resonant but if it is far from resonance then tuning it and getting a proper match may be a bit challenging. The usual means for checking tower resonance and tuning or detuning it is to add a shunt wire from near the top of the tower as indicated by the dashed line in Figure 3. If the tower needs to be tuned or detuned, then an impedance can be inserted in this wire as indicated. It is possible to perform both tuning and matching with the shunt wire. When only a single shunt wire is used, rotating the HF array to different positions may alter the tuning somewhat. Using three wires, symmetrically disposed around the tower, will

pretty much suppress this and also provide some additional matching opportunities.

Element shape

Different element shapes can be used in these arrays: vertical elements, a sloping element, like K1WA, or a bent element, like K3LR[5] and K8UR[6] as shown in Figure 4. The sloping element will have both vertical and horizontal current components, in proportion to the slope of the element, which contribute both vertical and horizontally polarized radiation. In an array you will find that the horizontal component is essentially that of a low dipole with lots of high angle radiation. Also it will be noticed that as the element phasing is varied, the total pattern (sum of vertical and horizontal components) does not behave the same as the phased purely vertical elements assumed in Figure 2. The result is an absence of a zenith null in the pattern and some reduction in maximum gain in endfire and broadside patterns. This effect can be seen by comparing the elevation patterns of the K1WA array to an early K3LR[5] array as shown in Figure 5. More discussion on this point can be found in my article in *the ARRL Antenna Compendium Volume 7*.[7]

This observation is not meant to imply that sloping elements should not be used. I know of several amateurs using essentially the K1WA array on 160 meters with very good results. It just may be that mixed polarization is a good thing. The point is to recognize that the two different element shapes will produce different radiation patterns and polarization mix. Some people may want the additional high angle. It doesn't cost much in forward gain and it provides a big signal at short distances. In my case, I choose to suppress the high angle radiation in the array and use a dipole for local and up and down the West Coast.

A bent element can be proportioned, as shown by G3LNP,[8] to null out most of the horizontal component and act much more like a straight vertical element.

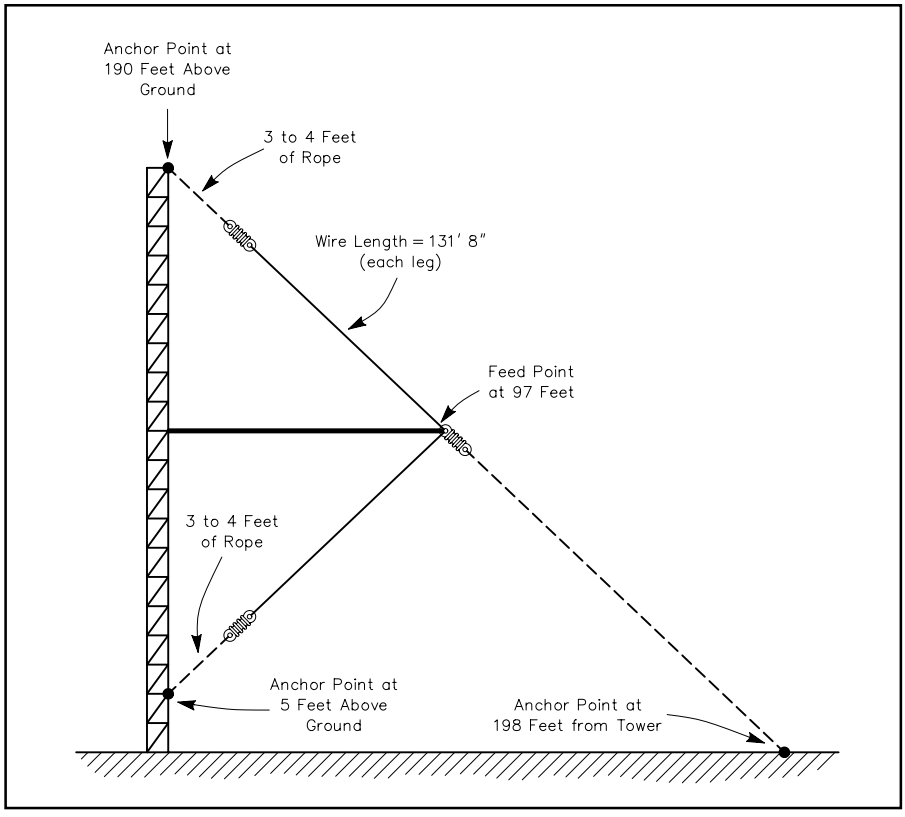

Figure 4—K3LR/K8UR bent element example.

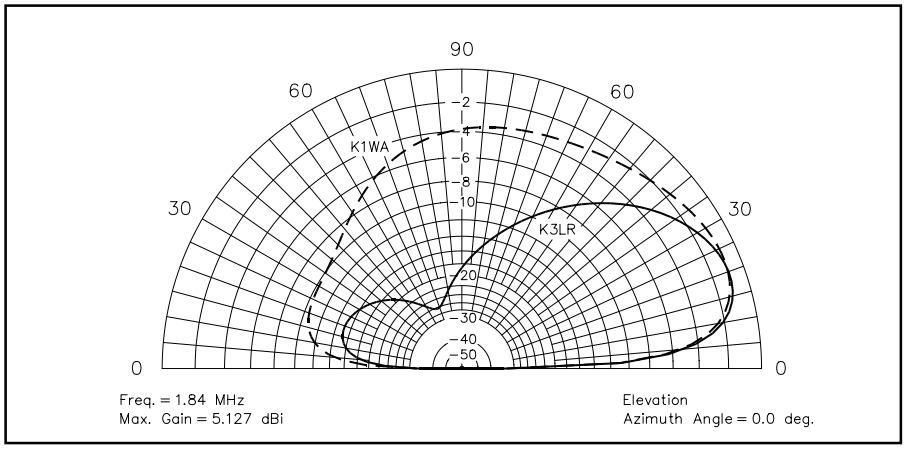

Figure 5—Elevation pattern comparison between straight sloping elements (K1WA) and bent elements (K3LR).

Examples of Sloper Arrays

When a guyed tower is driven, one of the simplest ways to add parasitic elements is to convert the guys into elements using strategically placed insulators as shown in Figure 6.[9] The tower is the driven element and the guys act as reflectors. Relays can be placed at the base of each guy (as indicated in the insert in Figure 6) to connect one guy at a time to act as a reflector and rotate the pattern. When the relay contacts are open the guy is non-resonant and transparent to the array. It is also quite possible to cut the active part of the guy to act as a director and then add a enough inductive loading so that it acts as a reflector. To enable a particular guy to act as a director, the relay can simply short out the loading inductor. When the relay is open the guy is a reflector.

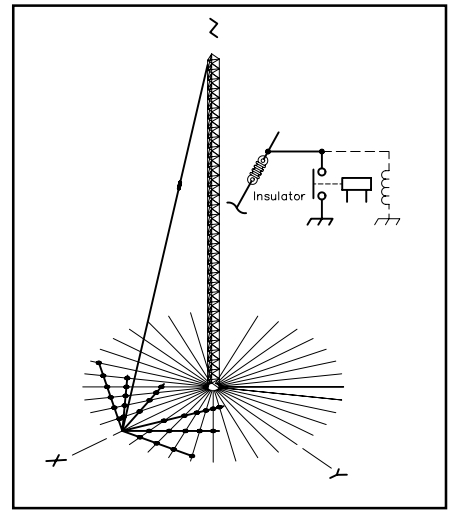

Figure 6—A simple 2-element slant-wire parasitic array.

Figure 7—Single sloping element per 4X4NJ.

4X4NJ has described several arrays[10] for 160 meters, one of which is shown in Figure 7. It is a two element parasitic array and the tower is tuned to act as a reflector. This idea can be extended to multiple elements, spaced around the tower as indicated in Figure 8. Each of the elements is about 100 feet long (0.19 wavelengths at 1.850 MHz) and resonated with a loading coil at the base which also provides a matching opportunity. Because the length of the elements is nearly one-quarter wavelength, the loading coil will be small and not greatly affect efficiency. There are many possible ways to drive the array elements. The tower can be detuned and one element driven with the other elements acting as reflectors like K1WA, or the tower may be driven and the elements tuned as reflectors and directors to form a 3-element parasitic array.

As a phased array, the element phasing can be adjusted to provide several different patterns. However, as indicated by the dashed line in Figure 8, a bent element, with cancellation of the horizontal component, would give better pattern flexibility. Depending on the phasing, this array can be bidirectional endfire, bidirectional broadside, or unidirectional endfire. The unidirectional endfire mode can be adjusted for either maximum gain or F/B. It should be pointed out that because of the relatively close spacing of the elements in most single support sloper arrays, broadside gain is usually modest at around 1-2 dB. Endfire gain can of course be very good if conductor and ground losses can be minimized.

A variation with one-quarter wavelength sloping elements and a driven tower appears in ON4UN's book.[11] Figure 9 shows the array where the elements are made slightly shorter than one-quarter wavelength to act as directors and then converted to reflectors by inserting a small inductance. Note! Each element must be tied into the overall ground system. Also remember that even if you don't use the guys as elements, they must be detuned so that they do not interact with the desired elements. Normally this would be done by breaking up the guys with insulators, or by using non-conductive guys.

The Spitfire array[12] (W1FV/K1VR) shown in Figure 10 is a variation using a driven tower (approximately one-quarter wavelength) and one-half wavelength ungrounded elements for reflector/directors. The changeover from director to reflector is done by connect-

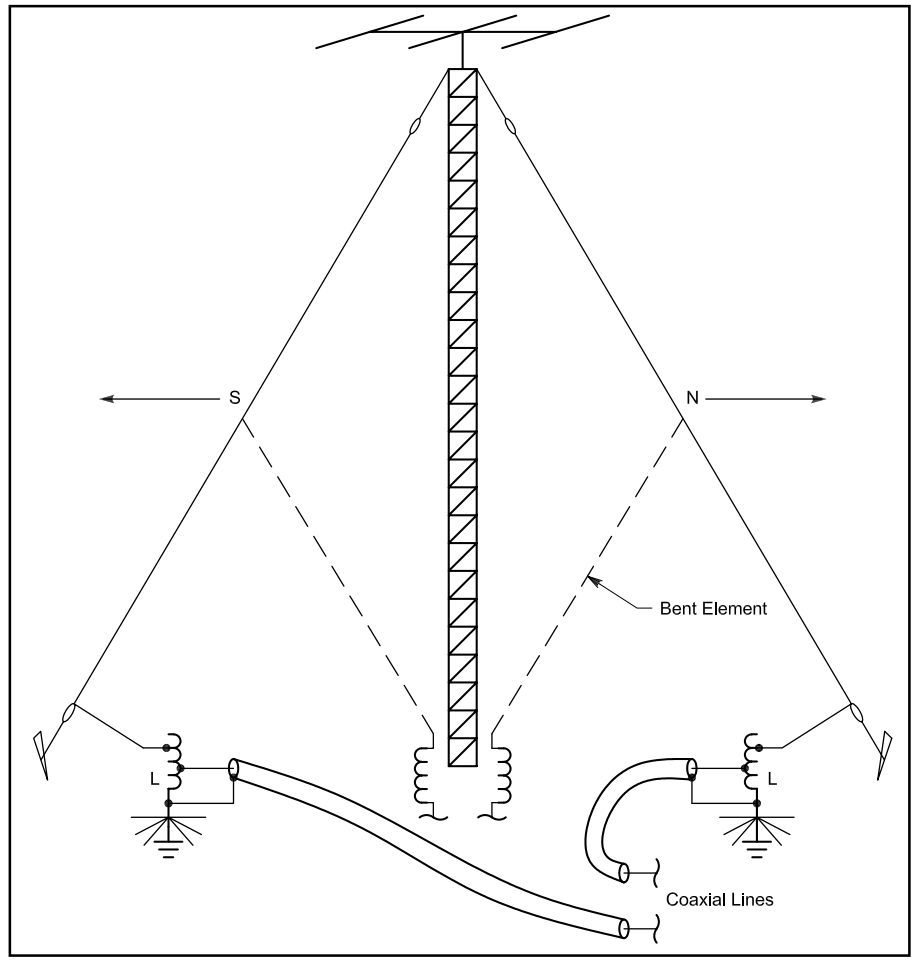

Figure 8—4X4NJ 2-element array.

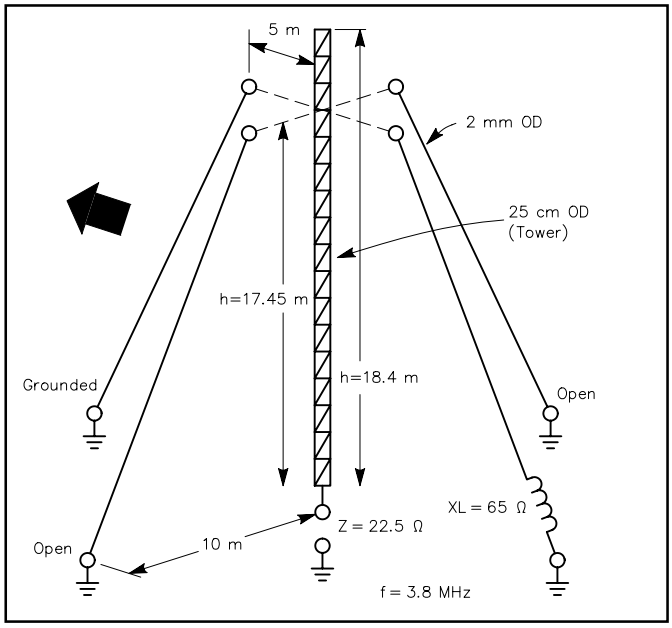

Figure 9—A three element array.

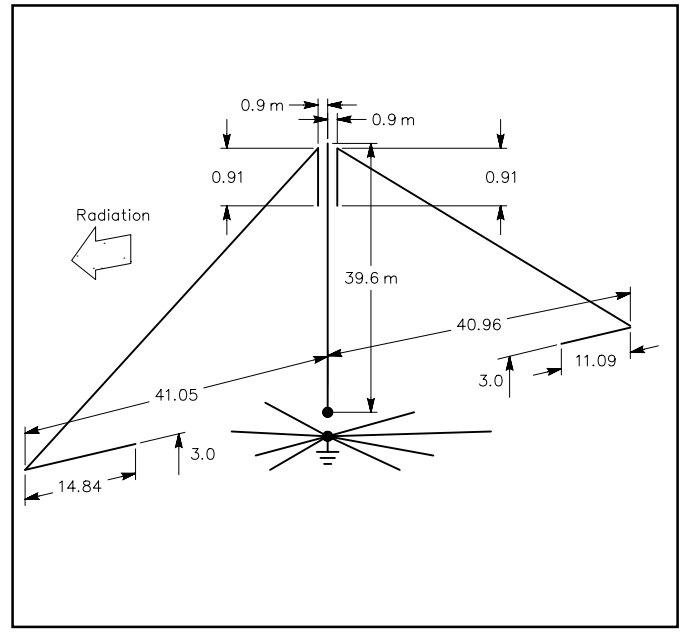

Figure 10—The Spitfire array.

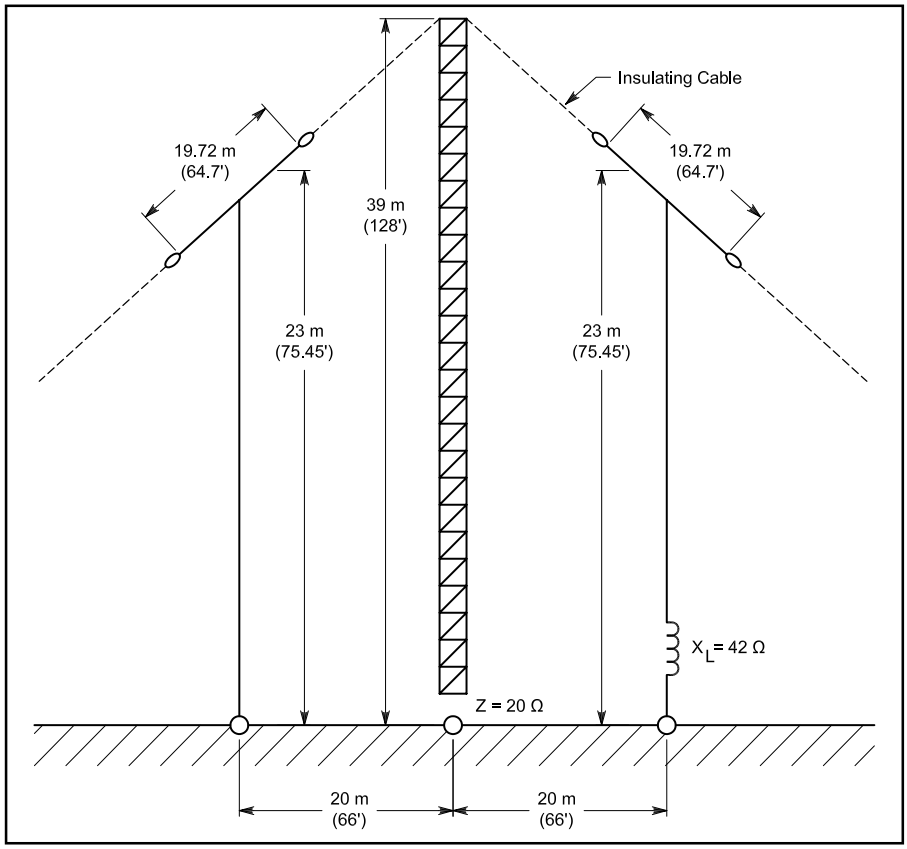

Figure 11—A three element array with vertical top-loaded elements.

ing an additional length of wire to the bottom ends as indicated. One disadvantage is that the relays in this case must be rated for 5 kV or more. A vacuum relay would be typical. Also you have to be careful to decouple the relay coil drive lines from the HV RF on the contacts. Even though the parasitic elements are not directly grounded, it is still important to have a ground screen under the elements due to the very high fields present near the element bottom ends and of course the driven element requires a ground system.

Purely vertical elements can also be used by suspending them from the guy wires and allowing a portion of the guy to act as top loading, as shown in Figure 11.[11]

Comments on Tuning and Adjustment

I have built a number of arrays of this type for 160 meters. I usually begin by carefully modeling the proposed array using *EZNEC* or similar software, being very careful to include conductor losses. Once I think I have a winner I then go out and erect the array. But before adjusting it, I go back to the modeling and model one element at a time, keeping the element lengths the same as the full model, with the other elements either open or absent. What I am looking for is the self-resonant frequency of each element, with the other elements not present, using the dimensions from the complete array model. I then go the actual array and repeat the exercise, only this time adjusting each element to be resonant at the same frequency as the modeling gives for each element in the absence of the other elements. During this part of the tuning process, the other elements are either lowered to the ground or open-circuited so they do not affect the element being adjusted. Resonance can be determined with a dip meter (monitored with a receiver for calibration!). I do this for each element in turn.

