This material from Bruce Balan is in response to this Panbo post:

https://www.panbo.com/problem-with-cog-sog-smoothing-on-garmin-handhelds/

Hi Ben,
Yes, I am surprised by the contentiousness of this issue as well. I'll add some background so that your readers can better understand my concerns.

My first GPS was an APELCO back in the 90s. A clunky thing but it worked! When I first went cruising to Mexico in 1999, I had a trusty Garmin GPS 48. This was, in my opinion, the last 'marine' handheld GPS because it was made for mariners and didn't have all the other software add-ons that came later for geo-cachers, hikers, etc. And it certainly didn't have any games as some GPSs do!

It was an excellent unit and it had speed filtering that you could turn on or off. It also didn't do a bad job with COG -- I don't know if that was because it had some software working on the issue or because it wasn't nearly as accurate as today's GPSs.

I purchased a second 48 when the screen began failing. Then, as it got older (along with my eyes!), I realized I needed a better screen. A fellow cruiser showed me his GPS 73 monochrome and I liked how easily I could read it. (By the way, that fellow cruiser was a French Canadian who solo circumnavigated using the GPS 72 as his primary GPS.) I chose to go with the color screen on the 76CX as it was even easier to read. Price had nothing to do with my decision. As a bluewater sailor, ease of use, safety, and power are our top criteria.

Most sailors preparing for cruising don't realize that passages are when the boat is most power hungry. The instruments are on, the VHF is on, nav lights are on at night, the autopilot may be working, crew is up all the time using computers or lights, etc. We have found that most marine electronics manufacturers don't create products for the relatively small market of long-distance cruisers. I've seen VHF radios that draw an amp on standby -- 24 amp hours in a day would be a huge chunk of our power budget!

So that's one reason we use a handheld. The power draw is miniscule. Additionally, Garmin does a pretty good job with their control of the screen dimming. (Their 3 button sequence with memory is brilliant!) Some instruments are so bright on the lowest setting that they are absolutely unusable during night passages. We have to hang a towel over our AdvanSea wind instrument display because it is so bright.

Most importantly, as I said in my original email, keeping one's head out of the chart plotter is one of our rules for being safe. So many boats are being lost these days because skippers are driving their boats on their chartplotter and not looking at the real world.

Now back to the 76CX. I loved so much about this GPS, but it was evident immediately that the SOG and COG were unusable. I wrote to Garmin in October of 2012 spelling out my concerns and offering them some suggestions that may improve their products based upon my experience (letter attached). One of their executives wrote back thanking me. I also received an encouraging email from Steve Phillips who was Director of Marine Engineering:

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From: Phillips, Steve
Sent: Friday, October 26, 2012 5:55 AM
To: xxxxx@brucebalan.com
Subject: Letter to Garmin

Hello Bruce,

Your letter to our Executives here at Garmin just crossed my desk and I was anxious to thank you for your input. It is nice to hear that some of our products satisfy the needs of sailors like yourself. But sometimes we fall short on our designs and again it's sailors like you that help us recognize our shortcomings and inspire us to do a better job the next time.

Your idea list is very good and I think very reasonable. I will make sure my design engineers see it.

Again thanks for taking the time to write and I hope you arrived in Thailand safely.

Regards,
Steve Phillips
Director Marine Engineering
Garmin
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This gave me hope. I thought that Garmin might issue a software update since this was, after all, a software issue. But no such luck. In 2015 the on/off switch on my 76CX failed when I was in Borneo. I bought the only thing I could find on short notice which was a GPS 78S -- a newer GPS that *surely* would have had a fix for this problem. But no, there was still no COG/SOG filtering. Not only that, the user interface had regressed in several ways. I was so disappointed. I wrote another letter to Garmin (also attached) which pointed out the shortcomings.

Garmin wrote back and kindly offered me a GPS with speed filtering:

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Dear Bruce Balan,

Thank you for your letter and your concern about our products and features. Here at Garmin we do not want to lose a customer like you and are very sad to hear your disappointment in our current product. I would like to offer you a unit that has the speed filtering features that you desire at no charge. We have 3 options to offer you:

- GPS 73 – monochrome handheld without maps which is similar to his original GPS 48
- echoMAP 4” – fixed mount product similar in size to GPS 78
- echoMAP 5” CHIRP – lowest-cost plotter that includes NMEA 2000 which would allow him to expand in with more garmin devices in the future

Keep in mind the echoMAP units are fixed mount and are not handheld units. The GPS 73 is like your old GPS 48. Please let me know if any of these interest you and I will create a order and get one sent out to you to give you the features you desire.

