



**Publication of the
Northern California
Contest Club**



Issue 503

April 2014

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Guests are always welcome at the NCCC!
Please join us.

Monday, April 14th, 2014

Time:

6:00pm Schmooz, 6:30pm Dinner, 7:00pm Program

Election/Non-standard Propagation Meeting

Location: Sneha Restaurant, 1214 Apollo Way, Suite 404 B, Sunnyvale, CA 94085

Indian Buffet Dinner: \$14.15 (not including drinks) (see <http://www.sneharestaurant.com/20922.html> for description of available food.

RSVP Optional



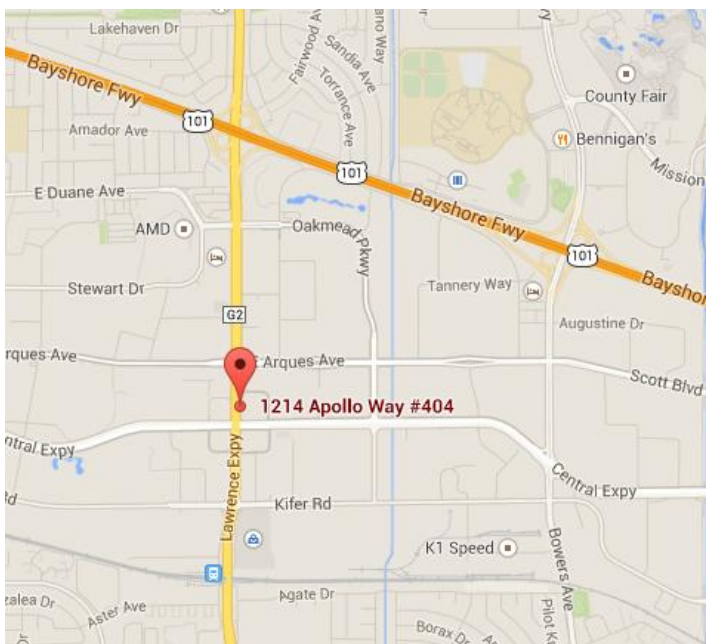
President's Report for April.

Right now it's pouring rain up here in Penngrove. The good news is that it's washing the dirt off the power lines. On some bands the noise level is down below S2 from maybe S7 at the height of the drought. The bad news is my out-building/workshop leaks like a sieve and I have spent some time this morning placing buckets in strategic spots to protect my tools.



And now—just now—I'm hearing distant thunder so it's time to retract the elements on my trusty Step-pIR and cross my fingers.

This is my last column as NCCC President. When I ran for the office last year my only real campaign promise was that I would try to leave our club in at least as good a shape as I found it—and I think we've done it.



Continued on page 3



Northern California Contest Club

Excellence In Amateur Radio Contesting

Officers:

President	Alan Eshleman	K6SRZ	doctore@well.com	Penngrove CA
Vice President /Contest Chair	Alan Maenchen	AD6E	ad6e@arrl.net	San Jose, CA
Secretary/Treasurer	Tom Epperly	NS6T	tepperly@gmail.com	Livermore CA
Past President	Dean Wood	N6DE	cqden6de@gmail.com	Sunnyvale CA
Director	Fred Jensen	K6DGW	k6dgw@foothill.net	Auburn CA
Director	Steve Dyer	W1SRD	w1srd@arrl.net	Redwood City CA
Director	Jim Brown	K9YC	k9yc@arrl.net	Santa Cruz CA

Volunteers:

New Member Mentor	Al Rendon	WT6K	wt6k@arrl.net
Charter Member	Rusty Epps	W6OAT	w6oat@sbcglobal.net
Awards Chairs	Joanna Dilley	K6YL	joanna.k6yl@gmail.com
	Rebar Rebarchik	N6DB	rebar@hamilton.com
CQP Chair	Chris Tate	N6WM	ctate@ewnetinc.com
CQP Certificates	Andy Faber	AE6Y	ae6y@arrl.net
K6ZM QSL Manager	George Daughters	K6GT	k6gt@arrl.net
K6CQP,N6CQP,W6CQP QSL Mgr	Ed Muns	W0YK	w0yk@arrl.net
NCCC Email reflector Admin	Phil Verinsky	W6PK	kb-w6tqg@verinsky.com
Webmaster	John Miller	K6MM	k6mm@arrl.net
JUG Editor	Ian Parker	W6TCP	w6tcpian@gmail.com

