The OST Morse Box Software V3.00

Ostend Radio Club UBA – OST V3.0

Contents

THE OST MORSEBOX - V3.0

May 2022 ON7DQ ONL12523

Introduction – Purpose

This manual describes the new software, version 3.00, for the OST Morse Box project.
This includes new firmware for the Arduino Nano, which was needed to support a number of new AT commands. The Windows Control program also received a complete makeover, with a lot of new or improved features.

The operation of the OST Morse Box has now become a lot easier.
The improvements are useful for teaching CW "on the air", but there are also some new functions for self-study. Try it out and you will be pleasantly surprised !

Hardware

No modifications are required to the hardware of the existing Morse Box PCB.
You must upgrade the firmware in the Arduino Nano to V3.00 though, but with the Xloader program this is done in less than a minute.*

Software – AT Commands

Gil, ONL12523, has written a completely new control program in the language C#.
For a number of functions, new AT commands were needed, which we describe on the next page.

These commands can still be used separately via a serial terminal (the Arduino IDE, Putty, ...).

* The necessary files can be found on github: https://github.com/on7dq/OST-Morse-Box-V3

The explanation of how to use Xloader can be found on p. 12 of the manual for the DG version:
https://github.com/on7dq/OST-Morse-Box-DG

New AT commands

AT+BSTART(or AT+BSTART=1)	Send beacon once .
AT+BSTART=10	Send beacon 10x.
AT+BSTART=65,000	Send beacon (almost) continuously.
AT+BSTART=0	Stop sending beacons.

AT+CALL=XXXX	Save your call or name in EEPROM. Retained after updating the Arduino program. Maximum length = 14.

AT+PLOT=0/1	Send keying info for the plotter function in the Windows program.

AT+RND (or AT+RND=1)	Send 1 random group.
AT+RND=10	Send 10 random groups.
AT+RND= 65,000	Continue sending for at least 7 days! Still not enough ? Use the random switch on the Morse Box.
AT+RND=0	Stop sending random groups.

AT+RUN=0	Stop current transmission.
AT+RUN=1	Continue with current transmission.
AT+RUN=2	Pause a current transmission.

Alphabetical overview of the AT commands

AT+	
BSTART BSTART=nn BSTART=0	Start sending the Beacon once. Start sending the Beacon nn times. Maximum = 65,000. Stop the ongoing Beacon transmission.
BTEXT=xxx BTEXT?	Set the Beacon text. Maximum length = 80 characters. Retrieve the saved Beacon text.
BTIME=ss BTIME?	Set Beacon delay to ss sec. Min = 5 sec. Max = 30,000 sec. Request the Beacon delay.
CALL=xxx CALL?	Save your call (or name) in the Arduino. Maximum = 14 characters. Retrieve the saved call.
CHARINT=nn CHARINT?	Set character interval for the morse generator Min = 3. Max = 20. Request the set value.
DECODER=ON DECODER=OFF DECODER?	Switch on the Morse decoder. Turn off the Morse decoder. Request the set status.
DELAY=ss DELAY?	Set the PTT delay to ss millisec. Min = 500 mS. Max = 10,000 mS. Request the set value.
ESTAT=nn,nn,nn… ESTAT?	Set all EEPROM values. See further. Request all EEPROM values.
FREQ=nnnn	Set the Morse tone frequency. Min = 200 Hz. Max = 1,500 Hz.
GEN=nnnn GEN=X GEN=0 GENE?	Start the tone generator. Min = 50 Hz. Max = 2,000 Hz. Start the tone generator, set the frequency with the WPM potentiometer. Stop the tone generator. Request the set frequency.
PADDLE=REVERSE PADDLE=NORMAL PADDLE?	Reverse paddle action. Paddle operation normal. Request the set status.
PLOT=1 PLOT=0 PLOT?	Send the key plotter info every 10 mS. Key on = 0xF6. Key off = 0xF5. Stop sending plotter info. Request the set status.
PMODE=0 PMODE=1 PMODE=2 PMODE?	Plain paddle mode. Paddle mode iambic A. Paddle mode iambic B. Request the set status.
RND RND=nn RND=0	Send one random group. Send nn random groups. PTT delay = pause. Maximum = 65,000. Stop random broadcasts.
RUN=0 RUN=1 RUN=2	Stop current transqmission. Continue with current transmission. Pause a current transmission.
STAT?	Request all settings. See further.
WPM=nn WPM?	Set the WPM signal speed. Min = 5 WPM. Max = 35 WPM. Request the WPM speed.

