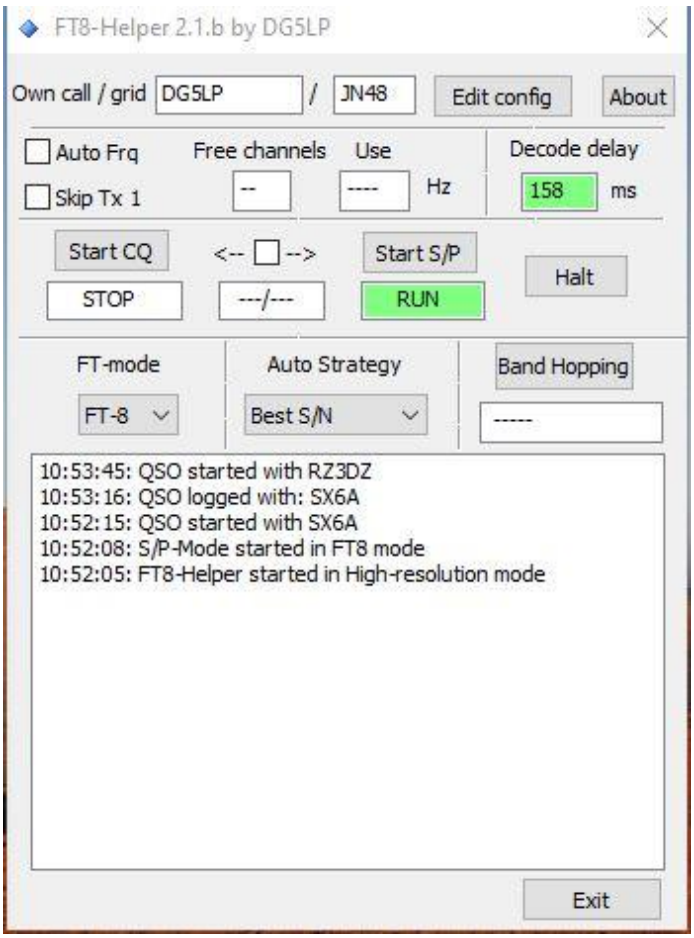
FT8-Helper v2.1 Manual (for WSJTX-2.2.x)

The FT8-Helper program was developed as macro extension for the WSJTX using the Quick-Macro program. The Helper interprets the received messages of WSJTX and acts according to the own pre-programmed QSO strategy. The delivered EXE file contains the licence for Quick-Macros.

The FT8-Helper controls WSJTX 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.

Main Features of v2.1:

- Automatic operation in both "CQ" and "S/P" mode.
- Automatic find of free frequency in CQ-mode
- Automatic changes between CQ and S/P mode with programmable intervals, depending on band activity.
- Various strategies in S/P-mode.
  Call stations with:
  - Best Priority according the WSJTX "Colors" settings
  - Best S/N
  - Only DX
  - Prefer-DX
  - Most distance
  - Prefer Wanted (according to wanted lists)
  - Only Wanted (according to wanted lists)
  - Exclude stations, prefixes and DXCC-entities according to exclude lists
- Band-Hopping
  - Programmable on daily basis
  - Two time ranges per day can be programmed
  - Operating band, mode, and strategy can be selected.
- Comfortable set-up of all parameter
- Easy installation
- Only one instance of WSJTX is supported. Do not start WSJTX with an argument (e.g. Transceiver name)



The main window - human interface:

Own call / grid:
Your callsign and grid location, should be entered using the “Edit config” dialog.

Edit config:
Opens configuration dialog. The configuration is stored in the “config.txt” file in the installation folder. See more details below in text.

About:
Shows the current version and the copyright information (Freeware)

Auto Frq:
If “Auto-Frq” checked in “CQ”-mode, a free frequency will be calculated and the transmitting frequency will set to a free frequency between 500 and 2800 Hz. 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 channel. For transceiver with narrow IF-filter the upper frequency can be limited (see “Edit config” dialog below).

Please note that only valid FT8 or FT4 signals can be regarded when searching a free frequency. On this reason it can happen that the frequency is set to a non-FT8/FT4 signal, e.g. noise, RTTY, MFSK or any other signal.
If “Auto-Frq” is used, the “Wide-Graph” window must be set up ad described in this manual below.