Thursday Night Contesting:

NCCC—Sprint	Ken Keeler	N6RO	kenkeeler@jazznut.com
NS Ladder	Bill Haddon	N6ZFO	haddon.bill@gmail.com
Slow NS (SNS)	Chris Tate	N6WM	ctate@ewnetinc.com

NCCC Net

Thursday 8 PM

Freq: 3.610 +/-

NCCC

Monthly meetings take place on the second Monday of each month !

NCCC Membership Information

If you wish to join NCCC, you must fill out an [application for membership](#), which will be read and voted upon at the next monthly meeting. ([PDF application form](#))

To join, you must reside within [club territory](#) which is defined as the maximum of:

- Northern California, anything north of the Tehachapi's up to the Oregon border, and
- A part of north-western Nevada (anything within our ARRL 175-mile radius circle centered at 10 miles North of Auburn on Highway 49).

For the next April-to-April club year we have candidates for all the club offices:

President—Rick Karlquist, N6RK

VP/CC ---Byron Servies, N6NUL

Sec. Treasurer—Tom Carney, K6EU

Traditionally, the new President picks his or her Board of Directors, while the outgoing president stays on as a BOD member. Fortunately, several other members have volunteered to be on the BOD. You'll learn their names after Rick makes his selection.

Being president of NCCC can be a slightly unsettling experience. On the one hand, you're the executive with whom the buck (sort of) stops. On the other hand, there is a group of longtime NCCC members who have the knowledge and wherewithal to get things done—to see to it that awards get awarded, that documents get filed, that there is a meeting every month with, we hope, an entertaining and informative program (broadcast as far as Japan via WebX)—and for all your executive powers, all you can do is step back and say “thank you”.

And speaking of programs, it seems unlikely that we'll ever satisfy the “no DXpedition” members. It's true we're a contest club, but it's also true that several of our members are also DXpeditioners and I for one find their presentations fascinating.

Going on a DXpedition has a lot to offer the contester. A DXpedition is like a contest where you become the only multiplier. Logging QSOs at 200 per hour or more definitely sharpens your skills. I hope more of you get the chance (perhaps for a WPX, a contest that NCCC is well positioned to win and for which members can travel anywhere on the planet and still contribute their scores) to do an expedition.

NCCC has a lot to be proud of:

- We remain the unlimited club champions for the RTTY Roundup.
- Dean Wood's NAQP Interclub Challenge has increased member participation in these short, fun, and very accessible contests with their 100 watt power limits.
- N6TV was the overall winner of the 2013 CW Sweepstakes.
- The NCCC sponsors CQP, which remains one of the most popular state QSO parties and which draws more DX participation each year.
- NCCC sponsors the Thursday night sprints and NS ladder competition (<http://www.ncccsprint.com/>).
- NCCC will again be sponsoring Contest Academy at this year's Visalia International DX Convention.
- And while they are not specifically NCCC events, the CWOPs monthly tests and CW Academy (www.cwops.org/cwacademy/html) are partly the result of Bob Brownstein's (K6RB's) efforts on their behalf.

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If there were no NCCC, there'd be a big hole in the fabric of radiosport. There's much work remaining to be done, but I'll leave that discussion to another time. For now, please give the new officers and Board of Directors your support and, if you can, join in on a club project or two.

73 & KB,

Alan/K6SRZ



Alan K6SRZ presenting the award for winning the NAQP Interclub Challenge. Photo by Bob Wilson, N6TV



2014 NCCC Awards Dinner

Photos from the 2014 NCCC Awards Dinner—All photos by Bob N6TV



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K5RC, W6OAT, K7AFO, K6GFJ, K6KO, K6TA



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NU6S, W6MSF



K6XX, KK6GMH (no she didn't drink it)



Tied House Brewmaster W6RN



N7MH, K6UFO, AJ6V



K6EU, AD6E



W6TCP, N6WM



K9YC with large clamp-on ferrites (from NCCC group buy)



AD6E, WC6H



K7GK, WB6ETY, N6DB



© 2014 N6TV

Tied House Patio



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NCCC President K6SRZ (with mic.)