Extra details of the commands STAT, ESTAT and PLOT

AT+STAT? **Request all settings:**

Answer with:

version, tone_freq, wpm, char_interval, ptt_delay, paddle_reverse, beacon_delay, decoder, p_mode

e.g.: `3.00,650,14,4,3000,0,120,1,2`

AT+ESTAT? **Request all EEPROM settings:**

Reply with the stored values in the Arduino EEPROM:

version, tone_freq, wpm, char_interval, ptt_delay, paddle_reverse, beacon_delay, decoder, p_mode

AT+ESTAT=… **Save the settings in the Arduino EEPROM**

AT+ESTAT= tone_freq, wpm, char_interval, ptt_delay, paddle_reverse, beacon_delay, decoder, p_mode

AT+PLOT=1 **Send plotter info**

Send the state of the key input or the decoder output on the serial line every 10 mS:

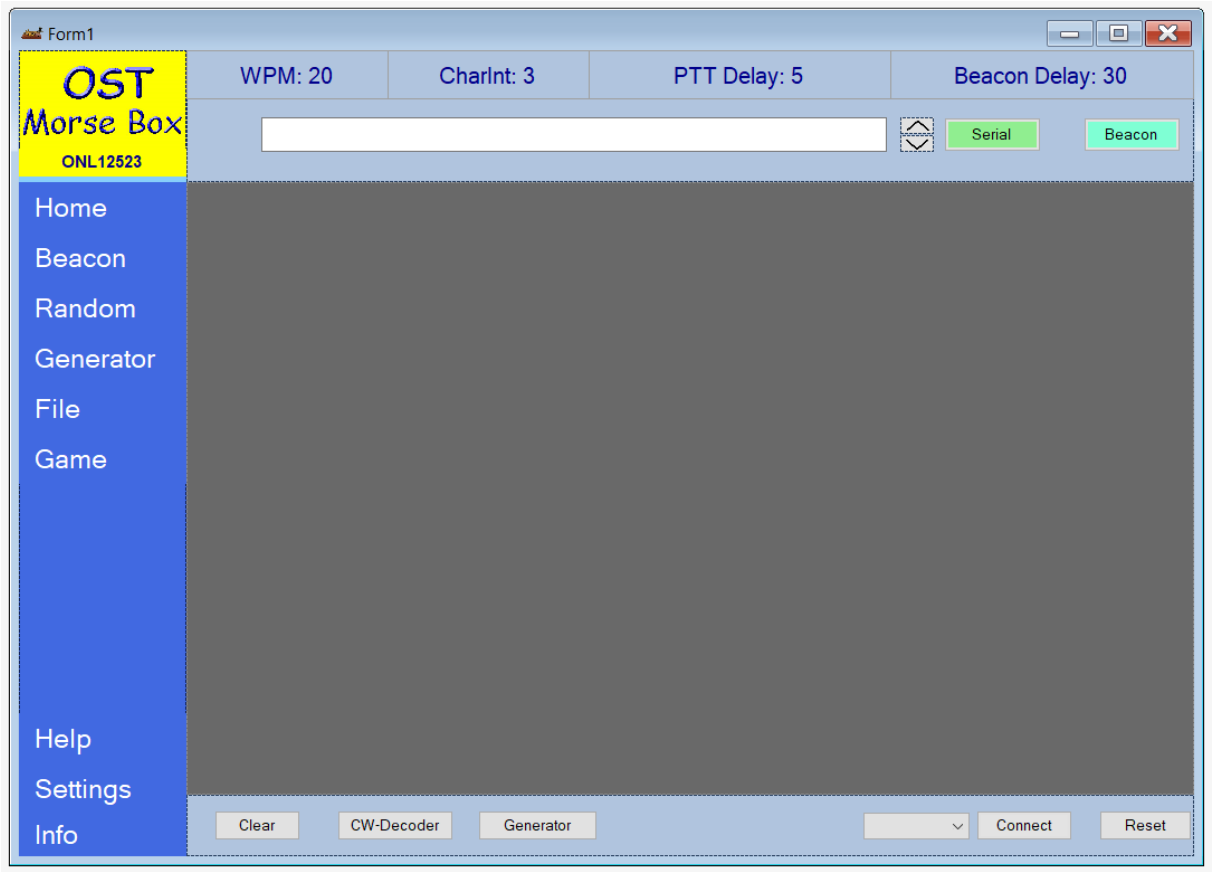
Key = 1 send 0xF6 (246)

