Next NCCC Meeting

Guests are always welcome at the NCCC! Please join us.
T33C Banaba DX-pedition
Alan Eshleman, K6SRZ

Date: Saturday, 24 July 2004
Time: 12 noon
Location: Senior Services Center, 229 New York Ranch Road, Jackson, CA

Directions:

Take State Highways 49/88 to Jackson. From the West (Highway 88) or the North (Highway 49), go through the traffic light at 49/88 intersection and proceed to the bottom of the hill, turn left at the 2nd stop sign (Safeway and Chevron gas station will be on your right), onto Highway 88 East toward Lake Tahoe. Follow signs to Senior Center and turn left onto Court Street (approximately 1 mile). New York Rand Road will be the first stop sign (1/4 mile). Turn right and the Senior Center will be on the left approximately 100 yards from the intersection and behind an apartment complex (signs will direct you to "Oak Manor"). Parking is available in both the front and the back. Additional parking is available next door at the Quail Hollow Professional Center with stairs at the rear that lead to the Senior Center. **Please do not park in the spots marked for the Oak Manor Convalescent Home.**

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VP/CC Report
Dean Wood, N6DE

CQ WPX CW
Thanks to all NCCC members who participated in WPX CW! Please submit your Cabrillo log by **July 1** to cw@cqwpx.com. You can go to the WPX CW logs received list at http://home.woh.rr.com/wpx/CWLOGSRECEIVED.pdf to verify that your log was successfully received.

Recognition
Each month in the JUG, I'll attempt to recognize outstanding NCCC efforts in contests after the official results are published. Last month I covered Sweepstakes. This month I'll touch on the ARRL 160m and 10m contests. I undoubtedly will accidentally miss a great effort or a winning score in a smaller contest, so please forgive me and send me an e-mail detailing my omission. I'll include it in the following month's column.

ARRL 160m Contest
N6WG – S/O QRP Pacific Division winner
NT6K – S/O LP Pacific Division winner
N6RO – S/O HP Pacific Division winner
ZF2NT – Second place among non-US/VE participants

ARRL 10m Contest
There were an impressive number of NCCC members who placed in the overall Top 10 boxes of their respective categories!

#1 DX S/O Mixed Mode – ZF2NT (Bruce ran LP and had a higher score than the top DX Mixed HP participant!)
#3 DX M/S and #4 overall score in the entire contest – P40K (K6KO, K6TA)
#6 M/S – W6YX team
#10 M/S – K6KM (K6LRN, W6SR)
#2 S/O Phone QRP – WR6WR (N6WR)
#9 S/O CW QRP – N6WG
#1 M/S and #1 overall score in the entire contest – our own K6AW joined K1TO for a M/S in Florida, signing NE4AA.

Summer Madness - NS: The NCCC Sprint.

Bill Haddon, N6ZFO

It's officially launched -- the NCCC Sprint, "NS". What is it? A Thursday night sprint-type practice contest designed with two goals in mind: 1) Provide a learning exercise on CW and, later RTTY, for newcomers or rusty old-comers to these modes. 2) Keep our brains and hand-eye-ear coordination in top condition from week to week. And there's a competition built in. That's the NCCC NS Ladder. We're still very early in the summer 2004 ladder competition, so please join in and compete, or just drop in to this quick Thursday evening event and have fun.

In one sense, NS is a long-term run-up to the National Contest Journal (NCJ) NA Sprints and NAQP's, which are held, for CW, in September, February and August, January, respectively. But NS is more than that -- it's a general practice for all CW contests. We've concocted a modified sprint contest which lends itself well to making a high-rate practice session with a relatively small number of participants. The restriction to low power - 150w - further helps smaller stations. You should be familiar with the concept of the Sprint QSY rule, which can be found at http://www.ncjweb.com/sprintrules.php. But our rules are a little more relaxed, in that

only a 1 KHz QSY is required before soliciting a call, not the 5KHz of the NA Sprint. Both Writelog and TR Log handle NS in a loose way within the Internet Sprint modules of these programs.

Immediately, NS gained notariety with an appearance on the WA7BNM website (www.hornucopia.com) as an official contest. It was also announced in the ARRL Contest Ratesheet published by Ward Silver, N0AX. Although NS is a national contest, via weekly announcements on CQ-Contest reflector, the ladder is NCCC-only.

