

Weber State University 2m Amateur Radio Repeater

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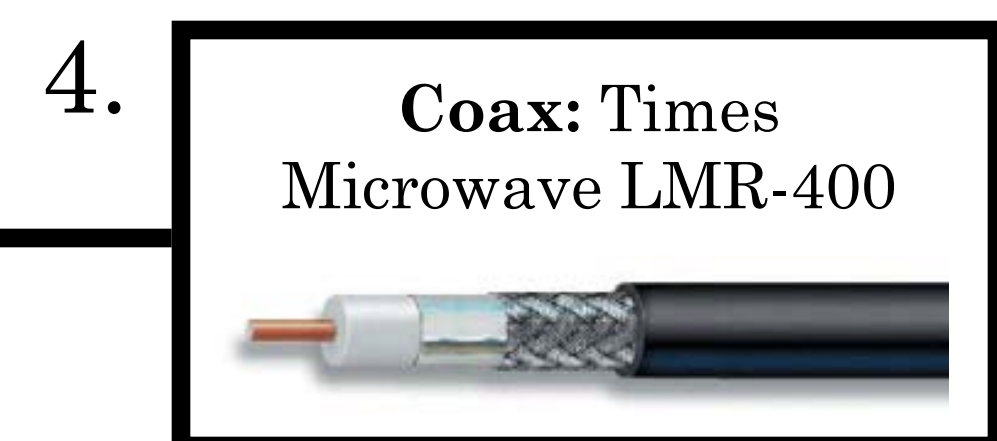
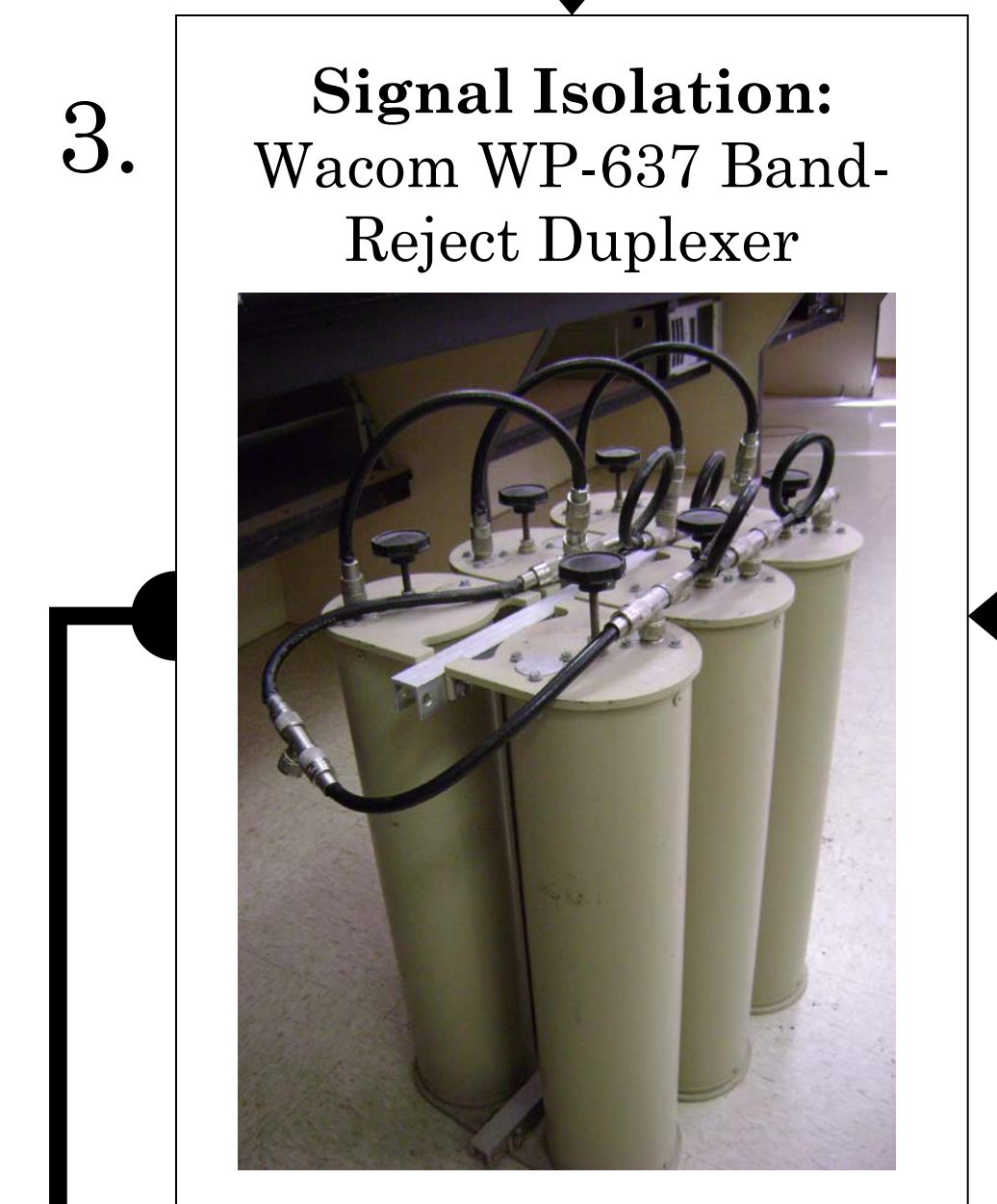
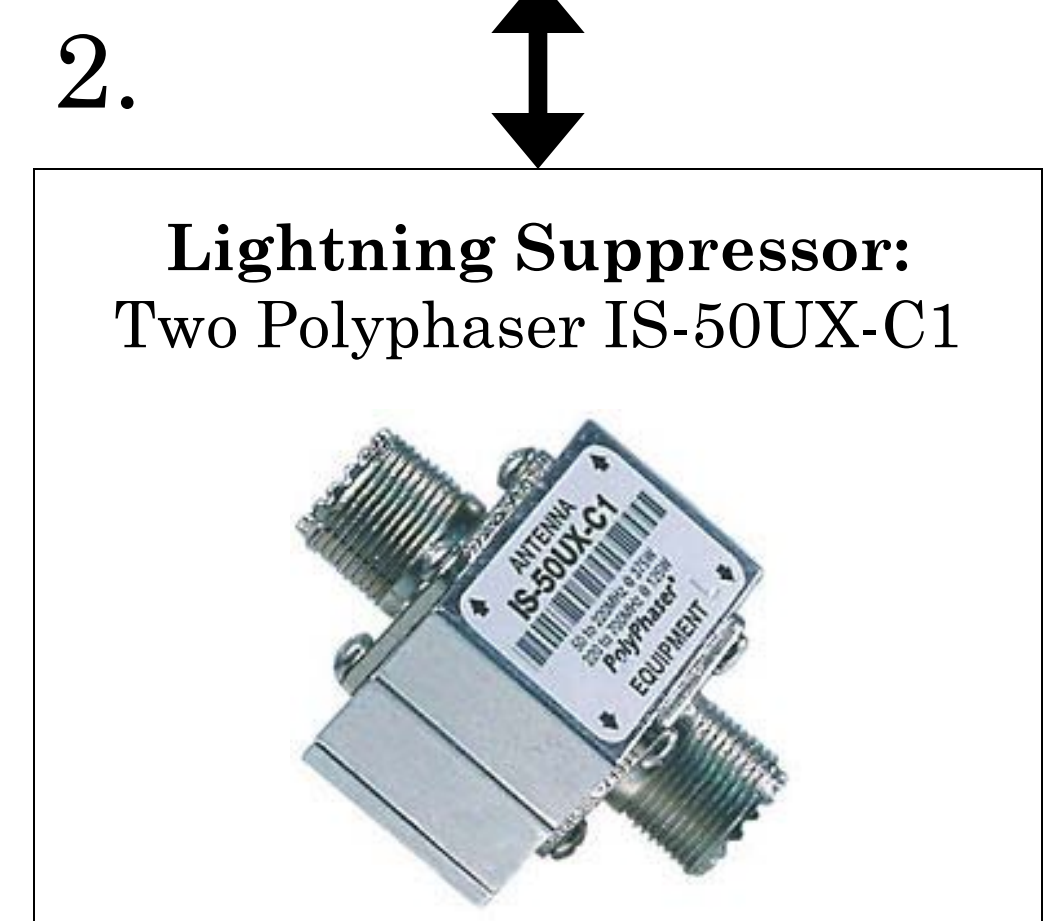
