

Amateur Radio Disability Access

Helpful tools and assistive technology solutions from a ham who has ALS.



Figure 1 — The left and right clicks on the Docooler PCsensor USB 2 Foot Switch Control Keyboard.

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In the latter half of 2017, I began to develop a weakness in my left arm, and in January 2018, I was diagnosed with ALS (Lou Gehrig's disease). The weakness progressed, extending to my right arm and both hands, and increasingly affected my ability to operate my radios. I've explored and implemented methods of mitigating this increasing level of disability, as they may assist with a wide range of conditions.

Using a Keyboard

In many cases, you can work around the need to use a keyboard by using the dictation facility now available on most computers, tablets, and phones. I use this function to send many of my emails. Still, there are many times when I need access to a keyboard function, like when I'm entering details into a log. Fortunately, a solution is now available in the form of an onscreen keyboard provided by Windows 10. You simply move the cursor over the keyboard with the mouse and left-click keys to type. You can access the onscreen keyboard by going to **SETTINGS**, then **EASE OF ACCESS, KEYBOARD, ONSCREEN KEYBOARD**. It can also be turned on and off using the Windows key + **Ctrl + O**.

Hands-Free Mouse Usage

Using the onscreen keyboard requires the ability to move a mouse and to left and right click. When I first discovered the onscreen keyboard, I could readily move the mouse and type at a decent speed, further enhanced by an excellent predictive text function. As my condition has progressed, I've needed to adopt additional measures. The first was simply to use the mouse on a lower table in front of my radio and computer. Currently, I can still move the mouse on this table, albeit in a much more limited way, but I'm no longer able to left and right click. Fortunately, I've found an effective solution for this, using a double foot

switch keyboard, specifically the Docooler PCsensor USB 2 Foot Switch Control Keyboard, which I found on Amazon (see Figure 1). The associated downloadable software allows you to assign any keyboard functions to the switches, including left and right mouse clicks, which you can then operate with your feet (visit www.pcsensor.com/usb-foot-switch.html to download the software).

I also found *Camera Mouse*, which is a free software that utilizes a webcam to track the movement of your head to control the position of the cursor (www.cameramouse.org). The only hardware you need to use this is a webcam. I've set up *Camera Mouse* on both of my desktop computers and they work well, particularly when you tweak the settings for your desired response.

Radio Operation

My radio is a Yaesu FT-1000MP, interfaced to my computer with a *microHAM* microKEYER II, providing full computer-aided transceiver (CAT) control, with CW and RTTY/PSK operation in conjunction with *N1MM Logger+* software (see Figure 2).

Basic operation of the radio is carried out using *N1MM Logger+* for selecting the mode (CW/SSB/PSK/digital), selection of the band and the filter, and tuning the radio via the band map and entry windows. SSB and digital operation is pretty straightforward. I use a push-to-talk (PTT) footswitch for SSB and onscreen keyboard/camera mouse with the two mouse footswitches for digital. Sending Morse code is a little more complex.

Sending Morse Code

The method I use for CW operation depends on the type of contact I'm making — contesting; a quick, basic exchange, or a longer chat.

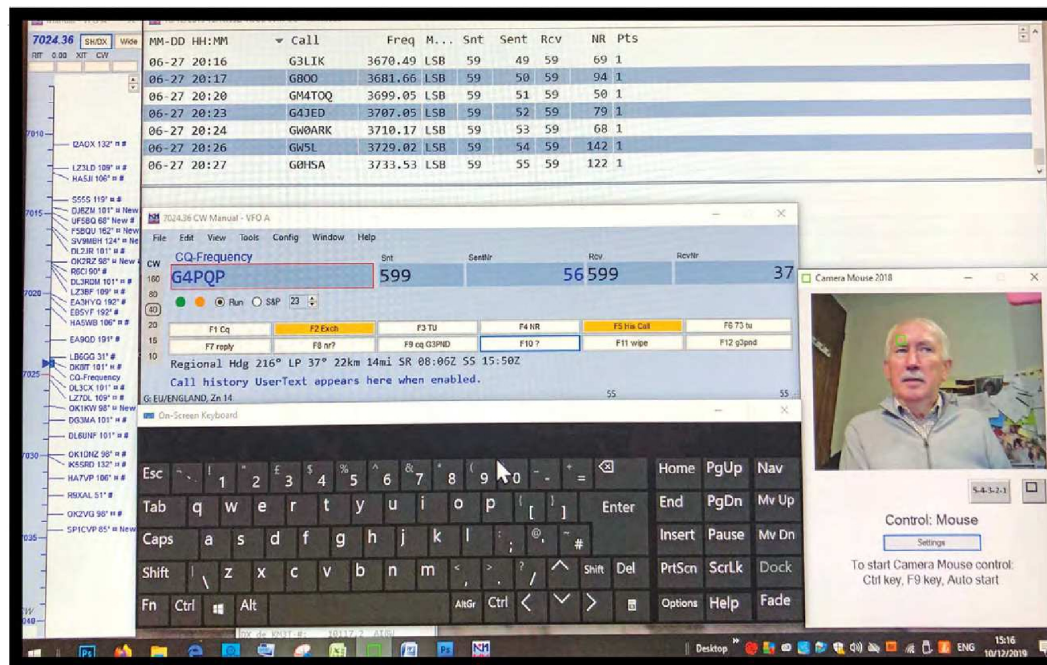


Figure 2 — The Windows 10 onscreen keyboard, the Camera Mouse software (at right), and N1MM Logger+. In the Camera Mouse software, the cursor follows a selected facial feature as you move your head. Here the green tracking square is locked onto my right eyebrow.

Contesting

Contesting is the simplest of the three forms of contact. In the past, I would have operated in run mode, however, I now find that I can't enter call signs and serial numbers fast enough. I now use the "search and pounce" method, using the band map to tune the radio, which gives me as much time as I need.

Quick Contacts

I use the N1MM Logger+ macros with customized preset messages as the basis of my contact. Each macro function can contain up to 255 characters. I always instigate the contact with calling CQ, rather than responding to one, so I control the contact's format and duration. I use the N1MM Logger+ general log, listed as "DX" in the log drop-down menu. This gives additional name and comment windows. I use the comment windows for sharing my location. I've also noted my condition on my QRZ.com page to explain any perceived differences in the way I communicate.

Longer Contacts

I have two methods of generating spontaneous Morse code for longer contacts. The first method is to use N1MM Logger+'s built-in keyer function (window/CW key). Whatever I type, using the onscreen keyboard

with the mouse or camera mouse and footswitch, is sent as Morse code.

My second method is more innovative, using a piece of hardware specially designed and built by my friend Bruce Ashdown, G4KZT, which he calls the "SAYMORSE CW keyer." You speak the Morse code into the built-in microphone. The circuitry includes audio amplification and a Schmitt trigger to produce a 0 and 1 output, which can be plugged directly into the radio's key jack in place of the Morse key.

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All photos by the author.

Steve Appleyard, G3PND, was first licensed as a radio amateur in 1961, while studying electronic engineering. He pursued a career in the electronics industry, designing marine navigation and communication equipment. He is now retired. Steve edited the book *International Antennas*, published in 2017 by ARRL and the Radio Society of Great Britain (RSGB). He also wrote the first chapter, "Using the Reverse Beacon Network to Test Antennas." He is co-author of *Getting Started In EME*, published in 2019 by the RSGB. He can be reached at sfappleyard@btinternet.com.

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