W1AW, WA6ZTY to Conduct Dual-Tone Frequency Measuring Test in July

The Hiram Percy Maxim Memorial Station, W1AW, and WA6ZTY on the West Coast will conduct a summer Frequency Measuring Test (FMT) on July 1 at 9:45 PM EDT (0145 UTC on July 2). According to FMT Coordinator H. Ward Silver, N0AX, 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, so the format will be repeated to give everyone another opportunity to make measurements."

Silver said that both stations will transmit on a carrier frequency of 3597.5 and 7095 kHz; these are 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. This is 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 tone transmissions will be made using LSB as is the standard for digital FSK and AFSK modulation.

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, with each lasting more than one minute.

Time Sequence

- **W1AW** (begins at 9:45 PM EDT [0145 UTC July 2, 2009])
  - QST and test announcement on 80 meters.
  - Repeat six times: 10 seconds of T1 followed by 10 seconds 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 seconds of T1 followed by 10 seconds of T2. This is a total of 120 seconds of transmission.
  - Announce conclusion of W1AW transmission and ID.

- **WA6ZTY** (begins at 10 PM EDT [0200 UTC July 2, 2009])
  - QST and test announcement on 80 meters.
  - Repeat six times: 10 seconds of T1 followed by 10 seconds 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 seconds of T1 followed by 10 seconds of T2. This is a total of 120 seconds of transmission.
  - Announce conclusion of WA6ZTY transmission and CW ID.

Background

According to Silver, the FMT has been run in the past where a modulated carrier or audio tones are held steady for a very long time. "This 'classic' carrier frequency FMT format will return in November," he said. "The new format addresses the growing important of digital modes. The challenge of this format is to make quick, accurate measurements of the characteristics of a digital signal where the tones do not stay steady for a long period of time. It's 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."

Silver said that he predicts there will be a future FMT that will conduct a true-FSK test. "In this future test, there would be four variables: Carrier frequency, Audio Tone 1, Audio Tone 2 and Shift," he said. "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."

Silver said that this can present some challenges to FMT participants: "One of the reasons we conduct the FMTs goes back to FCC Part 97.1 (c): '...advancing skills in both the communication and technical phases of the [radio] art.' We look forward to seeing the creativity and innovation of the measurement community applied to this new format."

Participants should send their FMT reports -- indicating their values of Tone 1, Tone 2 and Shift (the difference between the tones) -- via the Web data collection form by July 8. 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," Silver said. "It will make great reading and sharing in the best traditions of Amateur Radio. If you have pictures or diagrams, please send them so that they can be posted on the FMT Web page."