



SUMMER FUN WITH GADGETS & WEB

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Overview



- SUMMER FUN
- Get out but keep the gadgets



- GPS
- Music
- Web
- WIFI Photos



GPS FUN

- History of GPS
- Traditional Standalone devices
- Pocket PC – Smart Phones - Ultra Mobiles
- GPS receivers – Bluetooth - Built in
GEOCaching Gpstuner sample app
- NMEA Standard
- Window Mobile 5.0 enhanced APIs for
GPS.
- Sample c# Application to read the Stream

GPS FUN

- History of GPS
- Where am I?
- On June 26, 1993, the answer became as simple as the question. On that date, the U.S. Air Force launched the 24th Navstar satellite into orbit, completing a network of 24 satellites known as the Global Positioning System, or GPS. With a GPS receiver that costs less than a few hundred dollars you can instantly learn your location on the planet--your latitude, longitude, and even altitude--to within a few hundred feet.
- Time-difference-of-arrival technology, microwave communication, and radio navigation. A key breakthrough in particular the creation of atomic clocks
- <http://www.beyonddiscovery.org/content/view.page.asp?I=1275>

GPS FUN

- Traditional Standalone devices



- Pocket PC – Smart Phones - Ultra Mobiles



- GPS receivers – Bluetooth - Built in



GPS FUN

- www.geocaching.com



On May 2, 2000, at approximately midnight, eastern savings time, the great blue switch* controlling [selective availability](#) was pressed. Twenty-four satellites around the globe processed their new orders, and instantly the accuracy of GPS technology improved tenfold. Tens of thousands of GPS receivers around the world had an instant upgrade.

GPSTUNER PocketPC software demo www.gpstuner.com

GPS FUN

- Most Devices Talk NMEA sentences.
- The National Marine Electronics Association ([NMEA](http://www.nmea.org))
 - There are many sentences in the NMEA standard for all kinds of devices that may be used in a Marine environment. Some of the ones that have applicability to gps receivers are listed below: (all message start with GP.)
 - [AAM](#) - Waypoint Arrival Alarm
 - [ALM](#) - Almanac data
 - [APA](#) - Auto Pilot A sentence
 - [APB](#) - Auto Pilot B sentence
 - [BOD](#) - Bearing Origin to Destination
 - [BWC](#) - Bearing using Great Circle route
 - [DTM](#) - Datum being used.
 - [GGA](#) - Fix information
 - [GLL](#) - Lat/Lon data
 - [GSA](#) - Overall Satellite data
 - [GSV](#) - Detailed Satellite data
 - [MSK](#) - send control for a beacon receiver
 - [MSS](#) - Beacon receiver status information.
 -
- <http://www.gpsinformation.org/dale/nmea.htm>

GPS FUN

- Sample Stream from GPS receiver

- These streams will be modified when a route is active with the inclusion of route specific data.

- **Garmin**

- **Garmin g12** sentences for version 4.57

- \$GPRMC,183729,A,3907.356,N,12102.482,W,000.0,360.0,080301,015.5,E*6F \$GPRMB,A,,,,,,,,,V*71

- \$GPGGA,183730,3907.356,N,12102.482,W,1,05,1.6,646.4,M,-24.1,M,,*75 \$GPGSA,A,3,02,,,07,,09,24,26,,,,,1.6,1.6,1.0*3D

-

- \$GPBOD - Bearing, origin to destination
- \$GPBWC - Bearing and distance to waypoint, great circle
- \$GPGGA - Global Positioning System Fix Data
- \$GPGLL - Geographic position, latitude / longitude
- \$GPGSA - GPS DOP and active satellites
- \$GPGSV - GPS Satellites in view
- \$GPHDT - Heading, True
- \$GPR00 - List of waypoints in currently active route
- \$GPRMA - Recommended minimum specific Loran-C data
- \$GPRMB - Recommended minimum navigation info
- \$GPRMC - Recommended minimum specific GPS/Transit data
- \$GPRTE - Routes
- \$GPTRF - Transit Fix Data
- \$GPSTN - Multiple Data ID
- \$GPVBW - Dual Ground / Water Speed
- \$GPVTG - Track made good and ground speed
- \$GPWPL - Waypoint location
- \$GPXTE - Cross-track error, Measured
- \$GPZDA - Date & Time

GPS FUN



- Microsoft provides you with comprehensive development tools and resources to build and deliver innovative applications for Windows Mobile-based Pocket PCs and Smartphones.
- To get started, we recommend reading [Developing Applications for Windows Mobile-based Pocket PCs and Smartphones FAQ](#). Find additional resources below for
- <http://msdn.microsoft.com/mobility/windowsmobile/downloads/default.aspx>
- <http://msdn.microsoft.com/mobility/windowsmobile/default.aspx>

