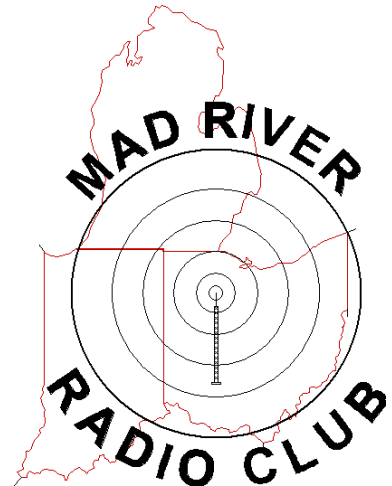


The MRRC Sweepstakes Handbook

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TOPICS

The ARRL Sweepstakes And MRRC	1
Glossary Of Terms Related To SS	2
Getting To Know the ARRL Sections	3
ARRL Section List	4
Getting Started In SS	5
SS Demographics	6
SS Bands, Propagation and Antennas	8
Planning SS Off-Times	10
QRP Techniques	12
Low Power Techniques	13
High Power Techniques	14
Multi-Operator Techniques	15
Single-Operator, Two-Radio (SO2R) Operation	17
Ten Ways To Maximize Part-Time SS Efforts	20
SS TOP TEN SCORES FOR MICHIGAN THROUGH 2005	21
SS TOP TEN SCORES FOR OHIO THROUGH 2005	22

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The ARRL Sweepstakes And MRRC

The ARRL November Sweepstakes is one of the oldest organized on-the-air amateur radio competitions. First held in the thirties, the early Sweepstakes were two weeks long and were CW only affairs. Later, as phone operation became more popular after World War II, a Phone Sweepstakes was added.

Over the years, as the activity levels in Sweepstakes grew the contest period was trimmed down to the thirty hour period we have today. The contest exchange, which has its roots in amateur message handling, was also abbreviated; from entire amateur radiograms, to just the message header, to the present "nr prec call check section" format.

Sweepstakes historically has seen periods of classic competition, where skilled competitors at well-equipped stations engaged in serious rivalry for top honors. In the late 50s and early 60s the big guns were the likes of Vic Clark, W4KFC (later president of the ARRL), and Larry LeKashman, W9IOP (later president of Electrovoice). The 70s saw a troika of "young guns" matched with established stations – Chip, K7JA operating at W7RM, George, WØUA operating at WAØCVS and Leigh, KR6X operating at W6HX leading the way. The 80s and early 90s were the "Texas era" where ops like K5ZD, N5TJ and N5KO led a succession of SS winners from the Lone Star state. From the late 90s until now we've seen the rise of the Caribbean superstation being challenged by a few "SO2R masters", at least on CW.

MRRC has a long history with the November Sweepstakes as well. The desire to compete in the SS Affiliated Club Competition led to the formation of MRRC in the spring of 1971. A period of rapid membership growth led to a victory in the SS Affiliated Club Competition later that year, however the score results chronicling the accomplishment was published under protest from some of the other vanquished clubs. (The MRRC score was listed with an asterisk next to it.) The win was later taken away, allegedly because some of the members recruited by MRRC had not been to an actual club meeting prior to the contest. For MRRC, 1971 will always be remembered as the "asterisk year".

From 1976 to 2005, MRRC has won the Medium Club Competition four times - in 1986, 1995, 2001 and most recently in 2003. Over that thirty year period, MRRC averaged a 3.9 finish, and finished out of the top five only seven times. MRRC has averaged 40 entries each of those years, at more than 95K per entry. Winning the SS Competition remains an annual goal for the club.

This SS Handbook has been assembled by the club to help its members do well in the November Sweepstakes. Several of the club's successful SSers have donated their SS ideas and strategies for you to assimilate into your own operation. Use of these ideas, and the application of sufficient amounts of time in the operating chair during the appropriate weekends in November are almost sure to result in a winning score. CU in November!

GO MAD RIVER!

Glossary Of Terms Related To SS

Asterisk Year – 1971, the year that MRRC's victory in the SS Affiliated Club Competition was disallowed.

Big Gun – An SS station that is usually competitive at a section or division level.

Little Gun – An SS station that because of limited antennas, power, or experience is not yet capable of being competitive.

Medium Gun – An SS station that is usually competitive at a local or section level.

Off-Time – Required periods of non-operation during the SS contest period which must total a minimum of six hours. These periods can occur any time during the contest at the operator's discretion, but must last a minimum of thirty minutes.

S&P – "Search and Pounce", the operating technique of tuning the band to find new stations to work.

SO2R – Single-Operator Two-Radio. A station configuration that has two complete, independent stations that can be operated by one person. In a true SO2R setup, while one radio is transmitting the other radio can tune another band looking for new stations to work.

Running – The process of soliciting stations to call you on a single frequency, usually by calling CQ, or calling QRZ after a QSO.

Getting To Know the ARRL Sections

Multipliers in the ARRL Sweepstakes are the sections of the ARRL Field Organization and those of the Radio Amateurs of Canada (RAC). These sections do not exist simply to be multipliers for SS, but rather to organize ARRL/RAC field-level activities. Sections are on occasion created and/or deleted; as a result, the number of multipliers in SS has changed over the years.

Sections tend to be organized on the basis of population density. States with low to moderate population densities tend to have a single section for the entire state – Michigan and Ohio are examples of this. Populous states such as California, New Jersey and New York contain several sections. Large states with pockets of population such as Texas and Florida also contain several sections. There are no sections that encompass more than one state. In Canada, sections are for the most part the same as provinces, although New Brunswick, Nova Scotia and Prince Edward Island are combined into a single section called MARITIMES, and the province of Ontario is split into four sections. Three other rare Canadian areas: Yukon Territory (VY1), Northwest Territories (VE8) and Nunavut (VY0) are grouped under the Northwest Territory designation.

It is important to become familiar with the names, territories, and official abbreviations for the various ARRL sections because there are opportunities for ambiguities and confusion, which lead to errors in logging. For example:

- “Los Angeles County” is a section and most people associate Los Angeles with “LA”. However “LA” is the abbreviation for the state of Louisiana; Los Angeles County is “LAX”. Your logging program will most likely accept “LA” as the section for a W6 since a callsign can appear from just about any section these days. But keep in mind that when the ARRL scores your log, it counts “LA” as Louisiana and if that’s wrong, you lose the QSO. Other sections with similar names are Orange County (ORG) and the state of Oregon (OR), San Diego County (SDG) and the state of South Dakota (SD). Ambiguous state combinations abound: Arkansas (AR) and Arizona (AZ), Alaska (AK) and Alabama (AL), and the quadruple-header of Michigan (MI), Minnesota (MN), Missouri (MO) and Mississippi (MS).
- The California sections “Sacramento Valley” and “Santa Clara Valley” sound very similar, but the abbreviation for the former is “SV” and the latter is “SCV”. Transpose the two and you lose the QSO as well.
- It’s not uncommon for a Canadian station in one of the sections comprised of combined provinces to give his province as the exchange rather than the section name. In SS most logging programs will not accept a province abbreviation which is not a section. Most people will substitute the section name; so if you hear a NB, NS or PEI you should substitute MAR and for YT, NWT or NU the abbreviation NT should be substituted.
- Hawaii, and all of the US possessions in the Pacific Ocean are grouped under the Pacific section, abbreviation “PAC”. In the Caribbean Ocean, Puerto Rico is a section (abbreviation “PR”) and the Virgin Islands are a section (abbreviation “VI”). Guantanamo Bay (KG4) is included as part of VI.