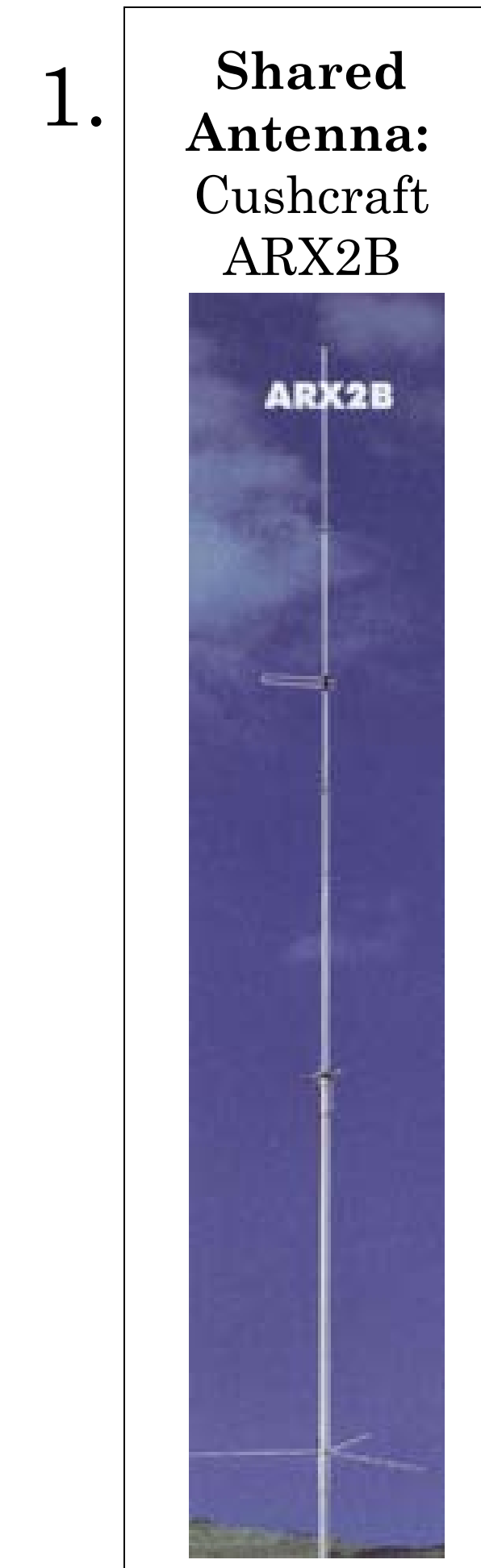
Weber State University Dept of Physics and
Computer Electronics Engineering Technology Dept



