



The Kanga WhisperMite WSPR/QRSS/CW Beacon

Setup/User Guide. (For Firmware version 9 from 01/08/2026)



The Kanga WSPR/QRSS WhisperMite (KWM) is a small low-cost method to get going with either a WSPR or QRSS beacon, even use it as a standard CW beacon, you can also enter a message up to 50 characters long and set it up as a FOX hunt beacon too

Whisper mode is a great way to test antennas, propagation, or just for the fun of seeing where your low power signal can go. There is a clue in the name 'WSPR' mode (Weak Signal Propagation Reporting Mode) even just a few mW can result in reports

from many 100s of miles if not 1000s. We have been using the KWM for some time and we have results (Spots) from over 5000 km and we only run 200mW of power into a simple end-fed half wave wire at 20-25ft AGL. The first prototype didn't even have a PA transistor just straight from the Si5351 module into a LPF and that got reports from over a 1000 miles (only running 5-10mW!)



QRSS beaconing is used by more and more Hams to check band propagation and antenna performance too. A group of Hams maintain beacons and the associated 'Grabbers' that capture and display the QRSS signals in a form of waterfall display, these grabbers are on most bands and spread around the world.

QRSS uses Morse code, but at VERY slow speeds, it takes about 5 minutes just to send a callsign so it's not used for QSOs. Signals close to the noise floor can be seen with ease on the grabber displays even when you can't hear the signal by ear. It's a great way to test antennas, propagation, or just for the fun of seeing where your low power signal can go. Even just a few mW can result in reports from many 100s of miles if not 1000s. We have been using a KWM for some time here now on 30m sending QRSS signals into simple end fed half wave wire at 20-25ft AGL and get good results.

The KWM's CW Beacon, the KWM can also be used as a standard CW beacon up to about 30wpm, the KWM uses software smoothing to give a better keying shape that automatically operates from approximately 5 wpm to 30wpm.



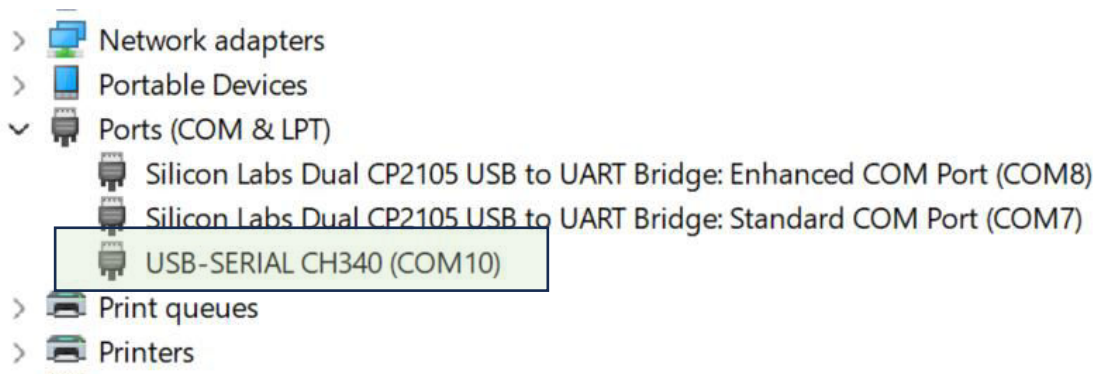
Once built your KWM will need to be configured before you can use it.

First we need to install the serial device drivers on your computer, you may well have this already installed. The driver is for the well known CH340 USB Serial driver. This is downloadable from the WSPR page on our website. Install this **before** plugging in the KWM.

Once the driver is installed on the computer plug in the KWM via the USB socket to the computer, the computer should see it as a Com port.

Look at the device manager if you need to so you can see what COM port it's been given.

Here my KWM has been allocated COM10, remember this number



To setup the KWM you need a computer with Terminal emulator software. We recommend CoolTerm, it's a free program that is intended for use with serial ports rather than network communications like some others. If you have a favourite package feel free to use that. We have not tested the serial communications with every program but have used CoolTerm since the first prototype of the KWM. It's great, simple to use best of all it's free.

A link to this free program is on our websites WSPR/QRSS page too. Consider a small donation to the writer of this program if you like it and can afford to do so.

Let's look at this first as it's the only way we can talk to the KWM and get it ready to go on air.

Downloads are available for most operating systems, I am using Windows 11 and so screenshots are from my Windows PC.