Final adjustments for matching should be done with the entire array up. You can also touch up the F/B by placing a source several wavelengths away to minimize the received signal. One word of caution is in order, however. The received signal will be ground wave at a

very low angle, minimizing what is not necessarily the same as maximizing F/B at the higher angles more typical of backward lobes.

One point often overlooked in large wire arrays is the effect of insulation on the resonant length of an element. Standard electrical wire insulation can shift the resonance downward 3-4 percent, seriously mistuning a parasitic element. This shows up during tuning by the need to shorten an element by several feet to obtain the desired self-resonant frequency when insulated wire is used in the field but un-insulated wire in the model. This can be a bit disconcerting if you don't expect it.

Conclusion

I think the forgoing discussion makes very clear the wide range of possibilities for creating a directive array with a switchable pattern when a single support of modest height is available. These arrays can be made from simple components: wire, insulators, and sections of transmission line. For the most part they are quite economical. But for all that they can still be very effective and are possible to implement even in modest size lots. Hopefully this discussion has shown you just how flexible the arrangements are and there is probably a solution for almost any situation.

The discussion is just an overview. If you want to build one of the antennas then you should read carefully the references that are full of practical details. In general each installation will be unique and require a design developed for that situation.

Acknowledgment

I would like to thank Mark Perrin, N7MQ, and George Cutsogeorge, W2VJN, for reading and commenting on the draft article. They helped to reduce the confusion quotient drastically.

Notes

[1]*The ARRL Antenna Book*, 19th edition, 2000, p 6-32. This antenna is also in earlier editions.

[2]John Devoldere, ON4UN, *Low Band DXing*, ARRL, 3rd edition. See examples in chapters 11 and 13.

[3]ARRL Antenna Book, 19th edition, 2000, page 8-8

[4]LB Cebik, W4RNL, "Some Notes on Two-Element Horizontal Phased Arrays," in four parts, *NCJ*, Nov/Dec 2001, pp 4-10; Jan/Feb 2002, pp 4-9; Mar/Apr 2002, pp 3-8; and May/Jun 2002, pp 3-8.

[5]Christman, Duffy, and Breakall, The 160-Meter Sloper System at K3LR, *QST* Aug 1994, pp 36-38. See also *The ARRL Antenna Compendium Volume 4*, pp 9-17

[6]D. C. Mitchell, K8UR, The K8UR Low-Band Vertical Array," *CQ*, Dec 1989, pp 42-45.

[7]R. Severns, N6LF, "Getting the Most from Half-Wave Sloper Arrays," *ARRL Antenna Compendium Volume 7*, Fall 2002.

[8]Tony Preedy, G3LNP, "Single Support Directional Wires," *RADCOM*, Aug and Sep 1997, pp 38-39 and 76-78.

[9]John Stanley, K4ERO, "The Tuned Guy Wire—Gain for (Almost) Free," *ARRL Antenna Compendium Volume 4*, pp 27-29.

[10]Riki Kline, 4X4NJ, "Build a 4X Array For 160 Meters," *QST*, Feb 1985, pp 21-23 and 45. Reprinted in *ARRL's More Wire Antenna Classics II*, 1999, pp 6-21 through 6-24.

[11]John Devoldere, ON4UN, *Low Band DXing*, ARRL, 3rd edition, p 13-48.

[12]John Devoldere, ON4UN, *Low Band DXing*, ARRL, 3rd edition, p 13-50.

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E.T. Ford, "A Directional MF Transmitting Antenna Comprising a Single Guyed Mast and a Sloping-Wire Parasitic Reflector," ICAP 83, IEE conference publication No. 219, part 1, 1983, pp 235-239. Synopsis of this paper can be found in John Belrose, VE2CV, *QST* Technical Correspondence, Sep1984, p 40.

Jurgen Weigl, OE5CWL, "A Shortened 40-Meter Four-Element Sloping Dipole Array," *Ham Radio*, May 1988, pp 74-78.

John Heys, G3BDQ, *Practical Wire Antennas*, RSGB 1989.

Erwin David, G4LQI, *HF Antenna Collection*, RSGB, 1989, 82-90.

Les Moxon, G6XN, *HF Antennas for all Locations*, RSGB, 2nd edition 1993, pp 227-230.

Al Christman, KB8I, "*The Slant-Wire Special*," *ARRL Antenna Compendium Volume 4*, pp 1-7. See also follow-up in *QST* May 1997, Technical Correspondence, pp 74-75.

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NCJ Reviews: The Elecraft K2—A Contester's Perspective

Rick Tavan, N6XI

A new name has begun to appear on contesters' station descriptions. The Elecraft K2/100 and its QRP predecessor, the K2, are showing up in increasing numbers. This article explores why this diminutive rig is suddenly getting so much respect.

As a long-time fan of Wayne Burdick, N6KR, I was thrilled when he teamed up with Eric Swartz, WA6HHQ, in 1999 to launch Elecraft and build the K2. Wayne's earlier rigs were club projects with the Northern California QRP Club, a non-conformist group with fun meetings, exciting projects and a refreshing lack of paperwork. Wayne designed club projects including the Norcal 40, the Sierra and the SST. Each had signature characteristics including no-wire construction, low parts count, minimum power consumption, good reproducibility and a focus on the needs of QRP kit builders. The K2 promised what I had been waiting for—"big-rig" performance in a QRP kit. "Why," I reasoned, "must one settle for marginal AGC, missing bands, inadequate display information, basic selectivity and other tiny rig compromises in order to run low power at high efficiency?"

The K2 lived up to my expectations. Clearly competitive with typical manufactured radios, it was everything my QRP alter ego dreamed of. But was that all? It took a few years to convince me and the rest of the contesting community just how good the K2 really is. Most of us did not take the little rig seriously. I had a blast rag chewing and vacationing with it, but when a contest came along I reverted to the TS-930S and FT-1000MP out of habit and existing station cabling. We made the misguided assumption that their full feature sets were necessary, their monolithic, plug-in filters superior and their performance obviously better. But we were (I was) wrong. As the March 2000 review in *QST* showed, the diminutive K2 had specs unmatched by these heavy, high-end rigs and their peers.

Gradually, contesters began using the K2, not only in QRP events and categories but also as an exciter for 100-watt external amps, sometimes driving a kilowatt. By Autumn 2001 it was clear that Elecraft had a winner. A Team Vertical contingent of K2KW, N6BT, W0YK, KE7X and N6XG took five K2s to Jamaica to prove it in the 2001 CQ Worldwide CW DX Contest. Operating as six single-op, single-band entries with separate call signs from a single location, they broke North American QRP records on five bands and World QRP records on four bands using only K2s and Force 12 vertical arrays set up Field Day-style along the beach. A return expedition in 2002 broke many of the new records again.

Figure 1—Front view of the 100 W K2

They were not alone. Alan Fryer, N3BJ/4, posted this comment on the cq-contest reflector: "After a few years of trying, I won the CQWW CW USA All Band QRP class in 2001. My rig was my original Field Tester K2 #78. The performance of the K2 in full tilt contest conditions is as good or better than any other rig I have ever used and I've used them all ... both at home and at MM and MS stations. The superior close-in dynamic blocking characteristics and the ability to accurately adjust the filters and BFO (using Spectrogram) gives the K2 a leg up on the commercial rigs." Alan broke 1000 Qs QRP, coming in sixth in the world with 1.2M points … from the U.S.

By the time the K2/100 and KPA100 retrofit kit became available, it was clear that this would be a competitive radio for high and low power categories as well as QRP. Team Vertical returned to Jamaica in May 2002 for the CQ WPX CW contest using K2/100s on 10, 15 and 80 meters. Again using temporary verticals, and with even less aluminum than used in the CQ WW effort, K2KW, N6BT, WA6O, KE7X, W0YK, N6WG and N6XI drove 6Y2A to an apparent second place world-wide multi-multi. (Winning entry A61AJ had a square kilometer of permanent towers and many rigs and operators.) The K2 was clearly a highly competitive radio! A pair of K2/100s also found its way onto the WRTC-2002 operating position of N5KO and 9V1YC and home stations such as N4BP, N0SS, N6TR, K7UP and N5TW. A recent reflector thread elicited many proud reports of section and division awards won by K2 operators. It is a real radio.

What makes the K2 a winner? What could be done to improve it? This article attempts a subjective answer. This is not a scientific study. Read the ARRL and *CQ* reviews for that. Also, I am not familiar with all the competitive radios. I know the TS-930S and the FT-1000MP best, but I have done only casual side-by-side comparisons. I will simply describe the features and capabilities of the K2 that I believe are most relevant to contesting as others and I have observed them in action.

A Modular Radio

Elecraft sells two versions of the K2: a basic, 15-W rig and the K2/100 version, which outputs over 100 W. The base unit includes an internal memory

keyer, a four-position configurable crystal filter, dual VFOs and 80-10 m hamband only, CW only coverage. An available "integration kit" converts the basic K2 to a K2/100 model. The power amplifier replaces the top cover of the base unit with no change in overall dimensions. You can exchange the QRP cover and the 100 W cover by removing six screws and exchanging four internal connectors.

This is definitely the most modular radio ever offered to the amateur community. To the basic K2 ($599), a contester of diverse interests would probably add the 100-watt amplifier ($359), SSB adapter ($89), 160 m/2nd receive antenna option ($35) and noise blanker ($35) for a total of $1117. Other options include an audio filter/real-time clock, QRP and 150-W automatic antenna tuners, internal battery for QRP, DB-9 control port for QRP K2s and a variety of matching cases and tilt stands. The QRP tuner fits inside the QRP cover. The 100-W tuner can be housed in a one-inch high accessory case that fits under the K2/100 or in a full-size case along with the PA. This remote PA option, documented by private individuals only, lets owners leave the PA/ATU box behind when they take the QRP base unit on the road.

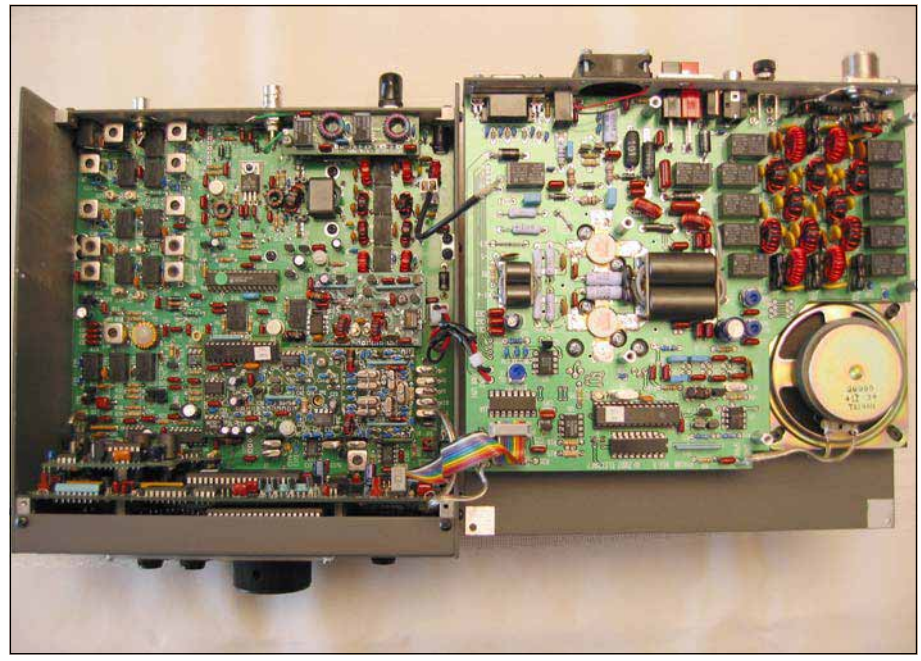

Figure 2—Inside the 100 W K2

Evaluation Criteria

I believe the following characteristics define a winning contest radio, in approximate order of importance:

- Receiver fundamentals
- Reliability, Serviceability and Support
- Ergonomics
- Computer compatibility
- Selectivity
- Transmitting characteristics
- Specialized considerations

(Receiver fundamentals are in clear first place above. The rest are tied for ninth!)

Let's take a look at the K2 through this lens:

Receiver Fundamentals

"If you can't hear 'em, you can't work 'em." Virtually all commercially available transceivers have adequate sensitivity, selectivity, and intermodulation distortion performance for rag chewing, noncompetitive DXing, traffic handling and other operations on uncrowded bands with low levels of atmospheric noise. In a contest, however, overload immunity, crowded band performance and selectivity become critical and the K2 excels. Check out the lab work summarized by Larry Wolfgang, WR1B, of ARRL in his March 2000 *QST* review and reported in detail in the Expanded Report available at **www.arrl.org**. The K2 exceeded the performance of contesting benchmark radios including the FT-1000MP, TS-870, TS-930S, IC-756 PRO and others in most measurements. Elecraft provides a tabular comparison of published ARRL data at **www.elecraft.com**. Scott Prather, N7NB, reports additional lab results in his November 2002 CQ article. For an explanation of how low phase noise, excellent blocking dynamic range and IMD dynamic range help the K2 to excel on crowded bands, see the article by Tadeusz Raczek, SP7HT, in the Sept/Oct 2002 *QEX*. In the words of Ed Hare, W1RFI, "The best dynamic range ever measured in the ARRL Lab at 5 kHz spacing belongs to the Elecraft K2 on 20 meters."

A factor of increasing importance to contesters is noise protection. The noise blankers in most transceivers range from terrible to useless. I consider them to be the shame of the industry. Many fail to suppress noise effectively in any situation. Almost all become useless under crowded contest band conditions because they degrade receiver overload performance to unacceptable levels. The K2 has by far the best noise blanker I have ever heard for suppression of man-made noise, particularly from power line sources. Performance degradation is noticeable on a crowded band, but the radio remains usable. Note that noise blanker effectiveness varies with spectral composition and intensity and your results may vary.

It is worth noting that the K2 receiver is a single conversion design. While most manufacturers tout their triple- and quadruple-conversion schemes as "features," Elecraft has managed to deliver world-class performance with, and perhaps because of, their simpler design. One downside—the 4.915 MHz IF results in natural CW reception on different sides of zero beat on the low and high bands. Unless you are "zero-beat ambidextrous," you will want to use CW NORMAL on some bands and CW REVERSE on others so that they all tune on the same side of zero beat. If you align the filters carefully, you will hear little difference in filter response because of this. The radio remembers your preferences, rendering this subtlety nearly transparent.

Reliability, Serviceability and Support

If all products had support like those from Elecraft, this would be a much more pleasant world. Elecraft's customers perform much of the support function themselves … very well! Imagine sending an e-mail inquiry and getting three on-target responses within hours. It happens daily on the Elecraft reflector. Gary Surrency, AB7MY, did such a good job of helping people this way that Elecraft hired him as their head of customer support! Gary monitors the reflector to make sure that questions receive good, timely answers. And when a question requires Gary or the designers themselves to respond, they do so promptly and concisely. This combination of volunteer and professional support is unique in the industry and highly effective. It also extends to new product design. Elecraft regularly solicits direct customer input and participation in the design of new products.

There is a company-served Web page devoted to Elecraft and third-party modifications, none of which alter the war-

ranty. E-mailed parts orders often ship the same day. Documentation is outstanding, explaining theory of operation and trouble-shooting techniques in enough detail that many non-engineers can determine the exact part or connection that is causing a problem. Nonetheless, reflector traffic shows that many Elecraft customers still ask first and debug later, perhaps because the advice tends to be so good!

Unlike many companies, Elecraft is not afraid to improve their product and then tell the world what they have done. After three years in the field, many user- and vendor-designed modifications have emerged. Elecraft recently announced K2 Rev. B incorporating the best of these changes and offers a set of inexpensive modification kits to upgrade any existing K2 to Rev. B standards.

Ergonomics

The K2 is small, but not so small that critical functions must be buried inside obscure menus, as they are on some portables. The ergonomics are actually quite good considering the size of the panel and the low price of the radio. However, Elecraft did make some compromises. For example, the RIT control is a pot, not a more expensive shaft encoder that could accommodate a RIT-Zero button. When running a pileup, it is best to use split mode in which the A=B button becomes equivalent to RIT-Zero. Also, this computer-controlled radio has trouble sending CW and adjusting RIT at the same time. Fortunately, sending wins and the only ill effect is a choppy side tone when tuning the RIT control while sending. The transmitted signal remains clean.

This lightweight rig does not have the rock solid mechanical feel of a '930 or an 'MP, but at five pounds plus power supply it does pretty well. Although the knobs are small and close, the main tuning knob can be adjusted for a rather nice feel. Nonetheless, some builders have substituted the heavier and slightly larger knob from a Yaesu FT-100 or a spinner knob available from Robert Parker, VE3RPF.

There are two VFOs but no second receiver. (On the other hand, you could purchase a second, basic K2 and still spend less than you would for many mainstream rigs. Hmmm.) The VFO controls are intuitive: A=B, Reverse A/B and Split. A=B is symmetric, setting the inactive VFO to the frequency of the active VFO. Reverse A/B can be persistent (quick push) or temporary (push and hold). I don't use these functions much in contests, but I am glad they are there for working split and for Slow Sunday Sweepstakes in a single-radio configuration.

I think microphone and headphone connectors should be on the rear panel to minimize front desktop clutter. Elecraft puts them on the front panel, just like everyone else. At least there is a speaker jack on the rear that you can use for headphones. The pin-out on the standard 8-pin mike connector is user-defined via jumpers, a nice touch. The manual documents jumper settings for the frustrating array of incompatible pin-outs adopted by the major manufacturers in their zeal to sell proprietary microphones.

Figure 3—Rear view of the 100 W K2

One more nit – several items on the display blink to annunciate modes such as Split, RIT, XIT, Reverse Sideband and VOX. I don't like blinking, finding it distracting and non-intuitive. I prefer dedicated textual annunciators or labeled LEDs. An available mod supplements some of the blinkers with a miniature LED.

Other than my pet peeves, I think human factors engineer N6KR, a degreed cognitive science expert, did a great job of laying out control functions on the front panel and designing a sensible menu system. He also provided two front-panel button functions that are user-assignable to favorite menu items, another nice touch.

