

## Capturing and Translating Call Signs

This Technical Tip provides instructions for capturing and translating call signs broadcast as Morse code by various radio transmitters including the radio modems used for RTK GPS. You do not need to be proficient in (or even know) Morse code to do this.

There are several translator programs that will convert Morse-code audio to text, but the writer's experience with such software has been far from successful. For translating only the seven or nine characters in a radio-station call sign the method presented below provides a simple and practical solution.

### What you need -

If you are reading this PDF it is probably safe to assume you have a computer, so the only additional items you need are –

1. A radio scanner (which you should already have if you are doing RTK GPS with UHF-band radio broadcast)
2. A device that can record audio. Something that can record directly to a digital audio format (i.e. a WAV file or the like), such as a survey data collector using the Windows Mobile or Windows CE operating systems, would be great. Your computer will also work fine if it has a microphone and it is operating in a location where the call-sign broadcast can be heard by the radio scanner. Or, you could connect an audio cable directly between the headphone jack on the radio scanner and the Line-In jack on your computer. Even if you have to record on magnetic tape, you can play back that tape to your computer's microphone and have your computer make a digital audio file.
3. An audio editor that provides a graphical timeline, such as the excellent free and open-source Audacity program which is available for download at <http://audacity.sourceforge.net/download/> **Note:** You can record directly into Audacity, which saves a transfer step and is the easiest method if circumstances allow.
4. A Morse-code table, like the one provided at the end of this document.

### What to do -

1. Set your scanner to the frequency on which the call sign will be broadcast and adjust the squelch so there is no excess noise.
2. Have your recording device running when the call sign is broadcast. 47 CFR § 90.425(a) requires a data radio to identify itself each 15 minutes. Most RTK GPS radios with which the writer has experience (Trimble Trimmark 3, Trimble HPB450, Pacific Crest RFM96W, and Pacific Crest PDL-series) comply with that requirement. (Note – at the time of this writing, the Trimble TDL450-series and the Pacific Crest ADL-series radio modems do not properly broadcast the call sign.) Obviously you could record continuously to catch the approximately five seconds during which the call sign is broadcast or you could minimize your recording time by determining when the next call-sign broadcast will occur and starting to record shortly before that time.
3. Get the audio into your audio editor. This document will not attempt to cover all the ways to do this or how to use the audio-editing software - that is up to the reader.

To prepare the example shown in the screen print below, the writer

Recorded the call-sign broadcast as received by the radio scanner into a Trimble TSC2 data collector  
Copied the WAV file from the TSC2 into a computer  
Opened the WAV file with Audacity  
Trimmed off the unneeded audio before and after the call sign