GPS FUN

- Virtual Earth Mobile (VEM) is an application for Pocket PC 2003, Smartphone 2003, and Windows Mobile 5.0 devices that displays maps and satellite photography
- GPS unavailable in Windows Mobile 2003
- <http://www.viavirtualearth.com/vve/Gallery/VEMobile.ashx>



GPS FUN

- Windows Mobile Version 5.0 SDK
 - **GPS** code sample
- Sample c# Application to read the Stream
- It demonstrates how to use managed code to write a C# Windows Mobile Global Positioning System (GPS) application. This code sample demonstrates how to wrap the native GPS APIs in a C# class.
- <http://msdn.microsoft.com/library/default.asp?url=/library/en-us/mobilesdk5/html/mogrfGpsSample.asp>

GPS FUN

- **Window Mobile 5.0 enhanced APIs for GPS**
- **GPS Without the GPS Intermediate Driver**
- Without the GPS Intermediate Driver, applications generally access GPS hardware directly through a COM port
- **Benefits of the GPS Intermediate Driver**
- Enable multiple applications to use GPS hardware at the same time. The GPS Intermediate Driver makes it appear that each application has its own dedicated GPS hardware.
- Remove the need for applications to parse NMEA strings to obtain meaningful data. The GPS Intermediate Driver internally parses the NMEA strings obtained from the GPS hardware and makes the parsed information available through a friendly API

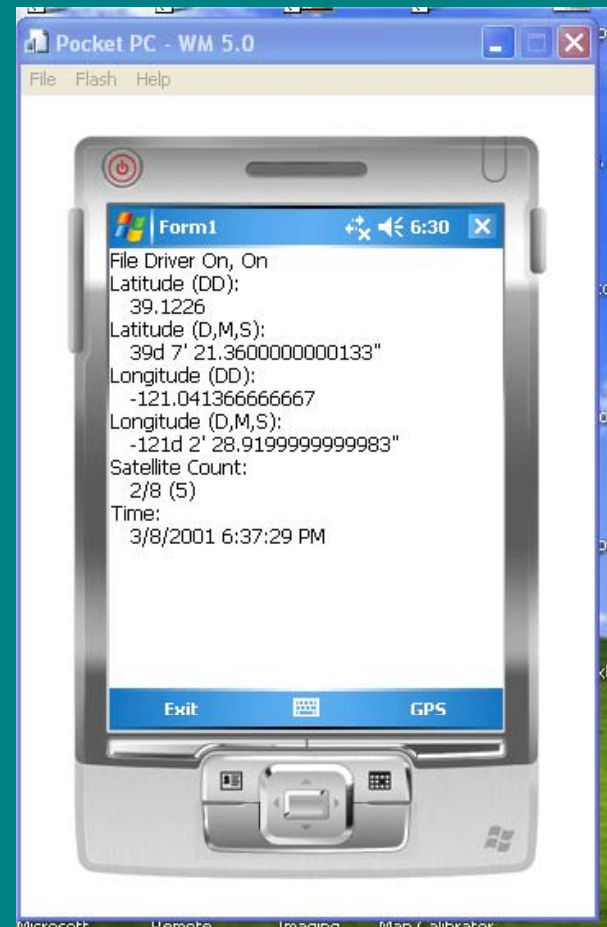
GPS FUN

- Sample c# Application to read the Stream
- Simplify access to allow you to focus on your app
- [GPSOpenDevice](#)
- [GPSGetPosition](#)
- [GPSGetDeviceState](#)
- [GPSCloseDevice](#)

GPS FUN

- Sample app display
- Visual Studio Tools
- Windows Mobile emulators
- Use File reader to simulate a GPS receiver

<http://blogs.msdn.com/barrybo/archive/2006/05/19/601949.aspx>



GPS FUN

- ```
 if (!Opened)
 {
 // create handles for GPS events
 newLocationHandle = CreateEvent(IntPtr.Zero, 0, 0, null);
 deviceStateChangedHandle = CreateEvent(IntPtr.Zero, 0, 0, null);
 stopHandle = CreateEvent(IntPtr.Zero, 0, 0, null);
 gpsHandle = GPSOpenDevice(newLocationHandle, deviceStateChangedHandle, null);
 }
```

# GPS FUN

```
• private void CreateGpsEventThread()
• {
• // we only want to create the thread if we don't have one created already
• // and we have opened the gps device
• if (gpsEventThread == null && gpsHandle != IntPtr.Zero)
• {
• // Create and start thread to listen for GPS events
• gpsEventThread = new System.Threading.Thread(new
System.Threading.ThreadStart(WaitForGpsEvents));
• gpsEventThread.Start();
• }
• }
•
```



