710 PANORAMA2 — control and spectrum display for the Yaesu FT-710

Version 2.2

710 Panorama2 controls the FT-710 over its USB cable: frequencies, modes, filters, DSP, transmit, CW, memories. It also shows the radio's spectrum and waterfall, read straight from the radio over USB (FT4222 bridge).
It shares the CAT link with WSJT-X and logging software (Hamlib NET rigctl).

The program is a single file, 710 Panorama2.exe, with no installation.
The interface opens in a dedicated Edge (or Chrome) window, and the program stops when you close it.

710 Panorama2 is version 2 of Panorama 710. Both programs share the same settings (%APPDATA%\Panorama710): port, LibFT4222 library, memories, spectrum settings. Only one of them can be open at a time: starting one closes the other.

WHAT'S NEW IN VERSION 2.2

- New spectrum background "Neon corridor": a grid floor of fine light-blue lines receding toward a glowing horizon. Signals stand up on this floor, which gives the spectrum a sense of depth. Selectable in Settings > Spectrum background, among several styles.
- The Mic and Data buttons (next to TX) keep their state across restarts. The last choice is saved on exit and restored on start-up: 710 Panorama2 reads the radio's MOD SOURCE menu on connection and lights the right button.

WHAT'S NEW IN VERSION 2.1.0

- VFO A frequency made even larger (100 points on a large screen; it shrinks in steps on smaller screens to leave room for the bands and the S-meter).
- Larger mode keys.

WHAT'S NEW IN VERSION 2.0.0

- Reorganised top bar: the Step is below the VFO A frequency, VFO B sits next to VFO A, all the bands (160 to GEN) are between VFO B and the S-meter, and all the modes are below the S-meter.
- Keys with white labels; a function in use lights the whole key blue (bands, modes, filters, receive, transmit, CW).
- Spectrum / Waterfall / Both (top of the right-hand column): the spectrum alone or the waterfall alone takes the full height.
- Detection: the noise floor is flattened and a weak signal stands out as soon as it rises above the noise (off, light, medium, strong).
- More effective smoothing: a signal's peak is held between syllables and its dips are filled in, without moving its edges (off, light, medium, strong, very strong).
- Larger Filter and DSP, Receive, Transmit and CW. The transmit readings (SWR, ALC, Comp, Id, Vdd) are at the top of the Transmit section.
- Memories, Log and CAT Console: in one window, "Memories" button on the top bar.

EARLIER VERSIONS (Panorama 710)

Version 1.4.3

- Frequency under the mouse twice as large, in bright yellow; the frequency where a click will tune (→) is in orange.

Version 1.4.2

- Colour of the frequency digits, your choice: red, amber, green, blue or white. Click one of the five dots to the left of the frequency; the choice is kept and also applies to VFO B.

Version 1.4.1

- S-meter: green and red bars twice as large (twice as tall and twice as wide).

Version 1.4.0

- Correct spectrum frequencies away from the centre. The 850 points sent by the FT-710 cover a little more than the span set (107.6%): signals looked pulled toward the centre, by about 0.7 kHz at 10 kHz from the VFO. This is fixed in Centered and Fixed windows (in Cursor mode the position stays approximate, as the radio does not report it).
- SCOPE CTR: 710 Panorama2 reads this radio menu on connection. If it is set to FILTER (spectrum centred on the filter, offset by about 1.5 kHz in SSB and depending on the width), a banner offers to switch it to CARRIER POINT.
- Click on an SSB station: the radio tunes to its carrier (the edge of the signal), rounded to the kHz or half-kHz when the station is close to one. An orange dotted line shows in advance where the click will tune. Alt + click: exact position.
- Smoothing: smooths the top of signals without moving their edges.
- Resolution: 850 points by default.
- Frequency display 35% larger, shifted 2.5 cm to the right.
- Settings → "Spectrum scale": FT-710 value (107.6%), and "Measure on a carrier" to check it against the radio.

