

How much does CW weigh?

Newcomers to the hobby often get a bit fed up when the older hands keep recommending CW. “...it’s more efficient” “...it gets through when SSB fails”, we’ve heard it all before. I want to look at it from a different angle; how much does it weigh? That might sound like a crazy question but bear with me.

First let’s look at CW from a communications perspective. An approximate way to compare CW to SSB is by comparing the bandwidths of the respective modes. This is a simplification but it will suffice for this analysis. The bandwidth of an SSB signal is about 2.7 kHz – so your transmitter power is spread across this bandwidth. Let’s assume that the bandwidth of a CW signal is 100 Hz – your transmitter power is much more concentrated! The ratio of these bandwidths is 27:1. All things being equal this equates to a 14 dB advantage for CW. Thus a 5 Watt CW signal will have the same power density as a 135 Watt SSB signal. What does this weigh?

Let’s start with our CW station and we will use an FT-817 to generate our 5 Watt signal. The manufacturers spec says that an FT-817 weighs 1.17 kg including batteries. If we take out the batteries we save 300 g giving a mass of 870 g, that’s 174 g/Watt.

There are no 135 Watt radios that I’m aware of so let’s just look at an FT-857 as it’s very similar in most respects to the FT-817. That radio weighs in at 2.1kg and runs 100 Watts so that’s 21 g/Watt. scaling our FT857 up to 135 Watts gives a mass of 2.85 kg. So as a start our “No Code penalty” is just under 1 kg of extra weight.

That’s just the start though. Let’s look at the batteries we will need. The FT-817 specification indicated 2 Amps on transmit at 5 Watts output. So for an hour of transmitting we will need a 2 Ah battery. The FT-857 draws 22 Amps on transmit at 100 Watts. Scaling to 135 Watts gives about 30 Amps, so an hour of transmitting would require a 30 Ah battery. If we look at Lithium Iron Phosphate batteries, I found a 2.4 Ah 12 Volt battery weighing in at 360 g. The best 30 Ah 12 V LiFePO4 weighs in at 3.7 kg.

So now we can work out our station weight.

FT817 + 2.4 Ah LiFePO4 battery = 1.53 kg

FT857 (scaled to 135 Watts) + 30 Ah LiFePO4 battery = 6.55 kg.

So with this simple analysis we can see that the “No Code penalty” is over 5 kg (11 lbs.).

CW is a skill that weighs nothing but if you are carrying your station it could save you a lot of sweat and toil!