Listed on the next page are the names and official abbreviations for the eighty-three ARRL sections. Become familiar with the names and abbreviations, and perhaps you can avoid having a busted exchange deleted from your SS log. □

ARRL Section List

W1

Connecticut	CT	San Joaquin Valley	SJV
Eastern Massachusetts	EMA	Sacramento Valley	SV
Maine	ME		
New Hampshire	NH		
Rhode Island	RI		
Vermont	VT		
Western Massachusetts	WMA		

W2

Eastern New York	ENY		
New York City/Long Is	NLI		
Northern New Jersey	NNJ		
Northern New York	NNY		
Southern New Jersey	SNJ		
Western New York	WNY		

W3

Delaware	DE		
Eastern Pennsylvania	EPA		
Maryland/DC	MDC		
Western Pennsylvania	WPA		

W4

Alabama	AL		
Georgia	GA		
Kentucky	KY		
North Carolina	NC		
North Florida	NFL		
South Carolina	SC		
South Florida	SFL		
Tennessee	TN		
Virginia	VA		
West Central Florida	WCF		

W5

Arkansas	AR		
Louisiana	LA		
Mississippi	MS		
New Mexico	NM		
North Texas	NTX		
Oklahoma	OK		
South Texas	STX		
West Texas	WTX		

W6

East Bay	EB		
Los Angeles	LAX		
Orange County	ORG		
Pacific	PAC		
Santa Barbara	SB		
Santa Clara Valley	SCV		
San Diego	SDG		
San Francisco	SF		

W7

Alaska	AK		
Arizona	AZ		
Eastern Washington	EWA		
Idaho	ID		
Montana	MT		
Nevada	NV		
Oregon	OR		
Utah	UT		
Western Washington	WWA		
Wyoming	WY		

W8

Michigan	MI		
Ohio	OH		
West Virginia	WV		

W9

Illinois	IL		
Indiana	IN		
Wisconsin	WI		

W0

Colorado	CO		
Iowa	IA		
Kansas	KS		
Minnesota	MN		
Missouri	MO		
Nebraska	NE		
North Dakota	ND		
South Dakota	SD		

VE

Newfoundland-Labrador	NL		
Maritimes	MAR		
Quebec	QC		
Ontario-East	ONE		
Ontario-North	ONN		
Ontario-South	ONS		
Greater Toronto Area	GTA		
Manitoba	MB		
Saskatchewan	SK		
Alberta	AB		
British Columbia	BC		
Northwest Territories	NWT		

USA Caribbean Possessions

Puerto Rico	PR		
Virgin Islands	VI		

Getting Started In SS

The best advice for anyone seeking to learn how to operate the Sweepstakes, or any other contest for that matter, is simply to follow the Nike slogan: **JUST DO IT**.

A beginner to contesting will naturally start by tuning around and finding people to call and work. This is the basic search and pounce technique. It gives the opportunity to listen to a guy, get his information and the rhythm of his operation before possibly embarrassing yourself. If the op is really good, you might do well to listen and observe, just soaking in how a real pro does it. But eventually you will have to speak up, or hit the key, and **JUST DO IT**.

When you have the confidence to make the QSO the first time, without waiting around to observe, you are ready to consider trying to take charge and call CQ. This is how good scores are made. First, it is faster since it eliminates the tuning around time. Second, if you're diligent with your S&P work, you will probably run out of people to call. Conversely, there are many people, perhaps a majority of those on the bands during a contest, who don't CQ. They are just passing out a few QSOs, checking out an antenna, or don't have the signal or desire to slug it out for a CQing frequency. If you don't CQ you won't work these people.

You will need to find a clear, or relatively clear, frequency. Higher up in the band is often a good place to look. Sometimes (especially on phone) there simply are no clear frequencies. An experienced contester might be able to find a possibility and make one, but if you're reading this to learn something new, don't bother. Keep tuning.

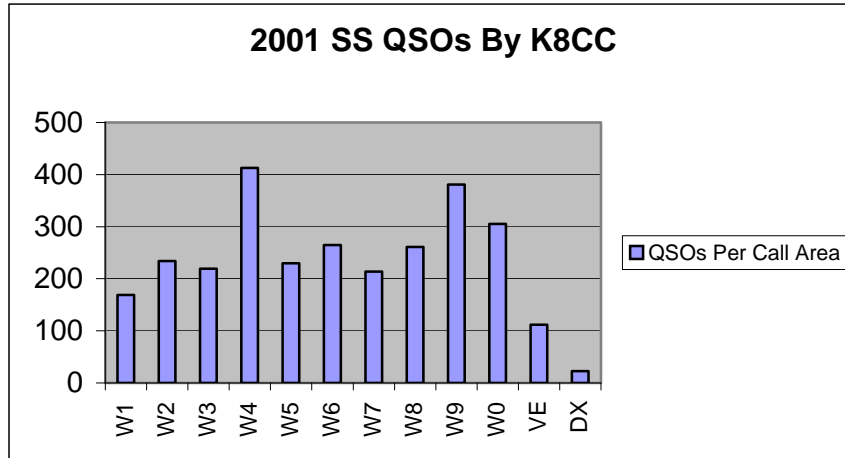
But if you find a possibility, **JUST DO IT**. Call CQ. Keep it short: a 1x2, i.e., "CQ CONTEST FROM KAY EIGHT MIKE RADIO, KILO EIGHT MIKE RADIO CONTEST". If someone calls you, work him. If someone comes back and says "THIS FREQUENCY IS IN USE", grab the tuning knob and move on. If nothing happens, **JUST DO IT** again. Contest tip of the week: Never make a transmission longer than what you can say in one breath. If you have to come up for air, you're talking too long between listens. The one exception: if you're sweet-talking a non-contester into a QSO.

There are probably hundred of little tricks and tips, but they are best passed along over a cold one at a club meeting or hospitality suite. But until you have done enough contesting to say that you've been there, and done that, there is just one tip to remember: **JUST DO IT**. □

SS Demographics

In radio or TV broadcasting, it's important to know who your audience is. Commercial stations carefully select their transmitter sites and antenna patterns to provide the best coverage of the areas where they expect their audience to be. The same holds true for the SS contester.

The chart below shows the breakdown by call area of the stations worked by K8CC on both CW and SSB from the 2001 Sweepstakes (2826 total QSOs).



For our purposes it's useful to condense this information down into east vs. west of the Mississippi River. (Note: includes VE but not Caribbean stations).

Mode	East	West
CW	736 (58%)	531 (42%)
SSB	1025 (67%)	511 (33%)

This chart tells us that the majority of QSOs for a W8 station in SS will likely come from the eastern half of the county. This means that bands where the skip is short (i.e., within 500 miles) will likely be more productive. This is good news for the "little gun" stations, since simple antennas such as dipoles are often all that is needed to be competitive.

Several years ago Tim, K9TM put together an interesting statistic on the subject of knowing your audience. Looking at logs from his high power SSB efforts from K8CC, the following sections were the ten highest by QSO total from 1990-1997:

Section	# of times
IL	7
VA	7
MI	7
EPA	7
WNY	5
NTX	5

Section	# of times
MN	4
WI	3
ENY	3
CO	3
WWA	3
NNJ	2

Section	# of times
MDC	2
NC	1
CT	1
EMA	1
OR	1
STX	1

What does this information tells us? First of all, the top four sections worked from W8 for seven years straight are all within 500 miles. Twelve of the top eighteen are also within this distance.