Zach C.
Marine Helpdesk
Garmin International
913-397-8200
800-800-1020
Fax: 913-397-8280, Attn: Zach, Associate #5870
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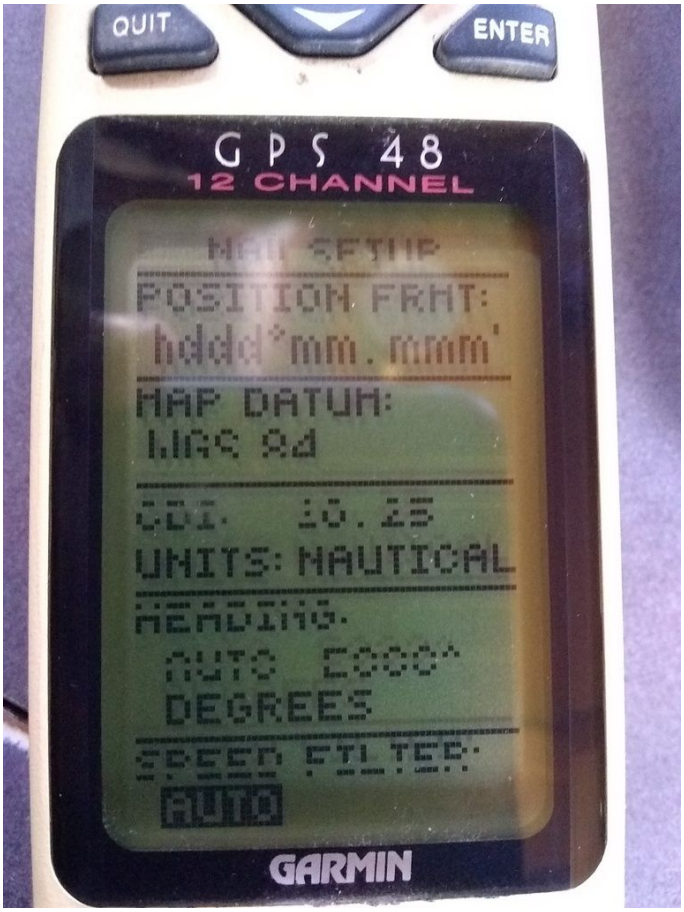
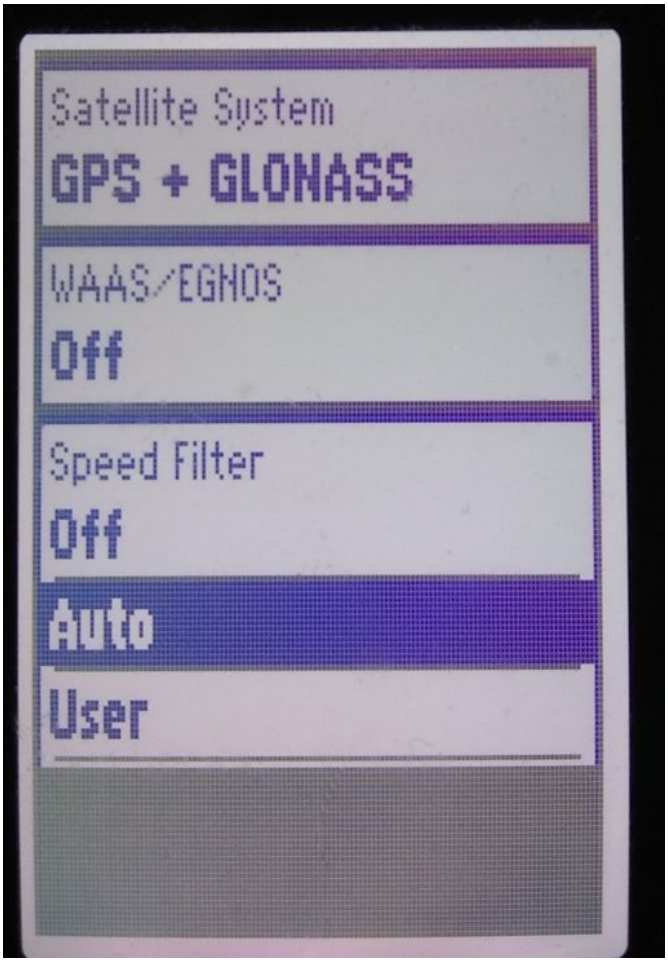
It was nice of them but it didn't solve my problem as those units are either fixed mount or monochrome (and the color units are so much easier to read).
There were a few more letters and emails involved but that is the shorter history (which is already too long!).
I do want to address the 'wrong tool' issue. I can only say that a GPS marketed to mariners and able to download world charts can hardly be called the wrong tool. When my wife and I first left to go sailing, we did most of our charting on paper. Now we use OpenCPN on a laptop for planning. I download our route to the handheld for passages. OpenCPN is an example of what you get when sailors (instead of non-sailing engineers) design a product. It is fantastic. I might add that OpenCPN provides COG and SOG smoothing on the NMEA data stream.
I did not choose a handheld GPS because it was cheap. I chose it because it is absolutely the right tool for the way we sail. I don't believe everything should be free. I invest heavily in keeping my boat well-maintained with quality equipment (Vesper AIS, RADAR, Navman Autopilot with a Raymarine Drive, Monitor Windvane, Icom Radios -- the list goes on).
I do understand that quick responsiveness of a GPS is essential in some situations (as was pointed out in the comments). Indeed, I turn OpenCPN smoothing off when I am entering a pass or in tight quarters. But in the middle of the ocean, when I am adjusting the windvane or entering course and speed in the log, or simple on watch and monitoring our progress, I want to know my course and speed with a simple glance at my instruments. Given the level of technology we are dealing with, I don't think that is much to ask.