Key = 0 send 0xF5 (245) ***stops after 800 ms***

Software - Windows Control program Version 3.00

The program is written in C# with Visual Studio 2022 for .NET Framework 4.8

Basic screen



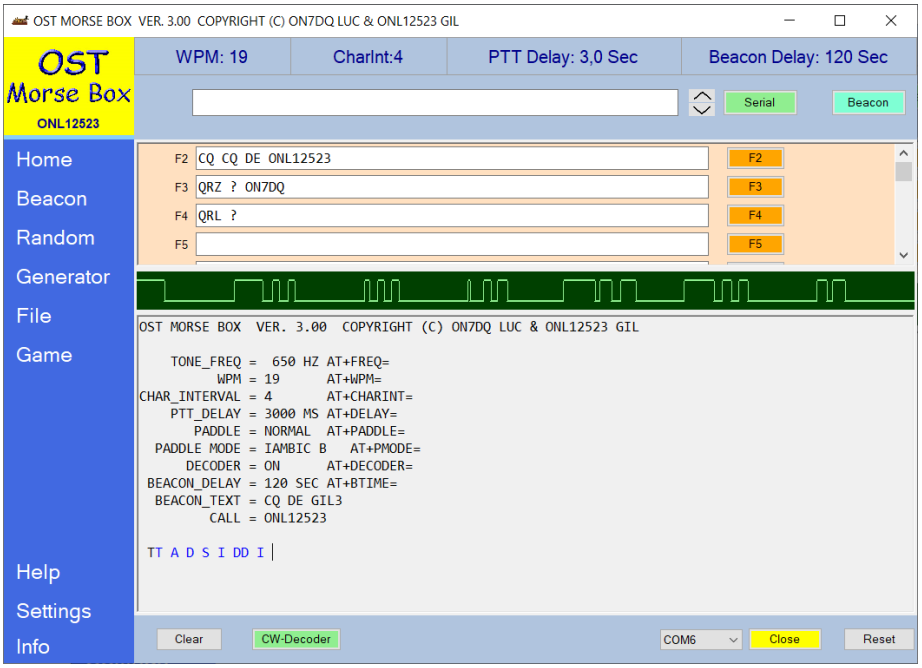
- At the top the status of the connected Morse Box.

- On the left the different menu items.