# GPS FUN

```
• while (listening)
• {
• int obj = WaitForMultipleObjects(3, handles, 0, -1);
• if (obj != waitFailed)
• {
• switch (obj)
• {
• case 0:
• // we've been signalled to stop
• listening = false;
• break;
• case 1:
• // device state has changed
• if (deviceStateChanged != null)
• {
• deviceStateChanged(this, new DeviceStateChangedEventArgs(GetDeviceState()));
• }
• break;
• case 2:
• // location has changed
• if (locationChanged != null)
• {
• locationChanged(this, new LocationChangedEventArgs(GetPosition()));
• }
• break;
• }
• }
• }
```

# GPS FUN

FILE STREAM

\$GPGGA - Global Positioning System Fix Data

```
 $GPRMB,A,,,,,,,,,V*71
$GPGGA,183730,3907.356,N,12102.482,W,1,05,1.6,646.4,M,-24.1,M,,*75
 $GPGSA,A,3,02,,07,,09,24,26,,,,,1.6,1.6,1.0*3D
$GPGSV,2,1,08,02,43,088,38,04,42,145,00,05,11,291,00,07,60,043,35*71
$GPGSV,2,2,08,08,02,145,00,09,46,303,47,24,16,178,32,26,18,231,43*77
 $PGRME,22.0,M,52.9,M,51.0,M*14
 $GPGLL,3907.360,N,12102.481,W,183730,A*33
 $PGRMZ,2062,f,3*2D
 $PGRMM,WGS 84*06
 $GPBOD,,T,,M,,*47
 $GPRTE,1,1,c,0*07
$GPRMC,183731,A,3907.482,N,12102.436,W,000.0,360.0,080301,015.5,E*67
 $GPRMB,A,,,,,,,,,V*71
```

<http://aprs.gids.nl/nmea/>

# GPS FUN

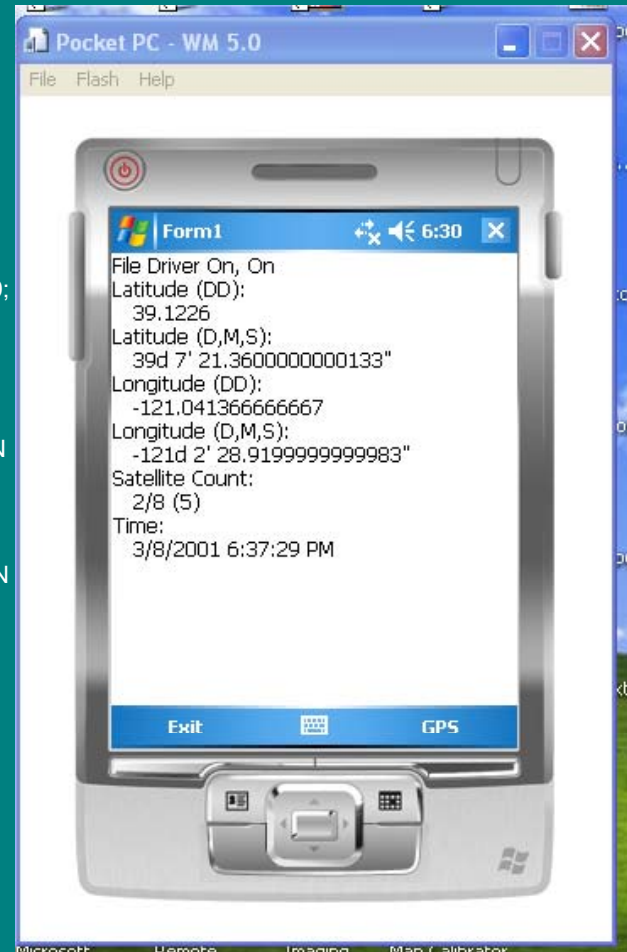
The screenshot displays the Microsoft Visual Studio IDE in a debugging session. The main window shows the source code for `LocationChangedEventArgs.cs` in the `Microsoft.WindowsMobile.Samples.Location` namespace. The code defines a class `LocationChangedEventArgs` that inherits from `EventArgs`. It has a constructor that takes a `GpsPosition` object and assigns it to `this.position`. There is also a `GpsPosition` property with a `get` accessor. A context menu is open over the `position` parameter in the constructor, listing various properties of the `GpsPosition` object, such as `dbllatitude`, `dbllongitude`, `dwSatelliteCount`, and `fixQuality`.