Both of these analyses come to the same conclusion. The main SS target areas are east of the Mississippi River. Everyone in the country will be aiming to hurl their mighty RF waves towards these locals to maximize QSO totals. How they will do it varies from different parts of the country. From W5 or W7 (prime SS operating areas), the higher the frequency the better. When the sunspots are high these ops will stray below 14 MHz only late at night. But how is a W8 going to work the main target areas? It won't be on the high bands without some exceptional form of high angle propagation (such as E-skip). While this is not likely, it DOES happen – Phone SS in 1993 is a prime example. However, most years the successful W8 Sser will be a low band maven. It might be tempting to QSY to one of the higher bands and avoid QRM, but the lower bands will be where the action is for us here in the Midwest. □

SS Bands, Propagation and Antennas

One of the most valuable skills an SS operator can possess is a working knowledge of domestic propagation on the 80-10 meter ham bands, and the ability to recognize or analyze the conditions being presented during the contest. Some operators will sit down at their station and operate while simply reacting to conditions. However, the operator who understands the propagation modes for each band, installs an antenna system appropriate to those modes, then chooses his operating frequency accordingly, is at a true advantage.

In the previous section we talked about “where our audience is”; that is, the people we want to work during SS. The density of participants roughly follows the overall population density – the greatest on the coasts and varying levels throughout the middle of the country. As we illustrated, there are typically more participants located east of the Mississippi River, however typically we run out of easterners before we run out of contest period so we have to work the westerners too, not just for the section multipliers. More potential “targets” means better chances for attracting stations via COs – a W8 is more likely to have big runs on the bands open to the eastern USA than drawing the attention of fewer participants out west.

It’s useful to think of the five bands typically used in Sweepstakes as “high” bands (20/15/10) and “low” bands (80/40). (160M typically sees little activity in SS, but in very low sunspots or disturbed conditions the converse may be true.) During the day the low bands (at least 40M) are useful for working stations in the eastern half of the USA, while the high bands are useful primarily for working stations out west. 20M actually can have either characteristic during the day; sometimes skip is short and we can work eastern stations, or even the whole USA on that band. During the evening 15M and 10M usually shut down and 20M is the only useful high band. At the same time, at night 40M stretches out so that westerners are easily worked – under the best nighttime 40M conditions the entire USA can be worked at once. 80M, which is dead all day due to D-layer absorption, comes alive at night and can be the preferred nighttime band for working eastern stations.

Another band-related aspect of the SS is that you can only work a station once, rather than once per band as is typical of many other contests. Because of this, band QSO totals can be “traded off” or “interchangeable” – for example, it probably doesn’t matter whether you work KL7Y on 10M or 15M (just as long as you work him!). 20/15/10 are essentially “interchangeable” with regards to the stations you can work. 80/40 can be grouped together as well.

For A W8, There Is No Meters Like Forty Meters

When you combine the ideas of “western” vs. “eastern” areas, “low” bands vs. “high” bands, and “daytime” vs. “nighttime”, an operating strategy begins to emerge. As a general rule, rates are better while working eastern stations, which typically occurs on the low bands. Run rates on the high bands will be lower, or the run may be shorter-lived. Station effectiveness can also have a major impact on the results of these strategies.

When we look to implement this philosophy, which type of antennas have the best characteristics and are the most useful in SS?

LOW BANDS – For 80M and 40M the most useful antenna is the simple dipole or inverted vee at heights between 0.25λ and 0.4λ . At these heights, the antennas are essentially omnidirectional, but most importantly have big, fat radiation patterns with no nulls at the high elevation angles necessary for working the all-important paths to reach eastern stations out to 500-600 miles.

Another useful antenna on the low bands is a good vertical for working further away stations in the western half of the USA. Make sure the vertical has reasonable efficiency by installing enough radials. Also, if you have a 40M beam point it out west for the same purpose. Both of these

antennas will be most useful at night. *However, no matter how good your beam or verticals are, remember that the most important antenna is the "cloud warmer" dipole mentioned above.*

HIGH BANDS – Most of a W8's high band QSOs will be out west. A good beam can produce runs of western stations, and is also useful for blasting through to the difficult multipliers like VY1, VO1/2, etc. Anything from 30' on up is useful, but real high beams can "overshoot" mid-distance sections in W5 and WØ. When planning SS-specific, high-band antennas, think in terms of wavelengths. One wavelength high antennas (20M = 70', 15M = 45' and 10M = 35') are probably the best all-around heights.

While most high band QSOs come from out west, the southeast USA is readily workable as well. If you have a stack of yagis, consider aiming them in different directions to "spray" RF all over the country. In lieu of sprayed stacks, consider putting up one or more dipoles in different directions as alternate antennas.

Whether low or high band, it is VERY useful to have multiple antennas on a band. Many times, switching to another antenna can bring a weak signal out of the noise enough to be copied.

Although we tend to think of beverages and other low-noise receiving antennas in the context of DX or 160M contests, such antennas can be useful during SS as well. While general coverage is usually the goal on the low bands, a directive array can be useful to provide discrimination against QRM and allow a frequency to be usable (for example, on 75M SSB). Also, it is often possible to attract western stations to call in on the low bands – the rate is always better when they call you than when you call them.

While your results in SS will be better with the right antennas, SS is a contest where huge antennas don't command the advantage that is seen in DX contests. Deploy the best antennas that you can, but keep in mind that the margin between you and the biggest guns is probably less than in many other contests. □

Planning SS Off-Times

The successful selection of off-time periods during SS seems difficult to many contesters. Even for experienced SSers, deciding when to take an off time without hurting your score is a mystery.

Actually, off-times are not mandatory – the rules simply state that you may operate a maximum of 24 hours. You could start the contest at 21Z on Saturday and operate straight through until 21Z on Sunday, but this would not likely be a winning strategy (if that's important to you).

The fundamental approach to off-times is that you want to operate when the rates are good, and take off times when rates are poor. There are some assumptions you can safely make about which times of the contest will produce good or poor rates. This is where planning comes in. Perhaps the bigger question is when, during the contest, to decide to take an off time?

Experience has proven that the first twelve hours of SS have the highest activity levels and in general produce the best rate for a serious station. Barring any station breakdown or catastrophic band conditions, you should plan to operate the first ten to twelve hours of the contest without any off times. This should be the most important objective of your operating strategy.

The second decision concerns how much sleep you need. In SS, operating a maximum of 24 hours out of the 30 hour long contest period means that you have a maximum of 6 hours available without impacting your score. Some people like to take all six hours in one chunk and simply soldier on until the end of the contest. A much better approach is to plan your sleep period to allow a few off times during the day on Sunday to give some flexibility in coping with drops in the QSO rate. One recommendation is to sleep in multiples of 90 minutes (i.e., 1½ hours, 3 hours, 4½ hours, etc.) to take advantage of the human body's normal sleep cycles.