Computer Compatibility

The K2/100 includes a DB-9 serial port and it is optional for the QRP K2. (Caution: Use only the custom cable assembled per the instructions. A standard serial cable will not work.) *TRlog* V6.71 recognizes the K2 as a valid radio type and I used it comfortably in the CW and Phone SS contests. I used CT V9.4 during CW WPX, telling it that the K2 was a TS-50. Basic frequency tracking and setting functions worked fine with both loggers. CT got confused a few times, but power cycling the K2 restored everything. TRlog's Shift Key RIT function works strangely, as would be expected with an analog RIT control, and is best ignored. The K2 control protocol, based on Kenwood, is clearly documented and commands can be embedded in TR messages. There are no dedicated band data output lines for controlling antenna switches or band pass filters. Elecraft is working on a nifty external interface box that will address this issue.

Selectivity

Selectivity is good and flexible, even though the K2 lacks some of the selectivity enhancers to which we have become accustomed, such as IF shift / pass-band tuning, notch filters, continuously variable bandwidth, selectable monolithic filters in multiple IF stages and DSP. The filter scheme is based on two 7-pole crystal filters. One is variable-bandwidth, tunable from about 100 to 2000 Hz, primarily for CW use. The other is fixed-bandwidth, designed primarily for SSB and located on the SSB option board. During filter alignment you can position the filters in the pass-band and set the bandwidths of the general-purpose filter. Either filter can be used in any of four selectable filter setups per mode. I have been happy on CW with 700, 500 and 300-Hz nominal bandwidths plus the fixed 2.2-kHz filter. To simulate IF shift on SSB, I set up three versions of the K2's SSB crystal filter—one centered, one shifted up a bit and

one shifted down. I set the fourth available SSB filter position to use the adjustable bandwidth filter at 2.0 kHz, centered. I used all four settings during SS SSB. I think I need to do further work optimizing these filters for SSB contesting, but I don't expect them to work as well as the phone selectivity options on some of the more expensive rigs.

Some owners have reported satisfaction with filter bandwidths as narrow as 100 Hz. Others have complained that the skirts are not as steep as those of some of the plug-in filters for mainstream rigs. This is true but, personally, I like these skirts. An optional audio filter, curiously packaged with a real-time clock, provides two bandwidths of audio filtering, configurable for center frequency. I have used it very little.

The overall filter scheme is simple but adequate. What is lost in bells and whistles is compensated for in outstanding crowded band behavior. Many readers will be familiar with the infamous "mush" characteristic of at least one very popular contest radio. When listening to a pileup or even just a handful of adjacent stations on a crowded band, signals seem to blend together and become difficult to separate. With the K2, however, signals inside the pass-band stand out very well, allowing the "filter between the ears" to do its job, at least on CW. I have operated the K2 side by side with a major "mush" radio and the difference is quite pronounced. I find the K2 more pleasant to listen to, especially for extended periods and under crowded conditions.

Transmitting

CW keying is excellent thanks in part to a clever adaptive ALC algorithm implemented in firmware. The internal keyer works well and supports both Curtis A and B emulations. There is a simple mod that lets you connect an external keyer or computer at the same time, a rare and welcome capability. Keyer memories normally require two button pushes, but there is a way to trade off some lesser-used panel functions for some single-push memories. This would be helpful in field contests that do not justify carrying a computer or external keyer.

The QSK is superb, among the best I have ever heard. With most rigs, I use QSK in a contest only in critical pileup situations, giving my ears a rest by using semi-break-in most of the time. With the K2, I don't give it a thought, leaving the rig in full QSK at all times, and it sounds great. There is no audible difference when I move from QRP to 100 W to driving a QSK amplifier at 1.5 kW!

Elecraft designed SSB "tracking ALC" circuitry (not firmware) to handle a wide range of speech characteristics, antenna loads and operating environments. This does not change the fact that microphone matching is subjective, as with most radios. Some owners have used preamps to match various microphones to the K2 while others have enjoyed plug-compatibility with the same mikes. The Heil IC cartridge provides a warm sound with the K2 and Elecraft offers it in its own handheld microphone. The Heil HC-4 contest/DX cartridge elicits the usual complaints from audiophiles when used with the K2. +5 V dc is available at the connector for electret mikes. The SSB option uses the same fairly narrow crystal filter for both receive and transmit. Some owners have modified it to increase transmitted audio bandwidth while others have been happy with it as is. Several owners have reported difficulty with the VOX characteristics. VOX gain is low and not adjustable and there is no anti-VOX circuitry. VOX delay is panel selectable at fixed values of 0.4 and 1.0 s. A firmware change under consideration at Elecraft may improve VOX behavior, particularly with low-output mikes.

There is no SSB monitor. You may or may not consider this a problem, depending on "how you drive." I usually like to hear myself. N6KR muses that additional circuitry could be devised to provide a monitor, a good project for the independent modification inventors out there.

SWR fold-back is fairly aggressive but not a problem when driving an amplifier or well-behaved antenna. Further improvement is in the works at Elecraft global software headquarters in Belmont, CA (a.k.a. the QTH of N6KR).

Specialized Considerations

Transmitter cleanliness is particularly important for multi-rig operation (SO2R, M/M, M/S, M/2) and in RF-saturated locations like Europe and Japan. In ARRL measurements, only the IC-756 PRO generated lower phase noise than the K2. Empirical observations at 6Y2A M/M HP were favorable, with no one reporting phase noise problems originating from the three K2s, all driving kWs. The 10M K2 suffered heavy noise from a JST JRC-245 operating outside the contest on 6 meters. K7UP enjoyed using a pair of QRP K2s for SO2R in the 2002 Sweepstakes and reported no noise problems.

For expeditions, size and weight are important. The K2 is a winner in this regard. A lot smaller than a breadbox and weighing in at five pounds, a fully tricked-out K2/100 fits in a corner of a suitcase. (Oh, for a correspondingly compact kilowatt!) The svelte Astron SS20 or Samlex 1223 20-A switching power supplies provide ample power. In the CW WPX at 6Y2A, we used the larger Astron SS30 supplies for headroom and mutual sparing—each could have powered two K2s although that was never necessary. Elecraft makes no attempt to sell a proprietary or private-labeled power supply at an inflated price. They do recommend positioning a switcher well away from the rig. Ignoring this good advice, I have placed several different supplies within a foot of the K2 without noticing any interference. However, I have heard hash from cheap accessory power supplies placed directly above the rig.

The optional antenna tuners are not necessary if you are driving an external amplifier, but for QRP to 100-W operation into less than perfect antennas, they are wonderful. They are nearly identical electrically, differing mainly in the ratings of their parts. They use relay-switched fixed value components instead of motor-driven variables. They are fully automatic, searching for resonance and remembering the settings for each band/antenna port combination. Once you tune them, they reset instantly as you change bands and antenna ports. If you have both ATUs, one inside the QRP base unit and the other mounted remotely with the PA, the firmware transparently bypasses the QRP tuner and uses the QRO unit only. This seamless integration is just one of many firmware delicacies that I continue to discover as I use and adapt the K2.

The KPA100 has a tiny cooling fan on the back of the heat sink that is surprisingly shrill. Although I barely hear it through my Heil Proset, I do set the option that it cycles on and off as needed. At 6Y2A, our maiden voyage with the K2/100 to a tropical venue, we also used muffin fans on the heat sinks as a precaution but in retrospect it was probably not necessary. Driving typical amplifiers, the K2 loafs at 60-80 W output. In SS CW, I noticed that the heat sink was never too hot to touch for five or ten seconds. On SSB, it was barely warm. At 100 W, however, the heat sink can get hot enough that you don't rest your hand on it.

Firmware options accommodate RTTY and PSK31 and include additional user-defined filter settings. The Elecraft Website includes ample material on using the K2 on digital modes. I have not yet dabbled with them. It also has good transverter support, with target band frequency readout, and is beginning to show up as the IF in some VHF/UHF contest stations. Its low-noise, single conversion design should be an advantage here.

Both versions of the K2 have unusually low current drain on receive and excellent under-voltage tolerance on transmit. Compare 150-300 mA for the K2 or 350-550 mA for the K2/100 to the 1-3 A drawn on receive by traditional "big rigs." This makes Elecraft a natural choice for field operation on batteries or with small generators and limited fuel.

In the future, remote control may be-

come important to many of us. Although remotely controlled contest stations are few and new at this point, the K2 is a strong candidate. Freeware K2 Remote, available at the Elecraft Web site, lets you control the K2 from a PC via TCP/IP. This could be a direct connection, local area network, dialup circuit or the Internet. K2 Remote offers a nearly full-function, on-screen control panel. Elecraft encourages others to develop alternative remote control programs.

Visually impaired contesters will welcome another piece of Elecraft freeware, K2 Voice, which provides voice annunciation of K2 operating parameters. John Glass, NU6P, operated my K2 comfortably at Field Day 2001 without K2 Voice, but he agreed it would be good to have. Elecraft is also designing an audible annunciator that will not require a computer.

Building It

This radio comes as a kit, so there is one thing to consider when evaluating the K2 that you don't need to worry about with other contest rigs—building the thing. Good news, folks—Heathkit is back! Elecraft's meticulous attention to detail is similar to that of the late, great kit giant. The clear diagrams and extensive handholding bring back memories of the good old days. Even better, the instructions are less pedantic and verbose than those from Benton Harbor. On nearly every page I had one of those "Ah hah!" moments, marveling at some clever design wrinkle, assembly technique or particularly clear instruction. There are remarkably few errors, parts problems and inconsistencies, thanks in part to Elecraft's prudent use of field-testing prior to production release. I participated in that test of the KPA100 and later built a production unit from scratch. The field test process was extremely valuable.

Assembly is in phases, with "smoke tests" along the way. Most of the test environment needed to complete the kit is built-in, so all you really need is a DMM and a receiver. Basic rig alignment is straightforward. Filter setup can be done by ear if your ear is good, but there is a nifty piece of software called *Spectrogram* (third party shareware, $40) that makes it easier and fun. You connect audio from the K2 to the audio input of your computer, run Spectrogram and see a plot of the rig's filter response. "Piece o' cake!"

For some, kit building is a pleasure and this facet of the K2 is welcome. For others it is drudgery or physically impossible. For them there is a cadre of builders who, for a reasonable fee, will build and align a K2. The Elecraft Web site lists many of them. Some hams are willing to build but dislike winding toroids. The K2 has lots of them and Elecraft service reports show that poorly tinned toroid leads are the leading source of construction problems. Therefore, Elecraft endorses a third-party supplier of pre-wound toroids. Personally, winding toroids does not bother me and I am getting better at stripping and tinning the enamel-coated wire!

This is not a kit for beginners because it is large and fairly dense. But any ham who has built a few simpler kits successfully can expect to complete a K2 without difficulty.

Bottom Line

I am convinced. The laboratory stats are impressive but, frankly, I prefer to let the radio speak for itself. It is the cleanest sounding of the three "serious" radios that I use regularly, particularly on CW. Although I bought it for the satisfaction of building a high performance QRP radio for traveling, it has now won a position as my CW rig of choice for home contesting and for any expedition.

I must confess to minimal phone contest experience with the K2. I used it in SS SSB 2002 and did not change my opinion about phone contesting in general. The rig performed well although I missed the pass-band tuning of the TS-930. I'm less certain about phone DX contesting, at least on 40m where a second receiver seems essential. But my K2 will certainly be Rig 2, and often Rig 1, as I grow into SO2R operation.

In terms of cost effectiveness, the K2 wins all the chips. For about $1100 you get better performance than rigs costing $2000, $3000 or more. You get the pride of contesting success with a rig you built yourself. You get copious advice and assistance on-line and you can enhance and repair it yourself. The K2 is an amazing accomplishment.

Thank you to N6KR and WA6HHQ of Elecraft for helping me to understand some of the design features and tradeoffs of their delightful rig. Thanks to W0YK and N0SS for editorial assistance, discussion and on-the-air tests. And thanks to those who are quoted or mentioned here, most of whom gave their permission. NCJ

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Contesting and QSL Volume

In the Correspondence section of the September/October NCJ, Cort, K4WI, wondered how others handled the QSL chores for contest operations, specifically the many multiple Qs (same band/same mode). Here's what other contesters are doing.

From Bob, K2UT

This has long been a subject of debate in the ham community. I have no idea how long you've been licensed, but I'm starting to become an "old timer" having been licensed for 28 years (I turn 40 this year).

Personally, I consider QSLing the final courtesy of a contact. If someone wants my card, I'll gladly send it. Since I only get 400 to 500 a year, it doesn't matter to me if they include an SASE or not. Many of my Qs are via WAS nets (slowly creeping towards 5BWAS), so a fair number of cards are handled through the nets' QSL buros.

If I send a card, I usually include an SASE if I really need it and if it's somewhat rare. For fellow NJ Qs, I don't bother. I have gotten cards back with a note like "this is our 4th band!" or the like. I read the comments, so if someone said something like "this is the 3rd card for the same band/mode combo" I would take it seriously. You might try a nice note on the QSL ... hopefully they'll get the hint.

My Elmer lives in a fairly rare state (New Mexico) and was making in excess of 100K Qs/year during contests. Unless someone included a SASE or the return card could be sent via the DX buro, he didn't answer QSLs. He tries to look for comments like "thanks for the one of the last states I need" and will usually reply to them.

When we could tell who was new by callsigns, then he'd always QSL new guys, sometimes mentioning that an SASE is usually appreciated for the hard states. I'm thinking about this ... most of the WAS net buros don't require that you worked the station ON the net to handle a card, so you might be able to "cheat" that way; I've got SASEs at a number of domestic buros (like KB5IPQ). If I wanted your card, you could save a few dollars by sending cards to IPQ for all guys that he handles (most of them have a list of who they serve on-line).

Still a lot of work, but you get to QSL more folks for less money. Buy cheap cards. We get 1000 for about $40 here. I also have my $120 for 200 type cards, but they are reserved for special uses.

From John, WA9ALS

Some people must just print labels for the whole contest and send. If the log says I've sent one, I don't send again. And I'm way behind, trying to figure out how to catch up!

From Bill, W7TVF

I have finally found someone who shares my sentiment on working numerous times on an individual band and requesting QSL cards for every one of the contacts. I am sure that you have experienced all of the episodes but I'd like to mention one instance last year when I was 5W0VF.

One individual worked me eight times on 160 meters, and when confronted he told me that he wanted to make sure that he was in the log. But the irony of this is that he never requested a card. How greedy can one person be?

I do not QSL via the bureau, as I don't even belong to the bureau just for the reason that I cannot afford to answer thousands of cards from people who want everything free. One "gentleman" confronted me at a convention and asked where his QSL card was as he had sent it through the bureau to save 34 cents. This man is a multimillionaire. I guess that I shouldn't have replied to him as I did but I was the only active amateur in Nevada for almost 30 years and I was deluged with QSL cards from all over the world and replied to every one of them regardless of how they requested them.

I can no longer do that as I am retired and don't have the financial means to continue it. I check each card and if they have received a card for that band I enclose their card in their SASE and do not enclose my card.

From Garry NI6T

My rule is ONE QSL per band-mode.

From Pete, N4ZR

I use the capability in *DX4WIN* to preemptively QSL the first QSO with a given station on a given band/mode combination. That way, I don't feel I even need to look at the bureau cards I receive, and my conscience is intact.

My last batch was 7000 QSOs, on about 4000 cards, and (my labor excluded) it cost me under 5 cents a CARD. I print QSO data directly on cards I have printed locally, to reduce cost and time (sticking on labels is expensive and slow). I have figured out the weight of QSLs where it makes sense to ship directly instead of through the ARRL, and routinely do that.

I believe the real solution, though, lies in the Logbook of the World project, when that finally becomes a reality.

From George, 5B4AGC

I get this all the time. With 140,000 QSOs in the log from here in 5 years you can imagine my buro stacks.

It's easy to deal with if you have the window for "previous QSOs" open. There you can see if the station has a CW/20 m QSL already, in which case I ditch the card. I have 10,000 cards printed at a time to get the best price and it saves a lot of cards if you send confirmation of all QSOs made with him/her even if you only get a card for, say, one 20 m QSO.

If there are a lot of QSOs I usually print directly to the card where I can fit 7 QSOs nicely. *DX4WIN* saves me a lot of effort and cards this way and it's fast too. BTW, if the card comes to me directly I will still send a card for the same QSO again, just in case he lost the first one.

From Bob, W7TSQ

I have *DX4WIN* but have not really used it so I am not sure about an answer to your question. However, in *LOGPlus!* each response is shown and a date when the answer was entered into the label list. So this tells me how many and when (providing that I sent it about the date entered). I do not get very many card requests for my call (except form JA's) so not too much of a problem.

But for the calls that I manage, I seem to get more. So for the last year and a half, I have been keeping a list of answers. Not too hard as I can copy the .DBF file into *QuattroPro* (or *Excel*) and list date actually sent, especially for buro cards. So what I do is compare how and when; if one is direct and one a buro, I will answer the direct since maybe a buro problem, providing SAE + postage is included.

However I put a label on the card pointing out that this is the #x answer and when the previous one was sent and that it is not appreciated by a manager as it makes more work. If it is a second buro request, I make a label and put it on his card. If it is third or greater, it goes into the round file!

Also, I judge the card if it does not say PSE QSL, I might not respond at all, especially if I know it to be a big contest operation. It seems that many are just QSLing every contact so that you will work them again next time. If these stations would just answer requests, it would help a lot so that they would get worked again. NCJ

Contesting from Prince Edward Island: An Interview with VY2ZM

Ari Korhonen, OH5DX

By now most active contesters are aware that Jeff, K1ZM, established a world-class contest station in PEI (Prince Edward Island), VY2. Here are Jeff's comments on the new station.

OH5DX: You have a very competitive location on Cape Cod. What led to the decision to establish another contest QTH in VY2?

K1ZM: Cape Cod is where my family roots are and I fully intended to retire there with a fine all-band station right at the edge of the Atlantic Ocean.

However, here in the USA, local zoning regulations are making the erection of tall towers with Amateur radio antennas increasingly difficult, and that is essentially what happened to me on Cape Cod.

I erected one 40-meter tower in 1997 and planned to add one more of similar height in 1999, plus an 80-meter four-square array. However, it became a real nightmare with local zoning authorities in my town and the neighbors objected to my antenna plans. Thus I wound up only receiving a permit for one more small 25-meter tower with no possibility for futher expansion at that QTH.

Thus there would never be a four-square for 80 m and no chance to really develop an array for 160 m from that location. So I will KEEP that QTH and live there most likely in the Winter once I retire fully, but look toward VY2 as my really competitive contest location in the future. Any future developmental efforts on the antenna side will take place here now in VY2 and not on Cape Cod.

