

# Choosing and setting up a tablet computer with a DistoX for paperless cave surveying

## Some technical details

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**Note that this talk was originally given at last year's Communications & Electronics Session and is therefore oriented towards just the technical aspects of the equipment. In the interests of full disclosure, I a surveyor but not a sketcher.**

Quote of the day: *You will never succeed if you don't try.*





**Left: DistoX based on Leica Disto A3**

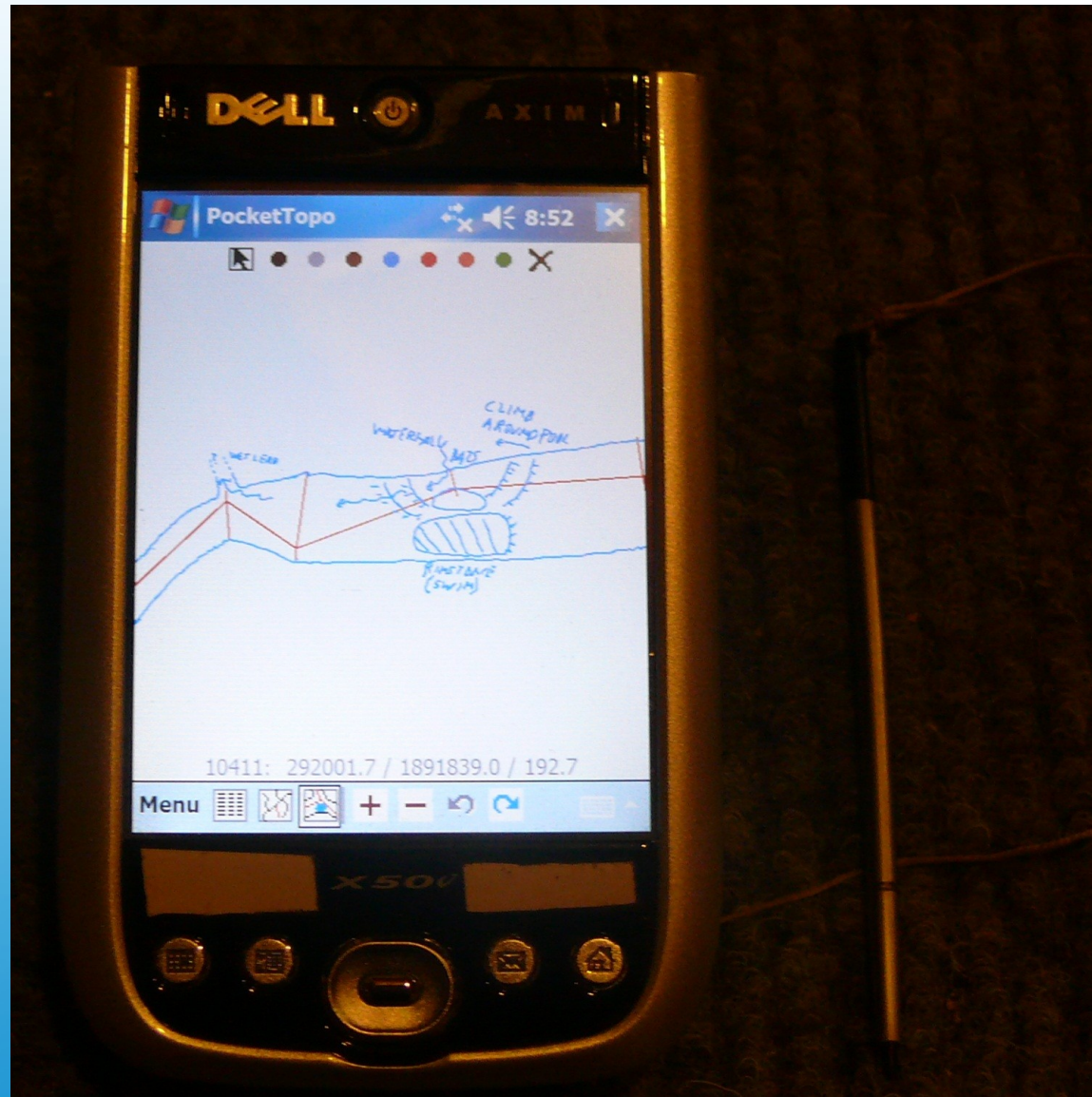
**Center: A3 in waterproof box with glass window**

