

Data Capture, Navigation, And Export Using A Garmin III+

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All GPS screen illustrations are from a Garmin III+. Other Garmin models may have similar screens.



Position Format And Map Datum

All GPS units capture and store positions as WGS84 latitude and longitude decimal degrees. Although users can set how positions are displayed on-screen, these settings have no effect on how positions are actually captured or stored.

To set the format of on-screen position display, navigate to **Main Menu – Setup – Position**, highlight the **Position Format** and **Map Datum** boxes in succession, and set as described below.



Format **UTM/UPS** and Datum **NAD27 CONUS** will capture and store positions in WGS84 decimal degrees, but display them on-screen as Universal Transverse Mercator (UTM) NAD27 coordinates.

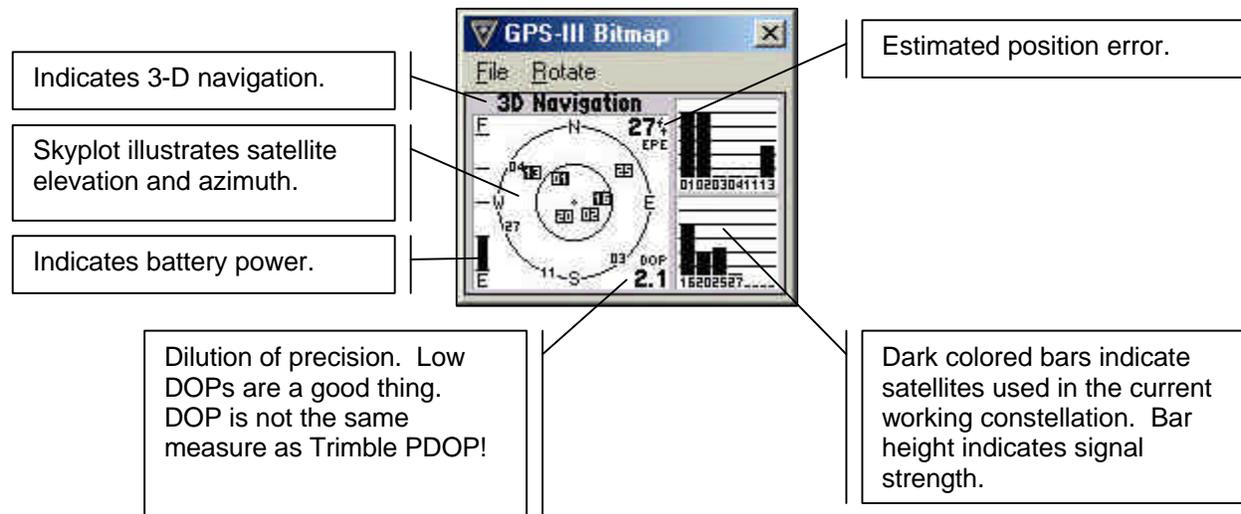
Format **hddd.dddd** and Datum **WGS 84** will capture and store, as well as display on-screen, positions in WGS84 latitude and longitude decimal degrees.

If you plan to manually copy coordinates directly from the screen, be sure to use **UTM/UPS** and **NAD27 CONUS**.

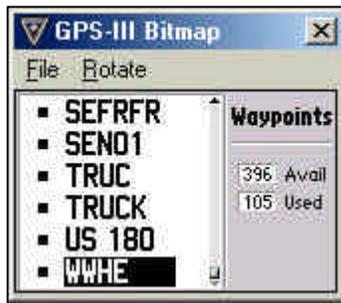
If you plan to download tracklogs or waypoints electronically, it doesn't really matter how Format and Datum are set.

Satellite Screen

Press the **PAGE** button until the **Satellite** screen is displayed.



Capture A Waypoint



To avoid duplication, delete all prior waypoints (assuming that all prior waypoints have already been manually recorded or downloaded electronically).

Navigate to **Main Menu – Waypoints** to view the **Waypoints** screen.

Press the **MENU** button, and then select **Delete All**.



Press the **ENTER/MARK** button to confirm deletion of all prior waypoints.



