

BASICS OF SO2R OPERATION

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SO2R: Single Operator 2 Radio

- Listen On Two Frequencies Simultaneously
- Rapidly Select Either Frequency As Transmit Frequency
- Ability To Listen On One Frequency While Transmitting On The Other



WHAT IS SO2R GOOD FOR?

MORE QSOs = Higher Score!

- Maximize Rate With Simultaneous Run And S&P
- Two-band S&P When Run Is Non-productive
- Check Conditions On Another Band
- Multiplier Spotting
- Moving Mults From Band To Band
- Maximizes Potential For Small Station With Limited Antennas



WHEN SHOULD I CONSIDER SO2R?

- Run and S&P Rate Capability Has Maxed Out
- Contests With Limited Rate Potential (e.g., SS)
- Additional Equipment Is Available



WHAT EQUIPMENT IS NEEDED?

- Two Radios (doh!)
- At Least Two Antennas
- Antenna Switching
- Switching Control For Key, Mic, PTT
- Headphone Audio Switching



GETTING STARTED

- Start Simple
- Low Power, At Least On Second Radio
- Modest Antenna For Second Radio
- Simple Antenna Switching
- Manual Control Switching
- Manual Headphone Audio Switching



GETTING USED TO SO2R

- You **WILL** Have Trouble At First
- Your Rates **WILL** Be Low
- You **WILL** Want To Quit — ***DON'T!***
- Practice, Practice, Practice!
- Listen To Two Radio Audio Outside Of Contests
- Practice In Low-Intensity Contests (e.g., QSO Parties, etc.)



STATION OPTIMIZATION FOR S02R

- Multiple Antennas Available
- Flexible Antenna Switching
- Flexible Audio Switching
- More Automation Is Better
- Compatible Logging Software
- Identical Or Similar Radios
- Ergonomic Station Layout
- High Quality Comfortable Headphones



ANTENNAS & SWITCHING

- Multiple Antennas Available To Each Radio
 - Monoband Antennas Best But Not Mandatory
 - Antennas Arranged For Minimum Coupling
- Flexible Antenna Switching *With Good Isolation*
 - Automatic Lockout Antenna Switches (SixPak, etc.)
 - Clear Indication Of Antenna Selections



FLEXIBLE AUDIO SWITCHING

- Stereo Audio
 - One Radio In Each Ear
 - Quick Switching Between Mono & Stereo
- Multiple Audio Modes
 - Left + Right (Default)
 - Mono For Active Radio
 - Mono For Non-Transmitting Radio



MAXIMIZE AUTOMATION

- Automatic Antenna Switching
 - Programmable Antenna Selection
 - Same Band **Hardware** Lockout & Transmitter Inhibit
- SO2R Control & Audio Switching Unit
 - Top Ten Devices DX Doubler
 - microHAM micro2R Or MK2R/MK2R+
 - YCCC SO2R Box
 - Ham Radio Solutions EZMaster
 - Homebrew



COMPATIBLE LOGGING SOFTWARE

- Windows® Software
 - WriteLog
 - N1MM Logger / N1MM Logger Plus
 - Win-Test
 - TR4W (UA4WLI)
 - Others?
- DOS Software
 - CT / CTWin
 - NA (K8CC)
 - TR LOG (N6TR)
- Mac & Linux Software??



POTENTIAL SO2R PROBLEMS

- Mutual Interference
 - Excessive RF From Antenna Coupling
 - Transmitter Phase Noise
 - Harmonics
 - Poorly Shielded Cables / Common Mode RF
 - QRO Is MUCH More Difficult
- Additional Hardware Complexity Reduces Reliability & Increases Maintenance



SO2R STATION ERGONOMICS

- Use Identical Or Similar Radios If Possible
 - Similar Control Layouts & Displays
 - Both Radios Tune In Same Direction
- Left Radio Audio In Left Ear, Right Audio In Right
- Logging Software Windows On Same Side As Radios
- Dedicated Antenna / Rotator Controls Located Near Associated Radio
- Keep Your Hands On the Keyboard
- Use High Quality Comfortable Headphones



EXAMPLE STATION LAYOUT



N1MM LOGGER SO2R LAYOUT

The screenshot displays the N1MM Logger SO2R interface with several key windows:

- 7055.74 CW FT-1000:** Shows a list of received signals with columns for TS, Call, Freq, Sent, NR, Prec, CK, and Sect. A summary table below shows QSOs by band and time.

Band	QSOs	Pts	Sec
8.4	76	150	4
7	287	574	10
14	262	524	14
21	255	510	62
28	100	200	3
Total	979	1968	83

Score: 162,514 Points

- 3546.91 CW FT-1000:** Shows a similar list of signals and a summary table.

Band	QSOs	Pts	Sec
8.4	10	100	0
10	100	0200	0300
31	30	33	0

Import Goals: Goal = 32

- 7055.74 (7055.74) CW Elecraft K3:** A control window for the K3 radio with various function buttons like Wipe, Log, Edit, Mark, etc.
- 3546.91 CW FT-1000:** A control window for the FT-1000 radio with similar function buttons.
- Multipliers - Sections - 83 of 83:** A grid of call sign multipliers for logging.
- W8FN:** A window showing a bar chart of QSOs over time.
- W8FBN:** A window showing a bar chart of QSOs over time.
- W8BMM 42*:** A window showing a bar chart of QSOs over time.
- N1MM Rotor Control:** A window for controlling the rotator, showing a 'Turn' button and a table of positions.

File	Tools	Help
0	Turn	
16	45	90
210	270	301
	330	359

- 7055.74 (7055.74) CW Elecraft K3 (Bottom):** A window showing a waterfall plot of the received signal.



PRINCIPLES OF SUCCESSFUL SO2R

- Start With Modest Hardware
- Design The Station Carefully
- Be Prepared For The Learning Curve
- Increase Station Complexity And Capability As Operator Skill Grows
- ***Practice, Practice, Practice!***



RESOURCES

- K5ZD Videos:
 - Part 1: http://www.youtube.com/watch?v=kHCveAeju_A
 - Part 2: <http://www.youtube.com/watch?v=eij1bs8Mg0E>
 - Part 3: <http://www.youtube.com/watch?v=3YJZ4-StwRs>
- http://www.k8nd.com/Radio/SO2R/K8ND_SO2R.htm
- <http://www.qsl.net/ct1boh/so2r.htm>
- www.pvrc.org/Powerpoint/SO2R_v4.ppt
- <http://zs6aa.files.wordpress.com/2008/02/a-simple-so2r-contest-station.pdf>

MANY MORE: GOOGLE IS YOUR FRIEND!



QUESTIONS?