**Right: DistoX2 based on Leica Disto E7400X**



## **Choice of the original PDA**

- 1) Windows Mobile 5.0 operating system to run PocketTopo**
- 2) High resolution color touch screen**
- 3) Bluetooth to download data and calibrate the DistoX**
- 4) A full-size SD card slot for saving data**
- 5) Ability to swap batteries in the cave**
- 6) Low cost (used off Ebay)**

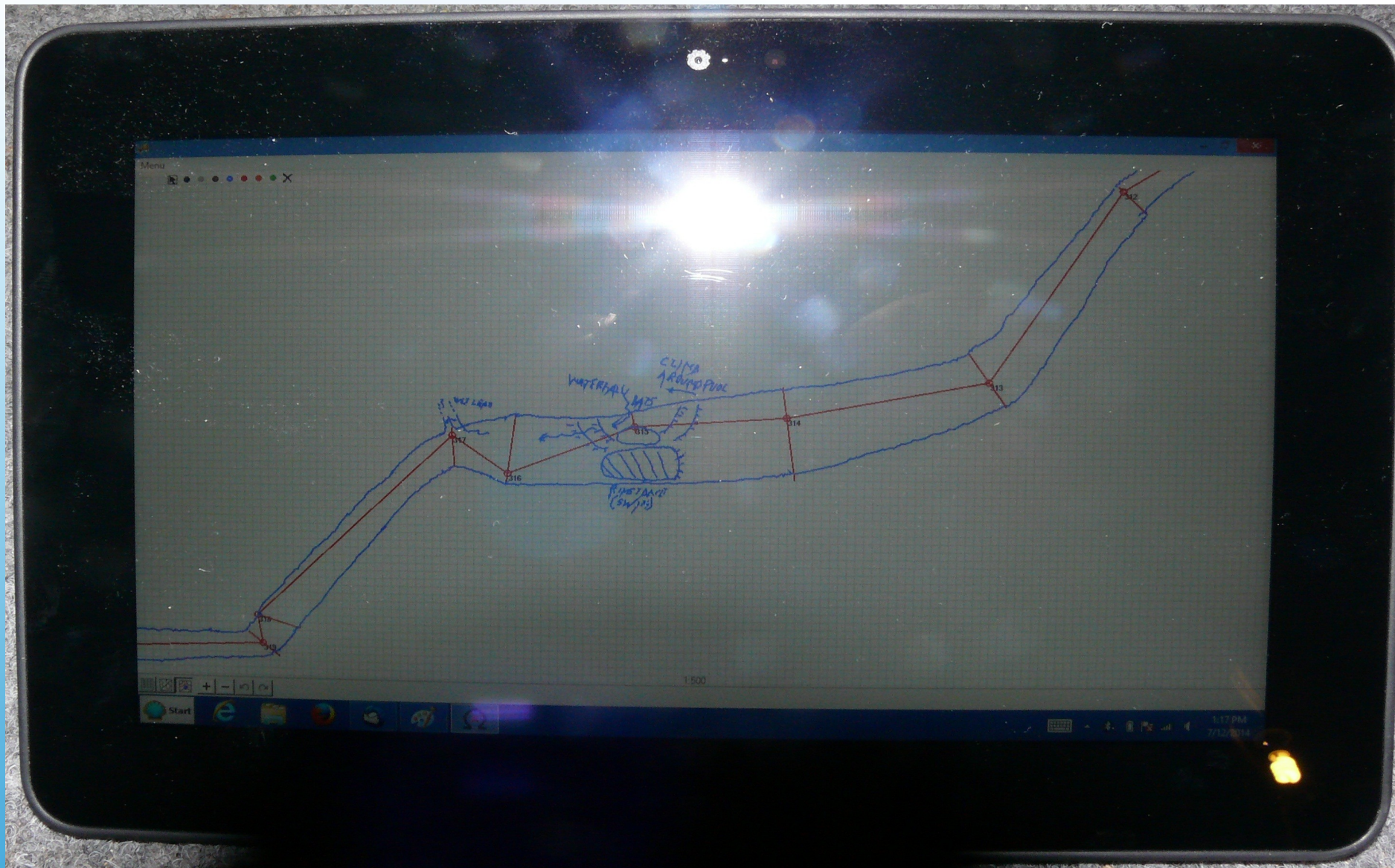


**Dell Axim X50V PDA with attached stylus**

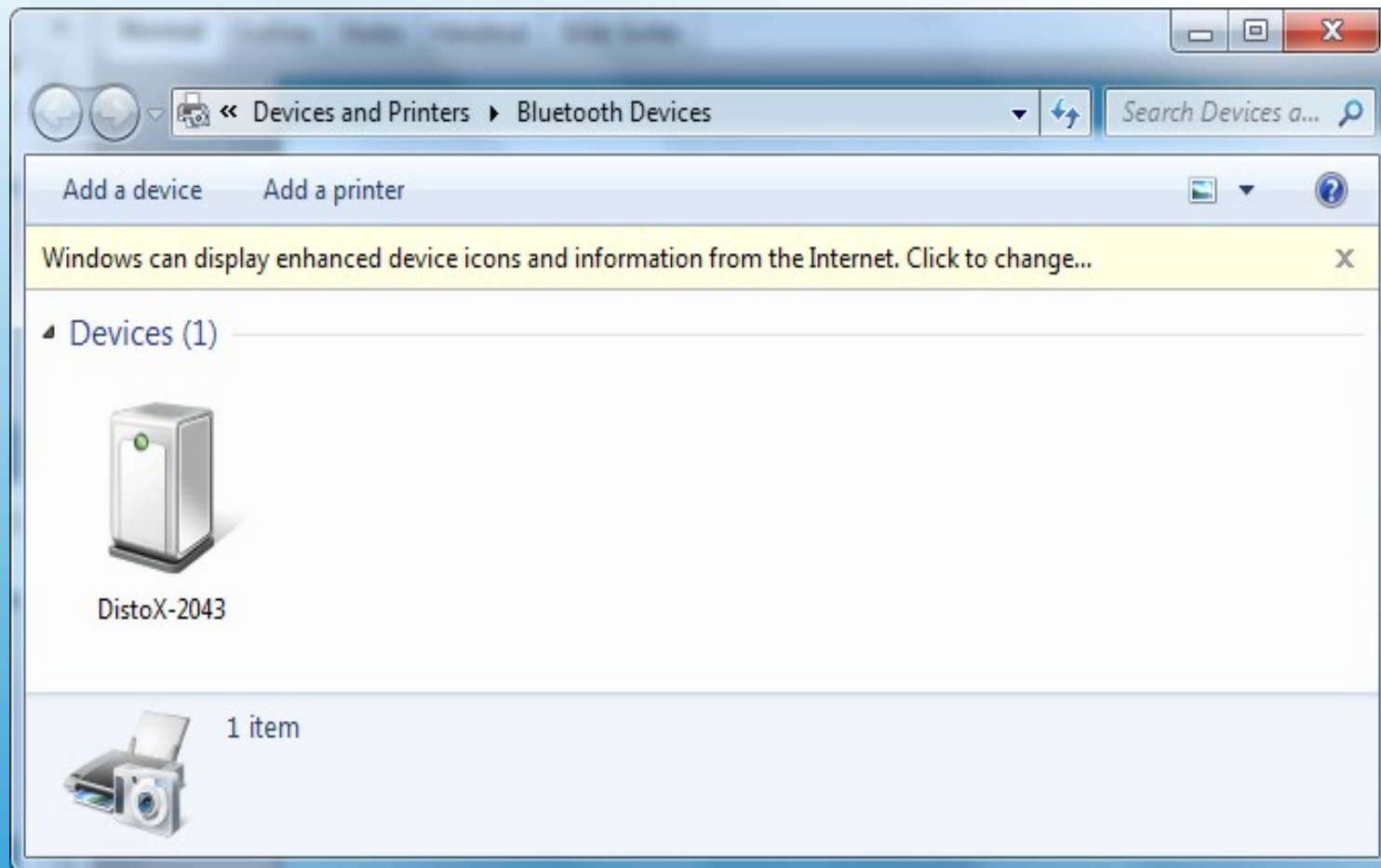