To capture a new waypoint (a point feature):

Press and hold the **ENTER/MARK** button until the **Mark Waypoint** screen appears.

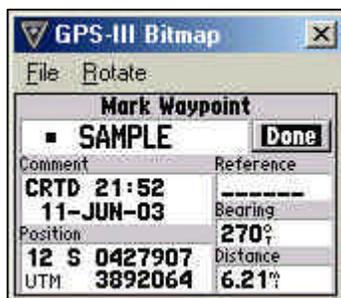
Then press the **MENU** button, and select **Average Position**.



The **Average Position** screen will appear.

Wait until 30, or more, positions have been captured.

Select **Save** to return to the **Mark Waypoint** screen.



Accept the default waypoint name (usually a sequential number like 081), or use the rocker switch to give it a new name of 6 characters, or less. In this example, the waypoint was given the name **SAMPLE**.

Select **Done** to complete waypoint capture.

Refer to the **Garmin III+ Owner's Manual & Reference** for additional guidance.

Capture A Tracklog



A tracklog is a connected string of positions (a line feature). Unless specifically turned off, tracklog positions are captured automatically for as long as the GPS unit is powered on, or until its memory is exhausted.

To avoid duplication, delete all prior tracklogs (assuming that all prior tracklogs have already been downloaded electronically).

Navigate to **Main Menu – Track Logs** to view the **Track Logs** screen.

Press the **MENU** button, and then select **Delete All**.



Press the **ENTER/MARK** button to confirm deletion of all saved and active tracklogs.



To configure tracklog capture from the **Track Logs** screen, press the **MENU** button, and then select **Setup Logging**.

The settings illustrated at left are a good general recommendation, and indicate that the active tracklog will continuously collect one position every 10 seconds until memory is full. Other options are available.

The active tracklog can contain up to 1,900 positions.



To save an active tracklog from the **Track Logs** screen, press the **MENU** button, and then select **Save Active Log**. **Note:** Saving an active tracklog will generalize it to 250, or less, of its most significant vertices. In other words, saving an active tracklog erodes (though perhaps not significantly) the detail of its alignment.



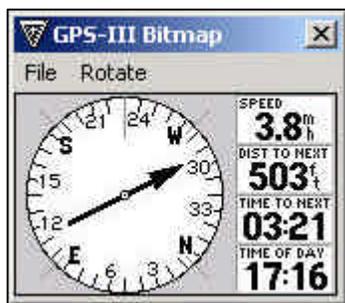
Accept the default tracklog name, (usually a date like 12-June-03), or press the **ENTER/MARK** button, and use the rocker switch to give it a new name of 13 characters, or less. In this example, the waypoint was given the name **SAMPLE TRACK**.

Refer to the **Garmin III+ Owner's Manual & Reference** for additional guidance.

Navigate To A Waypoint



Press the **GOTO** button to view the **GOTO** screen. Select a waypoint representing a desired destination, and then select **OK**.



Press the **PAGE** button until the **Compass** screen appears. The Compass screen features a “compass ring” and four data items.

The **Compass** screen illustrated at left indicates that:

- Current direction of travel is about 230°;
- Bearing to the destination waypoint is about 290°;
- Current speed is 3.8 miles per hour;
- Distance to the waypoint is 503 feet;
- Estimated time of arrival is 3 minutes, 21 seconds; and
- Current time is 5:16 p.m.



A proximity alarm can be set to notify users of arrival within a user-specified distance of the waypoint.

Refer to the **Garmin III+ Owner's Manual & Reference** for additional guidance.

Exporting Waypoints And Tracklogs To Shapefile Format

This section assumes users have general knowledge of internet and ArcView procedures, including:

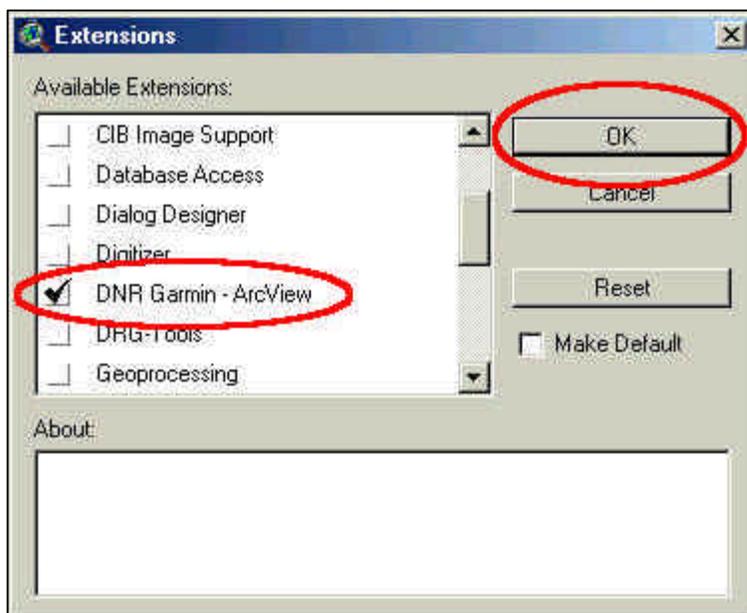
- Downloading software from the internet;
- Unzipping and installing software;
- Opening PC ArcView;
- Creating a new view;
- Loading ArcView extensions; and
- File navigation.

Download a free copy of DNRGarmin from the URL listed below.

<http://www.dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRGarmin/DNRGarmin.html>

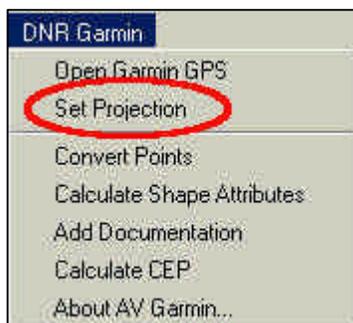
Unzip and install DNRGarmin as per its documentation.

Start PC ArcView, open a new view, and (in view properties) set map units to meters.



To load the DNRGarmin extension, click **File – Extensions...** from the ArcView menu bar, select **DNR Garmin ArcView** from the list of available extensions, and click **OK**.

A DNRGarmin item should now appear in the ArcView menu bar as illustrated below.



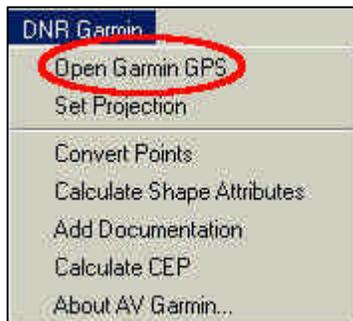
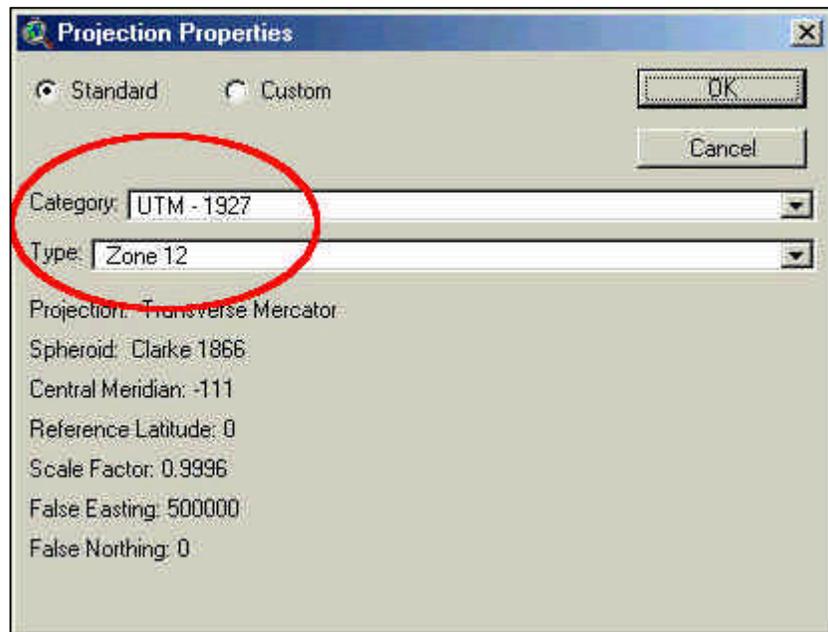
Click **DNRGarmin** on the ArcView menu bar, and then click **Set Projection**.



