Garmin StreetPilot c550 vs. TomTom GO 910 vs. Magellan RoadMate 6000T: Who's Cuisine Will Reign Supreme?

Comparison testing of Garmin StreetPilot C550, TomTom GO 910 and Magellan RoadMate 6000T

1. Intro

The purpose of this review is to compare the most popular GPS models currently available and perform side-by-side feature and performance comparisons to assist consumers in their purchasing decisions. We have selected the most popular three units from the top three GPS manufacturers: Magellan, TomTom, and Garmin. Pricing and features are similar for all three units, so this review will offer some answers many of you have been looking for.

We will also point out some basic system limitations, along with certain features that these systems offer that is not listed anywhere else on the Internet. This comparison report is not an endorsement of any kind, we only offer our test results for our readers to evaluate and choose which products would best suit their needs.

Round 1: Industrial Design
Winner: TomTom GO 910

The initial impression of the 3 most popular GPS PND is the extreme similarity of the hardware. It appears either Garmin imitated TomTom's hardware format, or TomTom replicated Garmin's format. They are very similar in size and shape, except the TomTom GO 910 has a slightly larger, 4" display compared to the Garmin StreetPilot c550's 3.5" display (measured diagonally). Both the TomTom and Garmin have an appealing form factor.

Garmin's StreetPilot c550

TomTom's GO 910

Magellan's Roadmate 6000T has a very different design than the GO 910 or c550. The RoadMate 6000T is the 5th generation hardware format from Magellan (the 1st generation was the boxy Magellan PathMaster, which was originally known as the Rockwell PathMaster. 2nd generation was the Magellan 750NAV, which was the same

system used in the Hertz rental vehicles known as the Hertz NeverLost. The 3rd generation was the extremely successful Magellan RoadMate 500 and 700/760 series. 4th generation was the Magellan 300/360 along with Magellan's RoadMate 800/860T format. And now the 5th and latest generation is the Magellan RoadMate 3000T/3050T/6000T).

Magellan's RoadMate 6000T

We found the design of Magellan’s input buttons surrounding the case somewhat awkward. It is almost impossible to hold or handle the unit without accidentally selecting a command button via the manual input buttons surrounding the case. On the plus side, the manual buttons can be used in the event the touch screen fails (or if you just don’t want to leave fingerprints on the display). It does cost Magellan more money to include manual buttons as well as touch screen interface, so it’s nice to have both options available. We just wish the buttons were less prone to accidental pressing.

TomTom's GO 910 and Garmin's c550 are strictly touch screen controlled. The only manual input button is the power on/off button and the volume control wheel on the StreetPilot C550. This design makes the TomTom and Garmin units streamlined and more visually appealing. Between the Garmin and the TomTom, we found the TomTom GO 910 overall had the nicest visual appearance.

Round 2: A Word About Mapping Data: Tele Atlas vs. NAVTEQ
Winner: NAVTEQ (Garmin c550 & Magellan 6000T)

Each GPS of the three systems in this comparison routed us successfully to our final destinations. However, there were notable differences in the selected route each system chose. One explanation for this routing variation is the mapping software. TomTom GO 910 utilizes Tele Atlas mapping software, while Garmin and Magellan use NAVTEQ. NAVTEQ is more popular in North America, and with good reason: it's database is more complete and more accurate (in North America) than Tele Atlas. NAVTEQ boasts that all automotive manufacturers in North America use their mapping software for the factory in-vehicle OEM GPS systems. I have heard that Tele Atlas, on the other hand, is more accurate/complete in Europe, although I have not been able to personally test this.

We found certain limitations using the TomTom 910 unit when routing to addresses that are routable with the Garmin or Magellan systems. For example, some addresses were simply not found on the TomTom 910, but were easily located on the Garmin and Magellan. We also found that at time the NAVTEQ mapping information is also inaccurate in rural areas, and does not take you to the right location even when the address range is available. This type of limitations makes it difficult to find specific addresses in rural area accurately, which could be frustrating. It has been a challenge to decide which mapping software is best since both mapping software have limitations and are not perfect. We believe overall, the result of TomTom using Tele Atlas mapping data is slightly inferior, while Garmin and Magellan both use NAVTEQ is marginally better. The c550 and Magellan 6000T win this test over the TomTom GO 910, due to the slight superiority of NAVTEQ's mapping software at this time.