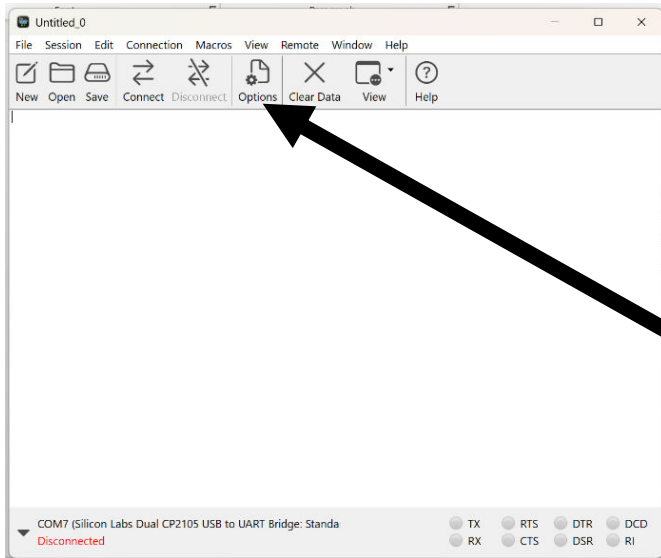
Download either the 32-bit or 64-bit depending on your computer and install.

When you run Coolterm for the first time you will get an option to set preferences now or use defaults. I normally select use defaults.

Plug the KWM into any available USB port on the PC

After a couple of seconds the KWM will light one of the TX Tone LEDs, wait, then the red sync LED will flash on/off for 10 seconds.

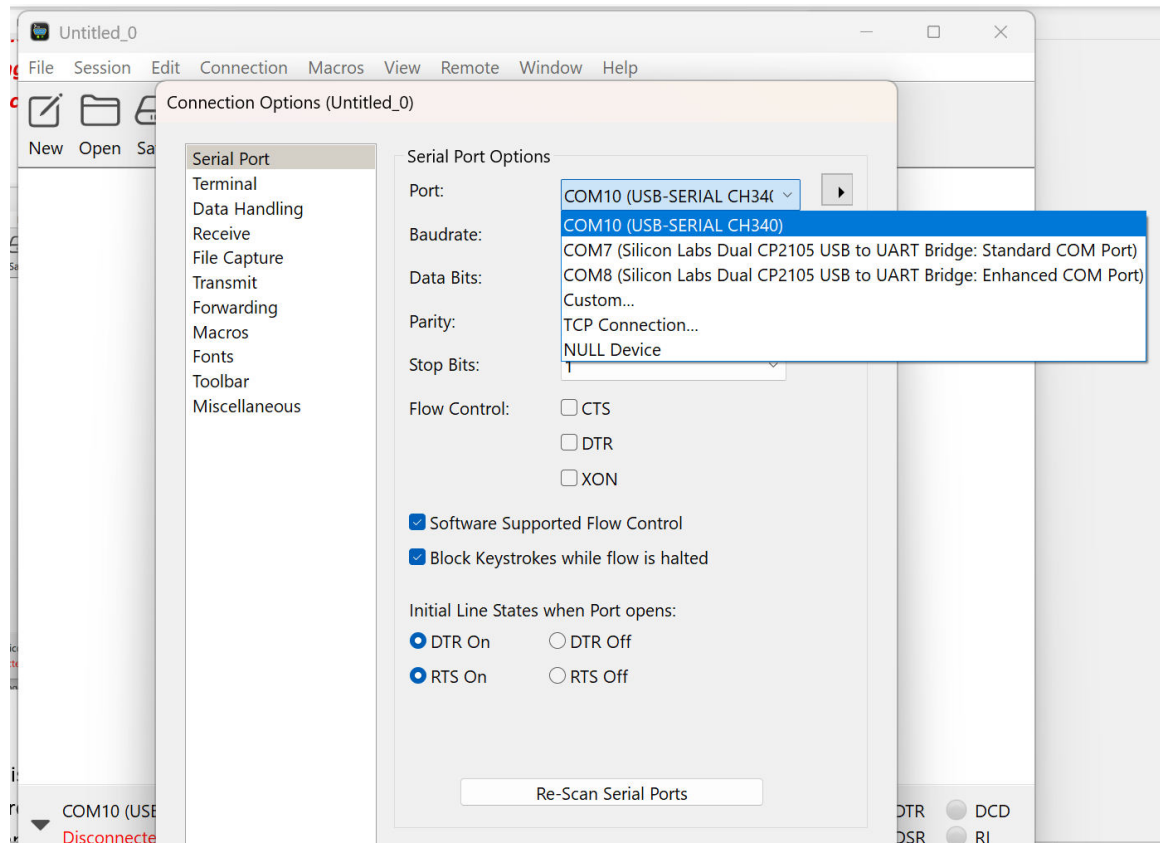
Start CoolTerm and look at the top for the Options Icon