When should you start and end your sleep break? Here in W8, SS activity on Sunday morning doesn't really pick up until 11Z-12Z, so that should be your target to get back on the air. On Saturday evening, as 07Z passes start watching your rate. Keep pushing on until your rate drops below what you think your worst rate will be on Sunday. A typical rule of thumb for a high power CW entry might be 40/hour, but this will be different for the various power levels, and also between CW and SSB. As you start to drop to this target rate, decide on a time duration for your off time, allowing for "90 minute multiples" of sleep, plus any shower or breakfast time. For example, let's say you're approaching 0830Z; 3 hours sleep plus 30 minutes for a shower and snack gets you back on the air at 12Z with 2½ hours of off time (five 30 minute periods) left for Sunday. Anything between three hours and five hours is OK, but the more you sleep the less off time you have to work with on Sunday.

The big question in most people's minds is when to take off times on Sunday? A general recommendation is whenever you've gone several minutes without a QSO and you're not sure where to go next. Take an off time, get a snack, relax for a few minutes, then plan what to do next.

Other recommendations:

- Plan for a 30 minute break around lunch and another around supper. You need to eat, so you might as well do it when most other people will. This may also allow you to eat with the rest of the family. Don't necessarily stop right at a particular time, but be prepared to take the off time when you encounter the conditions mentioned in the previous paragraph.
- Some operators recommend avoiding the start of the Sunday afternoon football games around 18Z and 21Z. However, it seems reasonable that if people are going to QRT to watch

the start, they'll watch the entire game. You can't avoid the entire game unless you have a LOT of off time remaining, so don't worry about it.

- One big question is the "end of the contest" strategy. Some years a lot of part-time SSers come out of the woodwork and provide "fresh meat" to work at the end of the contest. Other years, the rate simply continues to dwindle so that the end of the contest is a welcome relief. Pick a strategy (perhaps looking at last year's results) and take your chances.

Above all, keep an accurate record of your off times during the contest. Nothing is worse than finding out you took too much off time, except for maybe finding out you did not take enough and some of those tough-to-find QSOs have to be tossed from your log. □

QRP Techniques

The same rules apply to QRP operating as in the other power categories. CQ when you can, S&P when you can't, and act like any other big gun.

Unless you have a big antenna farm, most of a QRP station's contacts are going to come via S&P. Because of this, you have to be really good at finding stations you haven't worked, particularly on Sunday. You're going to be constantly tuning to find a new one. This can't be over-emphasized. You have to listen carefully to the pieces of exchanges that you copy as you tune, try to figure out who's running on the frequency, and try to catch the callsign portion of the exchange. If he's a new one, wait for the QSO to end and dump your callsign. If he doesn't come back to you, note the callsign and frequency, move on, and check back in a while. Perhaps propagation will change in your favor.

Another way you have to keep moving is to change bands often. Stations come and go all the time so it's your job to find them while they're active.

Running a frequency (calling CQ) is always preferable to S&P if you can attract attention and keep a steady stream of customers coming. Therein lies the rub – attracting attention with QRP power levels is tough to do unless you have lots of aluminum in the air. More times than not, someone is going to steal your frequency. Shake it off and move on. The next most likely outcome is that you'll call CQ and no one will answer for large blocks of time. This has an obvious negative impact on your score, although it does give you some time to rest your brain a bit. During daylight, 40M is one of the bands where the QRP S&P should be able to call CQ and hold a frequency for more than a few minutes. If the sunspots are good, 10M is another great place. If 10M is dead, 15M is the place to go, particularly about 21.050. You can usually find open frequencies on 20M below 14.025 at the cost of a more limited audience. The higher end of 80M (3.550 or so) is typically when you can find a frequency at night.

As is the case with QRO, it is vitally important to be on for the first 12 hours of the contest. When the rate drops, typically around 2:00 or 3:00 AM local, get some sleep until about 6:00 AM then grind your way through the next 12 hours. Again, change bands often and keep moving up and down each band. You have to pull out every QSO you can. During the second 12 hours be sure to get up and walk around for a minute or two every hour. This will help keep your body from cramping up and it helps to clear the cobwebs from your head.

There are two other things to keep in mind when running SS QRP. One is that you're going to need your best DX pile-up skills when you run across the rare ones like VY1JA and VO1MP. Listen carefully to what's going on in the pile so that you know when and where to transmit. If you get bogged down in the pileup, you will have to decide between bagging a multiplier (and a possible sweep) and your rate. The second thing is to act like you're loud even though you're not. Don't QRS just because you feel you're weak. Make exchanges at the rate that matches the running station - he'll ask for fills if he needs them. If you're answering a CQ along with another station, don't get gun-shy because you feel you're weak. Get in there and think loud. Use your skills to get through first and make the other guy wait.

The mental attitude of QRP operating in SS should be no different than QRO. Think **WIN-WIN-WIN**, **RUN-RUN-RUN** and **RATE-RATE-RATE** and you'll be doing just that – WINNING. You'll hit the same lows and highs as you do operating in the other classes so just keep going.

Good luck and work those weaker stations too. □

Low Power Techniques

Running 100W in SS can be very challenging, but with proper planning it can be very rewarding. You do not need an enormous antenna system to be successful – a low tribander and dipoles for 40M and 80M can produce 800+ QSOs from here in W8.

The first thing to consider is where to obtain the most QSOs for the effort and amount of time spent operating. Being located in the 8TH call district in the mid-west, the most productive bands that we have for SS is 40M followed by 80M. Using these two bands as your bread and butter for making contacts you should be very successful, while 15M and 20M can be used for picking up multipliers out west. If your operating time is limited and you're getting on to help the club, these are the two bands you will get the most out of for the amount of time you have to operate.

Start the contest on 40M and run for the first 15-20 minutes calling CQ and S&P through the band, then make a switch to 15M (if it is open or 20M to S&P for multipliers. Always watch the rate meter, because it prevents you from staying too long on a band without maintaining a decent rate. You have to remain flexible enough to make the necessary band changes to maintain a good rate level to hit your QSO target. Remember, the majority of the time you will make the most QSOs the first day. After sweeping 20M for mults, it's back ton 40M for running rate. Start out at one end of the band or the other and work my way up or down looking for clear spot to call CQ. Stick with this sequence for the next three hours until 80M opens up, usually around 0030-0100Z. Switch to 80M and use it for the run band and switch back to 40M to run when the rate drops. It is important to utilize the rate meter as much as possible when making band changes. If you are not making any rate then there is no sense in sitting there calling CQ. You need to start sweeping the current band that you are on or go to a different one. If you're successful, you'll finish up the first twelve hours with 500+ QSOs.

Start up Sunday morning for the first hour or so on 80M or until the rate drops then switch over to 40M. Most of the day will be spent on 40M with band changes to 15M/20M to get some rate going. However, if there is no real rate switch back to 40M. Finish up the contest either on 40M or 80M depending on which band is producing. One thing to keep in mind is the last half-hour of the contest will often yields some pretty good results. People are looking to get the 100 QSO pin and others just looking for another contact to work as they sweep the bands. So it is important to just pick out a spot for the last half-hour and call CQ.

The real key is to keep the rate going. A lot has been said about this, but maintaining a good rate level will help you get a good score. Sometimes just moving 20-30 KHz and calling CQ will often get the rate going again.

One last point is to THINK POSITIVE. Having the right attitude, thinking and operating like you're a "big gun" even though you're just a pee shooter will help you achieve the results you desire and help MRRC win the SS gavel. □

High Power Techniques

High power SS is the top of the heap – sort of the Nextel Cup of the SS race. You have the potential to work everybody, but geography and propagation conspire to make a top ten national ranking difficult for a W8. However, the good news is that SS is a contest where the mid-west can still work a LOT of people – an amplifier makes this easier to accomplish.