Over the years Tele Atlas' mapping software has been improving. Updates are made yearly to improve the mapping information quality. The TomTom Go 910 with the latest Tele Atlas mapping software is the closest in quality to the NAVTEQ database we have tested recently. We understand the soon to be release version of Tele Atlas' software for TomTom version 6.06 will incorporate the Geographic Data Technology (GDT) mapping software with the Tele Atlas software, and this additional data may improve the Tele Atlas map accuracy and details that is currently lacking. Still, if you live in North America, there is a slight advantage utilizing the NAVTEQ maps today.

Someday we may get a lot closer to the goal of having the most up-to-date mapping and POI information available by having a centralized, server-based mapping provider. This type of service is coming, and will allow users to download the latest mapping and POI information from a server directly onto your GPS system via WiFi or GPRS for a monthly fee of probably somewhere between $39.95 and $69.95. Until then, GPS mapping software will always be one to two years out-of-date before reaching end users.

Round 3: The Mighty SiRF Star III Chipset
Winner: Tie

All 3 models utilize the latest SiRF Star III GPS chipset. SiRF's technology boosts GPS sensitivity more than any other GPS receiver currently available on the market today. We have tested the performance for all three of the GPS units utilizing the SiRF Star III GPS receiver, and were pleasantly surprised how sensitive and accurate they were, even in marginal GPS signal locations, such as under bridges and in dense urban environments. Thanks to SiRF, GPS reception is no longer as extreme an issue as it was only a few short years ago. Prior to SiRF's Star III chipset, it was not uncommon for it to take as much as 10 minutes for a GPS unit to acquire a signal. And that signal would be lost as soon as line-of-sight to the sky was unavailable.

All three units were able to maintain signal tracking, even when navigating behind tall buildings, driving through short tunnels, etc.

Round 4: Startup Time
Winner: Tie

TTFF (Time to First Fix) is normally less than a few seconds if the GPS system is used frequently. Cold boot, or when a unit has been unused for a few days, or moved more than a few hundred miles from the last location that the unit was used, the GPS may take longer to acquire GPS satellite signal (because the satellites have moved since the GPS was last on, and it needs to re-acquire them one at a time).

In our test, all 3 GPS systems were able to acquire GPS signal within a minute of boot-up, which is considered very fast in the industry average for cold boot.

Round 5: Realtime Traffic Data
Winner: Garmin StreetPilot c550

All three units advertise the ability to get real-time traffic data, and incorporate that data into choosing the most efficient route. Both the Garmin c550 and Magellan 6000T include an integrated FM TMC traffic receiver, as well as 3 months of free traffic service. When traffic data is available to the GPS, the unit know if traffic, construction, or weather issues exist along your given route, and will automatically suggest alternative routes based on that information. This can be an extremely valuable feature if you commute long distances on a regular bases, as the traffic-enabled GPS device could save you literally hundreds of hours of drive time each year.

The Garmin StreetPilot C550's traffic data service is very straightforward and simple enough for first-time users to understand. The Magellan 6000T traffic feature is slightly more complex to use, however. Moreover, in our testing the Magellan traffic service was not as accurate as Garmin's. Sometimes the Magellan indicated heavy traffic on a

particular road, yet we were able to drive the speed limit, or even slightly faster, with no issue. This also occurred on the Garmin system, but not as frequently as it did on the Magellan. Clear Channel partners up with Tele Atlas/NavTeq to offer RDS/TMC service for the Garmin C550 units along with using XM NavTraffic provided by NavTeq, and Magellan uses NavTeq Traffic.

The TomTom GO 910 requires that you subscribe to the TomTom Plus program, and link the 910 to a compatible Bluetooth enabled cell phone that uses GPRS. The only downside to TomTom's traffic implementation is that you need a compatible Bluetooth phone (and the list of compatible phones isn't that large yet). TomTom is working on releasing a traffic antenna for the 910 so you won't have to use a cell phone, although the antenna is not yet available in North America (TomTom claims the TMC RDS accessory will be available in North America soon).