1. INSTALLATION

- Copy 710 Panorama2.exe into a folder, for example Documents\710 Panorama2.
- CAT port driver: "Silicon Labs CP210x" (the Yaesu FT-710 USB driver). Device Manager should show two COM ports: "Enhanced COM Port" (the CAT) and "Standard COM Port".
- Spectrum driver: FTDI D2XX. Windows normally installs it on its own. Device Manager should show "FT4222 Interface A" and "B".
- LibFT4222 library (free from FTDI): on ftdichip.com, open FT4222H → Software Examples → LibFT4222, then copy LibFT4222-64.dll next to 710 Panorama2.exe. The program also looks for it in the usual folders; you can also enter its path in Settings.
- SmartScreen: the program is not signed. On first launch, click "More info", then "Run anyway". If your antivirus blocks it, add an exception for 710 Panorama2.exe.

2. RADIO SETTINGS

- MENU → OPERATION SETTING → GENERAL → SCU-LAN10: ON.
  This is required for the radio to send its spectrum over USB.
  The "Enable SCU-LAN10 in the radio" button (Settings window) does it for

you. Then switch the radio off, unplug the USB for 10 seconds, plug it back in and switch on.
- MENU → DISPLAY SETTING → SCOPE → SCOPE CTR: CARRIER POINT.
  On FILTER, the radio centres its spectrum on the filter and not on the carrier: in SSB everything would be offset by about 1.5 kHz, and the offset would follow the filter width and the SHIFT. 710 Panorama2 reads this setting on connection and offers to fix it with one click.
- CAT-1 RATE: 38400 bps (factory setting).
- CAT-1 RTS: leave it on ENABLE (factory setting).
- Only one program at a time can read the spectrum and hold the CAT port. Close 710 Console, wfview, POTACAT, etc. before starting 710 Panorama2.

3. FIRST LAUNCH

- Start 710 Panorama2.exe. The "Connection" window opens.
- Click "Detect the radio", then "Connect". You can also pick the "Enhanced" port from the list.
- After that, the program reconnects on its own at every launch.
- "Demo mode" opens a virtual FT-710, with no radio, to explore the interface.
- If an older version (or FT710Control) is still open, 710 Panorama2 closes it and takes over its settings. Just close the old window.

4. THE FREQUENCY DISPLAY

- The five dots to the left of the frequency choose the colour of the digits.
- Wheel over a digit: that digit goes up or down.
- Click the top of a digit: +1; click the bottom: −1.
- Double-click (or Enter): direct entry in kHz, for example 14074 or 7155.5.

5. THE SPECTRUM AND THE WATERFALL

- Click on a signal: the radio tunes to it.
    SSB   it tunes to the station's carrier, that is to the edge of the signal
          (upper edge in LSB, lower edge in USB), then rounds to the kHz or
          half-kHz when the station is close to one. While hovering over a
          signal, an orange dotted line and the bubble (→ 3,635.00 kHz) show
          where the click will tune.
    CW   it tunes to the peak. AM: to the carrier.
  Alt + click: exact position, no snapping. Right-click: sets the other VFO.
  (Settings: the "Click on an SSB signal" box turns snapping off.)
- Drag: moves the frequency.
- Wheel: tune by the chosen step (Shift: ×10). Ctrl + wheel: zoom (span).
- The greyed area shows the filter passband, the red line the receive VFO and the orange line the transmit VFO in split.
- Spectrum / Waterfall / Both (top of the right-hand column): the spectrum alone, the waterfall alone (handy in CW) or both.
- Spectrum settings (right-hand column):
    Zoom   width of the window (radio span).
    Average   smoothing of the sweeps. The stronger it is, the flatter the
                noise floor; strong signals still appear immediately.
    Scale   screen height in dB. The smaller it is, the higher signals rise.
    Floor   position of the noise floor above the bottom of the screen. At
                0, the noise is squashed and the baseline becomes flat.
    Resolution number of points in the curve (850 by default). The strongest

