NCJ
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January/February 2002
Volume 30 Number 1

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- A Visit with Jeff Morris, 9H1EL
- Results: July 2001 NAQP RTTY, August 2001 NAQP SSB and September 2001 *NCJ* CW Sprint Contests
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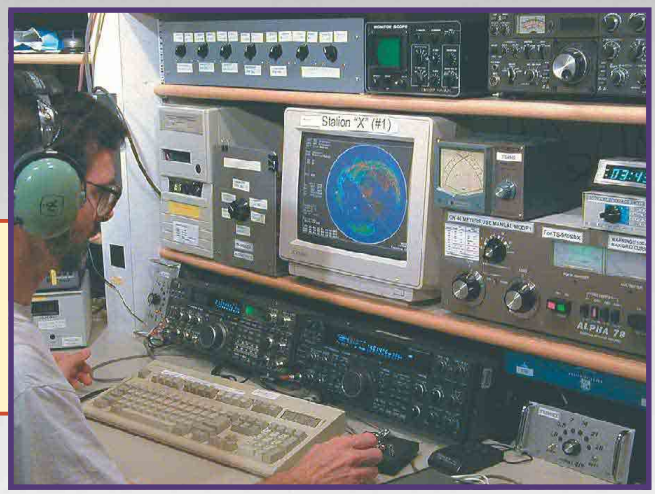

Dave Hodge, N6AN—formerly AA6RX—mans one of the operating positions at Caltech Amateur Radio Club's W6UE.

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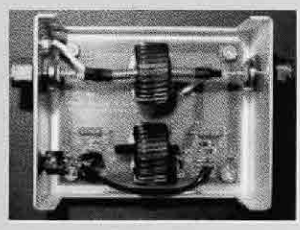

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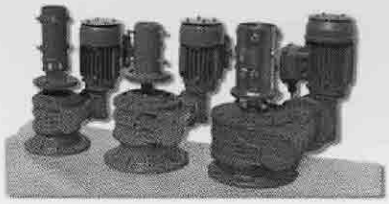

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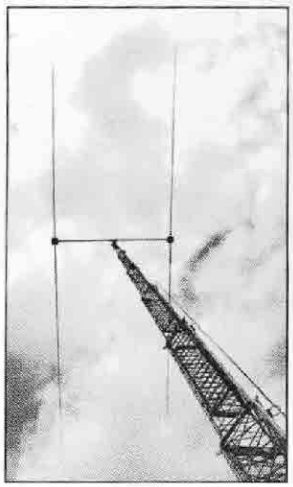

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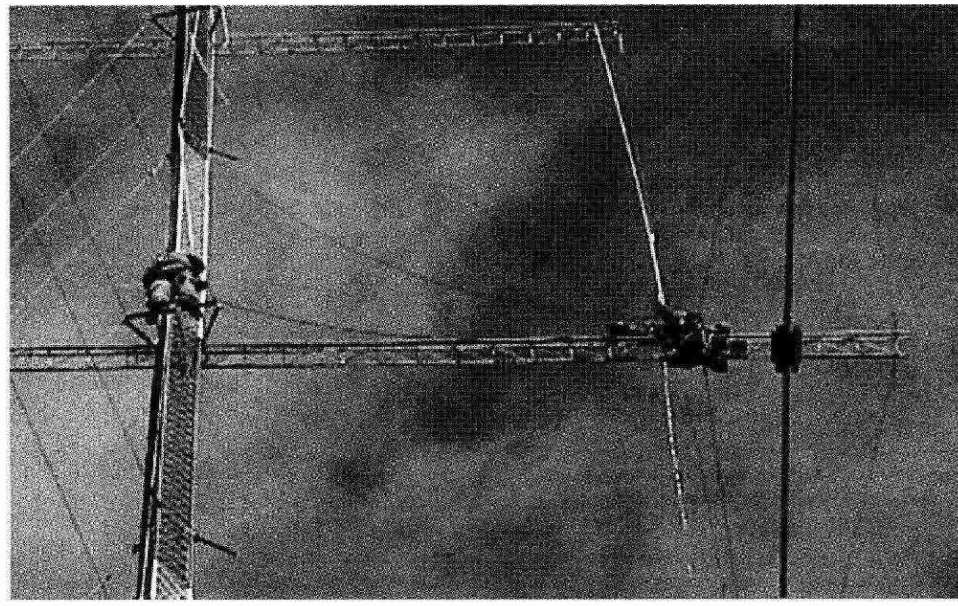

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Editorial

Carl Luetzelschwab, K9LA
***NCJ* Assistant Editor**

I'd like to thank Dennis, K7BV, for appointing me Assistant Editor. I hope I can take some of the workload off him, and perhaps even further enhance what he's been able to accomplish so far by providing him the perspective of a slightly less fanatic contester.

I've been following him closely since he took on the editor reins, and it has become obvious to me that serving as *NCJ* Editor is one big job. As Dennis mentioned in his November/December 2001 editorial, my primary responsibilities will include chasing down articles and helping him dream up new column concepts so that we can keep *NCJ* fresh and vibrant.

I look forward to working with the *NCJ* columnists and contest managers, and with Joe Bottiglieri, AA1GW, Shelly Bloom, WB1ENT, and the countless other unsung heroes at ARRL HQ who help us put this magazine together six times a year.

Now Those Are Some Names!

If you scan through the list of names that appear just to the left of the Table of Contents, you'll see (among others) Motschenbacher, Schaffenberger and Luetzelschwab. With names like these, perhaps the three of us should partner up and start a law firm!

Just a Sample of What You'll Find in this Issue

L. B. Cebik, W4RNL, delivers the second installment of his series on 2-element horizontal phased arrays. Personally, I'm very happy to see L. B. continue to provide us with insights into the science of antenna design and analysis. (If you love antennas—*and who among us doesn't?*—be sure to check out his terrific Web site: **www.cebik.com**.) What types of antenna articles would you like to see in future issues?

Results for the July NAQP RTTY, the September CW Sprint and the August NAQP SSB contests appear in this issue. Look for the August NAQP CW results in our March/April issue. Please join me in extending a huge THANK YOU to all of our contest managers for the work they put into organizing these contests and reporting results. "Contest Manager": yet another one of those "unsung hero" jobs.

NCJ Editor Quiz

The first issue of *NCJ* came out in 1973. Over the years, many editors have contributed their efforts to make *NCJ* what it is today. In a tribute to these former volunteers—and to refresh your memory of years past—we're putting together an "*NCJ* Editor Quiz" for the March/April issue. It should be interesting!

YLs in Contesting

One particular area that I would like to see explored in *NCJ* is that of YLs in contesting. I know you ladies are out there, as I typically hear several of you on in every contest. My wife Vicky, AE9YL, enjoys contesting, so I'm trying to encourage her to pen an article or two that covers contesting from a YL's viewpoint.

You can help get things rolling by sending Vicky an e-mail—at **ae9yl@arrl.net**—and letting her know that you'd like to hear more about women who contest (assuming you really do!). If you *are* a YL, include some information about your contesting interests. If you know of a YL contester, please send Vicky her name and call sign.

"Adventures in Contesting"

In this issue you'll find a photo with a humorous (I hope!) caption. These are intended to highlight the lighter side of contesting (after all, this is just a hobby, right?). We plan to run them on a regular basis, but in order to do that we'll need your photos. If you have any that you think might fit the bill, please pass them along. We plan to reveal the true identity of those who might appear in these photos—and any other interesting details—in the following issue.

Upcoming NCJ Contests—Don't Miss 'Em!

Don't forget the next runnings of the CW and SSB NAQPs in January and the CW and SSB Sprints in February. Following right behind these is the RTTY Sprint in March. Come on and join in on the fun on your favorite mode!

Our Cover

A new column—"Station Profiles"—makes its debut in this issue, and gets things rolling with a look at Caltech Amateur Radio Club's W6UE.

Our cover photos include a view of the antennas on the roof of the university's Student Center building. These feature an impressive stack of 10, 15 and 20-meter monobanders designed by N6ND and a couple of VHF and UHF arrays. A separate tower with a massive KLM 4-40 and a KT34XA is just barely visible behind the tree on the left edge of the photo. A third tower supports Force 12 antennas for the WARC bands. Wire antennas are used on the lower bands.

In the bottom photo, Dave Hodge, N6AN, settles in for a bit of late shift operating. ■

Some Notes on Two-Element Horizontal Phased Arrays — Part 2: The Limits of Geometric Phasing

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In Part 1, we noted that there are two ways of looking at the idea of a phased array. One perspective views the phased array as a combination of elements, all of which are fed. The other perspective is more general: it examines the relative current magnitude and phase angle of element combinations, regardless of which one or more of them may be fed. From this latter perspective, a 2-element parasitic array is phased in the sense that the unfed element will display a relative current magnitude and phase angle.

The parasitic array, of course, has a more common name: the Yagi-Uda beam. The Yagi (for short) may have as many parasitic elements as a designer can put to good use. Our interest will be in the smallest of such arrays: 2-element models. **Figure 1** shows the options that we have for creating 2-element Yagis. We may either use a director or forward parasitic element with a driven element, or we may use a reflector or rear parasitic element with a driven element.

The names "director" and "reflector" are simply conventional tags by which we identify a given parasitic element. The names do not themselves indicate how a parasitic array operates. Indeed, among those new to antennas, we find numerous misconceptions concerning reflectors, including the idea that they function similarly to the mirrored surface behind the light source in a flashlight. Directors, by the same analogy, appear to function in the manner of optical lenses by focusing the beam of RF.

Let's approach 2-element Yagis from a different point-of-view. The close proximity of the two elements provides significant inter-element coupling such that the unfed element will show at its center a relative current magnitude and phase angle. By adjusting the element diameters, spacing and lengths, we may alter the unfed element relative current magnitude and phase angle. However, this process is limited by the basic geometry of the array. It is composed of parallel linear elements. Hence, the three variables of length, diameter and spacing can only go so far in yielding on the unfed element a relative current magnitude and phase angle that corresponds with those identified in Part 1 as able to produce a desired radiation pattern.

In this episode, we shall look more closely at the basic properties of 2-element Yagis in both the reflector-driver and the driver-director configuration. Our efforts will be to understand the limitations that geometry alone, as a set of design variables, places on the performance of 2-element arrays, especially compared to independently feeding both elements. When we are done, we should be able to correlate typical Yagi patterns with the relative phasing conditions for the two elements. At the end, we shall look at some alternative 2-element geometries designed to improve those conditions.

The Reflector-Driver and Driver-Director 2-Element Arrays

The earliest detailed study of 2-element Yagis using method-of-moments modeling software is the work of Jerry Hall, K1TD, whose results appear in the 15th and 16th editions of *The ARRL Antenna Book* (pp 11-2 through 11-8). I shall replicate his work in part, using the modeling constraints applied in Part 1. The test frequency will be 28.5 MHz. The array will use 0.5-inch (0.001207-λ) diameter elements. Throughout our simplified examination of 2-element Yagis, I shall aim for two simultaneous goals: maximum front-to-back ratio and driver resonance. A driver will be considered resonant when the source reactance is ±1 Ω or less. Using these twin goals will not yield the absolute maximum 180· front-to-back ratio possible with two elements, but it will be close. As well, the results will permit easier graphing of the source impedances of corresponding reflector-driver and driver-director arrays.

We shall also limit our samples to the same increments of element spacing that we used in Part 1: from 0.05 λ to 0.2 λ in 0.025-λ increments. Where our interest will depart from the earlier study is in the recording of the relative current magnitude and phase angle on the parasitic element when the driver has a current magnitude of 1.0 and a phase angle of 0.0·.

Table 1 provides the basic performance data for the models of a reflector-driver parasitic array meeting the conditions we have just specified. In addition to the usual performance data (free-space gain in dBi, 180· front-to-back ratio in dB, and the source impedance in ohms), the table provides element lengths as a function of a wavelength at the test frequency. Unlike the models in Part 1, which used a relatively arbitrary but consistent set of dimensions for each model, the parasitic array must have different element lengths at each increment of spacing to achieve the maximum front-to-back ratio at a resonant driver impedance.

The dimensions themselves hold some interest. As you scan the table, note that

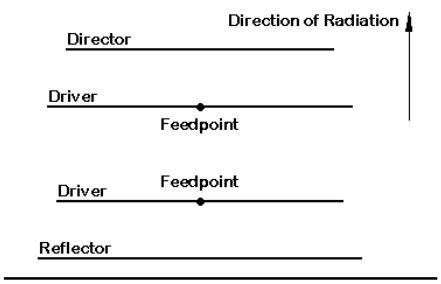

Figure 1—Options for the element arrangement of a 2-element Yagi.

Table 1

Two-element reflector-driver Yagi performance when set for maximum 180° front-to-back ratio and driver resonance.

Element Spacing (λ)	*Reflector Length (λ)*	*Driver Length (λ)*	*Gain (dBi)*	*Front-to-Back Ratio (dB)*	*Feedpoint Z (R +/– jX Ω)*
0.05	0.2505	0.2387	6.24	11.36	8.1 + *j*0.1
0.075	0.2507	0.2356	6.36	11.40	15.4 – *j*0.2
0.1	0.2511	0.2334	6.32	11.33	24.3 – *j*0.1
0.125	0.2514	0.2310	6.25	11.18	33.8 + *j*0.0
0.15	0.2513	0.2312	6.18	10.96	42.9 – *j*0.1
0.175	0.2513	0.2310	6.06	10.69	52.1 + *j*0.0
0.2	0.2511	0.2312	5.91	10.36	60.2 – *j*0.0

Note: All elements 0.5-inch (0.001207-λ) diameter aluminum

the reflector length required to meet the twin modeling objectives reaches a peak length at a spacing of 0.125 λ and then decreases. In contrast, the required driver length decreases until the element spacing is 0.175 λ and then increases.

Figure 2 graphs the gain and front-to-back ratio data as a convenient way to examine the trends. Within the limitations of the increments of element spacing used here, the gain and the front-to-back ratio reach their peak values with an element spacing of 0.075 λ. There are two good reasons why we rarely, if ever, design 2-element reflector-driver Yagis with this particular spacing. One of those reasons is the low source impedance: just above 15 Ω. The other reason is the narrowness of the operating bandwidth at this spacing, a facet of 2-element Yagi design that we shall examine more thoroughly in a moment.

The low level of the front-to-back ratio of the reflector-driver design has struck many antenna enthusiasts and has occasioned two responses. One is the design of 3-element and larger Yagis. The second is the design of arrays that feed both elements. The front-to-back ratio with an element spacing of 0.125 λ is about 11.18 dB. We can increase this level to about 11.50 dB largely by shortening the driver and thereby changing the mutual coupling between the elements. However, in the process, the gain begins to decrease, and the source impedance reaches a value of about 30– *j*52 Ω. Hence, draining the reflector-driver design of the last modicum of front-to-back ratio tends to result in relatively impractical source impedance values.

Table 2 reveals the reason for the low levels of front-to-back ratio associated with reflector-driver Yagi designs. The table lists the modeled rear element relative current magnitude and phase angle values, along with the values needed for the same set of elements to achieve more than 60 dB front-to-back ratio. (The ideal front-to-back ratio models show the same deep 180· null as those in Part 1, along with the rearward side lobes that result in worst-cast front-to-back ratios between 17 and 22 dB.) The gain of the models using two sources appears in the right-most column. The ideal phase angles have been converted from the negative angles typical of models in Part 1 to values that correspond to those yielded by models of Yagis. To convert either value to one that is more suited to phasing networks, simply subtract 180· from the listed value.

In concert with the curves that we saw in Figure 2, the relative current magnitude and the phase angle of the optimized Yagi both depart more

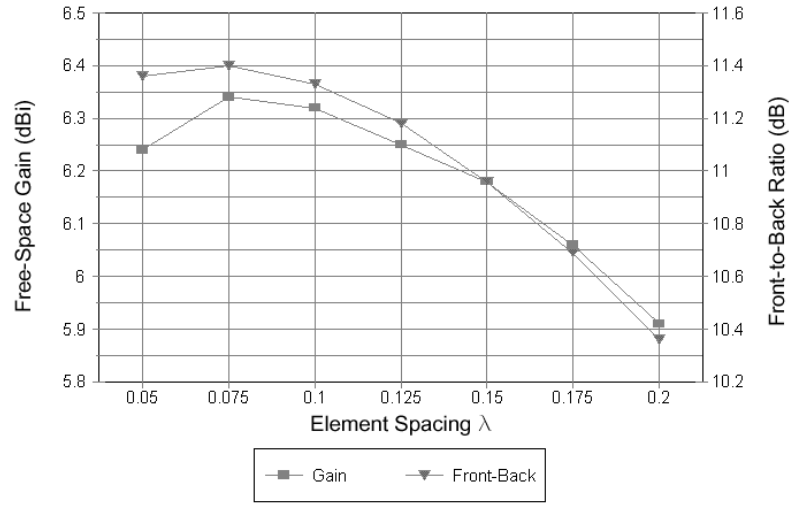

Figure 2—Gain and 180· front-to-back ratio of reflector-driver 2-element Yagis set for maximum front-to-back ratio and resonance at the design frequency (28.5 MHz) at element spacings from 0.05 λ to 0.2 λ.

Table 2

Actual vs ideal rear element relative current magnitude and phase angle values for maximum 180· front-to-back ratios for the 2-element reflector-driver Yagis in Table 1.

	Actual		*Ideal*		
Element Spacing (λ)	*Relative I Magnitude*	*Relative I Phase*	*Relative I Magnitude*	*Relative I Phase*	*Gain (dBi)*
0.05	0.833	165.1	0.963	163.1	6.51
0.75	0.774	158.1	0.953	154.1	6.51
0.1	0.719	150.7	0.944	144.9	6.44
0.125	0.670	143.1	0.938	135.6	6.33
0.15	0.636	136.5	0.938	126.1	6.18
0.175	0.603	129.3	0.936	116.6	6.00
0.2	0.576	122.4	0.937	107.1	5.77

Note: All phase angles adjusted for positive values. For negative angle values corresponding to those in Part 1, subtract 180 from the listed value. All "ideal models" set to a 180° front-to-back ratio greater than 60 dB.

Table 3

Bandwidth characteristics for 2-element reflector-driver Yagis at 0.1, 0.125 and 0.15 λ element spacing.

Element Spacing: 0.1 λ

Frequency (MHz)	*Gain (dBi)*	*Front-to-Back Ratio (dB)*	*Feedpoint Z (R +/– jX Ω)*	*SWR (Relative to 24.3 Ω)*
28.0	6.84	9.53	16.3 – *j*23.1	3.20
28.25	6.58	10.94	20.2 – *j*11.3	1.71
28.5	6.32	11.33	24.3 – *j*0.1	1.01
28.75	6.07	11.01	28.4 + *j*10.4	1.53
29.0	5.86	10.41	20.5 + *j*20.5	2.16

Element Spacing: 0.125 λ

Frequency (MHz)	*Gain (dBi)*	*Front-to-Back Ratio (dB)*	*Feedpoint Z (R +/– jX Ω)*	*SWR (Relative to 33.8 Ω)*
28.0	6.72	9.92	24.7 – *j*21.4	2.19
28.25	6.48	10.91	29.3 – *j*10.3	1.43
28.5	6.25	11.18	33.8 + *j*0.0	1.00
28.75	6.04	10.94	38.1 + *j*9.8	1.35
29.0	5.85	10.45	42.3 + *j*19.2	1.73

Element Spacing: 0.15 λ

Frequency (MHz)	*Gain (dBi)*	*Front-to-Back Ratio (dB)*	*Feedpoint Z (R +/– jX Ω)*	*SWR (Relative to 33.8 Ω)*
28.0	6.61	9.89	33.3 – *j*20.0	1.78
28.25	6.39	10.71	38.1 – *j*9.7	1.31
28.5	6.18	10.96	42.9 – *j*0.1	1.00
28.75	5.98	10.80	47.4 + *j*9.0	1.25
29.0	5.80	10.41	51.7 + *j*17.7	1.52

radically from the ideal numbers with the widening of the spacing between elements. Coincidence is closest at the narrowest spacings. However, the narrower the spacing between elements, the more exact the coincidence must be to yield the ideal maximum front-to-back value of more than 60 dB. Hence, the closeness of the values at a spacing of 0.05 λ is still not close enough to yield the highest front-to-back ratio. As well, the ideal model shows its highest gain at the narrowest spacing, although the Yagi does not reach maximum gain until the spacing is 0.075 λ. Interestingly, the ideal models have a higher gain potential only until the spacing reaches 0.15 λ, after which the Yagi shows slightly higher gain.

If we shift to driver-director models of parasitic arrays, we do not get the same picture of results. **Table 4** lists the element lengths and the basic performance figures for the driver-director configuration. Unlike the reflector-driver dimensions, the driver-director element lengths continuously decrease with increased spacing between elements.

The table also confirms the general proposition that a driver-director array develops a significant gain and front-to-back superiority over the reflector-driver array when the spacing is fairly narrow—under 0.1 λ. **Figure 3** tracks the gain and front-to-back ratio values. Above 0.1-λ element spacing, the front-to-back ratio drops rapidly to the reflector model values and below. The gain values start their drop above 0.75-λ spacing. Since the 21 Ω impedance of the 0.075-λ model is manageable with a matching network, this element spacing region is among the most popular for driver-director arrays.

The flatter curve between 0.05-λ and 0.075-λ element spacing hides a surprise for those not familiar with Jerry Hall's study. The slope of the curve beyond the 0.075-λ mark suggests that in the lowest region of spacing, there is a peak in the front-to-back value. In fact, at a spacing of 0.0625 λ, the front-to-back ratio can reach nearly 47 dB with a free-space gain of 6.52 dBi and a source impedance of about 16.5 + *j*7.9 Ω. Such an array also comes closest to meeting the ideal conditions for maximum front-to-back ratio, with a relative magnitude of 0.964 and a phase angle (adjusted) of 158.6· (or –21.4·). For single-frequency use, such an array might well fill a need.

Table 5 provides data comparing the modeled relative current magnitude and phase angle for the unfed element. The data has been adjusted to coincide in form with other data that we have examined. The negative phase angles of the director have been made positive, as if the forward element had a value of 0.0·. As well, the current magnitude has been adjusted as if the director had a value of 1.0. This set of adjustments allows the ideal data to correspond with all other dual-source models we have so far examined, where all forward elements are set to a magnitude of 1.0 and a phase angle of 0.0·, and the rear element values are presented for comparison. In concert with the curves of Figure 3, Table 5 makes evident the rapid departure from ideal phasing conditions for maximum front-to-back ratio above 0.075-λ element spacing. Equally evident, in comparison with the

Table 4

2-element driver-director Yagi performance when set for maximum 180° front-to-back ratio and driver resonance.

Element Spacing (λ)	*Driver Length (λ)*	*Director Length (λ)*	*Gain (dBi)*	*Front-to-Back Ratio (dB)*	*Feedpoint Z (R +/– jX Ω)*
0.05	0.2498	0.2378	6.48	26.03	11.0 – *j*0.0
0.075	0.2486	0.2335	6.52	23.60	21.1 + *j*0.2
0.1	0.2465	0.2298	6.44	14.85	29.7 + *j*0.2
0.125	0.2443	0.2263	6.22	10.66	36.6 + *j*0.1
0.15	0.2423	0.2234	5.98	7.94	41.2 + *j*0.2
0.175	0.2407	0.2202	5.62	5.96	45.9 + *j*0.1
0.2	0.2395	0.2170	5.23	4.45	50.0 + *j*0.2

Note: All elements 0.5-inch (0.001207 λ) diameter aluminum

Table 5

Actual vs ideal rear element relative current magnitude and phase angle values for maximum 180° front-to-back ratios for the 2-element driver-director Yagis in Table 3.

	Actual		Ideal		
Element Spacing (λ)	*Relative I Magnitude*	*Relative I Phase*	*Relative I Magnitude*	*Relative I Phase*	*Gain (dBi)*
0.05	0.934	162.8	0.961	163.1	6.51
0.75	1.006	149.5	0.951	154.1	6.51
0.1	1.140	149.7	0.948	144.9	6.43
0.125	1.333	146.1	0.943	135.5	6.31
0.15	1.555	145.6	0.939	126.1	6.16
0.175	1.845	145.8	0.926	116.7	5.96
0.2	2.188	147.3	0.910	107.3	5.72

Note: All phase angles adjusted for positive values. For negative angle values corresponding to those in Part 1, subtract 180 from the listed value. In addition, actual angles are taken from the director and appear as negative angles relative to the driver to the rear. The relative current magnitude values have been adjusted to reflect the values on the rear element if the forward element is set at 1.0. All "ideal models" set to a 180° front-to-back ratio greater than 60 dB.

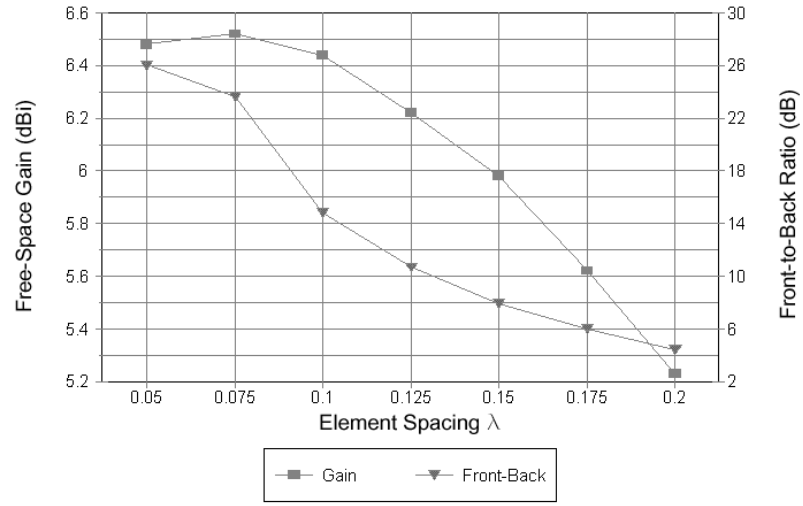

Figure 3—Gain and 180· front-to-back ratio of driver-director 2-element Yagis set for maximum front-to-back ratio and resonance at the design frequency (28.5 MHz) at element spacings from 0.05 λ to 0.2 λ.

data for the reflector-driver Yagi, is the relative uselessness of the driver-director array as a directional beam above about 0.1-λ element spacing.

Despite the radical differences in gain and front-to-back behavior between reflector-driver and driver-director Yagis, the resonant impedances of the two arrays do not differ greatly for any given element spacing. **Figure 4** tracks the source resistance of the two array designs as optimized for each element spacing increment. An interesting property of reflector-driver designs is that the impedance curve is nearly linear, in contrast to the curve for the driver-director array.

In our exploration of the two types of parasitic arrays, we overlooked **Table 3** and **Table 6**. These tables present modeled performance figures for each array at three increments of element spacing from 28.0 to 29.0 MHz. For each array, the most common element spacings are listed: 0.1 through 0.15 λ for the reflector-driver array and 0.75 through 0.125 λ for the driver-director Yagi. As expected, operating bandwidth increases with increased element spacing. The reflector-driver Yagi, shown in **Figure 5**, can be adjusted to cover the entire 1-MHz bandwidth by selecting a design frequency of about 28.35 rather than the 28.5-MHz figure used in this study. At a slightly wider element spacing of 0.15 λ, the 2-element reflector-driver design can be designed to cover all of the 10-meter band. At each level of element spacing, the gain and the front-to-back values tend to show the same sort of curve broadening with each increase in spacing, although the peak values decrease along the way.

The driver-director Yagi SWR curves, shown in **Figure 6**, are naturally steeper, given the narrower element spacings involved. The most notable feature of the SWR graph is its reversal from the one for the reflector-driver array: here, more rapid increases occur above the design frequency rather than below it. Likewise, gain increases with rising frequency (rather than with decreasing frequency in the case of the reflector-driver array). The source impedance of the driver-director array shows an increasing reactance with frequency in accord with the relative shortening of the element. However, the resistive component of the impedance decreases with rising frequency (in contrast to the resistance curve of the reflector-driver Yagi). At the spacing increments generally used in driver-director designs, narrow bandwidth is a condition of maximizing performance.