Round 6: GPS Processing Speed for Routing and Rerouting
Winner: Inconclusive

For this test we first chose a destination that was about 20 miles away. Here are the results:

- TomTom GO 910 – 5 seconds
- MRM 6000T – 6 seconds
- Garmin C550 – 8 seconds

The clear winner in this test was the TomTom 910 with an average time of less than 5 seconds for the route to complete. In second place is the Magellan RoadMate 6000T with a close 6 seconds, and third place goes to the Garmin C550 with 8 seconds. All 3 units were able to route to a destination within 20 miles in under 10 seconds, which is very acceptable.

Next we chose an address that was over 1500 miles away: routing from San Jose, CA to an address in New York City. The results surprised us:

- Magellan 6000T – 10 seconds
- Garmin C550 – 30 seconds
- TomTom 910 – 89 seconds

The Garmin c550 took 30 seconds to calculate the route from San Jose, CA to an address in New York City. Surprisingly, the TomTom 910 took a whopping 1 minute and 29 seconds to process the same exact route, and the Magellan 6000T unit took less then 10 seconds to start the turn-by-turn routing process.

Routing time on a long trip is much less of an issue than for shorter trips (if you're headed out on a 1500 mile trip, you can spare a few extra seconds on route calculation), but the results show how differently each unit handles the math involved in calculating

the route to take. And while the TomTom was the "loser" on the distance routing test, it was also the winner on the short trip (20 mile) test.

Round 7: Search by Zip code feature
Winner: TomTom GO 910

The search by zip code feature can be useful when the mailing address of a destination may be in a different city than the actual physical location. Sounds confusion, I know. But take a look at this real-world example: you might have a mailing address that shows your city as "San Jose", yet your house is actually located in the City of Campbell. If you were to search for the address in the City of Campbell, you would not be able to locate it using the address search feature. With the zip code search feature, however, simply put the zip code in and the GPS will offer you the cities that are associated with the address you are looking for. It makes finding a street name that may not be found by City search possible.

The Garmin c550 cannot search by zip code. Between the Magellan and TomTom, we found that the MRM 6000T was occasionally incomplete when searching by ZIP code. For example, when routing to the state of New York, and City of New York, street name "Main street", the MRM 6000T did not offer the different Main St in New York by zip code range, such as 11201 Brooklyn (NY), 10044 Manhattan (NY) and 10307 Staten Island (NY). The only address available to route to was 1 Main Street in Manhattan – it did not display Main Street in Staten Island or Brooklyn.

Round 8: Search by Nearby Cities / City District Communities
Winner: Garmin StreetPilot c550

This unique feature, only available on the Garmin StreetPilot c550, allows you to search for the different districts within a given city. This makes it possible for users to route to a given district that is within a City instead of a specific address. For example, Burbank district in the city of San Jose, or Willow Glen in the city of San Jose – neither of which can be found under spell City options. To use this feature, under the City icon on page two of the c550 Garmin unit, simply select the cities icon and it will display cities and city districts.

Round 9: Remembering Previous City and Street Names - No need to retype street name
Winner: TomTom GO 910

Remembering previous city and street names is a handy time-saving feature that remembers the previously entered city and street names. So when you want to route to an address, and are presented with the city search page, the unit automatically lists the city you most recently searched for. Same thing for the street name entry page. You can either tap the city that's already listed, or start to type out a new city.

Only the TomTom GO 910 has this feature. When entering a destination address, the 910 not only displays the previously selected cities, but also the street names of previous destinations. For short street names this feature isn't that much of a time saver. But if your street is named El Camino Real, for example, this nice feature can save time when inputting the city and street names. In our testing we really liked having this feature.

Round 10: Text-to-Speech audio command with street name pronunciations
Winner: TomTom GO 910

Speech quality of the TomTom was clearer than the Garmin or Magellan units. Occasionally, however, it would cut the street name short, which was slightly disconcerting. TomTom also appears to offer more information, such as the turn or maneuver after the first voice instruction, which is helpful in some instances. Overall, text-to-speech on the TT 910 is excellent, and the winner of this test.

