

First Field Test

ECHO Memorandum #001

November 29th, 2014

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Summary

Today we wanted to test how well our 3 dipole system worked. We placed the antennas 8 feet apart (North-South) on the metal fence square ground planes and placed the junction and laptop about 10 feet to the East. We think that a loose wire in the transmitter box was causing the synth to reset, so we flashed it to restart at a default 150 MHz.

Our first test involved standing between the ground antennas and walking perpendicular to them (West) to test the range. Our results indicate that the signal blends into the background noise at around 44 feet.

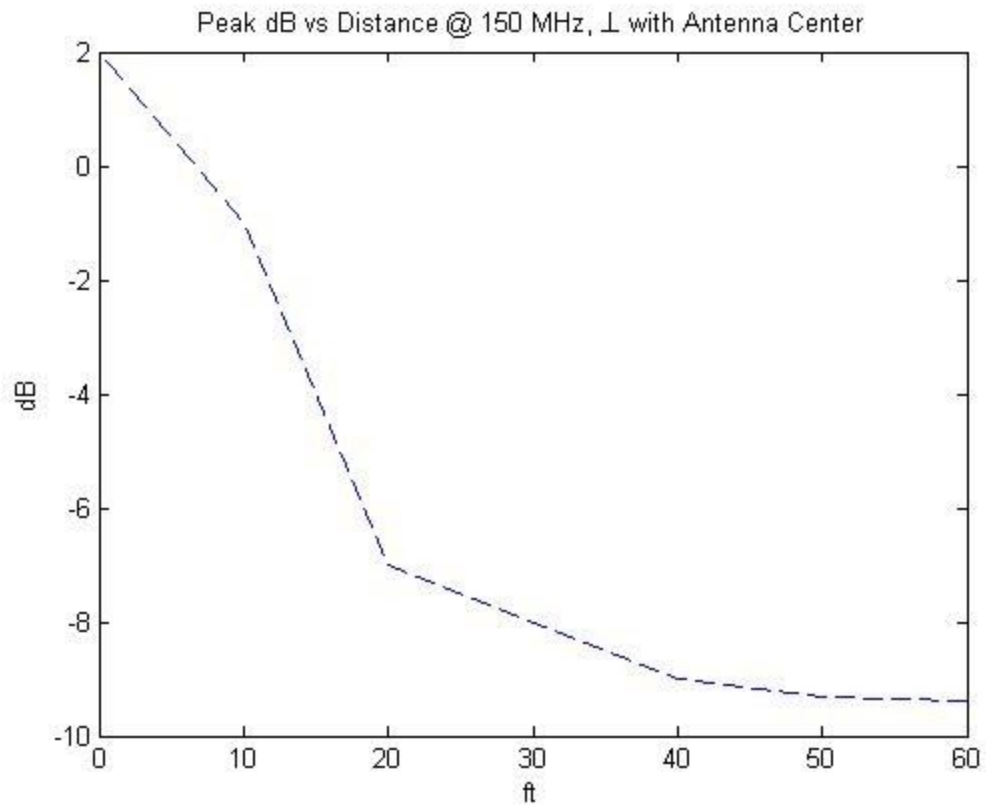
Our second test involved walking parallel to the antennas to try to find the lobes and the null between the them. Starting from between the two antennas, I (Mason) distanced myself about 40 ft West then began walking north. Although imperfect, the null and lobes we expected to see were present using the program SpectraView, however we currently lack the ability to precisely image these nulls.