Understanding basic 2-element Yagi-Uda performance limitations is a necessary condition of understanding

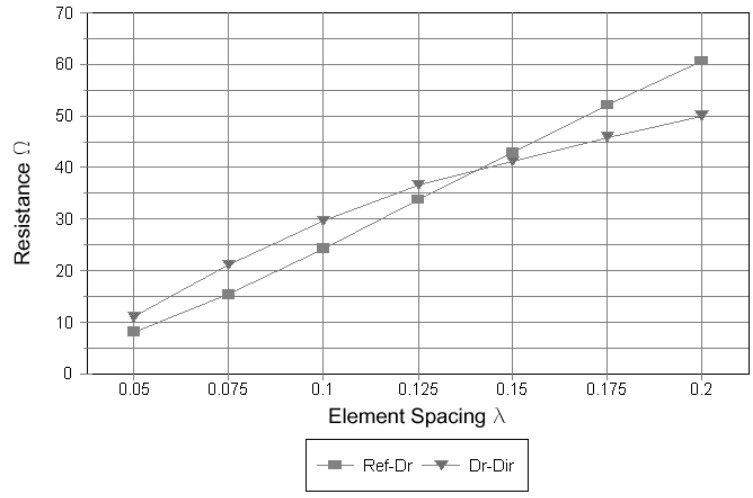

Figure 4—Resonant impedance of reflector-driver and driver-director 2-element Yagis at element spacings from 0.05 λ to 0.2 λ.

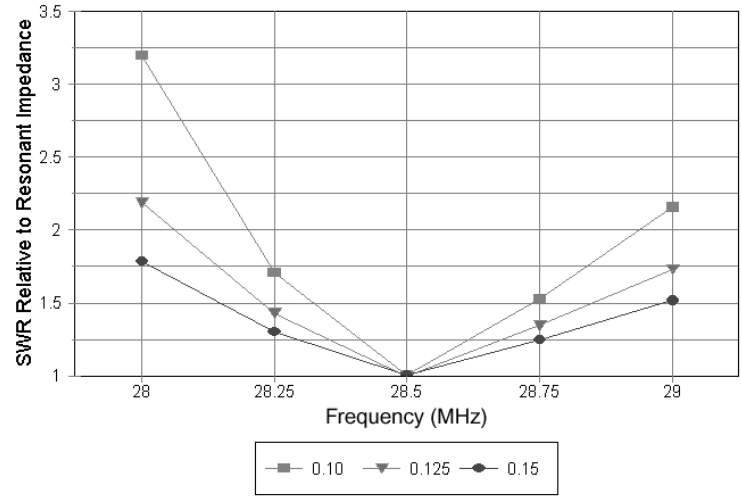

Figure 5—SWR curves of reflector-driver 2-element Yagis set for maximum front-to-back ratio and resonance at the design frequency (28.5 MHz) at element spacings from 0.1 λ to 0.15 λ.

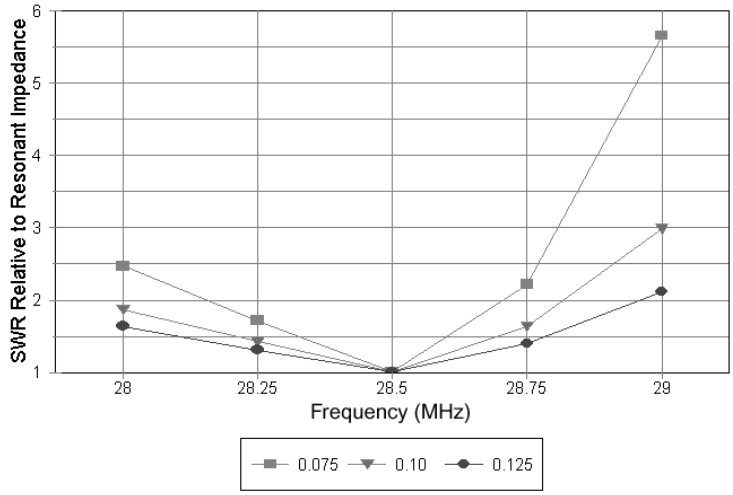

Figure 6—SWR curves of driver-director 2-element Yagis set for maximum front-to-back ratio and resonance at the design frequency (28.5 MHz) at element spacings from 0.075 λ to 0.125 λ.

the urge to design phased arrays in which both elements are fed. In principle, the dual source phased array is capable of higher gain and better front-to-back performance than all but the most closely spaced parasitic arrays. The reason is simple: the wider the spacing of a parasitic array, the further the elements get from relatively ideal conditions of element current magnitude and phase angle.

Alternative Geometries

We have omitted many details of 2-element Yagi behavior relative to the more complete data in some areas of interest that appear in Jerry Hall's study. However, we would be remiss if we did not acknowledge design efforts to overcome some of the phasing failings of 2-element parasitic arrays using linear parallel elements. Let's look in detail at only one of those efforts to use an alternative geometry: the Moxon rectangle. **Figure 7** shows the basic outline of this antenna whose origin is largely due to the initial efforts of G6XN.

The Moxon rectangle owes its operating characteristics to not one, but two forms of inter-element coupling. Between the parallel portions of the elements, we encounter the same sort of mutual coupling that is almost the sole source of coupling within a standard Yagi design. However, by bending the elements toward each other, we obtain an added form of coupling, often called capacitive coupling between the element ends. The result is a broader beamwidth and an increase in the front-to-back ratio. By judicious control of the element diameter, the gap between element tails, and the other dimensions of the array, we may obtain a broad-band reflector-driver array.

Figure 8 shows the free-space gain and front-to-back curves for a typical Moxon rectangle designed for 28.35 MHz, using 0.5-inch aluminum elements. The design frequency is necessary, since reflector-driver arrays decrease their front-to-back ratio and increase their SWR more slowly above the design frequency than below it. The resulting array covers the first MHz of 10 meters. The gain decreases nearly linearly across the passband, while the front-to-back ratio peaks just below the 28.4-MHz mark on the graph. **Figure 9** shows the 50-Ω SWR curve for the design.

Since Moxon rectangle designs using a variety of element materials and design frequencies are now common in antenna literature, we may turn our attention to **Table 7**. This table summarizes the performance data shown in the graph. In addition, it provides values for the rear element relative current magnitude and phase angle. At the design frequency, the parallel portions of the elements are about 0.133 λ apart. At that spacing, an ideal phase angle would be about 132.5° (or −47.5°). The rear element relative current magnitude would be close to 0.94. Compare these values to the ones in the table for 28.2 MHz (0.967 and 134.1°) and 28.4 MHz (0.943 and 128.0°). Little wonder that the Moxon rectangle achieves a maximum front-to-back ratio of well over 30 dB at its design frequency.

The cost for this improved front-to-back figure is a decrease in gain, partly resulting from the increased beamwidth relative to a standard Yagi design. Since the bent portions of the elements still have significant current levels near the array corners, their contribution to gain becomes a contribution to beamwidth. Hence, the Moxon rectangle has an average free-space gain of about

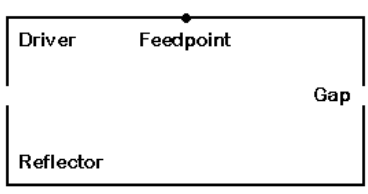

Figure 7—An alternative geometry array with parallel and end coupling: the Moxon rectangle.

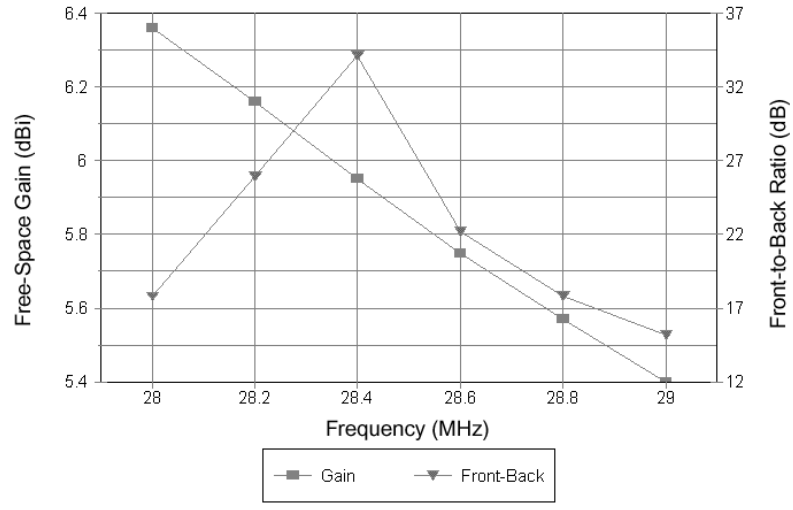

Figure 8—Gain and 180° front-to-back ratio of a Moxon rectangle from 28.0 to 29.0 MHz (design frequency: 28.35 MHz).

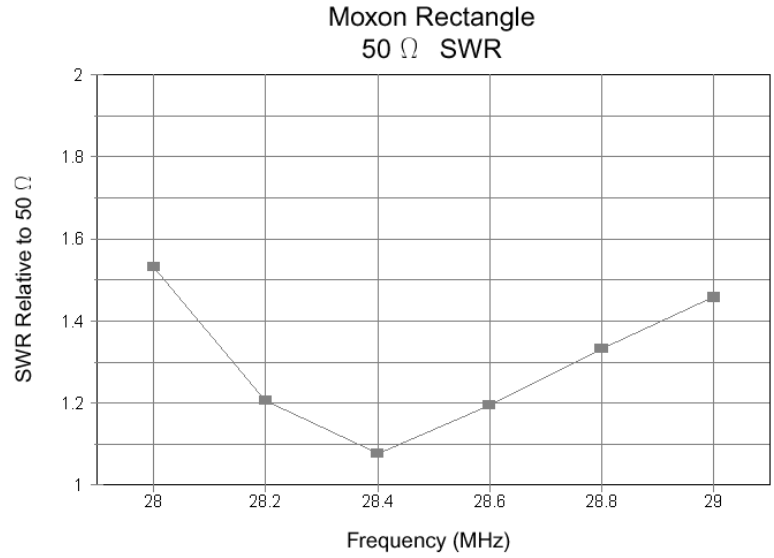

Figure 9—50-Ω SWR curve of a Moxon rectangle from 28.0 to 29.0 MHz (design frequency: 28.35 MHz).

6.0 dBi, somewhat below the levels of the optimized Yagis and of the idealized phased arrays that we examined in Part 1.

The Moxon rectangle is not the only attempt to alter geometry to improve performance over parallel-element Yagis. **Figure 10** shows some of the other arrangements tried with greater or lesser success. The VK2ABQ square was a forerunner of the Moxon rectangle. The diamond lends itself to inexpensive construction with a single non-conductive support for wire element ends. The hex and folded-× have been popular from time to time as near-ultimate compact full size designs. An interesting study, but beyond the scope of these notes, would be to investigate the relative current magnitude and phase on the unfed element in each design, noting that the most common implementation of the folded ×-beam is as a driver-director array. The others are all reflector-driver arrays.

Conclusions

Our goal has been to track the performance potential of parasitic arrays with only a single fed element with an eye toward understanding the limitations of using geometry alone to set the relative current magnitude and phase angle conditions between the elements. Both reflector-driver and driver-director Yagis show very serious limitations in this regard, except for very closely spaced driver-director models that are impractical for most (but not all) amateur applications. Alternative geometries, such as the Moxon rectangle, are able to overcome the problem of achieving high front-to-back ratio values by using multiple element coupling methods. However, they cannot achieve the higher gain levels (by about 0.5 dB or so) attained in principle by some ideal and compromise phased array designs.

The key to 2-element Yagi design shortcomings is also the key to 2-element horizontal phased array success. Can we find a practical way to implement a 2-element phased array with both elements fed to arrive at desired gain, front-to-back ratio and bandwidth values? In the next episode, we shall begin our exploration by reviewing the ZL-Special and its variants, all of which make use of what seems in principle to be the simplest phasing mechanism possible: a single phasing line that connects the two elements. More complex systems, such as the HB9CV and the N7CL systems do exist, but basic principles of phasing are often best explored by keeping the number of design variables to a minimum. The more complex systems will have their turn in Part 4.

Table 6

Bandwidth characteristics for 2-element driver-director Yagis at 0.075, 0.1 and 0.125-l element spacing.

Element Spacing: 0.075 λ

Frequency (MHz)	*Gain (dBi)*	*Front-to-Back Ratio (dB)*	*Feedpoint Z (R +/– jX Ω)*	*SWR (Relative to 21.1 Ω)*
28.0	5.59	12.31	33.0 – *j*21.6	2.47
28.25	6.03	16.75	27.0 – *j*11.6	1.72
28.5	6.52	23.60	21.1 + *j*0.2	1.01
28.75	7.00	15.47	15.7 + *j*13.9	2.22
29.0	7.30	8.87	11.6 + *j*29.2	5.66

Element Spacing: 0.1 λ

Frequency (MHz)	*Gain (dBi)*	*Front-to-Back Ratio (dB)*	*Feedpoint Z (R +/– jX Ω)*	*SWR (Relative to 29.7 Ω)*
28.0	5.64	11.39	39.2 – *j*19.5	1.87
28.25	6.03	13.54	34.7 – *j*10.3	1.43
28.5	6.44	14.85	29.7 + *j*0.2	1.01
28.75	6.84	12.96	24.6 + *j*12.4	1.63
29.0	7.15	9.28	20.1 + *j*26.4	2.98

Element Spacing: 0.125 λ

Frequency (MHz)	*Gain (dBi)*	*Front-to-Back Ratio (dB)*	*Feedpoint Z (R +/– jX Ω)*	*SWR (Relative to 36.6 Ω)*
28.0	5.55	9.35	43.2 – *j*18.7	1.64
28.25	5.87	10.24	40.2 – *j*9.8	1.31
28.5	6.22	10.66	36.6 – *j*0.1	1.00
28.75	6.56	10.05	32.7 + *j*11.1	1.40
29.0	6.84	8.36	28.8 + *j*23.7	2.11

Table 7

Bandwidth characteristics for 2-element Moxon rectangle, with modeled rear element relative current magnitudes and phase angles.

Frequency (MHz)	*Gain (dBi)*	*Front-to-Back Ratio (dB)*	*Feedpoint Z (R +/– jX Ω)*	*50-Ω SWR*	*Reflector I Magnitude*	*Reflector I Phase*
28.0	6.36	17.79	39.2 – *j*15.7	1.53	0.980	140.1
28.2	6.16	25.95	46.3 – *j*8.3	1.21	0.967	134.1
28.4	5.95	34.12	53.2 – *j*2.2	1.08	0.943	128.0
28.6	5.75	22.21	59.3 + *j*2.9	1.20	0.911	122.5
28.8	5.57	17.81	64.6 + *j*7.3	1.33	0.874	117.6
29.0	5.40	15.20	69.2 + *j*11.4	1.46	0.835	113.2

Note: Aluminum element diameter: 0.5 inch (0.001207 λ)

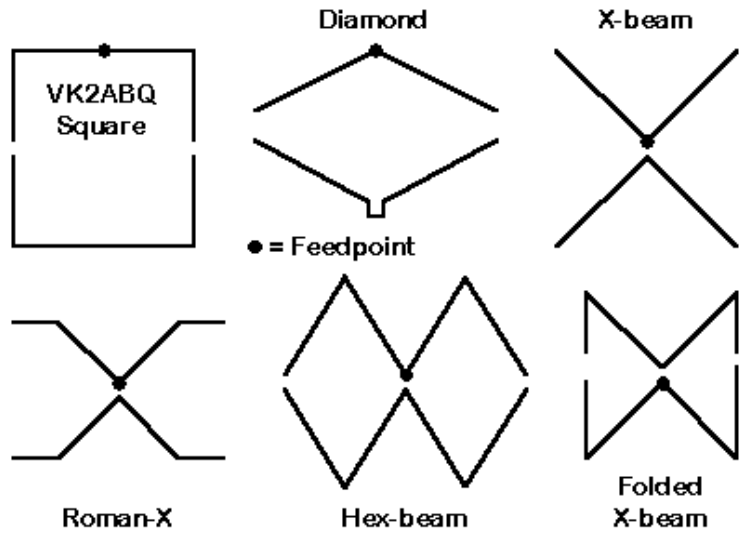

Figure 10—Some alternative 2-element parasitic array geometries. ■

A Visit with Jeff Morris, 9H1EL

Henryk Kotowski, SMØJHF/9H3HF
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When Jeff Morris, 9H1EL, was strolling past the ARRL's booth at Ham Radio 1998 in Friedrichshafen, Germany, he was completely taken by surprise upon spotting a photo of his home and antenna farm gracing the covers of a stack of July 1998 *QST*s on the table. Dave Sumner, K1ZZ, was manning the booth, and proudly presented him with a copy of the magazine.

That issue contained my article "Malta—The Amateur Radio Epicenter of the Mediterranean." I wrote the story after a visit to Malta in November 1997. After snapping the photograph that eventually ended up on the cover, I scribbled "Saw your antennas, took some pictures" on the back of one of my QSL cards and dropped it into Jeff's mailbox.

Over the 26 years that he's lived in Malta, Jeff's home has been haunted by a steady stream of ham visitors. His occupation as a Consulting Electrical and Electronics Engineer for the oil industry has kept him on travel abroad most of that time, so I'm sure finding yet another visitor's QSL card in the mailbox when he returned home was not a particularly memorable event.

On a return visit to Malta in May of last year, I finally had the pleasure of meeting him in person. We had only previously exchanged a handful of contest QSOs, but he greeted me as if we were old friends. He has an excellent memory for call signs, and immediately recognized me as the culprit behind that cover shot.

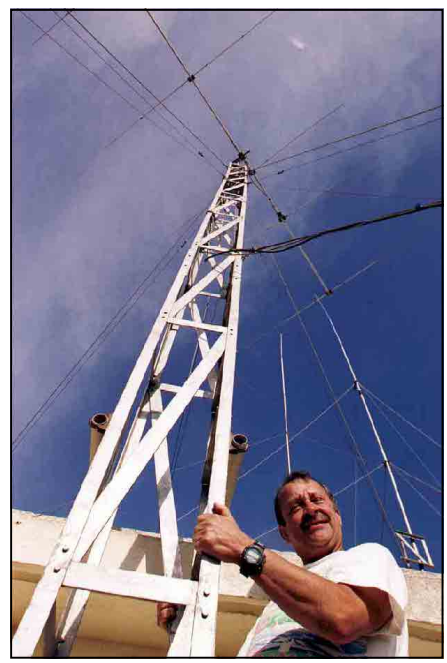
Jeff is in his early 50s, but appears to be at least 10 years younger. (Perhaps the rigors of working on offshore oil rigs and vessels has kept him fit.) He has recently semi-retired and now has more time to devote to ham radio. In spite of the fact that we had two cars to choose from, he insisted that we walk to his favorite restaurant—located a considerable distance from his home.

When we finally arrived, we sat down and shared life stories over bottles of fine Chablis. I'll admit that I don't recall all of the details of our conversation that evening, but I'll try to recount some of what Jeff revealed about himself.

Prior to moving to Malta in the early 70s, Jeff lived in Manchester, England. He was first licensed in 1969 as G3YDR. He moved to the house where he now lives in the early 1980s.

Jeff builds all his own antennas—and even homebrewed one of his towers. His station's weakest band is 160 meters; the antenna space is limited and the local noise level is high. Jeff's favorite band is 10. Propagation on that band is favorable to the rest of Europe, antenna size is more manageable and the QSO rate can be tremendous. Generating winning scores in the CQ World Wide contests from this part of the world is nearly impossible, though. Malta is in *Europe*—in spite of the fact that it lies farther south than Tunis in North Africa.

Jeff Morris, 9H1EL.



Jeff built this tower from scratch.

Most of you probably know Jeff better as 9H0A—the call sign that he uses during contests. A few multi-op efforts have been conducted from his station, and there are a couple of additional rigs and amplifiers that are stored there for just such occasions. His personal equipment includes an FT-1000MP and a legal-limit homebrew 8877 amplifier.

Jeff is active on all of the various contest modes—CW, SSB and RTTY—and he enjoys DXpeditioning. His most recent adventure was with the Comoros D68C DXpedition in February 2001. He was also a member of the 9M0C Spratly and Voodoo Contest Group 9G5AA Ghana teams. Even though he is not particularly fanatic about either contesting *or* DXpeditioning—we are certain to be hearing more from him in the future.

"When I think of it, almost all of my friends are Amateur Radio operators. I am probably going to remain in these circles for the rest of my life," Jeff said. "I regret that I didn't think of starting a visitors' book earlier. So many people from all over the world have stopped by my station. It would have been nice to have a record of it. Even the infamous Romeo Stepanenko lived here in Malta for a spell." We had a wonderful visit.

I ran into Jeff again a few days later at the headquarters of Malta's amateur radio organization—the Maltese Amateur Radio League. He had a couple of pounds of incoming QSL cards waiting there for him. "It's a problem," he said. "I don't bother with QSL cards. I have a QSL manager in Norway—LA2TO, yet every month hundreds of cards end up here, cards that I don't know what to do with." If you've been waiting for a card from Jeff, you may want to take this into consideration!

73, Henryk Kotowski, SM0JHF/9H3HF ■

2001 IARU HF World Championship Special Event Stations W1AW/6 & W6ROD

Ken Keeler, N6RO, and Mike Heideman, N7MH

QST de W1AW/6

by Ken Keeler, N6RO

For 24 hours, from 1200Z on July 14, to 1200Z July 15, 2001, the ARRL Headquarters station call sign—W1AW—was on the air from California for the 2001 IARU HF World Championship. Prominent contest operator teams in Northern California Contest Club territory made this well-known call available to the world, and set their sights on topping the IARU Headquarters competition category for this event. The current champion and record holder in this class is the DARC team—DA0HQ—who completed nearly 20,000 QSOs in the 2000 running.

Organizing the W1AW/6 operation was an interesting experience for me. Selecting the stations and manning them with just the right operators for the particular band/mode combinations was somewhat challenging, as the Northern California Contest Club suffers no shortage of fine stations and ops. In the months before the contest, over 600 coordination e-mails flew back and forth between the station hosts and organizers.

Special preparations—most involving the setup of supplemental antennas—were undertaken in the weeks leading up to the contest. During the contest there were some surprises though. At

The 15-meter 6 over 6 stack at N6RO.

Band/Mode	*Station*	*Operators*	*Antennas*
10 CW	K6KM	K2KW, N6BT, K6KM, N6TV	4/4/4/4 Yagis, 8-element Yagi
10 SSB	K6BL/W6NL	K6BL, W6NL	4- & 5-element Yagis
15 CW	K6IDX	W6OAT, K7NV	6-element Yagi
15 SSB	N6RO	N6BV, N6RO	6/6 Yagis
20 CW	K6KM	K2KW, N6BT, K6KM, N6TV	5/5 Yagis, C3
20 SSB	N6RO	K3EST, N6BV, AI6V	5/5/5 Yagis
40 CW	N6RO	K6AW	4/4 Yagis, four-square
40 SSB	AI6V	AI6V, K6XC, KI7WX	3-element Yagi, Dipole
80 CW	K6IDX	W6EU, WJ6O, W6OAT, K7NV	Four-square
75 SSB	W6RJ	W6RJ	3-element Yagi
160 CW/SSB	N6RO	N6RO	Four-square, Beverage

Submitted Results

Band	*QSOs*	*Points*	*Pts/QSO*	*Zones*	*HQ*
160	340	503	1.48	10	3
80	777	1763	2.27	27	3
40	1883	4397	2.34	35	9
20	3516	11389	3.24	54	36
15	2389	8487	3.55	48	21
10	811	2005	2.47	24	5
Totals	9716	28544	2.94	198	77

Total Score: 7,849,600

Breakdown of the Raw Results

(including dupes)

CW

Continent	*160*	*80*	*40*	*20*	*15*	*10*	*All Bands*	*Percent*
North America	195	370	597	769	496	376	2803	28.5
South America	0	3	12	13	15	3	46	0.5
Europe	0	1	8	453	368	0	830	8.4
Asia	1	37	212	260	337	15	862	8.8
Africa	0	0	2	8	2	1	13	0.1
Oceania	4	9	27	28	17	28	113	1.1
CW Totals	200	420	858	1531	1235	423	4667	
SSB								
North America	146	308	976	1511	841	329	4111	41.8
South America	1	9	11	31	34	8	94	1.0
Europe	0	0	0	309	98	0	407	4.1
Asia	0	43	30	143	177	10	403	4.1
Africa	0	0	1	7	2	0	10	0.1
Oceania	0	18	24	36	20	53	151	1.5
SSB Totals	147	378	1042	2037	1172	400	5176	
Grand Totals	347	798	1900	3568	2407	823	9843	

Dean, N6BV, and Ken, N6RO, handled W1AW/6's 15-meter SSB and 160-meter operations from N6RO.

AI6V, a low 40-meter dipole outperformed a big Yagi in the daylight hours, and sometimes heard better through the noise at night. The wire 40-meter four-square at N6RO outperformed their Yagi-stack at times, and proved more durable during the windy night, when broken spacers on one old Yagi resulted in arcing.

The K6KM crew replaced the feedline on their 10-meter 8-element JA antenna just before the start of the 'test. (It was particularly frustrating for them when they ended up working only 15 JAs on 10 CW after all that effort!) There were inter-station interference problems at one location, but we were able to swap some band-mode assignments around to make everything play all right.

My initial score projections were rather optimistic—especially for July—but we did manage to surpass our own estimates on the three low bands, in spite of the horrendous QRN we experienced. Propagation on the high bands—especially on 10—was disappointing to say the least, and that hurt both the QSO and multiplier numbers. The QSO distribution was more like what we might expect for a California QSO Party: 70% USA, 12% Europe, 12% JA. Thanks to everyone who persisted and made it into our log.

In spite of overall poor propagation conditions, there were a few high points. Rusty, W6OAT, reported that 15 was open all night Saturday to different areas in daylight, and 40 degrees on either side of the North Pole. The big beam at 3500-foot elevation helped generate reasonably good rates to parts of Europe and Asia.

W6RJ's big Yagi raised many South America, Oceania and Asia multipliers on 75 SSB, despite monstrous static crashes that resulted from storms over the Sierras. 160 meters produced five zone multipliers in the last two hours, and more than two dozen Zone 8 East Coasters before their sunrise. The 80 CW station at K6IDX snagged YR0HQ at 0447Z for our only 80-meter European QSO. Our 10-meter stations—at K6KM and K6BL/W6NL—reported a 15-minute opening to JA! The post-contest barbecue at AI6V on Sunday was the perfect ending for an enjoyable weekend. Thanks, Carl and Sue!

The most important goal that we had set for this operation was easily achieved: we had fun! Activating the HQ call sign provided tremendous enjoyment for all of our operators. Perhaps Ron, K6XC, summed it up best with this comment: "I was passing out 'thanks' to folks I was working in the middle of the day on 40 meters. Several responded, 'No!...Thank *You*!' The W1AW call is a magnet!"

We appreciate the support of all contesters, and especially the rest of the N triple C gang who logged our stations on as many band-modes as they could. Again, thanks to all who helped make this one-of-a-kind W1AW/6 operation an enjoyable event for our team. K2KW, W6OAT, N6TV, N6BV and W0YK provided great counsel and assistance in the organization and promotion. A special thanks to Dave Sumner, K1ZZ (ARRL Executive Vice President), and Joe Carcia, NJ1Q (W1AW Station Manager), for loaning us the world's most famous call sign!

IARU Region 2 Executive Committee Station—W6ROD

by Mike Heideman, N7MH

In addition to W1AW/6, Rod Stafford's call—W6ROD—was activated by a NCCC/Stanford ARC team set up at Stanford University's W6YX station. This operation represented the IARU Region 2 Executive Committee station and handed out the rare "R2" multiplier for the contest.

Participating operators were myself (N7MH), N6DE, N6EM, AD6FX, W6LD, W6ROD, K6ST, KE6ZZS (K6ST's nephew), and W7SW.

Since we were activating an "Executive Committee" station—not an IARU HQ station—we were limited to Single Op or Multi-Op/Single Transmitter operation. Unlike HQ stations, we'd be operating under the 10-minute rule. If we had given it more thought in advance, we would have published times that we'd be on the low bands and 10 meters ahead of time so that everyone would have a chance to collect our multiplier.

As can be seen from our band summary, we never did make it to 160 CW, 40 phone, or 10 CW. There was virtually no value in jumping for 10 minutes to a band for 1-point Qs and—very likely—no new multipliers that we hadn't worked on the other mode. Based on others' comments and the success of W1AW/6, we probably should have spent some time on 40 phone.

I think we overestimated the value of spotters due to our participation in other contests that exempt multiplier stations from the 10-minute rule. In such contests there are definite benefits to having additional spotters. We made an effort to post spots to the packet net, so I hope somebody was able to make good use of the talents of all of our excellent spotters! Thanks to the Northern California Contest Club members who served in that capacity. Overall a good time was had by all. Many thanks to Rusty, W6OAT, for arranging for the use of Rod's call sign.

