IMPORTANT - This is a training aid. Do not use in Instrument Meteorological Conditions.

Contents

This manual contains general information about ILS. Specific information relating to the operation of **vorilsLite is in bold type**.

Link to Youtube channel for videos of vorilsLite in action
https://www.youtube.com/channel/UCqeca33SIy7-Ug1x4Q8tMlg

1. About vorilsLite

vorilsLite is a simpler version of VORILS and has been written for Android phones. vorilsLite includes storage for 6 routes with 6 legs in each route and is available on Play Store for an annual subscription.

You can try it for free for 30 days. I'll send subscribers an Excel spread sheet to help with the route data calculation and entry.

PERMISSIONS.

Prior to starting vorilsLite, you will need to add a new folder named

vorilsLiteInput

in the Download folder on your device. Make sure you name the folder using the lowercase and capitals accurately as above, Java doesn't have much of a sense of humour. In that new folder, you will need to save a file called

vorilsLiteInput.txt

with data formatted as shown in Appendix 1. A typical vorilsLiteInput.txt is available on the web site to make things easier.

vorilsLite requires permission for Location and Storage.

Location is needed for the device position including altitude.

Storage is needed for 1 folder in Download – vorilsLiteInput – which stores the text file – vorilsLiteInput.txt - containing the navigational data.

There is a sample vorilsLiteInput.txt file to go into the vorilsLiteInput folder.

CRASH AFTER INSTALLATION.

You will also get a crash error if the vorilsLite folder and vorilsLite.txt file aren't available or formatted correctly.

The app has been run for 6 hours on a Samsung Galaxy S9 with a standard Samsung 3000 mAh battery but please use the free version to test that your phone and battery will have enough power to run vorilsLite for your required time.

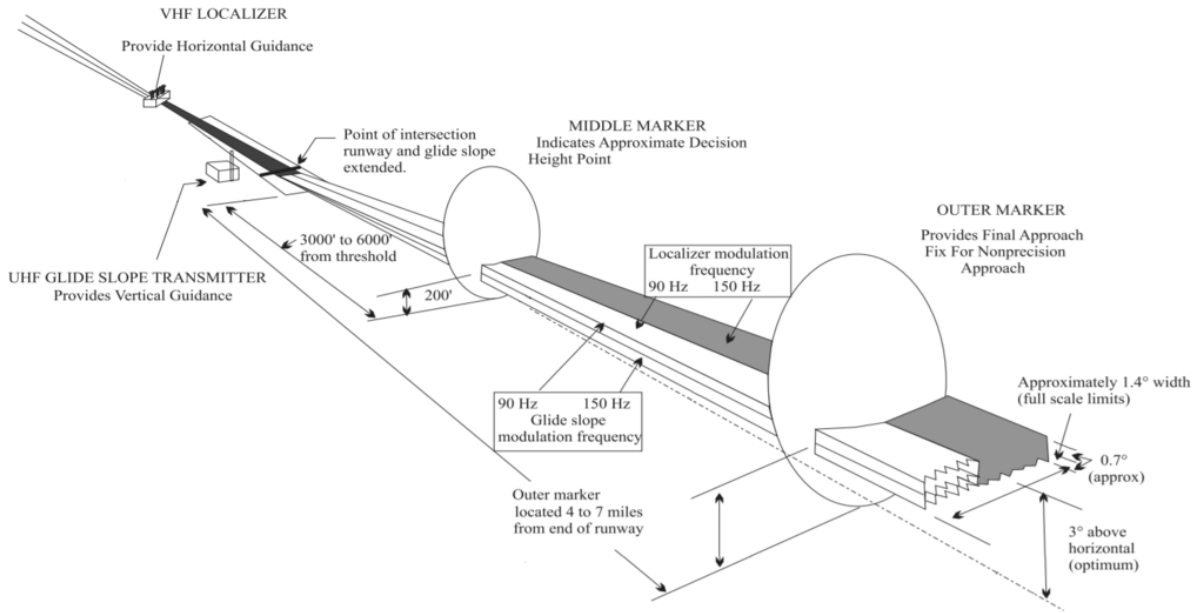
vorilsLite uses the GPS data plus barometer pressure sensor from your device to mimic the displays of an Instrument Landing Systems (ILS) in your aircraft. If your device doesn't have a barometer pressure sensor then the GPS altitude will be used.

vorilsLite will stay in either portrait or landscape depending on the orientation of your device as vorilsLite is started.

For background information, Wikipedia has information regarding ILS. There are links from Wikipedia to other sites that have graphics to practice ILS procedures.

1.1. ILS navigation

ILS is a ground-based instrument approach system that provides precision guidance to an aircraft approaching and landing on a runway, using a combination of radio signals and, in many cases, high-intensity lighting arrays to enable a safe landing during instrument meteorological conditions (IMC), such as low ceilings or reduced visibility due to fog, rain, or blowing snow.



Instrument approach procedure charts (or *approach plates*) are published for each ILS approach, providing pilots with the needed information to fly an ILS approach during instrument flight rules (IFR) operations, including the radio frequencies used by the ILS components or navaids and the minimum visibility requirements prescribed for the specific approach.