The principal reasons for investing in property in VY2 were these:

a) Land is relatively inexpensive on PEI (especially considering the US dollar exhange rate versus the Canadian dollar).

b) Local zoning regulations were more liberal and it appeared I would at long last be FREE to develop antennas of size and dimensions that I WANTED rather than what local land use authorities might say they WOULD ALLOW ME to erect. This is a HUGE difference to someone who wishes to erect aggressive towers and a serious contest station!

For example, not only might I erect a full-sized four-square array for 80 meters, I could also erect an even larger array for use on 1.8 MHz, which is my first love in Amateur Radio.

c) A move to PEI would place me CLOSER to Europe on the great circle path which is of critical importance on the low bands when working in a DX contest. For example, PEI is more than 4 degrees farther north than Cape Cod in latitude and it is also more than 7.25 degrees farther east than Cape Cod in terms of longitude.

A view of the 4-element VY2ZM 160-meter phased array, showing its rectangular footprint. The radiators are full-sized Rohn tower, on insulated bases, using phillystran guys.

d) Both locations were oceanfront (salt water) locations in terms of takeoff to Europe, and I could actually drive to PEI as there is a land bridge connecting New Brunswick to VY2.

e) VY2 is a separate (and RARE) multiplier in the CQ 160 Meter contests and also in the ARRL DX contests. This also offered material advantages over Cape Cod in certain contests.

f) Lastly, over the years, I have observed the very great success of Jack Leahy, VE1ZZ, on the low bands. For all my life I have been off the back of VE1ZZ's antennas on the low bands. Now, for the first time in my life, Jack would be off the back of *my* antenna on 160!

OH5DX: Now that you've operated a few times from VY2, what would you say are the main differences between Cape Cod and VY2 as far as propagation is concerned?

K1ZM: Well, what a wonderful question. Let me see...

VY2, being closer to Europe, seems to be produce signals out of Europe that are at least 3 to 4 S units stronger, on average, than any other place I have operated from on the USA Atlantic seaboard.

I can quite often work stations that most USA stations cannot hear, for example. I also can listen on a given frequency during a 160 meter contest and hear major US multi-multi stations calling CQ on a frequency and, at the same time, hear loud Europeans working each other on the other side. I can usually copy the Europeans quite a bit louder than the USA stations (as long as I am beaming towards Europe with my antenna), and the USA stations do not even know these stations are there.

Many times I can call and work these stations with ease, which is quite a rewarding experience.

One other thing I have noticed also is that it is possible to be heard over in Europe for 2-3 hours after local European sunrise. This simply never happens from Cape Cod. I have worked GM3POI as late as 1300Z already and, when we reach the bottom of the solar cycle, I think I might actually be able to work Clive 24 hours around the clock, as long

The view from the top of the Southeast tower of the 160-meter array looking Northwest out over the Gulf of St. Lawrence. To the left is the Northeast tower of the array, and to the right is a 100-foot tower for HF Yagis. A new home under construction is shown behind the towers.

The station setup during the CQ WW 160 Meter CW Contest in January 2002. Peter, WW2Y, is shown on the left, and Rob, K2WI, is on the right. The contest operation employed an FT1000D on the run station and two Drake R4C's as the outboard "chase" position receivers.

as we are at the Winter solstice period (around December 21).

Lastly, VY2 seems not to suffer much from auroral absorption, at least that I can determine so far, and by being farther north, there is very little summertime QRN. It is possible to work European stations on 160 m all summer long, some with enormous signals. I would have to say that, overall, this is a wonderful place to work the low bands from all year long. I wish I lived here full-time, but at the moment, that is not possible.

OH5DX: Can you tell us something about the antenna system/equipment?

K1ZM: The 160 meter transmit array is a *four-rectangle*, and should not be confused with a classic four-square array.

The classic four-square array produces 5.68dB of forward gain and can be switched in four directions (with unidirectional patterns). My antenna produces about 8.25dB of forward gain and can produce gain in six patterns, some of which are multidirectional.

For example:

1) Unidirectional to Europe: 8.25 dB of gain

2) Unidirectional to VK/ZL/KH6: 8.25 dB of gain

3) Broadside to EU and VK/ZL/KH6: 5 dB of gain in each direction

4) North and East (at the same time): 6 dB of gain in each direction

5) South and West (at the same time): 6 dB of gain in each direction

6) NW (to KL7) and SE (to ZS6) at the same time: 3 dB of gain in each direction

The front-to-back for the major lobes (NE and SW) is between 15-18 dB, which means that USA stations can usually hear me well enough to call me in domestic contests even when I am beaming (running) Europe. This is a material advantage over a classic four-square array that has a front-to-back of about 25-30dB. This antenna was designed to maintain a presence off the back of the array when running Europeans in a contest for two reasons:

a) To ensure that USA stations in W1-W4 could still hear me well enough to call me in a contest, and

b) To ensure that USA stations would realize that the frequency was in use and not start up a CQ right on top of me while I was beaming to Europe.

This is a principal design consideration and it has proven to be quite useful so far in DX contests that I have operated from VY2.

The station inside the shack here is a Yaesu FT1000D driving an old Amp Supply amplifier running 1 kW dc input power to the PA stage. There is also a backup AL-1500 available, if needed. In contests, two sidecar Drake R4C's with Sherwood filters are employed for "multiplier searching" and for listening simultaneously in pileups on separate receive antennas.

Since we do a lot of single-band 160-meter multioperator contesting here (with friends Rob, K2WI, and Peter, WW2Y/K2TOP), this station alignment is quite useful in order to pick multiple callers out of a European pileup, - without the need to go "QRZ?" after each QSO. We often pick out about 5-6 call signs from a European pileup after a single CQ, and it is quite efficient to work them in a string from 3 operating positions, each with a computer, keying, and access to the *run* station. After we have exhausted the list of callers each of us may have heard, *then* we call CQ again, which allows the Europeans to hear us better, without a constant pileup occurring over in EU. It is really very, very efficient and we do it all the time to maximize our throughput when the band is wide open to Europe from here.

Receive antennas here include about 6 Beverages, some 700 m long. We are currently planning the installation of a six radiator vertical array receive antenna this summer: six verticals with a 5/8 wave × 1/4 wave footprint, which will be a driven array with about 35 dB front to back. This will be a dedicated, remote receive antenna about 1500M off to the side of the transmit antenna when beaming to Europe. It will employ phase cancellation techniques in order to allow simultaneous CQing on, say, 1824 kHz, with the ability to listen to Europe as close as 1820 kHz and have a quiet receive noise floor on each of the R4Cs. We have employed such techniques before at WW2Y and K2TOP, but never with such a sophisticated receive antenna, and never with so much physical separation between our XMIT array and our receive antenna.

Since this property size is more than 1.7 km long, we will be able to install this antenna on my own parcel, which is fully compliant with contest rules for receive antennas as presently written. The antenna will be quite distant but still on my own land, which should be quite interesting. We are anxious to put this enhancement into actual operation for the 2002/2003 low band season.

OH5DX: You must have received quite a few comments on your signal. They're pretty good, I suppose?

K1ZM: Two things are worthy of comment:

a) Old 160 m friends (S56A/G3SED/G4OBK) and others tell us that we are hearing even the weakest EU stations that are calling us in a 160 m contest. This means we are able to hear into the weakest layers of stations, even those using 50 W into a short longwire-type antenna.

b) Good friends like OH2BH advise that VY2ZM can often be heard when no other NA stations are coming through into Europe.

These types of comments are most kind and let us know that all our hard work last summer during 2001 was useful and is now being rewarded.

OH5DX: Any plans for the future at VY2ZM?

K1ZM: I have already explained about plans for the new receive "sixpack" of verticals that is on the drawing board.

a) We are also going to improve the Beverage system. Snow and ice here on PEI are quite damaging, and we have already learned that more durable (reliable) supports are necessary in order to keep the Beverages up in the air. We also will increase the wire size and use more supports in the future.

b) This summer, a full-sized four-square array will be installed for 80 meters. This will allow expansion of DXing and contesting to 3.5MHz, and the long-term plan is to erect an array of *four* four-squares for use on 3.5 MHz—we call it a 16-Square—with each radiator in the four-square being a four-square of its own.

These kinds of dreams would NEVER have been possible on Cape Cod! If this antenna ever becomes a reality, we believe it will be the first in the world that has been attempted.

c) A second HF tower will go up this summer at 45 meters tall, to complement the existing 30-meter tall HF tower that went up last summer.

When these towers are installed, we will begin (in summer 2003) with the addition of HF stacked Yagis for 40-10 meters. I also plan to erect a 10-element 6 meter Yagi on one of the towers, as sporadic E skip into EU on 50 MHz from here is excellent, - even during the bottom of the sunspot cycle. I hope to find time one day to attempt DXCC on 6 meters. It will come someday—all things in due time!

OH5DX: You've experienced just about everything ham radio contesting can offer. How does operating from VY2ZM rank in there?

K1ZM: Well, it has to rank right up there. I am quickly learning why VE1ZZ has been so successful on the low bands over the years. We have a saying here in the USA, "If you cannot beat 'em, then you should think about joining them!"

A view of VY2 in Winter, showing the four radiators of the 160-meter array in the background and the HF tower in the left foreground.

So far, I am really enjoying this place and it has to rank right up there along with some other things I have done like:

a) Being the first East Coast USA station to work JA long path at sunset on 160M (1996/1997)

b) Being the first Asian station to work the USA West Coast via long path at sunset on 160 m (from A61AJ in 1998).

c) Being the first Caribbean station to work JA on 160 m (from NP4A in 1981 via short path).

There are still things that can be achieved from here, and I am especially looking forward to the bottom of the sunspot cycle from VY2, when I know it will be possible to work into Southeast Asia on the long path on 160 meters with regularity.

So, there is lots more to do, and I hope to live long enough to see these things happen in my lifetime.

OH5DX: It's a remote location. How do you get there and is snow much of a problem?

K1ZM: It is not all that bad, really. Driving time up here from New York is 16 hours by car, 13 hours from Cape Cod.

One can also fly into Charlottetown (the capital city) via a Boeing 747, and then it is only a short one-hour drive in a rental car to the Northeastern tip of the island where my QTH is located. So, yes, it is remote, but a lot easier to get here, I would say, when compared to having to take a ferry out to Mariehamm or perhaps to OJ0 from Helsinki.

But, yes, the winter weather is rather severe! In 2001, there was measurable snow depth of 15 feet (4.5 meters out here), and when that happens, you need a snowmobile to get in here from the highway 1.7 km away.We use it quite often with a sled to transport our gear.

There is also pack ice on the Gulf of Saint Lawrence as far as the eye can see in late-January, and icebergs can be seen floating down from VO1 in mid winter. The seal population can be seen birthing their young in the winter out on the ice from the shore, - so it is an interesting place in the wintertime! Plus the wind is always blowing here from the Northwest in the Winter.

It can get quite cold here in VY2, and one must always respect Mother Nature in a place like this!

Fortunately, I was born in New England and enjoy skiing and other winter sports. So, while PEI commands respect (you must recognize human limitations in such weather), it is not all that bad as long as you do not take chances. I must say that I have buried my snowmobile in 3-4 meter snowdrifts a couple of times already, and my local VY2 friends thought it was quite comical to learn what this US guy from NY did because of his inexperience on a snow-scooter, - especially when they came to help me locate my snowmobile after a 4-meter snowfall one day last January.

So, you live and learn and adapt to new circumstances.

I guess that is it from this side. I do wish to thank all my low band contest friends in OH for working us in the various contests. For that, we are most grateful and we look forward to more repeat QSOs from here as we head DOWN the sunspot cycle to 2005/2006/2007! NCJ

WRTC-2002 Wraps Up In A True Formula One Spirit

Martti Laine, OH2BH
WRTC-2002 Organizing Committee

(This was received just before Christmas.—Ed.)

December 15, 2002, marked a final gathering of the WRTC-2002 Organizing Committee and of all the spirited WRTC hosts in the shadow of a Formula racing track in Vantaa, near the Helsinki Airport.

Following an official report and a handover of the remaining work and accounts to Contest Club Finland (CCF), it was time for some fun activities. All the hosting station groups selected their driver and went for a session of serious racing. A total of ten (10) drivers, representing the same number of WRTC hosting teams, completed warm-up and qualifying laps and finally ran an actual race. These racing cars employed 10 hp engines; hence the race was quite speedy indeed.

The finish line was cut first by Toni, OH2JTE (1), followed by Pasi, OH2MZB (2) and Esa, OH2KPU (3). A large scoreboard kept the crowd entertained, just as at the WRTC-2002.

Race winners (L-R): Pasi, OH2MZB (2nd place), Toni, OH2JTE (1st place), and Esa, OH2KPU (3rd place) pose after winning an auto race contested by WRTC-2002 host teams.

The day was completed with a viewing of the WRTC official video that will be launched to the public at a CCF meeting January 17-19, 2003. It is a dynamite "sports video" that shows amateur radio contesting for the first time as a serious sport. The narration is by ESPN commentator Kurt Perry, and the script is by WRTC competitor James Brooks, 9V1YC.

Some 32,000 OJ1 through OJ8 QSL cards were to be released during the month of January, while the certificates and T-shirts for the competing general participants will keep CCF active well into the year 2003. WRTC-2002 was financially sound, and it is expected that the event's finances will stay positive even after these obligatory activities are completed.

While wrapping up their organizational activities and responsibilities, the WRTC-2002 Organizing Committee members and the hosts finished off the evening by story telling about their hosted teams. They also wanted to extend Season's Greetings to everyone involved in the WRTC-2002 in various parts of the world. NCJ

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Station Profile

Conducted by Mark Beckwith, N5OT

The temperature is in the teens outside; it is very cold. Although only January in Oklahoma, it has already snowed 3 times, with possibly a 4th coming next week. It is truly the dead of winter. The Hardware Addict is staring out the window; boredom consumes. Being originally from California, the Hardware Addict never really understood the term "cabin fever." Sure, we've all heard of it, but until you've been forced to put up a 20-meter Yagi in biting wind with a wind chill factor of minus five degrees in order to be ready for the next contest, you just don't know how frustrating it can be.

So here we sit, the Hardware Addict and me, thinking "what is winter good for, anyway?" We ponder as we listen to the biting wind beat on the shack from without. Suddenly we both look at each other. Mischievous, wry smiles breaking across our faces, and we blurt out the same answer:

"160 meters!"

Crazy or What?

Have you tuned the band lately? The Hardware Addict and I are up at N5OT in the mornings now because, well, we're finally getting up some antennas and, well, there are contests this time of year. Before the sun comes up, we tune around 160 meters and ever since October we've been hearing this real loud guy who's not in Georgia. It's K9DX, John Battin, in Illinois. John is one of those guys on 160 who drives you crazy by working stations you can't hear. It certainly drives us crazy, anyway.

This was a familiar call. Licensed in 1951 at 13 years old as W9MEM, John broke into contesting at age 15 by getting on in the old CD parties. He retired 4 years ago as an executive for Motorola with an engineering background.

I first ragchewed with K9DX one night on 80 meters from W6UE about 20 years ago. I have always remembered that QSO as highly gentlemanly.[1] I remember he did a stint in the late 80's as CEO of Wavetek in San Diego, but I lost track of him when he moved back to W9. He made regular appearances in my contest logs.

After a little asking around, we learned that John had built a spectacular station on the low bands, with antennas we had only dreamed about. Not only that, the entire operation is remoted so he can use it from his home about 30 miles away.

Anyway, we had to know more, because N5OT is about 16 miles away from my house. One night the Hardware Addict started a conversation with John, and I listened in. I could almost not write fast enough (John sends pretty fast). Here are some excerpts from the QSO.

Out of Frustration

"This whole remote thing started out three years ago in the February FOC contest. The noise came on sort of all-of-a-sudden and I just couldn't work Europe on 80 or 160. It aggravated me." This sounded really familiar. I have certainly been aggravated by not being able to work Europe on 160 meters, but I didn't realize you could do anything about it. I was very interested in John's solution.

"So, in March three years ago I started looking around for some land and I bought 80 acres of cornfield. It had nothing—no power, no phone, nothing. I built a 30 × 60 ft pole barn with a heated and air conditioned office on the inside." Now the Hardware Addict was getting so excited he could hardly send. You saw his pole barn in the first Hardware Addict article a few years back. The Hardware Addict has since enclosed 700 square feet of insulated radio space inside his 1500-square-foot barn. This was all sounding real familiar to both of us. Maybe we could be as loud as K9DX someday.

A Long Road

John stressed that *NCJ* readers would be more interested in the process than in the final result, although I did get a look at his 160 Meter Monster Array article (elsewhere in this very issue) and I could not put it down. "The most interesting question is not what was done, but rather why was it done that way," John says. Then he related a most brilliant piece of wisdom. If you take nothing else away from K9DX's experience, this should be it:

"When I decided to build this remote station, I began by assembling the entire remote system at my house." Like I said, brilliant. He breadboarded the entire thing at home where he could de-bug it. I thought of all the people who have put up a station and then remoted it, more as an afterthought. "I put extra telephone lines to the house so I could loop through the network and back to the remote equipment on the other side of the room. By being able to sit on one side of the room and see and measure exactly what was going at the remote equipment eliminated many hours of frustration and driving time."

Remote Control

"Most guys that have remote stations use it for casual QSOs. I was aiming for a no-compromise contest-level station. I found very quickly that if you digitize the audio with MPG or LDCELP, it was fine for SSB but for CW there was too much delay and the quantitizing noise caused the background noise to key along with the CW, which drove me crazy. I wanted a delay of less than 10 ms round trip. Many of the current remote stations send CW using a keyboard at the home location. I wanted to key the radio with my old fashioned paddle and also key the radio with contest software running on the computer at the house." John settled on a good old-fashioned analog audio link to get transmitted CW out. "So I key a tone on the outbound audio line, and at the remote end it goes through an audio filter, is detected, and keys the radio. For SSB, hum on the analog line was a big problem, especially with any audio compression activated on the transceiver. This was not a problem with the digitized audio, but with analog lines, the hum is down only 25 or 30 dB. I use a W2WHY 8-band equalizer at the remote to roll off 300 Hz and below. It does a pretty good job.

"One thing I found was that there seemed to be no telephone line that would not drop out from time to time. The lines may not drop out from an audio point of view, but the central switch causes occasional jumps in delay, which in turn, cause the modems to drop out and re-train themselves. If you're controlling your radio directly, and you have a drop out, you're in deep trouble. As a result, probably the most important thing I did was put a computer at the remote that controls the radio and everything else. Then I communicate with the computer through modems using *PCAnywhere* software. The computer display at the house is exactly the same as that at the remote. It is a touch screen, so the system can be controlled by either touching the display or using the mouse. By using the link for only computer-to-computer communications, the data line can go down for several seconds and I can just continue right on with the QSO."

