Investigation of Compatibility Problems When Using Callisto with Windows 7

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1. Introduction

Windows 7 is problematic when running application programs that use a USB-Serial Adapter. Apparently, Windows 7 uses different processes to communicate with a serial port than Windows XP. The problems are more severe with the 64-bit version of Windows 7 (x64) than the 32-bit version (x32).

Most problems are traceable to out-of-date and incompatible drivers and, in some cases, incompatible integrated circuits (chips) used in the adapter. Of particular concern in this report is Callisto software, callisto.exe version 117 (the current version as of this writing), which communicates with the Callisto instrument at 115,200 b/s.

2. Serial communications interface

Callisto uses an EIA-232 serial interface based on three wires (TD, RD and Common) and no flow control (figure 1). Modern PCs do not have a native serial port but, instead, are equipped with USB ports. Therefore, it is necessary to use a USB-Serial Adapter and a virtual communication port (VCP) driver that provides the necessary serial communications.



Figure 1 ~ Callisto serial port interface connections.

3. Callisto incompatibility symptoms

A number of problems have been observed when using Callisto with Windows 7:

- 1. Windows updates have made drivers inoperable that previously worked with callisto.exe
- 2. USB-Serial Adapter devices and drivers that worked with application programs at lower speeds (for example, 9600 b/s) do not work at the higher speed required by Callisto (115200 b/s)
- 3. Older USB-Serial Adapters that worked with Windows XP do not work with Windows 7 even though the driver may be current or claimed by the manufacturer to be Windows 7 compatible

- Nothing happens when callisto.exe is opened the Callisto software window is not visible on the Windows desktop. Subsequent attempts to open callisto.exe do not work, resulting in one or more instances of callisto.exe (called "zombies")
- 5. Opening callisto.exe the first time after PC restart or plugging in an adapter may not be successful (the Callisto software window is not visible), resulting in a "zombie" instance.

Image Name 🔺	User Name	CPU	Memory (Description		
ACDSeeProInTouch2.exe	Whitha	00	3,528 K	ACDSee P		
ACTray.exe *32	Whitha	00	3,548 K	ThinkVant		
ACWLIcon.exe *32	Whitha	00	3,824 K	ThinkVant		
callisto_v117.exe *32	Whitha	00	3,452 K	Radiospec		
ClassicStartMenu.exe	Whitha	00	2,524 K	Classic St		
csrss.exe		00	8,380 K			
dinotify.exe	Whitha	00	1,420 K	Windows		
dwm.exe	Whitha	00	1,840 K	Desktop		
explorer.exe	Whitha	00	48,272 K	Windows		
firefox.exe *32	Whitha	00	178,840 K	Firefox		windows task manager
GeTTime.exe *32	Whitha	00	7,592 K	SymmTime		
GoogleToolbarNotifier.ex	Whitha	00	472 K	GoogleTo		Do you want to end 'callisto_v1
hkcmd.exe	Whitha	00	2,296 K	hkcmd Mo		
HPNetworkCommunicator	Whitha	00	2,928 K	HPNetwor		If an open program is associated with
igfxpers.exe	Whitha	00	3,264 K	persistenc		will lose any unsaved data. If you en
iusb3mon.exe *32	Whitha	00	1,460 K	Intel(R) U		result in an unstable system. Are you
jusched.exe *32	Whitha	00	832 K	Java(TM)		
MCPLaunch.exe *32	Whitha	00	284 K	Message		
mmc.exe	Whitha	00	3,864 K	Microsoft		
msseces.exe	Whitha	00	5,096 K	Microsoft		lî.
netsession_win.exe *32	Whitha	00	7,140 K	Akamai Ne		
netsession_win.exe *32	Whitha	00	2,708 K	Akamai Ne		
pcee4.exe	Whitha	00	9,152 K	Dolby Prof		
PdfCreate8Hook.exe *32	Whitha	00	2,588 K	PdfCreate		
picpick.exe *32	Whitha	00	39,504 K	PicPick		
PrivacyIconClient.exe	Whitha	00	14,872 K	Intel(R) M		
RAVBg64.exe	Whitha	00	3,720 K	HD Audio		
RAVCpl64.exe	Whitha	00	3,796 K	Realtek H		
rundli32.exe	Whitha	00	6,596 K	Windows		

Figure 2 ~ If callisto.exe is opened but its window does not appear on the desktop, then it is a "zombie" (left). Task Manager is used to close (End Process) callisto.exe (right)

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ess, it will close and you n process, it might want to continue?

