Contesting 101
By Kirk Pickering, K4RO

Hello, and welcome back to Contesting 101. Please send me your questions or comments, whether you are a newcomer or an old timer. I can be contacted via e-mail at **k4ro@k4ro.net**, or at my call book address. Spring approaches as I write this column. The "Big 4" DX contests are over, and WPX and IARU are just around the corner. Thoughts turn to making station repairs and upgrading areas of weakness discovered during the last few months of operating. Many contesters were dealt harsh blows by mother nature this year, and will have to work hard to rebuild their stations. Most contesters will use the repair opportunity to make their stations even better than before the damage. Good luck to everyone on your station building, and always remember – Safety First!

Multitasking and SO2R
SO2R. Those letters have been the object of much discussion in recent years on the contest reflectors. (No, we're not talking about SP2FAX's contest call sign.) SO2R is an acronym for "Single Operator 2 Radios." The potential advantage of SO2R is more efficient use of time, accomplished by listening to an auxiliary receiver *while transmitting*. This technique was explained in detail by K1ZM in the National Contest Journal. I recommend Jeff's article entitled "Maximizing Single-Operator Contest Productivity" in the March/April 1994 issue of the NCJ. The section called "Time Multiprocessing Operation During a Contest" gets into the fundamentals of time-sharing between two radios.

Since this is "Contesting 101" it seems appropriate to cover the topic of SO2R from the perspective of an aspiring operator wanting to increase their scores. The construction of a fully-automated SO2R contest station is beyond the scope of this article, so we'll just touch on the fundamentals, and propose some ideas to get started.

We might wish to examine the pro's and con's of SO2R from a few different angles. Some of the benefits of SO2R operation include more productive use of time, less boredom during slow times, easier multiplier moving, and generally a larger "presence" on the bands due to an increase in available listening time. The liabilities of SO2R include a steep learning curve, increased station complexity, increased station costs, and no rest for the brain during contests. SO2R is not for everybody. Some operators have tried it, and decided that it was not for them. I think it is worth at least trying some form of SO2R, if for no other reason than to experience it for ourselves. That way, we can make an informed decision whether to pursue it. I've heard more than one operator declare that SO2R is simply "too much work" and that it takes away from their overall enjoyment of the contest. Some operators find listening to their own CQ's somewhat meditative, and would rather let their brains rest between QSOs.

Know How to use One Radio First
I don't know of anyone doing SO2R successfully who hasn't first tried to maximize other aspects of their station and operating technique as much as possible. SO2R can provide a competitive advantage, but this is only true for the operator who has learned to squeeze every advantage out of one radio, and is prepared to work hard at developing a new skill set. There are some operators who feel strongly that SO2R should be a separate category for the purposes of Single Operator competition. There are even a few operators who have actually stopped competing due to their beliefs that SO2R is somehow unfair to them. The general consensus among the majority of contest adjudicators is that SO2R does not warrant a

separate Single Operator category, as long as there is only one operator and only one transmitted signal at a time. In the case of SSB and CW where one's brain has to work very hard to decode more than one audio stream simultaneously, the consensus seems to be that if you can handle SO2R, you deserve any score increase you can derive from it. RTTY operation is different in that one's brain is not doing the actual signal decoding. Additional simultaneous data streams can be decoded simply with additional hardware and software. This fact has led some RTTY contest adjudicators to create separate classes for SO2R Single Operator competition.

Where to Begin?

Let's discuss how to get started with expanding our presence on the bands. First of all, the main idea here is to do something with your time while you are calling CQ – like finding other stations to work! It is also possible to search and pounce with two radios simultaneously, but we'll start with the assumption that we are trying to run somewhere. Time spent calling CQ can be used to locate stations on an auxiliary receiver or transceiver. I would like to point out that one can benefit from the "time-sharing" advantage of SO2R without a great deal of hardware investment. While I now have a fully-automated SO2R station with two transceivers, I was finding multipliers *while transmitting* long before I owned a second transceiver.

