

GolfTraxx.com

GolfTraxx: a Look Back With Founder Frank DeBenedetti on July 10, 2019.

Reflection, Validation, and A BIG thank you!

When I started GolfTraxx back in mid-2006 with my Palm TREO 650 and a bluetooth non-radio GPS receiver, I truly had no idea where the project would lead. Having played competitive golf in college, I had the inspiration years earlier of how *cool* it would be to get yardages to the green spoken to me by my phone.

What made the dream possible was an IDE (integrated development environment) from a company in India called Consigntech. Their IDE allowed me to simply create screens for my application, and then to publish the screens into one of several operating systems. Consigntech had funding from Intel which gave them credibility. When I learned that they had already completed the bluetooth GPS integration, and it was working, I knew I had to try to make it work.

In just a few weeks I had created an application and published it and loaded it onto my TREO. I started testing with GPS coordinates that I obtained from Google Maps or collected manually. It ALL worked! I searched and searched on Google for formulas in use to calculate yardages but to no avail. I just had to come up with my own. I discovered that the Pythagorean theorem $a^2 + b^2 = c^2$ works quite well for shorter distances on our planet, but needed to be localized for where I was playing golf (my latitude).

However, I wondered if it could be customized to work in other places on earth. Fortunately for me, I had a trip scheduled to Palm Springs some 500 miles to the south of me, and another to Seattle some 900 miles to the north of me during Spring and Summer of 2006. During my travels, I observed that the calculations were functioning but distances were off, in opposite directions. For you math students, guess which direction (north or south) distances were off (higher/lower). So... I needed a way to adjust the calculation we made, based upon where on this great earth the calculation was being made. Again, I searched and searched Google for any reference to such a calculation adjustment. No such reference was found, despite exhaustive searches.

What I concluded from the variances I observed in Palm Springs and Seattle was that while the distance between lines of latitude remains constant around the globe, the distance between lines of longitude change. The greatest distance between two lines of longitude is at the equator. The shortest is at either pole (north or south) where the distance converges to zero. My challenge was to find a formula that could be executed on the phone operating systems and in the IDE that would properly reduce the distance between lines of longitude for a given latitude. No one else had ever figured out how to do that in 2006. If they CLAIM that they did, just ask them to produce a product actually being sold in 2006 that worked anywhere in the world without localization. GolfTraxx IS and ALWAYS will be the first Golf GPS to provide accurate distances anywhere on the planet. We did it in 2006.

Incredibly, I stumbled upon a formula that worked perfectly after filling up dozens of legal pads with different calculation attempts. It involved using trigonometric function upon the number of radians away from the equator that a given latitude was, to determine what reduction was appropriate from the base 69.17 miles between two lines of longitude at the equator to the observed coordinates. How well did it work? Well, as one customer aptly put it in 2007..."It works... It ALL works! I played my best round ever."

So of course I proceeded to publish the same screens to all the other operating systems available through Consigntech, including: Palm, Windows Mobile, Pocket PC, AND also in 2006, Garmin Ique!

GolfTraxx, the worldwide golf GPS solution had been born. We were selling bluetooth GPS receivers for around a hundred bucks and our software for \$29.95.

All early devices except the Garmin used bluetooth GPS for obtaining the GPS data. Bluetooth GPS receivers were not classified by FCC as a radio devices and therefore could leverage the L2 (military band) satellite signal. The L2 band of data allows far more precise GPS calculations to be made than those available on radio devices including iPhones and Android phones. The Garmin Ique ran the Pocket PC operating system so our GolfTraxx application loaded just like any other Pocket PC but we still had to figure out how our application would receive data from Garmin's internal GPS. Since the Garmin had no phone, it was not classified by FCC as a radio device either.

A developer from South Africa responded to my web inquiry about other applications he had created on Garmin Ique and we made an agreement that he would assist with the Garmin internal GPS integration. In a few short weeks we had it working!

The other problem with Garmin of course was that it was not a phone, and did not come equipped with 3G or wi-fi. How could we get it to download the course data? Google search came in quite handy at that point as I stumbled upon a manufacturer in Taiwan who was manufacturing a small push-in card for the Garmin like a memory card that equipped the device with Wi-Fi. I first ordered a couple to try then placed an order for several hundred of them.

Our GolfTraxx Garmin bundle in 2006 included the wi-fi card, the Garmin Ique M4 or M5 and the pre-loaded GolfTraxx software. We sold it for around \$450 and sold hundreds of the devices on eBay. I had found Garmin wholesalers online who were selling me the units wholesale. We received 100% positive feedback on eBay for all of the units we sold there.

