

CW Operation with the RF2K-S

For the CW operator the RF2K-S provides major enhancement over the capabilities of its predecessor RF2K+. The electromechanical T/R system of the 2K+ has gone, replaced by a lightning fast and completely silent electronic T/R system. The dedicated system controller has been upgraded and new operating software provided to perform all functions including frequency measurement very much faster than before.

Universal Mode

In Universal mode only RF and PTT connections from your transceiver are required for operation. With this simplest of configurations full, high speed, silent QSK is possible with any capable transceiver.

As with the RF2K+, the RF2K-S is sequenced to prevent hot switching. To achieve this, the operating frequency is measured, the correct LPF and antenna selected and tuner settings adjusted before bias is applied to the LDMOS and amplification commences. An essential difference between the RF2K+ and the RF2K-S is the speed with which these actions are carried out.

In this first case let us assume LPF and ATU settings are correct. With the RF2K+ in Universal mode, the time taken from presentation of RF to bias being turned on is around 26mS whereas in the RF2K-S it is close to 3mS. This means the first character element will suffer only minor clipping of 3mS duration. To put this in context, a single 25 wpm dit of 48mS duration will be shortened by just 6% which a listener is unlikely to be able to discern. Even at 50wpm that first dit would be shortened by just 12%. In the graphic at figure 1 the output waveform from my K3 sending dits at 50 wpm can be seen rendered in yellow with the corresponding violet RF2K-S output above it. The effect of the 3mS truncation can be seen on the first output dit whereas subsequent dits can be seen to faithfully reflect the input waveform.



Figure 1.

In the second case let us assume we have changed band, making LPF and ATU adjustments necessary. In this case the time from presentation of RF to output appearing is 60mS which is long enough to noticeably shorten or perhaps completely prevent that first dit from being sent. Figure 2 illustrates the situation when an LPF and ATU adjustment is required. Keep in mind transmission speed is set to 50 wpm.

The first character may be corrupted if operation following a band change proceeds without care but this problem is easily avoided. A quick tap on the key following a band change will trigger the required amp re-tune, setting everything up correctly so when sending commences, performance will be as it would had a band change not taken place. In my own opinion as an ardent QSK operator, this simple configuration provides everything I need for top notch QSK operation. However for the absolute perfectionist who feels 3mS shortening of the first character element is intolerable or who is unhappy to routinely follow a band change with a single dit to set-up the amplifier for operation, the RF2K-S supports a CAT connection which may be used to avoid both of these issues.



Figure 2.

CAT Mode

The latest G39C79 software for the RF2K-S supports a CAT connection. Figure 3 reveals input and output waveforms in the earlier 1st case scenario with LPF and ATU settings correct but this time with CAT connected. As can be seen there is no longer any clipping of the first dit which in terms of shape and length faithfully reproduces the input waveform. A Figure 4 is unnecessary because with a CAT connection the RF2K-S is always aware of transceiver frequency and is ready to go with appropriate LPF and Tuner settings adjusted in advance.



Figure 3

On the Air

The above measurements tell a story to which I will now add my subjective assessment of the RF2K-S in use on air paired with my Elecraft K3.

I love it!

If it wasn't for the 1500W reading on my power meter I would hardly know it was there as it quietly goes about its business. As owners of the Elecraft K3 will know, it is a transceiver with outstanding QSK CW performance. It is fast and click free and so it remains when driving the RF2K-S to 1500W. Whether the RF2K-S is online or offline makes no discernible difference to what I hear. No clicks are added to T/R or R/T transitions and listen through appears unimpaired. As a routine I operate at between 25-35wpm but occasionally push upward from there. I was still easily able to sense on frequency activity beyond 50wpm.

Bob Henderson, 5B4AGN

8 November 2020