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AA6XV, NS6T, N6DE, KX7M



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W6RGG, W0YK, K6UFO



CQP Chairman N6WM

RTTY Contesting

July/August 2014 NCJ

Ed Muns W0YK

The Art of RTTY Sprinting

This column is being written a couple days after the March 2014 NA RTTY Sprint. A number of experienced RTTY Sprinters remarked about the widely different operating practices across the participants during those four hours. The Sprint regulars have evolved an unofficial way of operating among themselves that they now perceive as the defacto standard. Deviations seem to increase confusion and detract from an otherwise enjoyable experience.

RTTY operators new to Sprint contesting have only the rules to go by. They will not know the commonly accepted practices used by the long-time Sprint operators. While there have been several excellent articles written over the years about “tips” and “secrets” of Sprinting, most newcomers will not have seen them. The goal of this month’s column is to discuss the art of operating the RTTY Sprint and demystify this fun event.

Sprint QSY Rule

The Sprint QSY rule is at the core of the misunderstanding between crotchety old Sprinters and innocent, energetic operators venturing into this contesting niche. This unique QSY rule distinguishes Sprint from other contests. Specific practices that come into question include the order in which the required exchange elements are transmitted as well as how the QSO is acknowledged and completed. But, first, let’s discuss different ways to satisfy the QSY rule itself.

To most readers of the Sprint rules, the QSY rule implies a specific way of operation that goes like this. K6UFO finds a clear frequency and calls CQ. N0TA, N4DW and K5NZ create a pileup, each trying to get Mork’s attention. K6UFO works N4DW, then leaves the frequency and Dave works a station that calls him. After working that station Dave leaves the frequency. So, the initial belief is that the pattern of QSOs during Sprint is always series of these “couplets” where you find a CQing station, work them, then work one more station on that frequency before you QSY yourself.

This is certainly one way to work Sprint and it seems to be the most efficient at first glance. But the rules allow stations to only answer CQs (never CQing themselves) just as they would by searching and pouncing in any other contest. Alternatively, stations can exclusively CQ if they choose, as long as they QSY to another clear frequency at least 5 kHz away after each QSO. In fact, the CW Sprint was won one year by a station that only CQ’d for all four hours!

Any of these three operating practices, and any combinations of them, are completely valid in Sprint. The only constraint is that you must QSY after a QSO in which another station called you. You must QSY at least 1 kHz before calling another station, or at least 5 kHz before calling CQ. (If you QSY 1 kHz to work a CQing station, you may stay on that frequency to work one more station, or call CQ there until you can work a second station.)

Experienced Sprinters will deploy all of these scenarios throughout the Sprint, depending on conditions and each particular QSO situation. For example, suppose a pileup descends on the completion of a Sprint QSO but the station that “should” have stayed for a second QSO on that frequency has QSY’d as well.

RTTY Contesting—continued

In the silence following the pileup, one of the callers may simply switch gears and call another station that was also in the pileup. The station that broke the silence and called can stay on frequency for another QSO. The other station must QSY since he was the called station. Other variations are possible as long as the basic QSY rule is observed.

Sprint Exchange

As in other contests, there are several pieces of information that are required to be sent by each station in a Sprint QSO. And, RST, e.g., 599, is not one of them! Non-required information like this only slows down the contest for everyone. The Sprint rules explicitly state:

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

Yet, veteran Sprint operators are very precise about what order they send their exchange information. Moreover, they do it in exactly two very different ways at different times during each QSO:

K6LL: NA K6LL K6LL CQ
AA3B: AA3B AA3B
K6LL: AA3B K6LL 132 DAVE AZ
AA3B: K6LL 136 BUD PA AA3B
K6LL: TU
(K6LL must now QSY)
K0AD: K0AD K0AD
AA3B: K0AD AA3B 137 BUD PA
K0AD : AA3B 119 AL MN K0AD
AA3B: R
(AA3B must now QSY)
K0AD: NA K0AD K0AD CQ
N6RO: N6RO N6RO
etc...