Rod hiked the mile (and 1000-foot elevation rise) up to our shack in the Stanford foothills and operated the station for a short time. I won't go into details of his operating. Those who know Rod can ask him personally about his

Results

Band	*CW QSOs*	*SSB QSOs*	*Multipliers*
160	0	4	2
80	37	12	8
40	256	0	32
20	520	350	74
15	230	174	55
10	0	16	11
	1,043	556	182

Total Score: 979,342

Equipment:
Run station—Yaesu FT-1000MP, Alpha 87A
S&P station—Yaesu Mark V FT-1000MP, Alpha 78
Spotting/S&P station—ICOM IC-761, Alpha 78
Spotting station—Kenwood TS-850
10 meters—Telrex 6-element monobander at 70 feet
15 meters—Telrex 6-element monobander at 70 feet, Hygain 155CA at 25 feet
20 meters—KLM 6-element monobander at 60 feet, Hygain 205CA at 40 feet
40 meters—KLM 4-element monobander at 60 feet, Cushcraft 40-2CD at 50 feet
80 meters—Inverted-Vee, Dipole
160 meters—Inverted-V
10/15/20—KLM KT34XA
10/15/20/40—Mosley Pro 67A

To learn more about the energetic *Northern California Contest Club*, visit their Web site: **www.nccc.cc**

(*Thanks to the Northern California Contest Club for sharing these stories with the readers of* NCJ.)

2001 IARU contest experience.

We worked Jack, N6EM. He told us he'd be dropping by in a half-hour or so to help with spotting. We thought we'd get a call from him when he reached the gate at the bottom of the hill. We'd then send someone down to unlock it so he could drive up. We eventually did receive a call from him, but it was much later than expected.

Jack had decided it was such a nice day that he'd hike up. Unfortunately, he was misled by some research log-periodics he spotted on an adjacent hill (nice antennas, but *not* part of W6YX) and came up from the wrong entrance.

Jack had borrowed a hiker's cell phone to call us and let us know why his arrival was so delayed. He had finally spotted our towers and was heading in the right direction. We were a bit worried about 80-year-old Jack hiking that far on a warm day, but when he finally arrived it was *not* N6EM—but the young hiker who loaned him the cell phone—who was overheated and begging for water!

The remaining comments are from Dean, N6DE. He was running a swap meet during the first half of the contest and showed up in the early evening...

The Curse of the "R2" Multiplier

I couldn't make it up to the station until early evening. I arrived at around 6 PM on Saturday with a pizza in hand, and ended up staying for the remainder of the contest. During that time, I felt that 20 meters was definitely where all the action was! I felt louder on 20 than on any other band—we received lots of compliments on our 20-meter signal from all parts of the world! We were spotted eight times on the DX Summit. Five of those spots were for 20.

The average participant in the IARU contest has no idea what the R2 multiplier is. We got an amazing number of queries concerning our report.

Here are some examples:

"Was that Zone 02?"
"What is your *zone*?"
"*R2?* Again please?"
"Thanks for the Region 2, now *what is your zone required for the exchange*?"
etc, etc, etc…

I quickly abandoned saying "Region 2" on SSB. The one that seemed to work best was "Radio 2." But the confusion was not limited to SSB—I got lots of "?" and "NR?" on CW as well. It was not uncommon to spend 30 seconds sending/resending/explaining what the hell R2 was, then resending again—you get the idea. Some people just never did quite grasp the concept of R2!

Those in the contest who did understand were very happy to hear from us. Whenever we could not establish a run frequency on 20 meters, it was fun to hear the reactions of the Europeans when we S&Ped them and handed them our R2 multiplier! Instead of the normal "TU" message, some stations hammered out more emphatic appreciation! One guy sent "TU TU TU." Others sent "FB R2 TU dit dit." It was fun!

The 10-Minute Rule

Many of the serious participants in the contest wanted to move us to other bands. As a multi-single in the IARU HF Championship, the rules state that we have to remain on one band-mode for at least 10 minutes. We couldn't move to another band or mode before that 10 minutes was up.

We had to constantly balance the issue of putting forth a competitive effort versus trying to be a nice W6ROD host and give people the R2 multiplier on as many bands and modes as possible. We often told people that we would be on a particular band-mode in a certain amount of minutes or at a certain time. Sometimes we simply had to decline, explain the 10-minute rule, and say that we had been on that band before.

Compare being on 80 for 10 minutes, working primarily 1-point QSOs, versus being on 20 meters working 5-point QSOs at a higher rate. There is just no comparison, but we made a very reasonable effort to remain on bands like 80 longer than we should have.

Not only does the rule apply to the bands, but it also applies to the modes! We contacted W1AW/6 on 160 SSB, and had to decline an offer to move to 160 CW because A) we had to be on 160 SSB for 9 more minutes, and B) we would have to remain on 160 CW for another 10 minutes after moving there.

There were several comments on the 3830 Reflector from other M/S efforts complaining about the 10-minute rule. After spending a weekend running M/S as a rare multiplier, we also felt severely constrained by this rule. I personally hope that contest organizers will reconsider this rule for M/S stations in a contest like the IARU, where there are mixed modes and multipliers per band.

QSL our W6ROD 2001 IARU contest operation via Rod Stafford, W6ROD (2001 IARU), 5155 Shadow Estates, San Jose, CA 95135-1230.

Editor's note: At the IARU's Region 2 meeting in Guatemala in October 2001, the Administrative Council voted to revise the contest rules so that AC and Regional Executive Committee stations may only be operated by the individual licensees as single operators. ■

W1AW/6 2001 IARU HF Championship Certificates

To make the experience of working W1AW/6 even more special, a free certificate is being issued for North American stations that worked us on eight or more band/modes, and for non-North America stations that worked us on six or more band/modes. A special endorsement is also available for those stations who worked W1AW/6 on all 12 band-modes.

For single-mode entrants, a certificate for working us on five bands for North American stations or on four bands for non-North American stations is available, and there's a special endorsement for working us on all six bands.

Please apply for these awards by sending an e-mail to N6RO (**n6ro@arrl.net**). Include your name, call, mailing address and the times and band-modes of your QSOs.

Address QSL requests to ARRL (W1AW/6), 225 Main St, Newington, CT 06111-1494.

NCJ Profiles—Jeff Steinman, N5TJ

Ken Adams, K5KA
kladams@ppco.com

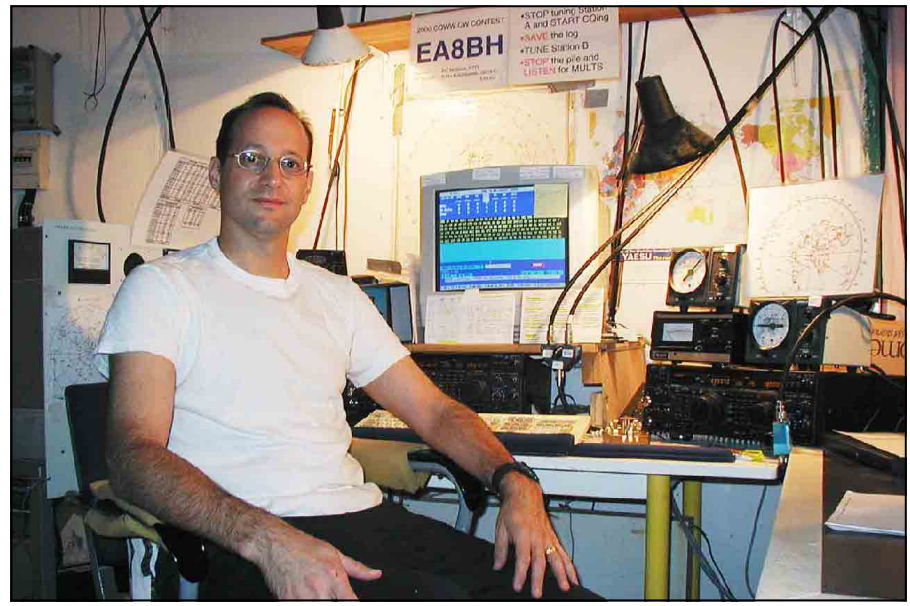
"WOW!" That was Jeff's only comment after he set a new CQWW CW Single Op record in 2000. He has managed to push many contesting records to new levels that will be very difficult to match. Jeff's journey to success is a good lesson for all of us "average" guys. It does not involve secret weapons or stealth technology, just practice, learning, planning and execution.

First licensed in 1978, Jeff initially enjoyed chasing DX. He participated in a couple of contests primarily as a means of working some new countries. He was hooked. In 1981 Lew Gordon, K4VX/0, was in the process of building a superstation in Missouri and ran an ad in *QST* soliciting operators. Shortly after the ad appeared, Lew's phone rang. The first words out of Jeff's mouth were "I'm your operator!" Over the years, Lew's station has served as the training ground for N5TJ, W4AN, NT1N, AG9A and several others. (These four operators will be competing in WRTC 2002 in Helsinki.)

Jeff was a regular at K4VX/0 in the early 80s (his call was KR0Y at that time), doing single-op efforts mostly in Sweepstakes, the NA Sprint and WPX. He had several top ten finishes in SS on both CW and SSB. During multi-op efforts Lew says Jeff would be the main operator on the high rate band, but when the action slowed down he became one of the best at "search and poach" (a phrase Lew says Jeff was first to coin).

In 1986, a career move took Jeff to the Dallas area. He quickly got involved with the North Texas Contesting Club who affectionately nicknamed him "Zero." It was during this time period when I first met Jeff and this other guy they called "Gator" at one of the early HamCom conventions. Jeff soon began operating from WM5G, a competitive station located in Garland. Jeff continued to hone his operating skills and—when combined with the evolving hardware at WM5G—some pretty impressive scores began showing up. It was around then that Jeff refined his ability to operate SO2R as his default mode.

After a computer crash in 1989 destroyed half of his CQWW SSB log (he would have been in the top ten), Jeff came back in 1990 to win the event. That was followed by wins in ARRL DX on CW and SSB in the following years…from Texas! Jeff managed a couple of wins in ARRL SS (SSB once, CW twice) from WM5G in the mid-90s. In addition, there were a few CW Sprints wins thrown in there as well, including something like 10 in a row at one point. By the mid-90s, he had become one of the top gun single operators in the US.



N5TJ at EA8BH for the 2000 CQWW CW Contest.

Unfortunately, the WM5G station fell prey to a very nasty storm in the mid-1990s and became unavailable. Around that same time Jeff had become a father with a mortgage and a blossoming, demanding career in telecommunications.

Jeff built a very efficient city lot station using a crank-up tower and some wires. With this setup, he won low power US single op in both the CQWW CW and ARRL DX SSB contests…from Texas…*not* the East Coast. He also won Sweepstakes CW low power several times, and even throttled the output down to the 5 W level to try out QRP one year in the SS CW. He came away with the win and a new record. The one he never could break is the low power SS CW record. He's come close many years, but he's never quite topped the score K7JA set from NP4A in the early 90s.

In the late 90s, he was ready to try a serious DX effort in the CQWW. The opportunity materialized in the form of a call from Martti Laine, OH2BH/EA8BH. This combination proved to be formidable…on CW and phone. In 1999, Jeff operated EA8BH in CQWW Phone and broke the magic 10,000 QSO barrier. This is a good example of what's possible when a world-class SO2R guy operates from a world class QTH under excellent conditions. And as if that was not enough, in 2000 Jeff returned to EA8BH and set a new world record for CQWW CW with over 7,500 QSOs. The bar has definitely been raised.

Jeff has competed in all three of the WTRCs conducted thus far. He and KQ2M finished third in the first running. He teamed up with K1TO to win first place in the last two events. Yes, Dan and Jeff will be joining forces again for WRTC 2002.

Jeff and his family moved to a new home early in 2000. Unfortunately, it's one with deed restrictions. Jeff has been making brief appearances at K5MR to support multi-op efforts.

I had the privilege to operate beside him a couple of times at K5MR. Jeff remains amazingly calm while running DX at 200/hour. He paces himself. He never gets overly excited and always seems to have a sense of the current propagation and conditions. What impresses me most is that if you ask Jeff what he does to win, he will tell you everything. The challenge, of course, is to execute his strategies at the same pace and level of efficiency that he does.

When asked what he has planned for the future, Jeff says he will probably operate from K5MR whenever possible but has no major single operator efforts in mind. He just wants to remain active. So when you hear him on from his new home, keep in mind that he is using wire antennas in the attic (and there's little doubt that he'll *still* be competitive!).

Jeff's success thus far is a good example for us all. Jeff has always remained active in contests and operated whenever possible. There's a lesson in this for us average guys: practice and stay active. If you really want to be good at something (*anything*), you've got to practice, learn, plan and execute. And one more thing—make sure you are having fun! ■

Contesting For Fun

Brian Kassel, K7RE
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"FYBO"—It's Not Just Another Four-Letter Word

K7RE

The 2001 ARRL Field Day results appeared in last month's issue of *QST*. It sure seems like eons ago when I set up my station (1B Battery, Single Op) and operated from the 7,600-foot level of the Arizona Mogillion Rim.

Field Day is purported to be the most popular contest around, and it's easy to see why. One gets to operate in the open air, outside of the confines of the all-too-familiar contest shack. The members of many ham radio clubs and groups use this annual event to initiate new members and renew old acquaintances. Lots of eyeball QSOs ensue. Often participants will bring along new rigs or gadgets for folks to check out and play with firsthand.

Portable operation can be difficult, though. Even with today's small, lightweight, full featured rigs, Murphy still seems to be able to strike at will. True, as we participate in this event year after year we gain experience, and—if we're smart—we learn from our mistakes.

Field Day, as is the case with any contest, presents unique challenges and rewards. Too bad that it only comes around once a year.

Well, guess what, folks, there *is* another operating event that's similar to FD. It has been held in the dead of winter for five consecutive years now. It's called FYBO Winter QRP Field Day, and it's organized by a QRP group in Arizona, the ScQRPions. (Sc*QRP*ions, get it?)

FYBO is the abbreviation for *Freeze Your* (insert applicable anatomical reference here) *Off*. In addition to the more typical factors used to calculate your final score (the number of contacts completed and such)—*dig this*—the magnitude of one of the multipliers is inversely proportional to the temperature measured at the operating position! That's right—no kidding—the colder you get, the higher the multiplier! Now, before you flip this page in a mad dash attempt to locate a column that might be written by a saner author, hear me out. This is really fun!

Extreme Operating, In the Extreme…Or Not

Fear not, the less adventurous among us can operate this contest from the warmth and comfort of their usual shack. Since part of the exchange reveals a little about what the other operator is enduring, it's great fun to copy the other station's temperature and imagine what he might be experiencing. It's unlikely that you'll break into the top ten with a temperature multiplier that's based on a cozy 70° F, but heck, you don't have to win every contest, do you?

For those hardy enough to take this one to the field, there's not only the logistics of preparing for your personal comfort (some might go as far as saying "survival"), there are equipment considerations as well. Keyers, radios and notebook PCs don't always perform at low temperatures as well as you might expect. And then there's the issue of trying to send CW while wearing heavy gloves or mittens.

The contest is only 12 hours long, so even if you do decide to brave the elements and go for the gold, you can still be back home in front of a fire in a reasonable time.

The exchange is RST, state/province/DXCC country, name, power and—of course—the temperature (measured *at* the operating position—*not* the outside temperature). A table is provided in the rules that lists the multiplier value for various ranges of temperature. Just to keep things simple, the lowest temperature that you observed (endured?) during your operation is the one that you use.

CW and SSB modes are allowed. The RF power output is limited to 5 W or less for CW, and 10 W (PEP) or less for SSB. Categories include Single Op Home or Field, Multi-Op Home or Field and Novice/Tech+ Home or Field.

The final score is calculated using this formula:

Number of QSOs x States/Provinces/DXCC Countries x Temperature Multiplier x Field/Home Multiplier x Alternate Power Multiplier x Transmit Power Multiplier = Total Score

- You can work a station once per band/mode. (Each S/P/C only counts once overall, regardless of the number of times you work them.)
- A location in the field yields a multiplier of 4. Home stations use 1.
- Alternative power yields a multiplier of 2. Stations running off the ac mains use 1.
- Transmitter power of less than 1 W yields a multiplier of 2, all powers above 1 W use 1.

For the contest dates and the complete official rules, visit NK7M's Web site: **www.extremezone.com/~nk7m/**.

There are several other similar field-oriented contests that I intend to cover in future columns. I will try to time my coverage so that you'll have a chance to join in on the fun.

You Don't Have To Be Crazy, However…

Lots of folks have taken the time to document their FYBO contest experiences and have posted pictures and text on their personal Web sites. If you do a simple Internet search on "FYBO" you'll get back hundreds of hits. I found tales of woe dating back several years and evidence that even some of us older folks are still getting out and FYBOing.

Here are a few comments from FYBO operators about their experiences during past runnings.

N7CEE

(N7CEE is a QRP/backpacker. I'm not sure of his age, but it has to be well past 40. He flies commercially for a living and lives in the mountainous Flagstaff, AZ area.—'RE)

"I skied solo a mile or so to a grove of pines I'd spotted from the air while flying a charter. I made all of seven contacts. The lowest temperature—at 7,000 feet—was 58° F. Achieving a big score was not the point, though. The point was to go skiing, and try out my recently completed Elecraft K1.

"On the solo bit—I've been exploring and hiking in the southwest for many years. I often go alone because my schedule does not mesh with anyone else's. It's certainly not as dangerous as driving in city traffic, probably by a factor of a 100 or more..."

—Bruce Grubbs, N7CEE

AC6KW & KQ6DV

(Jeff and Tom were set up in northern California.—'RE)

"We worked on through the day managing to stay fairly dry and just a bit warmer than hypothermic. When 5 PM came around, a ranger stopped by and hinted that she would be closing the park soon. We told her we were just finishing up. A bit later, she drove by and flashed her lights at us. Tom, KQ6DV, shouted, 'Just two more QSOs!'

"At about 5:45, with the ranger standing at our campsite tapping her foot on the ground, we decided it was time to quit.

By the time we finished breaking camp, it was pitch black, the fog had rolled in and we were *really* starting to get cold.

"All-in-all we had lots of fun. With 5 W, a 3 Ah battery and a field antenna, we completed QSOs from Alaska to Florida, and from New York to California. Seventy-five QSOs in all, and with our multipliers for the temperature, alternative power and field operation, we had plenty of points to keep us in the running. This year's FYBO turned out to be quite a blast. Now—on to the next QRP contest!"

—73, Jeff Grudin, AC6KW

AL7FS

(This last one is from Jim Larsen, AL7FS, in Anchorage, Alaska. I've met up with Jim twice now while he was on his trips down to the Lower 48 to attend Pacificon. This hamfest is held in October in Concord, California. Now, some of you may not know this, but Alaska's propagation to the rest of the world is known to be pretty tough much of the time. There have been several non-QRP contests where Jim has only been able to work a few stations. I will not go into the vagaries of far northern latitude propagation, but trust me; the AK folks are up against some difficult conditions in many contests.—'RE)

"I managed 27 QSOs and 14 SPCs in FYBO but conditions were very tough. Many of the contacts were completed during what seemed to be 60- to 120-second openings. The signals would come up, I would work the station, and then they were gone again. I lost a few contacts because we did not hit the tiny window just right. N6WG and N7MOB—I think—were lost that way. Even WE6W came up, we worked—and then he was gone again. There was not one area that stayed in for any great period of time. It was hit or miss all day.

"I was pleased to work Dave, AD6A, as my first QSO, and wondered if he was running his NorCal 20. I suspect he was. And I finished with Ade, W0RSP. The Alpha and the Omega in more than one sense. I managed only three QSOs with Arizona." *(I seem to work Jim in just about every QRP event, hence his "only" comment.—'RE)*

"I was very pleased to work Kohie, JR0BAQ. We exchanged 2 × 599 reports after I turned the beam. Then we worked on 15 meters. Great stuff!

"The winner of the AL7FS/FYBO Alaska Wildberry chocolate is N7YA! Way to go, Adam.

"As usual, I had fun. Thank you, everyone."

—73, Jim Larsen, AL7FS

(Jim sends a package of Alaska Wildberry chocolate every FYBO to a person drawn randomly from his list of contacts during the event. For as many times as I have worked and talked with Jim, I have yet to be lucky enough to receive a box. Hint, hint…—'RE)

And, folks, that's what the FYBO is all about—Fun. The QSOs may not come at a blistering pace, and the signals will probably not rattle the headphones from your ears, but—as the ScQRPion folks like to say—"If you ain't havin' fun, then you're just doin' it wrong!"

Something For Nothing! Can It Be True?

If you are a bit lazy like myself—and don't care to pencil in each QSO—there is a freeware software program available that will not only allow you to log contest contacts and compute your score, it will also generate CW exchanges that are contest specific.

The program—*QRPDUPE*—currently covers 26 contests, including all the major QRP events—even the field-oriented ones. It also works for several of the larger contests that are not specifically QRP-oriented—the CQWW and WPX contests, many of the ARRL contests and the IARU contest, for example. It will run under any version of *Windows* and is available, totally free—no strings attached—from **www.dancris.com/~bkassel/index.htm#top**.

As I am the author of the program, I am also the one to contact if you run into any problems. Enjoy!

73, Brian, K7RE ■

Adventures in Contesting

"You're the Mult station? I thought I was the Mult station!"

Contesting on a Budget

Paul Schaffenberger, K5AF
PaulK5AF@aol.com


K5AF

K7BV approached me to be the editor of this new column in typical Dennis fashion. His e-mail was titled "My New 'Contesting on a Budget' Columnist!" and stated (reproduced here in only *very slightly* abbreviated form), "I've picked you to write this column, sign here _____." My first inclination was to simply reply "TU but QRU," but after some thought, though, I decided to take this "assignment" on.

Due to a variety of circumstances, over the years I've always had to "make do" with very modest equipment and antennas, yet I've garnered great satisfaction from doing more with less. My focus with this column will be to encourage more and better quality participation by those of us who don't have the financial resources for a high-dollar contesting effort, but I will also focus on how even those with deeper pockets can get more bang for their buck.

A quick personal sketch. I got my first license at age 11, and started contesting in 1963. I graduated from the Air Force Academy in 1970. I had a 27-year career in the Air Force, and retired as a colonel. I am currently working as a consultant for Productivity Resources LLC and am on my third major consulting project with Dell Computer Corporation.

I moved 22 times during my military career. I've used wire antennas and low power from every location, and have never had a permanent tower or beam antenna.

If ham radio were my only passion, I wouldn't be as qualified to write this column, as I probably would have had enough resources to devote to building a serious station. But there has been competition for my limited resources over the years. I am also a musician—so keyboards, amplifiers, and PA equipment have all consumed a significant portion of my hobby dollars.

I've got to admit that music is a little more than just a hobby. For the first three years after retiring from the Air Force, I played over 200 nights per year. I've recently cut a CD, and—in spite of my Dell activity—I continue to find time to play at least once a week.

I currently have a low power station set up that's centered around two Omni VIs, which I acquired used after bartering and trading my way up from two Corsair Is. My antennas are simple wires fed with open feeders. I live in a covenant-restricted neighborhood, so my antennas are low and essentially invisible, but I've enjoyed a lot of success, including a USA Top Ten finish in the first major contest I entered from this QTH, the 1994 CQ WPX CW.

I realize that there is a whole universe of information that could be covered in a column of this nature, so I'll try to break it down to bite-size chunks. The overall pieces that I currently see are how to build a competitive station under $XXX, how to save money building a station, best dB per dollar investments, best long-term investments, new versus used equipment, and areas where NOT to scrimp. I certainly can't leave out the subject of homebrewing, as many of us have saved significant dollars building our own accessories, interfaces, etc…

I also realize—in ham radio as in life—the devil is in the details. What I mean by this is that even after major purchases of gear and antennas, the nickel and dime expenses such as cables, interfaces, filters, connectors and the like can really add up. This certainly is an area to address as well. Finally, financial tradeoffs between equipment, accessories and antennas are certainly rich subject areas to explore. For all of these topics, I welcome personal anecdotes and real-world experiences and successes.

I also realize that some of the ground I tread on has already been covered by Gary, W9XT. I've been a dedicated reader of Gary's "Contest Tips, Tricks and Techniques" column over the years and am an occasional contributor. I've always admired his work. I plan to work closely with Gary to ensure our topics are coordinated and that I'm not reinventing the wheel.

With all that said, let's move on to the topics for the March/April and May/June 2002 columns.

Topic for March/April 2002

The "Young Blood" Contester

We've all given a lot of lip service to encouraging young blood to enter our contesting world. I'd like to kick off this column with a very simple exercise.

A newly licensed lad of 17—let's call him "Justin"—got hooked on contesting during the most recent Field Day and Sweepstakes events. He wants to build a station of his own. He already has a memory keyer, a mike and a personal computer. His folks have told him that due to his impending college expenses he can spend no more than $1000 on station building. His house is on a typical suburban lot without covenants. His lot has trees and is well suited for wire antennas or a modest tower and beam. What advice should we give Justin? Should we tell him to forget it, and guest op? Is it possible for Justin to get into the game for under $1K? How should he allocate his dollars? What other advice can we give him?

Topic for May/June 2002

Used Equipment

Used Equipment can represent a significant savings over new equipment, but it can also be a huge headache.

- Where do you go to find good used gear: swap meets, on-line auctions, ham outlets?
- How do you know how much a particular piece of gear is worth?
- How do you know if a seller is reputable?
- What do you do if you get a lemon?
- Are package deals (including filters or accessories with a transceiver purchase, for example) the way to go?

I'm looking forward to your responses! ■

Propagation

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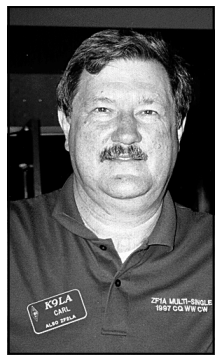
Cycle 23 Update



K9LA

I know that I promised the topic for this issue was going to be "The Importance of 'Ground'—Part 2." But since my last column on the progress of Solar Cycle 23 was way back in the March/April 2000 NCJ*, I figured we were overdue for an update. I'll return to the discussion on "ground" next time.*

Some interesting things have happened with Cycle 23 since we last examined it in my March/April 2000 column. In the unlikely event that you might not already know, the big news is that Cycle 23 peaked in April 2000 at a smoothed sunspot number (*SSN*) of 120.8. That's just over a year and a half ago.

Figure 1 includes the most recent data. I've superimposed it on a plot of Cycle 20. (So far, Cycle 23 has been fairly similar to Cycle 20, so Cycle 20 appears to be a good model to use to try to extrapolate what Cycle 23 may do as it continues its descent.)

Further confirmation that the peak occurred in April 2000 came in the form of a February 15, 2001 report by NASA scientists that the sun's magnetic field had "flipped." What that means is the sun's magnetic north pole, which was in the northern solar hemisphere early last year, now resides in the south. This transition happens like clockwork (as far as we know) at the peak of every cycle. (Here's an interesting fact: The Earth's magnetic field *also* flips, but—fortunately—with less regularity. The last time this occurred was some 750,000 years ago.)

After examining Figure 1 the question that comes to mind is "what will Cycle 23 do as it continues its descent?" Will there be a gradual downward trend from where it is now, or will it level off for a couple of years—as Cycle 20 did—before heading back down? There are predictions for the remainder of Cycle 23 out there, but only time will tell what it really does.

The impact on propagation (and on contesting) of being about a year and a half past the peak of a solar cycle depends on which end of the HF spectrum your interest lies.

With respect to the higher bands (15, 12 and 10 meters), the excellent worldwide propagation that we're experiencing now will continue for another couple of years (of course, that depends somewhat on your QTH and your target area). This translates to continued good contesting conditions, as the descent to solar minimum is much slower than the ascent to solar maximum. This can be seen in the plots in Figure 1. Cycle 20 took about 4 years to get to the peak, and then just over 7 years to reach minimum. That's about average performance for a solar cycle.

With respect to the lower bands (160 and 80 meters), being about a year and a half past the peak of a solar cycle means that we are finally beginning to see the light at the end of the tunnel. The really good days are coming, but they're still a couple of years away. That's because we're in the period of the solar cycle (the descending part) when geomagnetic storms occur most often. (If you'd like to develop a better understanding of this, now's a good time to have a look back at the text and figures of the March/April 2000 column.) When we move past this stormy period—and with absorption gradually decreasing as the SSN decreases—the good contesting days on the low bands will return.

At the Northwest DX Convention in Seattle last summer and at the W9DXCC Convention in Chicago last fall I showed forecasts of when we'd likely lose propagation on the higher bands to certain areas of the world and when we'd have good propagation on the lower bands. **Table 1** summarizes my conclusions. The results were derived by first extending the plot of Cycle 23 by using predicted SSN values (from **www.sec.noaa.gov/ftpdir/latest/Predict.txt**).

For the higher bands, I ran propagation predictions (using *W6ELProp*) from the Seattle and Chicago areas to a couple of popular target areas for a range of SSNs (25 to 150 in steps of 25) for the month of January. I chose January because that month is roughly centered in the contest season. Next I noted when the predictions indicated that the SSN was low enough so that the MUF fell below the band of interest.

