

K8MQP Multi-Multi in the 2007 Michigan QSO Party

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In the July/August 2007 *NCJ*, John, W4AU, wrote about his club's experience operating a multi-operator/multi-transmitter effort as W3ZI in the 2006 Pennsylvania QSO Party (PaQP). Interest in many state QSO parties has grown in recent years to provide a variety of contest experiences beyond the major events like CQWW, SS, ARRL DX or WPX. For the past three years our group has been mounting a multi/multi operation in the Michigan QSO Party (MiQP) — similar to that of the W3ZI team in the PaQP. I thought it would be interesting to show how these operations merge elements of "serious" contesting with aspects of Field Day in such a way that anybody — even someone with just a small station at home — can join with friends to put on a major portable contest effort.

The rules for the Pennsylvania and Michigan QSO parties are largely similar. QSOs count separately on CW and phone, and both events have an M/M category that does not preclude having simultaneous stations on phone and CW on the same band. If you think keeping transmitters on *separate bands* from interfering with each other is a challenge, preventing interference from two transmitters on the *same band* raises the difficulty to an entirely new level.

Planning any portable operation begins with finding a place to operate. Michigan is largely rural, with only a few major metropolitan areas. Since counties are multipliers in MiQP, we wanted to find a QTH in a somewhat rare county. For the past three years a diverse group of members from the Mad River Radio Club (MRRRC) has traveled north to Cheboygan County to operate the Michigan QSO Party as K8MQP from a QTH owned by club member, John, KN8S. In 2005 the QTH was a residence on a suburban-style lot on a canal off of Burt Lake near Indian River. In 2006, however, the group operated from a 10-acre site on the shores of Silver Lake, near Afton, Michigan. For 2007, the group returned to the Silver Lake location, but with more operators and hardware, in a quest to be the top MiQP multi-multi entry.

Station planning for a MiQP M/M, and especially for a portable operation, is a tradeoff between simultaneous coverage of any band-mode where contest activity exists and the amount of equipment required. MiQP bands are 80 thru 10 meters on CW and phone, with no



Fig 1—Correctly positioning the tower among the trees was a critical issue.

Table 1
A final band-by-band breakdown of the K8MQP 2007 MiQP M/M effort

Band	CW	SSB	Combined
80	200	150	350
40	342	314	656
20	128	549	677
15	1	1	2
10	1	2	3
Total	672	1016	1688
Mults	109	108	217



Fig 2—Raising the second tower

VHF or 160 meter operation. Experience has taught us that 40 is the main MiQP band, with good levels of activity for the entire contest period on both modes. So, we planned separate stations on CW and SSB for that band.

In the previous two MiQPs 20 meters was a pleasant surprise, providing QSOs virtually throughout the contest period. Since the majority of this activity occurred on SSB, we felt we could cover both modes with a single 20 meter station. The next most-important band for the MiQP is 80. At this point in the sunspot cycle 15 and 10 have negligible activity, so we felt we could cover all three bands on both modes with a single station. This added up to four sets of contest-grade radios, legal-limit amplifiers, networked logging computers, operating tables and chairs plus all the necessary accessories.

In 2006 we had just five operators for the four stations; our goal this time was to have at least six. Four 2005 participants — Dave, K8CC, Ken, W8MJ, John, KN8S, and fellow outdoorsman Tim, KE8OC — were back, and Mike, WD8S, joined the team for the first time. In addition, Uli, KK8I, was able to participate after a conflicting business trip fell through at the last minute. This gave us our six operators, but John also invited his brother-in-law, Jerry, KD8EGH, and Jerry's son Scott, KD8EGJ, to join the fray. Although Jerry and Scott are relative newcomers to ham radio, they were valuable assets.

The MiQP starts at noon local time on Saturday, so on Friday morning, W8MJ, WD8S and K8CC (in K8CC's Grand Cherokee) and KE8OC along with wife Nancy (in the KE8OC Ford F-150) headed north from Detroit for Cheboygan County. The K8CC Jeep towed a trailer carrying a 48-foot aluminum tilt-up tower, while the KE8OC pickup pulled another trailer carrying a 56-foot aluminum tilt-up tower belonging to Don, K8BB. Both vehicles were heavily loaded with radios, amplifiers, computers, operating tables and myriad necessary radio accessories.