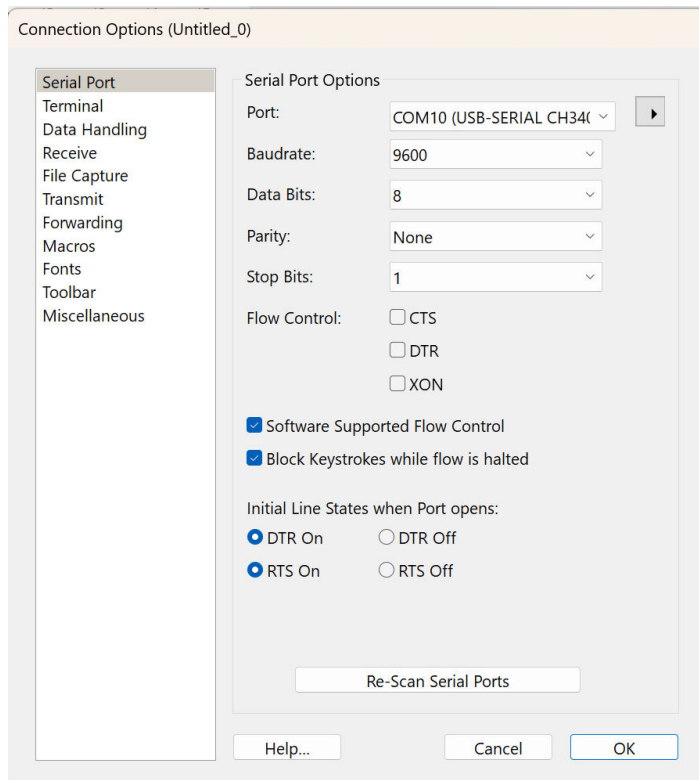


You need to have the KWM connected to the computer still. Click on the Options icon.

This will give you a pop-up.

Please note, If you can not see the KWM as a COM port the most common reason is that you are using a charge cable not a data cable, they look the same and many phone leads are just for charging and do not have the data wires inside. Get a data cable! (We sell them too)



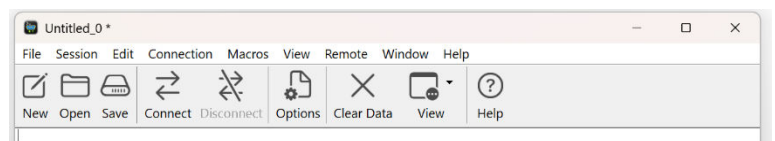


From this pop-up select the COM port for the KWM, **Your COM port number will depend on your hardware**. If you move your lead to a different USB port then the COM port number may also change. Check the other settings are the same as shown here.

Change any settings that differ from these shown here. (Except the COM port number you are using)

Then click OK.

Next click the 'Connect' icon on the top icon bar. After a few seconds the WhisperMite will reset and one of the 'W' or 'O' the front panel LEDs will light.



This is the time to select which mode you want to use, it's important to note that this can be changed at any time you want and you do NOT need the WhisperMite connected to a terminal to do so. Easy to change this anywhere you want from field to home.

For initial setup just leave the mode to the default of 'W' (for Whisper Mode') After a few seconds this LED will go out and no LEDs will be displayed for 2 seconds then the red TX LED will start to flash. When this happens, you get this message in the terminal window.

Press BUTTON to enter setup

If you do nothing the flashing LED turns solid, it may be green or red depending on if the unit has been configured and if it just happens to be entering a TX cycle.

Now we will start again and this time enter the menu to setup the WhisperMite.

Click disconnect, and then click Connect again, this will reset the KWM and when you see the message "Press Button to enter setup" Press the button!



Now a much bigger menu will appear

```
* Kanga WhisperMite Menu Ver 9 *
WSPR/QRSS Plus CW/FOX Beacon
>> See Instructions for WSPR/QRSS Freqs <<

>> WSPR Options <<

Q Set Call/Loc/dBm
F1 <freq>: Band1 freq
F2 <freq>: Band2 freq
B [1|2|DUAL]: Select band
R Toggle Random Shift
I <minutes>: Intervals (EVEN mins)

>> QRSS options <<

QC <call>: QRSS call
QF <freq>: QRSS freq
QP <0-7>: 0=Off 1=Line 2=AM 3=Tri 4=Saw 5=MNTs 6=ECG 7=ZigZag
QM <OOK|FSK|DTF>: Set QRSS mode
QD <ms>:QRSS dot length
QS <hz>:QRSS shift
QQI QRSS Interval Seconds (Default 600)

? Status
V View corr
C <n>: Set corr
X Exit

Cmd: ('M' for Menu) ?
```

Now the LEDs will change on the front of the WhisperMite, the Red LED above the 'Sync' button will turn Green, the two TX FSK LEDs (W & O) will start to flash alternatively. You are now in setup mode.

```
Cmd: ('M' for Menu)
End
|
```

If you do nothing for 60 seconds the menu will time out and End.

If this happens while you're reading the menu you will have to click disconnect and then connect again to get back to this menu after pressing the button again when asked.

So now we are in the menu



Let's work down the list.

There are two sections, one for WSPR and one for QRSS

WSPR Options

Q

This allows the user to enter the WSPR information.

So I would enter

Q M0BMN IO82 23 So that's callsign (up to 6 Chars), Locator (first 4 digits), Pwr in dB

F1 / F2

These are the frequency control settings for WSPR.

