

W7AW Repeater History

A Bit Of W7AW Repeater History.

The first club repeater was built by Steve O’Kelly WA7SXB (now N7IO) and lived at his house near High Point in West Seattle. It was moved to the Mount Saint Vincent Retirement Center where it served West Seattle fairly well. In 1996, the city Police and Fire departments had finished their move from 460 MHz to the new 800 MHz system, and the former SPD F-3 [GE MASTR II transmitter and receiver](#) was donated to the club. It was returned to the club’s frequency pair, a new antenna was installed on the city’s monopole tower, and a second receiver on Queen Anne hill was also tied in with a receiver voter. The repeater has served well since. In 2009, the city needed to recover some rack space, and the club was asked to “shrink down” the space used by the club’s repeater. The big MASTR II package had to go.

The receiver was replaced with a smaller version of the MASTR II, which is the same as the Queen Anne receiver. The transmitter was replaced with a Kenwood commercial mobile radio, and a smaller power supply was also installed. This reduced the total rack space used by 50%. The duplexer/filter package was mounted in the building’s rafters when the repeater was installed to save space.

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In 2012, space was again available to return the original Full-Size MASTR II package to the radio site. At the same time, a new controller was purchased to add many new features to the repeater. This included the ability for the repeater to record, and playback, a user's audio.

Sometime around 2011, the antenna was replaced due to a high VSWR. The new antenna is a tri-band, covering 6 meters, 2 meters, and 70 centimeters. It has always been the club's desire to add 2 meters and since we had the capability, why not add 6 meters too! The club added **2 meters** in 2015, and **6 meters** in 2016. Currently the 2 meter pair is a "shared, non-protected" frequency that has limitations on what we can do (Power output is limited, linking is restricted, etc). We continue to search for a new 2 meter pair, and if we are successful, there will be no restrictions on linking or power (within reason).

The **6 meter pair** we have has a legacy in the Puget Sound region. It was originally held by Jon Marcinko (W7FHZ,) and was on Buck Mountain near Quilcene, WA. After Jon became a silent key, his repeaters were eventually taken off the air. Since no new applications had been filed for his frequency pair, it was decided to choose that pair for our repeater, mainly because a lot of 6 meter hams had this pair already programmed into their radios. Hence, almost instant revival of the frequency was possible with existing equipment. The 6 meter repeater is full time linked with our 70 cm repeater. This was easy to do, because our 70 cm system uses a "receiver voter" to allow several receivers to be deployed, and the one having the "best audio" is selected and its output passed on to the transmitter. It was easy to just add the 6 meter receiver into the voter, and the transmitter was paralleled with the ...

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70 cm transmitter, both being GE MASTR II radios as well. The actual hardware came from the American Red Cross, having been removed from their service some months earlier and was on its way to the landfill. The original transmitter and receiver was on 35 Mhz, and would be difficult to re-tune to 53 Mhz where we are using it today. Luckily in the same pile of equipment at Red Cross, was a GE MASTR II mobile, on 47 Mhz. This was fantastic, as the mobile circuit boards are identical to the repeater circuit boards! All that was needed to do to make the repeater operate on 6 meters, was changing those circuit boards that are RF specific to the frequency bands, the receiver front end, the exciter, and the power amp. Since the original repeater was missing the power amp, that change was easy. The other RF boards were not as easy, but simple nonetheless. A new set of crystals and a few hours of work was all that was needed to put it on the air.

A note about the **6 meter duplexer**: These can be huge, and expensive (6 foot tall, 6 inch diameter cans, costing \$2000-3000). Luckily, in that same pile of stuff at Red Cross, was the remains of a 40 Mhz compact duplexer! It was missing the harness (the coax cables and connectors that tie all the filters together), but the "cavities" were intact. \$200 worth of double-shielded coax, and some connectors, put the duplexer back together and re-tuned nicely to our frequencies. The "cavities" are actually "helical resonators" which are about 1/10 the size of cavity type filters.

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The **2 meter repeater** was much easier to get on the air. It is a [Kenwood TKR-750](#) commercial repeater we purchased used and only required reprogramming to our frequency. The duplexer was a surplus unit sitting in storage at a club member's residence (for many years) and it was donated to the club. Re-tuning was easy and it is small enough to be mounted in the rafters next to our 70 cm duplexer (it's actually half the size of the 70 cm unit!) The 6 meter duplexer is also up in the rafters, keeping with tradition (and it's the only space we had available anyway).

The system continues to evolve, and this past year we updated our internet linking hardware. The old surplus PC running linux for IRLP and [EchoLink](#) was replaced with a [Raspberry Pi](#) and we decided to change from IRLP to [AllStar](#), so future remote receivers for voting could be added (our antenna on Queen Anne failed and we took out the remote receiver due to site access issues).

We added a DMR repeater (which was installed at SDOT's facility near Westcrest Park). Recently this was moved to our [High Point site](#) (where all our repeaters now reside) due to lack of permanent internet at Westcrest, which had been temporarily provided by member Randy W3RWN via commercial cell phone connection. At High point, we have a dependable [HamWan](#) connection for internet linking of everything.

Updates as things evolve....

Tom, N7OEP Nov 17, 2022