- Connection with a Morse Box at the bottom

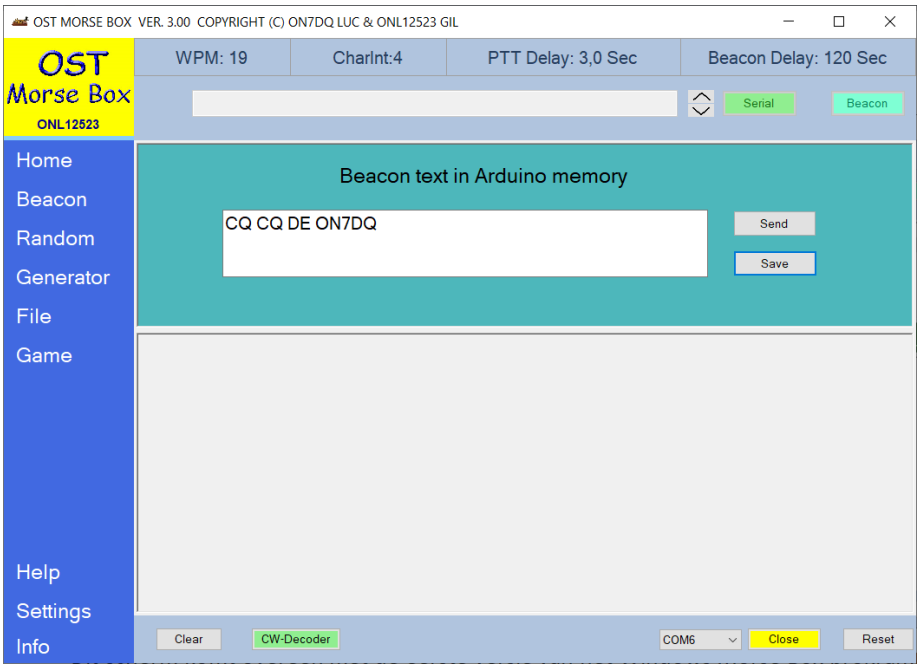
The basic screen is the Form that always remains visible. Each menu item is a separate Form that is loaded in the gray area after clicking on a menu item.
Some parts of the basic Form are disabled when executing a menu item.

Menu Home



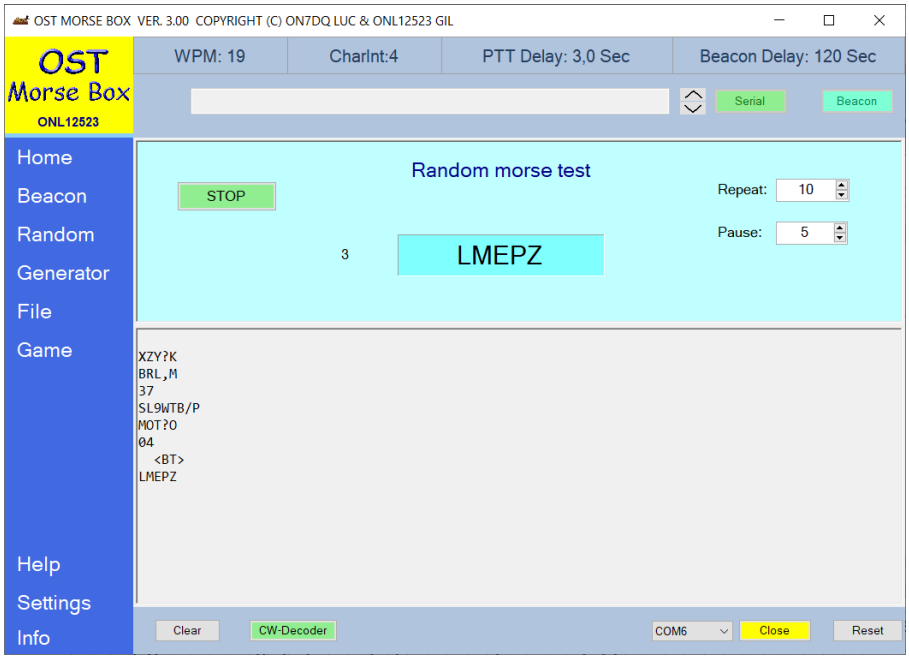
This screen corresponds to the first version of the Windows Morse Box program. As an extra, a plotter shows the Morse signal.

