

# Frequency Measuring Test 2008

*Can you tell your mark from your space?*

H. Ward Silver, N0AX

The format of the November 12, 2008 FMT will feature not just one signal, but two! Activity on the digital modes has skyrocketed with the advent of inexpensive radio interfaces and easy-to-use software. RTTY (radioteletype) remains the most popular data mode using simple FSK modulation. Critical to good performance on RTTY is using the proper “shift” or difference between the *mark* and *space* tones encoding the 1s and 0s that make up the Baudot code.

Thus, the November FMT will take a step toward the measurement of shifts of FSK signals. There will be two tones transmitted, one after the other, each with a 10-second duration. Stations will measure the frequency of each tone; then find frequency shift  $f_{\text{SHIFT}} = f_{\text{TONE 1}} - f_{\text{TONE 2}}$ .

## How to Measure Tones

It doesn't take a rack of expensive test equipment to measure audio tones. Modern transceivers already have excellent frequency stability and accuracy. With your rig warmed up and its display frequency calibrated against WWV or WWVH (<http://tf.nist.gov/timefreq/index.html>), you are ready to start. Measuring the audio tone frequencies can be done with a frequency counter, spectrum analysis software or even tuning forks!

Previous FMT announcements have presented techniques for calibrating a transceiver's displayed frequency, measuring a carrier frequency and measuring audio tones of a modulated carrier. All of these articles are available for download at [www.arrl.org/w1aw/fmt](http://www.arrl.org/w1aw/fmt).

You may think of other ways to make the measurement. That's what the FMT is for—experimentation and practice! If you do try something new or unusual, be sure to tell your story in the FMT Soapbox (see below).

## FMT Schedule

The 2008 ARRL FMT will run on the evening of Wednesday, November 13, 2008 at 0245Z (November 12, 2008 at 9:45 PM EST). It will replace the W1AW Phone Bulletin normally scheduled at that time. It is recommended that participants listen to

W1AW transmissions prior to the event to get an idea of conditions to see which band (or bands) will be best for measurement purposes. (The 2005 FMT announcement contains a sidebar on the effects of Doppler shift on sky wave signals.)

There will be a West Coast FMT station again this year, courtesy of Mike Fahmie, WA6ZTY. The West Coast transmissions will follow the W1AW transmissions as described below.

## FMT Format

The FMT will begin with a general call to all amateurs (QST) from W1AW beginning exactly at 0245Z sent simultaneously on the two amateur frequencies below. All identification and instructions will be transmitted in CW. The test will begin with an identification of the band on which the tones are to be transmitted (NOW 80 METERS). The tones to be used will be between 500 Hz and 2 kHz.

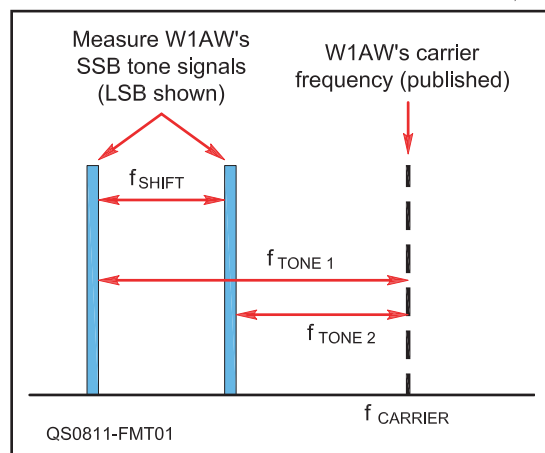
The two tones will be transmitted in an alternating sequence of 10 seconds of each

## Take a Collaborative Tone!

Making a club effort out of the FMT is an opportunity for technically skilled hams to teach frequency measurement techniques to beginners and other interested hams alike. Check out the W1AW FMT Web page for great club FMT stories and submit your own!

tone. Each tone will be transmitted three times for a total of 1 minute of continuous transmission on each band. W1AW will then ID and identify the next band (QST DE W1AW 40 METERS) and the tone sequence will be repeated on the next band. The test will last for a period of approximately 5 minutes total.

The test will end with a series of Vs, followed by station identification. Following the W1AW transmissions, W1AW will stand by



**FMT stations W1AW and WA6ZTY will transmit SSB signals modulated by two tones. Measure the audio frequency of the tones (not the carrier frequency) and calculate the shift between them.**

and WA6ZTY will begin transmissions (with different tone frequencies) at approximately 0250Z on 80 meters, followed by 40 meters approximately 5 minutes later on the following frequencies:

80 meters: 3597.5 kHz, LSB  
40 meters: 7095.0 kHz, LSB

## Reporting and Results

Your report should be submitted via the FMT Report form on the FMT Reporting and Results Web site, [www.b4h.net/fmt/index.php](http://www.b4h.net/fmt/index.php). Along with your call sign and e-mail address, enter your most accurate tone measurements on each band and indicate whether you measured the W1AW or WA6ZTY signal. There will be a window to list your equipment, describe the method you used to make the measurements and enter any Soapbox comments. W1AW will quickly post the tone frequencies following the test to help participants to assess the accuracy of their equipment and methods.

If you'd like more information about the equipment that will be in use at W1AW to generate the test signals, take a look at [www.arrl.org/w1aw.html](http://www.arrl.org/w1aw.html). Keep an eye on the FMT Web page for more information about the exercise and its results. Another FMT in the spring will be announced via the ARRL Web page.

QST