## **Choice of Tablet**

- 1) Windows 7 or 8, which also runs PocketTopo.**
- 2) WiFi for installing and updating software.**
- 3) Full-size SD card slot. PocketTopo and all data can be moved to a backup PDA if the tablet fails.**
- 4) Full-size USB port for data backup, even in-cave.**
- 5) Long life swappable battery.**
- 6) Bluetooth.**
- 7) Support for Wacom battery-less active stylus for sketching.**
- 8) 8 inch screen desirable, with wide viewing angle.**
- 9) Low cost (used off Ebay).**
- 10) Available low-cost (soft) waterproof housing.**

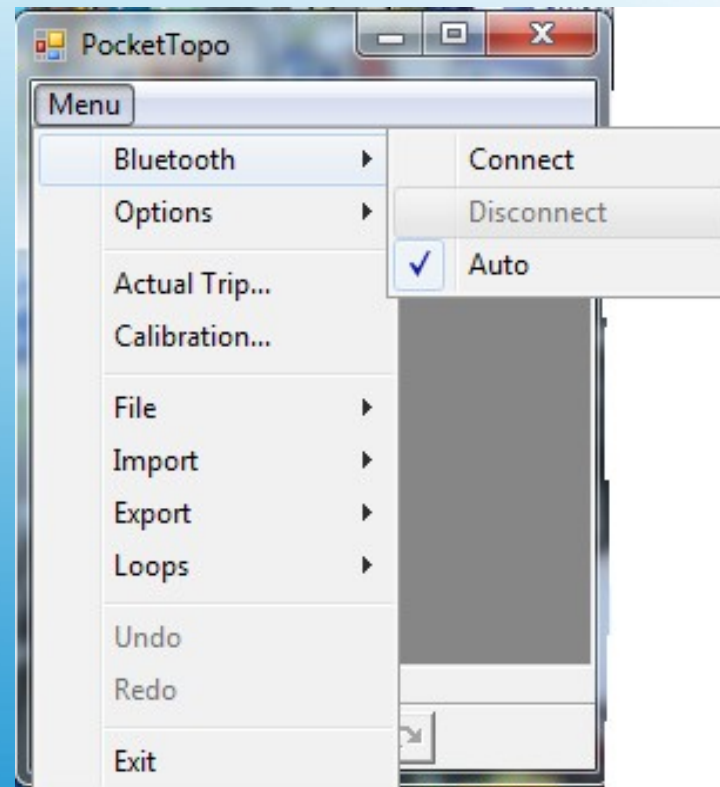




**Dell Latitude 10 ST2 64Gb Windows 8 tablet**



**Only one DistoX device at a time can be paired with a given tablet or PDA.**



**If the DistoX Bluetooth signal is lost, the automatic search function will freeze PocketTopo several times/minute, stopping sketching. Disconnecting solves the problem.**





Erase button (not for PocketTopo)

**The Wacom active stylus contains a loop antenna and electronics, but no battery. It harvests energy from the tablet's screen, and engages in 2-way communication.**