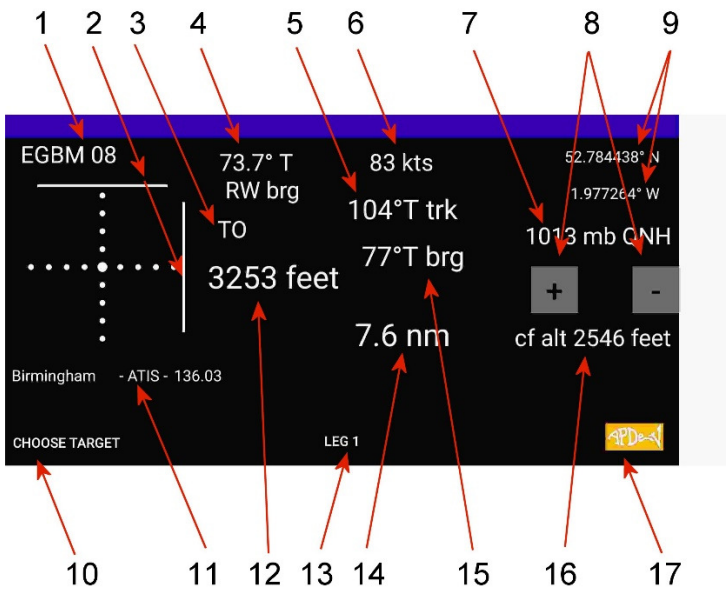
Radio-navigation aids must keep a certain degree of accuracy (set by international standards of CAST/ICAO); to assure this is the case, flight inspection organizations periodically check critical parameters with properly equipped aircraft to calibrate and certify ILS precision.

1.2 vorilsLite functionality

vorilsLite uses a text file (vorilsLiteInput.txt) for the input of lat and long co-ordinates to position ILS approaches at your preferred locations and altitudes.

ILS approaches, target / threshold information and other data can only be entered using the text file. The target ref / runway bearing information as currently being used is displayed in the app.

Please refer to Appendix 1 for the formatting required for vorilsLiteInput.txt.

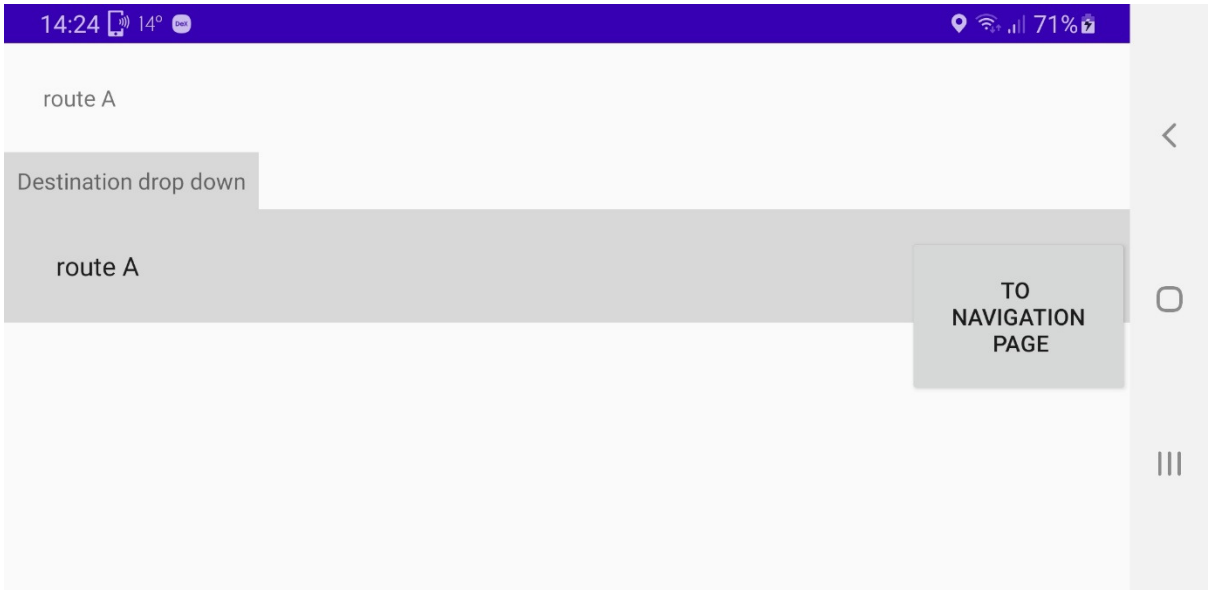


1. **Runway / Target ref as entered in text file.**
2. **Standard Glideslope / Localiser Indicator needles. Example shows fly up / fly right. Both Localiser and Glideslope needles will be centred with red flags prior to GPS data being available.**
3. **TO or FROM Indicator**
4. **Runway / Target Bearing as entered in text file.**
5. **Current track. This display can be toggled off / on by pressing the display field 3 times.**
6. **Current Ground Speed.**
7. **Current Pressure Setting.**
8. **Adjust Pressure Setting value.**
9. **Current position – Latitude / Longitude.**
10. **Change to Navigation / Exit page.**
11. **Nearest Airport broadcasting ATIS Fequency.**
12. **Altitude required for Glideslope. This display can be toggled off / on by pressing the display field 3 times.**
13. **Restart route. Go to Leg 1.**
14. **Distance to Runway threshold / Target.**