One little "trick" here, though. Since our propagation predictions give monthly median results, they are for when the band should be open on at least half the days of the month. I chose to gamble a bit more, so I used median MUFs that were about 90% lower than the band of interest. That says my predictions are really for when the band should be open on only a couple of days of the month. (We're hoping that those days happen to fall on a contest weekend!) Knowing the minimum SSN needed then allowed me to look at the Cycle 23 plot and estimate when that would occur.

For the lower bands, I eyeballed the data shown in Figure 2 of the March/April 2000 column. Then I simply made an educated guess as to when the magnetic storminess period would be low enough for good propagation. That's not very scientific, but it's my best guess.

If you'd like to make your own high band predictions for your specific QTH, just follow the procedure I used. If you have any questions, drop me an e-mail and I'll try to help. Remember the results will only be a general indication, as the uncertainty of Cycle 23's future and any simplifying assumptions made in the propagation predictions (like just using January to represent the entire contest season) can move things around a bit. ■

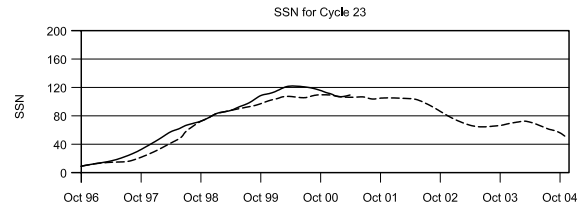


Figure 1—Cycle 23's progress through April 2001. The plot of Cycle 20 (the dotted line) is provided for comparison purposes.

Table 1

Broad Predictions for Propagation from Seattle and from Chicago to Europe and Japan during the descending phase of Cycle 23.

	When 10 Meters Will Likely Drop Out	*When 15 Meters Will Likely Drop Out*	*When the Low Bands Will Likely Be Good*
Seattle to Europe	Spring 2003	Spring 2004	Fall 2004
Seattle to Japan	Fall 2003	Spring 2005	Fall 2004
Chicago to Europe	Fall 2003	Spring 2005	Fall 2004
Chicago to Japan	Spring 2003	Spring 2004	Fall 2004

The Contest Traveler

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K8JP

Are you thinking about taking a contest trip to a warmer climate or exotic QTH—or perhaps just a vacation with ham radio on the side?

Besides preparing a list of the normal equipment and personal gear you'll want to bring along, there is another aspect of travel that you should invest some time in. That is becoming more familiar with the culture, the history and the laws of the countries you may need to travel through and, of course, your final destination.

Many people envy Bev's and my plans to settle down in Belize. Some go so far as to begin a search for a similar place for themselves. Before we ventured very far along on this adventure, however, we did a considerable amount of reading. For those of you that are interested in the Caribbean, I recommend two books, *Caribbean* by James Mitchener and *Don't Stop the Carnival* by Herman Wouk.[1]

The first is a novel that includes a wide spectrum of information on Caribbean history. I really impressed one of the young local Garifinas when I knew the history of his people—ex-slaves from St Vincent that were dumped on Roatan Island off the coast of Honduras by the British. To stay there, the Hondurans required that the ex-slaves take on Spanish surnames and adopt the Catholic religion, as this was during the time of the Spanish Inquisition.

The locals in our village in Belize are Creole, descendants of ex-slaves from the Island of Hispañola, home of Haiti and the Dominican Republic. *Caribbean* is more than just a good source of historic information on the region, though, I think James Mitchener's books are great reads.

The second book is a humorous tale about a fictitious island that's a possession of the US, and of a fellow who buys and runs a resort there. When I read it, it reminded me of how well—at times—the cartoon strips "Sad Sack" and "Beatle Bailey" reflected real life in the military. This book will teach you to laugh at the types of situations you will inevitably encounter in laid-back places like the Caribbean.

Learning about the local customs and culture before you go somewhere can only enhance the enjoyment you will experience. Travel guides from your travel agent, the library and bookstores offer a wealth of such information.

We picked up a travel guide for Mexico from AAA. It had many interesting points to look for on our trip through Mexico to Belize. It also included Spanish language phrases that can come in very handy in restaurants, hotels and emergencies.

Many times, you can find travelogue videos at libraries and from other sources. One Web site that provides travel and culture tips for a number of countries is **www.berlitz.com/globetrotter/default.htm**.

Many countries provide travel information through their tourist boards, embassies and consulates. Check your telephone book or search the Internet for contact information for these sources.

In addition, it should go without saying that you should seek out others who have already traveled to your destination. Knowing about their personal experiences can save you time and money, and help you avoid many of the potential hassles.

What will you do if you encounter an emergency or a legal problem resulting from an auto accident, a fallen antenna—or even a barroom brawl? Though prevention is always the best remedy, accidents and unpredictable situations can put you into a sticky predicament. When traveling abroad, know how to contact local representatives of your home country.

I do alright driving "with my elbow in the bush" in those countries with left side driving until it comes to entering driveways, parking lots or unusual intersections. But even if you are a cautious and skilled driver, accidents can occur that are not of your own doing. Sometimes all it takes is to be in the wrong place at the wrong time.

Do you have sufficient insurance on your vehicle (or the one you've rented) that's *valid* in the country you are traveling in? Do you know the proper procedures for accident reporting? In some places, if the parties involved lack sufficient insurance, the authorities will throw everyone in the calaboose until fault is determined. A good source for information on this, again, is a travel guidebook. Our state department also offers advisories about traveling in various countries.

What if you have a personal accident, like falling off a roof or ladder while putting up an antenna—or a similar activity? Do you have traveler's insurance? I am a certified SCUBA diver and always make sure my Diver's Alert Network (DAN) insurance is in place. They offer a "Preferred Plan" that covers some medical expenses and will bring you home, even for non-diving accidents (see **www.diversalertnetwork.org**). There are other forms of travel insurance available as well. Check with your local insurance agent and travel agent for suggestions.

Make a couple of copies of a list of contact information for the nearest consulate or embassy and keep one on your person and one at the place where you are staying. You might want to include contact information for your attorney at home. If there is a legal problem, they should be able to assist you with dealing with the situation. While you are at it, add your physician's telephone number and those of family members.

I feel that if I am prepared, it's much like carrying an umbrella; chances are that I won't need to use it!

Good traveling! Learn as much as you can before and while you travel to those exotic locales, and have fun!

73, Joe "Palooka," K8JP ■

[1]James Mitchener, *Caribbean*, Ballantine Books; ISBN: 0449217493 and Herman Wouk, *Don't Stop the Carnival*, Little Brown & Co; ISBN: 0316955124.

Contest Tips, Tricks & Techniques

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Reducing Inter-Station Interference in Multi-Op and SO2R Stations

W9XT

When hams discuss interference they are usually talking about interference to neighbor's telephones or TVs. With more multi-op stations and the advent of SO2R (single op, two radio) techniques, contesters are experiencing RFI much closer to home, right in their own shack. Even the conventional single op using packet assistance has two rigs going, the HF rig and the packet radio.

K9WO gives a good background on the basics of inter-station interference. Steve spent several years in Hong Kong as VS6WO. He would operate as many as six transmitters from his high rise penthouse. Some of the antennas were literally only feet apart.

Steve divides the interference into two parts—in-band interference and receiver overload. In-band interference is caused by harmonics from lower band transmitters. It must be taken care of at the transmitter side.

Large out-of-band signals can cause receiver blocking or intermod problems. These must be handled at the receiver side with filters or other techniques that reduce the out-of-band signal that appears at the receiver input.

Steve goes on to mention that harmonics are more of a problem on CW because the harmonics also land in the CW portions of other bands. Despite a lot of filtering and other techniques, many respondents to this topic indicated that they could not operate within several kHz of the harmonic frequency of a lower band transmitter.

Proper Grounding

One of the first steps towards reducing inter-station interference is something that should be achieved in every station—multi-transmitter or not—and that is proper grounding.

KB1H's station is located on the second story of a barn. Although his original goals were for a two station M/S or M/2, Dick occasionally runs as many as five stations. Originally he had a lot of trouble with RFI to non-ham electronic equipment, inter-station interference and interference with packet.

Dick put a lot of effort into grounding. Each station has a copper bar that's 4 × 1/4-inches and 3 feet long behind it. All of the equipment for each position is connected to the bar with 1 1/2-inch-wide copper straps. The copper bars are connected by 0000-gauge copper cable. This cable goes down to the ground floor and connects to an array of multiple ground rods. All of the connections are CAD welded.

His second major improvement came when he re-wired the ac feeds. Dick put in all new ac power wiring all the way back to the breaker box. The wiring was enclosed in metal conduit. These changes eliminated the majority of his RFI problems.

Antenna Spacing and Polarization

Simply moving the antennas farther apart will cut down interference. Signal intensity conforms to the inverse-square law. This means doubling the distance between the antennas will reduce the signal by a factor of four. Of course, most of us are limited in how far we can go with this by our property lines.

OH1EH reports that the OH0Z folks tried to achieve maximum distance between the antennas. K5ZD believes the 135-foot spacing between his towers helps a lot.

AA1K has a lot of land, so he is able to position his towers far apart. Jon's latest tower—for 15 meters—is more than 300 feet away from the other two. Jon thinks spacing is the biggest factor in minimizing RFI problems at his station. Another important point he revealed is the orientation of his towers. When they are all pointing towards Europe, the antennas are broadside to each other. This minimizes the signals that they pick up from each other.

Polarization can also be used to advantage. K0OU uses a horizontal beam on one station and a ground mounted vertical on the second station for his SO2R efforts. Despite living on a city lot and not using any additional filtering, this works for Steve. N9FH originally used a similar setup with horizontal beams and an R5 vertical.

Filters

A number of readers—including AA4NU, OH1EH, N9FH and WX0B—mentioned band-pass filters as the solution to their interference problems. Commercial filters are available from companies that advertise in the *NCJ*. Articles by W3LPL and others have appeared in the ham magazines for those who want to make their own.

Generally, these filters are capable of handling about 100 W on transmit. On receive, they filter out the out-of-band signals before they can get into the receiver front end and cause problems. On transmit, they help filter out-of-band signals before they get to the amplifier.

N9FH warns that if you want to keep your shack a "smoke-free" environment, be careful not to transmit into the wrong filter! They will pass the majority of the power on the band they are designed for, but they typically can absorb less than a watt of out-of-band energy.

WX0B recommends using high quality coax cables for connecting the radios, filters and switches. Jay uses double-shielded LMR195 coaxial jumpers to minimize leakage.

Coaxial stubs can be an inexpensive filtering solution. Basically a stub is a quarter wavelength piece of coax. It is hooked to the regular feedline through a coax T-connector. The free end can be either open or shorted depending on the function desired.

A feedline that is not one half wavelength long will transform the terminating impedance to a different value at the feed end. A quarter wave is a special case. A short at one end will appear as an open circuit on the opposite end. Likewise, an open circuit at the far end will be transformed to a short circuit at the feed end.

A shorted stub can be put on the feedline for the band of operation. At the operating frequency it will appear as an open circuit, or essentially out of the circuit. Signals on other bands will be shorted out. This works both on transmit and receive.

One thing to remember is that stubs need to be a quarter wave *electrically*. Depending on the type of the coax used, this will usually be between 66% and 85% of the length in free space. The velocity factor may be somewhat off from the specified value due to manufacturing tolerances. In practice, it is usually best to cut them a little long and trim them.

Coaxial stubs have some advantages over conventional capacitor/inductor band-pass filters. First, most band-pass filters are only able to handle lower power levels. These are normally placed between the transceiver and the amplifier. They do nothing to minimize harmonics produced by the amplifier. Coaxial stubs can handle higher power and can be placed at the amplifier output.

N9FH made up stubs for 40 meters out of CATV hardline. Fred put a relay at the far end so he can open or short the line depending on the band he is on. He is able to null out bands from 40 to 10 meters with this arrangement.

At VS6WO, Steve used two quarter-wave stubs placed 3/8-wavelength apart on 80, 40 and 20 meters. This reduced harmonic signals by about 40 dB.

AA4NU used to have problems with RFI getting into the QSK circuits of his amplifiers before he added stubs for the lower bands.

K5ZD found a coaxial stub on 160 eliminated all interference to 80 meters. Randy has experimented with Dunestar and WX0B band pass-filters. He reports that they work great, but has not used them in his own station due to their price.

If you would like more information on making and using coax stubs and band-pass filters, I would recommend a visit to K1TTT's Web site. Dave has posted lots of practical information. Check out **www.k1ttt.net/technote/techref.html#filters**.

Packet

Most packet interference will be from the HF radio to the VHF radio used for packet. Interference symptoms can range from garbled characters to the inability to stay connected.

AA1K managed to eliminate his packet problems, even though the tower that supports the 220-MHz and 2-meter antennas is series fed for 160 meters and supports wire verticals for 80 and 40. All of the feedlines and rotator cables are wound on 6-inch diameter PVC pipes to form RF chokes. Jon also found it necessary to put some large toroids over the hard line that connects to the 220-MHz antenna.

K1VR had difficulty with his packet station when transmitting on HF. Fred was using a power supply that was rated for only 4 amps. This was pretty marginal for a 25-W 2-meter rig. His problems went away when he replaced the power supply with one with a higher rating.

Miscellaneous Tricks

K9WO recommends monoband antennas because they provide some attenuation to other frequencies.

Another neat trick mentioned by W9RE is to use Beverage antennas on 40, 80 and 160. The directivity of them helps reduce interference. WX0B goes one step further and puts filters on his Beverages.

Thanks to AA1K, AA4NU, KB1H, K1VR, K5ZD, K9WO, K0OU, N9FH, OH1EH, W9RE and WX0B for their comments on reducing interference between stations. As usual, the success of CTT&T depends on reader input.

Topic for March-April 2002
(deadline January 6th)

UBN and Log Checking

Better and more complete log checking has resulted in more contacts being removed from logs along with penalty points. A few errors can knock a station out of first place. Have your operating procedures changed with the new log checking? UBN reports are available for many contests. Do you review your UBN reports to improve your logging accuracy? What kinds of logging errors do you make most often? What techniques do you use for improving your logging accuracy? ■

International Contests

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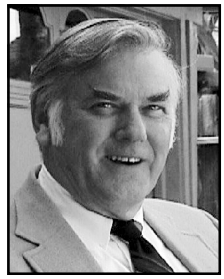
Keeping Up with the Joneses



W5ASP

The past several years have witnessed the emergence of the use of a second radio as an adjunct to serious contesting. While this scheme is not entirely new, its growing acceptance is drawing considerable attention, especially now that it is easily accessible using current contesting software together with recently introduced interfacing hardware. The big obstacle seems to be the rather demanding learning curve faced by the new user.

Like so many other desirable skills the ability to do "Single Operator Two Radio," popularly known as SO2R, is best

2001 JIDX Low Band CW Contest

Call	Category	QSOs	Points	Mults	Score
USA (Zone 3)					
K8PO	AB	580	836	105	87780
N6RO	AB	498	815	106	86390
WA5VGI	AB	128	302	51	15402
KC7V	AB	127	127	71	9017
W3SE	ABL	257	314	70	21980
K6XX	7	288	288	46	13248
K6III	7L	24	23	19	437
W7/JR1NKN	7L	4	4	4	16
USA (Zone 4)					
N6ZZ	AB	116	239	64	15296
N5DO	ABL	179	190	48	9120
USA (Zone 5)					
K3ZO	AB	187	212	59	12508
Canada					
VE7RG	AB	49	86	31	2666
VE7SL	1.9	49	196	25	4900

Score Rumors

(Claimed Scores for International Contest participation posted to the 3830 Reflector. Compiled by Mike Dinkelman, N7WA.)

2001 RAC Canada Day Contest

Call	Pwr	QSOs	CW	SSB	Hr	Score
M/S						
KA6BIM (NT6K)		604	36	34		322980
SOAB						
W4SAA	HP	382	25	16	18	107748
N4BP	QRP	345	25	14	16	93132
WN6K	LP	349	20	15		89110
K0CIE	LP	103	20	16	8	43200
N5QQ	HP	116	19	8	5	24246
W7KN	QRP	77	14	6	11	11480
WA6BOB	LP	23	9	0	2	1890
SOSB/80						
N6RO	HP	135	7	8	4	18750

2001 RSGB 21/28 Contest

Call	Pwr	QSOs	Mults	Score	Club
CW Open					
K2SX	HP	85	65	16575	YCCC
K1IB	LP	48	41	5904	YCCC
CW Restricted					
VE7NS	LP	20	20	1200	BC DX Club
SSB Restricted					
VA3UZ	LP	54	44	7128	

2001 SAC CW Contest

Call	Pwr	QSOs	Mult	Hr	Score	Club
DX SOAB						
K9NW (@K9UWA)	HP	215	101		34845	MRRC
K3WW	HP	144	86	6	21500	FRC
AA3B	HP	141	74	45	19166	FRC
K2SX	HP	135	81	5	18711	
K4BAI	HP	109	60	5	6900	SECC
VE3BUC	LP	102	58	8	5916	
N1RR	HP	100	54	5	5400	YCCC

2001 SAC SSB Contest

Call	Pwr	QSOs	Mults	Hr	Score	Club
DX SOAB						
VE3KZ	HP	257	103	125	31209	
AA3B	HP	204	976	42	24638	FRC
K3WW	HP	189	89	10	19936	FRC
N1RR	HP	159	90	7	16830	YCCC
WN6K	LP	161	81		15147	SCCC
VE3BUC	LP	158	69	8	10902	
K4BAI	HP	125	64	6	8000	SECC
K2SX	HP	81	49	2	4655	

2001 WAE SSB Contest

Call	Pwr	QSOs	Mults	QTCs	Score	Club
M/S						
VE9MY	LP	1074	379	1043	802343	
K4JA	HP	2232	214	1780	2105882	
SO/AB						
VE3MQW	LP	405	94	405	153710	
NF4A	LP	393	90	392	147580	
NQ4U	LP	308	89	300	114723	
VE3BUC	LP	301	164	282	95612	
WN6K	LP	245	73	241	74052	
NN1I/8 (NN1I)	LP	156	57	156	35568	
K3NM (LU9AY)	HP	2210	188	2202	1969929	
VA3UZ (@VE3OI)	HP	1906	186	1890	1614914	
K3WW	HP	1327	172	1322	1055754	
N2ED	HP	968	298	964	574544	
N3RD	HP	629	135	618	375046	
K9NW (@K9UWA)	HP	632	95	632	246480	
K1JE	HP	415	238	414	197302	
N1RR	HP	480	93	475	181450	
W0YR/4 (W0YR)	HP	805	52	802	166920	
K1GU	HP	322	111	319	163455	
K4BAI	HP	396	81	390	127332	
W7GG	HP	410	62	408	92343	WVDXC
W7ZR	HP	237	155	237	73470	
N8KM	HP	179	65	179	48330	

2001 Worked All Germany (WAG)

Call	Pwr	CW	SSB	Mult	Score
SO/B					
W4SAA (@N4BP)	HP	472	0	90	127620
K2SX	HP	403	0	93	112437
VA3TTT	QRP	73	11	48	12750
SO/B MIXED					
WN6K	LP	58	27	42	10710
SO/B SSB					
VE3BUC	LP	0	84	38	9576

attained by the simple expedient of practice. Once all of the hardware and software have been successfully integrated, debugged and tested, all that is needed is a suitable venue to repeatedly exercise the basic steps involved.

Obviously, this is best done within an actual contest environment. The trick is to find suitable occasions where the flow of QSOs is manageable. Peak rate periods of major contests are not really the place to take one's first steps into this activity. So where to start?

This issue of the *NCJ* coincides with the beginning of another premier season of "single country" DX contests. In the coming three months there will be events staged by Japan, Hungary, France, Belgium, the

2000 Dutch PACC Contest

USA

Call	QSOs	Mults	Score
W3BYX	204	49	9996
K3ZO	190	42	7980
KK3S	173	39	6747
W2CVW	140	43	6020
K4RZ	132	30	3960
W7LGG	91	30	2730
AB9S	91	22	2002
W1END	68	27	1836
AC6V	67	27	1809
W2EZ	47	20	940
K4BAI	42	22	924
K9NW	45	19	855
W6AFA	27	14	378
N2CQ	29	12	346
KM5G	25	11	275
W1SPI	30	9	270
W2UDT	14	9	126
KF3CV	4	2	8

Canada

Call	QSOs	Mults	Score
VE3KX	399	56	22344
VE3XN	218	44	9592
VE3KP	95	34	3230
VE3ZZ	86	26	2236
VA3IX	65	29	1725
VE7NI	17	8	136
VA3UZ	11	6	66

2000 Scandinavian Activity Contest (SAC)

Number	Call	QSOs	QSO-p	Mult	Score
CW					
High Power					
USA					
District 1					
1	K5ZD	88	126	50	6300
2	W1FJ	43	67	31	2077
3	K1BV	41	41	28	1148
District 4					
1	N4AF	114	158	64	10112
2	K3KO	87	101	53	5353
3	K4BAI	41	45	31	1395
4	N4MM	27	27	20	540
5	K4IU	14	14	13	182
District 5					
1	W5FO	48	48	30	1440
2	N6ZZ	52	52	27	1404
District 8					
1	K9NW	153	261	73	19053
District 0					
1	N7DR	62	62	36	2232
Low Power					
District 3					
1	W3CP	23	27	19	513
District 4					
1	K7SV	123	157	66	10362
District 7					
1	W7DRA/7	6	14	6	84
Canada					
1	VE2AWR	25	25	16	400
SSB					
High Power					
USA					
District 1					
1	K1BV	96	96	54	5184
2	W1FJ	37	37	26	962
District 2					
1	K2SX	103	111	67	7437
District 3					
1	W3BYX	145	179	77	13783
District 4					
1	AA3VA	118	118	60	7080
District 5					
1	W5FO	180	200	79	15800
District 6					
1	K6TA	54	70	34	2380
2	W6AFA	61	61	33	2013
District 7					
1	K0JJ	80	94	45	4230
District 8					
1	N8II	118	144	76	10944
District 9					
1	W9SS	145	145	69	10005
District 0					
1	K0OU	126	142	71	10082
Low Power					
USA					
District 2					
1	N2LQQ	80	80	51	4080
District 4					
1	K7SV	232	290	111	32190
2	K1DCB	93	93	52	4836
3	WB4SQ	66	66	38	2508
4	KF4ASU	43	43	26	1118
5	W4LLP	43	43	20	860
6	K1SO	25	29	19	551
7	KS4JB	14	14	12	168
District 8					
1	K9NW	16	16	10	160
District 9					
1	W9LYN	54	54	37	1998
2	KB9JIF	22	22	18	396
3	K9PG	6	6	6	36
District 0					
1	K0DAT	78	78	51	3978
Canada					
High Power					
1	VE3OBU	138	142	68	9656
2	VE3XN	108	108	64	6912
3	VE6JY	55	71	29	2059
Low Power					
1	VE2AWR	69	69	38	2622
2	VA3IX	53	53	27	1431
3	VA2IC	41	41	29	1189

Netherlands, Great Britain, Bermuda and Russia. Each of these can be viewed as an excellent opportunity to acquire, develop and polish SO2R skills. Several common aspects of these particular contests make them prime opportunities for the SO2R newcomer.

At this particular stage of the current sunspot cycle, it is quite likely that several bands will be open concurrently. However, the openings will tend to be limited in duration as the signals of interest will often be coming from a localized area. The ability to operate several bands during the same time period gives the two radio, single operator a definite incentive to build up the requisite skills. In addition, the fact that the DX stations are usually spread out over the band, and distributed among a couple of active bands makes it an even more interesting and effective way to operate.

Those who regularly do SO2R will attest to the fact that it is certainly exhilarating, but often somewhat stressful. The nice thing about these "one nation" contests is that there are extended periods where the gods of propagation choose to close down all paths, which provides rest and recuperation periods. Some say that any learning process is best taken in short but intense sessions.

I suggest those with an interest in building their SO2R skills take a good look at WA7BNM's "Contest Calendar" and pick out a couple of events to target. Do some browsing in the back issues of the *NCJ* and on the Internet to get the fundamentals of hardware and software sorted out, and then have a serious go at operating. I think you'll be pleasantly surprised at the rate at which you catch on to this particular operating style, and how much more fun the actual contests will be when you're making more Qs on more bands. Enjoy! ■

WRTC USA Youth Fund

The Boring (Oregon) Amateur Radio Club is happy to announce the establishment of a tax-deductible fund intended to help defray the travel costs of young USA competitors to the WRTC events. This fund is being administered by the ARRL Foundation.

To be eligible, an applicant must be a US citizen, no more than 25 years old at the time of the WRTC event, and must be selected as a competitor.

Up to $1000 of the actual travel expenses will be reimbursed per WRTC event, depending on fund availability. If funds are left over, they will be applied to the next WRTC event.

The Boring ARC will verify eligibility and request fund disbursements. You can send your request to the club's mailing address: 15125 SE Bartell Road, Boring, OR 97009. Include a copy of your receipts.

To contribute to the fund, send your check to the ARRL Foundation Inc, 225 Main Street, Newington, CT 06111. Make your check out to "The ARRL Foundation" and include a note indicating the name of the fund that you are contributing to (WRTC USA Youth Fund, in this case). All contributions of $25 USD or more will be recognized in *QST*.

For additional information about the ARRL foundation, visit **www.arrl.org/arrlf**. The Boring ARC Web page is at **jzap.com/k7rat**.

73, Tree, N6TR
n6tr@contesting.com

Station Profile—W6UE—The Caltech Amateur Radio Club

Conducted by Mark Beckwith, N5OT
swca@swbell.net

Just when you thought you were going to learn the identity of last month's mystery station, the owner-builder got cold feet and asked me if I would stand in for a few of his columns until he could calm down and get his wits together. It seems that seeing one's station on the cover of the *NCJ* is a surprise some people are just not expecting when they open the mail.

Anyway, this guy and I go back a long way. We were kids together. We always called him "The Quiet and Reserved One." I know him like I know myself. I can certainly report that progress at his station is going great—there are Yagis up for some bands and he even got serious enough in the CQWW (CW of course) that he smoked an amp (ouch).

I'm guessing that most stations finding their way into the pages of this column will share his addiction to Serious Hardware. In fact—if it were up to me—I think the title of this column, "Station Profiles" is maybe just a little stuffy. We need something more colorful—something that tells it more like it is: "Hardware Junkies" or "Secrets Revealed" or some such thing. I'll ask my friend and see if he agrees. Maybe we'll come up with something together and spring it on K7BV next month, hi.

In N0AX's "*NCJ* Profiles" we've read many biographies of ops whose rise to fame began by filling chairs at the stations of others. This column hopes to provide you with a peek not only at superstations that have been fixtures on the bands for decades, but also a look into new stations built by contest operators very likely once called "hired guns."

Who do you want to read about? My friend has arranged with *NCJ* Webhoncho Bruce, WA7BNM, to allow readers to make suggestions right on the site. My friend has vowed to jump in the truck with his newfangled digital camera and personally drive, if it's not too far, to visit other hardware addicts and capture a few peeks into what gets all that RF up into the air.

W6UE—The Caltech Amateur Radio Club

The station-of-the-moment will be one that I know better than my own: that of the Caltech Amateur Radio Club.

W6UE is the oldest continuously licensed college Amateur Radio club station in America. The Sweepstakes check itself—"23"—certainly qualifies it as an old geezer, but its roots actually go back even further. The radio club was founded in 1919.

For the first several decades, W6UE bounced around from lab to lab, depending on which professor would put up with it at the time. Finally—around 1965 or so—the station found a more permanent home in the campus student center. It took up residence in a small upstairs room that was actually designed for ham radio—or so they thought at the time. Classic design errors—too few coax runs and antennas 450 feet away—plagued W6UE.

Outside, perched atop a completely different building, were a lone Mosley TA-33 and a couple dipoles on a short, 30-foot tower. These were clearly Guyed and Grounded by Scientists. (Many of you who had college radio clubs can probably identify with this statement. Those who can't, ask me sometime).

Over the years, student ops came and went. Ham radio held various degrees of importance to each. Occasionally it led to a student's undoing, distracting them from their more noble pursuit (*Nobel* pursuit?)—a course of study at one of the finest centers of higher learning in the land. W6UE would be on the air—and then off the air—only to reappear some years later.

I grew up in Pasadena, California—home to Caltech. As a youngster I had the honor of attending Saturday classes at Caltech for local Junior High nerds (we didn't know the term back then, but hey, we gotta call it like it is and wear it with honor).

It was during this time—one Saturday in 1973—that I stumbled upon W6UE, and met Bob Palitz, WB2REH (now AA6Y).