The most frustrating aspect of this entire Garmin issue is that the older cheaper models HAVE speed filtering. It's clearly something they know how to do and have the software to do it. Why they refuse to include it in new models is a mystery and is what prompted me to post my video.
There are so many simple things designers can do to make their products truly worthwhile. Often it seems that new technology and marketing is driving the design rather than the real world experience of people who rely on their products.
Thanks again for posting the video.
Cheers,
Bruce Balan
s/v Migration
currently lying Aquatic Park, San Francisco

Bruce’s Garmin handheld GPS collection





Bruce’s illustrations of GPS48 and GPS 73 speed filtesr

Bruce Balan

s/v Migration
writeme@brucebalan.com

10 October 2012

Dan Bartel
Vice President, Worldwide Sales

Dawn Iddings
Vice President, Business Development and Customer Care

Michael Wiegers
Vice President, Consumer Engineering

GARMIN INTERNATIONAL
1200 E. 151st Street
Olathe, KS 66062-3426

Dear Mr. Bartel, Ms. Iddings, and Mr. Wiegers,

I am a blue water sailor in my 7th year of full-time cruising. I've just sailed from the South Pacific into the Indian Ocean and am currently in Indonesia on my way to Thailand.

I've been a fan of Garmin GPS products for many years. In fact, the first 28,000 miles of my cruising was with a simple, but very reliable, Garmin GPS 48. It was – and is – an excellent GPS.

Two years ago, because the 48's LCD was fading, I bought a new Garmin GPS 76CX. A friend had shown me his GPS 72 and I liked it very much.

The color screen on the 76CX is wonderful. It requires hardly any power and it is easy to navigate and use. Interfacing with a computer is simple and fast. Installation was simple as it used the same cable as my 48. There is so much I like about this unit.

However, there is one aspect of the device which makes it practically unusable: it has no speed or heading filtering. It works fine in smooth water, of course, but when sailing in any kind of a sea, the speed and heading are extremely erratic. It is practically impossible to get a reasonable reading as the GPS is so sensitive that the speed and heading constantly jump by many degrees and knots.

I was astonished to find that speed and heading filtering was not available in this model. Especially since speed & heading filtering is a feature in the older GPS 72.

I know this is now an older model GPS. And I know your market is more and more directed to land-based consumers and not mariners. But I also know that you can provide software updates for your products. Thus I urge you -- please, please, please -- to issue a software update to the GPS 76CX that adds speed and heading

filtering. It is so important to a sailor to have accurate information and it is a shame that such a well-designed device is rendered ineffective by this development oversight.

As I have sailed over 50,000 miles, I've also included a few features that would be wonderful to have. If not in this model, then possibly in others.

I hope my experience in using your products out in the blue water might be useful to your development team.

Many thanks,

Bruce Balan
s/v Migration
currently lying Serangan Island, Bali, Indonesia
xxxxx@brucebalan.com

1. Speed filtering

Average out SOG over a given number of seconds, or have an automatic mode with an algorithm that adjusts the averaging period based on SOG and range of variance. Can be turned on or off.

2. Heading filtering

Average out COG over a given number of seconds, or have an automatic mode with an algorithm that adjusts the averaging period based on range of variance. Can be turned on our off.

3. Anchor Alarm distance/direction offset

   With shifting or absent winds, a boat often circumscribes a complete circle around its anchor. For an anchor alarm to be truly useful, the point from which the drift is measured should be the spot where the anchor is, not where the boat is. If a boat has 150 feet of anchor chain out in 30 feet of water (the standard 5 to 1 ratio), that boat may drift over 250 feet away from its original spot to a location on the other side of the anchor. However, one really wants to know if the boat moves outside a circle which has the anchor as the center and a perimeter 170 feet away (in this example). Then, one truly knows if one is dragging. Thus, the anchor alarm should have a distance and direction offset which tells the alarm where the anchor actually is in relation to the boat.