Actually, Thursday nights won't be exclusively NS. At appropriate times we'll substitute practice sessions for major contests occurring on the following weekend. The Calendar below prepares you for what's ahead in these pre-Net sessions over the coming months. Because of intervening pre-net practices for RAC Canada Day, and the IARU HF World Championship Contest, NAQP-RTTY, and a week off for the 4th of July holiday, the next NS is not until July 15. On July 15 we'll also work an NAQP RTTY practice into the net.

When is the NS? Always 20 minutes prior to the NCCC Thursday night contest net. While follow-up participation on the net isn't mandatory, it's a convenient way to report scores and brag or vent frustrations. Scores can also be reported to n6zfo@arrl.net, or you can keep it to yourself and not participate in the ladder. For now, we're using three bands, 40, 80 and 160 CW but may add 20m later. Don't worry if you don't operate 160 as activity there is low. Once rules and format for CW NS are firmly entrenched, there's the option to start a similar RTTY session and ladder. Of course we're looking for an RTTY volunteer to take charge.

The rules for the CW NS follow the general concepts of the Internet Sprint, a CW contest run periodically by Tree, N7TR and his compatriots and described more fully at http://lists.contesting.com/archives/html/CQ

. The NS exchange is very similar to that of the NCJ NA Sprints, but with a key difference. For the name, on all but the first QSO, an op sends the name received on the *previous* QSO. On the first QSO it's your own name, which can be an invented one. In the first weeks we've had Phred, Pierre, Willie, Jayacuma (that one ended up as Jayakuma) and Im. Im is a little suspicious, as there was a Jim floating around for a while. So NS is a little like that "whisper a phrase around the table" party game, a characteristic hijacked from the Internet Sprint.

Another important feature of NS is the mandate to send CW relatively slowly during the first ten minutes - 20 wpm or less, but always to adjust speed to the responding or CQ'ing station. We want newcomers to participate and build code speed. If 20 wpm is too fast, don't worry. The mandate is for responders to slow to the speed of the calling station, so just call "CQ NS" yourself at a comfortable speed, or answer another station at your comfort level.

Look for the rules and contest ladder table on our Web site – www.nccc.cc.
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WPX-CW Participation

At W6SR, Jim, WX6V, and Jack, KF6T.

K6RB at NZ6K using newly minted SO2R set up.

Andy, AE6Y, visiting P43JB

Here's why the Sunol Ridge "boys" got that new tower.

K6XX StackMatch Controllers

Bob Wolbert, K6XX

There's always room for improvement. Take the StackMatch by Array Solutions (a.k.a. WX0B), for example. It controls a stack of two or three antennas. Its optional control box has a vertical line of LEDs that clearly indicate the selected antenna(s), but uses a rotary switch to select one of the various possible configurations. But, which switch position corresponds to which configuration? And, which antenna is represented by the little square symbol, and which one is the circle?

This control box also needs four wires (plus ground) to pick one or more of the three antennas. Using this hardware with two antennas requires three control wires. Simple and obvious station operation is important—let those brain cells concentrate on the second (or third?) receiver, not mechanical station operation!.Instead of deciphering geometric shapes, an instantly understandable, intuitive control box is an improvement. Reducing the number of control lines is another important goal, as the arrays around here are hundreds of feet from the shack. The following two designs accomplish these goals: one selects from a three-antenna stack, the other is optimized for a two-stack.

Three-Stack Controller

What's the best way to intuitively select antennas in a stack? After very little thought, I chose a column of toggle switches and a matching column of indicator lamps (see Figure 1). Designed for left-hand control, the LEDs are to the right of the switches so one's hand and arm do not block the view. You can reverse the switches and LEDs for right-hand operation.

The next design problem is determining the logic interface from this toggle switch control panel to the StackMatch. Reviewing its schematic, which appears on page 11-43 in the 20th Edition of the *ARRL Antenna Book*, we deduce the StackMatch truth table (Table I). Since the StackMatch defaults to the full stack when no power is applied, the control box must accept two states for the full stack: all switches ON and all switches OFF.

Toggle Switch (and Antenna)	Control Line			
	IN	3	2	1
Top + Mid + Bottom	0	0	0	0
Top + Mid	0	0	0	1
Top + Bottom	0	0	1	0
Mid + Bottom	0	1	0	0
Bottom	1	0	0	1
Mid	1	0	1	0
Top	1	1	0	0

Table I. StackMatch Controller Logic for a Three-Stack

Circuit implementation is shown in Figure 2 and Photo 1. An old-style TTL gate with high voltage open collector outputs, the 7445 (outputs rated to 30V) or the 74145 (outputs rated to 15V maximum) is used, along with some signal diodes to complete the logic. Please note the 330 resistors connected to the switches are semi-critical; much higher values cause the low-state input voltage to exceed TTL specs, and smaller values allow too much current through the LEDs. Precision resistors are definitely not required. At only about 40mA per output, the StackMatch is not a difficult load to drive, and "garden variety" PNP switching transistors like the 2N3906 are suitable. Figure 3 shows a number of different output circuits: build with whatever component types you have available The options using relays are less likely to suffer damage from nearby lightning strikes. Table II shows the measured current drain of my prototype using a 7445 and PNP Darlington outputs.