The commands F1 and F2 are used to set the frequency that WhisperMite will use for (The QRSS frequency can be completely different and is set later below)

Let's say we want to set the WhisperMite for 40m and 60m (See Appendix A), to start with try the WSPR frequencies below.

F1 7.0401

F2 5.3662

B [1] [2] [DUAL]

The WhisperMite can operate on two bands. Here you have the option to select which band to use or both. Use the following.

B 1 This will use F1 Freq

B 2 This will use F2 Freq

B DUAL This will transmit alternating between B1 and B2 can use "B D" as a short cut

For clarity again, In 'DUAL' mode the WhisperMite will switch bands on alternative transmissions.

B1 uses Freq F1 and B2 uses Freq F2

R

If we use this 'R' feature the transmission frequency will move by a random amount (+/- up to 80Hz) on each transmission. This feature is a toggle on/off



I can hear you now! Isn't that bad practice, someone else maybe on that new frequency? Well it would be better to transmit on a clear unused frequency for sure BUT... On WSPR mode people transmit on the start of an even minute, that can be 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 and so on up to the 60th min of each hour, some people band hop and may not appear on your band for 30 mins or more, it's just about impossible to be sure of any clear frequency. If you transmit on the same frequency for each transmission it's possible you will be right on top of one person (or more) each time, you really would not know. I suggest using the random shift option as this way you will not block the same person each transmission (or them you). Occasionally you may notice if you look at the WSPR database that on some transmissions you get less spotters than others, this can be the reason, if a higher power station is transmitting at the same interval and the same frequency they may be blocking that particular transmission. Since you only need to be a few Hz away from others this doesn't happen very often. **I strongly suggest that you use this feature.**

I

The 'I' command is used to set the Interval between transmissions, This MUST be an even number so 2, 4, 6, 8, if you have selected DUAL band it will alternate on each interval so if set for dual band and interval set to 4 minutes it will transmit on F1 and four minutes later it will transmit on F2, then back to F1 at the next interval and so on.

Now we move onto a few not frequently used options

V

This is to View the preset calibration factor of the built in Si5351 module, we are using our own version of a Si5351 setup that is different from the type you will normally find ours uses a very accurate TXCO with microstep adjustments. It's the most stable Si5351 I have seen. These typically have 0.5ppm stability rather than the 30-50ppm most modules offer. We have found that rather than being 1-2KHz off freq like many standard modules ours is typical around vary between 0 and 10Hz. we have found that the span of correction factors is very low so a default value has been selected that will give good accuracy without the need to make changes. We have given you an option to make changes yourself if you wish with the next command but 99% of users will not want (or need) to make any adjustments to this value.

C

Should you wish to super fine tune your correction factor this command will allow you to adjust the value used, the default is 500, that gives 5Hz adjustment, you need to enter the value in 10ths of a Hz so an extra 1 Hz adjustment would be entered as either 600 or 400 depending which way you wanted to move frequency.

If you do want to check and adjust your WhisperMite frequency accuracy read Appendix C



Next we can look at the settings for the QRSS Side, a lot more options to play with in this mode!

This mode can be used for the high speed CW beacon or the FOX hunt transmitter but that's covered in the appendix following these basic instructions for now let's stick to QRSS

The first setting to make is

QC

This is used to store the callsign for QRSS

It's used such as:

QC M0BMN

if you wanted to, a callsign tag could be used such as BMN. You can use a '/' If you wish so **QC M0BMN/IO82** would work if you wished (But it would take a very long time to send and would not fit into a standard 10 min window, bear this in mind!)

QF

Is next, this sets the frequency for the QRSS transmission, (See Appendix A) its use is:

QF <FREQ in MHz (or Hz) > so for say 7.0399 MHz we would use

QF 7.0399

Now we have an interesting feature many Beacons don't offer. The WhisperMite gives a choice of 7 patterns that can be used to fill in the gap between transmissions.



The patterns are :

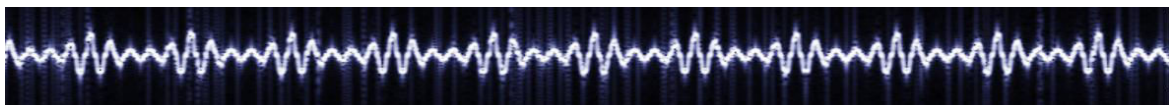
QP 0 All Patterns turned off, silence (no carrier) between callsigns (the traditional way)



QP1 is a straight carrier between QRSS transmissions



QP 2 is an AM (Amplitude Modulation) style waveform



QP 3 is a Triangle pattern



QP 4 is a Sawtooth Pattern



QP5 is my version of a Mountain Range Pattern (Changing Random heights & widths)