Is there a reason these stations are so uniform in their QSO exchanges? And, why have they settled on precisely these practices when the rules allow the exchange information to be sent in any order? Specifically, why did K6LL send his callsign in the middle of his exchange transmission, while AA3B sent his callsign at the very end?

An early Sprinter recognized that if the station leaving the frequency (after the QSO) puts their callsign early in the exchange, that would alert anyone listening that they would be leaving the frequency when this QSO completes, i.e., don't call them! Symmetrically, the other station in the QSO is allowed to stay on the frequency for one more QSO and this is communicated by putting his callsign at the end of the exchange. This latter practice works well for a new station just tuning across the end of the QSO because they instantly know

RTTY Contesting—continued

they can call that callsign as soon as they hear a 'TU' or 'R' from the first station in the QSO.

Radio contesting by its nature is a highly cooperative sport. Competitors all benefit greatly by working together closely to maximize QSO rate and minimize errors. The result is fast, reliable communication. It is fun to operate the amateur radio station at peak performance. The precise order of exchange elements, depending on whether the station is leaving or staying on the frequency, has evolved to a defacto standard as Sprinters cooperate to make Sprint QSOs as efficient as possible.

Why are the serial number, name and QTH always sent in that order? This accepted norm gives the receiving operator an advantage by knowing what kind of information to expect at each instant. This practice reduces the chance that an exchange element will be missed and a repeat required which will slow down and disadvantage both operators.

Ending the RTTY Sprint QSO

How one handles the completion of a RTTY Sprint QSO can effect a smooth transition into the next QSO or set off a spectacle of confused chaos. Secondly, how one interprets and responds to the QSO completion can similarly contribute to an effective transition or bedlam. Remember, this is not about the rules so much as it is about the long-standing conventions that have developed over the lifetime of Sprint contesting.

First, refer back to the QSO sequence earlier in this article. The last two transmissions in a given QSO are, by evolved convention:

AA3B: K6LL 136 BUD PA AA3B
K6LL: TU

Bud has sent his exchange with his callsign at the end, signaling that AA3B will be staying on the frequency for another QSO. K6LL signifies his acknowledgement of the QSO with a simple 'TU' and leaves the frequency.

Second, during these last two transmissions, other stations on frequency prepare to send their callsign once or twice as soon as they copy the final 'TU'. Thus, everyone knows what to expect, what they can do and when they can do it. Simple, smooth, peaceful, yet a secret practice to the unknowing participant.

The final transmission in the QSO, the 'TU' or 'R' or 'QSL' or equivalent, is very critical. First, it is critical that it be sent so that the other station knows his exchange information was received and no repeats are needed. Second, it is critical that this acknowledgement message be exactly this short with no additional information. Any other information almost always triggers subsequent ineffective transmissions on the frequency rather than a smooth transition into the next QSO. And, if the unnecessary information is substantial enough, some stations will tune away to find a quicker QSO.

Tempting as it is, don't send your callsign or the other station's callsign as this may negate the callsign (AA3B in the example) that identifies the station standing by for the following QSO. Don't send 'QSY' as this just takes additional time and adds no useful information. As polite as it may seem to wish the other station good luck and 73, know that contesting politeness is conveying the minimal information needed to reliably accomplish the contest QSO. Contesters socialize outside the contest, such as regaling each other with excuses about why their score isn't higher!