The Solution Explorer on the right shows the project structure, including references to `mscorlib`, `System`, `System.Data`, `System.Drawing`, `System.Windows.Forms`, and `System.Xml`. The Breakpoints window at the bottom left shows several breakpoints set in the code, including one in `Form1.cs` and two in `GPS.cs`.

| Name                            | Condition      | Hit Count                  |
|---------------------------------|----------------|----------------------------|
| Form1.cs, line 36 character 9   | (no condition) | break                      |
| Form1.cs, line 233 character 13 | (no condition) | break always (currently 0) |
| GPS.cs, line 290 character 17   | (no condition) | break always (currently 4) |
| GPS.cs, line 310 character 33   | (no condition) | break always (currently 1) |

# GPS FUN

- **public class GpsPosition**
- {
- internal GpsPosition() { }
- internal static int GPS\_VALID\_UTC\_TIME = 0x00000001;
- internal static int GPS\_VALID\_LATITUDE = 0x00000002;
- internal static int GPS\_VALID\_LONGITUDE = 0x00000004;
- internal static int GPS\_VALID\_SPEED = 0x00000008;
- internal static int GPS\_VALID\_HEADING = 0x00000010;
- internal static int GPS\_VALID\_MAGNETIC\_VARIATION = 0x00000020;
- internal static int GPS\_VALID\_ALTITUDE\_WRT\_SEA\_LEVEL = 0x00000040;
- internal static int GPS\_VALID\_ALTITUDE\_WRT\_ELLIPSOID = 0x00000080;
- internal static int GPS\_VALID\_POSITION\_DILUTION\_OF\_PRECISION = 0x00000100;
- internal static int GPS\_VALID\_HORIZONTAL\_DILUTION\_OF\_PRECISION = 0x00000200;
- internal static int GPS\_VALID\_VERTICAL\_DILUTION\_OF\_PRECISION = 0x00000400;
- internal static int GPS\_VALID\_SATELLITE\_COUNT = 0x00000800;
- internal static int GPS\_VALID\_SATELLITES\_USED\_PRNS = 0x00001000;
- internal static int GPS\_VALID\_SATELLITES\_IN\_VIEW = 0x00002000;
- internal static int GPS\_VALID\_SATELLITES\_IN\_VIEW\_PRNS = 0x00004000;
- internal static int GPS\_VALID\_SATELLITES\_IN\_VIEW\_ELEVATION = 0x00008000;
- internal static int GPS\_VALID\_SATELLITES\_IN\_VIEW\_AZIMUTH = 0x00010000;
- internal static int GPS\_VALID\_SATELLITES\_IN\_VIEW\_SIGNAL\_TO\_NOISE\_RATIO = 0x00020000;



# MUSIC FUN

- [www.shoutcast.com](http://www.shoutcast.com)
- Use a pocket PC as a streaming radio with WIFI.

The screenshot shows the SHOUTcast website in a browser window. The page features a navigation bar with links for home, news, download, winamp, documentation, stats, and supportforums. A prominent banner reads "When every college turned him down...". Below this, a paragraph describes SHOUTcast as a free Winamp-based distributed streaming audio system. A "Most Popular Stations" section is visible, listing various music stations with their names, descriptions, and listener statistics. A "Comprehensive Genre List" sidebar is also present.

| Rank | Action | Name                      | Description                                                                                        | Listeners/Max | BitRate | Type |
|------|--------|---------------------------|----------------------------------------------------------------------------------------------------|---------------|---------|------|
| 1    | Listen | Top 40 Dance Pop Rock     | FREQUENCIES - www.frequency3.fr - No ads! It's only HTS live from Paris France 1 - French Webradio | 2378/6808     | 192     | MP3  |
| 2    | Listen | Top 40 Dance Pop Rock     | CLUSTER HITMUSICSTATION - http://www.HiMusicStation.net - Enjoy the best & fresh the best          | 1645/2500     | 192     | MP3  |
| 3    | Listen | Dance Techno Trance House | PulsRadio - www.pulsradio.com                                                                      | 1551/3280     | 192     | MP3  |
| 4    | Listen | Green & English           | KANALIT 98.4 FM STEREO CYPRUS                                                                      | 1520/1661     | 24      | AAC+ |
| 5    | Listen | Dance Trance House        | RadioSeven - www.radioseven.se                                                                     | 1389/2250     | 128     | MP3  |



# WEB FUN

<http://del.icio.us/markm56>

- **del.icio.us is a collection of favorites** - yours and everyone else's. Use del.icio.us to:
- **Keep** links to your favorite articles, blogs, music, restaurant reviews, and more on del.icio.us and access them from any computer on the web.
- **Share** favorites with friends, family, and colleagues.
- **Discover** new things. Everything on del.icio.us is someone's favorite - they've already done the work of finding it. Explore and enjoy.

# Photo FUN

The Coolpix P1 and P2 are the world's first built-in Wi-Fi-enabled digital cameras to hit the market

- <http://www.dcvviews.com/press/Nikon-P1-P2.htm>



# Future FUN

**Your Ideas for Fun**

**Microsoft To Enable  
User-Created Xbox  
360 Games**

Ultra Mobiles

**Group**

**FeedBack**

[www.localfunguide.com](http://www.localfunguide.com)