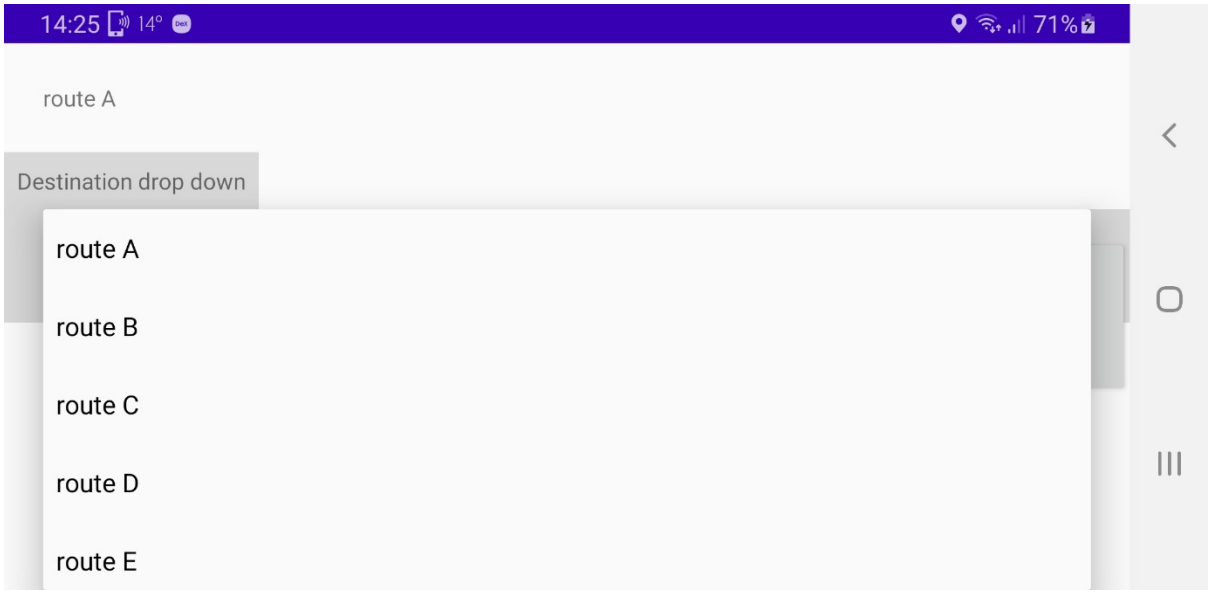
15. **Bearing to Runway threshold / Target. This display can be toggled off / on by pressing the display field 3 times.**
16. **Altitude as calculated from Pressure Setting. Adjust this to suit known airfield elevation prior to take off and then synchronise regularly with aircraft altimeter.**
17. **Logo / Button to advance leg along route. Legs will auto-advance as aircraft progresses along route unless leg is set to hold in text file when logo / button shows yellow outline. When last leg is reached, logo / button shows red outline.**

Naviation / Exit Page

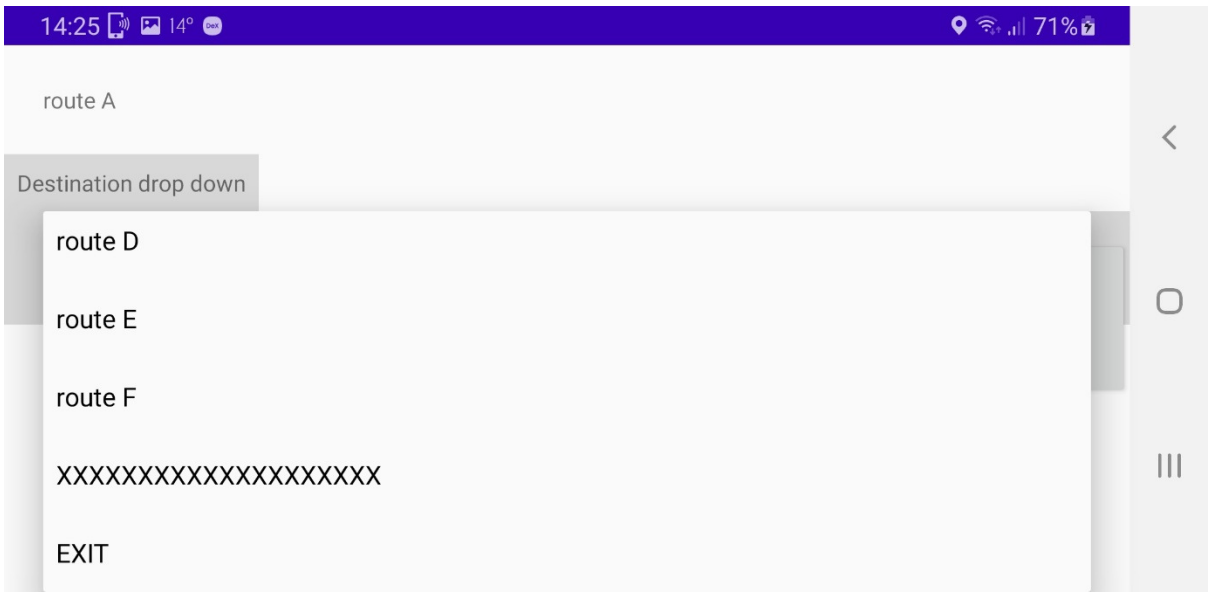
First page



Press route A for drop-down menu.



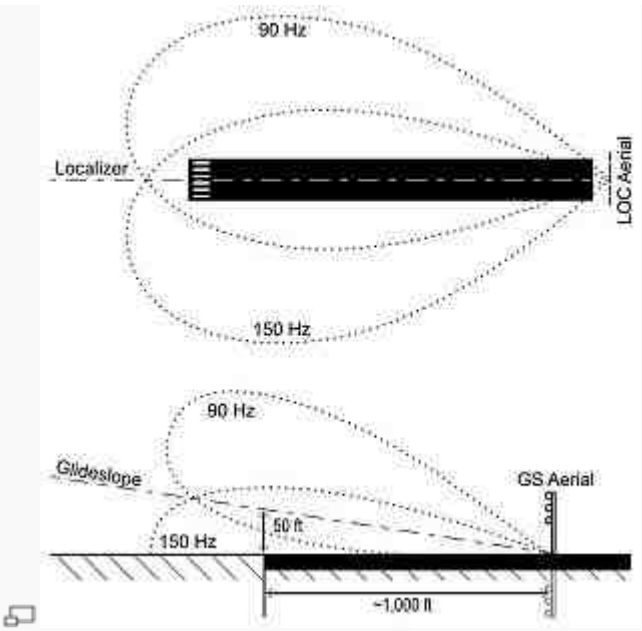
Swipe upwards for remainder of menu including EXIT.



