Contesting

Thanks to Nick, G4FAL for inviting me back as a guest columnist. In this article we will look at different aspects of CW contesting.

Despite being around for almost 200 years, Morse code (CW) is still alive and well in 2024, as is CW contesting. Effective SSB contesting and CW contesting are learned skills but of course CW has to be learned first, before considering entering a CW contest. Yes, you can use software or a hardware 'code reader' to decode CW, but there is no substitute for learning Morse – it's very enjoyable to use once you have overcome whatever hurdles you personally encounter during the learning process.

Setting up your receiver for a CW contest

Much of the following advice also applies to SSB contesting.

Unfortunately, your shiny new HF transceiver with every modern feature, arrives in its box with receiver settings which the manufacturer has decided are for the 'average' user – perhaps someone who rag-chews and/or likes 'easy listening' settings etc. These manufacturer's default settings must be understood and correctly altered to make any transceiver perform effectively under CW contest conditions eg a dense pile-up of loud signals, maybe with nearby QRM.

Key point 1

Your receiver settings can be altered to improve reception on a crowded contest band or when working a pile-up of stations.

In an ideal situation, every time an operator went back to receive after a QSO, they would be able to hear, and hence reply to, only one complete callsign each time. This greatly increases the QSO accuracy and rate, but it can often be very difficult, even for an experienced CW operator, to pick out just one signal from a dense pile-up. This is due to several factors:

1. Assisted operators just clicking on a DX Cluster spot, which takes them to your frequency immediately. They then don't bother to move their Tx VFO, even slightly.
2. Overall improvements in the frequency accuracy of DX Cluster spots worldwide.
3. Modern radios, often with TCXOs controlling their frequency, can result in several callers being 'zero beat' ie the received tone of their signals are almost exactly on the same audio frequency.
4. One or more strong signals cause your receiver's AGC to reduce the overall gain drastically, hence weaker callers are masked by stronger callers.

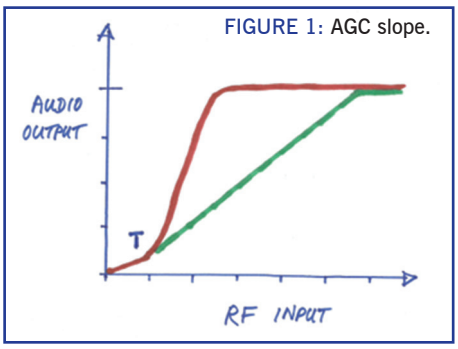

FIGURE 1: AGC slope.

Generally speaking, most HF transceivers have too much gain, especially on the lower bands (160, 80 and 40m). Conversely, older transceivers might have not quite enough gain on the higher bands (eg 15 and 10m). Accordingly, most transceivers have one or more Rx preamps and possibly several levels of Rx attenuation, all of which can be switched in or out by the operator, as required. They may also have some other feature for improving the intercept point eg IPO or AIP.

There are a number of things that can be done to make copying callers in a CW pile-up easier:

1. Switch off Preamps – select IPO, AIP etc.
2. Switch in attenuation – even 12 to 18dB initially, but usually just enough to make only one or two signals audible, ideally.
3. Switch the AGC to 'Fast' – or to 'Off' if you are prepared to be deafened at times and don't mind constantly adjusting the audio gain control. 'Slow' AGC should be avoided.
4. Back off the 'RF Gain' control – with the RF gain control fully up, some receivers exhibit gain compression, where above a certain input signal level the audio output remains constant – this makes it difficult to separate out signals.
5. Switch in a narrow filter eg 250 to 300Hz (see point 6 below).
6. Use your RIT control (or second VFO on receive) to listen slightly off (possibly only ±100Hz off but maybe a bit more) your transmit frequency. Some experienced CW contesters will deliberately call you off-frequency, in the hope of getting through the pile-up more quickly.

All of the above adjustments make it more difficult for weaker callers to be heard by you in your pile-up, so bear this in mind and possibly ask for QRP callers at times. Alternatively, ask for a directional call eg from the USA etc. As the pile-up thins out, you can reduce the attenuation etc until you can hear and work these weaker callers. This might seem unfair to them, but it is a reality that the stronger callers will almost always get through first. So the faster you can work them, the more chance the weaker callers have of working you.

One final very important point about AGC: many transceivers allow you to adjust the 'attack' time and the 'decay' time of the AGC, but very few allow you to adjust the 'AGC slope'. As far as I know, the TenTec Orion was one of the first available transceivers, in 2003, to have this very useful adjustment, which was also included in the Elecraft K3 in 2008. **Figure 1** shows what we mean by 'AGC slope'.

The red line is the most common transceiver AGC performance, with the marked 'T' being the AGC threshold on the RF input axis.

The green line is the ideal AGC performance. It's not 'no AGC' but the slope shows that a change in RF input signal results in a corresponding change in audio output, over a wider range of input signals. This makes separating out calling stations considerably easier. If your radio gives you the ability to alter that slope, make it as shallow as possible and the 'mush' around a big pile-up will often clear.

CW contesting

Moving on to the main topic of this article, it is fair to say that in 2024 the QSO exchanges during a CW contest are much briefer and faster than even ten years ago. In addition, most experienced CW contesters now hardly touch their Morse key or paddle during a contest – the logging software sends everything for them.

Key point 2

Speedy, accurate keyboard skills are essential for success in CW contesting. Here is the most common format of a CW contest exchange, with some comments :

PHOTO 1: J48FT contest team in the IOTA Contest 2024 (Tinos Island Greece).