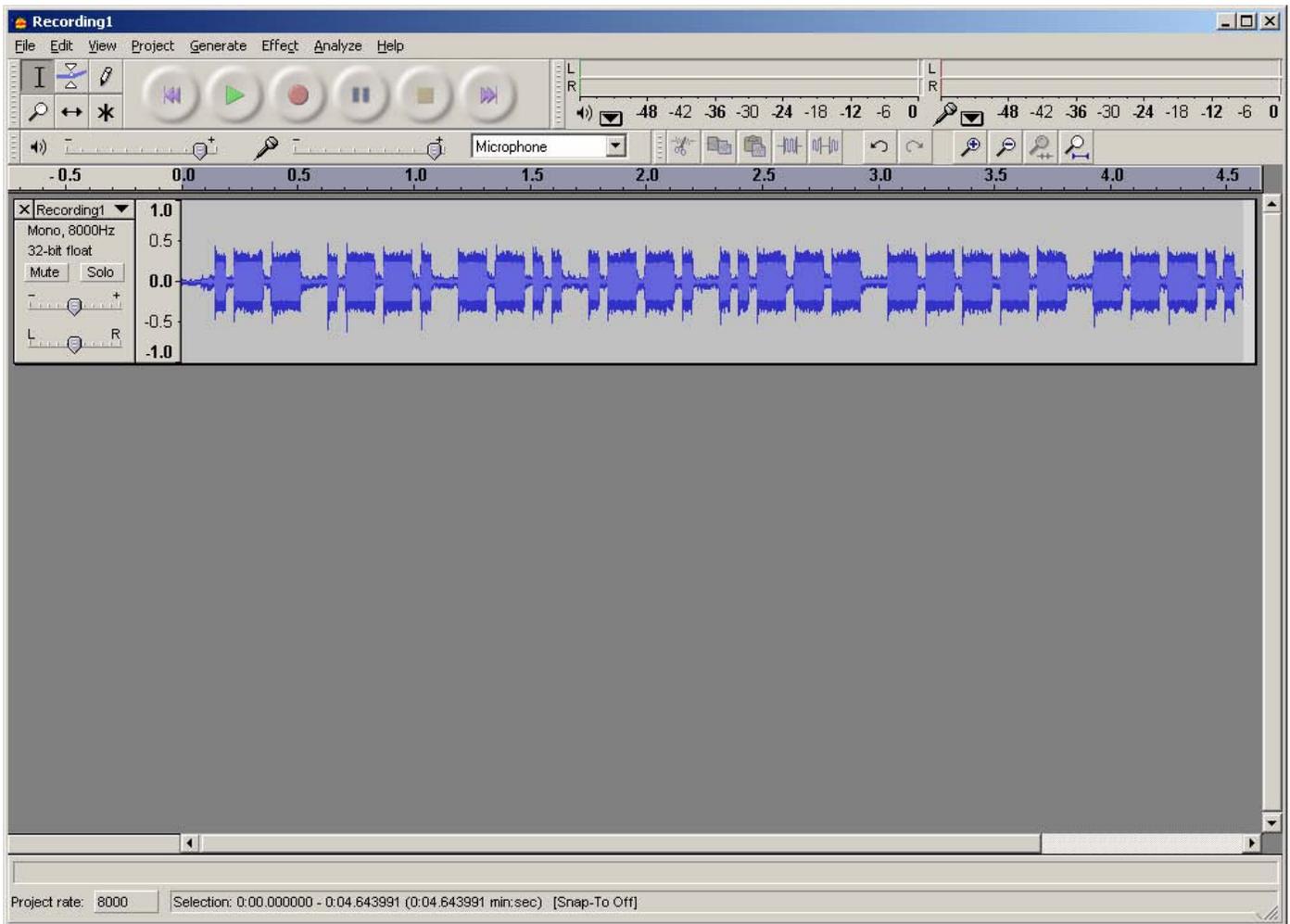
and there you have it. If the audio amplitude is too low to give a good graphical representation of the call-sign broadcast, you can select and amplify the call-sign broadcast.

4. Then simply compare the dits and dahs shown on the graphical timeline with the Morse-code table and write down the characters that make up the call sign. In the example below, the call sign is WPZP208.

The call signs issued to RTK GPS users consist of four letters plus three numerals.

You can identify the licensee by entering the call sign in the FCC's license-search utility at <http://wireless2.fcc.gov/UlsApp/UlsSearch/searchLicense.jsp>

Temporary call signs (typically used during the days or weeks after frequency coordination for a new license is completed but before the FCC issues the actual license) consist of the letters "WT" plus a seven-digit telephone number. You will have to guess the area code if you wish to contact the station operator by telephone.



Audacity screen print showing call sign WPZP208 broadcast in Morse code

### International Morse Code

- 1 dash = 3 dots.
- The space between parts of the same letter = 1 dot.
- The space between letters = 3 dots.
- The space between words = 7 dots.

A	• —	V	• • • —
B	— • • •	W	— • —
C	— • — •	X	— — • —
D	— • •	Y	— • — —
E	•	Z	— — • •
F	• • — •	.	• — • — • —
G	— — •	,	— • • • — —
H	• • • •	?	• • — — • •
I	• •	/	— • • •
J	• — — —	@	• — — • • •
K	— • •	1	• — — —
L	• — • •	2	• — — —
M	— —	3	• • • —
N	— •	4	• • • •
O	— — —	5	• • • •
P	• — — •	6	— • • •
Q	— — • —	7	— • • •
R	• — •	8	— — — •
S	• • •	9	— — — — •
T	—	0	— — — —
U	• • —		