4. Beware of losing information as you change page layouts in new models.

Two of the pages of the GPS76CX have *less* information than the corresponding pages of the old GPS48. New models should add features and information, not take them away. I hope my pointing this out will help avoid the situation in future models.

COMPASS SCREEN

GPS 48 shows compass plus 5 datum
GPS 76CX shows compass plus 4 data boxes maximum

ROUTE DETAIL SCREEN

GPS 48 shows DTK and DISTANCE between *each* waypoint *and* total route distance. Thus you can view important information about the route without selecting a waypoint. You can quickly scan down the list of waypoints and get a good sense of how extreme upcoming course changes will be.

GPS 76CX shows waypoint list plus 2 data boxes maximum for currently selected waypoint. You must select a waypoint to see any information.

sailing vessel *Migration*
Cross 46

29 September 2015

Dan Bartel, *Vice President, Worldwide Sales*
GARMIN INTERNATIONAL
1200 E. 151st Street
Olathe, KS 66062-3426

Dear Mr. Bartel,

In October of 2012 I wrote to you about my concerns over missing features in my then-new Garmin GPSMAP 76CX. You were kind enough to reply and also to forward my letter to Steve Phillips, Director of Marine Engineering. (see attached).

I'm writing now to share with you my most recent experience with your products in the hope that it may assist you understanding your customers' needs.

Unfortunately my 76CX failed two months ago. It was a surprising occurrence since it had been stored unused inside a house for 2.5 years while we did a major refit on our sailboat. The failure is clearly in the on/off switch as the power stays on only as long as the button is depressed. Repair was not an option as I could not figure out how to open the unit without destroying it (and Garmin Tech support would not provide the information). I am currently sailing in Borneo and unable to easily send and receive packages to the USA. As this GPS was our primary navigational tool, I replaced it with your newer model, the GPSMAP 78S. Though I wasn't happy to replace a GPS that only gave me 1.5 years of actual service, I must admit I was hopeful that the new GPS would have some of the features that were lacking in the 76CX and which Mr. Phillips said he would share with his engineers.

That is why I write to you today.

Not only does the newer GPS *not* have any of the essential features I discussed in my previous letter (SOG and COG filtering or smoothing, for example), it has actually regressed in usefulness.

I know that I am only one customer out of millions, but I did believe my extensive use of your products over of tens of thousands of sea miles might provide constructive feedback to your engineers. Instead, I find I now own a new GPS that is far less useful (except for the color screen) than the GPSMAP 48 I used 15 years ago.

As an example, in my previous letter I pointed out that the 76 displayed less information on the route detail screen than the 48. The 78 displays even *less* data. In fact, it only displays a list of waypoints and no other useful data at all.

Most disheartening is the fact that the 78 still does not have SOG and COG filtering. My only thought is that your engineers test your GPSs on lakes or other inland waterways where swells are not present. In those conditions, SOG and COG display perfectly. However, take the GPS to sea in anything but flat conditions and you will find that the SOG and COG change radically second to second as waves roll under the boat.

SOG and COG are critical pieces of data that we use constantly. To look down at the GPS and know that my speed is somewhere between 4.6 and 8.3 and my COG is within a range of 30 degrees is not helpful when navigating or log-keeping.

There are two additional points I would like to share with you. When switching screens on the 78S, a list of icons scrolls horizontally. One must either press ENTER to access the desired screen, or wait about 2 seconds for the screen to change. Though I understand that your engineers thought this an improvement, it actually creates more work for the user (and extra keystroke) and makes it take longer to get to the data one wants to view. It was far more effective on previous models.

Additionally, accessing the screen for the Anchor Alarm takes more keystrokes than it used to. And the Anchor Alarm distance defaults to the ten thousand place holder (no one sets an anchor alarm at 10,000 or more feet!) thus adding additional keystrokes.

There are some very nice improvements in the UI (for example, the ability to change the order of the screens), however, the above is an example of how the UI changes have actually made the GPS less functional.

Please understand that I am not writing to simply complain. I really do think you make some excellent products and I am writing because I would like you to know of their shortcomings so that you can improve them in the future.

That said, if you decide never to release a handheld GPS with SOG and COG averaging, I doubt I will purchase another Garmin GPS.

Thanks for your time. I hope you found it beneficial.

Cheers,

Bruce Balan
s/v Migration
xxxxxx@gmail.com
Please use email only for correspondence

cc: Dawn Iddings, *Vice President, Business Development and Customer Care*
Michael Wiegers, *Vice President, Consumer Engineering*