After pressing selection, the view returns to first page, select 'TO NAVIGATION PAGE' to return to main view or EXIT.

2. Using ILS

An ILS consists of two independent sub-systems, one providing lateral guidance (localizer), the other vertical guidance (glide slope or glide path) to aircraft approaching a runway. Aircraft guidance is provided by the ILS receivers in the aircraft by performing a modulation depth comparison.



The emission patterns of the localizer and glideslope signals. Note that the glide slope beams are partly formed by the reflection of the glideslope aerial in the ground plane.

A localizer (LOC, or LLZ until ICAO designated LOC as the official acronym) antenna array is normally located beyond the departure end of the runway and generally consists of several pairs of directional antennas. Two signals are transmitted on one out of 40 ILS channels in the carrier frequency range between 108.10 MHz and 111.95 MHz (with the 100 kHz first decimal digit always odd, so 108.10, 108.15, 108.30, and so on are LOC frequencies but 108.20, 108.25, 108.40, and so on are not). One is modulated at 90 Hz, the other at 150 Hz and these are transmitted from separate but co-located antennas. Each antenna transmits a narrow beam, one slightly to the left of the runway centreline, the other to the right.

The localizer receiver on the aircraft measures the difference in the depth of modulation (DDM) of the 90 Hz and 150 Hz signals. For the localizer, the depth of modulation for each of the modulating frequencies is 20 percent. The difference between the two signals varies depending on the position of the approaching aircraft from the centreline.

If there is a predominance of either 90 Hz or 150 Hz modulation, the aircraft is off the centreline. In the cockpit, the needle on the course deviation indicator (CDI), will show that the aircraft needs to fly left or right to correct the error to fly down the centre of the runway. If the DDM is zero, the aircraft is on the centreline of the localizer coinciding with the physical runway centreline. The localiser beam is 5° wide; 2.5° to left at full scale deflection or 2.5° to right at full scale deflection.

A glide slope (GS) or glide path (GP) antenna array is sited to one side of the runway touchdown zone. The GP signal is transmitted on a carrier frequency between 328.6 and 335.4 MHz using a technique similar to that of the localizer. The centreline of the glide slope signal is arranged to define a glide slope of approximately 3° above horizontal (ground level). The glideslope beam is 1.4° deep; 0.7° below the glideslope centreline and 0.7° above the glideslope centreline.

These signals are displayed on an indicator in the instrument panel. This instrument is generally called the omni-bearing indicator or *nav indicator*. The pilot controls the aircraft so that the indications on the instrument (i.e., the course deviation indicator) remain centred on the display. This ensures the aircraft is following the ILS centreline (i.e., it provides lateral guidance). Vertical guidance, shown on the instrument by the glideslope indicator, aids the pilot in reaching the runway at the proper touchdown point.

2.1 Adding an ILS target

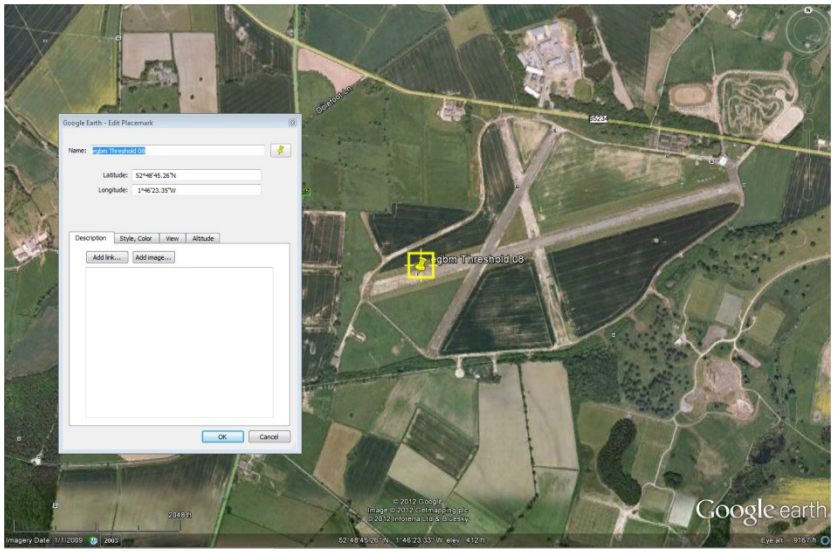
Setting up a target or ILS station is carried out as follows:

1. **Identify the latitude and longitude of the desired location. This can be done from published data or by using mapping programmes including Google Earth.**

2. **Please note that Google Earth states their data should not be used for navigation. <u>vorlsLite should only be used as a VFR training aid.</u>**

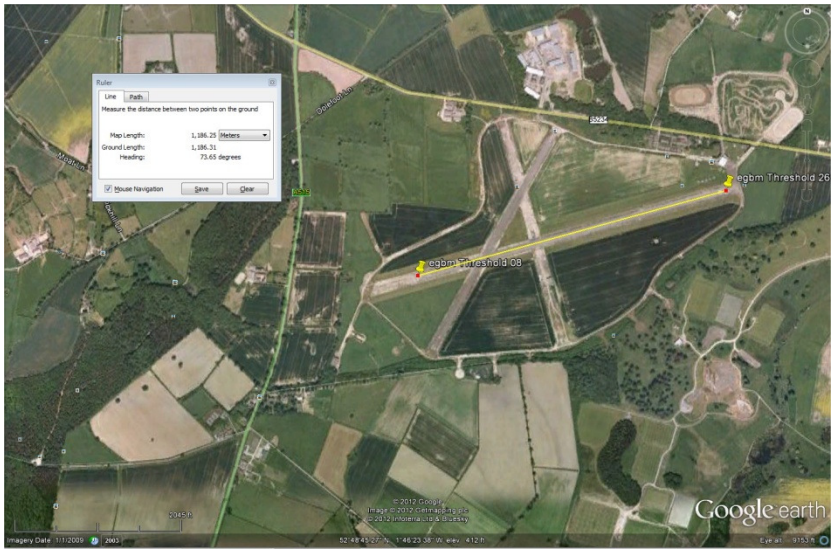
3. **Assuming use of Google Earth, zoom into your preferred location (example uses Tatenhill Airfield EGBM threshold runway 08) as following image.**