Cancel

- 6. When callisto.exe is opened, it may load very slowly as indicated by the "Yield" status bar in the callisto.exe window. This can happen when Callisto is not powered On or no USB-Serial Adapter is plugged into the PC. Correct the problem and try again.
- 7. If callisto.cfg is setup for the wrong COM port (parameter [rxcomport]), the Callisto software window indicates "Can't open RCU-port" (figure 3). Correct the problem and try again. After correction, the window should indicate "COM-port available" as callisto.exe loads. When callisto.exe finishes loading, "Receiver connected" should appear (figure 4). If callisto.exe is unable to establish communications with the Callisto, the text "COM-port available" will remain.

🕹 e-Callisto Radiospectrometer REEVE 📃 🔲 🗙	🔽 e-Callisto Radiospectrometer REEVE
	Edit Help
8:50:06 AM, \$HST:No calibration file found 8:50:06 AM, \$HST:Plot buffer erased 8:50:06 AM, \$HST:Parametrisation RCU 8:50:12 AM, \$HST:File FRQ99999.CFG read 8:50:12 AM, \$HST:No calibration file found 8:50:12 AM, \$HST:Plot buffer erased 8:50:12 AM, \$HST:Plot buffer erased	9:00:55 AM, \$HST:Callisto ready now 9:00:57 AM, \$HST:Measurement idle 9:00:57 AM, \$HST:File scheduler.cfg read 9:00:57 AM, \$HST:Measurement enable 9:00:57 AM, \$CX:ACC gain = 2.60V 9:00:57 AM, \$CX:Emitter BF199 = 0.11V 9:00:57 AM, \$CX:Analog Input = 11.26
Yield = 100%	Yield = 76%
Main functions	Main functions
Select frequencyfile Lightcurve y(t)	Loading - Lightcurve y(t)
Start measurement Spectrum y(f)	Start measurement Spectrum y(f)
Stop measurement Spectrum y(f,t)	Stop measurement Spectrum y(f,t)

Figure 3 ~ When callisto.exe is opened and no COM port is available, it indicates "Can't open RCU-port" (left). If a COM port is available, it indicates "COM-port available" (right)

leceiver connected	6/1/2013
20:45:47, #CRX:Frequency= 20:45:47, #IST:Receiver c 20:45:47, \$CRX:Sweeplengt 20:45:47, \$CRX:mid_band_m 20:45:47, \$CRX:mid_band_ 20:45:47, \$CRX:high_band_ 20:45:47, \$CRX:ldle=0	45.0MHz connected :h=200 uax=171MHz uax=450MHz max=863MHz
Next sched.: 23:00:00	Yield = 100% Time: 20:45:49
Next sched.: 23:00:00 Main functions	Yield = 100% Time: 20:45:49
Next sched.: 23:00:00 Main functions Select frequencyfile	<pre>Yield = 100% Time: 20:45:49 Lightcurve y(t)</pre>
Next sched.: 23:00:00 Main functions Select frequencyfile Start measurement	<pre>Yield = 100% Time: 20:45:49 Lightcurve y(t) Spectrum y(f)</pre>
Next sched.: 23:00:00 Main functions Select frequencyfile Start measurement Stop measurement	<pre>Yield = 100% Time: 20:45:49 Lightcurve y(t) Spectrum y(f) Spectrum y(f,t)</pre>

Figure 4 ~ If callisto.exe is able to establish communications with Callisto, the text "Receiver connected" appears when it is finished loading.

8. When callisto.exe is opened and communicating with the Callisto, the spectrum on the Spectrum y(f) plot appears to shift by multiples of 2x or 4x (figure 5). This problem has been traced to an out-of-date USB-Serial Adapter driver and was corrected by updating the driver (the old driver was dated 2012 and supposed to be Windows 7 compatible but a newer driver dated 2013 corrected the problem)



Figure 5 \sim If callisto.exe is able to establish communications with Callisto, but experiences serial communications problems, the spectrum shown in the Spectrum y(f) plot may shift by a factor of 2 or 4. A normal spectrum is shown top followed by 2x and 4x spectrum shifts (bottom-left and right)

9. When callisto.exe is opened and communicating with the Callisto, it momentarily loses communications and "Check RS-232 connection" appears in the status window (figure 6) occasionally or as often as every few seconds, sometimes accompanied by spectrum shifts as previously described. This is caused by an older adapter that should be but is not compatible with Windows 7 in this application.