Late Friday afternoon, KK8I started north after work with his VW Passat wagon also full of radio gear and traveling in caravan with the K8BB/N8NM team, which was planning to operate MiQP as a mobile, kicking off the contest near our location.

Erecting the Antennas

The K8CC and KE8OC vehicles arrived at Silver Lake around 2:30 PM. The available space around the house that was clear of trees was carefully considered. Tower siting was dictated largely by a need for the Yagi elements to clear nearby tall trees as the tower was cranked up. Also, the available clear space required that each structure be erected separately, because the two towers overlapped when tilted over.

A HyGain 153BA (3-element 15 meter monobander) and a 3-element CB beam converted to 10 with rotator were mounted on the K8CC 48-foot tower, which was positioned in front of the garage. Rotator and coax cables were run down a tower leg and taped, and the tower was quickly cranked up, thanks to the electric winch powered from the Jeep's battery. Some manipulation of the rotator heading was required to orient the elements so they'd clear adjacent trees and branches as the tower achieved its upright position. By 4 PM the tower was erect with its guy wires in place and operation of the 10 and 15 meter Yagis verified with an SWR analyzer.

Work quickly got under way to erect the 56-foot tower, which would carry a HyGain 203BA (3-element 20 meter monobander). The idea behind this arrangement was to allow the 20 meter operator to position his Yagi independently of 15 and 10 meters, since 20 was likely to have solid skip to the west and southeast, while 15 and 10 would likely only provide scatter QSOs. Again, clearance to trees was a factor, and the base of the tower was positioned in the driveway in front of the house.

Once the beam was mounted, the second tower went up. It ultimately



Fig 3—Overall view of the K8MQP antenna towers and beams



Fig 4—Back to front: KN8S on 40 CW, KE8OC on 40 SSB, WD8S on 20, and W8MJM on the 80/15/10 meter station



Fig 5—The 40 meter CW station with KN8S at the key



Fig 6—The 40 meter SSB station with KE8OC at the mic: The Corsair and its power supply are on the left, and W8MJ's AL-1200 amplifier is on the right. K8CC's MFJ-432 voice keyer sits atop the Corsair.



Fig 7—The 20 meter station with Uli, KK8I, at the controls. A FT-1000MP drove a Ten-Tec Titan amplifier, and the antenna was a 3-element Yagi.

achieved its full upright position, but not without incident. As the tower approached vertical, one antenna crew member (who shall remain nameless) attempted to “help” the process along by using the vertical pipe carrying the lifting cable (visible in the photograph) as a lever. This pipe is not intended to take side loading, however, and just as the structure arrived at vertical, the pipe snapped off where the threaded end screwed into a fitting welded to the tower base. Fortunately, KD8EGH — a plumber by trade — was able to extract the broken-off pipe end from the fitting with a hacksaw. KN8S took the pipe into town, where a plumbing shop rethreaded the end. Back at the site, the pipe was screwed back into the fitting, and the repair was complete.

Another problem became apparent once the tower was vertical and we attempted to rotate the 20 meter Yagi. The trees on the property are very tall, approaching 100 feet. This is great for supporting wire antennas but a hindrance for raising and rotating Yagis. The second tower and beam were too close to a nearby tree, which snagged the Yagi reflector element just enough to prevent the beam from rotating. After agonizing for several minutes, we disconnected the side stabilizing outriggers. Then, while two people held each guy wire, KE8OC simply backed up the pickup and trailer supporting the still-vertical tower and beam the five feet required to clear the tree. Talk about a big mobile antenna. It was pretty amazing to watch a 60-foot tower with a Yagi atop moving horizontally over the ground!

By 5 PM both towers were in the air and beams functioning. Our next task

was to erect the wire antennas. John has a 160/80/40 meter parallel dipole permanently installed at the QTH. We folded back the 40 and 160 meter wires and used this antenna for 80 and 75. The final two wire antennas were separate inverted Vs for 40 CW and SSB, installed near the lake.

Several years ago a path had been cut through the woods for an overhead power line. The power line has since been relocated underground, leaving a clear path through the woods — perhaps 100 feet wide and broadside south-southeast. This open area allowed us to position the 40 meter inverted Vs approximately 50 feet high and end-to-end about 200 feet apart. This provided enough isolation so neither 40 meter receiver was bothered by RF coming from the 1.5 kW transmitter on the other mode. We used KN8S's EZ-Hang to shoot fishing line over tree branches, then pulled up green Wire Man support rope.