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                of each group is kept, so a CW carrier stays visible.
    Smoothing   keeps the middle of signals full (voice, not-very-clean
                transmitters) without moving their edges: the start of an SSB
                signal, and so its frequency, reads better. At strong settings,
                two very close stations can merge on screen.
    Detection   flattens the noise floor and brings out a weak signal as soon
                as it rises above the noise. The dB scale is no longer shown,
                since the curve is no longer proportional.
    Auto        the level follows the noise floor.
    Peak        peak hold.
- Waterfall: Speed, Contrast, Brightness and Colours.
- Window: Centered, Fixed or Cursor, like the radio's scope setting.
  In Centered and Fixed, the spectrum is locked to the radio's.
  In Cursor, the radio does not say where it places its window: the position
  shown is approximate, and a banner says so.
- Settings → "Spectrum scale": the FT-710's 850 points cover 107.6% of the
  radio span; that is the default value. To check it: in AM on a broadcast
  station (VFO A, Centered window, 20 or 50 kHz span), click "Measure on a
  carrier": the radio shifts by a quarter of the span then returns, and the
  measured value is saved.
- Settings → "Center calibration (Hz)": leave it at 0. The scale and the
  centring are now corrected.
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6. KEYBOARD

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  ← →         tune by one step (Shift: ×10)
  ↑ ↓         change the step
  PgUp PgDn   next band, previous band
  + −         scope zoom
  Esc         stop transmitting immediately
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7. TRANSMIT SAFETY

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- Esc stops transmit at any time.
- A timer stops transmit after 180 s (adjustable in Settings).
- If the window closes while transmitting, the radio returns to receive.
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8. WSJT-X, JTDX, LOGGING SOFTWARE

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710 Panorama2 keeps the CAT port and shares it over your PC's local network.
In WSJT-X, open File → Settings → Radio:
    Rig             Hamlib NET rigctl
    CAT server      127.0.0.1:4532
    PTT             CAT
    Mode            Data/Pkt (or None)
    Split           Fake It (or None)
Start 710 Panorama2 before WSJT-X. The audio still goes through the radio's USB
sound card, as before.
N1MM+, Log4OM and JTDX have the same option (Hamlib NET rigctl / rigctld,
127.0.0.1:4532). The port can be changed in Settings.
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9. TROUBLESHOOTING

- "CAT disconnected": check the cable and the port (the Enhanced port, not the Standard one). Also check that the rate is 38400 and that no other software is holding that port.
- No spectrum:
  1. Check SCU-LAN10 = ON, then do the full cycle: switch the radio off, unplug the USB, plug it back in, switch on.
  2. Check that LibFT4222-64.dll is next to the program.
  3. Check that no other software is reading the spectrum.

  The banner on the spectrum gives the cause and offers "Retry".
- "Port 4532 busy": a rigctld or another program is already using that port. Close it, or change the port in Settings.
- Spectrum frequencies offset in SSB, more so as the filter changes: check the SCOPE CTR = CARRIER POINT menu (see 2).
- Update: drop the new version under the name 710 Panorama2.new.exe in the program folder. 710 Panorama2 puts it in place on its own in a few seconds; the old version stays as 710 Panorama2.old.exe. To roll back: quit, delete 710 Panorama2.exe and rename 710 Panorama2.old.exe to 710 Panorama2.exe.
- Settings and log: %APPDATA%\Panorama710 (config.json, panorama710.log). Attach the log if you report a problem.

10. ACKNOWLEDGEMENTS

The USB spectrum protocol was described by the wfview, POTACAT, N1MM Scope Bridge and Nexus projects. The CAT commands rely on Yaesu's CAT manual, Hamlib and flrig. Thanks to their authors. 710 Panorama2 reuses none of their code. Barlow Condensed font: SIL Open Font License (file provided in the sources).