Conditions

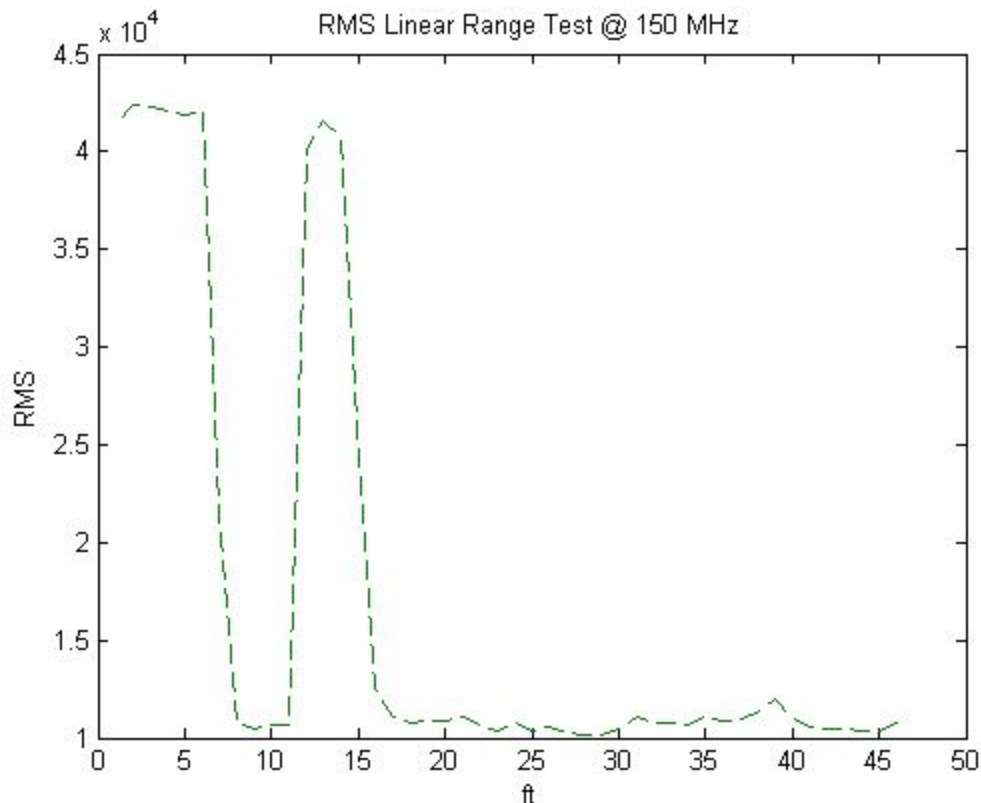
The SRC/SDFC field was quite dry with mostly dead grass.

Few clouds, low humidity and no wind with average temperature around 74F.

Results



RMS of 150 MHz range test.



The Linear range test of the RMS, the sudden drop at the beginning of the test may have been due to human test error when Danny ordered Mason to walk forward or backward while still calibrating. We do however, see our receiver hit the noise floor very soon afterwards. We were only able to walk outwards about 20-30 ft before our signal at 150 MHz disappeared.

**** No RMS data exists for the Angular Range Test ****

*****Danny Inserts A SpectraVue IMG*****

Conclusions

We need to add amplifiers to the 2 ground antennas. Alternatively, the antenna tuning at 150 MHz was not optimized, leading to a loss of signal retrieval. The spectral line at 1.4GHz was not visible to our software, including SpectraVue. This implies we are misinterpreting the way the FCD operates. Additionally, some fault wiring was discovered in the Valon, if shaken a bit, the Valon will restart to its initial flash memory conditions. This hurdle was overcome by writing the flash memory to our desired settings before conducting the experiment. Streamlining of the field test is needed in the future. We expect in our next test to be able to capture the 1.4 GHz signal to a much further range than the 20-30 ft we were able to receive with our antennas, which were not tuned to 150 MHz.

Flight Log

We successfully used waypoint flying near the end of the flight.

The second landing had the quad bounce back up, barometer issue? Sonar will fix that

Pictures





Flight Video can be found at:

<https://www.youtube.com/watch?v=uk5MyrOWGxE>

Time markers:

0:08 - Automated flight plan initiated

1:20 - Programmed flight path shows inaccuracy with field test placement.

1:35 - Pilot control reinstated

1:50 through 4:55 - Photo ops. Then piloted landing.

5:45 - Ant

6:22 - New Automated flight plan initiated - this one is executed in its entirety till the landing.

9:18 - Attempted automated landing. Philae like rebound; prop wash influencing barometer?

9:22 - Pilot control reinstated, then landing.