Configuration	Current
All Switches OFF	38mA
All Switches ON	60mA
One or Two Antennas Selected (worst case)	

Table II. Three-Stack Current Drain, V_{IN} = 13.6V

Note that four control wires are still required for this circuit. I decided that the extra complexity and potential RFI issues resulting from placing the control logic inside the StackMatch was not worth saving one wire run. When using this controller design, no changes are necessary inside the StackMatch unit.

Two Antenna Stacks

If a stack has only two antennas, we can design a control box that reduces the wiring requirement from three to only one wire. Using both positive and negative drive voltages this may be accomplished as described in Table III.

Switch	ge	ına
(none)	0	both
Upper	+12	Top
Lower	–12	Bottom

Table III. Single-Wire Two-Stack Controller logic.

Figure 4 shows the two-stack design. No ICs or transistors are required. Since the control box needs –12V, and no other use for this voltage presently exists at K6XX, a dedicated power supply was designed using an AC output "wall wart" (a small 12.6V transformer is also suitable). A semi-tricky aspect of this circuit is the LED display, which must have both LEDs ON when the relays are OFF, and is accomplished by shorting out the *opposite* LEDs by the control switches. In other words, the TOP control switch shorts out the BOTTOM LED, and vice-versa. The LED current passes though the StackMatch relay coils, so they will not illuminate unless the StackMatch is connected. This small current (about 1mA) is insufficient to either trigger or hold the relays, so their operation is unaffected. However, only 1mA is less than the 10mA normally used for LEDs, so if you find their luminosity too dim, consider changing to high efficiency LEDs. Do not reduce the current-limiting resistor values or else the StackMatch relays might not release after they have been activated. On my prototype, 50 F of filter capacitance was required on both the positive and negative supplies to eliminate relay chattering due to the half-wave rectified 60Hz. I recommend using at least 100 F of filtering on both supplies to provide some margin, unless a negative DC supply is available.

Figure 5 shows two possible control panels. Some may find the two-switch version is more intuitive, but the single switch version allows faster, single-finger stack selection and

optimization—with it, UP is the top antenna only, CENTER is the full stack, and DOWN is the lower antenna only.

Two diodes are added to the StackMatch when used with the single-wire controller. This is a screwdriver-only operation—no traces must be cut and no soldering is involved. The diodes are easily installed on the internal control wire terminal strip, as shown in Photograph 2.