John has used a progression of links to get data and audio back and forth. "Up to now everything has been done with telephone lines. I started out dial-up, and now have 4 wire leased lines. I am thinking about making one of next summer's projects the installation of a wide band RF link. I need more bandwidth."

I chuckled. "Don't we all!" I thought.

Radios

"I went through Kachinas. I tried the Pegasus. The Kachina had a great operator interface, but I didn't like the receiver. The Pegasus had a good operator interface, but I didn't like the receiver. I thought the remote control on the

Yaesus was just bad. The first rig I remoted acceptably was a Kenwood 870. It was a good radio plus it had very good computer control."

About a year later John replaced the '870 with an Icom 781. "I did that because even though the '870 had a much better computer interface, I was too close to a number of other big stations, and the '870 was susceptible to overload. The '781 is much more bulletproof, but then I had to hardwire switches to control the preamp, attenuators and noise blanker so they could be remote controlled."

Antennas

It is important to note that John uses his remote station primarily on 80 and 160 meters because it is superior to his home station. His home station is no slouch by conventional standards: two towers with a full-sized 40/20/15/10-meter Cubex quad, and a KT-34 for the high bands. "Home is a pain - noise and zoning problems." Been there. Done that. For sure.

At the remote, the first transmitting antennas to go up were 4-Squares for 80 and 160, made of Titanex verticals. John also has a wealth of knowledge about receiving antennas for the low bands. "I put up my basic 4-direction beverages. 580 foot phased beverage pairs in 4 directions, spaced 200 feet. All cables are underground. There's 15 miles of buried coax. It all comes up through the floor of the pole barn." Nothing short of first rate.

After a year of smoke-testing, he made changes. "I increased the length of the 90 foot Titanex verticals to 110 feet on the 160 meter 4-square. They worked better. I added a 70 foot telephone pole and put up a Bencher Skyhawk tribander on it along with the software to remotely turn it. I added phased 1300 foot Beverages to the Northeast and Southwest, a 1100 foot single wire Beverage to the west, and a 900 foot single wire to the east." His experience with what was becoming one of the premiere low-band stations in the world was growing. "The Beverages are important, and need further refinement. Sometimes I would think the 1300 foot Beverages were a total waste on 80 meters, but the other morning I worked a VU on 80 and the long Beverages heard it much better than any other antenna out there." John is also a believer in redundancy. "The verticals and Beverages are seldom correlated on QSB. The best way to predict which antenna will be the best is to click the switch and see what happens!" I can only wonder what that must be like.

Finally this past October (2002), John put the finishing touches on his newest and best antenna. "I spent all summer putting up the 9-element 160-meter array. As far as I know, this is the largest array in captivity."

Software

John uses quite a mix of software at K9DX. He uses *PCAnywhere* on the digital link from the home computer to the remote computer. He uses *TRlog* as his contest software of choice. "I use *TRX Manager* by F6DEX to control the radio and rotator. It is a very stable program that adapts to almost any radio. Laurent has been quick to make several changes I have requested." To run the Alpha 87a amplifiers, he uses their factory software that gives complete control and metering.

One really unique software-hardware trick John has employed is a product by Environmental Solutions called the AR-16. Quite simply, it is a bank of 16 separate switches that are remote controlled. "I have two of them. You'd be surprised how quickly you use up 32 switches." This is the switch bank, that, for instance, controls all of the antenna selection, and the IC-781's noise blanker, preamp and attenuators.

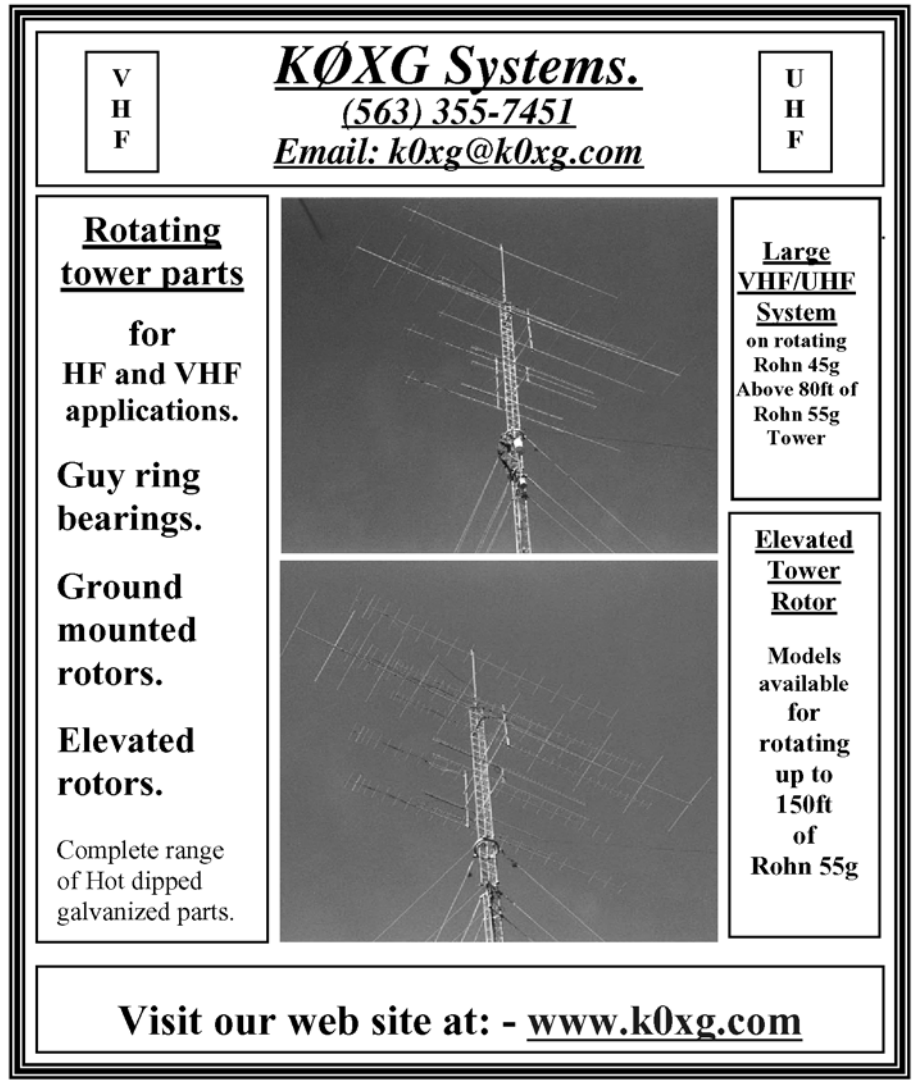
"There is another neat program - a Wattmeter called WinWatt by RF Applications. I run it on 160 and 80 to look at forward and reflected power, and monitor power into hybrid dummy loads. It shows me exactly how the array is functioning."

Wrap-Up

John sums it up with a single sentence. "The most important thing is: this is a remote station that is being optimized to be very competitive on 80 and 160 CW." Many of us have thought for years just what a nightmare it would be to have a competitive remote CW station. John has managed to get closer than just about anyone to making it a reality.

He closes with one of his few remaining elusive desires: "The station is in a continuous state of evolution. My biggest wish? I want a knob. One day, I am going to have a knob to tune my radio and put the mouse in the closet for good."

Good luck with it, John. Say, have you considered SO2R? NCJ



VHF-UHF Contesting

Jon K. Jones, N0JK
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Powerball Lottery and expanded VHF Contest results in *QST*

N0JK

The $300 million jackpot for the December 24 Powerball Lottery drawing got the attention of many, including myself. I normally don't play the Powerball, as the odds of losing your "investment" are almost 100%. But with a prize this rich, I bought a couple of tickets. Who knows? I then went to bed for a long winter's nap.

I didn't think much about it until I woke up the next morning with my wife yelling and waving one of the tickets in my face. "You won! All the numbers match!" I checked, and much to my wondering eyes, the numbers on the ticket did match the lottery numbers in the paper. We went on to claim the prize, party big time, pay off our credit card balances and home loan and plan a big round-the-world vacation this summer (with stops on Malpelo, Aves, Pratas and Heard for some 6m operating). Then I pondered on what charities I would like to fund.

I have always enjoyed Amateur Radio and appreciate the good work the ARRL has done over the years. I figured a $10 million contribution to "the General Fund" would be appreciated. I called up Mary Hobart, K1MMH, and Dan Henderson, N1ND, about my idea. They were obviously pleased. I had one condition, however, to my gift. Read on and see if you can guess what it is.

Ned Stearns, AA7A, did a great job with the "Results, 2002 ARRL June VHF QSO Party" in the January 2003 *QST*. He analyzed the contest both from the propagation standpoint and from the operators themselves. He noted, as I did, that "the low level of sporadic E propagation significantly affected the 2002 VHF QSO Party competition." Ned went on to say "stations that rely on this mode of propagation (E_s) in the June Contest to amass a winning score are missing from the regional leader tables." He observed that other stations—particularly those with multiple bands—were ready to take advantage of the lack of E_s as an opportunity. Take home lesson: it is worth adding more bands to your station. In a June Contest with poor conditions, it may pay off with a victory.

Geography counts as well. Ned discussed how "historically, the southernmost stations tend to dominate. The E-skip drought this year appears to have had more impact on the southern tier stations, leaving the door open to northern operators." Great analysis of how station location interacts with propagation.

Ned provided some interesting background information on the top scoring operators and multi-ops. "Larry, N0LL, participated in his 83rd (approximately) consecutive VHF contest this year." I didn't know that! He mentioned Pete, K9PW's, "impressive display of VHF/UHF operating prowess in this year's event. . . . This year he moved into the Single Operator Portable Category and not only won the region but also established regional and national record setting scores in the process." Pete set the record despite the poor conditions. One comment by Ned piqued my interest "One would be hard-pressed to assemble a Multioperator contest station in central Kansas that would realistically compete with W2SZ/1 on Mount Greylock in Western Massachusetts." Surely you remember WB0DRL located in central Kansas!? In the 1987 June VHF QSO Party we came very close, and would have beat W2SZ/1 if we had had K5JL's 6-meter line score. We spent too much time working tropo on 220, 432 and 1296 MHz that year and neglected the 6-meter position.

I enjoyed reading the summary results, but something seemed missing. Of course - the line scores and soapbox comments. To me, those are often as interesting as the commentary and analysis. I began to get the impression the only stations who participated in the June contest were those winning their regional classes or placing in the national "Top Ten." That is now the only way to get your call listed in *QST*. Otherwise, you are put out back on a web page. Emil Pocock, W3EP, did a great job discussing the merits of having information in print (*QST*) versus on the Web:

"Electronic media are also ephemeral. E-mail messages last only as long as someone saves them on a computer; rapid improvements make even saved files obsolete and inaccessible within a short time. Web pages, which provide opportunities to present timely information in more organized and elaborate fashion, are fleeting. They can and do disappear overnight, never to be recovered and rarely saved."—QST November 2002 p 88.

I am concerned the Web based "expanded ARRL Contest Results" will be fleeting as well. Right now I can pick up a back issue of *QST* and look at the results of the June 1987 VHF QSO Party in which WB0DRL had a shot at W2SZ/2. I can see all the scores, pictures and read the Soap Box comments. Fifteen years from now, will the web page with the June 2002 VHF QSO Party "expanded" results be accessible or available to review? Will only the elite "Top Ten" in each category and regions be remembered years after the Web pages have vanished?

The ARRL says that "real excitement has been generated by the expansion of coverage (of contests) on the ARRL Web … Members will find expanded feature write-ups, Top Ten Box Scores with additional information, Station Descriptions tables, extensive Soap Box items, more photos, and much more."—*QST*, November 2002 p 104. "Even so" as Emil aptly notes "there remains the problem of permanence. Books and magazines retained for decades and centuries; they are read and reread, put on shelves as references and revered as a continuous historical record of achievement. After all, printed books have survived for centuries, little changed since they first appeared more than 500 years ago."—*QST*, November 2002, p 88.

You may have guessed the condition of my gift to the ARRL. Print the "Expanded VHF Contest Results" in *QST* along with the Soap Box, line scores, station description tables, lots of pictures, summary results and everything else you are now putting on the Web for all the major VHF contests. And throw in the HF ones, too. Do this, and the $10 million is yours for the General Fund.

Just after I spoke these words to Dan, I heard a loud ringing in my ears. It was my alarm clock. I got up and checked the lottery tickets. No matches. Winning the Powerball Lottery and trying to expand the VHF Contest coverage in *QST* was all a dream. If enough of you care about this issue and write your ARRL Division Director, perhaps expanding the contest coverage in *QST* could happen.

Untapped population of "would-be" VHF contesters

Mark, K2QO, posted the following on the VHF Contesting Reflector:

But wait, there is a HUGE Untapped population of would-be VHFers on HFPACK(on Yahoo groups), the FT817 Yahoo Group, Adventure Radio Society

and QRP-L!! These guys must be shown the WA5JVB cheap beams and how to find good QTHs. If just 10% of these 6000 plus guys on the lists that have 6 or 2 would work a couple hours apiece, well the math is OBVIOUS! You wouldn't be able to find a font big enough to spell SUCCESS.

Mark has a great idea. Along the same line, W1XX suggested a "Hilltopper" QRP Portable Category for the CQ VHF Contest that would be a natural for the FT-817 ops:

Thus, how about a subset of the QRP category called the "Hilltopper QRP," which would be a quickie 6-hour operation, where you would either drive or hike to a nice spot with minimal QRP 10-W radio, operate from the start of the contest until dark and go home? Perhaps from a rare grid square. If you liked it so much and wanted to do it on the 2nd day, go to another neat spot in another nearby grid square, sign "portable (call area)" to distinguish it from the previous day's operation and rovers, operate six hours and call it quits. How's that for fun? This "easy does it" approach could promote many more portable operations that don't require the heavy commitment of a full-fledged operation.

Sounds like an interesting idea. Comments to John, W1XX, at **W1XX@aol.com**.

Portable antenna ideas

By the time you read this, many will be making plans for the June 2003 VHF QSO Party. If you are planning a portable or rover operation, and need antennas, consider the WA5VJB series of "Cheap Yagis." Kent, WA5VJB, designed a series of Yagis for 144 through 1296 MHz for portable, home and Rover use. These antennas are relatively small, easily constructed from common materials with available tools, and have surprising performance. They have the highest dB/dollar ratio of any antenna around. Typical cost is $5-15 depending on if you have to buy the wood and wire. Their gain has been verified on the Central States VHF Society antenna range, and they have won in several categories, beating commercial antennas. For more info see **www.clarc.org/Articles/uhf.htm** or **www.fredspinner.com/W0FMS/CheapYagi**.

E_S-F2 via "right angle side scatter"

George, K8NXI, in EN90 Ohio, E-mailed me details of an interesting occurrence on the 6 Meter band during a widespread Es opening January 06, 2003. He stumbled across XE1MM working NH7RO at 0200 UTC. K8NXI had his beam at a 175-degree bearing. XE1MM was about S5 and George could also hear NH7RO Q5! NH7RO was not moving the meter. After XE1MM and NH7RO completed their QSO, George worked XE1MM. Heavy QRM prevented a unique 3-way 6-meter QSO between Ohio, Mexico and Hawaii. XE1MM and NH7RO were QSOing via F2, George worked XE1MM via multi-hop E_s. There was no direct F2 between Hawaii and Ohio. One scenario is NH7RO's signal traveled via F2 from Hawaii to Mexico City, then scattered and some residual proceeded north via E_s to K8NXI. F2 on 6 meters side scatter is well known and documented. For example, J3/K6MYC worked many Europeans via side scatter (beam heading 70-90 degrees) as well as A45XR in November 2002. I have worked KH6/K6MIO via F2 side scatter in 2000. E_s to F2 links occur every so often, but are for direct great circle paths. K8NXI's report is the first I am aware of for an E_s-F2 side scatter path. With the solar flux still over 180, an opening like this could occur in the January VHF Sweepstakes. The 6-meter band still has some surprises.

January VHF SS

After two dull VHF contests in a row, the 2003 running of the Jan. VHF SS surprised many with some E_s and even some F2 DX excitement. W1JJM in Rhode Island worked NH7RO in Hawaii Sunday afternoon on 6 meters!

The contest started out slow Saturday. Saturday evening there was some tropo in the Midwest. I worked W5LUA, WW2R and WA5TKU (all EM13 in the Dallas/Ft. Worth metroplex) while running 10 W and a 4-element Yagi on 2m. They are about 400 miles from my portable site in the Kansas Flint Hills. I even heard a station in EL09. EME was reported by many to be good on 2M Saturday night. W0EKZ worked several Germans.

Sunday morning, N0LL worked WB4WXE on a loud meteor burst on 6m. Out in Oregon, N7DB CN85 had good 2 m tropo to K7YVZ (DN13), and Sunday evening KD7WH (DN40) worked a loud K7CA (DM37) at 0148 UTC on 2 m.

Sunday afternoon is when the 6-meter fireworks started. E_s popped up at 2030 UTC between the central US and east coast. At 2045 UTC, NH7RO (BK29_ heard a "CQ contest" by a station in FN20 on 50.130. At 2048 UTC, Jeff worked W1JJM (FN41) on 50.135! No other stateside stations worked Hawaii. Prop mechanism? My guess is an E_s link (possibly not all the way to the ground) then on to Hawaii via F2. At 1950 UTC, KH6SX had reported California comms up to 45 MHz on F2. What a great contest QSO by two sharp operators.

Most of the E_s was for stations east of the Mississippi River working 1s, 2s, and 3s. K0AZ (EM37) had 1-land well over S9 at 2157 UTC. At 2300 UTC, I began hearing NG4C and KN4SM on my vertical whip. I put up my 2-element Yagi and worked N3DB (FM18) at 2325 UTC. David was my only 6-meter E_s QSO of the contest. By 0025 UTC E_s was gone.

Some aurora showed up for northern tier stations near the end of the contest. K1SIX and K1TOL worked K0KP (EN36) around 0300 UTC.

K0HA (EN10) reported 83 QSOs on 6 meters during the Sunday afternoon Es opening.

And an all time first on 6 meters during the contest: KH7R and N4BQW/KH9 on Wake Island worked each other on 51110 at 2223 on 19 Jan. This is the first reported 6-meter contact between Wake Island and Hawaii.

Great EME conditions, some winter tropo, a Sunday afternoon Es opening and a Rhode Island to Hawaii DX contact! The January 2003 VHF Sweepstakes was a well deserved surprise.