4. **Using the "Add Placemark" icon, place the Placemark on the threshold of the runway or other landmark as desired. If you have published lat long co-ordinates for the threshold, then enter these into the Placemark windows.**

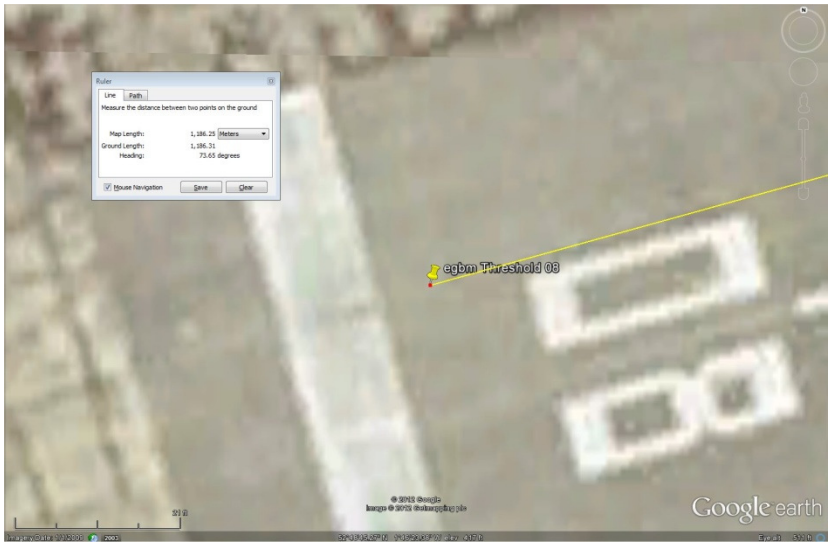


5. **Repeat the process for the threshold at the other end of the runway.**

6. **Use the "Ruler tool" to measure from the target / threshold to the other end of runway. The data page only requires the bearing from this step.**



7. **You'll notice that the Placemark is not in the centre of the runway nor on the marked threshold. This shows the error between the Google Earth co-ordinates and the published threshold data for Tatenhill Airfield.**



8. **Right clicking on the icon and selecting properties opens the "Edit Placemark" window. The latitude (52°48'45.26"N converted to decimal degrees 52.81257) and longitude (1°46'23.35"W converted to decimal degrees -1.77315) of the Placemark can now be entered into vorilsLiteInput.txt.**

9. **Placing the cursor over the threshold will enable the elevation to be read at the bottom of the Google Earth screen. Make sure the view is zoomed in as close as possible to avoid greater error. The reading of 417 ft from Google Earth compares with 412 ft as published for Tatenhill though errors of up to 300 ft can be expected. vorilsLite automatically adds 50 ft to the elevation entered into vorilsLiteInput.txt. This allows the user to enter actual elevation values for the Runway / Target knowing that an approximation for Minimum Eye Height over Threshold (MEHT) has been calculated. If you want to set up an ILS ending at 2,500 ft, you need to enter 2,450 ft in vorilsLiteInput.txt.**

   For more accurate approaches and to give better correlation with PAPI and ILS indications, the threshold elevation needs to be increased by a more accurate value of MEHT. MEHT varies between 20 ft on shorter runways to 55 ft on longer runways. Therefore, the reading of 417 ft above for Tatenhill would be increased to 437 ft. This figure for elevation plus MEHT (437 ft) less the automatic 50 ft addition (387 ft) is entered as the target altitude in vorilsLiteInput.txt.

10. **Even more accurate approaches can be achieved by moving the target to align with the Touch Down Zone (TDZ). This is the point on the centreline of the runway at right angles approx. to the PAPI or ILS Glideslope antennae. It is normally 90m approx. from the runway threshold when MEHT is 20 ft and glideslope 3.5 degrees. It will be 320m approx. from the runway threshold when MEHT is 55 feet and glideslope 3 degrees. Please note that relative differences in elevation between threshold and TDZ also affect this length in reality. The lat / long of the TDZ can be entered into vorilsLiteInput.txt together with the actual elevation of the TDZ less the automatic 50 ft addition. This will give the correct MEHT.**

Modern localizer antennas are highly directional. However, usage of older, less directional antennas allows a runway to have a non-precision approach called a *localizer backcourse*. This lets aircraft land using the signal transmitted from the back of the localizer array. A pilot may have to fly opposite the needle indication, due to reverse sensing. This would occur when

using a basic VOR indicator. Pilots may notice that they receive false glide slope signals from the front course ILS equipment. All glide slope information should be disregarded.

vorilsLite centres the Glideslope needle and displays red flag when aircraft is in "FROM" sector of an ILS target / threshold.

Distance measuring equipment (DME) provides pilots with a slant range measurement of distance to the runway in nautical miles. DMEs are augmenting or replacing markers in many installations. The DME provides more accurate and continuous monitoring of correct progress on the ILS glideslope to the pilot, and does not require an installation outside the airport boundary. When used in conjunction with an ILS, the DME is often sited midway between the reciprocal runway thresholds with the internal delay modified so that one unit can provide distance information to either runway threshold. On approaches where a DME is specified in lieu of marker beacons, the aircraft must have at least one operating DME unit to begin the approach, and a *DME Required* restriction will be noted on the Instrument Approach Procedure.

vorilsLite displays the horizontal distance to target and calculated Expected Altitude (if toggled on) at all times.