The Garmin c550's text-to-speech was also clear and easy to understand. Speaker volume was excellent, thanks to the c550's dual speakers (the MRM 6000T and TT 910 both only have a single speaker). Nevertheless, text-to-speech quality was not quite as good as the TomTom 910. Unlike the 910, the Garmin C550 does not announce the maneuver after the first voice instruction (not a huge deal, since some users like this feature, and others don't).

Magellan's text-to-speech implementation is significantly improved over earlier RoadMate series (760, 860). The pronunciations are much better and the 6000T gives adequate information. However, despite the improvement from previous models, the Magellan is behind in sound and street name pronunciations, and the clear loser in this round. Both the Garmin C550 and the TomTom 910 had better text-to-speech voice prompts than the Magellan.

Round 11: Audio announcements of final destination: Which side of the roadway, left or right hand side?
Winner: Garmin c550 and MRM 6000T

One of the more useful features of a personal navigation device is the ability to tell you if your destination is on the right or left hand side of the street. This may seem like a small thing, but imagine you are routing to a destination on a major street, like El Camino Real in San Jose. This road is 8 lanes wide in some places, and many of the addresses are part of large shopping complexes that don't have the addresses clearly marked on the street. It is very useful to know if your destination is going to be on the right or left hand side of the street. Both the Garmin and Magellan (and, by the way, Alpine and even Horizon) have this feature, but the TomTom GO 910 does not. In fact, not a single GPS that uses Tele Atlas mapping data offers this important feature.

We're not sure if it's the Tele Atlas mapping software itself, or if the GPS manufacturers are leaving off the attributes for which side of the street or road the final destination is on.

This information is available to the GPS manufacturers, albeit for a fee -- maybe some manufacturers are not willing to pay the additional cost. This is a significant feature to be missing from the TomTom GO 910.

Round 12: Text font size on displays and brightness
Winner: Magellan RoadMate 6000T & Garmin c550

Screen Brightness: we found the Magellan RoadMate 6000T to be the brightest of the three units we tested, the TomTom 910 was the least bright, and Garmin was in the middle.

Text Readability: reading text on the TomTom GO 910 was slightly difficult compared to the Magellan or Garmin. The text font size used on the TomTom 910 is smaller than the other 2 units tested – it looks like they used the same font & size as on their PDA-based device. The Magellan and Garmin units have the same font size, except Garmin's font is in bold. This round is a tie between the Magellan and Garmin, with TomTom being the clear loser.

Round 13: Ability to plan your route by shortest distance, shortest time, most efficient routing
Winner: Magellan RoadMate 6000T

A trip planner is a feature that allows users to input 10-20 random addresses and the GPS will calculate the most efficient route, telling you which addresses you should visit in what order. This is especially useful for people who regularly need to do multi-destination routing, like delivery drivers, or real estate agents.

The Magellan 6000T has this desired feature and it is the winner of this round.

TomTom 910 have a similar multi destination optimization feature, but a little more difficult to implement.

Round 14: Instant Locate by Providing Street Address and Lat/Long Information
Winner: Magellan RoadMate 6000T

The Magellan RoadMate 6000T has a neat feature that will display your current location. Touching the Locate button on the MRM 6000T displays your current street address, city, county, as well as your heading information (i.e. driving west on xyz road in xyz city/county). It also can tell you what street you are approaching, as well as address ranges on each side of the street. If for some reason you prefer raw numbers, the MRM 6000T can give you your current lat and long position.

Garmin and TomTom do have a stripped down version of the Magellan Locate feature, allowing you to save your current location (on the Garmin c550 you save your current

location by tapping the vehicle icon on the map), although you cannot view lat/long information on the Garmin.

Round 15: Additional features MP3, Picture viewer
Winner TomTom GO 910

TomTom GO 910 and Magellan RoadMate 6000T both have a picture viewing feature. The TomTom GO 910's interface is more refined than the Magellan, including well thought-out things like allowing you to play music while navigating, and including an option for iPod integration (via optional cable). Garmin StreetPilot c550 does not have a picture viewer, but it does have the MP3 music player feature and SD card expansion for additional features such as European maps, language guide, and more POI's at an additional cost.