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Contest Tips, Tricks & Techniques

Gary Sutcliffe, W9XT

Reconfiguring your station

W9XT

Serious contesters go to great efforts in designing and building their stations. One important goal of station design is to maximize operating efficiency. Now imagine having to redesign your station every few weeks because the configuration you used in the last contest is grossly inefficient for the next one. That is a fact of life for contesters who switch between multi-op efforts, SO2R and conventional single op at their station. This month's issue will look at ways to make station re-configuration a bit easier.

KL7RA points out that the big multi-op stations have six or more separate stations. These are often scattered around a large operating room or maybe in separate rooms. Rich notes that the strategy of separating bands conflicts with single operator contesting. Paul, K4JA, reflects Rich's comments and says that the bigger and more complex the station, the more difficult it is to reconfigure to SO2R. Paul says that most of the big multi-multis don't do SO2R for that reason.

KL7RA makes frequent switches between multi-op and SO2R efforts. Each one takes Rich the better part of a weekend, most of which he claims is on his back under the operating bench. That is an effort only the most dedicated contesters would endure on a regular basis!

One of the main problems in station reconfiguration is the antenna system. You have to deal with feed lines, coax switches and rotor boxes. KL7RA has a few suggestions for handling it all. First, Rich suggests using remote relay switch boxes instead of manual coax switches. That way, you only need to move the control box instead of a bundle of coax lines.

If you have multiple rotating antennas, you will have to move the rotor control boxes around as well. Rich likes having a number of antennas fixed in different directions instead. Multiple rotor controls may be replaced by a single-switch control box. Up in Alaska, not having to worry about broken rotors in the winter is nice, too. Rich also notes that the after-market rotor PC interfaces are another way to minimize moving rotor boxes back and forth. Moving a few RS-232 cables is definitely easier.

KL7RA is moving his station south this summer, which will get him out from under the auroral zone. In his new station, he plans on having two rows of operating benches. The backs of the benches will face each other, and there will be room to walk between them. This gives easy access to the backs of the radios, something Rich suggests for any station. In this setup, moving antenna controls and lines is as easy as moving them across the walkway.

K5AF uses a homebrew interface containing four 4PDT relays to switch everything between his Omni VIs. Paul likes it because it lets either radio play any role and is foolproof. Paul also keeps a separate TR directory for each contest. Each directory has unique config files for that contest and hardware configuration.

K4OJ and his father W1CW, SK, built a station designed for easy reconfiguration. Every remote switch controller and rotor box has a cable with a 6-pin Jones plug on it. Each cable to the rotors and switches has a socket at the main everyday station for the control boxes to plug into. They have wired "extension cords" with Jones connectors at each end between the main station and the remote station locations. When it is time to set up the other stations for a multi-op they can unplug the control box at the regular station, plug in the extension cord and plug the control box back in at the remote site. That is much easier than untangling and pulling cables back and forth each time.

Coax lines to K4OJ's shack come into the house through bulkheads. When it is time to reconfigure for multi-op, the coaxes are unscrewed from the bulkhead and routed to the second station location, which is the porch. The primary station is configured for SO2R, and can operate on any band that has not had its antennas routed to the other station.

K4JA has built a couple of really fine stations designed primarily for multi-single and multi-two operation in DX contests. Starting with KS9K, Paul retired to Virginia as K4JA to build on what he learned up in the Black Hole of Wisconsin. Paul's station is often used SO2R between the ARRL and CQWW DX contests.

The center two stations in the operating room at K4JA have all the SO2R switching and filter equipment. To go from multi-single to SO2R requires moving two feed lines, some antenna switches and the rotor control boxes. Check out Paul's Web site at **www.k4ja.com** showing the station.

KE4OAR operates SO2R for phone contests. He does a single rig operation for CW and RTTY contests. Chuck says limitations in gray matter for CW and limitations in RTTY hardware prevent SO2R on these modes. Paul installed a Six Pack antenna switch and a DX Doubler for handling SO2R switching between two transceivers.

Going from SO2R to regular single op is as easy as setting the switches to one radio. Chuck also keeps a set of computer logging configuration files for different contests and station configurations.

When he first got interested in RTTY, KE4OAR used a RigBlaster interface. Chuck says it is a nice piece of hardware but it took too much cable changing to reconfigure the station. He has since gone to an interface that plugs into the radio's accessory port.

Bill, K4XS, does not change his station configuration. He leaves it set up as SO2R. Bill feels that new configurations can cause confusion in the heat of the battle.

That wraps up this installment of Contest Tips, Tricks & Techniques. Thanks go out to K4JA, K4OJ, K4XS, K5AF, KE4OAR, and KL7RA for their comments on the topic of station reconfiguration. Also thanks to K4NO for suggesting this topic. If you have a topic you would like to see covered in CTT&T, please drop me a line.

Topic for May-June 2003 (deadline March 12, 2003)

What is the strangest or craziest antenna or other gear you have used in a contest? Did it work?

Send in your ideas on these subjects or suggestions for future topics. You can use the following routes: Mail: 3310 Bonnie Lane, Slinger, WI 53086. Internet: **w9xt@qth.com**. Be sure to get them to me by the deadline. NCJ

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Contest Expeditions

Kenny Silverman, K2KW

Travel Update

K2KW

Just when you thought that traveling with radio gear couldn't get harder, it did. On the plus side, in the beginning of 2003, the Transportation Security Administration (TSA) launched a massive education campaign to give passengers tips on preparing to go through airport screening:

- Make sure you have photo identification (keep it within easy access until you board the plane).
- Don't put prohibited items such as knives and metal scissors in carry-on luggage (most ham tools are prohibited items).
- Avoid wearing metal jewelry and big buckles; they set off metal detectors.
- Don't wear big-soled shoes; they draw extra scrutiny.
- Keep your electronic items in the open; you'll be asked to take them out anyway. (Don't put your keyer paddle in your carry-on. This item has ALWAYS caused screeners to check our hand-carry luggage.)
- Leave gifts you're carrying unwrapped for easier inspection.
- Get to the airport early to check in bags.
- Use airline self-service machines or the Internet to obtain your boarding pass (when checking in luggage, or for international travel, you need to go to the counter to check in and get your boarding pass).

Even with this campaign, there are a lot of people who still aren't prepared. One of the things I do before going to the airport is to remove every item from my pockets except for my travel documents, wallet and keys. When I am about to approach the metal detectors, I quickly remove these items and put them in my computer or carry-on bag. Speaking of computers, if you haven't flown recently, you will need to remove your computer from its bag and send the computer and bag separately through the X-ray machine.

Carry-on luggage is being strictly enforced: one carry-on sized suitcase, and one personal item (computer bag, purse, backpack etc). That's it. I used to like to have my carry-on suitcase, computer bag, and a fanny pack for often-needed items, but no more. If you can't get your stuff into those two items, you will be required to go back to the counter and check it in.

Other travel tips are to put personal belongings in plastic bags so screeners won't have to touch them or can easily identify the contents. This tip also applies to items in your checked luggage in case it is searched. On a recent trip to Jamaica, all of the airports I went through in the USA had the new SUV-size X-ray and bomb detection machines. While departing from Oakland, CA, I was selected to have my check-in bags X-rayed before they were allowed to go down the conveyer belt (and I presume X-rayed again). This new X-ray machine was s-l-o-w. My bags had to go through the X-ray machine 3 times before they found that the bandpass filters were what they were looking for. You can bet next time my bandpass filters will be at the top of my suitcase, and in plastic bags. Maybe with a big sign saying "TSA—remove this first." Passengers were also warned against putting film in checked bags, because the new high power X-ray equipment will damage it.

The TSA now says that check-in bags should be left unlocked! You got it: no locks to prevent theft or accidental opening. If your bag goes through the X-ray machines (in the bowels of the airport) and is flagged to contain questionable items (ham stuff is often in that category), your bag will be hand-searched by TSA. TSA has the authority to forcefully open your bags, so you should not lock the bag or they will break it open. Forcefully opening the case will likely damage it, and may limit its ability to keep all the stuff inside. It's recommended that you secure your bags with something like cable ties or zip ties that will prevent the bag from opening accidentally, but can be cut off easily by TSA. While TSA maintains a complaint desk, they are not responsible for damaged, lost or stolen items. Notice the problem here? If you lock your bags to prevent theft, they can be forcefully opened (and damaged) by TSA with no repercussion. If you don't use a lock, it makes it easier for airline employee theft. Either way, we probably lose.

Oh, another thing the airlines have quietly changed is the luggage allowance. It used to be that you could check in two bags that weighed up to 70 pounds each. In most cases, the weight limit has been changed to a 50-pound maximum. Over 50 pounds and you will be charged a varying premium based on weight. Since many hard-case airline bags weigh 10-20 lbs, that doesn't leave much weight for the important stuff! Most of my DXpedition buddies use the Pelican 1650 case, which weighs 22 lbs. It will be nearly impossible to stay under 50 lbs with that case. Oh well, that's the price of travelling with our hobby. With the change of weight limits, the airlines have also changed the cost for overweight and excess bags. Check with your airline for pricing, since they are all different. But make sure you factor these new costs into your travel budget.

For traveling with radio stuff, I have pretty much come to the following conclusion: limit the gear I take to the absolute minimum, pack every ham item except for my computer in checked luggage, and pay the excess fees for overweight and excess bags. While taking a vacation, I want to minimize the hassles, and this goes a long way towards that goal. In the end, you will remember the hassles more than the extra $$ for checking in all questionable items. NCJ

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Results, October 2002 *NCJ* RTTY Sprint

Recipe for fun: A bunch of dedicated, competitive RTTY ops on a fall evening for 4 hours of fast-paced S&P/CQ/QSY on 80/40/20M! Although last fall's Sprint heard nothing from W8-land, John, W8UL, joined in from Ohio this year. However, 1- and 3-lands were silent! This was balanced by some good DX participation, including EA, KL7, OH, 3 VE areas, and YO. There's no dozing at the keyboard during this one! The QSY rule and being able to work the same station again after both stations have worked 3 others tends to keep you awake!

There were 2 organized teams this time, the TCG Cool Cats and the NCCC. Team competition has been an active and important part of the NAQP as well, and is catching on. Witness the new rules for next year's RTTY Roundup providing for team competition!

Congratulations to everyone who participated, and especially to those 25 elite who submitted Golden Logs (greater than 50 QSOs submitted with none removed). Special thanks are due to Jay, WS7I, for his many hours of log-checking as Contest Manager for this one! Two logs were reclassified as check logs due to not having serial numbers, and some submissions didn't indicate power level clearly. Contact Jay at **ws7i@ewarg.org** for any questions or comments with these results. And note that Doug, W4OX, is the new RTTY Sprint Contest Manager beginning with the March 9, 2003 event.

Psssst! I heard a rumor that a RTTY Sprint contest module might be under development for a popular contesting program. That should really increase log submissions this year!

This year's NCJ RTTY Sprints are on March 9 and October 12. Complete rules are at **www.ncjweb.com**.

Table 1

Top 10 Breakdown

October 2002 *NCJ* RTTY Sprint

Call	*Score*	*QSOs*	*Lost QSOs*	*Mults*
W2UP	8750	250	0	35
W7WW	6528	204	2	32
K7WM	6030	201	0	30
K2PS	5017	173	0	29
W0ETC	4160	160	1	26
W7DPW	3900	130	0	30
KE5OG	3799	131	0	29
N6TQS	3610	95	0	38
W9HLY	3360	120	0	28
K4GMH	3294	122	0	27

Table 2

Golden Logs (Greater than 50 QSOs with none removed)

October 2002 *NCJ* RTTY Sprint

W2UP, K7WM, K2PS, W7DPW, KE5OG, N6TQS, W9HLY, VE6YR, KE4OAR, W8UL, W9ILY, KL7FH, K4WW, W7WHY, WA6BOB, N6EU, VE7ASK, K6OWL, N6EE, VE3GSI, K5CM, WA0SXV, WD9GMK, K5AM, WA9AFM/5

Table 3

Team Scores

October 2002 *NCJ* RTTY Sprint

Call	*Name*	*QTH*	*Score*
TCG Cool Cats			
K7WM	Wayne	AZ	6030
KE4OAR	Chuck	TN	3267
KE5OG	Bill	TX	3799
N6EU	Russ	CA	2366
WB9BSH	Jerry	TN	9
TOTAL			15471
NCCC			
N6TQS	Doug	CA	3610
N6EE	Ron	CA	1925
W6ZZZ	Mark	CA	1280
TOTAL			6815

Table 4

Single Operator Scores

October 2002 *NCJ* RTTY Sprint

Call	*Class*	*Name*	*State*	*QSOs*	*Mults*	*Score*
K2PS	HP	PETE	NJ	173	29	5017
W2EQ	LP	TOM	NJ	39	22	858
W2UP	HP	BARRY	PA	250	35	8750
K4GMH	HP	MIKE	VA	122	27	3294
KE4OAR	HP	CHUCK	TN	121	27	3267
K4WW	HP	BO	KY	104	27	2808
WB9BSH	HP	JERRY	TN	3	3	9
KE5OG	HP	BILL	TX	131	29	3799
K5CM	HP	CONNIE	OK	80	21	1680
K5AM	HP	MARK	NM	63	23	1449
WA9AFM/5	HP	TOM	OK	55	23	1265
K0COP	HP	DAVE	SC	20	12	240
N6TQS	HP	DOUG	CA	95	38	3610
WA6BOB	LP	BOB	CA	92	27	2484
N6EU	HP	RUSS	CA	91	26	2366
K6OWL	LP	MARK	CA	79	25	1975
N6EE	HP	RON	CA	77	25	1925
W6ZZZ	HP	MARK	CA	64	20	1280
W7WW	HP	DAVID	AZ	204	32	6528
K7WM	HP	WAYNE	AZ	201	30	6030
W7DPW	HP	DAVE	WA	130	30	3900
W7WHY	HP	TOM	OR	95	27	2565
W8UL	HP	JOHN	OH	124	26	3224
W9HLY	HP	VERN	IN	120	28	3360
W9ILY	LP	JOHN	IL	117	26	3042
KE9S	LP	JEFF	WI	79	23	1817
WD9GMK	HP	ALAN	IN	73	22	1606
W0ETC	HP	LAR	IA	160	26	4160
WA0SXV	HP	MIKE	MO	60	27	1620
N0AT	LP	RON	MN	29	18	522
KS0M	LP	DICK	MO	16	11	176
N4CW	HP	BERT	MO	10	8	80
VE6YR	HP	BOB	AB	113	29	3277
VE7ASK	LP	BUD	BC	95	22	2090
VE3GSI	HP	ERIC	ON	75	25	1875
VA3XRZ	LP	JULIO	ON	36	18	648
KL7FH	HP	FRANK	AK	101	29	2929
OH4BB	LP	VEIKKO	22	13	286	
YO6BHN	LP	JOSKA	9	6	54	
EA4WC	LP	AL	6	5	30	

Check logs: N0UX, N5PA

Contesting on a Budget

Paul Schaffenberger, K5AF
1703 Brush Creek Dr, San Antonio, TX 78248-2003

Budget Computing – Two Philosophies

When I proposed the topic for this issue's column, it all seemed quite simple. I would get inputs on how to save money with computers, peripherals and software. As the inputs came in, I came to appreciate two completely different approaches to budget computing.

The Digital Divide

The inputs to the column made me appreciate that ham logging and contesting software may be one of the last remaining battlefields between *MS-DOS* and *Windows* applications. The philosophy on saving money expressed by the readers reflects that divide.

There are still plenty of folks out there using *DOS*-based software, and programs such as *NA* and *TR* are elegant and capable, given the minimal computing resources they require. Most 386 or newer computers have no problem using these *DOS* programs.

Because of the low-tech requirements for running *DOS*-based software, contesters like Marc, W6ZZZ, recommend using a dedicated older machine for logging and contesting applications (or you can do what W5BAK discussed in his One Computer Running DOS and Windows article in the Sep/Oct 2002 *NCJ*—Ed). You can find these machines for free or next to nothing (I picked one up off a curbside) and they seem to run forever. Gary, W9XT, recommends putting out the word to friends and neighbors that you can use an older system — sometimes you'll even get one for free.

I'm as good an example as anyone of the *DOS*-only philosophy. I've been using the same computer platform for almost ten years with *TRLog* installed. The system was originally a 386, but was upgraded to a 133 MHz Pentium a few years back. I keep several different releases of the *TR* program in subdirectories for different contests, as some of the features (or lack thereof) seem to fit a particular contest better than others.

The opposite end of the spectrum seems to be the one-computer-does-all approach. With the multi-tasking capabilities of even the least expensive new and used computers on the market today, it is possible to run multiple applications simultaneously, including logging applications.

There is a blur across the spectrum between *DOS*-only and *Windows* multitasking philosophies, with combinations and permutations of *DOS* and *Windows* programs being used around the contesting community.

Some Clear Bargains

Regardless of computing philosophy, a good monitor can make a huge difference in your operating convenience and comfort. If you haven't priced monitors lately, you might be surprised to find how inexpensive a high-quality 17 or 19-inch monitor can be. Face it, we're not getting any younger, and our eyes can use all the help they can get. At $89 after rebate, my Magview 17-inch monitor is one of the best ham radio investments I've ever made, and it is reasonably quiet.

Pete, N4ZR, suggests going a step further. He's ordered a flat-screen LCD monitor to cure his RFI problems from his existing monitor. With prices coming down on these, it may be a worthwhile investment, as they are energy efficient, quiet and almost indestructible.

Speaking of monitors, those using more capable *Windows* machines made some very interesting suggestions. Many folks don't realize that it is possible to run two monitors off the same machine (*Windows 98* and later, I believe) with separate programs on each. Ken, WM5R, runs *TRLog* on one monitor and *DX Atlas* on the other at the N5XU station.

After monitors, storage was mentioned as a great bargain. Perhaps the best deal out there these days is on CDRW drives. A 24X drive can be purchased for as little as $20, and provides inexpensive storage for contest logs, WAV files, program backup discs, and other contest archives.

Finally, networking was mentioned as an inexpensive way of increasing capabilities. Networking software and hardware have become so inexpensive that it makes sense to tie the ham radio computer with other home systems to share files and printers, and allow access to the internet for direct software downloads. Rich, KE3Q, recommends checking with IT friends and professionals for network needs, as they often have older Ethernet cards that they'll give away.

Some Ideas for Bargain Hunters

Contesting sage Gary, W9XT, observes that two-year-old computers are much more capable today than they were back in the DOS days. He recently purchased a very capable used laptop computer for $350. To illustrate Gary's point, veteran contester Dave, K6LL, related how he bought a used Pentium system for $90 and loaded it with five com ports, two sound cards and a W9XT card! He uses two *MMTTY* windows (free software) running on the two sound cards, all integrated with *Writelog*. All this on a $90 system!