Menu Beacon



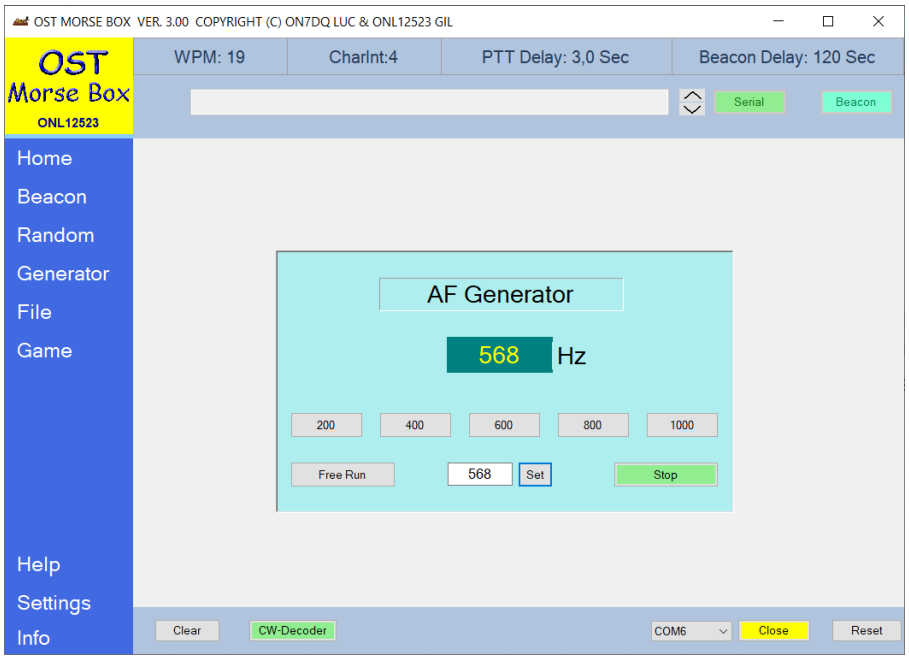
Setting and transmitting the Beacon text stored in the Arduino EEPROM.

Menu Random



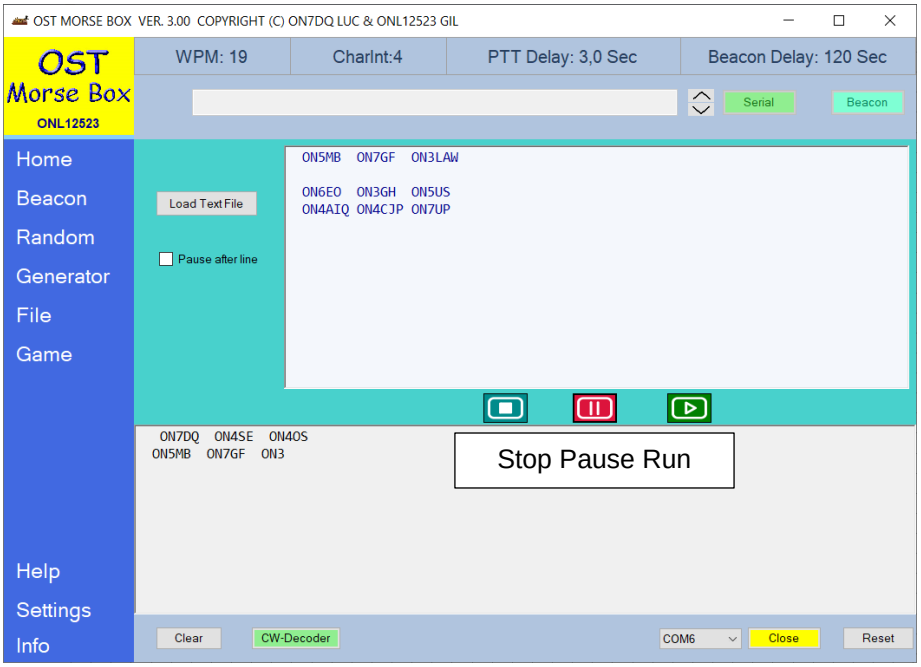
Transmitting random groups of text with the Morse Box. *Repeat* sets the number of groups you want and *Pause* sets the time between groups in seconds.
The monitor screen shows the text after a group has completed.