RTTY Contesting—continued

Stored Messages

Here are the basic RTTY Sprint messages that allow one to operate within the secret conventions of Sprint contesting:

CQ:	NA N0NI N0NI CQ
Your Call:	N0NI
Run Exchange:	<his call> N0NI <serial number> TONI IA
S&P Exchange:	<his call> <serial number> TONI IA N0NI
Run QSL:	TU

Other message attributes are the same as for other RTTY contests. Depending on the specific logging software used, a control parameter may be needed at the beginning of each message to initiate PTT and transmission as well as at the end to drop PTT and cease transmission. Always start a message with a CR/LF so that your message appears on a new line on the screen of the receiving station. And, end each message with a space character to separate any follow-on noise-generated characters from your message. Optionally, you may include a message parameter for clearing RIT, e.g., in the CQ and Run QSL messages, or for logging the QSO, e.g, in the S&P Exchange message.

Note that the 'Your Call' message only has one instance of the callsign. This is an example of modular messaging where one message can be customized dynamically into 1, 2 or 3 instances of your callsign. In this particular message you may choose not to include the CR/LF so that multiple instances of your callsign all appear on the same line separated by space characters.

Additional messages are needed for efficiently repeating exchange information when something is missed:

Serial Number:	NR?
Name:	NAME?
QTH:	QTH?
My Serial Number:	<serial number>
My Name:	TONI
My QTH:	IA
General Repeat:	AGN

Again, each of these messages contains only one instance of the information so that the message key can be tapped more than once to create the number of instances appropriate to the given QSO situation.

While seldom used, these messages are extremely important when required. Without them, the operator must send the entire exchange again which is unnecessary, time-consuming and often results in the needed information being missed a second time. In conditions of QRM, QRN and QSB, communication is much more reliable if only the information requested is sent an appropriate number of repeats called for by conditions.

RTTY Contesting—continued

SO2R and SO2V

Experienced RTTY Sprint operators often use two radios to interleave QSOs on two different bands. When executed effectively, this can increase QSO rate by paralleling QSOs, just as in any other contest. As expected, though, SO2R in Sprint is a bit more challenging just as Sprint itself is more challenging than most other contests.

Similarly, SO2V can increase QSO rate though not as much as SO2R. With SO2V, the operator must have a second full receiver in their radio which they can use to monitor a second frequency on the same band. With efficient coordination between the logging program and radio, the operator can instantly move their transmit frequency between the two received frequencies to more quickly transition between QSOs. It is also possible, though very difficult, to interleave QSOs on the same band with this method. Most people should not try this!

A third variant on these advanced techniques, is the use of VFO-B to instantly QSY between two frequencies on the same band while satisfying the 1 or 5 kHz QSY rule. The key advantage of using both VFOs is an easier way to manage the QSY distance. Depending on the radio's features and station configuration, the two VFOs may even be on different bands.

More details about these more advanced practices will be saved for a future discussion.

Other Tips

How many times should one send their callsign in response to another station's CQ or completion of a prior QSO? Well, as W6SX discussed in the Nov/Dec 2013 NCJ RTTY Contesting column, "it depends". Just as in other contests and other modes, one needs to judge the chance that one instance of a callsign transmission will be clearly received by the other station. If there is QRM, a weak signal, other stations calling, the prior station off-frequency, etc., then a second or even third instance of one's callsign may be appropriate. Usually, though, RTTY contest participants send their callsign too many times.

A related tip is to always send your callsign only once and then listen briefly to determine if a repeat might be useful. This allows you to dynamically determine how many times to send your callsign, as well as to time your transmissions to coincide with quieter lulls on the frequency. In general, the RTTY mode will more often require multiple instances of your callsign than the CW or SSB modes. Machine decoding, especially when dealing with a non-zero-beat signal, is still not as good and quick as the human brain.

When a station operates outside these unofficial Sprint conventions, rejoice! A new participant may have wandered into the RTTY Sprint and this offers the opportunity to add another QSO or two to our logs. There may be a decrease in our QSO rate when working a station that is unfamiliar with conventional Sprint practices. But, this is a sound investment the RTTY Sprint's future. We can increase the probability that they will return when they feel welcome and have a good time. Complaining about these situations will only be "preaching to the choir" since most of these operators will not be subscribed to the forums where we complain! And, if they do hear our complaints, it will only be off-putting.