For station recommendations, just about any competition-grade transceiver will do fine in SS. Find something that you're comfortable with ergonomically, but also examine receive performance, particularly strong signal handling. Cascaded IF filters are very desirable for CW, while good speech processing helps to punch through on SSB. A full legal limit 1500W amp will make a significant difference over the half-KW units, and the old beater SB220s as well. Whatever you use, make sure its reliable and that you are familiar with it. Practice so that you can bandswitch the entire rig in three seconds or less.

High power SS is almost 100% a rate contest. You need to call CQ constantly to finish well. Maintaining a run frequency is an art unto itself, but here are a few tips:

- Adjust your CQ to your current audience. If signals are loud and the rate is good, you can shorten up your CQs. If conditions are poor (perhaps on the low bands with QRN) or the rate is slow, you may need to slow down and lengthen your CQ to draw attention to your signal.
- The best way to hold a frequency is to be making QSOs quickly. While this might seem obvious, there are things you can do to make this happen. Keep your exchange short, and don't repeat anything unless asked. On CW send quickly, perhaps 30-35 WPM if you're comfortable at that speed, but don't send too terribly fast for you might drive away slower ops. Again, tailor your technique to the audience you think is there.
- If a frequency dries up, but you don't want to change bands, try a different place in the band. Vary your CQing spot in the band by trying down low, up high, or somewhere in the middle.

With one radio, if you're S&P'ing then you're at best holding your own and at worst losing the contest. With two radios you can CQ on one radio and S&P on the second.

With high power, if you are doing a good job of making yourself available to QSO, most of the section multipliers will come to you. Don't start to worry about multipliers until the second half of the contest. Usually, you'll end the first day with a section count in the mid-seventies, which leaves only a few to worry about. However, that doesn't mean that you shouldn't feel a little kick if a difficult section calls in early or on an unexpected band. (In the 1996 CW SS, VY1JA called K8CC on 3518 the first night!) In reality, none of the sections are difficult to work as long as there is reasonable activity from that section. These days there are permanent and rental contest stations in PR and VI, which typically makes them easy to work. Often, there will be one or more Canadian sections (never including Ontario) which proves elusive, particularly on CW. If you hear any of these, work 'em now - you might not hear them later. □

Multi-Operator Techniques

While there may be many reasons for choosing the multi-operator category for SS, the discussions here are written from a standpoint of true competition: WINNING! We all know that a southern QTH would benefit our scores more than adding operations, stations and antennas; however, competing within your region, against reasonably competitive stations, or even against your previous scores all fall into true competition.

Before we get too far along, it's important to understand the rules for the multi-operator category in SS. First, more than one person is involved in the operation and logging of contacts from a given station and callsign. Second, PacketCluster is allowed for locating available stations to be worked. Finally, while the use of two or more transmitters is allowed, there is the stipulation that only one transmitted signal be emitted from a station at a time. So in order to get started in multi-operator SS, plan around multiple radios BUT be sure you cannot transmit simultaneously.

Two transmitting stations is a definite advantage, if the antennas and feedlines can allow it. Some sort of lockout circuit is needed to lock out the second transmitter when the first was keyed. The best approach, if possible, is to treat each station equally in design so that either could serve as the principal RUN station or the secondary SEARCH station. If you're going to consider multiple stations, you'll need multiple antennas with each station having access to all antennas. This can be as simple as the "plug into whatever you need" approach using a patch bay which reduces the need for a lot of antenna switches. While it's easy to pre-plan and assign specific bands per radio, when you're in the heat of things plans quickly change. One important note: if you're switching between antennas on a single band, you won't want to mess with antenna tuners so make sure your amplifier easily loads into them without retuning. Plan what you need in antennas, make sure they have independent feedlines, and make them easy to identify! (By the way, we all know how important 40M is to us here in the Midwest during SS. Having two low 40M dipoles in two different directions is MOST helpful.)

Be prepared for inter-station interference when operating a pair of kilowatt stations from the same location. Some antenna combinations will be worse than others and you'll quickly find what's compatible and what's not. There are commercially built bandpass filters available that can help this, or homebrew designs have been published in QST and the NCJ. When using bandpass filters, remember to change or remove the filter when changing bands! If you cannot conquer the inter-station interference problem, keep in mind that the running station with RATE gets the preference.

When preparing your station for the contest, make sure all computers are properly connected for multi-logging. If possible, have the PacketCluster accessible at all the computers. Perform several tests to make sure you don't have RF problems. Nothing is more frustrating than to have your computers crash in the middle of a 120+ per hour run. (Oh yes, it's a good idea to have paper log forms and pencil handy!)

As with any contest operation, having back-up equipment available is important. Our back-up rig would be set up as a separate receiver to monitor bands not currently being worked. (Having that third person is most helpful!) This "third station" also had the back-up computer networked with the two transmitting stations. Make sure you write down all of the port settings on each computer in case you have to make any changes in equipment. If you have a major problem that would take a station off the air for 5-10 minutes, consider shutting down completely for a thirty minute off-time but do so only during the second day when rates are down. If both stations are affected, take the off time no matter when it is and get the problem fixed correctly!

Having the stations side by side can be most helpful. There's a lot of communication between ops during a contest, especially when things slow down and you need to make some strategy decisions. Your ops should be at the station a couple of hours before the contest starts. They need

to be VERY familiar with the equipment and logging program. Tuning settings on amplifiers should be clearly marked, and any limitations (such as grid current) noted. In front of each station BOLDLY display the callsign in use and the exchange. While it may be obvious for you, a guest operator will occasionally send or speak his call or check by mistake.

Operators can make or break your score, especially in a multi with interlocked radios. It's imperative for your ops to understand that the longer they have their radio keyed, the longer you'll have to wait to transmit on yours. It's most frustrating to hit the foot switch and yell and exchange into a dead microphone, especially if the other op is taking the time to say "have a nice day" or "hope you do well in the contest". Get the point? Keep transmissions short and to the point but remain friendly.

The number of operators can vary, but the optimum number is probably three. This way there's always two people on the radios, plus a spare person to run errands, fix antennas or computers, give relief to a tired op, or listen on a third radio. The team should plan to be together for the entire thirty hours, preferably sleeping at the same time and all in the shack at the same time. Develop a schedule to rotate ops when one is ready to take a break. The third guy can always keep the hourly graph updated and make notes and comparisons to previous scores, times and band performances. You want a totally committed team.

Starting the contest – the run station should open on the highest band possible that will support decent rate. Work the 6s and 7s whenever possible! We generally found 20M the best place to start. Put the second station on the band below the run station and sweep the band, then check out the next higher band. Remember to check for 10M activity. Your objective is to end up after a couple of hours on 40M looking for an empty hole to claim for running. Keep in mind that both stations can call CQ as long as it's not simultaneous. At some point the 40M station will be the main running station and the 20M station will start looking at 75M. When the rate falls below 60/hour (this is on SSB - ed.) it will be time to consider sleep. In this regard, a multi-operator station is just like a single op – see the section about *Planning And Taking Off-Time* elsewhere in this Handbook.