Gary also passed along some good pointers on buying used gear:

1. Find a dealer that specializes in used or low-cost systems. (Computergeeks was mentioned for used systems, Tiger Direct and Cyberpowerpc were mentioned for low-cost new systems, and Computergate was mentioned for cables and accessories.)
2. Laptops are a good deal used, but their Achilles heel is the battery. Don't expect a good battery on a used system, and replacements aren't cheap!
3. Used business systems are often "wiped" of their software, including the operating system, which is sometimes replaced with a "demo" system that is devoid of some of the drivers. Gary suggests finding out the status of the operating system before buying.

Freebies Abound

There are plenty of freebies both on the hardware and software side. On the hardware side, most computer repair shops don't repair anything; they simply replace. They often pitch entire systems when they are no longer economical to repair. Usually, anything from their trash heap is yours for the taking. These systems often include good drives, video cards and power supplies, not to mention the case itself. Mike, N4NT, notes that he never buys fans anymore, he just goes to his local computer repair shop, picks up the dead power supplies they are throwing out, and pulls the fans.

Don't forget the "freebies" advertised by some of the major computer chains. These are often useful peripherals, software, or media that cost you nothing after a mail-in rebate. I've seen mice, CD-ROM drives, 100-pack CDR disks, and even hard drives and sound cards advertised for free after rebate.

The real "deals" for freebies are on the software side. They include highly capable logging and contesting software, such as the N1MM logger. Tom notes that he has been distributing this free for the past four years. Dave, K6LL, uses the free *MMTTY* software, which he highly recommends. Ed, K4SB, uses the

free K4CY *Logger* program. There are also working demo disks for several other logging programs, including *TRLog*.

Pete, N4ZR, uses freebie *NEC* tools for antenna modeling, including *4NEC2* and *Multinec*, and *TA* and *YT* for terrain modeling. He does propagation modeling using *VOACAP*. He also uses *Winscope*, which is an audio-range oscilloscope.

It seems that everyone who builds something these days is showing it off on the net. Marc, W6ZZZ, suggests learning good search techniques for search engines such as Google. The result will often be either some usable information or even some applicable software. For example, Marc found detailed instructions on building a 2-meter J-pole antenna through his search efforts.

We've only scratched the surface of a very interesting topic. It will be interesting to see what the coming years hold! Thanks to N1MM, KE3Q, N4NT, K4SB, N4ZR, WM5R, K6LL, W6ZZZ, and W9XT for the great inputs.

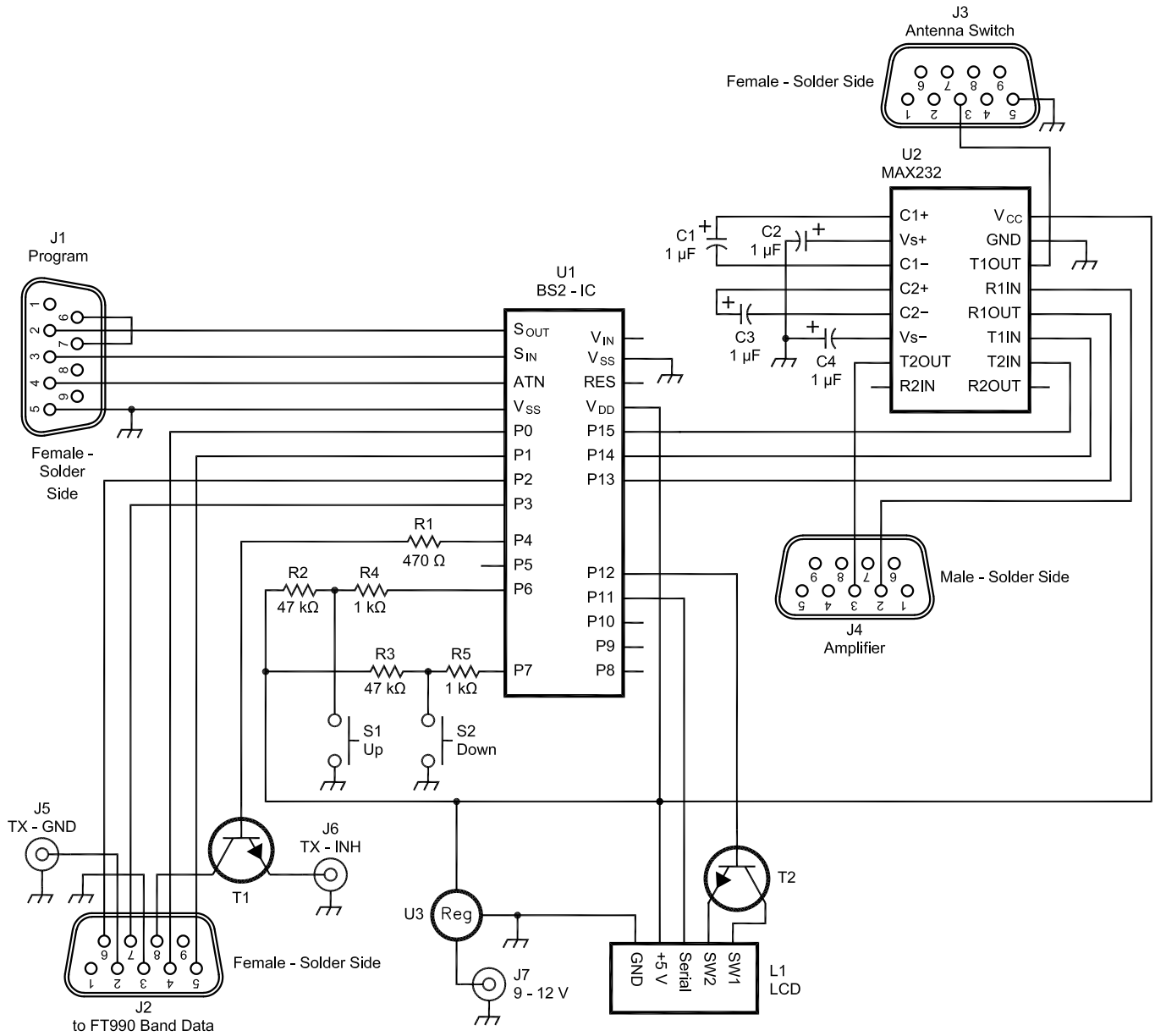
Topic for May-June 2003: Recycled Aluminum

It is often cheaper to rebuild an old beam than to buy new. What are your favorite rebuilding tips? What are the best systems to rebuild? Where do you find replacement parts? Is it worth salvaging old or broken/bent systems? How do you use new design software to make the "resurrected" system even more capable? What physical and durability improvements do you recommend?

NCJ

Feedback

In the November/December issue, we ran Brian, N8WRL's, article titled "Automated Antenna Selection for the ACOM 2000A Amplifier and 2000S Switch". Some errors crept into the schematic diagram on page 25. Here's the correct schematic.



Contesting for Fun

Brian Kassel, K7RE

The Prestigious Contest Character Awards (CCA) for 2002-2003

K7RE

Now that the bulk of the contest season is drawing to a close, I thought that it was time to note the achievements and attained goals of certain contesters. I am sure that you have worked most of these folks, and you definitely would have remembered each of them.

Johnny Amnesia

Johnny forgot, or never knew, what the current contest rules are for the event in which he has decided to operate—well, kind of operate. He asks you for a description and an explanation of the rules after he has responded to your CQ. He heard a contest once, and has decided that all events are the same. He sends a serial number, his name, his power and his mother's maiden name—at 7.5 WPM. This occurs right at the moment before your rate meter is about to peak for an all-time high.

We will be sending Johnny a large supply of Ginko Biloba, if I can remember where I stashed it.

Tommy ESP

Tommy feels that all other contest participants should know, through ESP, his exchange information. His CW sending is so bad that the receiving op has a plethora of choices from which to choose. Tommy spends as much time as possible making his signal as weak and as low quality as possible. Chirps, squeals and pops are Tommy's friends. He'll keep you guessing until your sanity gives up.

Tommy will be receiving a free root canal from our own dentist, Dr. Dementia. No anesthesia is included in this award package, however.

Peter PC

Peter has never been able to find the time to learn his contesting PC software. He is too busy downloading every available freebee on the Net. During the contest he loves to push random function keys to see what they do in this program as opposed to the last application. He strongly feels that software should automatically conform to his muddled recollection of the last seven programs that he has used, all during the current contest. Often he pushes the same erroneous key over and over hoping that somehow the right CW message will be sent.

Peter will be the proud recipient of a 1-terabyte hard drive complete with 6 viruses of our choosing. Each virus will be configured to turn on 30 seconds before the start times of each major contest.

Dick Distinctive

Dick is a cousin of Peter PC. He loves to tinker with his PC's software keying options, like mark ratio, Farnsworth keying and speed. He thinks that his latent creativity is expressed by attempting to send the most unique CW characters on the planet. When asked for a fill, he automatically switches to his vintage bug key, the weights of which were lost many years ago.

Dick will be sent a CD recording of encrypted WW II Nazi naval RTTY traffic, and told that it is really perfectly sent CW. He will be advised of a large cash prize if he provides the text that was actually sent.

Speedy Gonzales II

Speedy has never found it necessary to learn to copy CW above 7 WPM. He compensates by turning up his sending speed to 55+ WPM. When someone actually replies to his CQs at the same speed, he yells "QRM," "QSB," "My dog barked" or "XYL says supper is ready." He just loves to impress beginning ops with how fast he can send his canned exchange.

Speedy will be sent a fully charged 1000 µF/4 kV capacitor—in a plain brown envelope.

Xavier Xmtr Alligator

Xavier has never placed a lot of importance on his receiving capabilities. He worked hard to get the money to pay off the examiner, and to buy his 10 kW amplifier. He never actually makes any QSOs, and those are completed only by accident. But that is not Xavier's goal. Making a really LOUD CQ TEST on all amateur bands is really his aim. His 5-tube receiver failed years ago.

Xavier will be sent a faulty 7.5 kV/5 A transformer. Mysteriously the HV winding seems to have become shorted to the frame—somehow.

Carl Callsign (Uh-oh, is this me?—*Ed*)

Carl worked hard to get his ham ticket, too. His particular creative challenge lies in creating and obtaining new and clever call signs 4 or 5 times a year. Carl does have a bit of a memory problem though, and tends to throw out several different call signs before he actually remembers his currently assigned call.

Carl loves to send his call sign at least three times in each contest QSO, even after you have acknowledged it. In this way, you might get the impression that you copied it wrong the first time, so you ask for a repeat. Carl then gets to send it over again, and again. This further enhances his self worth, and throws your rate down the you-know-what.

Of course Carl also likes to send your call sign several times, just in case you may have forgotten it since the last QSO, 7 seconds ago.

Carl will be sent several call-sign-adorned planters, each with several very healthy stalks of poison oak.

Ricky RIT

Ricky saves time by not ever reading the instruction manual that accompanied his new rig. In fact, he threw out all of the documentation to make room for the rig. He loves to move around the bands calling people 3.5 kHz from their frequency. His radio has been back for repairs countless times. He is on a first- name basis with several UPS drivers, and he is godfather to one of their children.

Ricky will be sent a full packet of expired UPS Brown shipping labels. Ricky's stupidity is not honored here, only his insistence on it.

Dahtee Dit-Dit-Dit

We certainly don't wish to be gender biased in selecting our winners this year. Note the politically correct hyphenated last name. This lady operator has fallen in love with her ancient bug key. She has spent so much time working to save the money to be able to afford the incredibly inflated price found on eBay that she has never found the time to learn how to use it. Strange combinations of characters that Samuel Morse never dreamed of constantly emanate from her shiny, restored classic antique.

She will be sent a CD recording of her many broken QSOs. Ed McMahon will deliver the prize, and convince her that to win the 10 million bucks, she must listen to the CD in its entirety. Oh yeah, about that 10 million bucks—we lied!

Sigusmund Signalreport

Siggy thinks reports like "599" are

meaningless. He feels compelled to give exact signal reports. Actually, we all know deep down that Siggy is correct, strictly speaking. But then Siggy irons his toilet paper, and starches his undershorts, too. On repeats Siggy likes to change the report that he sent originally, as naturally the signal has changed at least 0.1 dB since he sent the first report.

Siggy will be sent a copy of *Anal Behavior for Dummies*, along with a copy of Idiot's *Guide to Numerology*.

And lastly our very top award goes to…

Brian "Cynical Malcontent" Kassel, K7RE

This top prize is awarded to writers who cast aspersions on other operators while still retaining in many ways the characteristics of all of the winners above.

For his award, he is sentenced to contest forever, exposed to all of the souls who made this list.

We are now open to any nominations for next season's awards. Don't look too far, though, before you check your own shack. NCJ

Adventures in Contesting

Last Issue's Photo

The contester deep in thought in the January/February 2003 issue is Jeff, K1ZM. In reality, he's taking a snooze break at a recent VY2ZM effort.

This Issue's photo

Next time it's raining, you climb the tower.

WriteLog for Windows with Rttyrite/WinRTTY/AFC

One Package Handles All Your CW, SSB, and RTTY Contesting Needs

NEW VERSION 10 for Windows, 95, 98, NT 2000

Operate 2 radios with one sound card on RTTY and SSB & Perfect CW transmission.

Tired of obsolete DOS logging packages that force you to use special configurations and don't use all of the power of your computer? WriteLog is the first contest logging software designed to fully deliver the convenience and ease of use of Windows 95, 98 & NT.

WriteLog includes these battle-proven features:

- Work RTTY using any 16-bit (or better) sound card. No other hardware required! Opt. 2 sound cards and run 4 radios
- Full Radio Control
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- Super Check Partial
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- Perfect Log Submission
- Two Radio Support
- Supports All Major Contests in All Modes
- ***Only $75.00*** Ver 9 users upgrade $30.

PLUS These NEW Features:

- RTTY mode AFC - also known as Autotune.
- Audio Compression - now you can save & play back your entire log after a contest, contact by contact from WAV files in your H.D., in CW, SSB, RTTY & PSK31 modes - Via WAV file compression.
- CW Reader - print CW on screen like in a RTTY contest. We also added multi-channel CW reader capability. With a fast PC (350MHz Pentium or faster) WriteLog will decode CW at 6 different pitches on 2 radios simultaneously. Like having a backup operator looking over your shoulder.

"I made the first contest (non RTTY) with WriteLog, and it is FANTASTIC. It is such an improvement for me over CT...I really love it, and from now on anyone who operates from here will HAVE to use this program! I will twist their arms." John, ON4UN

http://www.writelog.com
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High efficiency wound ferrite toroid transformers with isolated 50 ohm windings for minimum noise transfer. Color coded binding post for Beverage wire(s) and ground connections. Teflon and silver SO-239 coax connectors used.

Each unit is individually calibrated to eliminate variations found in mass production.

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KB-3 Two wire end termination transformer. (For two wire switchable systems).
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Contest Calendar

Compiled by Bruce Horn, WA7BNM
bhorn@hornucopia.com

Here's the list of major contests to help you plan your contesting activity through June 2003. The web version of this calendar is updated more frequently and lists contests for the next 12 months. It can be found at **www.hornucopia.com/contestcal/**.

Changes of interest include: a new Kuwait (9K) 15-Meter Contest has been added in March, and the Japan International DX Contest high band and low band CW segments have been combined into a single contest in April.

As usual, please notify me of any corrections or additions to this calendar. I can be contacted at my callbook address or via e-mail at **bhorn@hornucopia.com**. Good luck and have fun!

March 2003

ARRL Inter. DX Contest, SSB	0000Z, Mar 1 to 2400Z, Mar 2
Open Ukraine RTTY Championship	2200Z, Mar 1 to 0159Z, Mar 2
DARC 10-Meter Digital Contest	1100Z-1700Z, Mar 2
SARL Field Day Contest	1000Z, Mar 8 to 1000Z, Mar 9
RSGB Commonwealth Contest, CW	1000Z, Mar 8 to 1000Z, Mar 9
North American Sprint, RTTY	0000Z-0400Z, Mar 9
UBA Spring Contest, CW	0700Z-1100Z, Mar 9
NSARA Contest	1200Z-1600Z and 1800Z-2200Z, Mar 9
Wisconsin QSO Party	1800Z, Mar 9 to 0100Z, Mar 10
YLISSB QSO Party, SSB	0000Z, Mar 15 to 2400Z, Mar 16
10-10 Mobile Contest	0000Z-2359Z, Mar 15
BARTG Spring RTTY Contest	0200Z, Mar 15 to 0200Z, Mar 17
SARL VHF/UHF Contest	1000Z, Mar 15 to 1000Z, Mar 16
Russian DX Contest	1200Z, Mar 15 to 1200Z, Mar 16
AGCW VHF/UHF Contest	1600Z-2100Z, Mar 15
Virginia QSO Party	1800Z, Mar 15 to 0200Z, Mar 17
Oklahoma QSO Party	2300Z, Mar 21 to 2300Z, Mar 23
CLARA and Family HF Contest	1700Z, Mar 22 to 1700Z, Mar 23
9K 15-Meter Contest	1200Z-1600Z, Mar 23
Spring QRP Homebrewer Sprint	0000Z-0400Z, Mar 24
CQ WW WPX Contest, SSB	0000Z, Mar 29 to 2400Z, Mar 30

April 2003

SARL 80-Meter QSO Party	1700Z-2000Z, Apr 3
MARAC County Hunters Contest, SSB	0000Z, Apr 5 to 2400Z, Apr 6
SP DX Contest	1500Z, Apr 5 to 1500Z, Apr 6
EA RTTY Contest	1600Z, Apr 5 to 1600Z, Apr 6
Missouri QSO Party	1800Z, Apr 5 to 0500Z, Apr 6 and 1800Z-2400Z, Apr 6
QCWA QSO Party	1900Z, Apr 5 to 1900Z, Apr 6
YLRL DX to NA YL Contest, CW	1400Z, Apr 9 to 0200Z, Apr 11
JIDX CW Contest	0700Z, Apr 12 to 1300Z, Apr 13
QRP ARCI Spring QSO Party	1200Z, Apr 12 to 2400Z, Apr 13
EU Spring Sprint, SSB	1500Z-1859Z, Apr 12
UBA Spring Contest, SSB	0600Z-1000Z, Apr 13
YLRL DX to NA YL Contest, SSB	1400Z, Apr 16 to 0200Z, Apr 18
Holy Land DX Contest	0000Z-2359Z, Apr 19
TARA Spring Wakeup PSK31 Rumble	0000Z-2400Z, Apr 19
ES Open HF Championship	0500Z-0859Z, Apr 19
YU DX Contest	1200Z, Apr 19 to 1200Z, Apr 20
GACW CW DX Contest	1200Z, Apr 19 to 1200Z, Apr 20
EU Spring Sprint, CW	1500Z-1859Z, Apr 19
Michigan QSO Party	1600Z, Apr 19 to 0400Z, Apr 20
Ontario QSO Party	1800Z, Apr 19 to 1800Z, Apr 20
Harry Angel Memorial Sprint	1100Z-1246Z, Apr 25
SP DX RTTY Contest	1200Z, Apr 26 to 1200Z, Apr 27
Helvetia Contest	1300Z, Apr 26 to 1300Z, Apr 27
QRP to the Field	1500Z-2400Z, Apr 26
Florida QSO Party	1600Z, April 26 to 0159Z, April 27 and 1200Z-2159Z, April 27
Nebraska QSO Party	1700Z, Apr 26 to 1700Z, Apr 27