If the projection is set as illustrated at left, click **Yes**. The Coconino National Forest is UTM 1927, Zone 12.

If it is not shown as at left, click **No**, and set as illustrated below.

It is **critical** that projection properties be set correctly!

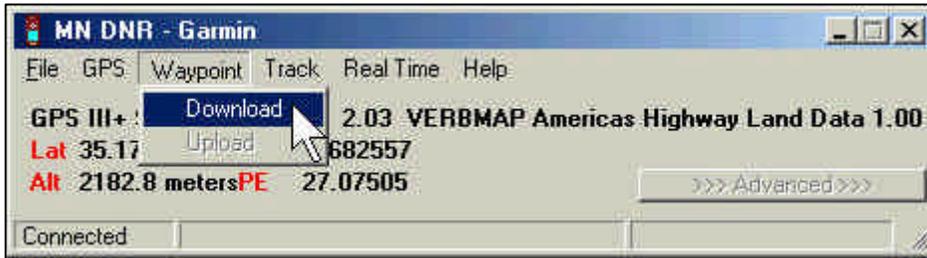


Once projection properties are set, click **DNR Garmin** from the ArcView menu bar, and then click **Open Garmin GPS**.

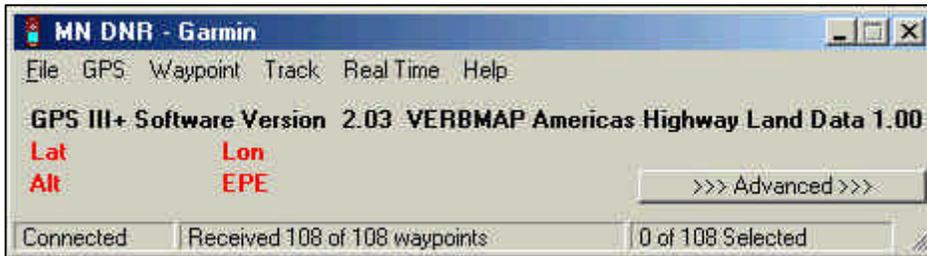


Use a serial cable to connect the Garmin III+ to a PC, and power the Garmin III+ on.

After a moment, the DNRGarmin status bar should indicate "connected".



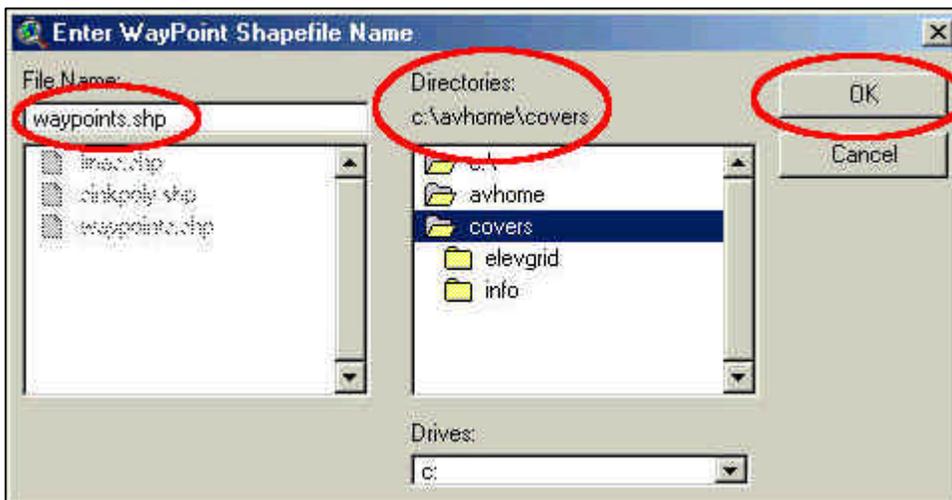
To download waypoints from the Garmin III+ to DNRGarmin, click **Waypoint – Download**.



The status bar lists the number of waypoints received.