Bob was a contester. He showed me around and even let me get on the air and work a few guys. But it wasn't until a few years later when I met Morris

In the Shack

***Radios*:**
Kenwood TS-950
Kenwood TS-940
Kenwood TS-850

Amps:
Two Alpha 78s

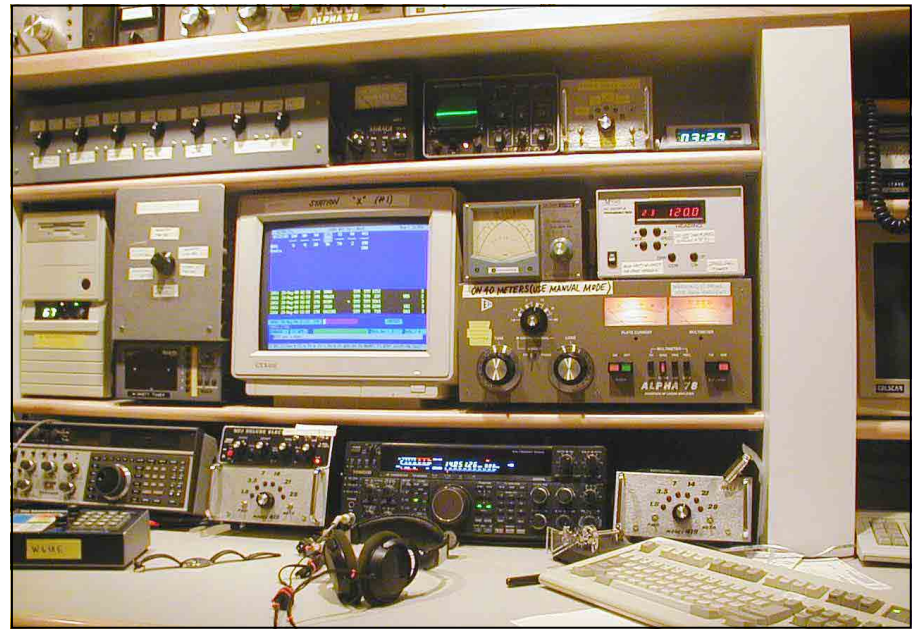
Antennas:
160 meters: Dipole at 100 feet
80 meters: Inverted V at 100 feet
75 meters: Inverted V at 60 feet
40 meters: 4-element KLM at 100 feet
20-meters: 5 elements on a 48-foot boom at 60 feet
15-meters: 5 elements on a 36-foot boom at 68 feet
10 meters: 5 elements on a 24-foot boom at 76 feet
Multibanders: KT34XA at 110 feet
WARC Band: Force 12s at 100 feet

Accessories:
SO2R controller: WX0B
Filters: ICE and coax stubs
Software: *TR*, *NA* and *CT*

A view of the tallest tower at W6UE. The tower itself is a 50-footer, and it's located on top of a 50-foot building. It supports a 4-element KLM 40 and a KT34XA.

The big arrays were lunching rotators until the W6UE gang came up with this custom flex drive setup. Problem solved!

Marty, N6VI, and Mike, W4EF, operating W6UE as a classic multi-single entry in the Collegiate Championship.



Next? This is what it looks like when you sit down at one of the operating positions.

Jones, WB4DJP (now AA4KB), that my life-long relationship with the Caltech Radio Club began.

I never attended classes there, not that I wouldn't have liked to. Despite straight-As in high school and good test scores, the admissions committee informed me I had too many "other interests," and in their combined opinion I would not have made a good Caltech student. Go figure. This was before they figured out well-roundedness was an *attribute*, not a liability. Well, *my* life was changed forever, and that's the short version of how I became an artist. And found gainful work writing for the *NCJ*. Their loss. But I digress.

Nevertheless, I lived nearby for the next 20 years, so I continued to focus energy on W6UE, because I would never have a home station in Southern California which could come close to the potential I saw at Caltech.

In about 1983 I met another student—David Ritchie, N6DLU (now W6DR). Dave and I made it our goal to end the cyclical rise and fall of activity from W6UE, hoping instead to establish long-term stability.

For whatever reason, campus subsidies for the station were not to be had—with the exception of the occasional grant of $200 or so from sources like "the Student Council." (That *might* be enough to keep us in QSL cards). Undaunted, Dave and I developed a knack for publicity and fundraising. We identified potential benefactors, tracked and managed donations, and found ways to get W6UE into the wills and tax returns of alumni and friends of Caltech. We cleaned out quite a few garages and lugged a lot of old stuff down to the monthly TRW swap meets. Many a glow-in-the-dark *Boat Anchor* saw renewed service in the hands of grateful collectors due to our diligence.

Over the years we made remarkable progress. We refurbished the shack, rebuilt the antennas, ran new coax and put up bigger towers and bigger antennas. Operators keeping W6UE active during this period included W6EJJ, AA6RX, KA6SAR, N6DLU and WA6OTU, with occasional visits from N6VI, AA4KB and even N6TR. There grew an endlessly evolving roster of student members who would enter contests casually or help out during big multi-op efforts.

My favorite story from this period originated one day as I was heading up the stairs to the shack and this teenager followed me up—as if he could tell where I was going. I'd never seen him before in my life, yet he spoke fluent radio but with a German accent. After talking for a while I learned he was 16 years old, lived in Germany, and was here on his own to "see America" (yaa, right). Then he whipped out his QSL card—Matthias Strelow—I honestly can't remember his German call, but years later when guest oping in Massachusetts at KC1XX I suddenly realized that this wild German kid had become one of the USA's hottest new station builders—for he turned out to be KC1XX *himself!*

In the '80s W6UE developed a huge appetite for portable operations, inspired fabulously by the SCCC efforts from XE2SI in the 1983 CQWW where we traveled 100 miles to come in second in the world Multi-multi. *From the West Coast of North America*. W6UE acquired trailer-mounted towers and generators, portable antennas and cabling—in short, everything needed to put a full-on, full-power multi-multi contest station on the air from just about anywhere. Some of these operations were legendary—such as the time we put California in the June VHF contest top ten (uh, that would be *third place*) for the first time in 25 years. (Were *we* proud! Photos of *that* operation made the cover of every ham's bible—the ARRL Handbook!).

Around this time we forged a close relationship with W6VIO—the club across town at JPL—and established Field Day traditions that are still going strong today.

In the 90s, Dave and I both moved away, leaving behind a club and station which could withstand the ups and downs of the future. Continued progress has ratcheted W6UE to a whole new level. Shortly after moving, I was honored (?) to be invited back for a week of antenna work including yet another new tower and three new Yagis. A year later, the Caltech Amateur Radio Club finally secured what Dave and I only dreamed of—an all-new radio room—larger and better designed.

After over a decade of pushing the limits of our station hard in the major contests, we knew what was good and bad about the old station. When Caltech announced plans to renovate the Student Center, we saw our Golden Opportunity to submit a wish list—developed from years of experience—for W6UE. All the time we spent cultivating relationships with administrators and faculty members all across campus finally paid off—the radio club was given nearly everything it requested.

Fate has it that a new generation of contest enthusiasts has emerged to carry the W6UE banner. Headed by Michael Tope, W4EF, this balanced blend of Old

(Continued on next page)

DX Contest Activity Announcements

Bill Feidt, NG3K
Bill@ng3k.com

This issue's listings highlight operations for the ARRL International DX Contests. As of early November 2001, we have not yet received very many announcements for these contests, so for the latest-breaking news see: ARRL International DX Contest, CW: **www.ng3k.com/Misc/adxc2002.html** ARRL International DX Contest, Phone: **www.ng3k.com/Misc/adxs2002.html**

Due to long lead-times involved with magazine publication, the Web pages will always end up containing a more complete list of operations than you'll see here in the *NCJ*. Please help "close the gap" by getting your announcements to me as early as possible.

Our *NCJ* Webmaster—Bruce, WA7BNM—has been hard at work preparing a special system that will take information from my Web site and reformat it for posting directly on the *NCJ* Web site (**www.ncjweb.com**). The system will automatically extract the information from **www.ng3k.com** in "real time," so the announcements that you will see on *NCJWeb* will always reflect my latest data. The project is not quite complete yet, but it should be ready for prime time soon. I hope to have the specific *NCJWeb* URL for it in time for the next issue.

At Jim, AD1C's, suggestion, I have created a Web-based form that makes it easy to quickly submit information on your operation. You'll find it at **www.ng3k.com/Contest/consub.html**.

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

- The contest you will be participating in
- Your personal call sign
- Your return e-mail address
- The call sign that the contest operation will be using
- The DXCC entity
- The operating class (ie: SOAB HP)
- The CQ Zone
- The QSL route
- The home calls of the participating operators
- Any additional notes (ie: By N2GA; QRV Feb 12-19 as VP5/N2GA; SSB CW; also on SSB: VP5/K2DO)

Send it to **Bill@ng3k.com**.

At the present time, I am especially interested in hearing about any operations that you have planned for the 2002 CQ WPX contests. Remember, folks, this column depends on the information that *you* provide. Please share your travel plans with your colleagues!

73, Bill, NG3K

ARRL DX Contest, CW (February 16-17, 2002)

Call	*DXCC Entity*	*Category*	*Operator(s)*
8P9JA	Barbados	M/S	K4MA, AA4NC
FO8DX	French Polynesia	SOAB	W1HIJ
PJ7/ND5S	Sint Maarten	SOAB LP	ND5S
V31JP	Belize	SOAB	K8JP
V47KP	St Kitts and Nevis	SOAB	W2OX
VP5GA	Turks and Caicos	SOAB LP	N2GA
ZF2NT	Cayman Is	SOAB HP	N6NT

See also: **www.ng3k.com/Misc/adxc2002.html**.

ARRL DX Contest, SSB (March 2-3, 2002)

Call	*DXCC Entity*	*Category*	*Operator(s)*
P40A	Aruba	SOAB LP	KK9A
PJ7B	Sint Maarten	SOAB	W8EB
V31JP	Belize	SOAB	K8JP
V47KP	St Kitts and Nevis	SOAB	W2OX
ZF2AH	Cayman Is	SOSB 10M HP	W6VNR

See also: **www.ng3k.com/Misc/adxs2002.html**.

CQ WPX Contest, SSB (March 30-31, 2002)

Call	*DXCC Entity*	*Category*	*Operator(s)*
J6DX	St Lucia	M/S	SW Ohio DX Association
V31BD	Belize	SOAB LP	WQ7R
ZF2AH	Cayman Is	SOAB HP	W6VNR

See also: **www.ng3k.com/Misc/wpxs2002.html**.

For more detailed and up-to-date information, such as QSL routes, CQ Zone numbers and any planned operation outside of the contest period, please visit the URLs given at the end of each contest's listing. ■

Station Profile—W6UE—The Caltech Amateur Radio Club

(Continued from previous page)

Timers and young ops continues to keep W6UE on the air in grand style. The newer ops learn the ropes of tower climbing and handling big Yagis; they know "how much is too much grid current." Shoot, these hotshots even have the club console wired for "single-operator two-radio" contesting (someone will have to explain that to *this* Old Timer). They have instituted a maintenance plan that continues the turnkey tradition of this solid club station.

Unlike a lot of clubs, W6UE runs more than just a TS-530 and a tribander. And we're really proud of what we have accomplished over two decades. I think it happened just in time, too. I don't know *what's* going on up at Stanford, but W6YX has dethroned us in the annual Collegiate Championship! It's probably time to send The Quiet and Reserved One up there with the trusty *spy camera.*

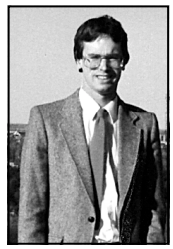
Thanks to you all for years of W6UE QSOs. Keep 'em coming! In the mean time, I'll see what I can do to get The Quiet and Reserved One to write a few words in coming issues. ■

VHF-UHF Contesting!

Jon K. Jones, N0JK
n0jk@hotmail.com

Solar Cycle 23: "Game Over?"—Hardly!

Solar Cycle 23 was believed to be beginning the downward leg of its journey this past fall. The general consensus was that 6-meter F_2 openings would be even fewer and shorter in duration.


N0JK

Surprise! The sun roared back to life and the F_2 conditions on the band have been absolutely fantastic! I believe we saw better conditions in the fall of 2001 than we did in the fall of 1989.

Gary, M0CTP, and Simon, GM4PLM, responsed to some "Game Over" comments that had been posted on the UKSMG's announcement page.

"GAME OVER!!? Guess it's more like "Wayne's World" GAME ON!!! I was hearing the HC8GR/beacon on 50.035, so I tuned to 28.885 and put out a call for Central American stations. TI5KD came up and we QSYed to 6. I called for him on 50.110, but a pileup of Ws came back to me. Eventually I found him on 50.120.—Gary, M0CTP

Re the "Game Over" comments—Indeed! I worked TI5KD and TI2ALF for country number 80 today!—Simon, GM4PLM

The last two weeks of October and every day in November 2001 were hectic here at my station. I've spent nearly every daylight moment (when I wasn't at work) monitoring and working 6 meters. I've collected over a dozen new countries so far. One of my best catches was ZK1AKX (North Cooks) via an Es to F_2 linkup on October 30th. Many Caribbean and South American stations—and even a few Africans—have been added to the log.

One new one that I'm particularly proud of is GW4VEQ. I worked him on November 13th. He was my first European 6-meter contact of Cycle 23. Here's my post to the UKSMG board:

G0RUZ, G0JHC, GM0EWX and GW4VEQ heard on November 13th. GW4VEQ worked at 1706Z on 50.106 with 559 signals! Got "QRZ?"s out of G0RUZ and GM0EWX. I was operating portable in EM18 running 100 W and a dipole on a high hilltop. It was too windy to put up the Yagi.—N0JK

You know conditions are good when you can work Europe on 6 with a dipole. Later that same day, stations in Colorado and South Dakota worked Finland "over the pole" and W7s and VE7s worked Finland, Sweden and Estonia via spread F and F_2 links. Daily 4- to 6-hour KL7 openings to the Lower 48 began occurring on November 10th. On November 14th K6QXY and others in California hooked up with GW4VEQ.

Nice openings to the left coast November 13th and 14th. I worked N6XQ and a few other W6s yesterday, along with many W0s and a few W7s. Today the morning F_2 to the east consisted of 4 hours of in-band video—and no DX. At lunchtime, I worked HC2FG and then VP5/K5CM for a new one.

The HC8 beacon has put in a good signal here every day for the past week between 1245 and 1400Z. I hope the conditions are still there when the CQWW CW Contest team arrives!

I had a wonderful opening to W1, 2, 3, 4, 5, 6, 7, 8, 9 and 0 in the afternoon. This included several W6s in the DM and CM squares, and also VE1, 2, 3, 4, 5 and 9. I worked VE4CP, VE5UF and VE5LY in the DO square.—Tony, GW4VEQ

I will be a member of the 2001 HC8N CQWW CW team, and I truly hope to be able to report in next issue's column that we did manage to work Tony—*and many more*—on 6.

What Effect Might the High Solar Activity Have on VHF Contests?

The only major VHF contests in the fall are the EME contests. High solar activity can actually cause poor conditions for EME QSOs—particularly on 2 meters (due to Faraday rotation and absorption).

The next major VHF contest is this month's ARRL January VHF Sweepstakes. Will the high solar activity continue? There's no way to know for sure, but there is a reasonable chance that it will continue for a few more solar rotations.

If this happens, there are several propagation modes that just might make an appearance during the January contest.

Aurora

A fast-moving CME (coronal mass ejection) erupted from the sun on November 4th. It swept past the earth at 0150Z on the 5th. This solar event triggered a severe geomagnetic storm and widespread aurora reaching from here in Kansas to as far south as Florida and Texas, and out to California.

If this occurs again during the VHF Sweepstakes, the 6- and 2-meter bands would be full of contest stations making hundreds of QSOs over 1,000-mile distances. The 2-meter band will sound like 80 CW does during the HF Sweepstakes!

Aurora contacts usually take place on 50, 144 and 222 MHz, but they can also be made by well-equipped stations on 432. Several 903-MHz aurora QSOs and one 1296-MHz QSO have been reported, but these are very rare occurrences. Aurora Es can appear, allowing 6 and even 2-meter QSOs over long distances with clear tones. KL7s have been worked in W1 land and the OX beacons have been heard in W1 via aurora Es. A big aurora would certainly make the 2002 VHF Sweepstakes a contest to remember. Let's keep our fingers crossed!

There are several Web sites that can offer predictions regarding aurora. One is **www.spaceweather.com**. Watch for an announcement of a substantial earth-directed "full halo" CME or large coronal hole two to three days prior to the contest.

CMEs erupt from large sunspots. The impact of the solar wind gust may cause an aurora. Not all CMEs or coronal holes cause geomagnetic storms. The interplanetary magnetic field must be pointing "south" for the solar wind gusts to interact with the earth's magnetic field.

F2

F_2-layer MUFs are still seasonally high in the Northern Hemisphere during January. A "trans-con" or transcontinental opening between the east and west coast of the US could occur during the contest. Hundreds to thousands of contest QSOs could be possible. Several trans-con openings occurred near the end of last year. An F_2 opening could also provide propagation into Alaska, Greenland…or even Europe and Japan, depending on how high the solar flux goes.

North/south F_2 paths are enhanced during geomagnetic storms, such as those that accompany auroras. Watch for K indices of 5 or more. Typical paths would be to the Caribbean, South America, Hawaii and VK/ZL. Take note: a big afternoon aurora may be followed by an evening 6-meter F_2 opening to South America (this happened in September of 2000).

Es

Recent studies have suggested that Es openings do not track the 11-year

sunspot cycle, but instead follow their own 6- to 8-year cycles. Sporadic E openings can and do occur during the January VHF Sweepstakes. Es can provide links to F_2 and TEP propagation to South America, Africa and the Pacific.

The evening Es diurnal peak coincides with TEP propagation towards South America and the Pacific. My ZK1AKX 6-meter QSO this past October was made via an Es to F_2 link. The Es cloud was located over the southeast corner of New Mexico (6-meter Es QSOs between Arizona and Texas were reported around that same time).

Aurora, F_2 and Es links—these are the main propagation modes that are enhanced by high solar activity and might possibly make an appearance in the January VHF Sweepstakes.

WSJT in VHF Contests

Joe Taylor, K1JT, the creator of the *WSJT* digital communications software, used it to make eleven 2-meter and six 6-meter meteor-scatter QSOs during the September VHF QSO Party. He reported that the median time to complete a QSO on 6-meters was approximately 5 minutes, and on 2-meters—around 13 minutes.

Joe authored a great article on the new communications technique that appeared in the December 2001 issue of *QST*. Check it out! WSJT can add new DX grids to your VHF contest log, even when the bands seem otherwise "dead." ■

World Radiosport Team Championship 2002

The Amateur Radio community owes a debt of gratitude to the energetic and ambitious amateurs in the fine country of Finland. Led by Jouko Häyrynen, OH1RX, Organizing Committee Chairman, the Contest Club Finland (CCF) and the Finnish Amateur Radio League (SRAL) have agreed to jointly host World Radiosport Team Championship 2002 from July 9th through 16th, 2002.

The on-the-air operating portion of the event will be held in concurrence with the 2002 IARU HF World Championship (July 14th and 15th). Amateurs worldwide are invited to come to Finland and experience the event firsthand—with all of its inherent excitement, goodwill and camaraderie.

It is our pleasure to announce our appointment as USA representatives. We are charged with assisting our Finnish friends with raising operating funds for WRTC2002.

We strongly urge everyone to support the Finnish effort by sending in a donation. The Northern California DX Foundation (NCDXF) has kindly agreed to assist in processing USA donations. Donations made by credit card or by check (made out to "NCDXF [for WRTC Project]") are tax deductible to the extent permitted by law for USA taxpayers. All cash, check and VISA/MC/AMEX donations from the USA should be sent directly to:

NCDXF, c/o Rusty Epps, W6OAT, 651 Handley Trail, Redwood City, CA 94062 USA (**w6oat@compuserve.com**).

All donations from outside the United States can be sent directly to a WRTC2002 bank account. See **www.wrtc2002.org/support.htm** for specific information.

For event information, please visit the WRTC2002 Web site: **www.wrtc2002.org**.

Thanking you in advance.

73 from the USA representatives,

Dennis Motschenbacher, K7BV—USA West (**K7BV@aol.com**)

Bob Allphin, K4UEE—USA South (**MAllphin@aol.com**)

Jeff, Briggs, K1ZM—USA East (**K1ZM@aol.com**)

Contest Expeditions

Kenny Silverman, K2KW
k2kw@prodigy.net

DXpedition Accommodations


K2KW

I've just returned from my third trip to Jamaica in 12 months, and I feel fortunate to have been able to operate from the same villa that I've used for the past four years. I'm applying the term "villa" rather loosely... it's a very plain, somewhat rundown house that is located in a quiet spot on the coast. While personally, I thoroughly enjoy this particular locale, each person will have his own definition of the "perfect" DXpedition accommodation.

The type of accommodation that best suits your needs will be based on several factors. If you don't want to bring your own radio equipment, you are essentially limited to Rent-a-QTHs—places that feature a completely operational ham station.

If you're willing to bring along your own equipment, however, then virtually the entire planet opens up for possible operating sites. In this case, it sometimes helps to target a location that hams have operated from before, as the property management—or local inhabitants—will already know what to expect, and you can get detailed information on the place from those previous DXpeditioners.

Other factors to consider include whether non-ham family members will be joining you, if you will be traveling with a large group, what kind of creature comforts you desire, the types of antennas you will be installing and your electrical power requirements—to name a few.

There are a few basic questions that you'll want to ask when you're researching any possible location.

- Will the management allow you to install antennas?
- How many bedrooms are there?
- How large is the property?
- What are the electrical standards?
- How stable and reliable is the electrical power?
- Are there locations to install antennas where others won't be inconvenienced by them?
- What is the distance from the antenna location to the operating position?
- Are there tall trees, and what height are they?

Rent-a-QTH

A Rent-a-QTH is a DXpedition rental package—these generally offer both lodging and an operational station. The type of equipment and antennas that are provided varies widely, so you'll need to do your homework.

Rent-a-QTHs are by far the easiest way to go on a DXpedition. Not having to haul in all your equipment sure makes things easier, and often the owner can assist you with licensing. On the downside, the most desirable locations are typically booked far in advance—particularly for major contest weekends and during popular vacation times.

There are Rent-a-QTHs on practically every continent, so there are plenty of exotic locations available to help you easily turn your DXpedition dreams into realities.

Hotels

DXpeditioning from hotels can be a mixed blessing. On the positive side, they can provide wonderful creature comforts—many offer room service! (*Knock, knock*—dinner's here! What more could you ask for when you're busy running pileups?) Often hotels are in great radio locations—such as at the beachfront, on a hill or in a high-rise building.

There can be some disadvantages, though. Getting permission to install your antennas may be difficult. You will often need to negotiate this with the hotel manager, and get that permission in writing—management can quickly change hands.

Depending on the hotel, finding a place to install your antennas can be difficult. Often you will have to ground-mount your antennas, and they will have to be out of the way of other guests. And there is always the possibility that you could interfere with TV or other electrical systems like stereo or public address equipment.

Some high-rise hotels offer great opportunities for installing antennas on the roof, but the windows might be permanently sealed. Routing coax is difficult in any building, and this may be a big issue in hotels due to safety or aesthetic concerns.

When considering a hotel, keep in mind that prime hotels may not be very receptive to your requests to install antennas, as they have an image they want to protect. Some of the smaller hotels may be more willing to oblige.

Hotels are often a good choice if your spouse or significant other is joining you, as the facility might offer amenities for them to enjoy while you are in your room operating.

If you have a large group and need several rooms, hotels can get expensive. In this case, it's best to negotiate rates directly with the hotel management rather than through a travel agent.

Dan Brown, NA7DB, wrote a great article on this subject. It's titled "Negotiating with Hotels," and is a must-read for those considering this option. It offers tips on how to get the best rates and the best rooms for your operation. The article was first published in *DX Magazine*. It's now available on my *DX Holiday* Web site (see **www.dxholiday.com/dxresources.htm**).

Villas

Using a villa for your ham radio adventure is one of the lesser-known options, yet these typically offer access to some of the best operating sites. It's often easier to set up antennas in these locations as well. Villas often have a swimming pool, TV, telephone and most creature comforts. In some cases, maid service—or even a staff—is included.

If there is no staff, you'll need to prepare your own meals or eat out. If you are traveling with a large group, keeping them fed is always a considerable logistical challenge. For large operations, villas are often the most cost-effective option for both lodging and meals. For many people, a self-catered vacation is a real joy, and you can save a significant amount of money by preparing your own meals.

There are thousands and thousands of villas to rent around the world, so you are sure to find one that fits your requirements for your group's size, the topographical location, proximity to the beach or city and creature comforts.

Condos

Operating from condominiums can be problematic. There are often strict guidelines as to what items can be located on the property, and usually ham antennas are prohibited. While you may not run into any difficulties getting approval from the unit owner for your radio operations, other owners or guests may complain. TVI/RFI can be a concern as there are typically many stereos, TVs and telephones within close proximately. Frankly, I don't see many positive aspects to operating from condos.

Field Day-Style

The term "Field Day-style" should be self-explanatory. You'll need to be 100% self sufficient—you'll probably need to haul in radio equipment, tents, generators and all food and provisions. For some of the small and rarer DXCC entities, this may be the only option.

While possible destinations are plentiful, this kind of DXpedition is by far the hardest to plan. It can be very difficult to maintain a smooth operation over a typical 7- to 14-day DXpedition.

If you are not experienced in Field Day-style DXpeditions (and *don't* confuse these with typical domestic Field Day operations), it is best to serve as a team member on an experienced operation before you venture out on your own. Managing a Field Day operation in your home country is simple compared to pulling one off in a foreign country or on an island in the middle of the ocean.

It's quite possible that there will be no medical facilities within hundreds—or perhaps even thousands—of miles, so health and life support become paramount issues. A doctor should always be included on teams traveling to otherwise deserted and remote locations.

Summary

As you can see, there are a number of different accommodation options available to the DXpeditioner. When planning your adventure, you'll need to think about what things are important to you, and select your destination accordingly. Rent-a-QTHs are the easiest. Private villas and tall hotels generally offer you the best locations and the ability to install effective antennas. Condos can be trouble. Field Day-style operations require careful planning and experience.

I hope to see/hear you on the DXpedition train soon! ■

Contest Calendar

Compiled by Bruce Horn, WA7BNM
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Here's the list of major contests to help you plan your contesting activity through April 2002. 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/**.

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!