leceiver connected	6/16/2013
7:08:30 PM, \$CRX:Emitt	er BF199 = 0.11V
7:08:30 PM_SCPX:Anale	g Input = 11.27
7:08:31 PM, \$HST:Check	RS232-connection!
7:08:34 PM, \$HST:Attem	pting Auto-Start
7:08:34 PM, +HST-Param	L forwards 00
7:08:35 PM sHST:Enabl	e data transfer
7:08:35 PM. \$HST:Conti	nuous measurement
	Load = 17%
	Load = 17%
Next sched.: 23:00:00	Load = 17%
Next sched.: 23:00:00	Load = 17% 0 Time: 8:06:20 PM
Next sched.: 23:00:00 Main functions	Load = 17%
Next sched.: 23:00:00 Main functions Select frequencyfil	Load = 17% 0 Time: 8:06:20 PM
Next sched.: 23:00:00 Main functions Select frequencyfil	Load = 174 0 Time: 8:06:20 PM Lightcurve y(t)
Next sched.: 23:00:00 Main functions Select frequencyfil Start measurement	Load = 174 0 Time: 8:06:20 PM Lightcurve y(t) Spectrum y(f)
Next sched.: 23:00:00 Main functions Select frequencyfil Start measurement	Load = 174 0 Time: 8:06:20 PM Lightcurve y(t) Spectrum y(f)
Next sched.: 23:00:00 Main functions Select frequencyfil Start messurement Stop measurement	Load = 174 0 Time: 8:06:20 PM Lightcurve y(t) Spectrum y(f, t)

Figure 6 ~ If callisto.exe is able to establish communications with Callisto, but momentarily loses communications, the text "Check RS-232 connection" appears in the status window. Callisto software automatically attempts to re-establish the connection and indicates with text "Attempting Auto-Start".

4. USB-Serial Adapters that have been tested with Window 7

Adapters that have been tested with Windows 7 x32 and x64 are tabulated (table 1). Two adapters known to be incompatible are included in the list. Note that only adapters using the FTDI and Prolific chips were tested. Other chip manufacturers exist (for example, MOXA) but have not been tested.

Table 1 ~ Tested USB-Serial Adapters

Manufacturer	Model Number	Chip	Website	Remarks
StartTech	ICUSB2321F	FTDI	www.startech.com	Note 1
USConverters	XS880	FTDI	www.usconverters.com	Ultimate, Note 2
USConverters	XS8801	FTDI	www.usconverters.com	Professional, Note 2
USBGear	USBG-10ft-232-STF	FTDI	www.usbgear.com/	Note 2, 3
Plugable	USB Serial Converter	Prolific HXD	plugable.com/	
Trendnet	TU-S9 V2 (white)	Prolific HXD	www.trendnet.com/	
Trendnet	TU-S9 V1 (blue)	Prolific HXD		Incompatible, Note 4
IOGear	GUC232A	Prolific HXA		Incompatible, Note 5

Table Notes:

- 1. The "F" in the model number indicates FTDI chip. StarTech supplies several versions of the ICUSB232 adapter, including some with different chips, but only the model number shown was tested
- 2. These adapters are equipped with Rx, Tx and power LEDs, which are very helpful for troubleshooting
- 3. The model shown has a 10 ft cable; a similar model with 6 ft cable, USBG-6ft-232-STF, is available. The "F" in the model number indicates FTDI chip
- 4. The TU-S9 V1 (blue) is an older model and is not recommended even though it uses the HXD chip
- 5. The GUC232A is an older model with an incompatible chip (HXA) and ATEN drivers and is not recommended

5. USB-Serial Adapter drivers

If the adapter was obtained prior to 2010, it probably will not work with Windows 7 even though a Windows 7 x32 or x64 driver may be available. A web search or the manufacturer's website may yield the necessary compatibility information. However, many adapters are unbranded, making it impossible to find reliable information on them and, for this reason, are not recommended.

Before attempting to update, troubleshoot or repair USB-Serial adapter problems, remove all unused drivers using the procedures described here (this does not uninstall the driver, it only deletes the instance of the driver for a particular adapter):

http://www.reeve.com/Documents/Articles%20Papers/USBPortManagement_Reeve.pdf

Next, determine the chipset used in the adapter. This usually can be found by examining the Device Manager as follows:

- Unplug all adapters except the one being investigated
- Right-click My Computer, click on Properties and then select the Device Manager
- Click the + next to Ports (COM & LPT) to expose the adapter
- Right-click the adapter, select Properties and then select the Driver tab. The driver provider should be indicated (figure 4)

General	Port Settings	Driver	Details	
1	USB Serial P	ort (COM	8)	
	Driver Provide	er: F	TDI	
	Driver Date:	1/	/18/2013	
	Driver Version	n: 2.	8.28.0	
	Digital Signer	: M Pu	icrosoft Windows Hardware Compa Jblisher	tibility
Driv	ver Details	To v	iew details about the driver files.	
Upda	ate Driver	To u	pdate the driver software for this de	vice.
Roll	Back Driver	If the back	e device fails after updating the drive to the previously installed driver.	er, roll
	Disable	Disal	bles the selected device.	
L	Jninstall	Tou	ninstall the driver (Advanced).	