# **The Wacom Active Stylus**

## **Benefits**

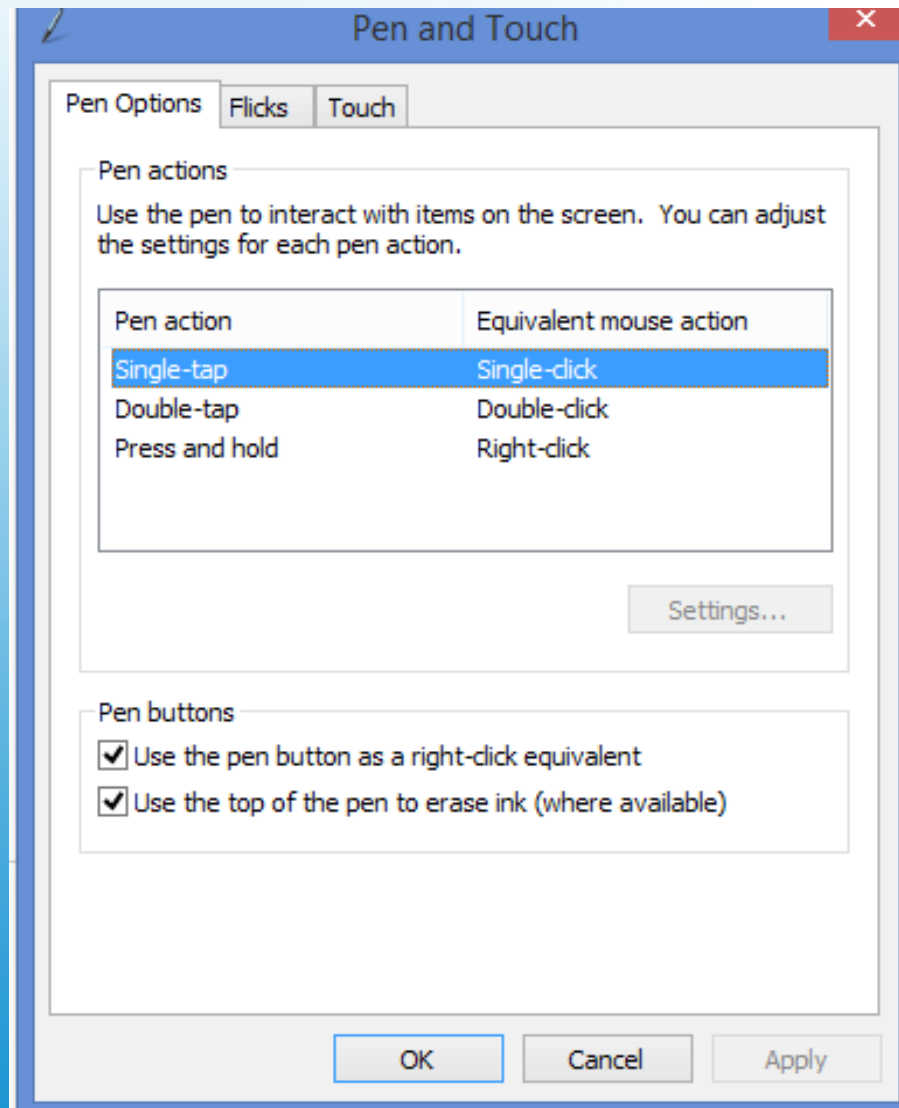
- 1) The Active Stylus is independent of the tablet's touch screen**
- 2) When brought within about 3/4" of the screen, the Stylus activates and automatically turns the normal touch screen off to allow resting one's hand directly on the screen while drawing.**
- 3) Slight pressure of the Stylus tip on the screen starts the drawing, which follows a little mark that appears on the screen under the tip.**
- 4) The Stylus works perfectly through even a thick waterproof case.**
- 5) A button on the Stylus can simulate a right mouse click.**