January 2002

AGB NYSB Contest	0000Z-0100Z, Jan 1
SARTG New Year RTTY Contest	0800Z-1100Z, Jan 1
AGCW QRP Winter Contest	1500Z, Jan 5 to 1500Z, Jan 6
ARRL RTTY Roundup	1800Z, Jan 5 to 2400Z, Jan 6
Japan International DX Contest, 160-40m	2200Z, Jan 11 to 2200Z, Jan 13
Midwinter Contest, CW	1400Z-2000Z, Jan 12
North American QSO Party, CW	1800Z, Jan 12 to 0600Z, Jan 13
NRAU-Baltic Contest, CW	0530Z-0730Z, Jan 13
NRAU-Baltic Contest, SSB	0800Z-1000Z, Jan 13
Midwinter Contest, Phone	0800Z-1400Z, Jan 13
DARC 10-Meter Contest	0900Z-1059Z, Jan 13
LZ Open Contest, CW	1200Z-2000Z, Jan 19
MI QRP January CW Contest	1200Z, Jan 19 to 2359Z, Jan 20
North American QSO Party, SSB	1800Z, Jan 19 to 0600Z, Jan 20
ARRL January VHF Sweepstakes	1900Z, Jan 19 to 0400Z, Jan 21
CQ 160-Meter Contest, CW	2200Z, Jan 25 to 1600Z, Jan 27
REF Contest, CW	0600Z, Jan 26 to 1800Z, Jan 27
BARTG RTTY Sprint	1200Z, Jan 26 to 1200Z, Jan 27
UBA DX Contest, SSB	1300Z, Jan 26 to 1300Z, Jan 27
Kansas QSO Party	1800Z, Jan 26 to 1800Z, Jan 27

February 2002

Vermont QSO Party	0000Z, Feb 2 to 2400Z, Feb 3
New Hampshire QSO Party	0000Z, Feb 2 to 2400Z, Feb 3
10-10 International Winter Contest, SSB	0001Z, Feb 2 to 2400Z, Feb 3
Minnesota QSO Party	1400Z-2400Z, Feb 3
YL-OM Contest, CW	1400Z, Feb 2 to 0200Z, Feb 4
FYBO Winter QRP Field Day	1400Z, Feb 2 to 0200Z, Feb 3
Delaware QSO Party	1700Z, Feb 2 to 0500Z, Feb 3 and 1300Z, Feb 3 to 0100Z, Feb 4
Mexico RTTY International Contest	1800Z, Feb 2 to 2400Z, Feb 3
North American Sprint, Phone	0000Z-0400Z, Feb 3
Six Club 2nd Winter Contest	2300Z, Feb 8 to 0300Z, Feb 11
CQ/RJ WW RTTY WPX Contest	0000Z, Feb 9 to 2400Z, Feb 10
Utah QSO Party	0000Z, Feb 9 to 2400Z, Feb 10
Asia-Pacific Sprint, CW	1100Z-1300Z, Feb 9
Dutch PACC Contest	1200Z, Feb 9 to 1200Z, Feb 10
YL-OM Contest, SSB	1400Z, Feb 9 to 0200Z, Feb 11
FISTS Winter Sprint	1700Z-2100Z, Feb 9
RSGB 1.8 MHz Contest, CW	2100Z, Feb 9 to 0100Z, Feb 10
North American Sprint, CW	0000Z-0400Z, Feb 10
QRP ARCI Winter Fireside SSB Sprint	2000Z-2400Z, Feb 10
ARRL International DX Contest, CW	0000Z, Feb 16 to 2400Z, Feb 17
CQ 160-Meter Contest, SSB	2200Z, Feb 22 to 1600Z, Feb 24
REF Contest, SSB	0600Z, Feb 23 to 1800Z, Feb 24
North Carolina QSO Party	1200Z-2359Z, Feb 23 and 1200Z-2359Z, Feb 24
UBA DX Contest, CW	1300Z, Feb 23 to 1300Z, Feb 24
RSGB 7 MHz DX Contest, CW	1500Z, Feb 23 to 0900Z, Feb 24
High Speed Club CW Contest	0900Z-1100Z and 1500Z-1700Z, Feb 24
CQC Winter QSO Party	2200Z, Feb 24 to 0359Z, Feb 25

March 2002

ARRL International DX Contest, SSB	0000Z, Mar 2 to 2400Z, Mar 3
World Wide Locator Contest	0000Z, Mar 9 to 2400Z, Mar 10
SARL Field Day Contest	1000Z, Mar 9 to 1000Z, Mar 10
RSGB Commonwealth Contest, CW	1200Z, Mar 9 to 1200Z, Mar 10
North American Sprint, RTTY	0000Z-0400Z, Mar 10
UBA Spring Contest, CW	0700Z-1100Z, Mar 10
Wisconsin QSO Party	1800Z, Mar 10 to 0100Z, Mar 11
Alaska QSO Party	0000Z, Mar 16 to 2400Z, Mar 17
BARTG Spring RTTY Contest	0200Z, Mar 16 to 0200Z, Mar 18
Russian DX Contest	1200Z, Mar 16 to 1200Z, Mar 17
Virginia QSO Party	1800Z, Mar 16 to 0200Z, Mar 18
Spring QRP Homebrewer Sprint	0000Z-0400Z, Mar 25
CQ WW WPX Contest, SSB	0000Z, Mar 30 to 2400Z, Mar 31

April 2002

MARAC County Hunters Contest, SSB	0000Z, Apr 6 to 2400Z, Apr 7
SP DX Contest	1500Z, Apr 6 to 1500Z, Apr 7
EA RTTY Contest	1600Z, Apr 6 to 1600Z, Apr 7
JIDX HF CW Contest	2300Z, Apr 12 to 2300Z, Apr 14
QRP ARCI Spring QSO Party	1200Z, Apr 13 to 2400Z, Apr 14
EU Spring Sprint, SSB	1500Z-1859Z, Apr 13
His Majesty King of Spain Contest	1800Z, Apr 13 to 1800Z, Apr 14
Yuri Gagarin International DX Contest	2100Z, Apr 13 to 2100Z, Apr 14
UBA Spring Contest, SSB	0600Z-1000Z, Apr 14
YU DX Contest	1200Z, Apr 20 to 1200Z, Apr 21
GACW CW DX Contest	1200Z, Apr 20 to 1200Z, Apr 21
EU Spring Sprint, CW	1500Z-1859Z, Apr 20
Michigan QSO Party	1600Z, Apr 20 to 0400Z, Apr 21
Holyland DX Contest	1800Z, Apr 20 to 1800Z, Apr 21
Ontario QSO Party	1800Z, Apr 20 to 1800Z, Apr 21
Harry Angel Memorial Sprint	1100Z-1246Z, Apr 25
SP DX RTTY Contest	1200Z, Apr 27 to 1200Z, Apr 28
Helvetia Contest	1300Z, Apr 27 to 1300Z, Apr 28
Florida QSO Party	1600Z, Apr 27 to 0159Z, Apr 28 and 1200Z-2159Z, Apr 28

■

RTTY Contesting

Wayne Matlock, K7WM
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Results, July 2001 NAQP RTTY Contest


K7WM

Over the past several years, propagation hasn't been very kind to the NAQP RTTY contests. This has resulted in low scores, less than hoped for participation and a relative lack of team competition.

This year we finally reaped the rewards of favorable propagation. Overall team and single operator participation was definitely up. There were more logs submitted and a noticeable increase in both activity and overall scores.

Who Let the Dogs Out?

About three or four weeks before the contest, the Big Dogs team issued a challenge: "If you want to run with the Big Dogs, you've got to get off the porch and howl." This was loosely directed at any and all individuals who might muster the courage to form teams and make an attempt to run alongside this motley crew. Courageous leaders soon stepped forward, and numerous individuals answered their rally cries. A record number of teams were assembled.

As the time of the contest drew near, an ever-increasing number of invectives were hurled at the Big Dogs. Some of these went so far as to speculate about their pedigree, and still others forewarned of dire consequences should they dare let their paws hit the pavement. (All of this was done in fun, of course, and all taunts—be they supportable or unsupportable—were met with appropriate counter-taunts from various members of the Big Dog pack.)

But, alas, all of the competing team's planning, conniving and scheming was in vain. The Big Dogs rolled over even the most worthy of their foes. Perhaps it should come as no surprise that four out of the five Big Dog team members placed in the Top Ten of the Single Operator class. The fifth finished in 11th place.

The View from My Porch

The NAQP is first and foremost a rate contest. To quote another desert rat, "you've got to pump it up and turn it on." Having a 150-W maximum power limit for both the single operator and multi-operator classes helps keep strategy, antennas and—of course—location the foremost considerations.

Nearly all of the continental states were represented in the submitted logs,

Team Scores

1. The Big Dogs (W1ZT, K3MM, WT4I, AA5AU, WS7I)	413265
2. NotnufRTTY (AA9RR, K4GMH, N8YYS, WA9ALS, WA0SXV)	207445
3. Floboys (K4PX, AF4Z, K4QD, WB4EQS, KC4HW)	169525
4. Baud Boys (KI6DY, VA7SW, W7TI, N1NB, VE6RAJ)	156170
5. Cool Dudes (AK6R, K7WM, W0DC, AK0A, K6EP)	112332
6. TCG Banjos (K0CIE, W4LC, WM4Q, K4BEV, NY1S)	108409
7. TCG Fiddles (W4GKM, W4AUI, W0ETC, W4OX, KK5OQ)	88397
8. TCG Guitars (N4JN, NA6E, KA4RRU, WN1OTV, W1/WB6BIG)	70228
9. TCG Dulcimers (W0MRD, K0TG, AK4ST, NB1B)	15624
10. TCG Mandolins (WA4CFG, KB5BOB, WB5QLR, K4NR, AA4NU)	6931

Single Op Top 10

AA5AU	103400
K3MM	102808
WT4I	99372
P43P	67769
K4WW	59584
W1ZT	59220
K4GMH	53098
W4/KL7Q	51975
KI6DY	49128
N0AT	48620

Top 10 QSOs

K3MM	568
AA5AU	550
WT4I	546
W1ZT	423
P43P	401
K4WW	392
W4/KL7Q	385
K4GMH	382
WS7I	359
KI6DY	356
K7WM	356

Top 10 Mults

AA5AU	188
WT4I	182
K3MM	181
P43P	169
K4WW	152
K3FH	151
N0AJ	145
N0AT	143
WA0SXV	142
AA9RR	141

Single Op Top 10 Breakdowns

Call	*Name*	*QTH*	*80*	*40*	*20*	*15*	*10*	*QSOs*	*Mults*	*Score*	
AA5AU	Don	LA	60/31	152/46	174/44	120/45	44/22	550	188	103400	Big Dogs
K3MM	Ty	MD	60/28	142/39	188/43	121/40	57/31	568	181	102808	Big Dogs
WT4I	Thor	FL	53/28	171/45	173/47	107/41	42/21	546	182	99372	Big Dogs
P43P	Data	P4	80/38	137/45	119/47	56/31	9/8	401	169	67769	
K4WW	Bo	KY	23/12	88/31	136/40	98/41	47/28	392	152	59584	
W1ZT	George	MA	15/7	140/34	142/38	81/35	45/26	423	140	59220	Big Dogs
K4GMH	Mike	VA	13/7	81/25	130/41	99/38	59/28	382	139	53098	NotnufRTTY
W4/KL7Q	Tom	AL	5/3	111/32	164/46	70/36	35/18	385	135	51975	
KI6DY	Bob	KS	5/3	54/27	124/40	125/42	48/26	356	138	49128	Baud Boys
N0AT	Ron	MN	17/13	48/26	142/41	95/38	38/25	340	143	48620	

Multi-Two Breakdowns

Call	*Name*	*QTH*	*80*	*40*	*20*	*15*	*10*	*QSOs*	*Mults*	*Score*
N0AC	Bill	IA	20/14	123/35	161/44	139/45	50/26	493	164	80852
W6YX	Leland	CA	20/9	166/44	183/50	96/38	15/8	480	149	71520
N5YA	Bill	TX	30/22	28/17	135/43	110/42	47/27	350	151	52850
N1MGO	Charlie	VT	4/1	35/18	70/30	90/36	35/21	234	106	24804
SP5ZCC	Mark	SP	0/0	32/109	72/38	5/5	0/0	109	62	6758

along with most of the Canadian provinces and several DX countries. With the 1800Z start time and 0600Z finish, this contest period can include openings to most parts of the world. And what you might miss at one point in time will likely become available at another (*if* you plan your off times carefully). Not much comes out of the Pacific, so guys on the West Coast can aim the antennas roughly east and pull the plugs on the rotator control boxes.

With band multipliers for US, Canadian and other North American countries, the points can add up fast. The ability to rapidly change bands—and the savvy to know when to do it—are the keys to maximizing your score in this contest.

I Ain't Never Had Too Much Fun

If you missed this 2001 running, don't let that happen again this year. There has even been some discussion of the possibility of adding a second yearly running. Let us know what you think. I'm for it, let's double the fun!

Single Operator Scores

Call	Name	QTH	QSOs	Mults	Score	Team
W1ZT	George	MA	423	140	59220	Big Dogs
NY1S	Lobsta	ME	302	118	35636	TCG Banjos
K1JE	Michael	MA	307	110	33770	
K5ZD	Randy	MA	212	97	20564	
N1NB	Steve	CT	182	92	16744	Baud Boys
W1/WB6BIG	Keith	NH	146	70	10220	TCG Guitars
N1XS	Chris	CT	118	56	6608	
AB1BX	Andy	RI	98	51	4998	
W1TO	Tom	MA	73	46	3358	
WN1OTV	Topkick	ME	40	23	920	TCG Guitars
NO2T	Yerrj	NJ	187	90	16830	
KA2D	Tom	NY	140	75	10500	
K3MM	Ty	MD	568	181	102808	Big Dogs
W3MEL	Mel	PA	261	106	27666	
K3FH	Mike	PA	151	87	13137	
WN3C	Mac	MD	89	62	5518	
K3WW	Chas	PA	92	46	4232	
N3YEA	Jeff	PA	41	24	984	
KA3PPH	John	PA	20	14	280	
WT4I	Thor	FL	546	182	99372	Big Dogs
K4WW	Bo	KY	392	152	59584	
K4GMH	Mike	VA	382	139	53098	NotnufRTTY
W4/KL7Q	Tom	AL	385	135	51975	
KA4RRU	Mike	VA	350	134	46900	TCG Guitars
AF4Z	Don	FL	348	134	46632	Floboys
KW4DA	Dinger	NC	345	128	44160	
K4QD	Jan	FL	342	122	41724	Floboys
KE4KWE	Tom	AL	292	133	38836	
KC4HW	Jim	FL	286	113	32318	Floboys
W4UEF	Rick	NC	248	117	29016	
W4LC	Ed	KY	242	110	26620	TCG Banjos
W4OX	Tonedeaf	FL	257	98	25186	TCG Fiddles
K4PX	George	FL	236	104	24544	Floboys
WB4EQS	Ron	FL	223	109	24307	Floboys
W4AUI	Bill	TN	216	111	23976	TCG Fiddles
K4BEV	Jethro	TN	161	98	15778	TCG Banjos
N4CW	Bert	NC	170	77	13090	
WA4KY	Gary	KY	151	81	12231	
W9KEN	Ken	FL	140	58	8120	
AA4NU	Billy	TN	91	58	5278	TCG Mndolins
K4FYM	Allen	GA	46	35	1610	
N4JN	Mrguitar	TN	39	28	1092	TCG Guitars
K0COP/4	David	SC	36	23	828	
AA5AU	Don	LA	550	188	103400	Big Dogs
W5UQ	Cary	TX	267	128	34176	
N5TY	Ken	TX	259	128	33152	
K0CIE	Karl	OK	243	125	30375	TCG Banjos
N5ZM	Bodiddle	AR	201	104	20904	
NA4M	Phil	TX	176	93	16368	
W5MK	Chris	AR	166	78	12948	
KK5IJ	Nelson	TX	92	54	4968	
WA9AFM/5	Tom	OK	82	55	4510	
N5LUL	Brad	TX	70	39	2730	
WB5QLR	Tom	TX	57	29	1653	TCG Mndolins
KE5OG	Hero	TX	32	20	640	
KR6E	Ben	CA	317	112	35504	
W7TI	Bill	CA	306	114	34884	Baud Boys
AK6R	Beachdude	CA	258	107	27606	Cool Dudes
AC6JT	Bryan	CA	214	106	22684	
K6EP	Eric	CA	174	90	15660	Cool Dudes
N6EE	Ron	CA	162	87	14094	
K6MI	John	CA	164	85	13940	
NA6E	Rfgal	CA	152	73	11096	TCG Guitars
K6BIR	Vince	CA	132	76	10032	
WA6BOB	Bob	CA	129	71	9159	
W6JOX	Chuck	CA	110	73	8030	
N6TQS	Doug	CA	111	64	7104	
W6ZL	Bigwave	CA	94	60	5640	
K6ZJ	Tom	CA	86	54	4644	
KB5MU	Paul	CA	64	48	3072	
KE6QR	Gary	CA	19	16	304	
WS7I	Jay	WA	359	135	48465	Big Dogs
K7WM	Wayne	AZ	356	129	45924	Cool Dudes
K7ZUM	Zummie	OR	288	112	32256	
N7US	Jim	AZ	261	122	31842	
KE7AJ	Barb	WA	308	101	31108	
N7UJJ	Allan	AZ	118	69	8142	
K7JJ	Dave	NV	115	63	7245	
WD9EWK/7	Patrick	AZ	118	57	6726	
K7ZO	Scott	ID	98	59	5782	
WA7NPX	Tom	AZ	40	25	1000	
W7DPW	Dave	WA	43	22	946	
KC7WUE	Joe	WA	14	14	196	
N8YYS	Algrower	WV	271	125	33875	NotnufRTTY
KD8FS	Choppy	MI	255	120	30600	
WA8RPK	Tom	OH	234	99	23166	
K8IR	Jim	MI	170	93	15810	
NX8C	Neil	MI	181	80	14480	
K9JY	Scot	IL	314	137	43018	
AA9RR	Tim	WI	303	141	42723	NotnufRTTY
K9USA	Unclesam	IL	257	129	33153	
WA9ALS	John	IN	281	117	32877	NotnufRTTY
N2BJ	Barry	IL	107	38	4066	
KI6DY	Bob	KS	356	138	49128	Baud Boys
N0AT	Ron	MN	340	143	48620	
WA0SXV	Mike	MO	316	142	44872	NotnufRTTY
N0AJ	Jim	MO	295	145	42775	
W0ETC	Korndog	IA	295	133	39235	TCG Fiddles
AE9B	Tom	MO	292	127	37084	
K0BX	Joey	MO	245	122	29890	
W0TY	Tony	MO	223	110	24530	
AK0A	Bill	KS	204	98	19992	Cool Dudes
K0IDT	Bodiddles	NE	201	92	18492	
K0TG	John	MN	186	84	15624	TCG Dlcimers
W0BR	Bob	KS	95	68	6460	
N0IBT	Dave	CO	89	54	4806	
W0DC	John	MN	70	45	3150	Cool Dudes
W2JGR/0	Jules	MN	70	44	3080	
KE0LY	Terry	SD	53	35	1855	
K0XU	Jim	NE	37	29	1073	
NE0P	John	IA	10	8	80	
AH6OZ	Wizard	HI	147	67	9849	
NH6XM	Neddy	HI	111	50	5550	
VE1AOE	Don	NS	53	20	1060	
VE3BUC	Don	ON	158	69	10902	
VE3HG	Peter	ON	148	71	10508	
VE3GSI	Eric	ON	105	48	5040	
VA3SB	Serge	ON	72	34	2448	
VE4COZ	Irek	MB	142	58	8236	
VE6RAJ	Gismo	AB	273	120	32760	Baud Boys
VA6MM	Macraster	AB	189	86	16254	
VE6YR	Liveyr	AB	109	62	6758	
VA6RA	Dave	AB	82	38	3116	
VA7SW	Guinessman	BC	241	94	22654	Baud Boys
VE7QO	Vikings	BC	16	13	208	

Call	Name	QSOs	Mults	Score
P43P	Data	401	169	67769
CT1AOZ	Jose	141	83	11703
UZ7U	Sergio	177	62	10974
LU4DRC	Esteban	138	72	9936
ON4AME	Herman	123	72	8856
DL1YFF	Hans	141	59	8319
LY3BH	Alex	111	67	7437
YU7AM	Arpad	109	54	5886
J41K	Jim	106	53	5618
DJ3NG	Sigi	78	50	3900
YL2KF	Vilnis	81	39	3159
SP3BGD	Stan	69	44	3036
SP3RBT	Jozef	68	41	2788
YO9HP	Alex	58	44	2552
GU0SUP	Phil	46	37	1702
DK5AI	Wolf	35	29	1015
I4HRH	Carlo	30	22	660
SM7BJW	Kurt	29	21	609
OK1FM	Milan	28	20	560
F5NZO	Didier	27	18	486
SP3XR	Tadeusz	24	20	480
DL6UAA	Mart	23	19	437
ES1QV	Arvo	23	17	391
DJ2YE	Diet	20	16	320
JA1BHK	Maza	12	11	132
OK1JN	Ivan	9	8	72
RK6BZ	Yuri	8	7	56
7S3A	Jan	8	6	48
SV2AEL	Savas	7	6	42
OY/DF2SS	Fred	5	5	25

Check Logs

AB1BX, DJ2IA, K1US, K5EIR, K5HCJ, KD7RX, KG0PI, KK5OQ, KK6IO, N0AO/6, N5LUQ, N5WL, N9PQU, OH2GI, PR7AR, RW9WA, SM6SRW, SP3CUG, VE7SW, VK4WPX, W6/G0AZT, W9HLY ■

Results, September 2001 NCJ CW Sprint

Boring Amateur Radio Club
cwsprint@ncjweb.com

Imagine that you are invited to attend an unusual dance. Once you arrive, you are instructed by the host to make a sincere attempt to dance with as many different individuals as you can before the end of the last number—some four hours later. The floor is divided into three sections, and you can boogie with each person only once in each section. The dance steps always remain the same—two steps forward, one step back. After you have completed an encounter, you must move at least 5 meters before you can pair up with another partner. Now let's put about 300 people out on the floor, strike up the band(s), and see how long it takes for the first few folks to begin to pass out.

Now, imagine that the venue for this dance is the RF playground that you connect to with your HF radio, antenna, keyer and headphones. Perhaps this analogy comes close to describing the "Sprint Experience." The 49th opportunity to dance this dance on CW occurred on September 9th, 2001.

Activity seemed to be very good for a September running. A total of 306 different stations appeared in two or more logs. New records were set in Washington (K7RI/K7SS) and North Carolina (N4AF), and we received our first log submission from Guatemala, courtesy of TG9/N5KO. Stations in most parts of the country reported pretty good conditions, though the guys in the South did suffer through very noisy conditions on 80 meters. One of the top ten high power scores—from a participant in Texas—only included 46 QSOs on 80!

The low power category continues to gain popularity. It required nearly 10 kilopoints to make the top ten list this time around. Paul Gentry, K9PG (operating from K9XD), "…had to go low power at the last minute" and ended up with the top low power score. Sprint low power veteran Dave, K1HT, was less than three QSOs behind him. Jeff, KU8E, followed closely in third place. W1RM, W4OC (your SC multiplier), K5AF, W7UQ (with KL9A at the key) and N0AX all racked up over 10k points running low power. This is an achievement that ranks right up there with breaking 300 Qs running high power. K4XU and W7GG, both in Oregon, grabbed the 9th and 10th place low power spots.

In the high power category, six previous CW Sprint champions snapped up the top six positions. Four of them were essentially tied before the log checking process was performed. When the dust settled, Tree, N6TR/7, posted his first September CW Sprint victory. Close on Tree's heels were Bill, W4AN (using his "triple A" call sign), and Andy, N2NT. Andy won the race for the most QSOs, but fell one multiplier short of victory. Fourth place went to Randy, K5ZD/1, followed by Jeff, N5TJ, who was operating from the ice-damaged K5MR station. Jeff was the only station placing in the top ten who also turned in a Golden Log. Tom, K1KI, came in sixth—proving once again that it is possible to make the top ten with only one radio. W4PA, N2IC/0, N6ZZ/7 and former CW Sprint editor AG9A filled out the rest of the top ten slots. Once again, most areas of the country are represented in the top scores.

Our lonely QRP entry is once again Dale, KG5U. Dale, and many others, chose to use the name "Sharp" to honor Clarence E. "Sharp" Sharp, K5DX, who passed away just one week before the contest. Sharp joins the list of silent keys honored by the Sprint operators, a tradition that started with Homer, K7RA, and includes Bip, W6BIP, who was honored last year.

In the team competition, the Southern California Contest Club continued its stranglehold on the number one spot with their 20th victory. The Society of Midwest Contesters #1 team came in second place with only nine scores and NCCC #1 came in third. The YCCC was the only other team scoring over 100k

Sprint-Related Web Sites

For the Sprint rules and contest dates, visit the *NCJ* Web site: **www.ncjweb.com**. The list of submitted logs can also be found there. A wide range of *NCJ* and contesting-related topics are covered on our site.

Seasoned veterans—as well as those interested in trying the Sprint for the first time—should check out N6TR's Sprint Survival Web Page at **jzap.com/n6tr/sprint.html**. It explains the exchanges, gives examples and is loaded with good information, advice and contest strategies.

Sprint Tip

It is important that each QSO is confirmed by the other station. It is all too easy to forget this while dumping in your call at the end of another QSO. Please remember to give the stations a chance to make sure they have all the information they need *before* you jump.

Top 10 Scores

Call	*Score*	*Band Changes*	*QSOs Lost*	*00Z*	*01Z*	*02Z*	*03Z*
N6TR	17689	56	1	104	88	76	93
K4AAA (W4AN)	17650	148	3	98	94	76	86
N2NT	17616	93	3	103	93	79	92
K5ZD	17493	60	5	94	85	80	86
K5MR (N5TJ)	17334	41	0	87	85	81	68
K1KI	16950	6	8	101	85	78	77
W4PA	16168	128	4	99	79	78	89
N2IC	15886	45	5	92	82	86	80
N6ZZ	15840	63	2	90	77	77	86
AG9A	15839	94	2	93	89	70	85

Guidelines for Log Submission

Please carefully read the submission instructions that appear in the Sprint rules that are posted on the *NCJ* Web site (**www.ncjweb.com/sprintrules.html**) and published elsewhere in this issue.

The Cabrillo log format is now preferred and eliminates the need for a summary sheet. Otherwise, submit your ASCII log and a summary sheet via e-mail or diskette. E-mail your logs to **cwsprint@ncjweb.com** or mail them to BARC—CW Sprint, 15125 SE Bartell Rd, Boring, OR 97009.

Check the received logs list on the *NCJ* Web site to verify that your log has been properly received.

Feedback on log accuracy is available through e-mail (send your request to **cwsprint@ncjweb.com**) or by postal mail by sending an SASE to the BARC after the results have been published.

points with only eight operators.

There were a few new call signs heard in the pileups this time around. We would like to recognize the fine effort of Dave, KM3T, who made 254 QSOs from the K1EA station in his first CW Sprint.

Of the 168 logs that we received, 165 were in electronic format. We would like to thank those of you who submitted your logs in the Cabrillo format. This is helping us improve the quality of the results by standardizing the format of the logs and allowing us to automate the process for determining category, guest operators and soapbox comments.

Once again, the SO2R (single-op, two radio) stations were out in force. Four stations made over 100 band changes, and it took 75 or more changes to make the "Top 10 Band Changes" list.

A great challenge is to operate this contest and submit a perfect log with no errors. No fewer than six stations with MORE than 300 QSOs turned in "Golden Logs." Congratulations this time around go to N6RT (at W6EEN), N5TJ (at K5MR), K4BAI, N6TV, AA3B, K1DG, K1HT, KL9A (at W7UQ), K9BGL, WQ5L, KI7Y, K4MX, KG5U, HP1AC and W7LR—all submitted perfect logs. This ties the record for the highest total of Golden Logs—set in February last year.

The next CW Sprint will be held on February 10th (Zulu) at 0000Z. Will N6TR be able to string together three consecutive victories? Will N5TJ be back at full strength and reclaim his QSO record? Will someone come in with over 400 QSOs? Can the SCCC make it number 21, or will the SMC, NCCC or YCCC put together a full team to challenge them? Will anyone else dive into this "mosh pit" armed only with 5 W, like KG5U? Tune in and find out.