Things were starting to look up. Garmin first contacted me in 2007 and told me they were hearing good things about my software and wanted to help me support it. They asked me to send them my code. Naively I did so. I didn't realize at the time that I had been the only one to figure out a formula that localized the distances between two sets of GPS coordinates. Within weeks after Garmin contacted me, I was suddenly unable to acquire any more Garmin M5 or M4 units from the wholesalers, and Garmin NEVER contacted me again. If one looks at the current Garmin golf GPS product offerings of TODAY, one could easily conclude that the 2006 GolfTraxx product became the 12 year roadmap for Garmin as their golf GPS devices sold today are offering the same features offered by GolfTraxx in 2006-2008. The code Garmin obtained from me under false pretenses enabled them to solve technical questions they had not solved for themselves.

Of course, the other challenge we faced was how to capture coordinates for all of the courses around the world. I had used Google Maps in early testing in 2006 and stumbled upon Google Earth in 2007 as well. I found that adding placemarks on a Google Earth map actually stored the GPS coordinates into a kml file. So..as all loyal GolfTraxx users know, I published a pdf in 2008 about how to map

their local courses using Google Earth and send us the kml file. I also offered free licenses to anyone who mapped their local course and sent it in. At the time I was also working full time at Paypal, and a co-worker assisted me in creating an Excel macro that parsed the coordinates out of the kml. I was a database guy so I used my database skills to automatically construct queries in that same Excel workbook using the parsed coordinates which could simply be copy/pasted into my sql database and executed.

This partially automated the kml processing which was a BIG help as hundreds of people were sending in kml files for free GolfTraxx licenses. Then, a year later we hired a Google developer in India to allow users to do the Google Earth mapping directly from the GolfTraxx website.

Those of you who used GolfTraxx on your device with a course you personally mapped know that our mapping process worked flawlessly. Thank you! The distances were great! AMAZING in fact! The mapping you did is still viewable on the GolfTraxx website today. On our courses page, enter a zip code and you'll be presented with all the nearby courses in your county and sometimes beyond, along with link to view the scorecard. Next to each hole in the scorecard, you can click a link to view the placemarks you placed on that hole in that kml file or from the GolfTraxx website for the specific course(s) that you mapped.

Today, there are over 10,000 courses mapped in Golftraxx. For the past few years, the maps did not accurately display the placemarks on the GolfTraxx website even though when you used GolfTraxx on your device you know they were accurate. Google Maps imagery and the the Google Maps API we were using had not been updated to the newly released Google standard which resulted in older map imagery and TILT distortion. But go look today at courses you mapped, and as of this week, we're on Google Maps API v.3.3. You can easily see the collective results.

Our web hosting provider Ipower who has hosted the website for the past 12 years actually moved our website to another server in 2013 without our authorization or knowledge which resulted in further degradation, distortion, and feature breakage on the GolfTraxx website. A few weeks back they put us back into the shared hosting environment we started in which was a great move forward. Since then we have been testing and fixing features that were broken through obsolescence, website configuration, or poor-intentioned developers who we worked with.

My goal in launching Golftraxx was to make courses available to any device that had ever run our software for as long as that device existed. As of today, that is still our commitment. The 10,000 mapped courses can STILL be downloaded by the PALM TREO 650, Pocket PC, Garmin Ique, Windows Mobile devices, Blackberry, and iPhone up to v. 4.

We chose not to continue development on the iPhone due to its classification by FCC as a radio device which meant it is limited to receiving L1 GPS band signal (and as all of us know who have used Google Maps on our phone results in 5-15 yard variances). The inaccuracy within the L1 band makes the DEVICE not accurate enough for golf.

We halted development on the Android version for the exact same reason several years ago...5-15 yard inaccuracies are not accurate enough for golf. But as we announced on our website a couple weeks ago...things...they are a-changing. Nine satellites have now been launched into orbit around the earth which send a third GPS signal band called L5 which enables decimeter precision. To within a foot. It takes a little time for the signal to hone in, similar to the Garmin iQue to reach 3D positioning, but it works.

The first Android phone offering the dual band GPS is the Xiaomi Mi 8. It is confirmed that it IS

receiving the L5 band by an independent party. It is our belief that over the next couple of years, many Android phones will utilize the Broadcom chip that enables this dual band GPS signal reception. It is our intent to launch GolfTraxx for Android when we can leverage this L5 band to achieve one meter or better precision. Our course mapping efforts to date deserve to have a platform to experience such results.

Apple's iPhone could also utilize the same Broadcom chip but it seems they are intent on creating their own chips in the future. It is my sincere hope that if Android phones begin to announce dual band GPS, iPhone will at some point follow suit.

We've come a LONG way from humble beginnings. I am grateful to each of you who participated in the journey. I am of course still available as always to respond to your comments, questions, or concerns.

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