Menu Generator



This activates the Morse Box tone generator. There are some fixed pre-selections, or an arbitrary frequency between 200 and 2000 Hz can be entered and activated with the *Set button.*
With the *Free Run* button the frequency is controlled with the WPM potentiometer on the Morse Box.
Pressing the *Stop* button, or touching the key or paddle will stop the generator.

Menu File

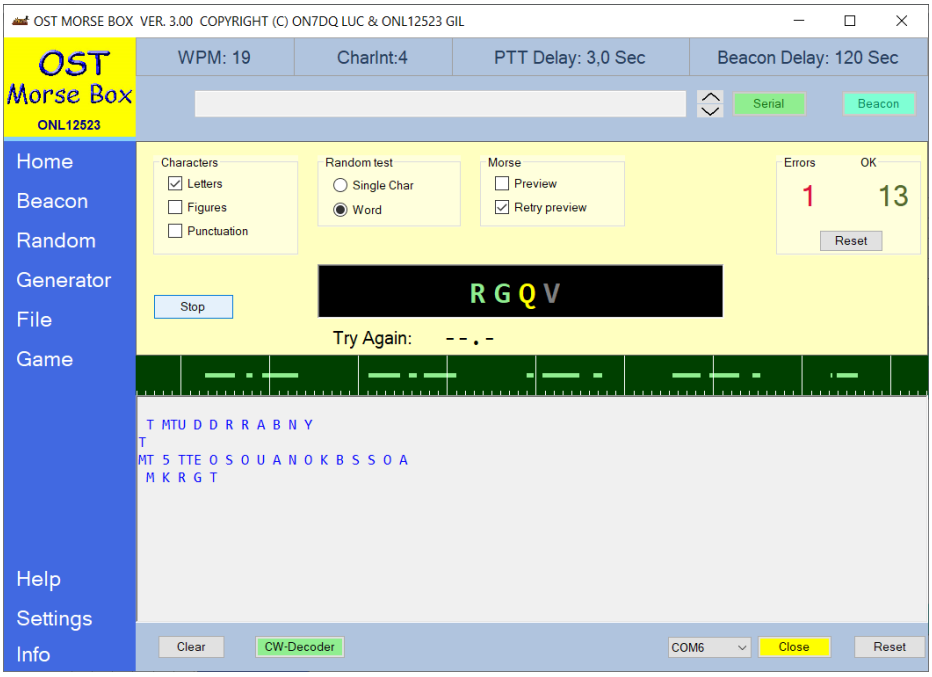


A pre-formatted text is read with the *Load Text File* button. Lines longer than 80 characters are split when reading.

When the box *Pause after line* is checked, the text will be sent line by line.
Briefly pressing the key immediately starts the next line. With the *Pause* button the sending can be interrupted, after pressing the *Stop* button you can start all over again.

The sent text is displayed on the monitor screen.

Menu Game



This is the morse sending skills testing application. Text is shown on the screen, and you have to key it with the key or paddle.

The *Characters* selection box determines which characters appear in the randomly generated text.
Under *Random test* select if you want 1 character at a time, or words up to 8 characters.
The text to be keyed is shown in grey, the letter to be sent in white.