# **The Wacom Active Stylus**

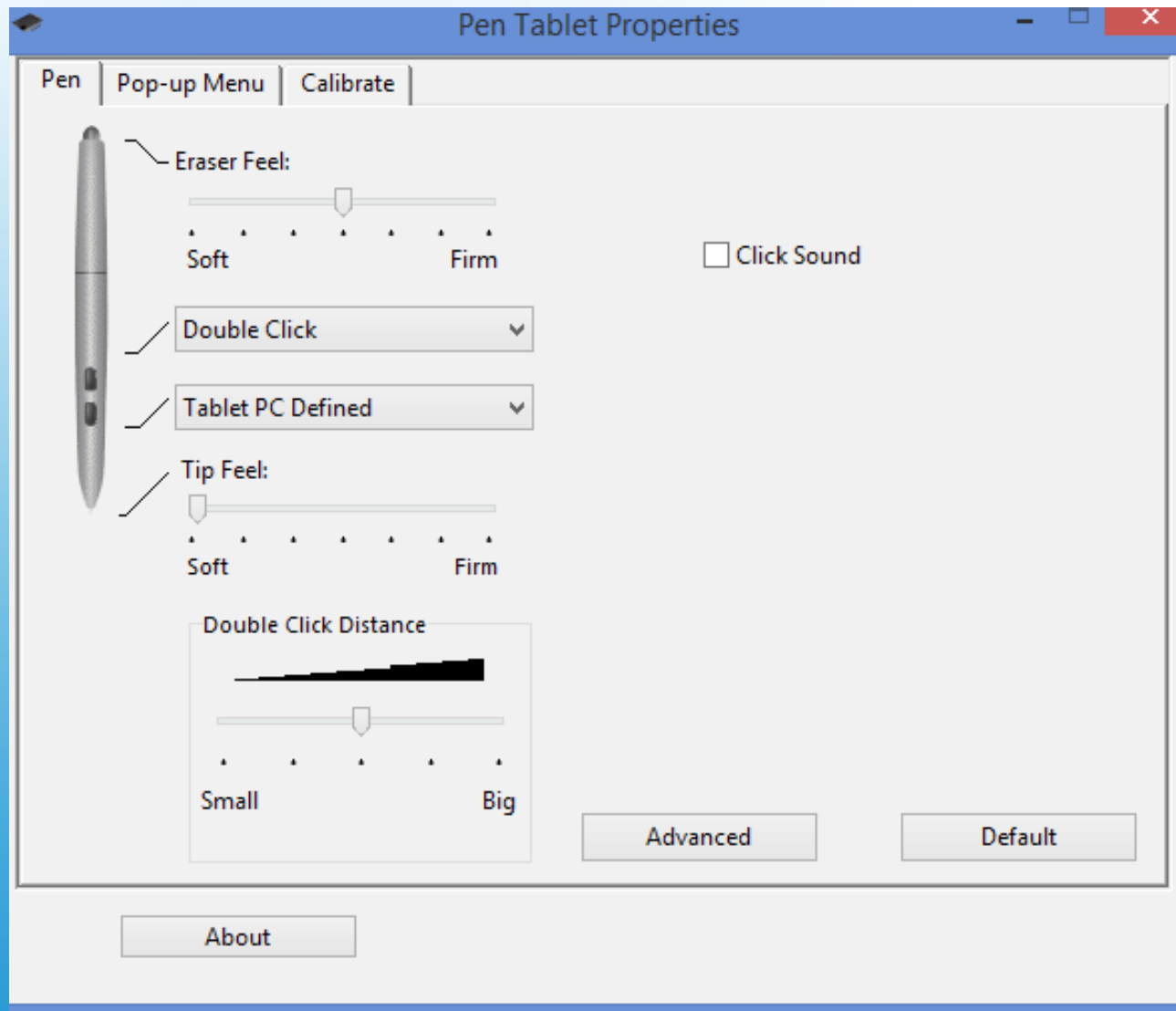
## **Drawbacks**

- 1) The calibration of the pen is not perfect, especially near the edges of the screen.**
- 2) Placing the tablet on a steel surface or near a magnetic object will also disrupt the calibration.**
- 3) There is noticeable parallax between tip and mark, especially when the pen is tilted.**
- 4) Perhaps the most annoying thing is that the drawing is fairly slow. It is easy to get ahead of the line being drawn. I suppose that one can adapt.**
- 5) If the stylus is lifted more than 3/4" from the screen while the sketcher's hand rests on the screen, the touch screen will become active with likely bad results! This can be overcome by turning the touch screen fully off.**

