# **PicoTuner V2 Pro Installation**

# created by DJ7TH

- If not already installed, you must first download the latest USB firmware for the PicoTuner from Colin G4EML's <u>github page</u> (.uf2 file) and install it. The subsequent installation of the uf2 file on the Pico is very simple: Unscrew the four upper housing screws and remove the housing section. The Pico is put into programming mode by holding down the white BOOTSEL button on the Pico board and plugging the USB cable connected to the PC into the Pico. In the file manager, you will now find another USB drive to which you can copy the xxx.uf2 file. The green LED on the Pico should then flash. That's it.
- The installed Pico firmware generates two USB interfaces on the software side: BATC Pico Minitiouner i2c (Interface 0) and BATC Pico Minitiouner TS (Interface 1). In order for the Windows PC to recognize the two USB interfaces from the PicoTuner, the two associated USB drivers must be installed on the PC using the <u>ZADIG 2.8</u> software:

Zadig Device Options Help	- 🗆 X
BATC Pico Minitiouner i2c (Interface 0)	✓ ☐ Edit
Driver       WinUSB (v6.1.7600.16385)       →       WinUSB (v6.1.7600.16385)         USB ID       2E8A       BA2C       00       ◆         WCID <sup>2</sup> ×       Reinstall Driver       ▼	More Information <u>WinUSB (libusb)</u> <u>libusb-win32</u> <u>libusbK</u> <u>WinUSB (Microsoft)</u>
Driver Installation: SUCCESS	Zadig 2.5.730
Zadig <u>Device Options Help</u>	- 🗆 X
BATC Pico Minitiouner TS (Interface 1)	✓ ☐ Edit
Driver       WinUSB (v6.1.7600.16385)       ➡       WinUSB (v6.1.7600.16385)       ➡         USB ID       2E8A       BA2C       01       ♥       Reinstall Driver       ▼         WCID <sup>2</sup> X       X       X       X       Y       Y	More Information WinUSB (libusb) libusb-win32 libusbK WinUSB (Microsoft)
Driver Installation: SUCCESS	Zadig 2.5.730

On the PC, you can now find "USB devices" in the device manager:



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The PicoTuner only runs in conjunction with the new <u>OpenTuner software</u> from Tom ZR6TG. The MiniTiouner software from F6DZP cannot be used.

The current OpenTuner software (August 2024) can be downloaded here: <a href="https://www.zr6tg.co.za/files/open\_tuner\_0.B\_20240714.zip">https://www.zr6tg.co.za/files/open\_tuner\_0.B\_20240714.zip</a>

The OpenTuner software supports various versions of the MiniTiuner and PicoTuner. You have to select the PicoTuner in the "Source Settings" after starting OpenTuner:

Frequenz: Minitiouner Varia	nt	~				
Minitiouner Variant Should work with most Minitiouner Varia	ants	^				
Select FTDI or PicoTuner interface in S	Settings	~				
Source Settings Connect		More Info				
xtra Features		4	Minitiouner Settings			
MQTT Client	Settings	More Info .	Hardware Interface			
Quick Tune Control	Settings	More Info	Default Interface:	PicoTuner		~
Pluto Control (F50E0)			e staat menaoe.	ricoruner		
ISS HamTV			IP Address:			
☑ BATC Wideband Spectrum (QO-100	)	<u>More Info</u>				
BATC Wideband Web Chat (QO-10)	0) <u>Settings</u>	<u>More Info</u> .	Tuner Properties			
ocumentation and Resources		_	Tupor 1 Frog Offect	9750000		
OpenTuner Updates			rulier i ried Oliser	5750000		
OpenTuner Documentation			Tuner 2 Freq Offset	9750000		
OpenTuner Github Issues Page			LNB A Supply Default	18V Horizont	al	~
OpenTuner Forums			LNB B Supply Default	18V Horizont	al	~
OpenTuner Test Versions & Support			Default RF Input:	Tuner 1 = A,	Tuner 2 = A	~
Resources:						
British Amateur Television Club					Cancel	Save
Add 2nd TS to Minitiouner Article		1				
Experimental PicoTuner Article						

The setting values of the Serit tuner are predefined and can be adjusted here.

The two tuners (1+2) are switched to LNB-A and to 18V LNB voltage.

