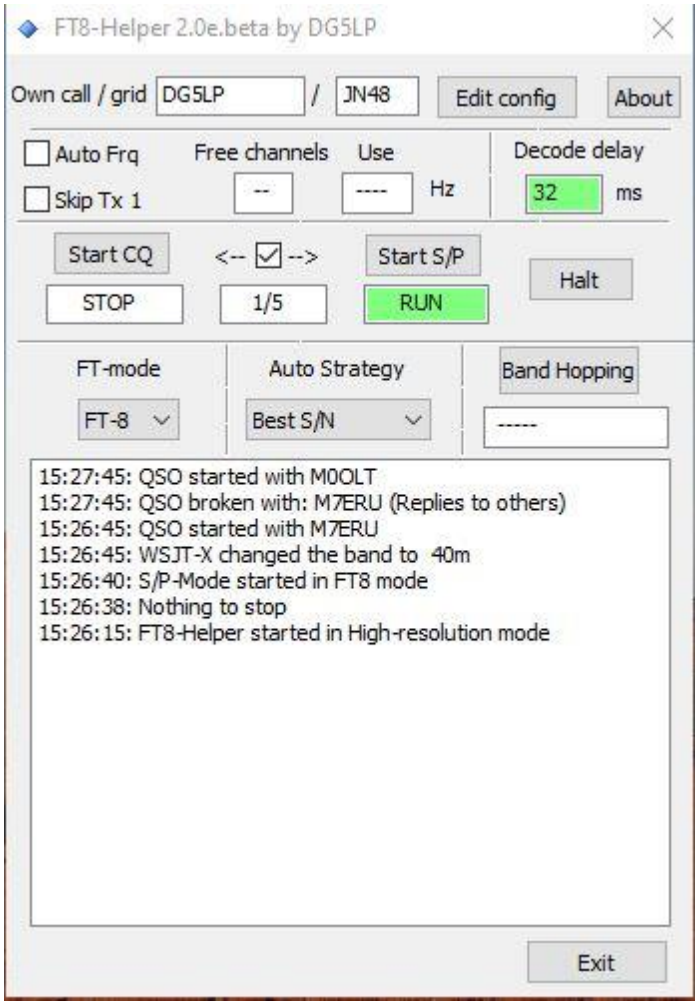
Brief description of the FT8-Helper for WSJT-X

The FT8-Helper program was developed as macro extension for the WSJT-X using the Quick-Macro program. Comparing to FT8-Robot programs, the FT8-Helper is more “intelligent”, it interprets the received messages of WSJT-X and acts according to the own pre-programmed QSO strategy. The delivered EXE file contains the licence for Quick-Macro.

The FT8-Helper controls WSJT-X via virtual mouse and keyboard commands. When the FT8-Helper is running, you should not use your computer for other applications, as the mouse focus will be caught by FT8-Helper every 7,5 or 15 sec depending on the Mode FT4/FT8.



The human interface:

Own call / grid: Your callsign and QRA-grid, should be entered opening the "Edit Config" Session.

Edit Config:
Allows to edit and store the configuration. The full configuration is stored in the

file "config.txt".
During installation, a configuration with default settings is created. Only callsign, QRA-grid and location must be entered. Examples for "location-list": "EU DE" or "NA US USA" or "AS JA".

Auto Frq:

If “Auto-Frq” checked, a free frequency will be calculated. To do it, the transmitting frequencies of all received stations are logged in four subsequent 7,4/15 sec. cycles. From this data the FT8-Helper calculates the most usable free frequency between 500 and 2800 Hz. A channel is indicated as "free" if no message is received on the given frequency during the four last sequences. For transceiver with narrow IF-filter the upper frequency can be limited (see download page, Version history).

Important Note: If "Auto-Frq" is used, the entire Wide-Graph window must be moved into the monitor screen and the size may not be changed later. For monitors with lower resolutions (less than 1900 horizontal pixels) it means, that the right edge of the window must be visible, even if left part of the Wide-Graph window overlaps the WSJT-X window.

Please note that only valid FT8-signals can be regarded when looking for a free frequency. On this reason it can happen that the frequency is set to a non-FT8/FT5 signal, e.g. noise, RTTY, MFSK or any other signal. When using the Auto-Frq feature, the "CQ-only" checkbox may not be checked.

Free channels / Use: If Auto-Frq is selected in CQ-Mode, it shows the number of free channels and the selected AF frequency.