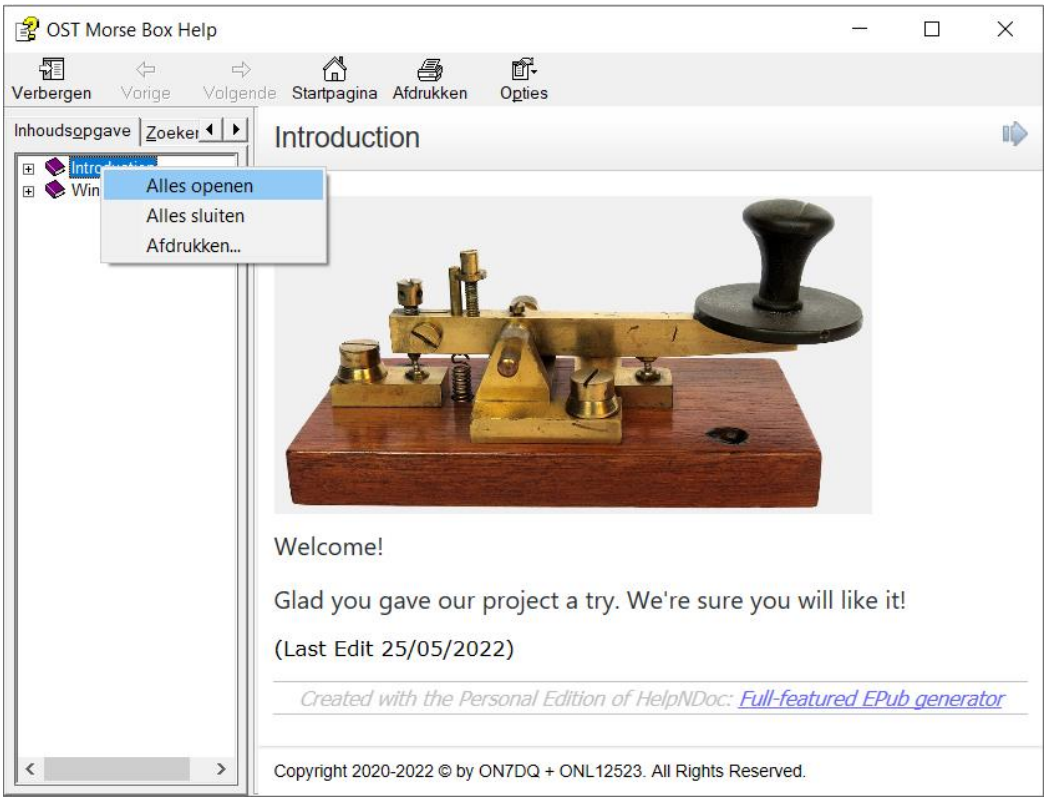
With the Morse Box, the correct letter is keyed (key, paddle or touch paddle), the decoder in the Morse Box will decode it and send it to the program. A correctly received letter turns green and the next letter white. In case of wrong reception, the letter turns yellow and there is a second attempt. When *Retry preview* is selected, the Morse code is displayed. After a second error, the letter changes to red and moves on to the next letter.

With *Preview* selected, the Morse code is also shown on the first attempt.

In the example above, the plotter is set to display the Morse code as dots and dashes, and the scale is also shown per 100 mS and per 1 second (long bars).

Correct characters and errors are counted and after pressing *Stop* the score is calculated (in %).