1. You: 'CQ GM7V'. On busy bands, there is absolutely no need for a longer CQ – most RBN skimmers will respond quickly to this simple CQ format. There is also no need to send 'CQ GM7V test' (this format is embedded in many contest logging software packages). The 'test' is redundant and wastes time. Everyone knows that it is a contest and you are using a UK special contest callsign! However, some contesters favour sending 'Test Callsign' instead of 'CQ Callsign'.
2. Caller: 'G9XXX'. Again only one, single call should be sufficient.
3. You: 'G9XXX ++5nn -- a4'. Some abbreviation of the exchange saves time, as does using ++ and -- (or similar) to send the 5nn (or enn) at a higher speed than the rest of the message.
4. Caller: '5nn a4'. As the calling station, if the CQing station has responded with your correct callsign, there is no need to resend it (or their callsign) at this stage.
5. You: 'TU'. If you have a big DXcluster- or RBN-driven pile-up calling, then there is no need to send your callsign after every QSO. After every two to three QSOs is a good compromise. This shows consideration for any unassisted contesters who have tuned in to your pile-up and are waiting (impatiently?) for you to give your callsign.

You can speed your CW up (probably no faster than about 38wpm) when the pile-up is big, and slow it down (even to 26-28wpm) when there are few callers to help encourage those who can't read CW at high speed to call you.

As with receiver settings, the default messages in most contest logging software packages need to be changed – usually by removing extra characters which only the software writers think are needed.

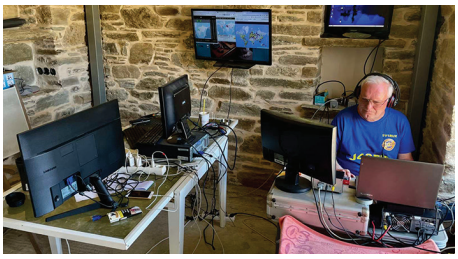

PHOTO 2: David, SV1RUX at the controls.

Some hardware considerations for CW contesting

You will be very unpopular on the bands if your transmitted CW is a poor-quality signal. Common problems are wide, clicky or buzzy signals.

To avoid this, you really need to do an on-air test with a nearby station (make sure they know clearly what they are listening for) and they will tell you whether or not your signal is 'clean' at all transmitted power levels.

Many current transceivers allow you to adjust the rise and fall times of the transmitted CW wave form. This is a balance. Times that are too short lead to wider transmissions but, conversely, longer times lead to 'slurring' of the transmitted CW signal, especially at higher sending speeds. Times in the range of 4 to 6ms are a good compromise for most radios, but make sure that you check the transmitted waveform.

How you change from transmit to receive is another crucial consideration – personally I never use semi or full break-in (QSK) CW for the following reasons:

1. Unless the T/R timing is carefully checked, QSK could stress or damage your radio or linear amplifier.
2. Why would you want to listen on your transmit frequency when transmitting, given that at 30wpm your transmitted messages only takes 2 or 3 seconds at most?
3. SO2R/SO2V (2BSIQ, SO3R) operators (not me!) use the time when transmitting to listen to one or more other radios, instead of listening to the sidetone of their own transmission.
4. Over many years of contesting, I have found that a simple footswitch is the easiest and most predictable way of changing from receive to transmit and back on CW. You can stop any message being sent instantly (faster than pressing 'Escape', without waiting for any software delay) and generally have complete, speedy control when you need it most. When combined with a timing-checked parallel PTT switching system, the transceiver and amplifier are switched to transmit and back simultaneously, then things are noticeably faster – no missed first dots or dashes, no waiting for the transceiver to go back to receive, etc. Your view of this footswitch method may differ of course. The advantages may not be immediately apparent. If you prefer not to use a footswitch for this purpose, most logging software also allows you to key the radio's PTT line from the computer before starting to send CW (often named 'TX delay' and defaulted to 50ms delay). If your switching is particularly slow, you can extend that delay as necessary.
5. I have mentioned this before, but I don't like ESM – Enter Sends Message. Yes, it saves you keystrokes, but it also is annoying and stressful if it responds incorrectly – possibly getting confused and sending something you don't want to send at that particular moment. Again, your view of how useful ESM is will possibly differ from mine!

Some computer considerations for CW contesting

It is not only the operator who has a busy time during a major CW contest – there will be a lot going on for your shack PC (or Mac). Not just logging QSOs, checking for dupes, checking for mults from databases, sending the CW, polling your transceiver via the CAT port(s), but it is also possibly connected to an external DX Cluster or RBN or running a local skimmer etc.

It is therefore crucial that the hardware of your logging PC is up to the job – having a fast processor, sufficient RAM, well integrated interfaces, and a speedy internet connection etc. You should also consider whether or not you actually need any extra hardware box between your PC and radio. Often logging software defaults to logging every incoming cluster spot to disk. If you are connected to a busy RBN feed with tens of spots per second arriving, and your PC is old and slow, this can be a source of CW keying distortion. You should consider turning off that spot logging.

One final point regarding operating on CW in a contest: choose your operating frequency carefully. Consider going as low as possible on the band, if you can hold the frequency for some time.

Key point 3

Success in CW contesting is a combination of personal motivation, multi-tasking skills, fast reaction times, accurate logging etc, combined with well-configured software, station hardware and antennas.

Websearch

[1] https://www.rsgbcc.org/hf/rules/2024
[2] https://www.contestcalendar.com/index.html
[3] https://www.cqcontest.eu/
[4] https://www.qsl.net/ct1boh/so2r.htm
[5] *RadCom Contesting*: https://rsgb.org/main/radio-sport/

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