Figure 4 ~ Device Driver Properties – Driver tab for a USB-Serial Adapter

• Alternately, click the Details tab and select Manufacturer and then Driver Assy Version from the dropdown (figure 5)

USB Serial Port (COM8) Properties	USB Serial Port (COM8) Properties
General Port Settings Driver Details	General Port Settings Driver Details
USB Serial Port (COM8)	USB Serial Port (COM8)
Property	Property
Manufacturer	Driver assembly version
Value	Value
FTDI	2.8.28.0
OK Cancel	OK Cancel

Figure 5 ~ Device Driver Properties – Details tab for a USB-Serial Adapter

• Make a note of the driver date and version. If the driver is dated prior to 2013, then it is out of date and likely will not work with callisto.exe under Windows 7. However, it is not guaranteed to work even if it is dated 2013.

Websites for FTDI and Prolific drivers are provided in the next section. Prolific provides a program with their driver software that identifies the chipset used (figure 6). This may indicate an older, incompatible chip.

Check PL-2303 chip version v1006	Check PL-2303 chip version v1006
COM5 Check Exit	COM3 Check Exit
This is a PL-2303 HXD chip Clear	This is a PL-2303 XA / HXA chip Clear

Figure 6 ~ Prolific chip identification tool. If the chip is identified as HXD (left), it is compatible with Windows 7. If it is identified as any other, such as HXA (right), it is incompatible.

6. Driver updates

The USB-Serial Adapters that were tested use either FTDI or Prolific chips. The respective websites for the drivers are:

http://www.ftdichip.com/FTDrivers.htm http://prolificusa.com/pl-2303hx-drivers/

See last page for revisions. File: Reeve_Investig_Callisto_USB-Serial.doc, Page 7

Do not attempt to update device drivers from the Device Manager, Driver tab. It has been found that this method often does not find the latest drivers, so avoid using it. The recommended procedure is to visit the website of the adapter chipset manufacturer and obtain the driver directly.

Some driver update programs will first uninstall the old driver. This means the update program must be run twice – first to remove the old driver and second time to install the new driver. When the new driver is installed, the update program may indicate the PC must be restarted. Do not skip this step.

If the new driver does not automatically uninstall the old one, then the old driver must be manually uninstalled. This may be done from the Device Manager, Driver tab. The USB-Serial Adapter must be plugged in for the Uninstall process.

Some driver installation programs require that the USB-Serial Adapter be plugged in when running the update program. When a new adapter is plugged in, and no driver exists for its chip, Windows 7 will attempt to automatically install the needed drivers, and this can lead to an out-of-date driver. Allow Windows to finish its process and then go to the Device Driver Properties – Driver or – Details tab to check the driver version. If a newer one can be found on the adapter manufacturer's website, then uninstall the existing driver and install the new driver.

After installing the new driver and restarting the PC, go once again to the Device Manager and check the driver date and version. It should correspond to the information on the driver provider's website.

After the correct, up-to-date driver is installed for a given type of chip, it can be applied to any USB-Serial Adapter that uses that chip. When a new USB-Serial Adapter is plugged in, Windows 7 should automatically use the new driver. However, if that adapter was previously installed, Windows 7 may use the old drivers if they still exist. Otherwise, it will use the new driver. If Windows 7 selects the old driver, then follow the above procedures to install the new driver.

The driver update process needs to be repeated for each USB-Serial Adapter.

7. Callisto software installation

The Callisto software should be installed in a dedicated folder as discussed in the Software Setup Guide. Go to the folder, right-click callisto.exe and select Properties. Alternately, if a short-cut was setup to callisto.exe, right-click the short-cut and select Properties (figure 7).

Security	Details		Previous Versions
General	Shortcut		Compatibility
ou have problem earlier version of tches that earlier Ip me choose the	is with this progra Windows, selec version. <u>e settings</u>	im and t the co	it worked correctly or mpatibility mode that
Compatibility mode	e		
Run this pro	gram in compatib	ility mo	de for:
Windows 95			-
ettings			
Run in 256 c	colors		
Run in 640	480 screen reso	olution	
Disable visu	al themes		
T Disable desk	ctop composition		
Disable displ	lay scaling on hig	h DPI :	settings
nivilega Level —			
Run this nor	aram ao an admir	sistrator	
Hun this pro	grant as an admir	istrato	
a		-r	
the second	nos for all users		

Figure 7 ~ File properties window allows Compatibility Mode and Run as Administrator

First, check "Run this program in compatibility mode for:" and select Windows 95 from the drop-down box. Second, at the bottom of the window check "Run the program as an administrator".

Document Information

Author:	Whitham D.	Reeve

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Revision: 0.0 (Initial draft, 19 May 2013)

- 0.1 (Draft major revisions, 15 June 2013)
- 0.2 (Final draft, 17 June 2013)
- 1.0 (Distribution, 18 June 2013)