By 8 PM, all wire antenna work was done, with coax feed lines run and SWR checks complete, so the antenna crew broke for the drive into town and dinner at an excellent Italian restaurant in Indian River. Around 10 PM, KK8I and the N8N mobile team (K8BB and N8NM) arrived, and we talked them into the QTH through a combination of VHF FM and cell phones. We regaled them with tales of our adventures of the day while the evening was spent setting up stations and equipment. Most gear was in place and hooked up by midnight, so the team hit the sack.

Station Arrangement and Setup

One advantage of the KN8S QTH is

that John has a large, heated workshop adjacent to his garage. When cleared of his woodworking and archery tools, this could be turned into a comfortable multi-station ham shack with good outside access for routing coax cables. It's also away from the other living areas of the house, which avoided disturbing other family members. After having struggled with some haywire 220 V ac wiring to power the amplifiers in 2006, John this time around fabricated a custom power distribution cord out of 10 gauge cable, providing plenty of 220 V power to each operating position.

We learned from our 2006 experience that most modern frequency-synthesized radios emit a broad spectrum of in-band phase noise whenever they're transmitting. This severely interferes with the other radio sharing the band, prompting a search for older, contest-grade radios for the two 40 meter positions. On CW, we deployed K8CC's 1970s-vintage Drake C-Line, which we'd used successfully in 2006, along with another '70s artifact, a Dentron MLA-2500 amplifier borrowed from K9TM. The computer was commandeered from K8CC's M/M shack at the last moment, as two other PCs checked out DOA the night before the trip. The 40 meter CW inverted V, oriented end-to-end with the 40 meter SSB antenna for maximum RF separation, did not seem to play very well to the west, a condition aggravated by high QRN levels on the band. The CW station never experienced any problems with QRM from the SSB station, however, so in that sense the setup was a success. Dave, K8CC, and John, KN8S, were the 40 meter CW operators.

We went looking for an appropriate,

older contest-grade radio for 40 SSB, again to avoid the phase noise problems of the previous year. Our 2006 experience with an FT-1000MP and IC-756PROIII had proven these radios to be “phase-noisy” in-band, which proved to be a significant problem for the CW op. Based on some comments from W8JI’s Web site, K8CC decided to test an IC-751A owned by W8MJ, but it, too, exhibited similar problems. An old Yaesu FT-107M — owned by K8CC but recently on loan to a relatively inactive ham friend — proved to be totally clean on transmit, but the radio had other problems, due to a decade or more of disuse. Meanwhile, we discovered that team member Mike, WD8S, owned a Ten-Tec Corsair I transceiver, another older non-synthesized radio. Testing by K8CC verified that Mike’s Corsair did not exhibit excessive phase noise on transmit. With some R&R through the application of contact lubricant to resolve some noisy controls, we had our rig for 40 SSB!

An ICE 40 meter bandpass filter provided isolation from the other bands. One odd problem we encountered was that the laptop would lock up from RF ingress when run off its ac power brick but ran fine powered off the 12 V station power supply, sitting on a shelf behind the rig. All told, the antenna orientation described earlier turned out to be sufficient to prevent problems to the Corsair. Tim did most of the 40 meter SSB operating, but WD8S and KD8EGH also took turns in the chair.

Compared with the challenge of getting two rigs to function optimally within the same band, our other two stations were relatively straightforward. Our 20 meter CW/SSB station utilized KK8I’s FT-1000MP, which introduced a couple of wrinkles. First, Uli had purchased some optional filters for the radio from another ham. These had arrived the day of the trip north. After arriving on Friday night, he popped open the radio and undertook the filter installation with some kibitzing from K8CC. Second, Uli had never used his FT-1000MP with an amp before, so there was some uncertainty about whether the amp relay keying would work okay. This concern turned out to be unfounded, however, as the radio functioned flawlessly.