Soapbox

For the first Sprint that I can recall, I worked every mult that I heard, but judging from some other reported scores, I missed hearing a few!—*AE6Y.* Yikes! That's fast.—*K0CO.* Tnx to Bill/W4AN for organizing teams. Only a part time effort.—*K0EJ.* First time using computer logging. Score probably down a few QSOs, but first Sprint with no dupes. Somehow managed to skip a few QSO numbers.—*K1DG.* My best multiplier total so far! A special thanks to K4FXN, who called me at 0347, for KY. 40 was great at the start but didn't seem as good later. I'm still using one radio.—*K1HT.* First Sprint for me. Thanks to K1KI.—*K2KQ.* Nice break in WAE SSB action, second time I've broken 300 in Sprint while working WAE most of the weekend.—*K3WW.* 80M with QRN was not the place to be Low Power. The big guys ate my lunch almost every time.—*K4QPL.* Best start ever. The low bands were very rough.—*K4RO.* Great Sprint, just wish that the 80M conditions were better.—*K5AF.* Lousy noise, but any Sprint is a fun Sprint.—*K5GN.* Operated at KV4T in AL.—*K5OT.* My first attempt at SO2R in the Sprint. As if the Sprint isn't crazy enough with one.—*K5PI.* The best four hours in contesting!—*K5ZD.* Semi-Field Day-type operation. I fixed a generator problem, but a crashed hard drive caused a big scramble searching for pen/paper and setting up the

Top 10

Low Power Scores

Call	*Score*
K9XD (K9PG)	13279
K1HT	13152
KU8E	12737
W1RM	10956
W4OC	10922
K5AF	10516
W7UQ (KL9A)	10234
N0AX	10032
K4XU	9460
W7GG	9430

QRP Scores

Call	*Score*
KG5U	7650

QSOs

Call	*QSOs*
N2NT	367
N6TR	361
K4AAA (W4AN)	353
W4PA	344
K5ZD	343
N6MJ	341
K1KI	339
N2IC	338
AG9A	337
W6EEN (N6RT)	337

Mults

Call	*Mults*
K5MR (N5TJ)	54
K5ZD	51
K4AAA (W4AN)	50
K1KI	50
K1DG	50
K6NA	50
N6TR	49
K9XD (K9PG)	49
Many	48

Band Changes

Call	*Changes*
K4AAA (W4AN)	148
N9RV	147
W4PA	128
W6EEN (N6RT)	116
AG9A	94
N2NT	93
K9XD (K9PG)	90
W5WMU	84
K1VUT	77
N5RZ	75

Golden Logs

(no QSOs removed)

Call	*QSOs*
W6EEN (N6RT)	337
K5MR (N5TJ)	321
K4BAI	319
N6TV	315
AA3B	307
K1DG	306
K1HT	274
W7UQ (KL9A)	238
K9BGL	237
WQ5L	226

Team Scores

1. Southern California Contest Club #1

N6ZZ	15840
N6MJ	15686
W6EEN (N6RT)	15165
K6NA	13150
W6UE (W4EF)	12465
K6LA	12390
AC6T	12056
N6CW	11655
N6AN	10578
N6VR	9996
	128981

2. Society of Midwest Contesters #1

AG9A	15839
N9RV	14996
K9NW	14928
N2NC	13677
K9XD (K9PG)	13279
WB0O	12138
N9CK	12040
K0OU	11616
NA9D (KB3AFT)	10648
	119161

3. Northern California Contest Club #1

N6TV	14805
N6RO	13872
AE6Y	12190
W6YX (N7MH)	12056
K5RC	11572
K6AW	11193
AJ6V	10707
W6RGG	9804
K6XX	9589
K7NV	9480
	115268

4. Yankee Clipper Contest Club #1

K5ZD	17493
K1KI	16950
K1DG	15300
KI1G	14030
K1HT	13152
W1WEF	13029
KM3T	11176
K1IR	8400
	109530

5. Kudzu (K4BAI, KT3Y, K9AY, KZ5D, WQ5L, K5OT, W4NZ, WO4O, AE4Y) 90926
6. Beam SE (K4AAA [W4AN], N4AF, K4RO, K4NO, W5WMU, N4ZZ, K4MA, K0EJ) 89411
7. Austin Powers (K5MR [N5TJ], N3BB, K5NA, K5PI, AF5Z, K4QPL, N2LA, K5TR, KE5C, N5DUW) 83719
8. Corner Pocket (N6TR, K7RI [K7SS], W7UQ [KL9A], N0AX, W7VJ, KI7Y, VE7QO, N7WA) 77066
9. Texas DX Society Sharp (K5GN, K5NZ, K5XR [W5ASP], N5TU, KG5U, N1LN, N5XZ, KN5H) 70107
10. North Coast Contesters (K2UA, VE3EJ, VA3RU, W8KIC, ND8L, ZF2VV, AD8J, K3LR, WW3S) 67843
11. Frankford Radio Club (N2NT, AA3B, K3WW, K2PS, W1NN, N8NA) 65693
12. Middle East (KU8E, K3WU, NA0N, K4MX, N2MG) 43306
13. YCCC #2 (W1RM, K2KQ, K1VUT, K2LE, KB1H, N1XS) 36067
14. NCCC #2 (NI6T, K6CTA, N6PN, N6IJ [AD6TF], K6KYJ) 27039
15. SMC #2 (KG9X, K9BGL, N9CO) 25155
16. SCCC #2 (W6TK, N6ED, N6TW, N6AA) 20191
17. 2 of Us (VE3FU, VE3IAY) 11646
18. Mad River Radio Club (K8MR) 10718
19. SMC #4 (KJ9C, W0UY, W9LYA) 9753
20. YCCC #3 (W1FJ, W1TO) 8126
21. LU Contest Group (LW9EUJ) 3168
22. SMC #3 (AK9F, AI9X) 2341

old keyer.—*K6XX.* A great operating event—much more than a contest! Thank you!—*KE5C.* I just didn't have my heart in this one.—*KJ9C.* My first full CW Sprint...simultaneously the most fun and frustrating contest there is! Can't wait 'til the next one!—*KM3T.* This was my first Sprint, WOW, too bad I started late, there's always next year.—*KW4DA.* Need some more skill sharpening. I'll be back next time.—*N1LN.* Got home late after helping K2UA with some tower work. I don't have a 20M antenna anyway, so no big deal! Thanks to W4AN for twisting my arm and sticking me on a team. That was the one thing that got me to stick it out.—*N2MG.* My first Sprint. What a rush!—*N5XZ.* Many thanks to Arnie, N6HC, for the generous use of his station. After 24 years as AA6RX I finally got a new call. This was my debut as N6AN. My humble apologies to all for being spastic and slow. Due to problems caused by lack of preparation, CW except for pre-programmed messages was sent in keyboard mode. But prepared or not, this is loads of fun. My thanks to the tireless volunteers among us who make the Sprints possible.—*N6AN.* A bit rusty at first, but got the hang of it after a while. Great fun!—*N6ER.* Inverted-V on 80 seemed to contribute to a stronger-than-usual last hour, despite a lot of QRN.—*N6ZZ.* Thanks to the encouragement of K3LR, K9PG and N2NC I put the antennas back up and away we went... except the computer crashed halfway thru. After a piece of peach pie for stamina, I finished the contest on paper. Unfortunately, I couldn't remember what was the last QSO number, so I restarted arbitrarily at 100. Thus there is no QSO 90 thru 99. I was able to retrieve the first part of the log, but I guess it is time to replace the 386 with a 486. PS: My last Sprint entry should have been listed as Low Power, as always—and first time over 10k!—*N8NA.* Great fun as usual. Looking forward to the next one.—*NO5W.* Clearly, THE most difficult contest going. Great fun.—*VE4XT.* Had fun but next time will have better antenna for 40. Thanks for Qs.—*VE7QO.* I'm beginning to think that my personal contesting demons simply don't like Sprint contests. Saturday morning I got everything set up just the way I like and then the XYL and I left to drive to a wedding about 100 miles away. We got back from the wedding festivities about 2320. I didn't even drink one beer! Plenty of time to get all the radio gear up and running, right? Suddenly, 10 minutes before the start, my parallel port SO2R box doesn't like the 40M double Zepp and begins to chatter the keying relay on that band. I quickly switch things around to keying with the serial port (no point for me to even try SO2R in this contest, I get befuddled easily enough with only one radio...). By the time I get all of that squared away the Sprint is already 3 minutes underway. But the signals on 20 sound kind of weak and watery, and I'm having a hard time getting heard. I hope we haven't had another solar flare, etc. About 10 minutes

Sprint Observations—A Little Gun Perspective

by Rich Ferch, VE3IAY

The Sprint is a challenge for everyone, but I believe it is especially tough for newcomers and popguns.

As a station with an anemic signal (100 W to a ground-mounted trap vertical in my case—many QRP stations are louder than I am!) I found the Sprint unusually frustrating for several reasons. This was only my second attempt at it, so I am still learning, of course.

Although overall, the operating standards were very high, once or twice I had someone start calling on my frequency while I was in the middle of a QSO. One or two folks (dare I call them "alligators"? Not really, but...) would repeatedly CQ while I was still trying to send another contact my call sign. Both of these are indications that my signal is hard to hear, and perhaps some people can't be bothered (…or honestly can't hear me, even though other stations in the same location seem to be able to).

Needless to say, my long call sign is no help either. I called one station—only 500 to 600 miles from me—at least half a dozen separate times, and every time he would be well into his exchange with someone else before I could even finish sending my call (at around 33 WPM).

I am not trying to place any blame, nor am I suggesting that anyone should change his operating habits. I am just identifying some of the facts of "little gun" life. But it is also a fact that these phenomena help contribute to the frustration of the "fresh meat" participants that I'm sure the big guns and the contest promoters are looking to attract.

These types of things occur in other contests as well, but the amount of frustration they cause seems greater in a high-pressure event like the Sprint. Perhaps it's just a matter of mental preparation.

I also found that some strategies that I adopted—whether consciously or unconsciously—worked against me. For example, I initially assumed that I would be better off CQing in this contest. In others I have achieved some modest levels of success with a pure S&P strategy. I also thought that it would be best to follow the crowd and try to minimize the number of band changes.

These assumptions led me to adopt (and unfortunately stick to) a less-than-optimal game plan. This was my own fault, but it was still frustrating. While it was fresh in my mind, I tried to come to some tentative conclusions about how to get more out of this contest from a peanut-whistle station. I jotted down some notes mainly so that I'd have them for my own future reference. But I thought perhaps that they would also be of some use to other newcomers as well, so I sent them in to the *NCJ*.

It may be useful for the promoters of this contest to spend a bit of time thinking about what advice they might provide to newcomers to encourage their repeat participation. My own ideas here may well be all wet, but I think that some good advance warning and advice to newcomers—whether along these lines or not—might help encourage their long-term participation.

First, if you don't get a call immediately after completing a QSO, don't waste time calling CQ (no more than one token call, if that). This is especially important on bands where your signal is weak. On 80 meters, out of 30 QSOs (based on my log's frequency data) at most four of my QSOs were "solicited." In fact, I'm pretty sure at least one of these was a second S&P contact. Even on 20 meters, where I was much more likely to have a second QSO on the same frequency (18 times out of 33 possible), I wasted too much time on useless second and third repeat CQs. These were only rarely answered. The Sprint is nothing like a Sunday afternoon during SS where CQing can pay off for a weak station.

Second, don't leave a band when the action seems to be starting to thin out. With a weak signal, you may do better when the band is less crowded and there is less competition. I got my best rates on 20 after some of the action had moved on to 40. In hindsight, I left 20 too soon. If you've got a weak station, you may be better off moving between bands a bit more often so you can stay on the skirts of the main activity, rather than trying to be on the most popular band. This is not a DX contest where you have to follow the propagation to make contacts.

Third, if your station is weaker on one of the bands, don't waste a lot of time there. Multipliers don't count separately on different bands in this contest. If 80 meters is your weakest band, you might spend just a short time there (perhaps before the hordes descend) in order to pick up some of those close-in multipliers that you won't be able to work on 40 and 20. But otherwise, as soon as your rate starts to drop, go where you have a better chance of making QSOs.

Fourth, don't bother calling really big signals. While it seems obvious that you should avoid wasting too much time on weak signals, it's also the case that if you call a really strong signal and yours is weak. You'll probably lose out in the mini-pileups those stations attract. That's especially true if your call sign is not short and snappy. Go for the signals that are strong enough to work easily, but not so strong that they will attract too much competition. This is very different from a contest where the big signals can sit on a frequency and run, and will quickly "clear away" your competition from stronger S&Pers.

Finally, recognize ahead of time that it is difficult to achieve a high rate in this contest. For example, my best 10 minutes in this running of the Sprint barely managed to match the rate I can maintain—using a pure S&P strategy—for the entire 10 hours in the NAQP. My overall rate was low, even relative to my own low standards.

later I notice that my 20M beam is still pointed at Europe, where I was handing out a few Qs in the WAE contest earlier, duh. Being rattled is definitely not the best way to start the Sprint.—*W4AU.* My first September CW Sprint from the states. Lots of fun, but February is much better!—*W7UQ* (*KL9A*). ICOM IC-706MKIIG, Butternut HF-9V. Had to transcribe from paper log; RF got into my computer!—*W9LYA.* My best Low Power score yet.—*WO4O.*

Single Operator Scores

Call	Name	QTH	20	40	80	QSO	Mults	Score	Team
K5ZD	Sharp	MA	133	134	76	343	51	17493	YCCC #1
K1KI	Tom	CT	122	144	73	339	50	16950	YCCC #1
K1DG	Doug	NH	131	105	70	306	50	15300	YCCC #1
KI1G	Rick	RI	116	119	70	305	46	14030	YCCC #1
K1HT	*Dave	MA	112	110	52	274	48	13152	YCCC #1
W1WEF	Jack	CT	93	122	88	303	43	13029	YCCC #1
KM3T	Dave	MA	89	101	64	254	44	11176	YCCC #1
W1RM	*Pete	CT	103	98	48	249	44	10956	YCCC #2
K1IR	Jim	MA	72	90	48	210	40	8400	YCCC #1
K1VUT	*Dave	MA	72	74	21	167	40	6680	YCCC #2
K1PQS	Geo	ME	82	38	33	153	42	6426	
W1FJ	Al	MA	58	44	32	134	39	5226	YCCC #3
NY1S	*Joe	ME	69	48	8	125	40	5000	
W1TO	*Tom	MA	45	31	24	100	29	2900	YCCC #3
KB1H	*Dick	CT	32	30	19	81	30	2430	YCCC #2
N1XS	*Chris	CT	16	22	0	38	21	798	YCCC #2
N2NT	Andy	NJ	143	144	80	367	48	17616	FRC
K2UA	Rus	NY	99	120	78	297	45	13365	NCC
K2PS	Pete	NJ	72	102	56	230	41	9430	FRC
K2KQ	Don	NY	83	85	53	221	41	9061	YCCC #2
K2LE	*Andy	NY	45	87	34	166	37	6142	YCCC #2
N2MG	Mike	NY	3	75	45	123	39	4797	Middle East
AA3B	Bud	PA	110	138	59	307	45	13815	FRC
K3WW	Chas	PA	123	106	76	305	44	13420	FRC
K3WU	Jim	PA	105	88	57	250	43	10750	Middle East
W1NN	Hal	PA	61	60	23	144	40	5760	FRC
N8NA	*Karl	DE	54	34	69	157	36	5652	FRC
AD8J	John	PA	51	64	15	130	36	4680	NCC
WW3S	*JT	PA	39	30	21	90	31	2790	NCC
K4AAA (W4AN)	Bill	GA	124	150	79	353	50	17650	Beam SE
W4PA	Scott	TN	138	136	70	344	47	16168	
N4AF	Al	NC	126	106	83	315	46	14490	Beam SE
K4BAI	John	GA	113	110	96	319	44	14036	Kudzu
KT3Y	Phil	VA	105	114	65	284	46	13064	Kudzu
K4RO	Kirk	TN	95	121	57	273	46	12558	Beam SE
K4NO	Greg	AL	108	98	58	264	47	12408	Beam SE
K9AY	Gary	GA	112	95	51	258	47	12126	Kudzu
KO7X	Al	NC	92	118	55	265	44	11660	
N4ZZ	Don	TN	99	101	61	261	44	11484	Beam SE
W4OC	*Don	SC	98	100	56	254	43	10922	
K5OT	Larry	AL	98	99	39	236	42	9912	Kudzu
W4AU	John	VA	64	98	52	214	43	9202	
K4IQJ	*Dick	AL	89	96	36	221	40	8840	
W4NZ	Ted	TN	73	89	48	210	42	8820	Kudzu
WO4O	*Ric	TN	61	77	54	192	45	8640	Kudzu
K4FXN	*Dan	KY	74	98	54	226	38	8588	
K4QPL	*Jim	NC	78	64	39	181	40	7240	Austin Powers
K4MX	*Jeri	VA	56	78	44	178	37	6586	Middle East
K4MA	Jim	NC	69	52	42	163	38	6194	Beam SE
AE4Y	*Kent	GA	25	86	0	111	40	4440	Kudzu
K0EJ	*Mark	TN	10	42	25	77	31	2387	Beam SE
AA4LR	*Bill	GA	37	27	6	70	34	2380	
KW4DA	Dave	NC	0	54	11	65	23	1495	
K5MR (N5TJ)	Ed	TX	144	131	46	321	54	17334	Austin Powers
N6ZZ	Phil	NM	150	113	67	330	48	15840	SCCC #1
K5GN	Sharp	TX	149	106	68	323	48	15504	TDXS Sharp
N5RZ	Gator	TX	148	122	54	324	45	14580	
K5NZ	Sharp	TX	123	112	44	279	48	13392	TDXS Sharp
N3BB	Jim	TX	152	89	45	286	46	13156	Austin Powers
W5WMU	Pat	LA	114	104	37	255	48	12240	Beam SE
N5OT	Mark	OK	103	107	50	260	43	11180	
K5NA	Sharp	TX	98	108	63	269	40	10760	Austin Powers
K5KA	Ken	OK	113	97	55	265	40	10600	
K5AF	*Paul	TX	113	93	33	239	44	10516	
KZ5D	Art	LA	94	96	36	226	44	9944	Kudzu
WQ5L	Ray	MS	128	96	2	226	44	9944	Kudzu
N5DO	*Dave	TX	87	102	33	222	41	9102	
K5PI	Rob	TX	96	87	50	233	39	9087	Austin Powers
K5XR (W5ASP)	Sharp	TX	91	87	20	198	45	8910	TDXS Sharp
W8FN	*Randy	TX	79	106	6	191	46	8786	
N5TU	*Sharp	TX	97	74	6	177	47	8319	TDXS Sharp
KG5U	**Sharp	TX	123	44	3	170	45	7650	TDXS Sharp
AF5Z	*Bob	TX	79	106	7	192	38	7296	Austin Powers
N2LA	Larry	TX	86	67	12	165	41	6765	Austin Powers
N1LN	Bruce	TX	61	90	0	151	39	5889	TDXS Sharp
N5XZ	Sharp	TX	81	44	25	150	36	5400	TDXS Sharp
K5TR	Geo	TX	59	59	20	138	37	5106	Austin Powers
K3LR	Tim	OK	114	0	0	114	40	4560	NCC
KE5C	John	TX	42	56	26	124	36	4464	Austin Powers
NO5W	*Chuck	TX	82	0	0	82	32	2624	
N5DUW	*Jack	TX	48	31	2	81	31	2511	Austin Powers
K0CIE	*Karl	OK	37	33	0	70	29	2030	
W3DYA	NM	TX	43	17	0	60	25	1500	
N6MJ	Dan	CA	155	133	53	341	46	15686	SCCC #1
W6EEN (N6RT)	Doug	CA	125	135	77	337	45	15165	SCCC #1
N6TV	Bob	CA	135	125	55	315	47	14805	NCCC #1
N6RO	Ken	CA	133	100	56	289	48	13872	NCCC #1
K6NA	Glen	CA	116	93	54	263	50	13150	SCCC #1
W6UE (W4EF)	Mike	CA	123	109	45	277	45	12465	SCCC #1
K6LA	Ken	CA	130	122	43	295	42	12390	SCCC #1
AE6Y	Andy	CA	118	105	42	265	46	12190	NCCC #1
W6YX (N7MH)	Mike	CA	124	121	29	274	44	12056	NCCC #1
AC6T	Steve	CA	125	112	37	274	44	12056	SCCC #1
N6CW	Terry	CA	130	97	32	259	45	11655	SCCC #1
K6AW	Steve	CA	99	115	59	273	41	11193	NCCC #1
AJ6V	Ed	CA	117	95	37	249	43	10707	NCCC #1
N6AN	Rex	CA	106	89	51	246	43	10578	SCCC #1
N6VR	Ray	CA	105	93	40	238	42	9996	SCCC #1
W6RGG	Bob	CA	109	78	41	228	43	9804	NCCC #1
K6XX	Bob	CA	122	72	29	223	43	9589	NCCC #1
K9ZO	Ralph	CA	105	76	37	218	43	9374	
N6ER	Kevin	CA	107	75	41	223	41	9143	
W6TK	Dick	CA	103	80	24	207	41	8487	SCCC #2
NI6T	Garry	CA	111	47	43	201	42	8442	NCCC #2
K6CTA	Ed	CA	93	78	20	191	40	7640	NCCC #2
N6PN	Matt	CA	84	78	27	189	36	6804	NCCC #2
N6ED	Ed	CA	91	52	18	161	40	6440	SCCC #2
KU6J	*Eric	CA	60	64	22	146	37	5402	
N6TW	Larry	CA	65	26	13	104	28	2912	SCCC #2
N6AA	Dick	CA	0	71	13	84	28	2352	SCCC #2
N6IJ (AD6TF)	Jim	CA	37	27	12	76	28	2128	NCCC #2
K6KYJ	Ron	CA	39	28	8	75	27	2025	NCCC #2
N6TR	Tree	OR	149	131	81	361	49	17689	Corner Pocket
K7RI (K7SS)	Dan	WA	139	125	54	318	46	14628	Corner Pocket
K5RC	Tom	NV	99	121	43	263	44	11572	NCCC #1
K7UAZ	Tor	AZ	120	108	45	273	41	11193	
W7UQ (KL9A)	*Jim	ID	131	73	34	238	43	10234	Corner Pocket
N0AX	*Ed	WA	121	83	24	228	44	10032	Corner Pocket
K7NV	Kurt	NV	99	97	41	237	40	9480	NCCC #1
K4XU	*Dick	OR	107	75	33	215	44	9460	
W7GG	*Bob	OR	120	53	32	205	46	9430	
W7VJ	Andy	WA	81	86	38	205	42	8610	Corner Pocket
KI7Y	*Jim	OR	106	72	18	196	43	8428	Corner Pocket
KN5H	*Sharp	AZ	67	51	5	123	41	5043	TDXS Sharp
KL7WV	Tim	AK	106	0	0	106	36	3816	
N7WA	*Dink	WA	56	31	15	102	32	3264	Corner Pocket
WC7S	*Dale	WY	21	17	1	39	23	897	
W7LR	Bob	MT	1	3	0	4	4	16	
KU8E	*Jeff	OH	81	121	69	271	47	12737	Middle East
K8MR	Jim	OH	83	93	57	233	46	10718	MRRC
W8KIC	Val	OH	64	109	44	217	39	8463	NCC
K3JT	Terry	WV	64	93	38	195	42	8190	
W8KW (W8UE)	*Emu	MI	86	37	30	153	38	5814	
ND8L	*Ray	OH	71	53	27	151	38	5738	NCC
AG9A	Mark	IL	118	149	70	337	47	15839	SMC #1
N9RV	Pat	IN	122	133	71	326	46	14996	SMC #1
K9NW	Mike	IN	109	125	77	311	48	14928	SMC #1
N2NC	John	IL	120	120	51	291	47	13677	SMC #1
K9XD (K9PG)	*Dave	IL	102	116	53	271	49	13279	SMC #1
N9CK	Steve	WI	103	113	64	280	43	12040	SMC #1
NA9D (KB3AFT)	Jon	IL	83	101	58	242	44	10648	SMC #1
KG9X	Fred	IL	65	102	68	235	42	9870	SMC #2
K9BGL	Karl	IL	93	114	30	237	39	9243	SMC #2
N9CO	*Gomer	IL	33	107	19	159	38	6042	SMC #2
KJ9C	*Mel	IN	54	68	28	150	36	5400	SMC #4
AK9F	*Hal	IL	0	75	0	75	31	2325	SMC #3
W9LYA	*Dave	IL	15	8	3	26	18	468	SMC #4
AI9X	*Tony	WI	2	2	0	4	4	16	SMC #3
N2IC	Steve	CO	147	120	71	338	47	15886	
N0AT	Ron	MN	104	114	53	271	45	12195	
WB0O	Bill	ND	116	108	65	289	42	12138	SMC #1
K0OU	Steve	MO	95	129	40	264	44	11616	SMC #1
NA0N	*Pat	MN	84	109	35	228	37	8436	Middle East
N0UR	*Jim	MN	72	109	13	194	43	8342	
W0UY	Tom	KS	44	64	3	111	35	3885	SMC #4
K0CO	Jack	CO	36	17	1	54	20	1080	
VE3EJ	John	VE3	90	101	56	247	46	11362	NCC
VA3RU	Lali	VE3	90	102	65	257	44	11308	NCC
VE3FU	*Chris	VE3	75	50	40	165	42	6930	2 of Us
VE3IAY	*Rich	VE3	51	50	30	131	36	4716	2 of Us
VE7QO	*Wilf	VE7	87	5	21	113	37	4181	Corner Pocket
VE7NH	Doug	VE7	49	29	0	78	31	2418	
VE4XT	*Kelly	VE4	34	41	0	75	28	2100	
TG9/N5KO	*Trey	TG	150	0	0	150	42	6300	
ZF2VV	Fubar	ZF	75	62	6	143	39	5577	NCC
LW9EUJ	Ty	LU	77	11	0	88	36	3168	LUCG
LY1DS	Dan	LY	37	28	4	69	23	1587	
HP1AC	*Cam	HP	22	0	0	22	17	374	

*Denotes 150 W or less
**Denotes 5 W or less

■

Results, August 2001 NAQP SSB Contest

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As usual, the summer conditions of August did not produce record-setting scores, but many contesters had a great time participating in the August 2001 NAQP SSB Contest. N6RT piloted W6EEN's station to first with 232288 points. Unable to break the West Coast domination of first place in this contest, K4XS took second by 5k points over N6MJ. N6ED took fourth while operating K6NA. Once again finishing in the top ten, W5AO operated W5TM to round out the top five. K9PG driving K9XD's station finished sixth, while KB3AFT at K9RS finished seventh. K6IF nudged out N4ZZ for eighth place by less than 1000 points, while W6LD at W6YX finished out the top ten.

Many contesters had a great time participating in the August 2001 NAQP SSB Contest

The WJ1Z crew, operating from the northeast corner of the US, turned in the number one multi-two score. Following 27k points behind, NX5M took second, while W4WS took third.

Even though only three of its team members submitted logs, the Southern California Contest Club #1 team, with three top-five single-op finishers, took first place. The Society of Midwest Contesters #1 team took second, while the Tennessee Contest Group #1 team, with only 10k fewer points, took third. Once again both the SMC and TCG strongly supported the contest by each fielding six teams.