Decoding Delay (Lag Time): Depending on the computer speed and the decoding depth, decoding of messages cannot be completed to the end of the 15/7,5 sec interval. The decoding delay shows how much time was required in the next cycle. This value should be kept under 500 msec.

Start "CQ Mode“:

In „CQ-mode“ (former RUN-Mode) the FT8-Helper will call CQs continuously. Successfully completed QSOs will be logged automatically. After completing or aborting the QSO due to timeout, it restarts calling CQ again. The number of CQ repetitions without answer can be limited setting the "Max CQs sent before sleep" in the configuration menu. Reaching the specified value, the FT8-Helper goes into a short "sleep cycle". The field between the start buttons shows the progress. After expiring the sleep time it starts calling CQ again. CQ mode activates "Hold TX Freq" in WSJT-X automatically.

Start „S&P Mode“:

In „Search and Pounce“ Mode the FT8-Helper selects one from the stations calling CQ. The QSOs, similar to the “CQ-mode”, will be executed automatically and –if successful- will be logged automatically. QSOs will be broken if the called station does not answer, or returns to another station. QSOs will be closed unsuccessful if no report received after a specified number of repetitions. Stations with broken QSOs are postponed for approx. 7 minutes to allow making QSOs with other stations. The maximum number of repetitions can be set in the configuration menu:

- Max CALL repeats ; repeating CALLs wen replying to CQ.
- Max. Repeats in QSO ; repeating Report, R-Report
- Max. Repeats at QSO-end. ; repeating RR73 and 73

FT8-Helper selects the CQ calling station with the highest priority, based on the selected "Auto Strategy"
S/P mode deactivates "Hold Tx Freq" in WSJT-X automatically

Best S/N:
calls the highest priority station according to the selected "Decode Highlighting" in WSJT-X. Stations with “CQ-In message (green)” will be never called. If more stations received with the same priority, the message with the best S/N value is called.

DX-Only:
Only stations will be called, when the calculated distance exceeds the specified "Min. DX-distance". Stations calling CQ without QRA-grid are ignored.

Prefer-DX:
DX-stations, if available will be called with higher priority.

Most Distance:
Stations with the highest calculated distance will be called first. Stations calling CQ without QRA-grid are ignored.

Prefer Wanted:
Stations matching to one of the "Wanted" lists in the configuration are called first.

Only Wanted:
Only stations matching to one of "Wanted" lists in the configuration are called. Exception: Stations with priority higher than "New Grid". If in the WJST-X configuration "New DXCC on Band" is selected, New DXCCs are treated always as "wanted".

For all "Auto Strategy" settings:
Stations matching to on of the Exclude lists in the configuration, are ignored. Stations calling directional CQs are only called if the CQ-extension matches to

one of the entries in the "My location" field in the configuration.
Stations calling DX, are not called, if the calculated distance is less than the specified "Min. DX distance".

XCHG-Mode: Automatic switching between CQ and S&P: (<-0-> symbol)
When starting CQ or S&P with this feature checked, the selected mode ends after a certain number of unsuccessful QSO attempts or broken QSOs and changes to the other mode. The max. number of broken QSOs can be set in the configuration session by means of the "Max broken QSOs in CQ/SP cycles" The field between the Start buttons shows the progress.

Halt (Stop):
First stop initiates "graceful stop". The current mode will stop at the end of the running QSO. If the button pressed again, the QSO is broken and stops immediately all activity of the FT8-Helper.

In contrast to older versions, it is possible to switch direct from CQ to S/P. After completing the running QSO it will switch to the new mode.

FT8 / FT4 Selection:
Switches between FT8 and FT4. It also controls the mode in WSJT-X. If the FT-Mode is changed by WSJT-X, the Helper will indicate FT-Mode mismatch when starting CQ or S/P-Mode.

Band Hopping
It allows CAT-controlled transceivers to change the bands and FT-mode according a pre-defined timetable**.**
For each band two time ranges can be specified, typically day, night and/or grayline times according to the current propagation forecast. When starting the Band Hopping function, the FT8-Helper scans the specified bands and starts CQ and/or S/P sequences on the first available band where the current time is in the specified time ranges. The sequences are stopped if the specified number of **unsuccessful** attempts is reached. At the end of the sequence it continues on the next available at the current time. If the last band on the list is reached, it continues again from the beginning. The Band-Hopping field shows the current band and mode, CQ, S/P or XCHG. If no active band found, it shows "IDLE".