Sunday morning operations usually begin between 1200-1230Z. With two stations you should always be able to find the "hot" band. It can't be stressed enough about checking 10M. Even with the licensing changes, there's a class of amateurs on 10M that you won't find anywhere else! Don't neglect 160M either – WD9INF once finessed 100 contacts on that band in SS. Virtually all of them gave numbers less than ten. They all counted and very few, if any, were in our competitor's logs.

Save some off time for anytime during the day when the rate would gets really bad. If convenient, break for thirty minutes around supper on Sunday to gear up for the last "run to the end". It's also a good time to plan strategy. Review the last four hours of the previous year's log and pick a strategy.

Make notes about what worked and what didn't. On Saturday night, write down frequencies on 40M SSB which you find fairly clear and try to be there early Sunday night. Try out new antennas and if you discover something you need, have one the following year.

A good multi-operation in SS takes a lot of planning and preparation. Once you have everything in place, the contest will be a lot of fun. □

Single-Operator, Two-Radio (SO2R) Operation

The concept of a single operator running two radios has become very popular in recent years. The idea itself is not new – many long time operators like Scott, KØDQ and Len, W3GRF used stereo headphones and one radio in each ear. I was first introduced to the technique back in the early 80s from Tim, K3LR. Back then there was an East Coast “brat pack” of young guys like Tim, Andy/N2NT, Phil/K3UA, etc. who had really perfected the technique. My contribution was to apply some engineering logic to the inter-rig switching required, and ops like K5GO, W9RE, K2UA and others joined the fray using the K8CC switchbox design. Then in the early 90s, N6TR took the automation control even further, adding advanced two-radio controls to his *TRlog* contest logging program. I merged Tree’s methods with my prior two-radio control logic and have added these to my *NA* Contest Logging program. These programs are the current state-of-the-art in single-operator, two-radio (SO2R) operation.

However, the single-op doesn’t have to utilize one of the latest state-of-the-art setups to gain the benefits of a second radio. In fact, I would recommend starting with a simple two-radio setup before attempting to tackle a more advanced arrangement which can take some time to master. Practicing ahead of time is very valuable – Bill, W4AN used to keep his two radio setup at a smaller station his home (his big contest station was on a mountain top an hour away) so he could practice during the week.

Before going further I would like to recommend that newcomers to SS and/or contesting in general become proficient with one radio before attempting SO2R. You need to have the basic operating techniques mastered before tossing the second radio into the mix. Listening on two radios and jumping back and forth can get confusing and is mentally tiring.

Obviously, to do SO2R you have to have two radios. If you only own one, perhaps you can borrow one from a non-contesting buddy. It’s a real benefit to have two radios of the same type so that you are not flip-flopping back and forth struggling with different control layouts. However, even a mediocre second radio will provide benefits through SO2R, so don’t be afraid to go with what you have.

The key issues for setting up a SO2R station center around dividing the bands and prioritizing the radios. At K8CC there are two identical FT-1000Ds with single band amplifiers and monoband antennas. Everything is identical and symmetrical – that is, either radio can work any band and assume the role of either the primary run station or secondary search station. Take a log at your two radios (and final amps, if you’re QRO) and decide whether you’re comfortable with radios of equal priority or whether you want to use one as primary and the other as secondary.

The antenna farm also comes into play in prioritizing the radios. If you have two “equal” stations, you might decide to assign certain bands to one and certain bands to the other. This can be a useful approach when running high power and you have to bandswitch one or more amps. For a number of years, at K8CC we would put one radio on 40M and bandswitch the other between 80/20/15/10. This works real well for a W8 where 40M is so important. Be sure to test all band combinations for RF interactions that might damage the other radio. Bandpass filters and isolation stubs such as used in multi-operator, multi-transmitter stations may be necessary. Another option that is particularly useful if you have one “good” radio and another of lesser capability is to simply put up a multi-band trap vertical for the second radio. There are very few stations you can’t work with a trap vertical in SS, even with 100W. Another advantage of such a setup is that if your main antennas are a beam and dipoles, the cross-polarization will help isolate the two radios.

A major consideration in your SO2R setup is ensuring that each receiver is not subjected to too much RF when the other radio is transmitting. If you’re running low power or QRP, you probably won’t couple enough RF from one antenna to another to damage a receiver connected to it.

When we were at WRTC in 1996, we had two IC-765s and would have one on a tribander making QSOs and the other on a 40M dipole only a few feet below it searching for mults on any other band. While we had bandpass filters but they were inconvenient to switch manually, so we tried operating without them and found we did not damage the radios. On the other hand, there was a case up here in Michigan where RF from one transmitter actually set the other receiver on fire, however this was an extreme case where both radios on the same band running high power and the antennas were both on the same tower.

Your first line of defense against damaging a radio due to excessive RF is to make sure both can't wind up on the same band together. But a radio can also be damaged from out-of-band RF. If you're using multi-band antennas such as tribanders, you need to consider all of the potential cases. For example, if you're transmitting on a triband yagi on 14 MHz with one radio, while receiving on a multi-band trap vertical on the other radio on 21 MHz, the vertical might pick up enough 14 MHz RF to damage the radio it's connected to.

The second line of defense against receiver damage is physical separation between antennas. There are no hard and fast rules here, so experimentation with an RF probe in place of your receiver is in order. Polarization differences can accomplish much the same thing – one radio on a horizontal antenna and the other on a vertical will pick up much less RF from each other. Keep in mind that some antennas (like low band inverted vees) have both horizontal and vertical components.

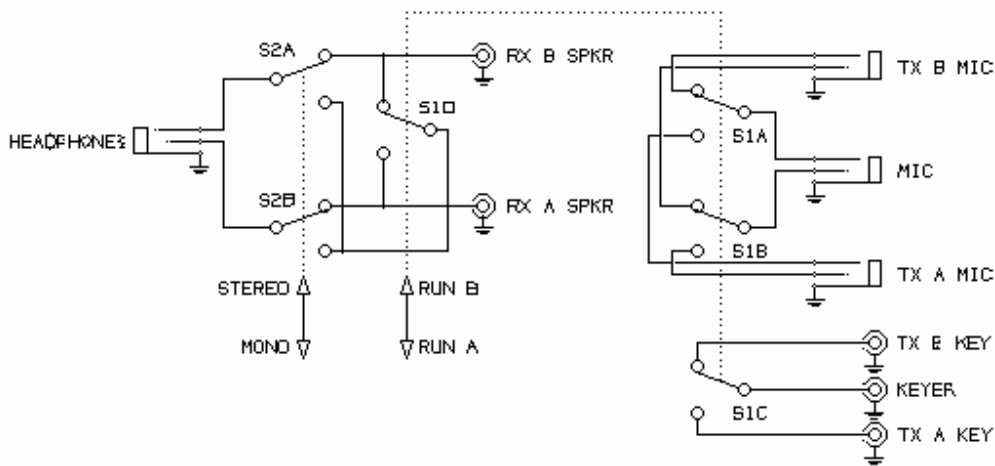
The elegant way to protect your receiver from excessive out-of-band RF is with bandpass filters. Commercially made multi-band and single band filters are available from Array Solutions (<http://www.arrayolutions.com>), Dunestar Systems (<http://www.dunestar.com>) and Industrial Communications Engineers (<http://www.inducomm.net>). Homebrew designs from W3LPL and K4VX have appeared in the National Contest Journal over the years. However, bandpass filters add yet one more task during the bandswitching process which should be considered in your station layout.