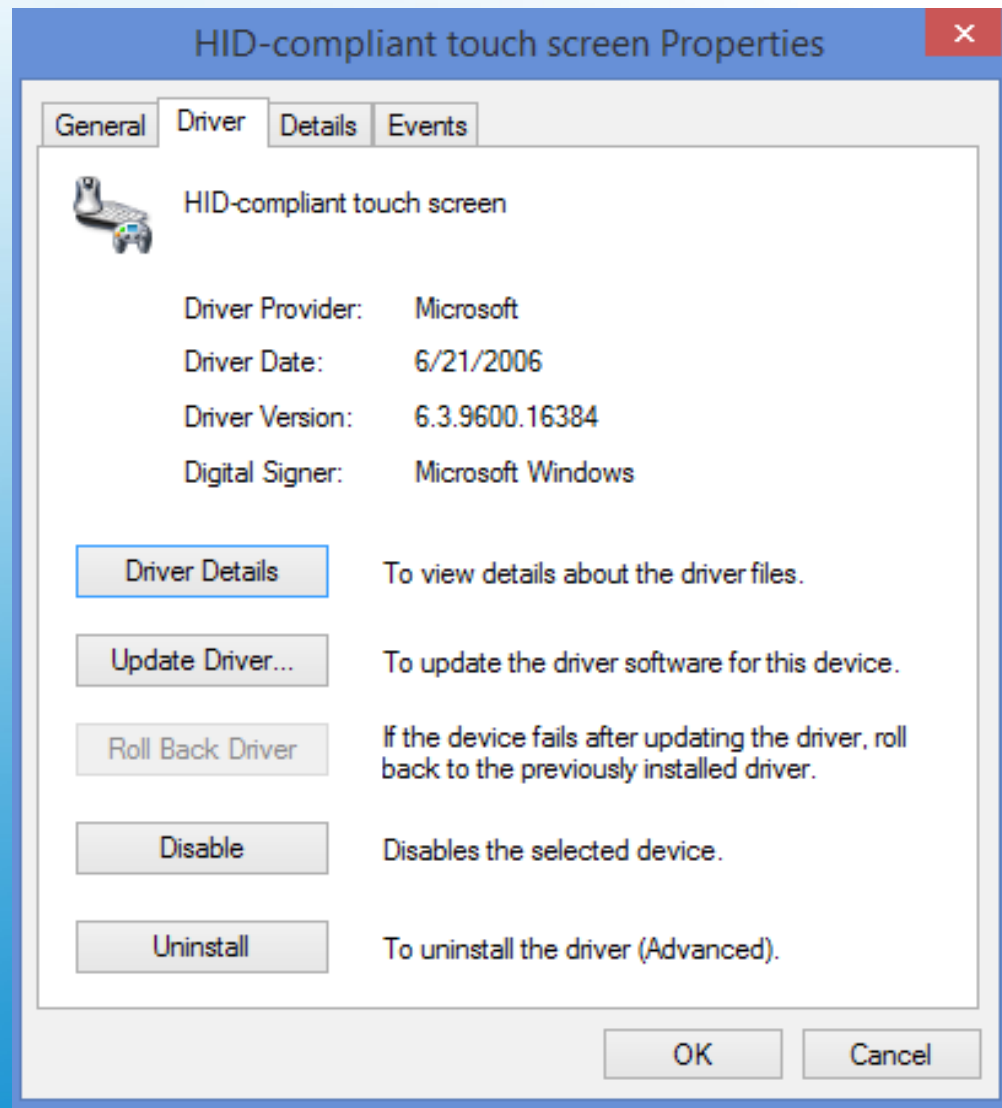


**There was no way to turn off the touch screen on the Latitude 10 in this window, but it might be present on other tablets.**





**There was no control over the touch screen here either, but it is worth a look anyway.**



**I finally found the touch screen control in  
Device Manager/Human Interface Devices/  
HID-compliant touch screen**



## **Conclusions**

**The goal is to attempt to create a working map in real time as we start to explore and map a large Central American cave, instead of just collecting data and paper sketches, which may or may not be made into a map by a cartographer at some future date.**

**If the sketcher can learn to use the tablet in the cave, and everything keeps working, and the Mayan Gods are willing, we might actually start creating a map.**