Release Notes Version 1.40

Version 1.1 Sept 2023

Content

1 What's new in Release 1.40

Relase 1.40 was primarily created to support the transverter TRV1D. In addition, some new functions and numerous improvements have been made.

This release can be downloaded directly into the transceiver, if it uses firmware 1.36 or higher. For older firmware, you must proceed as per Release Notes 1.36.

If a PC with Windows 10 or higher is used, the download must be carried out with the terminal program TeraTerm (see appendix). The ADAT Commander is no longer supported from Windows 10. Download first the file

"Download_Code_V140g_p0.dat"

after the successful download it is recommended to download also the backup file

"Download_Code_V140g_p4.dat".

2 New features and changes

2.1 Support for the TRV1D transverter

The transverter with reduced performance and other compromises was produced in a small series for interested OM's. For details please refer to the TRV1D manual.

2.2 Frequency display with single and double conversion

As in Release 1.39, external transverters can be used. Their transmit/receive frequency is now displayed correctly in a range from 100 MHz to 12 GHz, taking care if the LO is above the operating frequency.

In order to achieve sufficient resolution even with 32 bit variables, the frequencies are internally divided consistently into two variables in Hz and MHz.

If the internal transverter TRV1D is present, bands in the GHz range can be converted to the 2m band with another external transverter, which then results in a double conversion. The advantage of this process is greater image frequency rejection thanks to the higher IF of e.g. 144 MHz.

The LO frequencies of the external transverters can be saved for the respective VFO's 1...3 using the commands $FV1=xxxxxxxxx (x = frequency in Hz) or $FV2 and $FV3. If the LO frequency is above the operating frequency (reverse position), it must be marked with a minus sign:

$FV1=-1260000000

leads to an IF of 28 MHz at a reception frequency of 1232 MHz.

The reverse position influences:

o the calculation of the frequency

o the collateral ligament

o the direction of rotation of the tuning knob

o the representation of the spectrum

2.3 PA Calibration

The power calibration of the power amplifier has been redesigned. A HW modification (replacing of 3 resistors) is no longer necessary. The complete calibration takes place as follows:

1. Create a USB connection to the PC and open the terminal program TeraTerm (see appendix)

2. Reset the transceiver to the default state with CONFIG / SYSTEM / RESET and SYS_RST

3. Delete the current tables with CONFIG / TX / MORE / MORE /P-CAL and RESET

4. Set tune power to 10W with CONFIG / TX / MORE / MORE / P-TUNE

5. Connect the power meter to ANT1 and enter the measured value for each band into the TreaTerm by typing $XP2=xx.x. If there is a small residual error, repeat the process. This somewhat hard work must be carried out for all HF bands

6. **Important:** save the just corrected values with the command $XPC:00. The storage is acknowledged with $XT:06

7. Start automatic calibration with CONFIG / TX / MORE / MORE / P-CAL and 2-T PWR. First, the 2-tone modulated signal is set to 20Wpep for all bands (a thermal power meter will show 10W). In a second step, the 'open loop gain' of the predistortion is determined.

8. Connect the power meter (or artificial load) to ANT2 and set the ANT2 option under P-CAL and start the process by pressing the SELECT button. Any discrepancies between ANT1 and ANT2 are eliminated here.

9. Leave the ANT1 output open and set the SWR oo option under P-CAL. This calibrates the SWR. Note: the length of the bottom bar is approximately 4 times the value of the return power.

10. This completes the calibration of the power amplifier. The values of points 7 to 9 are saved automatically.

2.4 Calibration of new Preselector PSL2

The adjustment of the filters in the new preselector has been improved. An adjustment is only necessary if a PSL2 is newly installed. The procedure hasn't changed. If a new adjustment becomes necessary, this can be carried out according to Manual 1.35, Chapter 10.5.

2.5 Usage of Configuration Sets

The firmware 1.40g allows you to save up to 6 complete configurations, including 3 VFOs with 50 frequencies each. The desired configuration can be selected under CONFIG / SYST / VFOSET. The sets are labeled with

STNDRD, SPLIT, CONF 1, CONF 2, CONF 3, CONF 4

The sets allow complete configurations to be saved and reloaded later.

After a FW reset, STNDRD is always set.

2.6 Usage of the Spectrum Analyzer

The spectrum display program can no longer be maintained. That is why the following modifications have been made on the ADAT firmware.

The most important change was the presentation:

> While previously the analyzer frequency could be independent of the Rx frequency, in the new concept the receive channel frequency is now always in the display area. If the right or left edge of the display is reached while scanning a band, the current frequency jumps to the center, with the center frequency being rounded to an even value.

The functions 'Set_TRX _CF' and 'Set CF = TRX' can still be used. The TRX frequency can also be set to the corresponding location by clicking with the mouse in the spectrum window.

Restrictions:

1. If the TRX is turned with the tuning knob above the display limit of the analyzer, the Center_Freq in the waterfall diagram jumps immediately to a rounded frequency (n * half_scan_width); in the analyzer window it may take a short time until the correct display appears there too. This is due to an internal error in the analyzer software and cannot be corrected via command entries.

2. Before the transceiver is switched off, the SA must be disconnected with 'Disconnect'. This also causes the SA settings to be saved. Otherwise, the Spektrum software will respond with a Windows error message.