RTTY Contesting—continued

Are savvy RTTY Sprinters just born that way? Hardly! Every one of them was a newcomer, and then they practiced a lot! There are 6 Sprints each year, two for each mode, about 6 months apart. So, there are 6 opportunities to practice Sprinting and 2 opportunities to hone our RTTY Sprint skills. But, wait! Every Thursday evening, NCCC hosts 30-minute Sprint practices in both the CW and RTTY modes. (Prior to each of the two SSB Sprints, there is also a SSB Sprint practice.) Thus, for a 30-minute-per-week investment, one can build their RTTY Sprint skill while having a blast with the world's most unique and fun contest.

There you go. The art of RTTY Sprinting. I look forward to working a growing number of callsigns every Thursday in the NCCC Sprint practices and in the next official RTTY Sprint on 12 October 2014.



2014 NCCC Awards Dinner

This newsletter only contains a very small collection of the photos Bob took from the 2014 NCCC Awards Dinner. The full album can be found on line here:-

<https://picasaweb.google.com/rawilson/2014NCCCAwardsDinner02>

John, K6AUC SK

John Larson K6AUC became a Silent Key on March 21, 2013 in Fairfield, CA. John, K6AUC was one of the first members of NCCC, having joined the club back in the early 1970s. He often operated multi-op with his close friend Cliff, K6HIH (SK). John had been in poor health for the last few years and was able to attend only a few NCCC meetings. Most recently, John made a very generous cash gift to NCCC to endow one of the CQP plaques.

RIP, John. We will miss you.

Rusty, W6OAT



Contest Calendar—April page 1

QRP Fox Hunt	0100Z-0230Z, Apr 2
CWops Mini-CWT Test	1300Z-1400Z, Apr 2 and 1900Z-2000Z, Apr 2 and 0300Z-0400Z, Apr 3
SARL 80m QSO Party	1700Z-2000Z, Apr 3
NRAU 10m Activity Contest	1800Z-1900Z, Apr 3 (CW) and 1900Z-2000Z, Apr 3 (SSB) and 2000Z-2100Z, Apr 3 (FM) and 2100Z-2200Z, Apr 3 (Dig)
QRP Fox Hunt	0100Z-0230Z, Apr 4
NCCC RTTY Sprint	0200Z-0230Z, Apr 4
NCCC Sprint	0230Z-0300Z, Apr 4
15-Meter SSTV Dash Contest	0000Z, Apr 5 to 2359Z, Apr 6
LZ Open 40m Sprint Contest	0400Z-0800Z, Apr 5
QRP ARCI Spring QSO Party	1200Z, Apr 5 to 2359Z, Apr 6
+ PODXS 070 Club PSK 31 Flavors Contest	1200-1800 local, Apr 5
Texas State Parks on the Air	1400Z, Apr 5 to 0159Z, Apr 6
Mississippi QSO Party	1400Z, Apr 5 to 0200Z, Apr 6
Missouri QSO Party	1400Z, Apr 5 to 0200Z, Apr 6 and 1400Z-2000Z, Apr 6
SP DX Contest	1500Z, Apr 5 to 1500Z, Apr 6
EA RTTY Contest	1600Z, Apr 5 to 1600Z, Apr 6
Montana QSO Party	1800Z, Apr 5 to 0559Z, Apr 6
RSGB RoPoCo SSB	1900Z-2030Z, Apr 6
RSGB 80m Club Championship, CW	1900Z-2030Z, Apr 7
144 MHz Spring Sprint	1900 local - 2300 local, Apr 7
ARS Spartan Sprint	0100Z-0300Z, Apr 8
NAQCC Straight Key/Bug Sprint	0030Z-0230Z, Apr 9
CWops Mini-CWT Test	1300Z-1400Z, Apr 9 and 1900Z-2000Z, Apr 9 and 0300Z-0400Z, Apr 10
NCCC RTTY Sprint	0200Z-0230Z, Apr 11
NCCC Sprint Ladder	0230Z-0300Z, Apr 11