The band-hopping schedule can be configured in the "Edit Config" session.
First the band list should be specified. It can contain maximum 10 entries, the order should be the same as in the band selection menu of WSJT-X. The default order is: “160 80 40 30 20 17 15 12 10 6”. If 60m is required, one of the bands, e.g. 6m should be deleted.

The band-hopping configuration can be added line by line. On line can be specified entering the band, one or two time ranges (caution, time is local computer time), selecting the CQ/SP-Mode, FT4/FT8 and the strategy. Do not forget to save the configuration. You can also edit (add, copy, delete) the lines in the editor window. Entering "#" at the beginning of the line invalidates the line. You can enter the bands in any order. It is

allowed to enter two lines for one band with different arguments (e.g. FT-Mode).

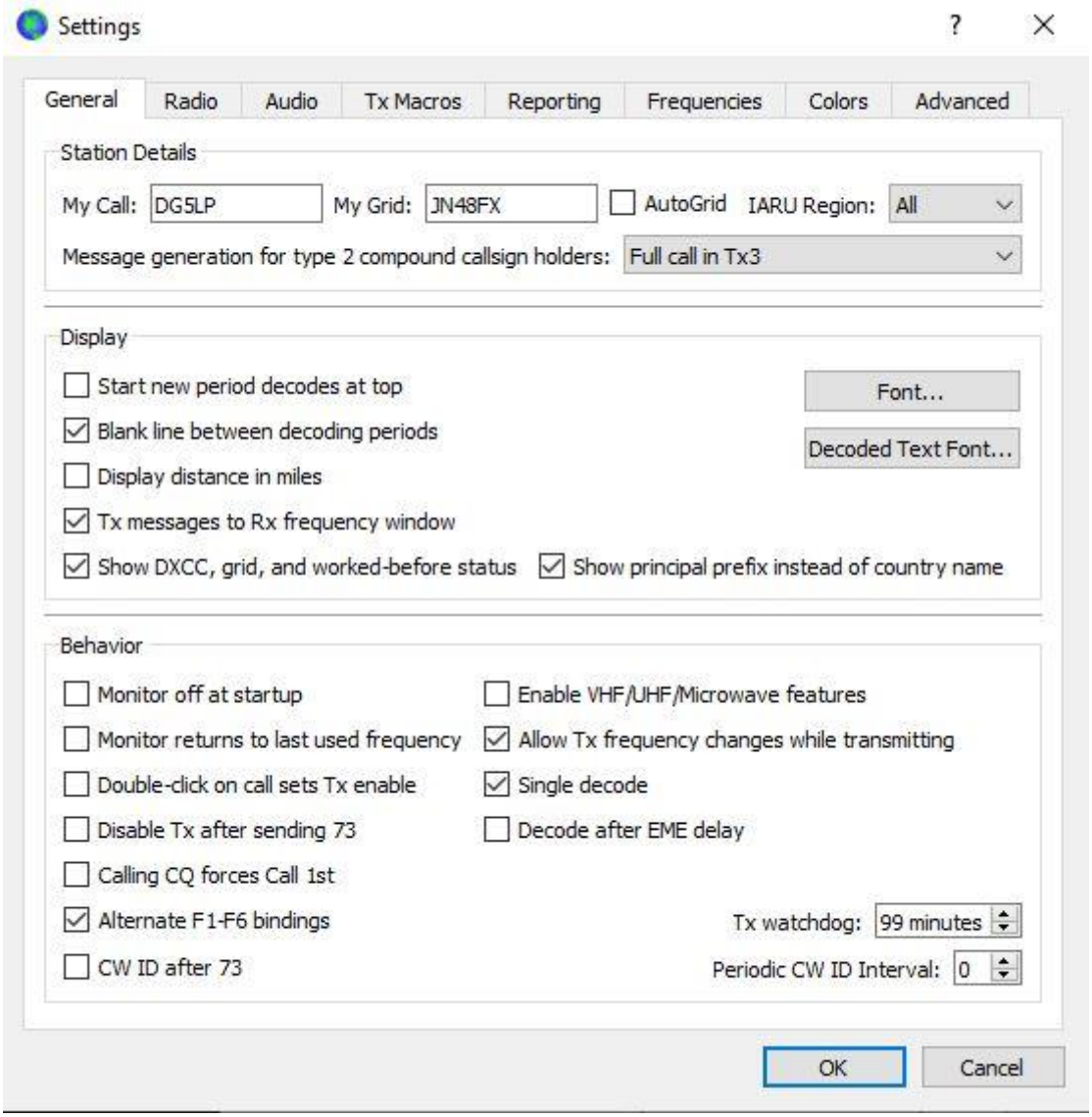
Important Notes:
- Before starting, be sure that your radio and antenna works well on all the specified bands.
- The specified times are local computer times!
- Band-Hopping always activates the "<-x->" and the "Auto-Frq" functions.-
- On first start of Band-Hopping it starts with the first available band on the list.
- When stopping and re-starting of Band-Hopping, it continues with the next available band
- When starting, the program has to be confirmed. The current band-hopping program is listed, whereby
  - An arrow at the beginning of line indicates the band which will be started.
  - A Plus (+) at the beginning of line indicates the bands which are active at the current time
  - Nothing at the beginning of line indicates inactive bands at the time point of starting band hopping.
- Pressing "Halt" stops Band-Hopping immediately.