It is essential that any failure of the ILS to provide safe guidance be detected immediately by the pilot. To achieve this, monitors continually assess the vital characteristics of the transmissions. If any significant deviation beyond strict limits is detected, either the ILS is automatically switched off or the navigation and identification components are removed from the carrier. Either of these actions will activate an indication ('failure flag') on the instruments of an aircraft using the ILS.

2.2 Checking GPS accuracy

The user should use moving maps and geographical checks / other certified navigation aids to make sure that the device GPS location and general GPS data is accurate.

In addition, the GPS altitude can be amended to synchronise with the altitude as displayed on the aircraft altimeter.

2.3 Aircraft separation

At a controlled airport, air traffic control will direct aircraft to the localizer via assigned headings, making sure aircraft do not get too close to each other (maintain separation), but also avoiding delay as much as possible. Several aircraft can be on the ILS at the same time, several miles apart. An aircraft that has turned onto the inbound heading and is within one and a quarter degrees of the localizer course (half scale deflection shown by the course deviation indicator) is said to be *established* on the approach. Typically, an aircraft will be established by at least two miles (3 km) prior to the final approach fix (glideslope intercept at the specified altitude).

vorilsLite is a VMC only training aid and separation is the responsibility of the pilot.

I've always used a minimum of 4 nautical miles (nm) as Distance to run to Target to allow time for the correct descent power setting and wind correction angle to be established.

The curved approach starts on the downwind leg with a 2 nm or 4 nm curved approach and then a final approach leg of 1 nm.

Once established on an approach, the pilot will follow the ILS and descend along the approach path indicated by the localizer and glideslope to the decision height. This is the point at which the pilot must have adequate visual reference to the landing environment (i.e. approach or runway lighting) in order to continue the descent to a landing, or else must carry out a missed approach. After executing the missed approach procedure, the pilot will try the same approach again, try a different approach or divert to another airport.

2.4 Glideslope angles

Number of feet of descent per nautical mile for various glideslope angles are shown below.

Glideslope angle	Descent in feet per nautical mile
3 degrees	318 ft
3.5 degrees	372 ft
4 degrees	425 ft
6 degrees	639 ft
10 degrees	1071 ft

Due to the complexity of ILS localizer and glideslope systems, there are some limitations. Localizer systems are sensitive to obstructions in the signal broadcast area like large buildings or hangars. Glideslope systems are also limited by the terrain in front of the glideslope antennas. If terrain is sloping or uneven, reflections can create an uneven glideslope causing unwanted needle deflections.

As vorilsLite is GPS based, none of the above errors are applicable. However, GPS data is not as accurate nor as reliable as ground based systems and this training aid should only be used in VMC.

Appendix 1 – vorilsLite Data

Sample **vorilsLiteInput.txt**

```
hix pS26
52.83370795
-2.033559399
253.64886
3300
0
0
0
hix rad1
52.82352068
-2.028613582
163.64886
3300
0
7
0
hix dw26
52.82271752
-1.970742105
73.64886
2851
2.826604305
5
0
hix rad2
52.83290479
-1.97568899
343.64886
2250
2.826604305
7
0
hix fin26
52.8384
-2.00711
253.64886
1950
2.826604305
0
0
hix pS26
52.83370795
```

-2.033559399
253.64886
3300
0
0
0
hix pL26
52.82901589
-2.059974464
253.64886
4200
0
0
0
hix rad1
52.80865734
-2.050093975
163.64886
4200
0
9
0
hix dw26
52.80237496
-1.960865023
73.64886
3450
2.826604305
5
0
hix rad2
52.82273351
-1.970748712
343.64886
2250
2.826604305
9
0
hix fin26
52.8384
-2.00711
253.64886
1950
2.826604305
0

0
hix pL26
52.82901589
-2.059974464
253.64886
4200
0
0
0
EGBMpS26
52.81087461
-1.782702188
253.6488621
1750
0
0
0
EGBMrad1
52.80068734
-1.77775897
163.6488621
1750
0
7
0
EGBMdw26
52.79988418
-1.71991788
73.64886212
1309
2.826604305
5
0
EGBMrad2
52.81007145
-1.724862166
343.6488621
708
2.826604305
7
0
EGBMfin26
52.81556667
-1.756266667
253.6488621

408
2.826604305
0
0
EGBMpS26
52.81087461
-1.782702188
253.6488621
1750
0
0
0
EGBMpL26
52.80618256
-1.809103423
253.6488621
2550
0
0
0
EGBMrad1
52.78582401
-1.799228121
163.6488621
2550
0
9
0
EGBMdw26
52.77954163
-1.710045987
73.64886212
1908
2.826604305
5
0
EGBMrad2
52.79990017
-1.719924485
343.6488621
708
2.826604305
9
0
EGBMfin26

52.81556667
-1.756266667
253.6488621
408
2.826604305
0
0
EGBMpL26
52.80618256
-1.809103423
253.6488621
2550
0
0
0
EGBMpS22
52.80060828
-1.780761082
208.3500248
1750
0
0
0
EGBMrad1
52.79556689
-1.765310024
118.3500248
1750
0
7
0
EGBMdw22
52.81986093
-1.723670467
28.35002475
1301
2.83
5
0
EGBMrad2
52.82490232
-1.739131955
298.3500248
700
2.83

7
0
EGBMfin22
52.815276
-1.767689
208.3500248
400
2.83
0
0
EGBMpS22
52.80060828
-1.780761082
208.3500248
1750
0
0
0
EGBMpS04
52.82571404
-1.758351806
28.3476948
1750
0
0
0
EGBMrad1
52.83075506
-1.773815716
298.3476948
1750
0
7
0
EGBMdw04
52.80645999
-1.815461664
208.3476948
1281
2.83
5
0
EGBMrad2
52.80141898
-1.800008188

118.3476948
680
2.83
7
0
EGBMfin04
52.811046
-1.771465
28.3476948
380
2.83
0
0
EGBMpS04
52.82571404
-1.758351806
28.3476948
1750
0
0
0

Explanation of sample

Using the last 3 legs from the sample.