QP6 is an ECG Pulse Pattern



QP7 is a ZigZag or Inverting V Pattern



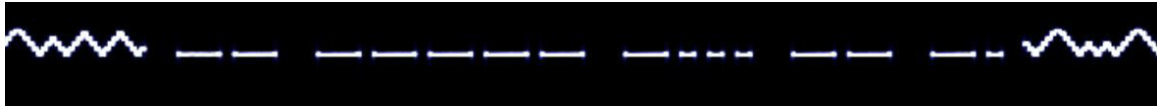


Next we have the option to select which one of three QRSS Modes we want to send

In the early days the only choice was straight On Off Keying (OOK Mode)

This is our first choice

QM OOK Simple but classic



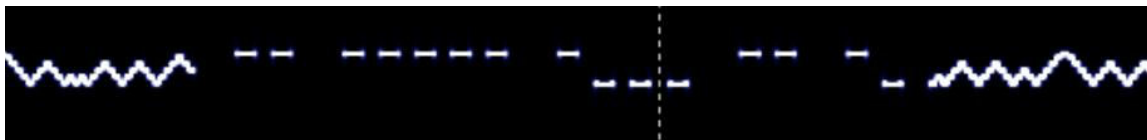
Next, we have what is probably the most common used today, Frequency Shift Keying, that switches between two tone the Gap tone is low and the char tone is high, the width of the high tone line tells us it's a dit or a dah here's my callsign using this mode.

QM FSK



Our last choice is also a FSK mode but this is called Dual Tone Frequency Shift Keying (DTF) This typically take less time to transmit than the other two modes.

QM DTF



Next, we need to be able to set the Dot Length. Dot length is the measurement that everything is based on in QRSS modes. This is to be entered in milliseconds.

QD 5000 This would set a 5 second Dot length

If you wanted to use the WhisperMite as a high speed CW beacon you can set this much lower, 100mS is 12 WPM, 40mS is 30 WPM.

At speeds below 500mS we have used a form of software smoothing of the CW signal to help clean up the transmission and so reduce key clicks. If you do use high speed Morse (for a QRSS Beacon that's 1 WPM up to 30WPM you need to make sure you are using Mode OOK and that you set the patterns to OFF (**QM OOK**, and then **QP 0**)

The latest firmware can also operate as a FOX Hunt transmitter (see Appendix C for more details on Beaconsing Options)



Now we have :

QS This is used to set the QRSS Shift when using one of the FSK modes usage is:

QS 5 This would give a shift of 5Hz , 5Hz is about the standard but you can use other values, don't go too mad with this or you will not make friends in the QRSS community.

QQI **Warning Advance Setting **

Usage QQI xx (Seconds)

Now this feature is a late addition requested by a number of users as a custom feature. Since I had a little bit of free space in the control chip I have decided to add this to the standard release.

This only effects QRSS mode, it allows the QRSS interval time to be changed. For normal QRSS operation set this to 600. This is 10mins (600 Seconds).

If using the QRSS section as a high speed Beacon, or for FOX hunts you may want the transmissions more frequent than the standard 10 mins (see appendix B and C for details on these modes) . This command will allow you to repeat the CW beacon text from 10 sec intervals to 24Hrs , this interval must be entered in seconds.

Example of use:

The user enters a message , not a callsign in the QC field.

“FOX HUNT FOX HUNT DE M0BMN” This can be up to 50 Characters inc spaces.

set the mode to standard on off keying, (QM OOK)

Set the QRSS Dot length to get the WPM speed you want eg ' QD 100 ' is 12 WPM.

Now that message would take about 30 secs at that 12wpm. If we set the QQI interval to 60 Secs then every minute the message will repeat. Its is worth noting that the interval, 60 seconds in this case, is from the START of the 1st transmission. So if we start and press sync at 10:00:00 hrs we will transmit at the start of each new minute. The interval is NOT from the end of the transmission. The way we have set this allows users and listeners know when to expect to hear a transmission, in this case at the start of a new minute.

if the interval is less than the duration of the message then the next transmission will be at the next new minute after the transmissions stops. Users will always know when to expect to hear the beacon.

The last couple of options now



? This command will display the current setting you have made, useful for a quick check!

The screenshot below is with my test settings

```
>> WSPR STATUS <<

B1=28000000Hz (28.000000MHz) B2=5366200Hz (5.366200MHz)
BandMode=B1
Rand=ON
Slot=4m
Q : M0BMN IO82 23 dBm

>> QRSS STATUS <<

QRSS Freq=28000000Hz (28.000000MHz)
Mode=OOK
Dot=100 ms
Shift=5Hz
Call=FOX FOX FOX DE M0BMN
User QQI=600 seconds
QRSS pattern: OFF
```

If anything doesn't look right you can of course re-enter any values, here are just the frequencies I used for testing

Finally.....

The last command is X

X This exits the menu and starts the WhisperMite using your set values, of course the values are written to eeprom and will be remembered even with the power off.

There are still two more options you can set but you don't need a computer connected to the WhisperMite to adjust these.



Option Switches on PCB Inside the WhisperMite there is a 2-way switch block.