Log Window:
The “Log Window” shows what the FT8-Helper just doing.

Installation and Initial Setup

- Download the FT8-Helper-exe-file and into a directory your choice.
- Start WSJTX first, then the FT8-Helper. At first start, the callsign/grid field is empty. Open the configuration session pressing the "Edit Config" button and enter your callsign and grid into the corresponding fields. Enter your continent and country in the "My locations" field. Example for Europe "EU DL" or whatever you want accept in directional CQ calls. Save the configuration. Now the FT8-Helper is ready to start.
- **Following settings are required In the Main-Window of WSJT-X:**
  - CQ only: **not** checked if "Auto Frq" is used in CQ Mode.
  - Auto Seq: will be switched off automatically when CQ or S/P-mode is starated.
  - Call 1st: will be switched off automatically when CQ or S/P-mode is starated.
  - Hold Tx Freq. will be set/reset automatically depending on CQ or S/P mode.
  - Monitor: Running (green)
  - Enable Tx: not enabled, will be set by FT8-Helper automatically.
  - Menus: checked
  - Vertical split of the screen: abut 50/50%. Check that in the Band activity window a country e.g. UA0 fits

Required in „Settings - General“



- **Required in “Settings – Reporting”**
  - All "Logging" checkboxes are **not** checked.

Required in “Settings – Colours”

- All default settings, do not change the colours!
- The required lines can be checked,
  Suggested to check:
  - Transmitted message
  - CQ in message
  - My Call in message
  - Any other New Call, DXCC, GRID, ITU or CQ-Zone, New Continent, etc. according your needs.

Settings in "Wide Graph" Window

The following settings are only requested if "Auto-Freq" is used.

- Horizontal width: 500 - 2850 Hz must be visible.

- Bins/Pixel: 3
- Start: 500 Hz
- All other settings are not critical

Operation

The window sizes are optimized full-HD monitors with a resolution of 1920x1080 pixels. On start of FT8-Helper, both main WSJT-X and Wide-Graph windows are resized with the requested size and positions. The size of the main WSJT-X window **may not be changed by the user!** The text size for windows applications must be set to 100%. If it was set correctly, you have 25 or 26 lines in the Band Activity window of WSJT-X, depending on whether horizontal scroll bar is available or not.

If a monitor with lower resolution (e.g. with 768 lines) is used, FT8-Helper reduces the height of the main WSJT-X window accordingly. In this case there are 20/21 lines visible in the Band Activity window.

If the horizontal resolution of your monitor less than 1920 pixels, FT8-Helper resizes and sets the Wide Graph window accordingly. The left part of the Wide-Graph window comes under the WSJT-X main window. Especially when using "Auto-Frq" in "RUN-Mode" the size and position of the Wide Graph window **may not be changed.**

Opening modal (blocking) dialogs during either "CQ" or "SP" mode is running will lead to crash of the FT8-Helper. It happens if you e.g. change the WSJT-X parameter settings during CQ or S&P mode is active.

Do not try to interact with WSJT-X if CQ or S/P is running. If you see that something goes wrong, press "Halt" and try to complete the QSO manually.

73´DX,
Geza DG5LP

Bug reports to: dg5lp@darc.de