3. If the Spektrum software is interrupted with Disconnect / Connect, the settings entered will only be implemented after several seconds. This problem cannot be avoided by the DSP. As a remedy, you can press the 'Noise_Blanker' button twice, this triggers the data transfer.

3 Modifications and Bug Fixes

More over a hundred problems have been solved and documented. Below is a list of the fixes that are relevant to the user.

The corrections related to the TRV1D transverter module are not listed here.

3.1 New Commands

o With the command **$RST!** all databases will be reloaded with default values. This can be helpful if the SYS-RST command is not sufficient

o If the S-meter display is at the limit (-150dBm or +18dBm), a default value can be loaded again with the command **$XPF=55**. The deviation from the target value will then be within ±2 dB without calibration.

o S-meter calibration: connect a signal generator with a level of -60 dBm and 14.1 MHz to the antenna input. Then read the deviation of the S-meter display and enter it with the command **$XPA=xx.xx**. Example: the S-meter shows -57.4 dBm. Then the correction must be $XPA=-2.6.

o If the personality file is partially destroyed and the data of the preselector PSL2 is corrupt, a valid data set can be loaded again with **$XPF=66**. After that, the PSL2 must then be recalibrated.

o The input format for measured values (e.g. **$XPA=-2.45**) is now largely freely selectable. Values can also be entered without a decimal point (xx) or abbreviated with a decimal point (.xx). A comma is also tolerated instead of the decimal point (x,xx).

3.2 Bug Fixes

o Entering options using the SELECT button often resulted in errors. Entries had to be acknowledged several times. These errors could be greatly reduced through extensive modifications in command processing.

o Inadequate DC suppression resulted in spectral lines at a distance of 20 kHz in the spectrum analyzer.

o An external transverter has always been assigned to all VFOs using the COFIG / SYSTEM and ext-TVL commands. Now only applies to the active VFO.

o Selecting memory channels 98 and 99 resulted in the front being blocked

o After Memory_Off, the previous frequency was not loaded

o The predistortion has been improved

3.3 Restrictions

o It is not possible to change the band when the clarifier is switched on

o Wide_Band_IQ operation is no longer supported

o Spectrum Analyzer: at frequencies >1.5GHz the sideband bar is not displayed

4 Appendix

4.1 The TeraTerm Program

The free TeraTerm terminal program is well suited for communication between PC and TRX and for firmware downloads. There are versions available that run on Win11. The download procedure is described in detail in the manual (1.35) under Chapter 11. New is that the connection type and COM port must first be selected:
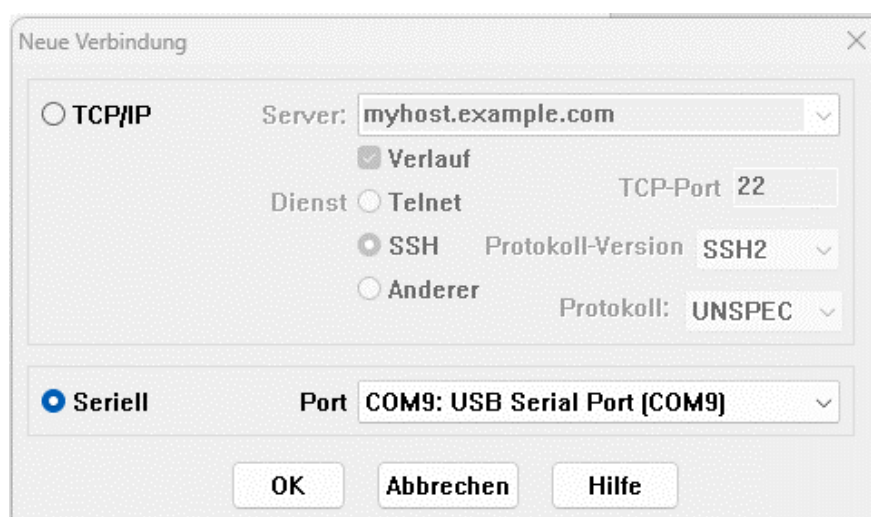
The port number must be determined by trial. Often the com port with the highest number has to be be selected. Then press OK and make the remaining settings if necessary.

Important: for the firmware download and the download of the Personality File, the 'Local Echo' checkbox under 'Settings' / 'Terminal Settings' must be unchecked.

4.2 Installation of Spectrum Analyzer Software under Win 10/11

- o The Spectrum Analyzer software can be found under www.adat.ch in the Downloads section. Clicking on version V3.0 opens a .zip file in the Download window.
- o Using 'Open File' creates a folder 'ADATSpectrumAnalyzer_PreBuild'
- o Open this folder and run 'ADAT.SpectrumAnalyzer.exe'
- o Click 'Extract all' in the new, small window
- o Click on 'Extract' in the next window
- o The folder 'ADATSpectrumAnalyzer_PreBuild' appears, but this time linked to internal data.
- o Run 'ADAT.SpectrumAnalyzer.exe' again. Here you can create a shortcut for an icon on the desktop.
- o A blue window 'The computer has been protected by Windows' appears. Click on 'More information' and 'Run anyway'

With this procedure, the SA V3.0 can be operated safely on Windows 10 and 11.