Option 1 (left hand switch)

With this turned on (up position) the WhisperMite's configuration is locked, that means you cannot enter mode or menu setup or even re-sync the time. The idea is set up the WhisperMite first, do a time sync and then lock the config so if using it in the field or worried about catching the sync button when you didn't mean to this will not be a problem with this lock on.

You will need to reset the switch again to make changes or re-sync.

Option 2 (Right hand switch)

When ON (up) it will use the frequency stored in F1 to generate a steady carrier, the correction factor is set to zero in this mode so you can determine the frequency error so you can fine tune the accuracy using the 'C' command after working out the correction.

Both these modes should be set when the WhisperMite is unplugged but no damage will occur if powered and making these changes but software operation may not be correct if you do.



How to use the WhisperMite

So now you have set all the options and the WhisperMite will burst into life and transmit either WSPR or QRSS or even both! But you're certainly not going to get any WSPR spot reports and the traces on grabbers will not be time synced to other users yet.

I am going to tell you to time sync in WSPR mode, you can sync in the other modes but there is a possibility you can catch a brief deadband that will not accept the sync input so let's stick to syncing in WSPR mode.

Let's make sure we are in WSPR mode. When you plug the WhisperMite in after a second or two the TX Tone LEDs will come on, which one tells us the current mode i.e. WSPR, QRSS, or Dual Alternating mode.

The pattern is

LED 'W' on LED 'O' off = WSPR Mode

LED 'W' off LED 'O' on = QRSS Mode

LED 'W' on LED 'O' on = Alternating Mode

The mode choice is controlled at this time by pushing the sync button, you only have around 5 seconds to make your choice so know what you want to select before getting to this point. Each push of the button moves to the next mode and the LEDs will change to reflect this.

Once you have selected the mode there is a short dead band where all the LEDs go out, do not hold the button during this time. The red TX LED will now flash to allow you to enter the menu if you wish (you shouldn't need to this time so leave the button alone now) if you do press it and don't have a PC connect, no worries just leave it alone and ignore the two flashing TX Tone LEDs after 60 secs they will time out.

Whichever mode you have selected will take over. Don't expect that the WhisperMite will instantly burst into life with a fancy LED light show. WSPR and QRSS both operate on schedules, we haven't told it when the beginning of a schedule is yet. If it is the first boot and setup the schedules could be all over the place.

I suggest to start with select WSPR mode, this is the mode to use for time syncing. Press the sync button 3 or 4 times before worrying about setting the time accurately, this will initialise the eeprom for storing the sync time. This should only be needed the first time you sync the WhisperMite following a new build.

WSPR transmissions have a strict timing requirement, more than about 5-7 seconds out and you will not get any decodes. Although WSPR will tolerate being a few seconds off the even minute boundary try and get as close to the start of a new even minute as you can.

You need to have an ACCURATE time source now. To be honest I find the clock on my Phone or smart watch is just about bang on (both Internet connected). You need to be able to see



seconds not just minutes now. Other ways are websites like 'Time.is' that show a very accurate clock or even listen to the 'pips' on the hour from Radio 4 FM. Whisper needs to start on **EVEN** minutes, and most grabbers are set to start at 10 min intervals starting on the hour or every 10 minutes from the new hour point, so my advice is to wait for a new 10 minute slot to come round and while watching the seconds get ready to press the Sync button one last time, count from 57, 58, 59, and when the new minute starts and you see the seconds roll over to '00' press the sync button (not before you see this 00). The two TX Tone LEDs will flash about 5 times to let you know the new sync time has been accepted. watch the first WSPR reports if you can and if your time offset (DT) is negative next time you sync don't be so quick to press the button, likewise if the DT value is Positive be a little quicker! Either way don't try for perfection, the reported DT figures will depend on the receiving stations clocks accuracy too. Aim for less than 1 second +/- . WSPR will allow you to be up to about 7 seconds and still decode

We are using a very accurate clock module with its own TXCO built-in, this will keep time at an accuracy that WSPR will be happy with for weeks if not months. Even with power removed its backup battery will make sure that the time keeping is accurate. Of course at some point in the future the internal button cell may need to be replaced when you find time keeping is lost when the power is removed but the battery will last over a year normally so should not be a big issue, it's a standard low cost 3V button cell CR1220. **Be warned! Batteries such as these are dangerous around children as they are easy to swallow so be sure to dispose of them safely and keep children away from any spare cells you may have.**

Using the WhisperMite

Assuming you have entered all your information in the menu we don't need a computer to switch between modes.

To use the WhisperMite in WSPR mode.

Connect the Antenna and plug in the power. After a couple of seconds one or both of the TX Tone LEDs will come on. Now following the pattern of LEDs detailed above, repetitively push the button until just the left hand LED is lit (The 'W' for Whisper LED), you only have about 5 seconds to do this. Now leave the unit alone.

The LED will go out and the red TX LED will flash, do not do anything.