Skip Tx-1:
If selected In “S/P” mode, CQ-calling stations are called with reports instead of QRA-grids. The Skip-Tx1 checkbox in WSJTX must be selected too.

Free channels / Use:
If “Auto-Frq” is selected in CQ-mode, it shows the number of free channels and the selected frequency. If no channels could be bound, it shows “—“ and “-----“

Decode Delay (Lag time):
In most cases WSJTX cannot decode all messages within 15/7,5 sec. This value shows how long WSJTX needs to decode the messages in the next Cycle. Set the decoding depth in WSJT-X so, that this value remains below 500ms. Values over 1000 msec can prevent remote stations to decode our messages.

Start CQ
In „CQ-mode“ FT8-Helper calls CQs continuously. Successfully completed QSOs will be logged automatically. After completing or aborting a QSO due to timeout, it restarts calling CQ again. The Helper manages its own timeouts and repetition limits. If no answer, of not the expected answer is received after the third attempt, the QSO will be indicated as "broken". If no call received after the predefined number of CQ calls, FT8-Helper goes into a 5 cycle “sleep” period. At the end of the sleep period it starts calling CQs again. The number of maximum allowed CQ calls can be defined in the “Edit config” dialog (see later in this document). Incoming calls are accepted during the sleep period.

The field between “START” and “STOP” shows the current and maximum number of CQs. The “sleep” period only activated if “Start-CQ” is activated without the “XCHG” option (see below).

Start S/P:
In „Search and Pounce“ mode the Helper selects the highest priority station from the stations calling CQ. The priority depends on the "Auto-Seq" strategy and the priority settings in the "Colors" page of the WSJTX parameter settings. QSOs will be executed automatically and successful QSOs will be logged automatically. QSOs will be broken if the called station returns to another station or does not answers or answers with an unexpected message three times. Stations with broken QSOs are postponed for approx. 7 minutes to allow making QSOs with other stations. If no new stations are calling, a second call is accepted from stations the QSO was broken previously.

<-- X--> XCHG Mode:
When starting “CQ” or “S/P” with this feature checked, the selected mode ends after a predefined unsuccessful QSO attempts and changes to the other mode. Running QSOs will be completed before switching. This function can be selected for Band-Hopping. The maximum number of QSO attempts can be set up in the “Edit config” dialog (see below).

- „Max. broken QSOs in CQ-cycle“ for CQ-Mode
- „Max. broken QSOs in S/P cycle“ for S/P –Mode

The field between “START” and “STOP” shows the current- and maximum number of QSO-attempts.

FT-Mode:
Switches between FT-8 and FT-4. It controls the FT-mode of WSJTX. If the FT-mode is changed in WSJTX, it does not synchronise with the FT8-Helper. On this reason, on each start of “CQ” or “S/P” the FT-mode consistency is checked. If the check fails, an error message is indicates the inconsistency and the selected mode does not start.

Halt (Stop):
Stops running “CQ”, “S/P” or Band-Hopping activities. First pressing the “Halt” button initiates a “graceful” shutdown and waits for completing the running QSO. If an immediate stop is required, a second “Halt” stops immediately.

