

W1AW and WA6TZY Repeat Dual-Tone Frequency Measuring Test - 1 July 2009

By Ward Silver, N0AX

The Hiram Percy Maxim Memorial Station, W1AW, and West Coast FMT Station, WA6ZTY, will be presenting a summer Frequency Measuring Test (www.arrl.org/w1aw/fmt) on the evening of July 1st, 2009 at 9:45 PM EDT. (This is 0145 UTC on July 2, 2009.) The format will be a "do-over" of the dual-tone test conducted in November of 2008. The timing glitches that occurred during the November test have been ironed out and so the format will be repeated to give everyone another opportunity to make measurements.

The format will be as follows:

Transmissions of both stations will be made with a carrier frequency of 3597.5 and 7095 kHz. (the W1AW digital bulletin frequencies) Two audio tones between 2000 and 2500 Hz will be transmitted in an alternating sequence with a shift between 100 and 500 Hz, similar to what is used for RTTY communication. Beginning on 80 meters, Tone 1 will be transmitted for 10 seconds, followed by Tone 2 for 10 seconds. The tones will then alternate until each tone has been transmitted six times for a total transmission of 120 seconds. The transmitting station will then change to 40 meters after identifying in Morse code and repeat the two-tone sequence.

All transmissions for announcing the test, identification, and band changes will be in CW at 15 WPM (18 WPM character speed). CW transmissions will be on the carrier frequency. Each CW transmission is expected to last more than one minute.

Time Sequence

W1AW - begins at 9:45 PM, EDT (0145 UTC, 2 July 2009)

- QST and test announcement on 80 meters
- Repeat six times: 10 sec of T1 followed by 10 sec of T2. This is a total of 120 seconds of transmission.
- ID and notice of QSY to 40 meters
- QST and test announcement on 40 meters
- Repeat six times: 10 sec of T1 followed by 10 sec of T2. This is a total of 120 seconds of transmission.
- Announce conclusion of W1AW transmission and ID.

WA6ZTY - begins at 10:00 PM, EDT (0200 UTC, 2 July 2009)

- QST and test announcement on 80 meters
- Repeat six times: 10 sec of T1 followed by 10 sec of T2. This is a total of 120 seconds of transmission.
- ID and notice of QSY to 40 meters
- There will be a pause of five minutes while WA6ZTY reconfigures for 40 meters
- QST and test announcement on 40 meters
- Repeat six times: 10 sec of T1 followed by 10 sec of T2. This is a total of 120 seconds of transmission.
- Announce conclusion of WA6ZTY transmission and CW ID.

Background

Why only 10 seconds per tone? The Frequency Measuring Test has already been run with test formats in which a carrier or audio tones are held steady for a very long time. (This "classic" carrier frequency FMT format will return in November.) The new format addresses the growing importance of digital modes. The challenge of this format is to make quick, accurate measurements of the characteristics of a digital signal in which the tones do not stay steady for a long period of time. It is not expected that the level of accuracy demonstrated for a long-tone test will be achieved for these short tone transmissions - that's not the point.

Eventually, a future FMT will conduct a true-FSK test in which there are four variables: carrier frequency, audio tone 1, audio tone 2, and shift. Given the value of any one of the variables in advance, two of the remaining variables would be measured and the final variable calculated or measured. The symbol rate (the number of transitions per second) would be representative of actual digital signals. For example, a 60 wpm RTTY signal.

Yes, this presents some challenges to FMT participants, but that is one of the reasons the FMT is conducted, "...advancing skills in the communications and technical areas of the (radio) art." (from the Basis and Purpose of the Amateur Service - FCC Part 97.1(c)) We look forward to seeing the creativity and innovation of the measurement community applied to this new format.

As always, reporting will be conducted via the Web data collection form available via www.arrl.org/w1aw/fmt. Participants report their values of Tone 1 and Tone 2 and Shift (the difference between the tones). You will have until July 8th to enter your data on the Web site - a period of one week. The published results will evaluate error in Tone 1, Tone 2, and Shift.

Be sure to include the details of how you made the measurements, obstacles you faced, and how you overcame them. It will make great reading and sharing in the best traditions of ham radio. If you have pictures or diagrams, please send them to fmt@arrl.org so that they can be posted on the FMT Web page.

Good luck, may propagation be good, and we'll see you in July!