Contest Calendar—April page 2

JIDX CW Contest	0700Z, Apr 12 to 1300Z, Apr 13
SKCC Weekend Sprintathon	1200Z, Apr 12 to 2400Z, Apr 13
OK/OM DX Contest, SSB	1200Z, Apr 12 to 1200Z, Apr 13
New Mexico QSO Party	1400Z, Apr 12 to 0200Z, Apr 13
EU Spring Sprint, CW	1600Z-1959Z, Apr 12
Georgia QSO Party	1800Z, Apr 12 to 0359Z, Apr 13 and 1400Z-2359Z, Apr 13
Yuri Gagarin International DX Contest	2100Z, Apr 12 to 2100Z, Apr 13
International Vintage Contest HF	1200Z-1800Z, Apr 13
Hungarian Straight Key Contest	1500Z-1700Z, Apr 13
222 MHz Spring Sprint	1900 local - 2300 local, Apr 15
CWops Mini-CWT Test	1300Z-1400Z, Apr 16 and 1900Z-2000Z, Apr 16 and 0300Z-0400Z, Apr 17
RSGB 80m Club Championship, SSB	1900Z-2030Z, Apr 16
ARLHS Annual Spring Lites QSO Party	0001Z, Apr 17 to 2359Z, Apr 22
NCCC Sprint Ladder	0230Z-0300Z, Apr 18
Holyland DX Contest	2100Z, Apr 18 to 2100Z, Apr 19
TARA Skirmish Digital Prefix Contest	0000Z-2359Z, Apr 19
ES Open HF Championship	0500Z-0559Z, Apr 19 and 0600Z-0659Z, Apr 19 and 0700Z-0759Z, Apr 19 and 0800Z-0859Z, Apr 19
Worked All Provinces of China DX Contest	0600Z, Apr 19 to 0559Z, Apr 20
Nebraska QSO Party	1200Z, Apr 19 to 1759Z, Apr 20
Manchester Mineira DX Contest	1200Z, Apr 19 to 2359Z, Apr 20
Michigan QSO Party	1600Z, Apr 19 to 0400Z, Apr 20
EU Spring Sprint, SSB	1600Z-1959Z, Apr 19
EA-QRP CW Contest	1700Z-2000Z, Apr 19 (20-10m) and 2000Z-2300Z, Apr 19 (80m) and 0700Z-1100Z, Apr 20 (40m) and 1100Z-1300Z, Apr 20 (20-10m)
Ontario QSO Party	1800Z, Apr 19 to 0500Z, Apr 20 and 1200Z-1800Z, Apr 20



Contest Calendar—April page 3

North Dakota QSO Party	1800Z, Apr 19 to 1800Z, Apr 20
Feld Hell Sprint	2000Z-2200Z, Apr 19
YU DX Contest	2100Z, Apr 19 to 0500Z, Apr 20 and 0900Z-1700Z, Apr 20
ARRL Rookie Roundup, SSB	1800Z-2359Z, Apr 20
Run for the Bacon QRP Contest	0100Z-0300Z, Apr 21
Low Power Spring Sprint	1400Z-2000Z, Apr 21
SKCC Sprint	0000Z-0200Z, Apr 23
CWops Mini-CWT Test	1300Z-1400Z, Apr 23 and 1900Z-2000Z, Apr 23 and 0300Z-0400Z, Apr 24
432 MHz Spring Sprint	1900 local - 2300 local, Apr 23
RSGB 80m Club Championship, Data	1900Z-2030Z, Apr 24
NCCC Sprint Ladder	0230Z-0300Z, Apr 25
10-10 Int. Spring Contest, Digital	0001Z, Apr 26 to 2359Z, Apr 27
SP DX RTTY Contest	1200Z, Apr 26 to 1200Z, Apr 27
Helvetia Contest	1300Z, Apr 26 to 1259Z, Apr 27
QRP to the Field	1500Z, Apr 26 to 0300Z, Apr 27
Florida QSO Party	1600Z, Apr 26 to 2159Z, Apr 27
BARTG Sprint 75	1700Z-2100Z, Apr 27
CWops Mini-CWT Test	1300Z-1400Z, Apr 30 and 1900Z-2000Z, Apr 30 and 0300Z-0400Z, May 1