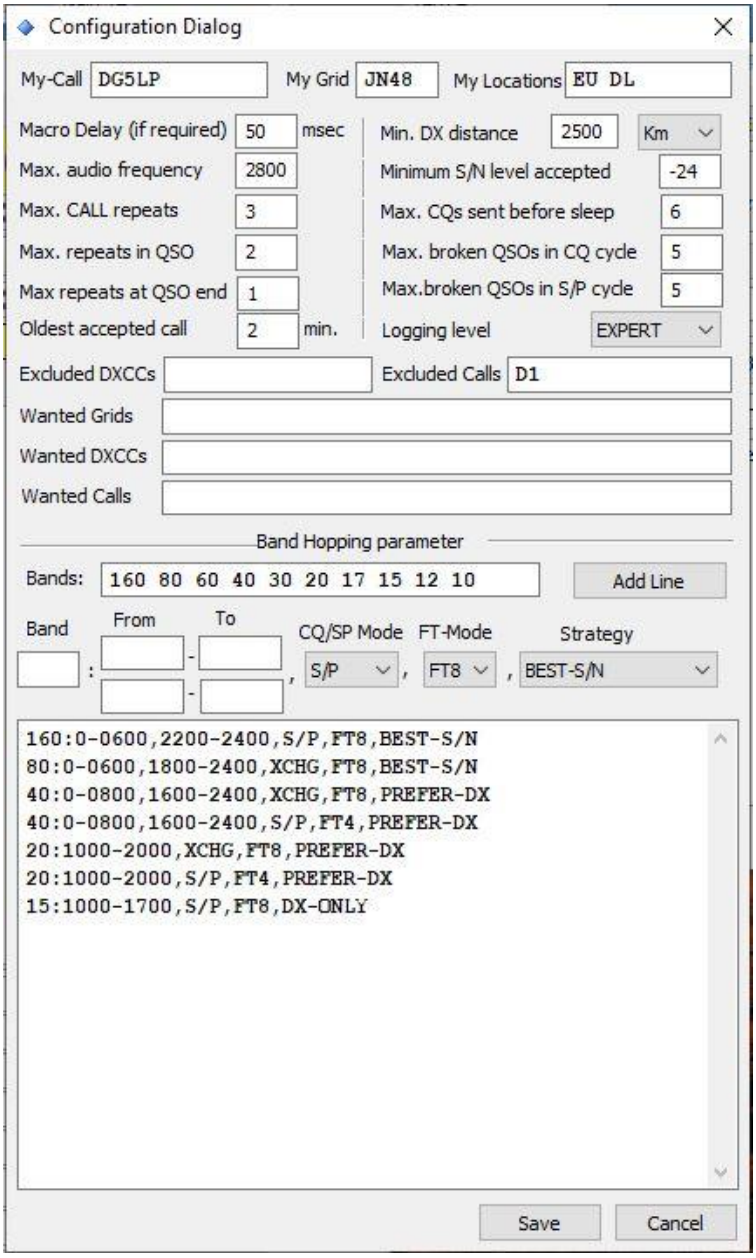
Auto-Seq. Strategies:

- **Best-S/N:**
  The highest priority messages are called first. The lowest priority is “New Call in Band”, the highest priority is “New CQZ”. Please note, that only selected items (colours) in the WSJTX “Colors” dialog will be regarded. If more than one message is received with the same priority, the message with the better S/N ration will be called first.
- **DX-only:**
  When selecting “DX-Only”, only DX stations will be called. A stations are considered as "DX", if the calculated distance between the own grid, and the grid of the calling station increases the specified “Minimum DX-distance” in the “Edit config” dialog.
- **Prefer-DX:**
  As with "DX-only", but if there are no DX-stations, non-dx stations are called according to the "Best-S/N" rules.
- **Most-distance:**
  Stations with the largest distance (based on the distance of the grid locations) are called first.
- **Prefer-wanted:**
  Wanted calls and wanted DXCCs can be specified In the “Edit config” dialog. Stations matching to one of the specified entries in the wanted lists are called with higher priority
- **Only-wanted:**
  Selected in S/P mode, only stations are called matching to one of the specified entries in the wanted lists. Stations with priority "New DXCC" or higher will treaded always as "wanted".

For all Strategy settings:

- Stations matching to the “Excluded” stations are ignored in both “CQ” and “S/P” mode. In the “Edit config” dialog lists of excluded callsigns or prefixes an d DXCC-entities can be specified
- Stations calling directional CQs are called only, if the CQ-extension is matching to one of the entries in the “My area” list in the “Edit config” dialog.