Now that you have two radios, how do you interface them to your one single brain? There are endless possibilities in this regard, and I've tried most of them. It is absolutely imperative (as mentioned in N8KR's multi-operator techniques) that your setup MUST NOT BE ABLE TO TRANSMIT ON BOTH RADIOS. There is no doubt about it – this is explicitly against the published SS rules. You cannot police yourself, no matter how much discipline you intend to apply. It got a very well know SS big gun in trouble one, and a certain W8 SS big gun has been caught doing it too. Stay out of trouble and save your reputation

So how do you operate SO2R in SS? The objective is to be able to CQ on one band while searching on another. You want to be able to easily work people who answer your CQ, but you also want to be able to find new stations, stop CQing to work them, then start CQing again.

Here is a typical SO2R scenario – its 18Z hour on the Sunday of SS CW. One radio is CQing on 40M and getting an answer every two to three minutes. In the meantime, you're scanning 10M on the second radio with the beam northwest looking for KL7 and VY1 for your last two section multipliers. Eureka! There's KL7Y on 28038 with a good signal. When he finishes his QSO and send QRZ, you stop your CQ on 40M and dump your call to KL7Y. If he answers someone else, you start CQing again on 40M. However, if he answers you then copy his exchange, send your exchange, log the QSO THEN start CQing on 40M again.

The simplest SO2R setup I've seen is shown below. S1 is a multi-pole, two-position switch that is used to select either radio "A" or radio "B" to be the "running" radio (i.e., the one which usually transmits). S2 is a DPDT switch that selects from either monaural or stereo headphone operation. In the monaural mode you hear the "running" radio in both ears. In stereo mode, you hear one radio in each ear. It may be obvious, but setup your stations and headphones so the left radio is in the left ear and vice versa. Some people set up their station for stereo mode all the time, but I have found that it is quite often useful to switch to monaural mode to concentrate on copying a weak signal.



The SO2R setup shown above works manually. However, both the NA and TRLog contest logging programs will automate the process using an SO2R interface that connects to the logging computer's LPT port. Recently, two commercially-made, computer-compatible SO2R switchboxes have become available. The SO2R Master from Array Solutions (<http://www.arrayolutions.com>) and the DX Doubler from TopTen Devices (<http://www.qth.com/topten/>) connect to your logging computer running CT, NA or TR and handle the switching described above. Designs for homebrew boxes have also been published; the 2000 or later ARRL Handbook has a design by N6BV, while another design is shown in the manual for the **NA** Contest Logging program.

Ordinarily the second radio isn't needed during the first twelve hours because the rate is usually pretty good. However, in 1996 the conditions stunk so bad at K8CC during the CW contest that the second radio was being worked hard by the middle of the third hour. It is also useful for checking activity on a band before committing to a band change. When the rate is good (say, over 60/hr on CW) then you can allow yourself to concentrate on the main radio.

However, the second day of SS is when SO2R comes into its own. During daylight hours, a good approach is to CQ on 40M while searching 20/10/10. Then, perhaps try CQing on a high band while searching 40M. After sunset, split your time between 40M and 80M using the same setup. With two radios, you can be CQing *SOMEWHERE* all of the time. It takes coordination, and a certain amount of finesse to pull it off. You might actually lose your run frequency if you're not careful. Also, you'll probably find that after a weekend of SO2R, you're much more fatigued because you're thinking more and working harder. However, you'll also have more QSOs and that's what it's all about.

Good luck with single-operator, two-radio operation. □

Ten Ways To Maximize Part-Time SS Efforts

Not all of us can devote a full weekend to SS. However, as a club member the rest of MRRC is hoping that you will get on and contribute to our efforts to win the Affiliated Club Gavel. With a weekend full of typical family chores, how do you make the best use of the time you have available? Here are some tips to help you maximize your part-time score.

1. Set aside specific times to work the contest; don't just drift in and out of the shack making a few QSOs each time. If you clear specific time periods ahead of time with the family, it should not be too difficult to find six or ten hours that can be devoted to SSing over the contest period.
2. One possible strategy to maximize a part time score is to focus on the high bands for a couple of hours in the late afternoon (to get western sections), then a couple of hours on 80M/75M in the evening (for the close in sections), and finally a couple of hours on 40M during Sunday morning (when conditions and rate are typically good for a W8 station).
3. Enter the highest power category your station can muster. Your goal in a part-time effort should be to make as many points as possible and QRO typically means more points.
4. If possible, operate on Saturday when the activity is the highest. If you can, try to re-arrange family time so that you can work the first few hours full blast and spend more time off with the family on Sunday.
5. An alternative to #3 above is to operate when the bands are less crowded, or when you might garner more attention as "fresh meat" on the band. Examples might be on 75M on SSB after 0400Z, or on Sunday when lots of people are combing that bands looking for new stations to work.
6. Concentrate on QSOs and let the majority of sections come to you at first, whether you're CQing or S&P. After the first few hours, check your section list and if necessary, adjust your operating patterns and band selection to maximize your opportunities to work the remaining sections.
7. Use a real-time contest logging program. This turns the contest into a video game – each QSO that rolls the score counter over a little more is fun and an impetus to keep going.
8. Turn on your PacketCluster and use it to help located needed sections to boost your score. Such operation will put you in the "unlimited" category, so change the precedence in your exchange to "U". Since there are no power distinctions in the unlimited category, you might as well go ahead and turn on the amp (see point 2 above).
9. If you're missing some of the hard northwest sections (VY1, KL7, etc.) make time around 21Z either day on the high bands with the antennas northwest. Trying both CQing and S&P. Sometimes conditions make it hard for even good stations from these areas to be heard, so don't ignore weak signals – you might be rewarded with a pileup-free opportunity for a new section.
10. If you haven't been on much during the contest, get on for the last few hours and be the new station on the band. It can be lots of fun being fresh meat...

After all your hard work, be sure to SEND IN THE LOG. □

SS TOP TEN SCORES FOR MICHIGAN THROUGH 2015

CW Single Operator - High Power

94	WA8ZDT	195,000	1300	75
96	K8CC	188,916	1211	78
93	WA8ZDT	182,704	1202	76
91	K8CC	182,490	1185	77
93	K8CC	181,336	1193	76
90	K8CC	171,300	1142	75
83	WA8YVR	159,100	1075	74
88	K8CC	156,436	1057	74
78	K8LX	153,150	1021	75
83	K8CC	152,144	1028	74

SSB Single Operator - High Power

93	K8CC (WD8IJP)	294294	1911	77
96	K8CC (K9TM)	272064	1744	78
94	WA8ZDT	263802	1713	77
95	K8CC (WD8IJP)	252406	1639	77
94	K8CC (WD8IJP)	249942	1623	77
94	AA8U	248248	1612	77
96	AA8U	247572	1587	78
93	AA8U	239316	1554	77
91	K8MJZ	239008	1552	77
92	K8MJZ	236852	1538	77

CW Single Operator - Low Power

10	N8SS	171,746	1087	79
01	W8MJ	171,680	1073	80
02	W8MJ	163,214	1033	79
03	W8MJ	161,634	1023	79
08	N8SS	161,120	1007	80
97	W8MJ	159,738	1011	79
14	N8SS	159,572	973	82
09	N8SS	158,240	898	80
99	W8MJ	154,440	990	78
98	W8MJ	151,838	961	79