As both tuners have a tuning range of 140MHz to 2450MHz each, you could also switch tuner 2 = B, i.e. to input LNB-B and directly control your own transmission on 2.4GHz. The offset of tuner 2 must be set to 0.

#### Updating the firmware:

The tool "picotuner\_driver\_test\_app" is a helpful program for checking and transferring the firmware to the Pico module without opening the tuner to access the BOOTSEL button. You can find it under "Downloads" as "Firmware Test Program" on my HP: <u>http://www.download.dj7th.de/PicoTuner/picotuner\_driver\_test\_app.zip</u>

#### Setting the LNB voltages:

The four jumpers K30-K32-K33-K34 on the PicoTuner board can be used to determine whether the LNB voltages for LNB-A and LNB-B are fixed or can be selected via software.

Here are the jumper placements for LNB voltages permanently set to 18V (factory setting):



The following changes are possible: Jumper K30 not plugged in: LNB-B voltage = 12V Jumper K32 not inserted: LNB-B voltage = 0V Jumper K33 not plugged in: LNB-A voltage = 12V Jumper K324 not plugged in: LNB-B voltage = 0V

Here are the jumper placements for LNB voltages that can be set via software: Note: the selection via software does not (yet) work in the LAN version.



#### **Operation in a network:**

The Ethernet firmware from Brian G4EWJ must be installed for this (Winterhill mode). The installation process on the Pico is identical to the USB version (see above) The current file (August 2024) has the name **ptwh0v3b-w5100HAT.uf2** There is a comprehensive instructions manual in German and English.

The current **OpenTuner version 0.B** is required for operation.

The following changes must be made in the OpenTuner settings: In "Actions - Main Settings - Media Source", select "Winterhill Variant" as the default:

📸 Open Tuner (ZR6TG) - Version D.B - Build: 2024/0	7/13 11:17:32,80	- 🗆 X	
Aktionen			
Source Properties Debug			
Source Selection			
Frequenz: Winterhill Variant	~		
Winterhill Client, Compatible with: ZR6TG - WH Variant (websocket) G4EWJ - PicoTuner WH (Ethernet)	Main Settings		
	Media Source		
Source Settings Connect	Default Source:	Winterhill Variant	~
Extra Features	Media Player Settings		
MQTT Client	Madia Spanshot Path	C:\satmadia\	
Quick Tune Control	media Shapshot Pain.	C.(saunedia)	
Pluto Control (F50E0)	Media Player 1:	FFMPEG	~
ISS HamTV		Seperate Window	
BATC Wideband Spectrum (QO-100)	Media Player 2:	MPV	~
BATC Wideband Web Chat (QO-100) DATV Reporter		Seperate Window	
	Media Player 3:	MPV	~
Documentation and Resources		Seperate Window	
Documentation and resources	Media Player 4:	MPV	~
OpenTuner Updates		Seperate Window	
OpenTuner Documentation		— of sizes (	
OpenTuner Github Issues Page			
OpenTuner Forums			
OpenTuner Test Versions & Support			1 Carton

Here you can also select the various media players for the 4 windows.

Only the FFMPEG and MPV players are suitable for receiving broadcasts in H.266. The VLC player is standard.

Please note: The FFMPEG player cannot (yet) display the beacon with 1500kS.

This is irritating as you will not see a beacon in the FFMPEG windows when you start OpenTuner. If no player window appears, you have to reset the values in "open\_tuner\_settings.json" to the original value in the "settings" of OT. (Bug in OT) The "PicoTuner Ethernet (G4EWJ)" must be selected under "General" in the "Source Settings" and the "IP Address" is the IP assigned to the Pico by the router (FritzBox) via DHCP. If only one PicoTuner is running in the network, leave the UDP port at 9900.