The “Edit Config” Dialog



- My-Call ; enter your call-sign
- My-Grid ; enter your four character QRA-grid
- MY-Area ; enter your country and continent separated by "space" e.g. K NA USA.
- Macro Delay ; for slow computers enter a value between 10 and 50 for correct operation.
- Min. DX distance ; specify the minimum DX distance
- Km/Mile ; select Km or Miles used for DX distance
- Max. audio freq. ; stations above the specified frequency are ignored.
- Min. S/N level ; stations with S/N value below this value are ignored
- Max. CALL repeats ; maximum repeats of calls with QRA-grid or report (QSO not yet started)
- Max. CQs before sleep ; the maximum number of CQ calls sent before going to “Sleep”
- Max. repeats in QSO ; maximum repeats of reports and R-reports (QSO not yet logged)
- Max. repeats at QSO-end ; maximum repeats of RR73 and 73 at QSO-end (QSO already logged)
- Max. broken QSOs in CQ ; maximum number of QSO attempts in CQ-Mode
- Max. broken QSOs in S/P ; maximum number of QSO attempts in S/P-Mode
- Oldest accepted call ; Stations calling us during a QSO are stored and after completing the QSO will be called back, if the call is not older than the specified value. Use 1-2 min.

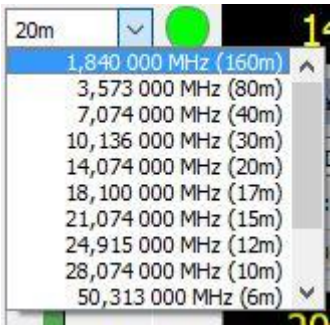
- Logging level ; Log is written into the file "\log\log-<YYMMDD.txt" in the installation directory;
  - Logging level: NONE ; No logging file written
  - Logging Level: LOG ; Only the content of the log-window of the FT8-Helper is logged
  - Logging level: MSG ; Additionally, all received and transmitted messages are logged
  - Logging level: EXPERT ; Additionally, information for software debugging are logged
- Excluded DXCCs ; List of DXCCs should not be worked, separated by "space".
- Excluded Calls ; List of callsigns or prefixes should not be worked.
- Wanted-Grids ; list of wanted grid locations separated by "space". Two or four characters are allowed
- Wanted DXCCs ; list of wanted DXCC items separated by "space"
- Wanted Calls ; list of callsigns or prefixes you want call, separated by "space"

Band-Hopping:

Using with CAT controlled Transceivers "Band Hopping" allows automatic changing between bands, FT-Mode and QSO-Strategy according a programmable schedule.

When starting, a popup window shows the current schedule. Active bands at this time are marked by "+", the first executable band is indicated by "->". Confirming the schedule pressing "OK" starts the first executable program line. Depending on the program, CQ or S/P cycle is started. Similar to XCHG-mode, the cycle is stopped if the specified number of unsuccessful QSOs is reached. If the next program line is executable, i.e. one of the time ranges fits to the current time, the program is executed. If the time does not match, it tries the next line etc. If no executable program could be found, It goes to the "IDLE" state and remains as long as no executable program found. The status field below the "Band-Hopping" button shows the current program.

The "Band Hopping parameter list:



Fort the default frequency settings in WSJTX, following entry is required in the „BANDS" field: 160 80 40 30 20 17 15 12 10 6

If e.g.60m also required, enter 60 between 80 and 40
As only 10 entries are allowed, one of the bands must be removed.

The band order in the BAND-field must be the same as the order in the frequency selection menu of WSJTX

The schedule list can be entered line by line. First, enter the required band and the time range(s), select the FT-Mode and the QSO-strategy. Pressing "Add line" enters the line into the schedule list. The time ranges must not overlap. If only one time range required, the second field should be left empty. Time values between 0000-2400 are accepted. (Example: 0000-0800 and 1600-2400)

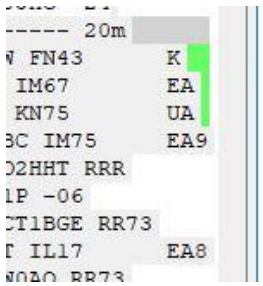
I**mportant Notes:**

- Local time of the PC is excepted for the time ranges, not UTC !
- Lines in the schedule list can be edited, copied and deleted.
- Lines can be disabled inserting "#" at the beginning of the line.