After a few more seconds the unit will start up in WSPR mode. If you had set the interval in the menu (item 'I') to 4 Mins it will not transmit instantly it will wait till the next interval start, depending on the timing of schedules and when you synced it's possible that the 1st expected interval will be missed but it will align itself ready for the start of the next one and so on from that point. When it's transmitting a WSPR transmission the TX Tone LEDs will change to represent each of the 4 tones that WSPR use. If you have selected dual band each WSPR transmission will be on alternative frequencies.



Using the WhisperMite in QRSS Mode

Get to the mode select section as above but this time keep pushing the button until the right hand TX Tone LED ('O') comes on, now release the button as before and just wait, since we are using a preset 10 min interval for QRSS (unless you have changed the setting with the advanced QQI option) you may find you have to wait anything up to 20 mins before the first QRSS transmission starts while the schedules sort themselves out, When transmitting QRSS the RX/TX LED will turn Red. Once the QRSS transmission starts the TX LED may stay on all the time if the Pattern option is used. The WhisperMite is design to be able to run 24/7 so don't worry about it overheating. It runs cool all the time.

The Final mode and this can be more confusing at first but it's really as easy as the other modes to use.

Alternating WSPR/QRSS (ALT) Mode

Now as before get to the point where you are selecting the mode by pushing the button and selecting which of the TX Tone LEDs comes on, this time press a few more times till you get BOTH TX Tone LEDs on (W and O) . you are now in ALT mode. This uses a mix of schedules and complicated timing rules. If you change mode a couple of seconds after what would be the start of a QRSS transmission it may start in QRSS mode, if you start late into the cycle it may start with a WSPR transmission first when the next interval period starts, you may time it such that you need to wait again a clean starting point that resets the schedules. There is nothing for you to do, just wait.

In this mode QRSS is given priority, the callsign will be sent and if the callsign takes less than 8 mins to send the WSPR side will transmit one cycle of WSPR too. In this mode only frequency F1 is used for the WSPR transmission. The remaining time of that interval the WhisperMite will just be idle.

The WhisperMite takes care of all this scheduling and control so once you have selected the mode nothing more for you to do other than look at the grabbers and also the WSPR websites to see where your signal is going!

It sounds complicated at first but you will soon get the hang of it and realise how simple the WhisperMite is to use.

If you have any questions about using the WhisperMite feel free to contact me at

sales@kanga-products.co.uk



Appendix A WSPR & QRSS Frequencies (UK)

60m

WSPR: 5,288.700 KHz +/- 100 Hz

QRSS: 5,288.550 KHz +/- 50 Hz (Old Legacy frequency. Not recommended but still used)

QRSS: 5,366.000 KHz +/- 100 Hz (New WRC15 allocation Preferred Section March 2026)

40m

WSPR: 7,040.100 KHz +/- 100 Hz

QRSS: 7,039.900 KHz +/- 100 Hz

30m

WSPR: 10,140.200 KHz +/- 100 Hz

QRSS: 10,140.000 KHz +/- 100 Hz

20m

WSPR: 14,097.100 KHz +/- 100 Hz

QRSS: 14,096.900 KHz +/- 100 Hz

17m

WSPR: 18,106.100 KHz +/- 100 Hz

QRSS: 18,105.900 KHz +/- 100 Hz

15m

WSPR: 21,096.100 KHz +/- 100 Hz

QRSS: 21,095.900 KHz +/- 100 Hz

12m

WSPR: 24,926.100 KHz +/- 100 Hz

QRSS: 24,925.900 KHz +/- 100 Hz

10m

WSPR: 28,126.100 KHz +/- 100 Hz

QRSS Region 1 (Europe / Africa):

28,125.500 - 28,125.700 KHz



Appendix B High Speed CW time examples

WPM	Dot Length (Milliseconds)
30	40 ms
25	48 ms
20	60 ms
15	80 ms
12	100 ms
10	120 ms
5	240 ms

Set these Dot Lengths in Option **QD**

Now make sure you have selected straight CW Mode (OOK)

QM OOK

Set the idle pattern to off

QP 0 (THAT'S A ZERO!)

I am assuming you have already set the freq using QF <freq in MHz>

Finally select '**X**' to exit

Job done, The beacon will transmit every 10 min, on the start of that slot.

You can always test your system using the RBN (Reverse Beacon Network) If you set your 'QC' to something like 'TEST TEST ONLY DE M0BMN' , (I would set the pattern to off (QP 1) if I was testing things this way)



Appendix C Using as a Fox Hunt Beacon

The WhisperMite can also be used as a FoxHunt beacon.

Rather than enter a Callsign using The QC command you can enter a message up to 50 characters long (Inc Spaces)

So messages Like 'FOX FOX FOX DE M0BMN M0BMN' can be entered

Then set the QD (QRSS Dot Length) to a suitable speed for the event (See Table Below)

WPM	Dot Length (Milliseconds)
30	40 ms
25	48 ms
20	60 ms
15	80 ms
12	100 ms
10	120 ms
5	240 ms

Set these Dot Lengths in Option **QD** (e.g. for 12 wpm enter **QD 100**)

Now make sure you have selected straight CW Mode (OOK)

QM OOK

Set the idle pattern to 1 is best for this option

QP 1

Makes Sure you have set the frequency your event is using QF command

Finally select '**X**' to exit

Job done, The Fox beacon will transmit its message every 10 min (default), between sending the message it will fill in the 10min window with a steady tone to let hunters get a bearing.