📺 Open Tuner (ZR6T)	G) - Version 0.B - Build: 2024/07/13 11:1	7:32.80	- D >	<
Aktionen				
Source Properties De	bug			
Source Selection				
Frequenz:	Winterhill Variant	~		
Winterhill Client,	Compatible with:	^	Winterhill Settings	
ZR6TG - WH Va G4EWJ - PicoTu	riant (websocket) iner WH (Ethernet)	~	General Default Interface:	PicoTuner Ethernet (G4EWJ) 🛛 🗸
Source Settings	Connect	More Info		
Extra Features			Winterhill (PicoTuner Etherr	net)
MQTT Client	Settings	<u>More Info</u>	ID Addrose:	102 169 0 99
	ontrol <u>Settings</u>		IF Address.	132.160.0.00
Pluto Control (	F50E0)		Udp Base Port	9906
ISS HamTV				
BATC Wideba	and Spectrum (QO-100)	More Info		
BATC Wideba	and Web Chat (QO-100) Settings	<u>iviore into</u>	Winterhill WS Settings	
☑ DATV Report	er <u>Settings</u>	±	Winterhill WS IP:	192.168.0.122
			Winter Hill WC Dest	2020
Documentation an	d Resources		Winternin W3 For	6060
OpenTuner Upda	ates		Winterhill Udp Port.	9900
OpenTuner Docu	umentation			
OpenTuner Githu	b Issues Page			
OpenTuner Foru	<u>ms</u>			
OpenTuner Test	Versions & Support			
Resources:			Dise Turner (M/L) Providence	tilistanas Canada Canada
British Amateur T	elevision Club		Pico i uner (WH) broadcas	Cancel Save

If no stations appear in the window after "Connect", proceed as follows:

Open the "Pico Tuner (WH) Broadcast Listener" in the "Winterhill Settings" window and check which "Detected IP Address" is listed there. This must be the same in the "Winterhill Settings" window, otherwise enter it there. Also accept the value of "Detected Base Port" (should be set to 9900 for only 1 tuner) and also enter it in "Change Base Port".

Then click on "Change Base Port" and wait until this value has been transferred to "Detected Base Port". This may take several seconds.

Save settings with "Save" and start OT with "Connect".

If there are two PicoTuners in the network, select UDP port 9002 or 9004 for the second tuner. Unfortunately, the above procedure must be carried out every time the tuner is restarted, as the port addresses > 9000 are obviously not saved. The best way has proven to be: first switch on the tuner with port 9000 and start OT with "Connect" and then switch on the 2nd tuner with port 9002 or higher, whereby the above procedure with "Change Base Port" must be carried out again in OT before "Connect". You will then see in the broadcast listener that the displayed IP + port address changes back and forth.

### **DATV Reporter:**

If you want to send reception data to the DATV reporter, you can check the box there and enter your data in the window with "Settings":

<ul> <li>☑ BATC Wideband Spectrum</li> <li>☑ BATC Wideband Web Cha</li> </ul>	t (QO-100) <u>More in</u> t (QO-100) <u>Settings</u> <u>More in</u>	<u>ifo</u>
DATV Reporter	Settings	
	DATV Reporter Settings	
Documentation and Resources	DATV Reporter Settings	
OpenTuner Updates	Callsign:	DJ7TH-2
OpenTuner Documentation	Grid Locator:	JN38VI
OpenTuner Github Issues Pag	Reporter Service URL:	wss://datvreporter.info:3000
OpenTuner Forums		
OpenTuner Test Versions & S		Save Cancel
Resources:		

These then appear in the browser on page <a href="https://www.datvreporter.info">https://www.datvreporter.info</a>

Stations Listening				Stations R	lecently Seen (Viewers	)		
2E0ILY , SP9ACQ , DL4	FBN			R6WAX (3	i), A71A (1), f6has (1)			
Live View			_					
10 🗸 entries per	. page					Search:		
Date/Time 븆	Callsign	Seen By	dB Margin	MER 👌	Frequency	Symbol Rate	Application	
2024/08/25 18:30:13	A71A	2E0ILY	7.70	12.40	10491530	1500	OpenTuner	
2024/08/25 18:30:11	R6WAX	DL4FBN	2.40	7.10	10498753	333	OpenTuner	
2024/08/25 18:30:08	R6WAX	SP9ACQ	1.20	5.90	10498748	333	OpenTuner	
2024/08/25 18:30:02	R6WAX	2E0ILY	4.00	8.70	10498753	333	OpenTuner	
2024/08/25 18:29:52	f6has	2E0ILY	5.00	7.30	10497230	333	OpenTuner	
2024/08/25 18:29:42	A71A	2E0ILY	7.60	12.30	10491530	1500	OpenTuner	
2024/08/25	R6WAX	DL4FBN	2.50	7.20	10498753	333	OpenTuner	

**Optional settings in OpenTuner from version 0.B:** 



Click on one of the windows to show/hide an info bar at the top.

