

# LandMark Spatial Solutions Android GPS Test

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Current GPS Units we  
recommend for use  
under canopy:



**handheld**



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# Trimble Units Tested



TDC150  
Submeter  
\$4995



TDC600  
Phablet  
1-3 M  
\$1300



TDC100  
1-2 M  
\$1000



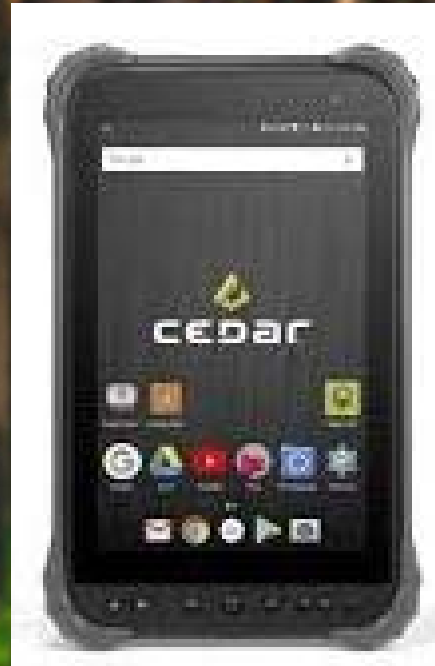
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# Juniper System Units Tested



Mesa 3  
2-5 M  
\$2233



CT8  
1-3 M  
\$999



CP3  
2-4 M  
\$799



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# Units Tested



Samsung  
Galaxy Active

Tab 2  
1-3 M  
\$540



Handheld  
Nautiz X6

1-3 M  
\$999



iPhone X



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# Bluetooth Units Tested



Garmin Glo  
2-5 M  
\$99



Bad Elf Pro+  
1-3 Meter  
\$249



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# Juniper Systems Geode GNSS2



- External, Bluetooth
- **Windows, Windows Mobile, Android, iOS**
- Tracks GPS, SBAS, GLONASS
- SBAS: <30 cm RMS and <60 cm 2DRMS
- 10 hr battery
- ip65 rugged
- **\$2032**

**NOTE: Tested on Oct 28, 2016**



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# Trimble PG200 GNSS Receiver



- External, Bluetooth
- Windows, Windows Mobile, iOS, and Android
- Tracks GPS, SBAS, GLONASS, Galileo, QZSS & BeiDou
- Global sub-meter accuracy
- ip65 rugged
- \$2495

**NOTE: Tested on Oct 28, 2016**



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# GPS Accuracy

## Test Course Details



- Test Date - Oct 29-2019
- 14 stations – 1 in clear, 13 in canopy
- Stations Surveyed with VRS to 10 cm
- Estimated Accuracy < 20 cm



# Test Protocol

- Static Test
  - Allowed the estimated accuracy of each unit to settle at surveyed location 20 to 30 seconds
  - Recorded a 1 sec GPS position in Terraflex
  - Compared GPS position to surveyed position in ArcGIS
- Dynamic Test
  - Walked around 10 stations under canopy with one second logging interval
  - Buffered Course – 5 one meter buffers
  - Calculated the % of Positions in each buffer



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# Static Test Results – All Stations

	Avg Error	
Handheld/Antenna	Meters	Rank
Trimble TDC150	1.439	1
Handheld Nautiz X6	2.833	2
Trimble TDC600*	2.896	3
Cedar Tree CT8	2.944	4
Samsung Galaxy Active Tab 2	3.149	5
Trimble TDC100	3.164	6
Garmin Glo	5.284	7
Cedar Tree CP3	5.625	8
Juniper Systems Mesa 3 - Beta	5.625	9
iPhone 10	5.787	10
Bad Elf GPS Pro +	9.089	11

**NOTE: On Oct 28, 2016, the Geode averaged 1.667 m and the PG200 averaged 1.717 m error.**



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# Dynamic Test Results - All Stations

	% of positions within buffers					Rank at 2M
	1	2	3	4	5	
Trimble TDC150	51.77	78.78	84.89	90.03	96.78	1
Handheld Nautiz X6	32.77	59.60	72.88	82.20	99.15	2
Samsung ActiveTab	31.72	57.24	75.86	87.59	95.17	3
CedarTree CP3	35.20	51.71	67.60	78.19	89.10	4
CedarTree CT8	24.27	49.37	65.27	78.66	88.70	5
Trimble TDC600	20.85	46.20	64.79	82.25	89.58	6
iPhone 10	23.29	43.17	68.01	83.54	95.34	7
Trimble TDC100	24.38	41.67	54.63	67.90	74.38	8
Juniper Systems Mesa 3	13.42	35.78	54.31	72.84	88.18	9
Garmin GLO	8.59	16.41	26.61	39.34	49.37	10
Bad Elf Pro +	0.00	0.62	3.70	11.42	25.00	11

**NOTE: On Oct 28, 2016, the Geode had 39.56% in +/-1 meters, 56.70% in 2 meters, and 70.40% in 3 meters. The PG200 had 47.44% in +/- 1 meter, 78.85 in 2 meters, and 98.4% in 3 meters.**



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# GPS Mapping Conclusions

1. There are some very accurate Android handhelds, phablets, and tablets on the market.
2. The Geode and PG200 can definitely improve GPS accuracy for Android units.
3. iPhone 10 is very erratic for static points
4. 1-3 meter Bluetooth external GPS antennas did not improve accuracy.
5. Bad Elf is bad!



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