SSB Single Operator - Low Power

02	W8MJ	208,640	1304	80
95	AA8AV	206,052	1338	77
97	W8MJ	202,082	1279	79
98	W8MJ	196,394	1243	79
01	W8MJ	196,000	1225	80
00	W8MJ	195,040	1219	80
96	W8MJ	190,832	1222	78
92	AA8AV	186,494	1211	77
94	AA8AV	186,032	1208	77
03	W8MJ	178,640	1160	77

CW Single Operator - QRP

10	K8MM	157,120	982	80
99	K8MM	121,836	781	78
08	K8MM	106,018	671	79
00	W8RU	102,700	650	79
13	KT8K	101,352	618	82
98	W8RU	95,004	609	78
09	K8DD	92,746	587	79
99	W8RU	91,504	602	76
14	KT8K	90,396	558	81
09	KT8K	89,782	583	77

SSB Single Operator - QRP

93	WB8G	100,408	652	77
06	K8IR	66,676	422	79
12	KT8K	66,584	406	82
13	KT8K	64,960	406	80
02	K8IR	63,360	396	80
14	KT8K	55,748	362	77
11	KT8K	55,380	355	78
04	K8IR	55,068	353	78
05	K8IR	52,350	349	75
09	K8IR	48,516	311	78

CW Single Operator - Unlimited

08	W8MJ	193,760	1211	80
07	W8MJ	193,600	1210	80
09	W8MJ	183,360	1146	80
06	W8MJ	180,000	1125	01
99	AA8U	142,200	900	79
03	W4FMS	129,948	833	78
15	K8BZ	128,152	772	83
04	KT8X	126,560	791	80
10	W8MJ	125,120	782	80
03	W4FMS	122,122	793	77

SSB Single Operator - Unlimited

10	W8MJ	258,560	1616	80
04	W8MJ	242,720	1517	80
09	W8MJ	241,760	1511	80
08	W8MJ	240,480	1503	80
06	W8MJ	228,000	1425	80
07	W8MJ	225,120	1407	80
99	AA8U	213,300	1350	79
05	W8MJ	211,360	1321	80
11	N8SNM	206,400	1290	80
12	N8SNM	201,026	1211	83

CW Multi Operator

06	K8CC	198,080	1238	80
97	K8LX	197,974	1253	79
01	K8CC	197,920	1237	80
02	K8CC	192,640	1204	80
00	K8CC	190,240	1189	80
04	K8CC	181,920	1138	80
96	WA8ZDT	180,024	1154	78
09	K8CC	180,000	1125	80
95	AA8U	172,018	1117	77
94	AA8U	164,934	1071	77

SSB Multi Operator

98	K8CC	272,708	1726	79
04	K8BB	252,480	1578	80
06	K8BB	250,720	1567	80
95	AA8U	250,250	1625	77
96	NU8Z	246,460	1580	78
93	K8MJZ	246,092	1598	77
03	K8CC	244,584	1548	79
02	N8KR	240,960	1506	80
02	K8CC	240,160	1501	80
01	N8KR	240,000	1500	80

SS TOP TEN SCORES FOR OHIO THROUGH 2015

CW Single Operator - High Power

95	K8AZ (K8NZ)	193,732	1258	77
02	K9NW	183,040	1144	80
93	KW8N (WD8IXE)	180,424	1187	76
92	KW8N (WD8IXE)	180,334	1171	77
92	WR3G	179,256	1164	77
93	KQ8M	178,752	1176	76
00	K9NW	177,440	1109	80
03	K9NW	176,328	1116	79
01	K9NW	175,040	1094	80
15	K1LT	174,798	1053	82

SSB Single Operator - High Power

97	K8DX	298,778	1891	79
13	KW8N	278,714	1679	83
93	KW8N (NZ4K)	270,424	1756	77
00	K8DX	252,000	1575	80
91	K8AZ (K8NZ)	238,700	1550	77
99	K8DX	237,790	1505	79
00	K8ND	237,440	1484	80
95	NZ8O	235,620	1530	77
00	N8VW	233,920	1462	80
01	K8DX	226,572	1434	79

CW Single Operator - Low Power

12	W1NN	168,656	1016	83
10	W1NN	165,742	1049	79
09	N8AA	163,372	1034	79
97	K8BL	162,740	1030	79
99	K9TM	162,740	1030	79
11	W1NN	161,760	1011	80
13	W1NN	159,526	961	83
00	K9TM	158,400	990	80
13	W8CAR	158,384	954	83
98	K9TM	157,248	1008	78

SSB Single Operator - Low Power

94	N8JEC	206,836	1246	83
94	N8JEC	189,266	1229	77
99	KU8E	184,228	1166	79
96	K8JZ	175,656	1126	78
02	W8DD	175,200	1095	80
03	N8AA	174,880	1093	80
01	W8DD	174,400	1090	80
03	N0FW	171,200	1070	80
00	ND8DX	170,080	1063	80
01	K8BL	162,720	1017	80

CW Single Operator - QRP

13	K9TM	117,588	717	82
94	K8MFO	100,168	659	76
00	N8ET	95,004	609	78
11	N5EE	93,288	588	78
99	WA8RJF	84,300	562	75
95	WA8RJF	83,232	578	72
92	WA8RJF	82,950	553	75
04	W8TM	77,700	518	75
06	W8TM	80,050	525	77
97	WA8RJF	79,952	526	76

SSB Single Operator - QRP

02	K9TM	133,120	832	80
04	N8IE	75,816	486	78
03	N8IE	68,882	471	71
02	N8IE	67,680	423	80
01	N8WL	65,832	422	78
07	N8IE	65,280	408	80
93	WA8RJF	64,824	438	74
92	W8ILC	64,064	416	77
92	WA8RJF	61,500	410	75
01	N8IE	60,514	383	79

CW Single Operator - Unlimited

15	K8ND	164,984	1006	82
12	N8BJQ	156,040	940	83
02	N8BJQ	148,000	925	80
99	W0CG	144,924	929	78
14	K8AZ (K8NZ)	134,622	831	81
09	N8BJQ	132,800	830	80
04	N8BJQ	131,200	820	80
10	N8BJQ	113,440	709	80
02	W8AV	107,598	681	79
07	N8BJQ	102,880	643	80

SSB Single Operator - Unlimited

10	KW8N	267,520	1672	80
12	WZ8P	172,972	1042	83
07	N8TR	156,320	977	80
08	K8YM (ND8L)	132,160	826	80
05	W8DD	125,610	795	79
06	N8TR	121,600	760	80
08	N8TR	117,280	733	80
00	N8BJQ	114,240	714	80
09	N8TR	111,232	704	79
03	N8TR	109,760	686	80

CW Multi Operator

01	K8ND	164,684	1006	82
01	W8AV	162,266	1027	79
83	WB8JBM	161,616	1092	74
99	W8AV	159,738	1011	79
99	KU8E	155,220	995	78
82	WB8JBM	154,944	1076	72
81	WB8JBM	154,322	1057	73
12	W8EDU	151,392	912	83
	WB8JBM	150,088	1028	73
02	W8FT	149,942	949	79

SSB Multi Operator

95	KW8N	332,640	2160	77
96	KW8N	325,728	2088	78
94	KW8N	316,008	2052	77
92	KW8N	304,766	1979	77
91	KW8N	294,140	1910	77
95	WD9INF	288,750	1875	77
98	KW8N	287,718	1821	79
10	N8HR	265,920	1622	80
89	KW8N	260,106	1689	77
04	N8HR	259,520	1622	80