(41.1906° N, -111.9399° W) 1470 m ASL

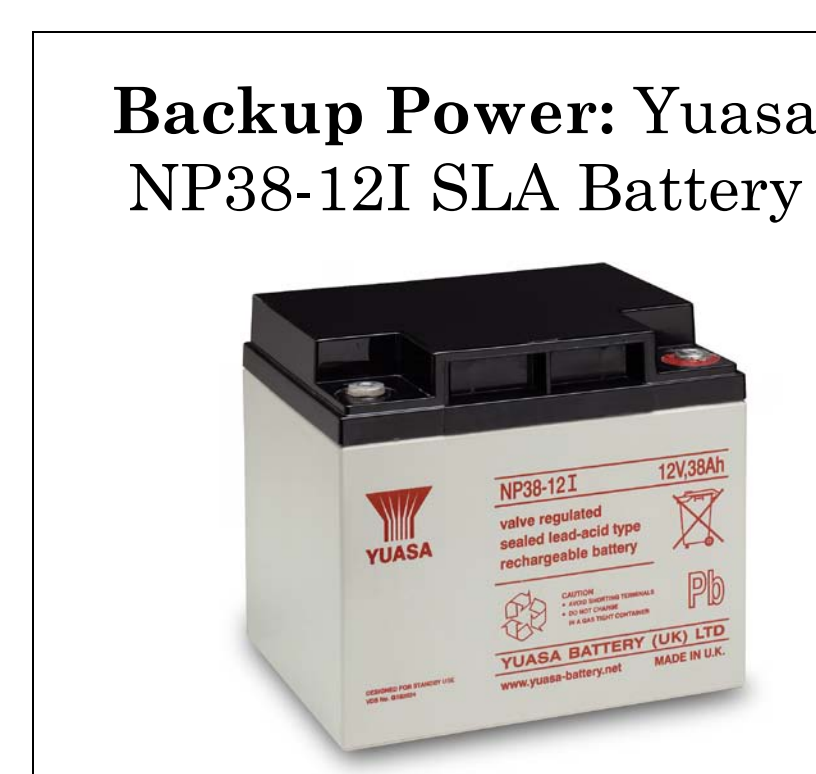


A radio repeater is capable of retransmitting short-range, low-power communications at a higher power over a larger area. The entire system was designed and coordinated by the Weber State University Amateur Radio Club and funded by the Office of Undergraduate Research. The equipment is installed in a previously vacant radio tower on the East end of the main WSU campus (see above map). The input frequency to access the repeater (repeater listening frequency) is 144.650 MHz with CTCSS (continuous tone-coded squelch system) tone 123.0 Hz. The sub-audible CTCSS tone is used to check if the incoming signal should be repeated. The radio system covers the Ogden City area where any amateur radio station will be able to access the repeater and have their signal rebroadcast on 145.250 MHz at 25 W from the WSU campus. The system is also capable of digipeating (repeating packet data) from the Automatic Packet Reporting System. APRS packets from amateur radio stations heard on 144.390 MHz are received and retransmitted from the same transceiver and frequency at 25 W. The repeater receiver and transmitter and the digipeater transceiver are capable of sharing a common antenna by utilizing the notch filtering characteristics of the duplexer on the receive and transmit frequencies.



Description of Equipment:

1. Cushcraft Ringo Ranger II 7 dbi monoband antenna shared between the voice repeater and the APRS digipeater.
2. Two Polyphaser lightning suppressors in line with the antenna and duplexer.
3. Wacom six cavity duplexer which acts as a notch filter for the receiving radio on the two transmitting frequencies.
4. Low loss LMR-400 coax with amateur radio standard UHF connectors throughout the entire system.
5. There are three Yaesu FT-1900R Amateur Radio Transceivers for receiving and transmitting. The receiver is tuned to frequency 144.650 MHz and requires a CTCSS tone of 123.0 Hz.
6. An Arcom RC210 controller decides if the incoming audio should be repeated. It passes audio to the transmitter and periodically transmits the repeater station callsign KE7PRO.
7. The repeater transmitter is tuned to 145.250 MHz and transmits the audio received from the controller at 25 W.
8. The system also has a digipeater tuned to 144.390 MHz which receives and retransmits packet data for the Automatic Packet Reporting System at 25 W.
9. The Argent Data Tracker2 Terminal Node Controller decodes the APRS packet data and decides if the packet should be digipeated.
10. A 25 A linear power supply provides primary power for the system.
11. A Super PWRgate instantaneously switches from the primary power supply to battery power in case of power outages.
12. System backup power is provided by a 38 Ahr battery in a float charge state which is capable of running the entire system for at approximately two hours.
13. Power is distributed through RIG Runner 4008 which provides eight fuse protected Anderson Powerpole type connections.



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