12 STORE BUYING POWER

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(Near Disneyland)
933 N. Euclid St., 92801
(714) 638-7373
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BURBANK, CA
1525 W. Magnolia Bl., 91506
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S. Victory & Buena Vista
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2210 Livingston St., 94606
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(877) 892-1745
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oakland@hamradio.com

SAN DIEGO, CA
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Jerry, N5MCJ, Mgr.
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Gary, N7GJ, Mgr.
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(800) 444-7927
Mark, KJ4VO, Mgr.
Doraville, 1 ml. no. of I-285
atlanta@hamradio.com

WOODBRIIDGE, VA
(Near Washington D.C.)
14803 Build America Dr.
22191
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(800) 444-4799
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(Near Boston)
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TS-2000 HF/VHF/UHF TCVR

- 100W HF, 6M, 2M • 50W 70CM • 10W 1.2GHz w/ opt UT-20 module • Built-in TNC, DX packet cluster
- IF Stage DSP • Backlit front key panel



TM-281A 2 Mtr Mobile

- 65 Watt • 200 Memories • CTCSS/DCS • MH-Std specs • Hi-quality audio



TS-590S HF + 6M Transceiver

- 100W HF + 6M • 500 Hz & 2.7 KHz roofing filter
- Built-in auto tuner • Best dynamic range in class
- 32 bit DSP

TH-F6A 2M/220/440

- Dual channel receive • .1 - 1300 MHz (cell blocked) RX • FM, AM, SSB • 5W 2M/220/440 TX, FM • 435 Memories
- Li-Ion Battery



TM-V71A 2M/440 Dual Band

- High RF output (50W) • Multiple Scan • Dual receive on same band (VxV, UxU) • Echolink® memory (auto dialer) • Echolink® Sysop mode for node terminal ops

ICOM

IC-7000 All Mode Transceiver

- 160-10M/6M/2M/70CM
- 2x DSP • Digital IF filters
- Digital voice recorder
- 2.5" color TFT display



ID-51A VHF/UHF Dual Band Transceiver

- 5/2.5/1.0/0.5/0.1W Output • RX: 0.52-1.71, 88-174, 380-479 MHz** • AMV FM/FM-N/WFM/DV • 1304 Alphanumeric Memory Chis • Integrated GPS • D-STAR Repeater Directory • IPX7 Submersible



IC-7600 All Mode Transceiver

- 100W HF/6M Transceiver, gen cov. receiver • Dual DSP 32 bit • Three roofing filters - 3, 6, 15kHz • 5.8 In WQVGA TFT display • Hi-res real time spectrum scope



IC-V8000 2M Mobile Transceiver

- 75 watts • Dynamic Memory Scan (DMS)
- CTCSS/DCS encode/decode w/ tone scan • Weather alert • Weather channel scan • 200 alphanumeric memories

ID-880H Analog + Digital Dual Bander D-STAR

- D-STAR DV mode operation • DR (D-STAR repeater) mode • Free software download • GPS A mode for easy D-PRS operation • One touch reply button (DV mode) • Wideband receiver



YAESU

The radio



FTDX-3000 100W HF + 6M Transceiver

- 100 Watt HF/6 Meters • Large and wide color LCD display • High Speed Spectrum Scope built-in • 32 bit high speed DSP/Down Conversion 1st IF



FT-7900R 2M/440 Mobile

- 50W 2M, 45W on 440MHz • Weather Alert • 1000+ Memories • WIRES capability • Wideband receiver (cell blocked)

FT-60R 2M/440 5W HT

- Wide receiver coverage • AM air band receive • 1000 memory channels w/alpha labels • Huge LCD display • Rugged die-cast, water resistant case • NOAA severe weather alert with alert scan



FT-450D 100W HF + 6M Transceiver

- 100W HF/6M • Auto tuner built-in • DSP built-in
- 500 memories • DNR, IF Notch, IF Shift



FT-857D Ultra Compact HF/VHF/UHF

- 100W HF/6M, 50W 2M, 20W UHF • DSP included
- 32 color display • 200 mems • Detachable front panel (5K-87 required)

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