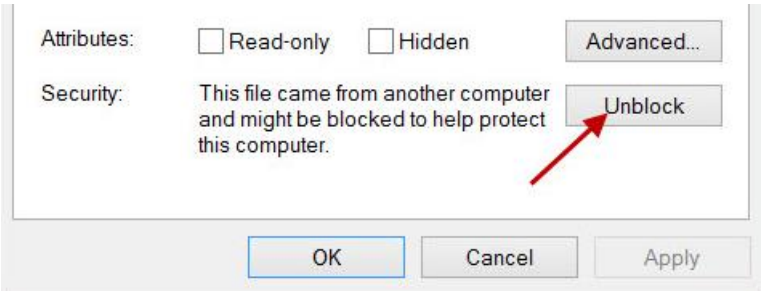
Menu Help and F1



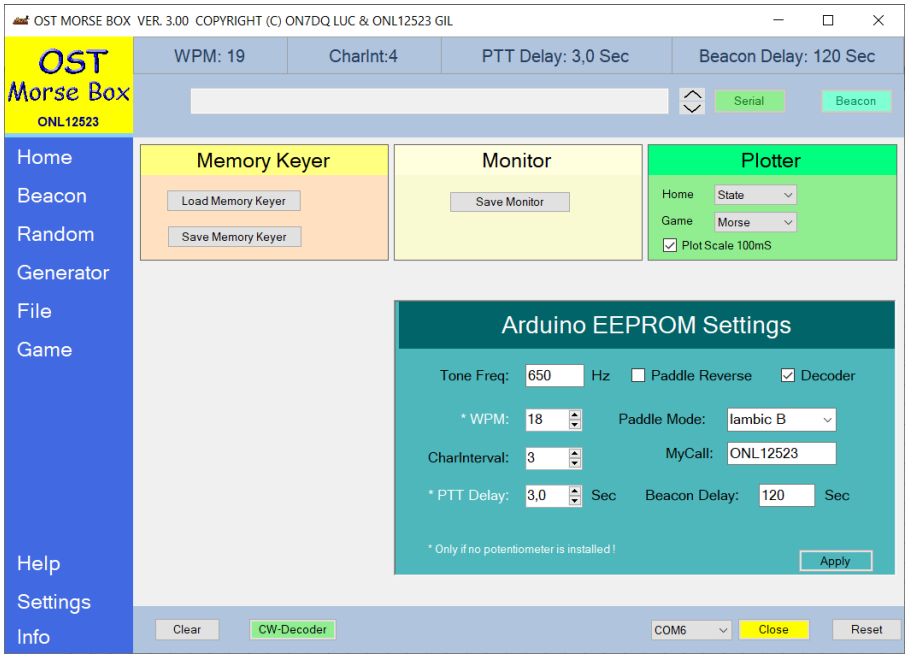
This will display the Help text in the ***MorseBox-3.chm*** file.

TIP : to see all topics at once, right-click on 'Introduction' and select “Open all” (see Dutch example above, “Alles openen”).

If the Help file looks empty, it may be blocked by Windows. Locate the file *MorseBox-3.chm* , right-click it to open its properties, and hit the Unblock button.



Menu Settings



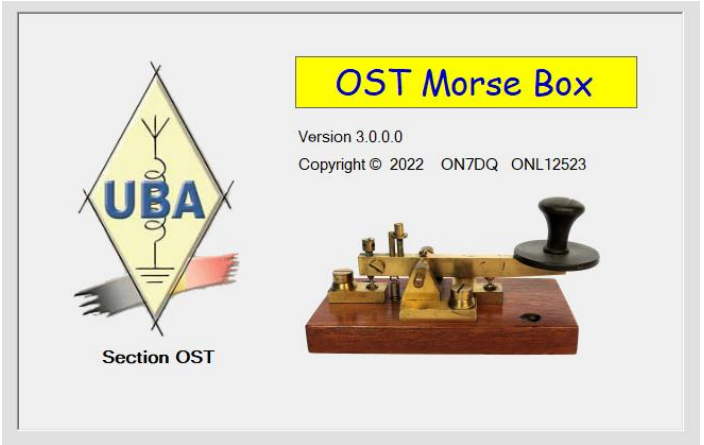
The texts of the *Memory Keyer* can be saved or reloaded.

The text on the Home monitor screen can be saved as a *.txt (monochrome) or *.rtf (color) file.

The plotter can be set to morse, state mode or nothing for the Home and Game screens.
A scale in 100 mS / 1 sec can also be displayed.

And finally the Arduino EEPROM settings can be adjusted here. In the field *MyCall* a text (callsign or name) can be entered that will be saved in the Arduino even after loading a new version of the firmware (maximum 14 characters).

Menu Info



Shows the program version ... and a nice CW key !