Round 16: Mounting Hardware
Winner: Garmin StreetPilot c550

Round 17: Mounting hardware is my pet peeve. For such an important aspect on a GPS that will be mounted in your car, it sometimes feels like GPS makers consider the mount an after thought. TomTom's GO 910 is the clear loser in this round. Although the TomTom mount is attractive, and has inputs on it for power, microphone, and expansions, it simply did not hold up well in testing. Our mount started drooping downward as we would drive, eventually breaking altogether. TomTom has released a modified mount for the 910 and reports are the mount is improved. But even apart from the quality issue, the TomTom GO 910 is difficult to put on and take off the windshield mount. You have to get the hang of it, and even then it often feels like you might break it.

Magellan's mount is leaps and bounds better than the TomTom mount, but it's bulky and huge.

Garmin's ball-joint suction mount is excellent. It keeps the c550 firmly in place while driving, the c550 can be rotated to almost any angle on the mount, and the mount is inexpensive to boot. Garmin has done an excellent job with their mount design.

Overall Comparison Matrix

	c550	**MRM 6000T**	**TT 910**
SiRF Receiver Test			
Time to first fix (cold boot)	60 seconds	45 seconds	45 seconds
Time to first fix (warm boot)	35 seconds	15 seconds	15 seconds
Time to first fix (hot boot)	1 second	1 second	1 second
Urban canyon	GPS lock good	GPS lock good	GPS lock moderate

environment			(it was the first unit to lose signal)
Tunnels & Bridges	GPS lock good	GPS lock good	GPS lock moderate (it was the first unit to lose signal)
Time to re-acquire after signal loss	2 seconds	2 seconds	2 seconds
Mounting Hardware	Excellent	Good	Poor
Battery Life	~6-8 hrs	~4 hours (beta unit)	~4-6 hours
User Interface	Excellent	Fair	Good
Mapping Software	NavTeq	NavTeq	Tele Atlas
* NavTeq releases 4 mapping data updates per year. Tele Atlas release 2. NavTeq is slightly more accurate than Tele Atlas for North America.			
Traffic Service	Clear Channel TMC	NavTeq Traffic RDS	TomTom Plus Traffic (requires Bluetooth cell phone)
Traffic TMC Hardware included?	Yes	Yes	No
Traffic Information Accuracy	Good	Acceptable	NA (not available in North America yet)
BlueTooth Interface	Very Good	Good	Very Good
Audio Quality	Very Good (dual speaker)	Good	Very Good
Text-to-Speech Quality	Good	Acceptable	Very Good (but cuts off some names)
MP3 Music Storage	700MB internal, SD card	1GB + SD card expansion	12GB HDD free for music/pictures

	expansion		
Enroute PIO, nearby POI on your route	No	Yes	No
Language and Voice			
Spoken Voices	40	3	36 languages / 50 voices
Language Text	20	3	23
Display Size (diagonal)	3.5"	3.5"	4.0"
2D or 3D display view	Yes	Yes	Yes
Display performance under direct sunlight	Good	Good	Fair (slightly washed out)
Text readability	Good	Good	Fair (smaller text)
Quick Spell input search feature	No	Yes	Yes
Trip Planning (multi-destination routing)	No	Yes	Yes
Route Exclusion (avoid a certain street or highway)	Yes	Yes	Yes
Detour function to offer an alternate route	Yes	Yes	Yes
Route by Lat/Long input	No	No	Yes
Audio out port /	Yes	Yes	Yes

Headphone audio out			
External Mic port for hands free phone	Yes	No	Yes
Automatic Vehicle Location Service (AVL)	No	No	No* (will be able to track via the Buddy System Plus Service)
Anti-Theft PIN security capability	Yes	Yes	No
Internal battery replaceable by owner	No	No	No
European Maps	Yes, but requires $400 purchase for SD card with additional maps	NO, not at this time, possible expansion in the future with SD	Yes
Calculation speed for routes <20 miles	8 seconds	6 seconds	5 seconds
Calculation speed for routes >1500 miles	30 seconds	15 seconds	89 seconds
Reroute speed for routes < 20 miles	4 seconds	2 seconds	2 seconds
Reroute speed for routes >1500 miles	6 seconds	9 seconds	9 seconds
Search and route by zip code	No	Yes	Yes
Search by nearby cities	Yes	No (only previous cities)	Yes
Search previous city shortcut	No	Yes	Yes
Route simulator	Yes (with GPS	Yes (set	Yes (select option