EGBMrad2	Runway / Target Ref
52.80141898	Runway / Target Latitude (decimal degrees)
-1.800008188	Runway / Target Longitude (decimal degrees)
118.3476948	Runway / Target Bearing
680	Runway / Target Altitude (50 ft automatically added to this figure)
2.83	Runway / Target Glideslope Approach Angle
7	Accuracy / Type of Approach. Set to 0, 1, 5, 6, 7, 8, 9 – Left Hand Small Radius Leg – See more detail below
0	Auto-advance. 0 - Leg advances automatically. 1 - Leg advances manually using amber logo. Logo turns red for last leg unless set to 1.
EGBMfin04	Runway / Target Ref
52.811046	Runway / Target Latitude (decimal degrees)
-1.771465	Runway / Target Longitude (decimal degrees)
28.3476948	Runway / Target Bearing
380	Runway / Target Altitude (50 ft automatically added to this figure)
2.83	Runway / Target Glideslope Approach Angle

0	Accuracy / Type of Approach. Set to 0, 1, 5, 6, 7, 8, 9 – Normal Fan Accuracy – See more detail below
0	Auto-advance. 0 - Leg advances automatically. 1 - Leg advances manually using amber logo. Logo turns red for last leg unless set to 1.
EGBMpS04	Runway / Target Ref
52.82571404	Runway / Target Latitude (decimal degrees)
-1.758351806	Runway / Target Longitude (decimal degrees)
28.3476948	Runway / Target Bearing
1750	Runway / Target Altitude (50 ft automatically added to this figure)
0	Runway / Target Glideslope Approach Angle
0	Accuracy / Type of Approach. Set to 0, 1, 5, 6, 7, 8, 9 – Normal Fan Accuracy – See more detail below
0	Auto-advance. 0 - Leg advances automatically. 1 - Leg advances manually using amber logo. Logo turns red for last leg unless set to 1.

NB. Care must be taken that this format is entered accurately or the app will crash when opened. Therefore, vorilsLiteinput.txt must contain 6 routes comprising 6 legs and each end of leg target is defined by 8 lines (288 total).

Accuracy of Approach. 0. 1. 5.

This setting allows the user to practice approaches en-route. By setting the Altitude at 50 ft below altitude actually required (automatic 50 ft added) and the Approach Angle to 0 degrees, you will receive ILS indications to correct your position for tracking error and altitude.

Setting 0 calculates ILS indications using the normal vertical (+ or - 0.7 deg) and horizontal (+ or – 2.5 deg) fan accuracy.

Setting 1 calculates ILS indications as above but assuming the aircraft is always 1nm from threshold.

Setting 5 calculates ILS indications as above but assuming the aircraft is always 5nm from threshold.

Type of Approach. 6, 7, 8, 9.

These settings allow the user to fly curved approaches.

Setting 6 calculates ILS indications using the normal vertical (+ or - 0.7 deg) and horizontal (+ or – 2.5 deg) fan accuracy but using a clockwise / right hand 0.6 nm radius turn .

Setting 7 calculates ILS indications using the normal vertical (+ or - 0.7 deg) and horizontal (+ or – 2.5 deg) fan accuracy but using an anti-clockwise / left hand 0.6 nm radius turn .

Setting 8 calculates ILS indications using the normal vertical (+ or - 0.7 deg) and horizontal (+ or – 2.5 deg) fan accuracy but using a clockwise / right hand 1.2 nm radius turn .

Setting 9 calculates ILS indications using the normal vertical (+ or - 0.7 deg) and horizontal (+ or – 2.5 deg) fan accuracy but using an anti-clockwise / left hand 1.2 nm radius turn .