Required setting in WSJTX

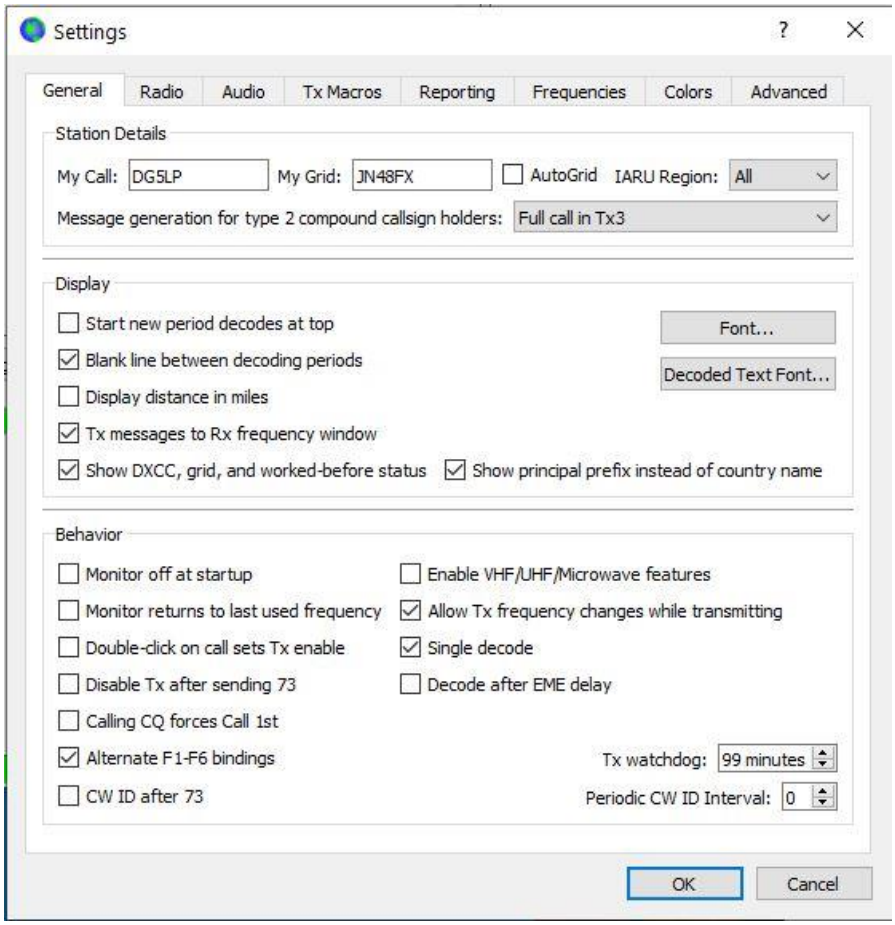
WSJTX main window:

- Set the "Decode" parameter according to your computer performance. The "Decode" phase should be completed at the latest 0.5 sec after starting the next cycle. Obtain the “Decode delay” field and the colour of the “Decode” button in WSJTX.
- “CQ only” **must not** be checked, especially if “Auto-Frq” should be used.
- The "Menu" box shall be checked the
- Select folder "1" in the DX area, so that the messages TX-1 to TX-6 can be selected.
- All other buttons are operated by the FT8-Helper automatically
- Do not change the windows geometry. Both the main WSJTX session and Wide-Graph is set for the correct size at program start.
- Do not move the WSJTX windows so that parts of the windows are outside of the desktop.
- Set the vertical tiling of the WSJTX main window as showed below:



The correct setting is, if you see all three characters of the DXCC identifier.

Settings In "General":



The default setting of “Font” and “Decoded Text Font” **must not** be changed.

In “Colors” folder:

- “CQ in message” (green) should be selected
- At least one of the colors must be selected, typically “New Call on Band”
- Depending on your needs other highlighting colors can be selected too.

Correct settings of the Wide-Graph window:

- Bins/Pixel = 3
- Start 500 Hz
- Do not change the size of the window.

Installation and Initial Setup

Download the FT8-Helper-exe-file from www.github.com/dg5lp , copy it into a directory of your selection. Start WSJTX, then the FT8-Helper. At first start, the callsign and grid fields are empty. Open the “Edit config” dialog and fill the first three fields according your station. Enter your DXCC and continent into the “My Locations” field, e.g. “K NA USA” or “G EU”. Do not forget pressing “OK” to store the changes.
Now, FT8-Helper is ready to use. Start “CQ” or “S/P” mode.

Bug reports and observations to:
dg5lp@darc.de