Summary

RF-wise, the StackMatch is a well-designed system for selecting among antennas in a stack. The control box from Array Solutions, however, is not as well thought out. The controllers presented here allow more intuitive and simpler means of selecting your stack.
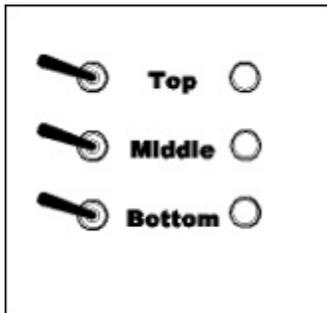
Figure 1. Three-Stack Control Panel
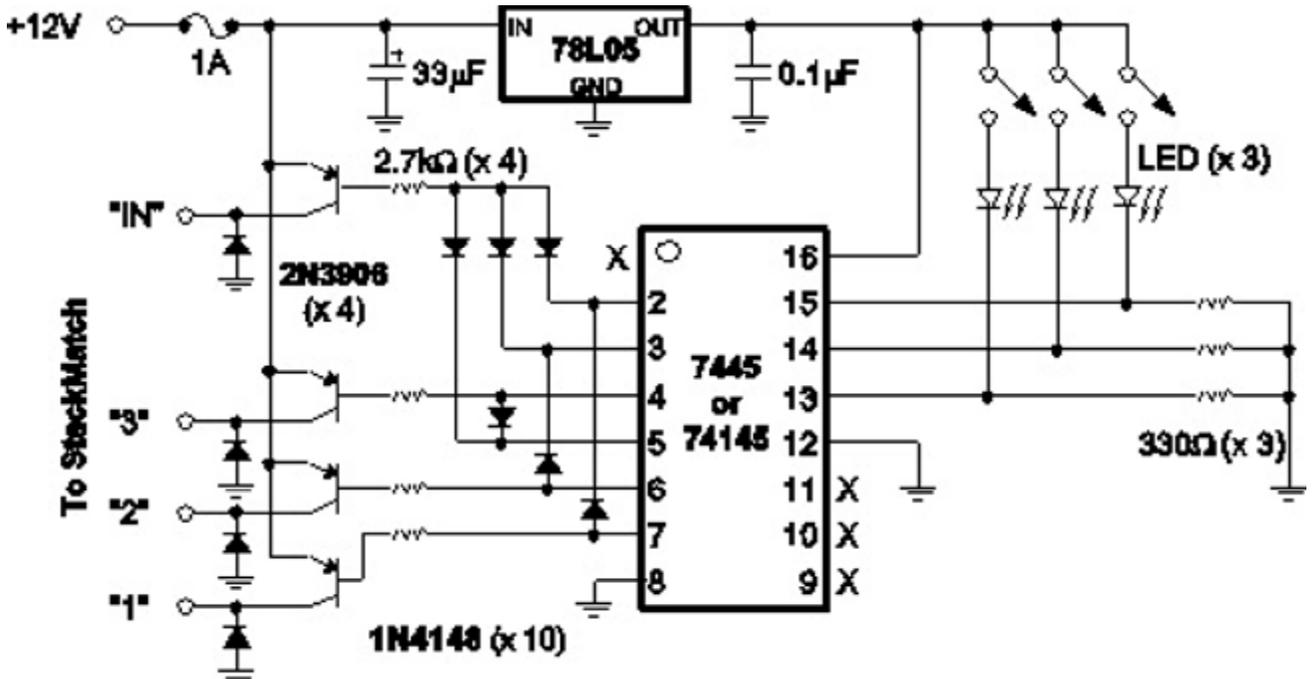
Figure 2. Three-Stack Controller Schematic
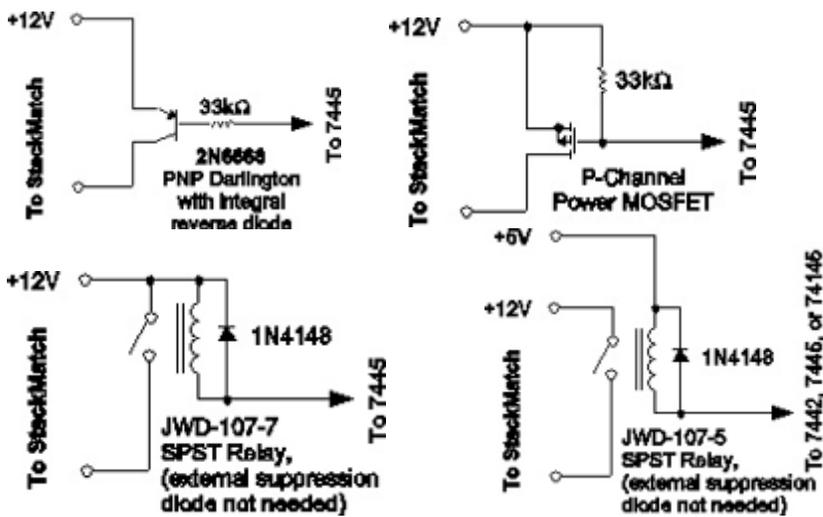
(A) PNP Darlington with internal diode (B) P-Channel Power MOSFET (C) SPST Relay with
12V coil   (D) SPST Relay with a 5V Coil.
Figure 3. *Three-Stack Output Options*
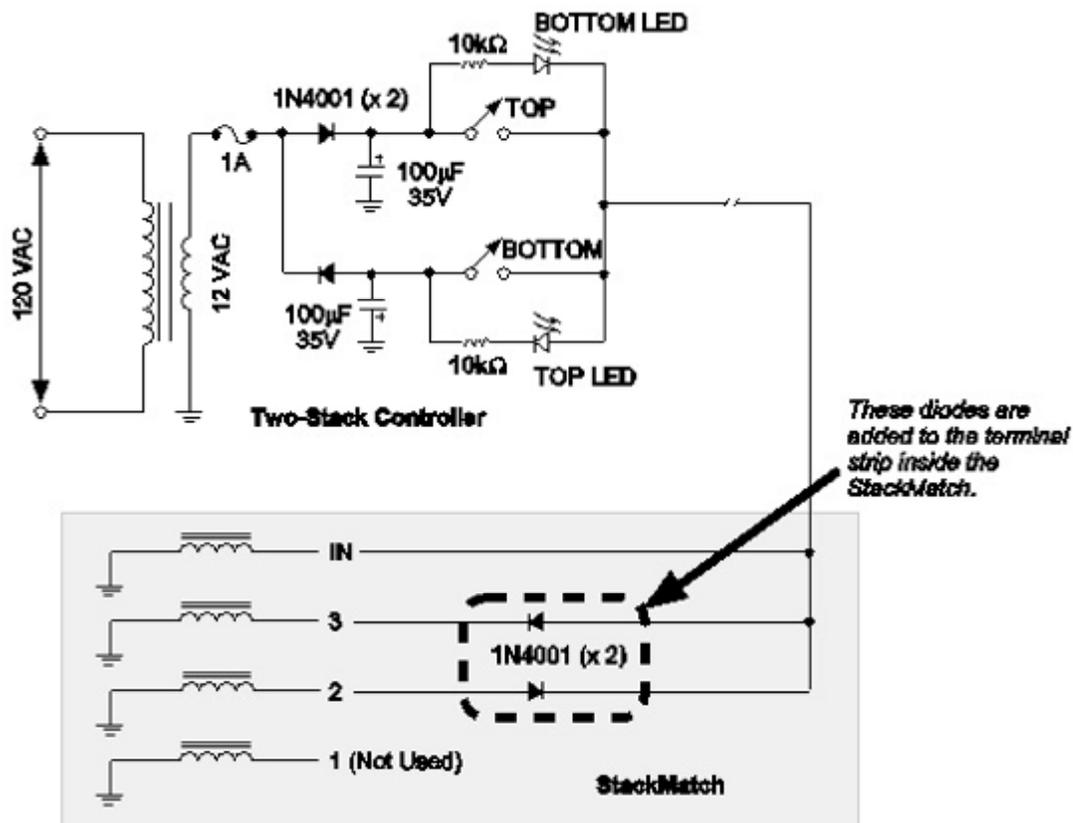
**Figure 4. Two-Stack Controller Showing
Additional Diodes needed Inside the StackMatch**
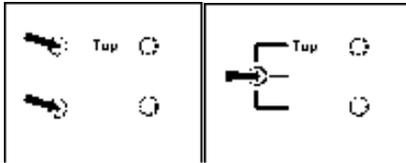
A) Vertical Column (B) Single Center-Off Switch
Fig. 5
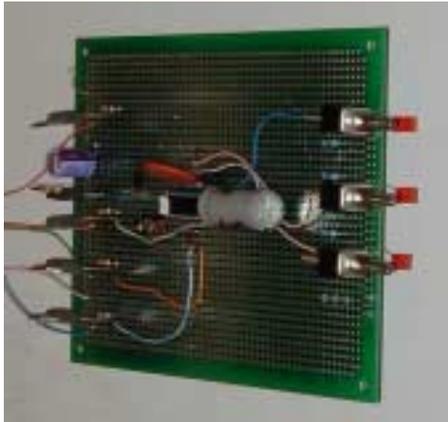
Photo 1. Three-Stack Prototype

Photo 2. View of diodes needed inside the StackMatch for the single-wire two-stack controller.

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Member News

Ever wonder where Kurt Andress, K7NV, gets it from? It's genetic. Dad, Ed, W6KUT, has been QRV for six decades, now.

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Just around CQP time, don't be looking for Trey Garlough, N5KO, to be putting in much time. He's working on a new startup, and his better half is working on a new contester. Congrats.

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Rob Brownstein, K6RB, has just finished the last month of FOC "starred" list status. He should be getting his "number" any time now.

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Dean Straw, N6BV, wrote an eloquent and well reasoned note to the FCC regarding BPL. Here's just a sample…

BPL Analogy

The Federal government is going to allow a toxic-waste dump to be established in your backyard, but we assure you that toxic emissions will be low.

However, if somehow the emissions from the toxic-waste dump in your backyard do affect you in the future, we are setting up rules so that you can petition the company running the toxic-waste dump to move it to someone else's backyard. And we're confident that all the toxic-waste companies will be excellent corporate public citizens and that they will take care of any problems in a prompt and courteous fashion.

And just to be sure that Federal operations vital to your safety and welfare aren't affected by any emissions, we're not going to allow the establishment of any toxic-waste dumps on Federal property

CL

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http://www.cqp.org
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