You can adjust the volume with the scroll wheel of the mouse (white vertical bar on the right) With "Control-P" you can show/hide the left menu "Hardware Properties".

If you have two tuners and operate them with two separate OpenTuners, four windows can be displayed. These settings are also saved in this form when closing.



## QO-100 Wideband Chat:

In "Actions - Source" under "BATC Wideband Web Chat..." select "Settings...".

In the "QO-100 Specific" window, you can accept the "Signal Report Template:" line or add your own details, as I have done, for example:

3.450		<ul> <li>☑ BATC Wideband Spectrum (QO-100)</li> <li>☑ BATC Wideband Web Chat (QO-100)</li> <li>☑ DATV Reporter</li> </ul>	Settings	<u>More Info</u> <u>More Info</u>		
QO-100 Web Chat Settin	gs					
QO-100 Specific						
Chat Font Size: Signal Report Te	12 🚖					
SigReport {SN} {SN} - ServiceNa	/{SP} - D{DBM} ({MER}) - {SR}kS - {Fi ame	REQ}MHz - 1.1m offset dish				
{SP} - ServicePri {DBM} - db Marg {MER} - Mer {SR} - Symbol R {FREQ} - Freq	ovider in (D) ate					
				Can	cel	Save

When you start the chat, you must first log in if you want to send a signal report of a received signal from one of the two tuner windows (bottom left):

QO-100 Wideband Chat - Viewer	IS: 71 -		×
dbrooke ^	18:51 <chris 2e0ily=""> Good evening all.</chris>		^
DD1US	18:52 <dl2ghm_martin> ge Chris</dl2ghm_martin>		
DJ7TH_R@LF	18:52 <chris 2e0ily=""> Hi Martin</chris>		
DL2GHM_Martin	18:55 <chris 2e0ily=""> @CT7ABD A very happy birthday to you!</chris>		
DL3HQD - Winni	19:09 <r6wax_tagir> GE All</r6wax_tagir>		
DL4FBN Reinhard	19:10 <r6wax_tagir> WTF on 496.250</r6wax_tagir>		
DM2CFL Hartmut	19:11 <dl2ghm_martin> ge Tagir</dl2ghm_martin>		
EA7CTL_Manolo	19:12 <rgwax_tagir> hi, Martin ) i'm setup VARAC and play with it several days ) but not found your bea</rgwax_tagir>	acon )	
f6BFY	19:12 <dl2ghm_martin> lets try</dl2ghm_martin>		
F6GDL_Roland	19:12 <rgwax_tagir> sometimes my beacon was RX in New Zeland ))</rgwax_tagir>		
f1_0	19:12 <dl2ghm_martin> 🖕</dl2ghm_martin>		
G8ADM-Dave	19:12 < <b>R6WAX_Tagir&gt;</b> 15500km with 10W		
G8HKN_Roger	19:12 <dl2ghm_martin> very good</dl2ghm_martin>		
GW7BZY-Peter	19:12 <dl2ghm_martin> like ft8</dl2ghm_martin>		
IK4IDY-TV Alex	19:13 <r6wax_tagir> yeah</r6wax_tagir>		
OD5TB	19:13 <dl2ghm_martin> but with chat mode :-)</dl2ghm_martin>		
ON1RC Chris	19:15 <dl2ghm_martin> saw your beacon</dl2ghm_martin>		
R6WAX_Tagir	19:15 <dl2ghm_martin> -19</dl2ghm_martin>		
SP9ACQ Adam	19:16 < <b>R6WAX_Tagir&gt;</b> )))		
	19:16 <dl2ghm_martin> so it seems that you cant hear me</dl2ghm_martin>		
Cianal Danast Tunar 1	19:19 < <b>DL4FBN Reinhard&gt;</b> ga Martin		
Signar Neport Tuner 1	19:19 <dl2ghm_martin> Hallo Reinhard</dl2ghm_martin>		
Signal Report Tuner 2	19:22 < <mark>Chat&gt;</mark> You are now known as 'DJ7TH_R©LF'		
Signal Report Tuner 3			
Signal Report Tuner 4			×
Stay On Top	SigReport: / - D ( dB) - 333kS - 10495.26MHz - 1.1m offset dish		
DJ7TH R@LF			