

Thoughts on HHARC Simplex and Repeater Tests

K8RL

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In recent months tests have been suggested for VHF/UHF FM simplex and our two NO8I repeaters. To date we have run one planned simplex test on two meters. Post-test some club members made improvements to their stations. Additional tests should yield more insights.

Benefits of testing are broad and can include: maintain club readiness (support during power outages, tornados, floods, etc.), check on station changes (degradation, upgrades), help club members make better choices for routine daily communications, establish a general baseline for communications throughout the year (winter snow and summer foliage), educate and train (technical advancement and hands-on understanding), and generate interest and activity within the club and the Huber Heights area.

This short paper is intended to stimulate interest and initiate action for future testing by offering 'seed ideas' to consider, including some thoughts on how to conduct tests, what to document, what to analyses to perform, and recommendations.

Rather than "wing it," thought should be given ahead of time as to how to conduct each simplex and repeater test. A test plan should be drafted and made available to club members prior to testing. The plan should include basic testing steps (sequence of events), a data collection sheet (log), and any other important information concerning the test (such as scheduled date/time, band, specific objectives, etc.). This will help members to better participate in each test (less confusion and wasted time) and to be prepared to record important measurements.

Consideration should be given as to whether the two repeaters need to be unlinked or linked for repeater testing.

Test planning should attempt to involve all club members within a reasonable radius of Huber Heights to include Vandalia, Union, Tipp City, Dayton, Springfield, Xenia, etc. Tests should be constructed to include all normal station types (fixed/base, mobile, and

portable/handheld). Some portions of the testing may need to be structured differently to accommodate or emphasize mobile users.

A Test Control and Alternate(s) should be identified prior to tests. Relay stations in key locations should be designated, especially for simplex tests.

Primary items for simplex and repeater testing include user transmit power(s), station antenna system(s), and received signal levels. Additional items need to be captured for completeness and to avoid later questions and confusion. Some items may be entered once (e.g., station location) and others (e.g., received signal level) recorded multiple times during a test. A log sheet in the form of a fill-in table can be made. As more tests are completed, additional things may be included. An initial list of some items to record include (not in final order):

- Callsign/User:
- Date/Time:
- Test Name/Type:
- Band/Frequency:
- Radio:
- Transmit Power:
- Antenna:
- Transmitter Location:
- Receiver Location:
- Distance:
- Direction:
- Received Signal Level:
- Notes/Comments:

In the event a club member were to use multiple radios and/or antennas, separate logs or annotations on one log sheet would need to be made.

Audio recordings of the tests would be very useful. Selected video recordings with audio, radio display (frequency, signal strength bars, etc.), and perhaps even time information would be most valuable. For repeater testing, recordings made of the audio and, if possible, signal levels in the repeater, per se, should be considered.

Participating club members should plan to email, mail, or make other arrangements to get copies of their log sheets to the team conducting the test.

Post-test analyses should be conducted of station locations, transmit powers, antenna systems, received signal levels, terrain features, and other relevant factors. Use of a terrain map with locations of each station would be most helpful in evaluating station communications. If a copy of the coverage prediction program used by the cellular providers were available for use (think P&R), it may be useful for test planning and post-test analyses.

A Test Team committee consisting of at least two or three club members should be established (appointed) to oversee planning, execution, and post-test analyses. This committee may be a sub-committee under an existing committee.

The Test Team should use this paper and inputs from the membership for consideration in preparing for tests.

Tests should be conducted on a regular basis. Testing at least quarterly (spring, summer, fall, winter) is highly recommended.

Testing should be conducted for both simplex and repeater communications. Presently, this includes the designated Huber Heights ARC 2m simplex frequency of 147.420 MHz and NO8I repeater operations on 224.300 MHz and 442.950 MHz. Tests on 442.950 should be conducted for the main repeater (CTCSS 118.8) and the backup repeater (CTCSS 123.0). Simplex tests on the 222 and 440 bands are also recommended.

Selection of club simplex frequencies for operations and testing in the 222 and 440 bands is recommended. Testing could initially be on 223.500 MHz and 446.000 MHz until specific simplex frequencies are selected by the club. Because of linking, remote, and control operations in the 445.000-447.000 MHz area, a primary and one or two alternate simplex frequencies should be considered.

The Test Team should conduct a post-test analysis of each test. Test results should be provided to the club in the form of a summary report (hharc.org) and a briefing to the membership.

'Lessons learned' from past testing should be incorporated into future testing.