At the 20 meter position K8CC’s Ten-Tec Titan amplifier boosted the MP’s signal, while an ICE 20 meter bandpass filter provided isolation from the other bands. QSOs were logged on the on a small Acer desktop with a 15-inch flat screen monitor, and the computer was equipped with a W9XT Contest Card to provide a voice keyer. Uli made most of the 20 meter QSOs, but WD8S also spent time in the operating chair. This position made more QSOs than any of



Fig 8—The 80/15/10 meter station with W8MJ at the computer keyboard: The rig was KN8S’s IC-756PROIII driving his AL-1200 amplifier through W8MJ’s IC-419 multiband bandpass filter. The Alpha-Delta coax switch, at the right of the transceiver, selected either the 15 or 10 meter Yagi or the 80 meter.



Fig 9—The K8MQP team photo: Front (L-R): KK8I, KD8EGJ, W8MJ, KN8S, WD8S and KD8EGH. Rear (standing on trailer, L-R): K8CC and KE8OC.

the other stations, largely because of the seemingly endless supply of new amateurs to SSB.

Our fourth position covered 80, 15, and 10, CW and SSB. For this station we took advantage of the equipment from the KN8S station on site. QSOs were logged on another Acer desktop computer with a 17-inch flat panel monitor "borrowed" from John's wife's computer and equipped with a Contest Card for voice keying. W8MJ made most of the QSOs at this station, with help from WD8S and KD8EGH.

This station setup posed several challenges. First, for some reason the 12 V dc power supply for the transceiver would not put out any power. We're not sure we ever found the problem, but the supply eventually began working. The second problem involved the Palstar automatic antenna tuner, which was used to match the 80 dipole on CW and phone. It accomplished that task admirably, but when operating on 15 and 10 on the Yagis, the tuner would try to match the 80 meter antenna to those bands as well. Getting around this unwanted behavior required deactivating the tuner through a series of button presses, and, in some instances, putting the amp in standby as well. None of this prevented QSOs. It just made the band-switching process a lot more complicated and offset the convenience of the automatic tuner.

The Contest

As the contest started, the 40 meter CW station hit the ground running with a 70-QSO hour while the SSB team struggled with RF problems in their transmit audio until they resolved it by grounding the voice keyer to the radio. Despite the poor in-state propagation on 40 meters, we managed roughly 100 more QSOs per mode than in 2006, still far fewer than we expect the band is capable of when favorable in-state propagation returns in the new sunspot cycle. The 20 meter SSB station had a terrific first hour, with 116 QSOs and a lot of seemingly new call signs.

The 80/75 meter bands started producing as early as 1700 UTC, and a lot of these were in-state QSOs that bolstered the multiplier totals. In the end, 15 and 10 were pretty much a waste of time, with just five QSOs between the two bands and modes. Given the effort expended on hauling and installing the second tower, this was very discouraging. Twenty meters was up roughly 100 QSOs as well, largely because of the bottomless pit of SSB QSOs. It was impressive to be able to make QSOs on 20 every hour of the contest. Eighty meters was a big improvement, with roughly 200 more QSOs than in 2006,

thanks largely to increased early daytime activity. Table 1 provides a final band-by-band breakdown.

After log checking, our score was 1688 QSOs and 217 multipliers for 512,120 points. We are quite pleased with the results. This marked the first time a MiQP score exceeded a half-million points. Another appealing aspect of participating as a multi-multi in the MiQP is having another capable group to compete against. The K8XXX team from Barry County in southwestern Michigan is as avid about this event as we are and puts forth a great effort every year. Many of the K8XXX crew are friends of ours from the MRRC, and this makes it all the more fun.

K8XXX also broke the 500,000 point barrier and, in the final standings, the two groups were only 7385 points apart. A swing of four multipliers or 36 QSO points by either team would have re-

versed the final order of finish. While K8XXX finished with more QSOs, K8MQP worked more multipliers and had a higher ratio of two-point CW to one-point SSB QSOs.

Sunday morning, after a great breakfast provided by KN8S's XYL Linda, the K8MQP crew gathered for a group photo around the base of the 56-foot tower in front of the KN8S homestead. Then, in about three hours, we dismantled everything and repacked the vehicles for the trip home. Before departing, we were treated to a tour of the adjacent land where KN8S and friends hunt in the woods.

The team would like to thank Linda Sullivan for allowing us to invade her home once again for our MiQP effort. Thanks also go to Nancy Sullivan, who provided encouragement and helped keep us fed in fine style.

NCJ