I got into SO2R using an old tube-type receiver with a random wire thrown out the window for an antenna. The January 1998 National Contest Journal had an article by W5ASP describing a simple headphone switching system made from easily available Radio Shack parts. The headphone switch allowed one to select audio streams as needed, and provided three choices: 1) left radio in both ears, 2) right radio in both ears, or 3) one radio in each ear. Using this simple system, I was able to find multipliers on 10 meters while calling CQ on 15 meters, for example. It worked as follows. While calling CQ on 15 meters, I would tune the old tube-type receiver for stations on 10 meters. Once I located a new station on 10 meters, I would note its frequency and then punch that frequency into a memory on the CQ'ing transceiver, between CQs. If my last CQ went without an answer, I would quickly swap the VFO to the 10 meter frequency in memory. With a little bit of luck and good timing, the 10 meter station would be just finishing a CQ and I would drop in my call. If he came back to me, I would work him quickly and then swap the VFO back to my 15 meter run frequency. If my run frequency was still clear, I would call another CQ. If my run frequency was occupied, I would have to go find another run frequency. Over time I learned to make the switch as quickly as possible, so as not to lose my run frequency. I also added devices to make the switching more fool proof.

Timing is Everything

It is important to understand that when you lose a run frequency, you lose a run frequency. Be prepared to lose your run frequency a lot when learning to operate SO2R, particularly in the major contests. It is considered bad form to leave a run frequency for say, over a minute, and then expect it to be there when we return. If we are gone long enough for someone else to make a couple of QSOs, then that is no longer "our" run frequency. It takes experience to understand when it is "safe" to sneak in a second radio QSO without making one's run frequency vulnerable.

One effective technique for the beginning SO2R operator is to call CQ on a band that is NOT wide open, especially while S&P on a band which is ripe with low-hanging fruit. Calling CQ on the less-open band will require less effort to maintain one's run frequency (because of fewer answers) and allow for a little more time to manage the second radio. By the way, it is usually

counterproductive to spend our time trying to "poach" a run frequency from an SO2R operator when they've abandoned their run frequency momentarily. Our time is usually better spent trying to find the next QSO, or our own run frequency somewhere else.

RTTY contests are a great place to learn the mechanics of SO2R operation. Hardware or software does the actual signal decoding on RTTY, freeing our brain to focus on managing two radios. Some of the Windows logging programs can even operate two radios from a single sound card operating in stereo mode, resulting in minimal hardware requirements. RTTY contests are an excellent opportunity to work on our timing, without the additional concentration requirements of decoding two SSB or CW audio streams at the same time.

Receiver Protection
Most receivers, especially today's solid state designs, can be damaged if the antenna connector is presented with too much energy. It is quite easy to damage a receiver with just a 100 watt transmitter if some precautions are not taken. My first forays into SO2R were done with a tube-type receiver because 1) it's what I had available at the time, and 2) the older tube designs tend to be a little more forgiving with regards to antenna input levels. Later on, my second receiver's random wire was replaced with a 4BTV, and the tube receiver was replaced with a second transceiver. During the ensuing years, I added more antennas, band pass filters, automated switching, and all of the other little things that help speed up the band changing process. Last year I added stubs for some bands, in my never-ending quest for interference-free SO2R using high power on one tower.

Protection schemes can be as simple as a low-voltage incandescent light bulb or milliamp fuse in series with the antenna input. Other approaches include a string of diodes back-to-back, commercially available "Front End Saver" devices, or elaborate automatically band-switched filter designs. An Internet search for "SO2R" should yield a number of ideas. The primary advantages of SO2R can initially be obtained at very little cost. Like everything else in this hobby, the sky is the limit after that.

I've been working at SO2R for almost two decades now, and am starting to get the hang of it. SO2R really is a difficult skill to master, which also makes it quite rewarding. My suggestion is to just try it yourself, and see if you are missing anything. You might like it, or it might not be your cup of tea. You might find that it only gives you a headache. You won't know unless you give it a try. Fire up that old receiver you have laying around, protect its front end, and see what you can hear while you are transmitting. You might be surprised. SO2R truly comes to shine when we have some spots on old Sol, and several bands are open at once.

That's all for this time. Please remember to send me your questions or comments. Next time we'll get back into some nuts and bolts of operating technique. Most of all, don't forget to have FUN with contesting. It's possible to take this stuff too seriously, so try to keep it enjoyable, regardless of your level of pursuit.

73

-Kirk K4RO