mode	turned off)	manually in options)	demo mode)
Previous street name remembered	No	No	Yes
Route Options			
Fastest Time	Yes	Yes	Yes
Shortest Distance	Yes	Yes	Yes
Most use of freeways	No	Yes	No
Least use of freeways	Yes	Yes	Yes
Avoid tolls	Yes	Yes	Yes
Avoid unpaved roads	Yes	No	No
Avoid U-turns	Yes	No	No
Avoid carpool lanes	Yes	No	No
Avoid Traffic	Yes	Yes	Yes (with Bluetooth phone + TomTom Plus Service
Walking route / pedestrian route	No	No	Yes
Bicycle route	No	No	Yes
Limited speed	No	No	Yes
Vehicle Type Options			
Car/Motorcycle	Yes	No	No
Truck	Yes	No	No
Bus	Yes	No	No
Emergency	Yes	No	No
Taxi	Yes	No	No
Browse map, select destination on map	Yes	Yes	Yes
ABCD, Qwerty, Azerty keyboard options font size	No	No	Yes
Picture viewer	No	Yes	Yes

Mute MP3 when turn-by-turn direction is available	Yes	No	Yes
Custom POIs	Yes	Yes	Yes

(Note: Test comparisons were performed in San Francisco, Alameda and Santa Clara County, CA area only. Test results may vary, depending on location and vehicle type.)

Conclusions
Overall Winner: Garmin StreetPilot c550 by a hair.

Consumers today are making PND purchasing decisions based on user interface, fast processors for faster route calculation and re-route time, touch screen, Text-to-Speech, full coverage mapping software without needing to load maps, 3D map view, large POI selection, small footprint with larger screens (3.5"-4" displays), internal rechargeable battery, the extremely sensitive SiRF Star III GPS receiver, Bluetooth hands free phone capabilities, MP3 player, and TMC Traffic Message Channel options.

Future options such as Wifi, TV, MP4 video, gaming, real time POI's with video feed, etc. are features that will eventually become available to the GPS industry. Surprisingly, XM radio, traffic, and weather data have not been as popular as predicted. Garmin's flagship units have included some of these features but have not been as popular due to monthly service fees.

Overall all three units proved to be excellent GPS devices packed with lots of features. Basic navigation performance on all three units was outstanding, thanks to SiRF's STAR III chipset. Just a few years ago, GPS performance like this was unheard of. At the end of the day, a navigation device is designed to help get you from point A to point B, and is only as good as the maps it contains. Although TomTom has created a very elegant and refined product with the GO 910, their current choice of Tele Atlas makes their unit not as desirable of a GPS to choose for use in North America. Although the Garmin StreetPilot c550 is not as feature rich as the Magellan RoadMate 6000T, the Garmin is considerably easier to use than the Magellan. Simplicity seems to be the choice of consumers, and for this the Garmin have met these criteria. The Garmin also include a no nonsense windshield mount which is something that TomTom and Magellan should look into. Garmin's traffic implementation is also the simplest and, in our testing, the most up to date. For that reason, the overall winner by a very small margin of this comparison is the Garmin StreetPilot c550.

Reviewers note: this review was made possible by testing data performed by James S Keh of Auto Nav 2000 Plus, Inc. Auto Nav 2000 Plus, Inc. is a leading brick-and-morter and online GPS retailer, and has three locations in California:

Auto Nav 2000 Plus, Inc.
Corporate Office
438 S. Bascom Ave.
San Jose, Calif. 95128
1-408-298-8188
1-408-292-3621 Fax
Lat- 37.19.243
Lon- 121. 55.895

Auto Nav Palo Alto
481 Page Mill Road
Palo Alto, Calif. 94306
1-650-328-8832
1-650-328-8836 Fax
Lat- 37. 25.399
Lon- 122. 08.502

Auto Nav Cupertino
10919 N. Wolfe Road
Cupertino, Calif. 95014
1-408-255-8327
1-408-255-8417 Fax
Lat- 37° 20' 08.12"N
Lon- 122° 00' 54.37"W

www.AutoNav2000.com