Single Op Breakdowns

Call	Score	QSOs	Mults	160	80	40	20	15	10	Team
W6EEN (N6RT)	232,288	1,037	224	21/7	67/31	171/49	267/54	280/50	231/53	SCCC #1
K4XS	226,218	1,019	222	15/10	81/30	172/50	469/59	207/50	75/23	FCG #1
N6MJ	221,098	974	227	16/5	69/29	135/46	318/58	241/54	195/35	SCCC #1
K6NA (N6ED)	177,800	889	200	30/7	77/27	99/37	196/54	354/48	133/27	SCCC #1
W5TM (W5AO)	171,292	916	187	47/22	104/36	142/37	488/51	127/33	8/8	TCG #1
K9XD (K9PG)	166,129	713	233	45/24	76/35	159/47	254/57	118/41	61/29	SMC #1
K9RS (KB3AFT)	155,610	741	210	36/21	97/39	168/48	274/52	126/32	40/18	SMC #1
K6IF	147,609	781	189	14/4	46/14	206/47	202/53	225/46	88/25	NCCC #1
N4ZZ	146,795	935	157	0/0	33/15	234/49	523/54	130/31	15/8	TCG #1
W6YX (W6LD)	143,068	761	188	3/2	44/14	123/44	162/48	234/44	195/36	NCCC #1

Multi-Two Breakdowns

Call	Score	QSOs	Mults	160	80	40	20	15	10
WJ1Z	339,680	1544	220	18/11	93/35	306/50	635/52	354/43	138/29
NX5M	312,873	1497	209	21/12	53/20	257/54	738/59	410/53	18/11
W4WS	136,566	843	162	8/4	59/26	241/48	428/53	83/24	24/7

Team Scores

1. Southern California Contest Club #1

W6EEN (N6RT)	232,288
N6MJ	221,098
K6NA (N6ED)	177,800
Total	631,186

2. Society of Midwest Contesters #1

K9XD (K9PG)	166,129
K9RS (KB3AFT)	155,610
N0AV	134,670
K9ZO (KB9UWU)	112,450
Total	568,859

3. Tennessee Contest Group #1

W5TM (W5AO)	171,292
N4ZZ	146,795
K4RO	91,980
W0ETC	86,720
KE4OAR	61,476
Total	558,263

4. Northern California Contest Club #1 (K6IF, NT6K, W6YX) 365,206
5. Florida Contest Group #1 (K4XS, N4AO, N4IG, W4SAA) 332,847
6. Southern California Contest Club #2 (K6AM, WN6K, N6AA, W6TK) 295,741
7. Society of Midwest Contesters #2 (KG9X, N9FH, K9PW) 222,106
8. Tennessee Contest Group #2 (NY4T, K4BEV, NQ4U, K0EJ) 173,576
9. Society of Midwest Contesters #4 (W9YK, W9YS, AA9RT, K9JLS, N9LF) 146,140
10. South East Contest Club #1 (K4OGG, K4BAI, W2JJC, W4NTI) 123,383
11. Society of Midwest Contesters #3 (K9WX, W9IU, WT9U) 113,088
12. Society of Midwest Contesters #5 (N9GUN, KX9DX, K9MI) 92,227
13. Northern California Contest Club #2 (WT6P, W6IXP, K6EP) 87,121
14. Order of Boiled Owls (KS2G, N2GA, K2LE) 45,014
15. Tennessee Contest Group #4 (AK4ST, KG4BIG, AF4QB) 42,947
16. South East Contest Club #2 (K5OT, K4WI, AA4LR) 35,529
17. CTRI Contest Group (K1JN, KB1LN, N1HRA) 29,124
18. Tennessee Contest Group #6 (K4BP, K4MA) 17,367
19. Tennessee Contest Group #5 (W4TDB, AC4ZD, N4KN, N4JN) 10,713
20. Society of Midwest Contesters #6 (N9KG, W9HL) 10,230

Single Operator Scores

Call	Score	QSOs	Mults	Section	Team
KM3T	134,865	729	185	MA	
NZ1U	51,745	395	131	CT	
NY1S	28,496	274	104	ME	
K2LE	25,676	262	98	VT	Order of Boiled Owls
AB1BX	21,432	282	76	RI	
K1JN	16,617	191	87	CT	CTRI Contest Group
N1HRA	11,055	165	67	RI	CTRI Contest Group
N1MD	2,584	68	38	CT	
WN1OTV	2,205	63	35	ME	
KB1LN	1,452	44	33	RI	CTRI Contest Group
KB1DOR	1,035	45	23	NH	
WU1T	104	13	8	MA	
KG2AU	76,172	548	139	NY	
KS2G	12,958	209	62	NY	Order of Boiled Owls
N2GA	6,380	110	58	NY	Order of Boiled Owls
K2DBK	2,997	81	37	NJ	
N3ZPL	2,059	71	29	NY	
N2LQQ	1,782	54	33	NY	
KV2M	1,323	49	27	NJ	
N3AD	134,966	754	179	PA	
K3WW	21,093	237	89	PA	
NY3C	19,565	215	91	DE	
N3SZW	432	27	16	MD	
K4XS	226,218	1,019	222	FL	FCG #1
N4ZZ	146,795	935	157	TN	TCG #1
K4RO	91,980	630	146	TN	TCG #1
NX9T	87,702	622	141	NC	
N4AO (WC4E)	66,825	495	135	FL	FCG #1
NY4T	62,530	481	130	TN	TCG #2
KE4OAR	61,476	436	141	TN	TCG #1
W2JJC	56,350	490	115	SC	SECC #1
K4BEV	44,604	378	118	TN	TCG #2

Call	Score	QSOs	Mults	Section	Team
NQ4U	44,530	365	122	TN	TCG #2
K4BAI	40,455	435	93	GA	SECC #1
KO7X	31,800	318	100	NC	
K4QPL	29,386	319	94	NC	
K5OT	27,120	240	113	GA	SECC #2
N4IG	23,688	252	94	FL	FCG #1
K0EJ	21,912	249	88	TN	TCG #2
K4OGG	20,250	225	90	GA	SECC #1
AK4ST	19,488	232	84	TN	TCG #4
W4SAA	16,116	204	79	FL	FCG #1
KK4TA	16,044	191	84	FL	FCG #2
AF4QB	15,407	217	71	TN	TCG #4
W4NZ	14,878	173	86	TN	
K4MA	12,078	183	66	NC	TCG #6
K1HG	11,932	157	76	FL	
K5EEE	10,074	146	69	FL	
W4LC	9,782	146	67	KY	TCG #3
KG4BIG	8,052	122	66	KY	TCG #4
KB4N	7,560	135	56	FL	
W4NTI	6,328	113	56	AL	SECC #1
N4KN	5,734	122	47	TN	TCG #5
K4BP	5,289	129	41	TN	TCG #6
KW4DA	5,247	99	53	NC	
NI4S	4,704	96	49	NC	
AA4LR	4,268	97	44	GA	SECC #2
K4WI	4,141	101	41	AL	SECC #2
AC4ZD	2,405	65	37	TN	TCG #5
KV4CN	2,301	59	39	NC	
N4JN	2,052	54	38	TN	TCG #5
K1SO	798	38	21	VA	
W4TDB	522	29	18	TN	TCG #5
KE4PIB	330	22	15	KY	
W5TM (W5AO)	171,292	916	187	OK	TCG #1
AB5SE	136,655	755	181	AR	
W5WMU	111,222	666	167	LA	
N5DO	110,376	657	168	TX	
K5TR (WM5R)	98,596	628	157	TX	
K5XR (W5ASP)	89,100	675	132	TX	
K5NA (KI5DR)	66,456	468	142	TX	AP-CTDXCC
AA5UN	62,848	491	128	TX	
NA4M	31,314	307	102	TX	
K5ER	17,955	189	95	LA	
W5RL	10,956	249	44	AR	
N6ZZ	9,180	153	60	NM	
NE0P	7,820	115	68	OK	
KC5NYO	6,552	117	56	OK	
KC5RPF	3,990	95	42	TX	
KB5ESE	714	34	21	TX	
AB5FS	304	19	16	OK	
W6EEN (N6RT)	232,288	1,037	224	CA	SCCC #1
N6MJ	221,098	974	227	CA	SCCC #1
K6NA (N6ED)	177,800	889	200	CA	SCCC #1
K6IF	147,609	781	189	CA	NCCC #1
W6YX (W6LD)	143,068	761	188	CA	NCCC #1
K6AM	122,925	745	165	CA	SCCC #2
W6TK	83,160	540	154	CA	SCCC #2
WN6K	82,474	602	137	CA	SCCC #2
NT6K	74,529	507	147	CA	NCCC #1
K6ZM (K6WG)	59,640	497	120	CA	
W6AFA	55,944	504	111	CA	
N6KI	52,245	405	129	CA	
WT6P	33,463	307	109	CA	NCCC #2
W6IXP	33,384	321	104	CA	NCCC #2
AD6WL	31,209	309	101	CA	
WA7BNM	25,048	248	101	CA	
KE6ZSN	23,550	314	75	CA	
K6EP	20,274	218	93	CA	NCCC #2
KA6MAL	19,600	245	80	CA	
WB6NFO	18,528	193	96	CA	
K6LRN	17,672	188	94	CA	
N6VH	14,706	171	86	CA	
KE6QR	10,296	143	72	CA	
K6EY	8,646	131	66	CA	
N6AA	7,182	114	63	CA	SCCC #2
K6ZCL	5,292	98	54	CA	
N6TW	4,368	91	48	CA	
W6MVW	551	29	19	CA	
KE6QKO	408	24	17	CA	
KG6DEX	378	21	18	CA	
AK6DV	238	17	14	CA	
K7RI (NW7DX)	113,646	806	141	WA	
W7ZR	102,638	703	146	AZ	
N7LOX	78,227	571	137	WA	
WG7Y	31,959	603	53	WY	
K5RC	29,326	341	86	NV	
AC7NK	8,840	136	65	WY	

Call	Score	QSOs	Mults	Section	Team
KI7Y	6,313	107	59	OR	
K7ZO	3,444	84	41	ID	
WB7QBO	3,225	75	43	NV	
KC7WDL	2,176	64	34	WA	
KC7WUE	121	11	11	WA	
W7JLF	1	1	1	WA	
K8CC (WX3M)	95,782	577	166	MI	
WA8WV	55,944	518	108	WV	
K8MR	35,708	316	113	OH	MRRC
NN1I	20,604	202	102	OH	
K8KHZ	7,353	129	57	MI	
W8KNO	6,480	120	54	OH	
KU8E	4,876	92	53	OH	
N8NX	2,730	70	39	MI	
K8IR	425	25	17	MI	
K9NW	280	20	14	OH	
K9XD (K9PG)	166,129	713	233	IL	SMC #1
K9RS (KB3AFT)	155,610	741	210	IL	SMC #1
K9ZO (KB9UWU)	112,450	650	173	IL	SMC #1
KG9X	101,990	658	155	IL	SMC #2
K9PW	86,420	596	145	IL	SMC #2
W9IU	66,234	498	133	IN	SMC #3
N2BJ	64,135	505	127	IL	
W9YK	62,910	466	135	IL	SMC #4
K9MI	50,560	395	128	IN	SMC #5
WT9U	36,110	314	115	IN	SMC #3
N9FH	33,696	312	108	WI	SMC #2
K9JLS	32,686	277	118	IL	SMC #4
W9YS	29,952	288	104	IL	SMC #4
KX9DX	21,829	263	83	IL	SMC #5
N9GUN	19,838	218	91	IL	SMC #5
AA9RT	15,840	198	80	IL	SMC #4
K9WX	10,744	158	68	IN	SMC #3
N9KO	6,270	114	55	IL	SMC #6
KG9JP	5,200	100	52	IL	
KB9LIE	4,950	99	50	WI	
N9LF	4,752	99	48	IN	SMC #4
K9KUP	4,752	99	48	IL	
W9HL	3,960	90	44	IL	SMC #6
AK9F	1,066	41	26	IL	
N0AV	134,670	670	201	IA	SMC #1
W0ETC	86,720	542	160	IA	TCG #1
W0ETT	82,344	564	146	CO	
KE0T	24,480	288	85	ND	
N0WY	15,762	222	71	NE	
K0DAT	14,440	190	76	MO	
KC0ADP	1,612	52	31	KS	
N0LZ	1,040	40	26	NE	
K0CO	988	38	26	CO	
VE2AWR	26,051	239	109	PQ	
VE3BUC	17,600	220	80	ON	
VE3KP	15,996	172	93	ON	
VE2QY	6,324	102	62	PQ	
VE7XB	4,469	109	41	BC	
VA2IC	2,730	70	39	PQ	
VE7FO	2,376	66	36	BC	
VE4MG	884	34	26	MB	
VE7RCF	416	26	16	BC	
XE1/AA6RX	51,590	385	134	XE	
LW3EX	7,150	130	55	DX	
PT2ND	57	13	9	DX	

Multi-Two Scores

Call	Score
WJ1Z (+ KK1L, K1LI, N2EA)	339,680
NX5M (+ N5XJ)	312,873
W4WS (N4VHK, N0KTY, KG4NEP, KG4MQD, WB4MSG, KU4BP)	136,566
K7UV (+ N7GTE)	50,076
KE0FT (+ KB9SKP)	29,526
WA5SOG (+ daughter)	13,688
W0BR (+ WB5PLJ, N0SZE)	8,064
N8KLX (+ N8RHV)	6,413
W2GSB (N2GA, KA2D)	2,464

Check Logs: DL2JRM, N6RO, PY5EG, W2RDS

Multiplier Availability

This table shows the maximum number of multipliers available on each band during the entire contest period.

Band	160	80	40	20	15	10
Multipliers	41	57	61	72	70	67

■

2002 North American Sprints Rules for CW, SSB and RTTY

Contest Managers:

CW—Boring Amateur Radio Club
cwsprint@ncjweb.com
SSB—Jim Stevens, K4MA
ssbsprint@ncjweb.com
RTTY—Wayne Matlock, K7WM
rttysprint@ncjweb.com

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. 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 2002 Contests:
SSB: 0000Z - 0400Z February 3, 2002
CW: 0000Z - 0400Z February 10, 2002
RTTY: 0000Z - 0400Z March 10, 2002

September/October 2002 Contests:
CW: 0000Z - 0400Z September 8, 2002
SSB: 0000Z - 0400Z September 15, 2002
RTTY: 0000Z - 0400Z, October 13, 2002

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 Rd
Boring, OR 97009
e-mail: **cwsprint@ncjweb.com**

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

Send RTTY logs to:
Wayne Matlock, K7WM
Rt 2, Box 102
Cibola, AZ 85328
e-mail: **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.

14. 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/cwsprintteam.html
SSB Team Registration:
www.ncjweb.com/ssbsprintteam.html
RTTY Team Registration:
www.ncjweb.com/rttysprintteam.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. ■

2002 North American QSO Parties (NAQP) Rules for CW, SSB and RTTY

Contest Managers:

CW—Bob Selbrede, K6ZZ
cwnaqp@ncjweb.com
SSB—Bruce Horn, WA7BNM
ssbnaqp@ncjweb.com
RTTY—Ron Stailey, K5DJ
rttynaqp@ncjweb.com

1. Eligibility: Any licensed radio amateur may enter.

2. Object: To work as many North American stations as possible during the contest period.

3. North American Station: Defined by the rules of the CQWW DX Contests with the addition of KH6.

4. Contest periods:

January Contests:

CW: second full weekend in January (1800Z January 12 to 0600Z January 13, 2002)

SSB: third full weekend in January (1800Z January 19 to 0600Z January 20, 2002)

July Contest:

RTTY: third full weekend in July (1800Z July 20 to 0600Z, July 21, 2002)

August Contests:

CW: first full weekend in August (1800Z August 3 to 0600Z August 4, 2002)

SSB: third full weekend in August (1800Z August 17 to 0600Z, August 18, 2002)

5. Entry Classification:

a) Single Operator:

i) One person performs all transmitting, receiving, spotting, and logging functions as well as equipment and antenna adjustments.

ii) Use of helpers or spotting nets is not permitted.

iii) Only one transmitted signal allowed at a time.

iv) May operate 10 out of the 12 hours of the contest. Off times must be at least 30 minutes in length.

b) Multi-Operator Two-Transmitter:

i) More than one person performs transmitting, receiving and logging functions, etc.

ii) A maximum of two transmitted signals at any given time, each on a different band. Both transmitters may work any and all stations.

iii) Shall keep a separate log for each transmitter.

iv) Each transmitter must have at least 10 minutes between band changes.

v) May operate for the entire 12 hours of the contest.

6. Output Power: Output power must be limited to 100 W for eligible entries. Use of external amplifiers capable of more than 100 W output is not allowed.

7. Mode: CW only in CW parties. SSB only in phone parties. RTTY only in RTTY parties.

8. Bands: 160, 80, 40, 20, 15, 10 meters only, except no 160 meters for the RTTY contest. You may work a station once per band. Suggested frequencies are 1815, 3535, 7035, 14035, 21035 and 28035 kHz (35 kHz up from band edge for Novice/Tech) on CW; and 1865, 3850, 7225, 14250, 21300, and 28500 kHz (28450 for Novice/Tech) on SSB.

9. Exchange: Operator name and station location (state, province or country) for North American stations; operator name only for non-North American stations. If the name sent is changed during the contest, as sometimes happens with multi-operator stations, the name used for each QSO must be clearly identified in the log.

10. Multipliers: US states (including KH6 and KL7), Canadian provinces/territories (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, PEI, Labrador, Yukon, NWT, and Nunavut) and other North American countries. Newfoundland counts as Labrador, and District of Columbia counts as Maryland. Non-North American countries, maritime mobiles and aeronautical mobiles do not count as multipliers, but may be worked for QSO credit.

11. Valid Contact: A valid contact consists of a complete, correctly copied and legibly logged two-way exchange between a North American station and any other station. Proper logging requires including the time in UTC and band for each contact. Regardless of the number of licensed call signs issued to a given operator, one and only one call sign shall be utilized during the contest by that operator.

12. Scoring: Multiply total valid contacts by the sum of the number of multipliers worked on each band.

13. Team Competition: You may wish to form a team with fellow NAQP participants. If so, your team must consist of 2 to 5 single operator stations whose individual scores are combined to produce a team score. Although clubs or other groups having more than 5 members may form multiple teams, there is no distance or meeting requirements for a team entry.

Teams must be registered with the appropriate contest manager prior to the start of the contest. Team registration information must be in written form (mail or e-mail) and must include the name, call sign of the operator, and the call sign of the station operated if the operator is a guest at a station other than his own (eg WF1B op at K1NG). Use the log submission addresses given below for team registration notification.

14. Log Submission: Entries must be postmarked no later than 30 days after the contest to be eligible for awards. All logs containing more than 200 QSOs, which were generated with a computer program, must be submitted on 3.5-inch floppy disk or via e-mail. If paper logs are submitted, please submit originals. Sample log sheets and a summary sheet may be obtained with an SASE to the appropriate contest manager. These forms are also available on the *NCJ* Web site.

A proper entry consists of: (1) a summary sheet showing the number of valid contacts and multipliers by band, total contacts and multipliers, total score, team name (if applicable), power output, name, call sign and address of the operator, station call sign and exchange (name and location) sent during the contest; and (2) a complete legible log of all contacts.

Logs and summary sheets submitted on floppy disk or via e-mail must be in ASCII text format.

Name your files with your call sign (ie yourcall.SUM and yourcall.LOG). Please do not send binary files produced by a contest logging program (eg yourcall.BIN, yourcall.QDF, etc). Use of the Cabrillo log format for electronic log submissions is encouraged and may be required in the future.

Send CW logs to:
Bob Selbrede, K6ZZ
6200 Natoma Ave
Mojave, CA 93501
e-mail: **cwnaqp@ncjweb.com**

Send SSB logs to:
Bruce Horn, WA7BNM
4225 Farmdale Ave
Studio City, CA 91604
e-mail: **ssbnaqp@ncjweb.com**

Send RTTY logs to:
Ron Stailey, K5DJ
504 Dove Haven Dr
Round Rock, TX 78664-5926
e-mail: **rttynaqp@ncjweb.com**

15. Disqualifications: Entries with

score reductions greater than 5 percent may be disqualified. Any entry may be disqualified for illegibility, illegal or unethical operation. Such disqualification is at the discretion of the contest manager.

16. Awards: Plaques will be awarded for the high score in each of the categories given below. If a plaque is not sponsored, the winner may purchase it. Certificates of merit will be awarded to the highest scoring entrant with at least 200 QSOs from each state, province, or North American country.

Certificates of merit will also be awarded to the overall second and third place finishers in the multi-operator category for each mode.

NAQP Plaques and Sponsors

Mode	*Category*	*Sponsor*
CW	Single Op/North America	Florida Contest Group
CW	Multi-Op/North America	Texas DX Society
SSB	Single Op/North America	South East Contest Club
SSB	Multi-Op/North America	Tennessee Contest Group
Combined CW/SSB	Single Op/North America	Southern California Contest Club
RTTY	Single Op/North America	Glenn Vinson, W6OTC
RTTY	Single Op/DX	Will Angenent, K6NDV
RTTY	Multi-Op/North America	*RTTY* by WF1B
RTTY	Multi-Op/DX	*Writelog* for *Windows*
RTTY	Best name in North America	Eddie Schneider, W6/G0AZT

(The name must be rated PG and contain no more than 10 letters.) ■

WRTC USA Youth Fund

The Boring (Oregon) Amateur Radio Club is happy to announce the establishment of a tax-deductible fund intended to help defray the travel costs of young USA competitors to the WRTC events. This fund is being administered by the ARRL Foundation.

To be eligible, an applicant must be a US citizen, no more than 25 years old at the time of the WRTC event, and must be selected as a competitor.

Up to $1000 of the actual travel expenses will be reimbursed per WRTC event, depending on fund availability. If funds are left over, they will be applied to the next WRTC event.

The Boring ARC will verify eligibility and request fund disbursements. You can send your request to the club's mailing address: 15125 SE Bartell Road, Boring, OR 97009. Include a copy of your receipts.

To contribute to the fund, send your check to the ARRL Foundation Inc, 225 Main Street, Newington, CT 06111. Make your check out to "The ARRL Foundation" and include a note indicating the name of the fund that you are contributing to (WRTC USA Youth Fund, in this case). All contributions of $25 USD or more will be recognized in *QST*.

For additional information about the ARRL foundation, visit **www.arrl.org/arrlf**. The Boring ARC Web page is at **jzap.com/k7rat**.

73, Tree, N6TR
n6tr@contesting.com

United States Postal Service

Statement of Ownership, Management, and Circulation

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PS Form **3526**, October 1999 *(See Instructions on Reverse)*

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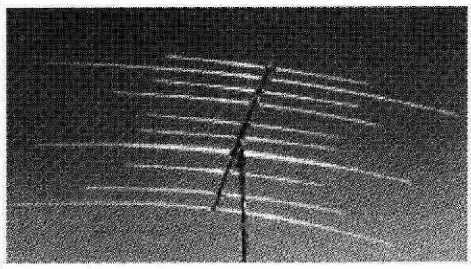

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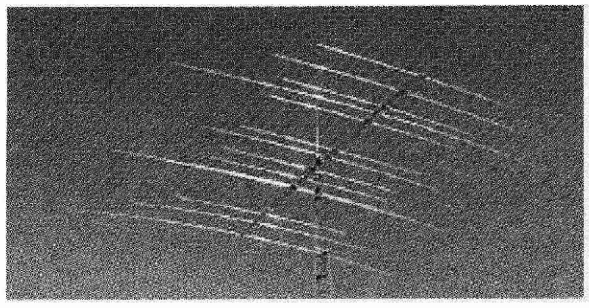

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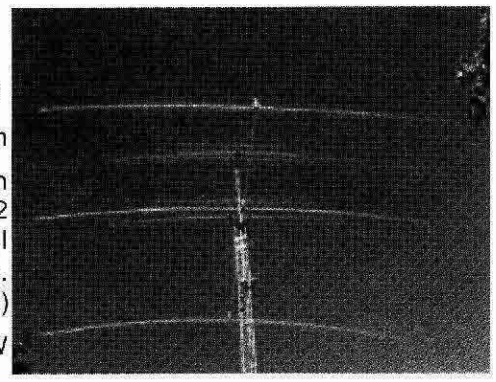

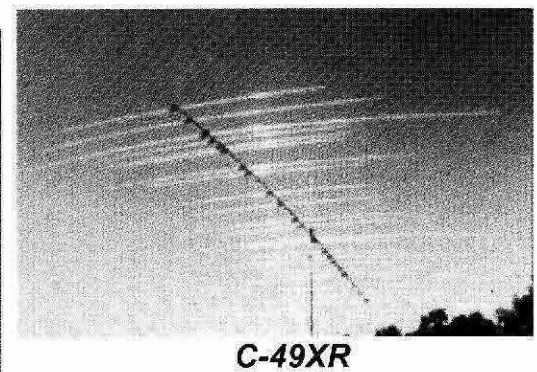

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12M4DX, 4 Element 12m	$379
15M4DX, 4 Element 15m	$419
17M3DX, 3 Element 17m	$379
20M4DX, 4 Element 20m	$499

More M2 models in stock–please call

MFJ ANTENNAS

259B, Antenna Analyzer	$219
269, Antenna Analyzer	$299
941E, 300W Antenna Tuner	$109
945E, 300W Antenna Tuner	$99
949E, 300W Antenna Tuner	$139
969, 300W Antenna Tuner	$169
986, 3kW Antenna Tuner	$289
989C, 3 kW Antenna Tuner	$309
1796, 40/20/15/10/6/2m Vert.	$189
1798, 80–2m Vertical	$249

Big MFJ inventory–please call

LAKEVIEW HAMSTICKS

9106 ... 6m	9115 ... 15m	9130 ... 30m
9110 ... 10m	9117 ... 17m	9140 ... 40m
9112 ... 12m	9120 ... 20m	9175 ... 75m

All handle 600W, 7' approximate length, 2:1 typical VSWR ... $24.95

HUSTLER ANTENNAS

4BTV/5BTV/6BTV	$149/189/209
G6-270R, 2m/70cm Vertical	$169
G6-144B/G7-144B	$129/179

Hustler Resonators in stock–call

FORCE 12–MULTIBAND

C3	10/12/15/17/20m, 7 el	$599
C3E	10/12/15/17/20m, 8 el	$649
C3S	10/12/15/17/20m, 6 el	$539
C3SS	10/12/15/17/20m, 6 el	$559
C4	10/12/15/17/20/40m, 8 el	$759
C4S	10/12/15/17/20/40m, 7 el	$679
C4SXL	10/12/15/17/20/40m, 8 el	$979
C4XL	10/12/15/17/20/40m, 9 el	$1119
C19XR	10/15/20m, 11 el	$959
C31XR	10/15/20m, 14 el	$1299

Please call for more Force 12 items

ROHN TOWER

25G/45G/55G	$89/189/239
AS25G/AS455G	$39/89
GA25GD/45/55	$68/89/115
GAR30/GAS604	$35/24
SB25G/45/55	$39/89/109
TB3/TB4	$85/99
HBX32/HBX40	$349/439
HBX48/HBX56	$589/699
HDBX40/HDBX48	$549/699
BXB5/6	$39/49

Please call for more Rohn prices

GLEN MARTIN ENGINEERING

Hazer Elevators for 25G

H2, Aluminum Hazer, 12 sq ft	$359
H3, Aluminum Hazer, 8 sq ft	$269
H4, HD Steel Hazer, 16 sq ft	$339

Aluminum Roof Towers

RT424, 4 Foot, 6 sq ft	$159
RT832, 8 Foot, 8 sq ft	$229
RT936, 9 Foot, 18 sq ft	$389
RT1832, 17 Foot, 12 sq ft	$499

Please call for Glen Martin info

COAX CABLE

RG-213/U, (#8267 Equiv.)	$.36/ft
RG-8X, Mini RG-8 Foam	$.19/ft
RG-213/U Jumpers	Please Call
RG-8X Jumpers	Please Call

Please call for more coax/connectors

TIMES MICROWAVE LMR® COAX

LMR-400	$.59/ft
LMR-400 Ultraflex	$.89/ft
LMR-600	$1.19/ft
LMR600 Ultraflex	$1.95/ft

ANTENNA ROTATORS

M2 OR-2800PDC	$1099
Yaesu G-450A	$249
Yaesu G-800SA/DXA	$329/409
Yaesu G-1000DXA	$499
Yaesu G-2800SDX	$1089
Yaesu G-550/G-5500	$299/599

ROTATOR CABLE

R61 (#20)/R62 (#18)	$.28/32
R81/R82	$.25/.39
R83/R84	$.52/.85

TRYLON "TITAN" TOWERS

SELF-SUPPORTING STEEL TOWERS

T200-64	64', 15 square feet	$1099
T200-72	72', 15 square feet	$1299
T200-80	80', 15 square feet	$1499
T200-88	88', 15 square feet	$1769
T200-96	96', 15 square feet	$2049
T300-88	88', 22 square feet	$1989
T400-80	80', 34 square feet	$1939
T500-72	72', 45 square feet	$1879
T600-64	64', 60 square feet	$1799

Many more Trylon towers in stock!

US TOWER

MA40/MA550	$849/1399
MA770/MA850	$2359/3649
TMM433SS/HD	$1139/1379
TMM541SS	$1499
TX438/TX455	$979/1579
TX472/TX489	$2459/4579
HDX538/HDX555	$1269/2269
HDX572MDPL	$5899

Please call for help selecting a US Tower for your needs. Shipped factory direct to save you money!

UNIVERSAL ALUMINUM TOWERS

4-40'/50'/60'	$519/739/1049
7-50'/60'/70'	$939/1369/1789
9-40'/50'/60'	$729/1049/1469
12-30'/40'	$559/869
15-40'/50'	$969/1399
23-30'/40'	$869/1289
35-30'/40'	$979/1509

Bold in part number shows wind-load capacity. Please call for more Universal models. All are shipped factory direct to save you money!

TOWER HARDWARE

3/8"EE / EJ Turnbuckle	$11/12
1/2"x9"EE / EJ Turnbuckle	$16/17
1/2"x12"EE / EJ Turnbuckle	$18/19
3/16" / 1/4" Preformed Grips	$5/6

Please call for more hardware items

HIGH CARBON STEEL MASTS

5 FT x .12" / 5 FT x .18"	$35/59
11 FT x .12" / 10 FT x .18"	$80/125
15 FT x .12" / 16 FT x .18"	$105/185
17 FT x .25"	$267
23 FT x .12" / 21 FT x .18"	$155/235

PHILLYSTRAN GUY CABLE

HPTG1200I	$.45/ft
HPTG2100I	$.59/ft
PLP2738 Big Grip (2100)	$6.00
HPTG4000I	$.89/ft
PLP2739 Big Grip (4000)	$8.50
HPTG6700I	$1.29/ft
PLP2755 Big Grip (6700)	$12.00
HPTG11200	$1.69/ft
PLP2558 Big Grip (11200)	$18.00

Please call for more info or help selecting the Phillystran size you need.

WEEKDAY HOURS:
9 AM–5 PM CST

SATURDAY HOURS:
9 AM–12 NOON CST

CREDIT CARDS:
M/C, VISA, DISCOVER

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HF/6M • 100W • All Mode • Enhanced Rx • Dual Watch • 32 Bit IF-DSP • Independently Selectable IF Filter Shapes For SSB & CW • Variable Level Noise Blanker • Auto & Manual Notch Filter • Twin Passband Tuning • Improved 5" TFT Color Display • CW Memory Keyer • VOX • Auto Antenna Tuner • SSB/CW Synchronous Tuning • External Control For Voice Memory & Memory Keyer • Adjustable RIT Clear • 1/4 Tuning Steps In Digital Mode

IC-756PROII Features
- Improved Third Order Intercept Point
- Improved Sensitivity Without Preamp
- Selectable IF Filter Shape
- Improved Noise Reduction
- Adjustable Level Noise Blanker
- Improved Bandscope Noise Floor
- Improved Audio Fidelity
- Enhanced Backlighting - better for dark rooms
- Enhanced 5" TFT Color Display

Digital User Features
- Digital & Voice modes store filter settings independently
- Compression no longer allowed in Digital Modes
- 1/4 Tuning Steps in Digital Mode
- Improved low-level volume control

Contester Features
- Fast, adjustable RIT clear
- SSB/CW "synchronous tuning"
- External control of Digital Voice Recorder Playback & Memory Keyer, selectable even while displaying the bandscope

The 'PROII has the familiar look and feel of the '756PRO - but with the improvements and features that you requested most!

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