May 2003

AGCW QRP/QRP Party	1300Z-1900Z, May 1
IPA Contest, CW	0000Z-2359Z, May 3
MARAC County Hunters Contest CW	0000Z, May 3 to 2400Z, May 4
10-10 Int. Spring Contest, CW	0001Z, May 3 to 2400Z, May 4
Indiana QSO Party	1300Z, May 3 to 0500Z, May 4
ARI International DX Contest	2000Z, May 3 to 1959Z, May 4
New England QSO Party	2000Z, May 3 to 0300Z, May 4 and 1100Z-2400Z, May 4
IPA Contest, SSB	0000Z-2359Z, May 4
VOLTA WW RTTY Contest	1200Z, May 10 to 1200Z, May 11
Oregon QSO Party	1400Z, May 10 to 0200Z, May 11
FISTS Spring Sprint	1700Z-2100Z, May 10
CQ-M International DX Contest	2100Z, May 10 to 2100Z, May 11
Anatolian RTTY WW Contest	1800Z, May 16 to 2100Z, May 17
His Majesty King of Spain Contest, CW	1800Z, May 17 to 1800Z, May 18
Baltic Contest	2100Z, May 17 to 0200Z, May 18
CQ WW WPX Contest, CW	0000Z, May 24 to 2400Z, May 25
VK-ZL Trans-Tasman Contest, Phone	0800Z-1400Z, May 24
QRP ARCI Hoot Owl Sprint	2000-2400 local, May 25
MI QRP Memorial Day CW Sprint	2300Z, May 26 to 0300Z, May 27
Six Club WW Contest	2300Z, May 30 to 0200Z, Jun 2
Great Lakes QSO Party	0000Z, May 31 to 2359Z, Jun 1

June 2003

VK-ZL Trans-Tasman Contest, CW	0800Z-1400Z, Jun 7
IARU Region 1 Field Day, CW	1500Z, Jun 7 to 1500Z, Jun 8
ANARTS WW RTTY Contest	0000Z, Jun 14 to 2400Z, Jun 15
Portugal Day Contest	0000Z-2400Z, Jun 14
WW South America CW Contest	0000Z, Jun 14 to 1600Z, Jun 15
Asia-Pacific Sprint, SSB	1100Z-1300Z, Jun 14
ARRL June VHF QSO Party	1800Z, Jun 14 to 0300Z, Jun 16
All Asian DX Contest, CW	0000Z, Jun 21 to 2400Z, Jun 22
SMIRK Contest	0000Z, Jun 21 to 2400Z, Jun 22
AGCW VHF/UHF Contest	1600Z-2100Z, Jun 21
West Virginia QSO Party	1600Z, Jun 21 to 0200Z, Jun 22
Kid's Day Contest	1800Z-2400Z, Jun 21
Marconi Memorial HF Contest	1400Z, Jun 28 to 1400Z, Jun 29
ARRL Field Day	1800Z, Jun 28 to 2100Z, Jun 29
QRP ARCI Milliwatt Field Day	1800Z, Jun 28 to 2100Z, Jun 29
His Majesty King of Spain Contest, SSB	1800Z, Jun 28 to 1800Z, Jun 29

NCJ

DX Contest Activity Announcements

Compiled by Bill Feidt, NG3K
bill@ng3k.com

Now is the time to submit your announcements for summer contests, including the IARU HF World Championships. If you want your listing to appear in the May/June 2003 issue, I'll need to receive it no later than **March 20**.

You can submit your data using the form that you'll find at **www.ng3k.com/Contest/consub.html**.

If you would prefer to e-mail me your information, please be sure to include:

- Call sign to be used
- DXCC entity
- CQ Zone (for the CQ WW contests)
- Entry class anticipated
- QSL route
- Your call sign and e-mail address
- Operators and other information of likely interest

Send your information to **bill@ng3k.com**. You can review what has been received to date at **www.ng3k.com/Contest/conasc.html**. This page is continuously updated as new announcements are received.

ARRL DX SSB Contest (March 1-2, 2003)

Call	*Entity*	*Class*	*Operators*
6Y8Z	Jamaica	M/S	WN9O, WO9Z
7S2E	Sweden	SOSB 20M	SM2DMU
8P5A	Barbados	SOAB HP W2SC	
9Y4TBG	Trinidad Tobago	???	DL6RAI, IV3IYH
CE4Y	Chile	SOSB 10M	CE4FXY
CN2R	Morocco	SOAB HP W7EJ	
D4B	Cape Verde	SOAB HP	4L5A
D44TD	Cape Verde	SOSB	IK4UPB
EA8/OH6XX	Canary Is	SOSB 15M	OH6XX
EA8/OH9MM	Canary Is	SOSB 20M	OH9MM
IO4T	Italy	M/S	IK4VET, IK4XCL, IK4RQJ, IZ4EFN, IZ4DIJ
LY1YK	Lithuania	M/2	LY2FY, LY2CO, LY3CI, LY4CW
LZ125O	Bulgaria	M/S	Team
OH0B	Aland	M/S	NW0L, AE9B, WB9Z
PJ5NA	Sint Maarten	SOAB	K1NA
PJ7B	Sint Maarten	SOAB	W8EB
S21YV	Bangladesh	???	KX7YT
TI5N	Costa Rica	SOAB QRP	W8QZA
TI8/K4UN	Costa Rica	M/2	K4UN, TI2KAC, W4BD + others
TM5C	France	M/S	F6CTT, F5MUX, F5VCO
TO1A	Martinique	SOAB	IK2QEI
V26DX	Antigua	M/2	W3CF, WX0B, N5CK, N2EA, KD3TB
V31QQ	Belize	M/?	KQ1F, K1XM
VP9I	Bermuda	SOAB LP	W6PH
ZF2DQ	Cayman Is	SOAB HP	KODQ

Thanks to: 4L5A, CE4FXY, F5NLY, IK2QEI, IK4UPB, IK4VET, IV3IYH, K0DQ, K1NA, K1XM, KX7YT, LY2FY, LZ1ZF, N4AA, NW0L, OH2JTE, OH9MM, SM2DMU, W2SC, W3CF, W4BD, W6PH, W7EJ, W8EB, WN9O. See **www.ng3k.com/Misc/adxs2003.html** for further details.

CQ WPX SSB Contest (March 29-30, 2003)

Call	*Entity*	*Class*	*Operators*
CB4Y	Chile	SOSB 10M	CE4FXY
CN2R	Morocco	SOAB HP	W7EJ
D4B	Cape Verde	SOAB HP	4L5A
HQ9R	Honduras	SOAB LP	WQ7R
IO3T	Italy	M/S	Magnagati DX Gang
IO4T	Italy	SOAB	IK4VET
LY1YK	Lithuania	M/2	LY2FY, LY2CO, LY3CI, LY4CW + others
ST0RY	Sudan	???	DK7YY, DL3DXX, DL9NDS, DL7FER, DL5NAM
SX1R	Greece	SO LP	SV1XV
VK8AA	Australia	SOAB	VK2CZ

Thanks to: 4L5A, CE4USW, DL5NAM, IK4VET, IZ3ESV, LY2FY, SV1XV, VK8AA, W7EJ, WQ7R. See **www.ng3k.com/Misc/wpxs2003.html** for further details.

Russian DX Contest (March 15-16, 2003)

Call	*Entity*	*Class*	*Operators*
BW3/UA3VCS	Taiwan	SOAB	UA3VCS
EY8MM	Tajikistan	SOSB 10M	EY8MM
YM0T	Turkey	SOAB SSB	TA2RC

Thanks to: EY8MM, RW1AC, UA3VCS. See **www.ng3k.com/Misc/rdxc2003.html** for further details.

North American Sprint CW/SSB/RTTY Rules

1. Eligibility: Any licensed radio amateur may enter.

2. Object: For North American stations to contact as many licensed radio amateurs as possible. For non-North American stations to contact as many North American stations as possible.

3. North American Sprint CW/SSB/RTTY Rules

Entry Classification: High power, low power (100 W) and QRP (5 W). Single operator only. Use of helpers, packet or spotting nets is not permitted.

4. Contest periods:

February/March 2003 Contests:

SSB: 0000Z – 0400Z February 2, 2003 (Sunday of first full weekend in February)

CW: 0000Z – 0400Z February 9, 2003 (Sunday of second full weekend in February)

RTTY: 0000Z – 0400Z March 9, 2003 (Sunday of second full weekend in March)

September/October 2003 Contests:

CW: 0000Z – 0400Z September 7, 2003 (first Sunday following first Monday in September)

SSB: 0000Z – 0400Z September 14, 2003 (second Sunday following first Monday in September)

RTTY: 0000Z – 0400Z, October 12, 2003 (Sunday of second full weekend in October)

These are entirely separate four-hour Sprints. Note that the CW Sprint comes before the SSB Sprint in September, but not in February.

5. Mode: CW only in CW Sprints, SSB only in SSB Sprints, RTTY only in RTTY Sprints.

6. Bands: 80, 40 and 20 meters only. Suggested frequencies are around 3540, 7040 and 14040 kHz on CW; 3850, 7225 and 14275 kHz on Phone; and 3580, 7080 and 14080 kHz on RTTY. You may work the same station once per band.

Note: For RTTY only, the same station can be worked multiple times provided 3 contacts separate the contact in both logs, regardless of band.

7. Exchange: To have a valid exchange, you must send all of the following information: the other station's call, your call, your serial number, your name and your location (state, province, or country). You may send this information in any order. For example:

N6TR DE K7GM 154 RICK NC K
K7GM NR 122 TREE OR DE N6TR K

8. Valid Contact: A valid contact consists of a complete, correctly copied and logged two-way exchange between a North American station and another station. Proper logging requires including the time of each contact. Serial numbers must begin with serial number one and be sequential thereafter.

9. North American Station: Defined by the rules of the CQ WW DX Contests. Note that KH6 is not in North America.

10. Scoring: Multiply total valid contacts by the sum of the U.S. states, Canadian Provinces and other North American Countries to get final score (do not count USA and Canada as countries). KH6 is not counted as a State and is not a North American country (but counts for QSO credit). The eight Canadian multipliers are Maritime (VE1, VE9, VO1, VO2 and VY2), VE2 through VE7, and Yukon-NWT (VY0, VY1 and VE8). Non-North American countries do not count as multipliers, but do count for QSO credit for North American stations.

11. Special QSY Rule: If any station solicits a call (by sending CQ, QRZ?, "going up 5 kHz," or any other means of soliciting a response, including completion of a QSO where the frequency was inherited), they are permitted to work only one station in response to that solicitation. They must thereafter move at least 1 kHz before calling another station, or at least 5 kHz before soliciting other calls. Once a station is required to QSY, that station is not allowed to make another QSO on the vacated frequency until or unless at least one subsequent QSO is made on a new frequency.

12. Additional Rules: Simultaneous transmission on more than one frequency is prohibited. All contacts must be sent and received using means requiring real-time human intervention, detection and initiation. Each operator must use only one call sign during the contest.

13. Reporting:

Send CW logs to:
Boring Amateur Radio Club
15125 Bartell Road
Boring, OR 97009
USA
email: **cwsprint@ncjweb.com**

Send Phone logs to:
Jim Stevens, K4MA
6609 Vardon Ct.
Fuquay-Varina, NC 27526
USA
email: **ssbsprint@ncjweb.com**

Send RTTY logs to:
Douglas McDuff, W4OX
10380 SW 112th Street
Miami, FL 33176
USA
email: **rttysprint@ncjweb.com**

Entries must be received no later than 30 days after the Sprint. All competitive logs (more than 100 QSOs) must be submitted electronically (e-mail, 3.5-inch floppy disk, etc.). The file format for electronic logs for *NCJ*-sponsored contests is Cabrillo.

Team Competition: Team competition is limited to a maximum of 10 operators as a single entry unit. Groups having more than ten team members may submit more than one team entry. To qualify as a team entry, the team registration form on the *NCJ* web site must be completed before the contest starts. Use one of the following links:

CW Team Registration:
www.ncjweb.com/cwsprintteamreg.html
SSB Team Registration:
www.ncjweb.com/ssbsprintteamreg.html
RTTY Team Registration:
www.ncjweb.com/rttysprintteamreg.html

15. Penalties and Disqualification: Contacts with incorrect received information will be removed. Contacts not found in the other station's log will be removed with a one QSO penalty. Entries with score reductions in excess of 5 percent may be disqualified. Any entry also may be disqualified for illegibility, illegal or unethical operation.

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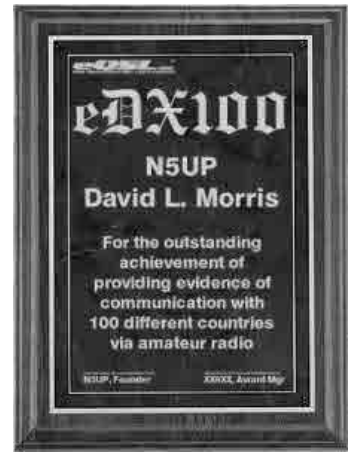

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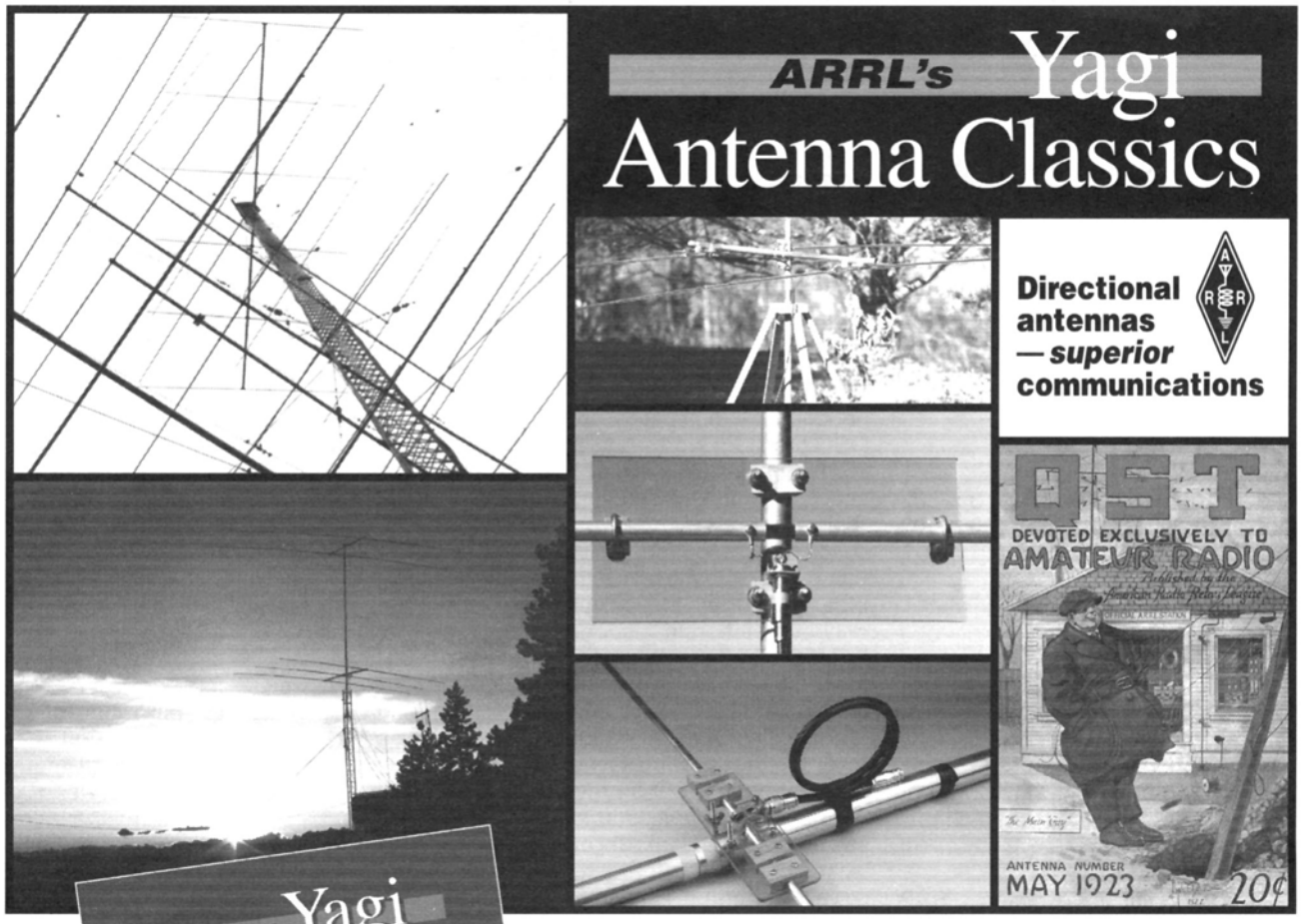

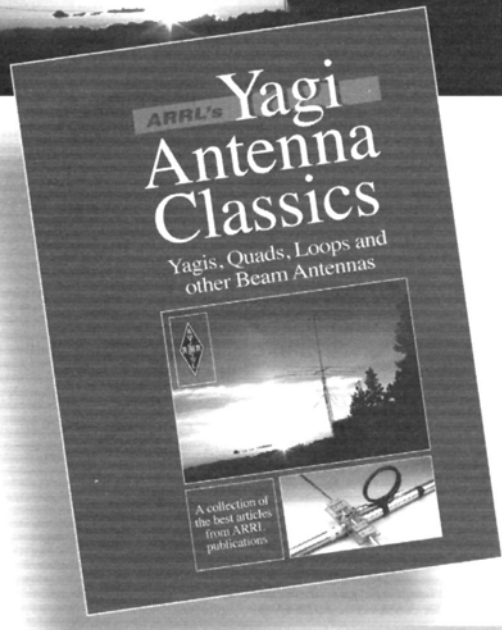

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-Glenn Johnson WØGJ , A50A WW SSB Contest

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-Bob Voss N4CD, TI9M DXpedition

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