You can set how often the message is transmitted by using the QQI command and set it from 10 seconds to 24hrs this way.

Happy Beaconsing!



Appendix D Calibrating your WhisperMite

Please note this is not a task I expect many users to undertake but offer this information for those that want to fine tune their frequency accuracy. I will give you a guide to how to do this but you will need some experience yourself. This is not a line by line account of how to do this.

We are using a very stable and accurate TXCO version of the Si5351 (well in fact the replacement Mi5351), all such chips require some software adjustment to bring them on frequency. We have found that 99% of our boards are just about the same offset and so have used a default correction factor of 5.5Hz (entered as 550 in the menu as it has to be in 100ths of a Hz in the software) for most applications this will be fine, no adjustment needed but some of us want perfection so I have given an easy way to adjust this.

In the setup menu you can View (command 'V') the current correction factor (will be 500 if you haven't changed it from default) and the command 'C' to change the value, also on the main board we have the two-way switch block. The first switch on the left is the lock switch detailed elsewhere in these instructions, the second switch option2 on the right when active (in the up position) will transmit a steady carrier on the frequency set for F1 in the menu. During this, the calibration factor is temporarily set to zero so you can see any frequency error if you are using a frequency counter as it is only intended for use in this calibration procedure and power alignment. Set the switch to on (up position). Plug in the power. Use a frequency meter if you have an accurate one and check your transmission frequency, for this test I set F1 to 10.0000MHz (doesn't matter what band version you have it will still leak enough RF for an adjacent meter/receiver). Check how many Hz your signal is from the F1 frequency. This difference will tell us what to set the 'C' value to. For example, if you find your transmitting at 10.0020Mhz and have set 10.0000MHz for F1 you are 20Hz too high, so the 'C' value will be 2000, why 2000 when the difference was only 20? Well we have to enter the value in 100ths of a Hz so you need those extra two zeros to do that. Now return the switch to its normal position (down) and reset F1 frequency to your desired operating frequency, if you haven't done so already set the correction factor to what we have just calculated with the 'C' command. To be sure you entered it correctly (Type 'V' in the setup window to view the correction factor), depending which way you need to correct the offset use positive or negative values for 'C' example if 20Hz to high enter 'C 2000' , if you find your 20Hz to low then enter 'C -2000' .

Other ways are simpler but not so elegant, if you find you are transmitting 5Hz higher than the frequency you expected and entered just take 5Hz off the frequency you enter, problem solved!



Extra Notes

This Option2 Calibrate switch has another use, set the operating frequency in menu option F1 (you should have already done this) flick the switch to on and reboot the WhisperMite, have a power meter connected (the free kit is ideal for that). After rebooting the WhisperMite will switch to carrier mode and constantly transmit until switch 1 is reset and rebooted, now you can adjust the power via the bias control. This makes setting the power level easy.

Syncing the start time

In practice I have found that the best way to get an accurate time sync is press the sync button a fraction of a second **AFTER** the accurate time source your using rolls over to the start of a new minute so for example if you are intending to sync at 11:20hrs at 11:19:00hrs start watching the seconds pass, wait until the source rolls over to display 11:20:00 and as soon as you see the change from 19-20 press the button, do not press it just before you see the 20 appear. Press when you see the 20 displayed, this method normally puts me withing a few hundredths of a second, remember you don't need to be perfectly synced as WSPR will allow about 7 secs variation from the even minute boundary and still decode fine. Over the weeks and months you will learn if your mite runs slow or fast if after a week or two you see that mite is firing a couple of seconds late then next time you sync press the button a couple of seconds before the new boundary (say 11:19:58 secs), if you find the mite is running slow then sync next time a couple of seconds after the boundary (say 11:20:02 secs) this way you should find you will still be getting 100% decodes months after you sync.

If using the WhisperMite only for QRSS modes then I find you are better syncing 5 to 10 secs **AFTER** the boundary so your first character isn't right on the edge of a 10 min boundary on a screen grab for monitoring grabbers.

A Word on output Power

We have stated that the whispermite is designed to be a 5v @200mW transmitter. It will in fact generate much more power than this (additional 50-100% more in fact) BUT... we are looking for long term reliability. The difference in going from 200mW to 300mW sounds a lot but its 1.8dB, no one will really notice but you are pushing the little PA device harder for that small gain. We have tested the whispermite into open loads and short circuits, it as always be fine when we run at the recommended power level. I strongly suggest sticking to the 200mW level to allow for unforeseen antenna problems especially if used in a temporary location with make shift antennas.

At this power level a random untuned length of wire is effective and safe to use.