Save the downloaded waypoints as an ArcView shapefile by clicking **File – Save As – ArcView Shapefile...**

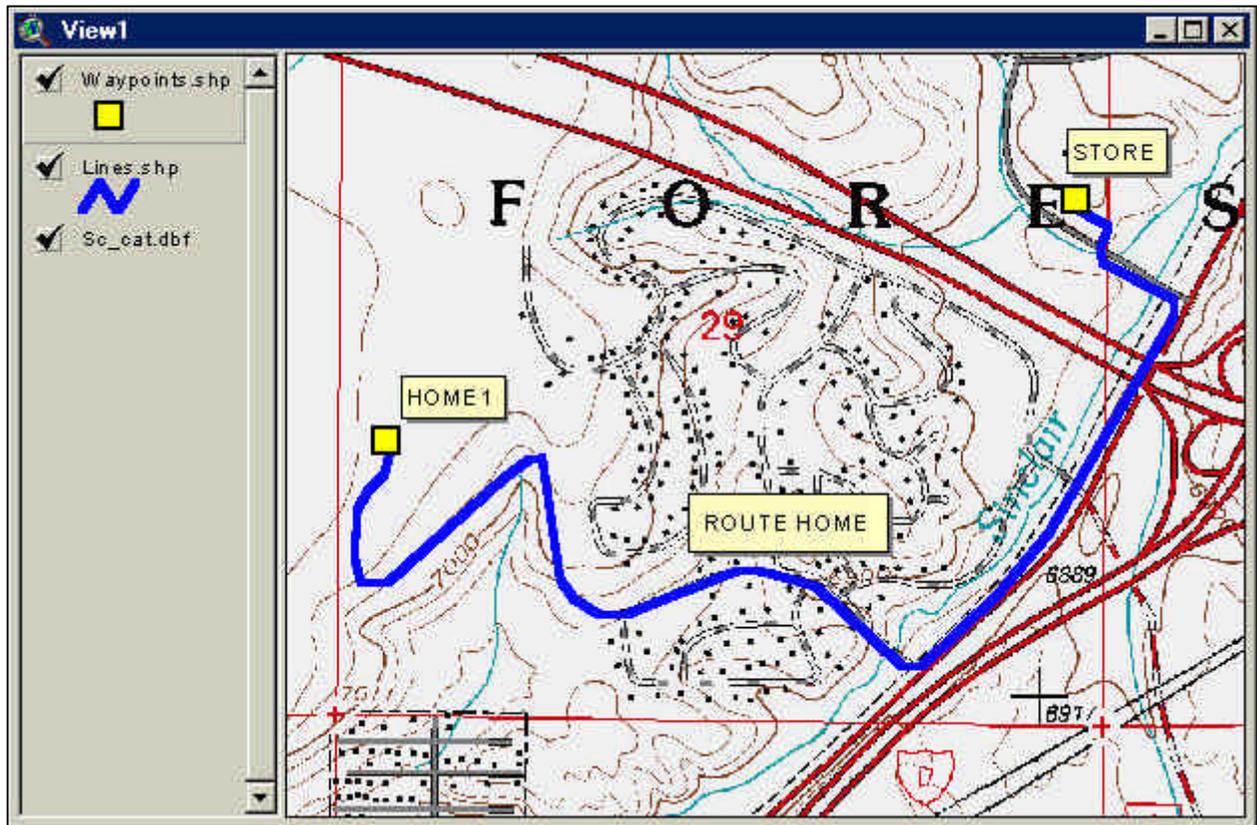


Navigate to an appropriate directory, and provide a meaningful name for the new shapefile.

Repeat this process for tracklogs by clicking **Track – Download** on the DNRGarmin menu bar.

Refer to the **DNRGarmin documentation** for additional guidance.

Add the new shapefile(s) to an ArcView view and inspect feature locations and alignment to ensure they are rendered correctly.



Please! GPS units, salary, and data processing are expensive. Avoid turning taxpayer funded work into “one-time-use”, “throw-away” data by capturing and annotating data to correspond with existing corporate GIS data structure.

Contact a GIS Coordinator if assistance is needed integrating your data with corporate data. Thank you...