Appendix 2 – vorilsLite ATIS stations

```
"   Antwerpen / deurne        - ATIS -  124.205             ",   51.18944444,   4.460277778,
"  Brussels          - ATIS -  132.48          ",              50.90138889,   4.484444444,
"  Charleroi Brussels South          - ATIS -  115.7 / 134.63        ",   50.46,   4.453055556,
"  Frankfurt main        - ATIS -  118.03          ",          50.03861111,   8.559722222,
"  Hamburg Fuhlsbuettel          - ATIS -  124.325             ",   53.63888889,   9.988611111,
"  Koln/Bonn         - ATIS -  132.13          ",              50.86777778,   7.1475,
"  Duesseldorf           - ATIS -  123.78          ",          51.28083333,   6.757222222,
"  Nurnberg          - ATIS -  123.08          ",              49.49861111,   11.07777778,
"  Leipzig/halle         - ATIS -  123.95          ",          51.42388889,   12.23611111,
"  Stuttgart         - ATIS -  126.13          ",              48.68972222,   9.221944444,
"  Hannover          - ATIS -  136.575             ",          52.4675,   9.680833333,
"  Friedrichshafen           - ATIS -  129.605             ",  47.67111111,   9.511388889,
"  Belfast International         - ATIS -  126.13          ",  54.6575,   -6.215833333,
"  Belfast City          - ATIS -  124.58          ",          54.61805556,   -5.8725,
"  City of Derry         - ATIS -  119.375             ",      55.04333333,   -7.161666667,
"  Birmingham        - ATIS -  136.03          ",              52.45388889,   -1.748055556,
"  Gloucestershire           - ATIS -  127.48          ",      51.89416667,   -2.167222222,
"  Manchester        - ATIS -  128.18          ",              53.35388889,   -2.275,
"  Doncaster Sheffield           - ATIS -  134.955             ",   53.47527778,   -1.004166667,
"  Cardiff Int           - ATIS -  132.48          ",          51.39666667,   -3.343333333,
"  Bristol           - ATIS -  126.03          ",              51.38277778,   -2.719166667,
"  Liverpool john Lennon         - ATIS -  124.33          ",  53.33361111,   -2.849722222,
"  Luton         - ATIS -  120.58          ",                  51.87472222,   -0.368333333,
"  Bournemouth           - ATIS -  133.725             ",      50.78,   -1.8425,
"  Southampton           - ATIS -  130.88          ",          50.95027778,   -1.356666667,
"  Newquay Cornwall          - ATIS -  127.405             ",  50.44083333,   -4.995277778,
"  Guernsey          - ATIS -  109.4           ",              49.435,   -2.603333333,
"  Jersey        - ATIS -  134.68          ",                  49.20833333,   -2.195,
"  Shoreham          - ATIS -  130.98          ",              50.83555556,   -0.297222222,
"  Biggin Hill           - ATIS -  135.68          ",          51.33166667,   0.033333333,
"  Gatwick           - ATIS -  136.525             ",          51.14805556,   -0.190277778,
"  London City           - ATIS -  136.355             ",      51.50527778,   0.055277778,
"  Farnborough           - ATIS -  128.405             ",      51.27527778,   -0.7775,
"  Heathrow          - ATIS -  115.1           ",              51.4775,   -0.461388889,
"  Southend          - ATIS -  136.055             ",          51.57027778,   0.693333333,
"  Lydd          - ATIS -  129.23          ",                  50.95666667,   0.94,
"  Carlisle          - ATIS -  118.43          ",              54.9375,   -2.81,
"  Blackpool         - ATIS -  127.2           ",              53.77166667,   -3.028611111,
"  Humberside        - ATIS -  124.13          ",              53.57333333,   -0.351388889,
"  Leeds Bradford        - ATIS -  118.03          ",          53.86611111,   -1.660833333,
"  Warton        - ATIS -  121.73          ",                  53.745,   -2.883333333,
"  Hawarden          - ATIS -  125.43          ",              53.17805556,   -2.977777778,
"  Ronaldsway        - ATIS -  123.88          ",              54.08333333,   -4.623333333,
"  Newcastle         - ATIS -  118.38          ",              55.03805556,   -1.689722222,
"  Durham Tees Valley        - ATIS -  132.38          ",      54.50916667,   -1.429444444,
"  East Midlands         - ATIS -  122.68          ",          52.83111111,   -1.327777778,
"  Valley        - ATIS -  120.725             ",              53.24833333,   -4.535,
"  Kirkwall          - ATIS -  108.6           ",              58.95805556,   -2.900555556,
"  Sumburgh          - ATIS -  125.855             ",          59.88166667,   -1.293333333,
"  Wick          - ATIS -  113.6           ",                  58.45888889,   -3.093055556,
"  Aberdeen          - ATIS -  121.855 / 114.3             ",  57.2025,   -2.198055556,
"  Inverness         - ATIS -  109.2 VOR           ",          57.5425,   -4.0475,
"  Glasgow           - ATIS -  129.575             ",          55.87194444,   -4.433055556,
"  Edinburgh         - ATIS -  131.355             ",          55.95,   -3.3725,
"  Prestwick         - ATIS -  121.13          ",              55.51,   -4.595,
"  Benbecula         - ATIS -  113.95          ",              57.48055556,   -7.363888889,
"  Scatsta           - ATIS -  128.505             ",          60.43277778,   -1.296111111,
"  Dundee        - ATIS -  119.33          ",                  56.4525,   -3.025833333,
"  Stornoway         - ATIS -  115.1 VOR           ",          58.21555556,   -6.331111111,
"  Cambridge         - ATIS -  134.605             ",          52.205,   0.175,
"  Norwich           - ATIS -  128.63          ",              52.67583333,   1.282777778,
"  Stansted          - ATIS -  114.55 / 127.18             ",  51.885,   0.235,
"  Cranfield         - ATIS -  121.88          ",              52.07222222,   -0.616666667,
"  Exeter        - ATIS -  119.325             ",              50.73416667,   -3.413888889,
"  Oxford        - ATIS -  136.23          ",                  51.83694444,   -1.32,
"  Northolt          - ATIS -  125.125             ",          51.55333333,   -0.418333333,
"  Wittering         - ATIS -  123.925             ",          52.61166667,   -0.476666667,
"  Cranwell          - ATIS -  126.325             ",          53.03,   -0.481666667,
```

" Barkston Heath - ATIS - 132.125 ",	52.96166667,	-0.561666667,
" Mount Pleasant - ATIS - 128.55 ",	-51.82333333,	-58.44666667,
" Amsterdam Schiphol - ATIS - 132.98 ",	52.310463,	4.768264,
" Maastricht - ATIS - 124.58 ",	50.91166667,	5.77,
" Eindhoven - ATIS - 126.03 ",	51.45,	5.374444444,
" Groningen - ATIS - 133.555 ",	53.11805556,	6.575833333,
" Rotterdam - ATIS - 128.565 ",	51.95694444,	4.437222222,
" Cork - ATIS - 120.925 ",	51.84138889,	-8.491111111,
" Dublin - ATIS - 124.525 ",	53.42138889,	-6.27,
" Shannon - ATIS - 130.955 ",	52.70194444,	-8.924722222,
" Copenhagen-kastrup - ATIS - 122.75 ",	55.61805556,	12.65583333,
" Luxembourg - ATIS - 134.755 ",	49.62333333,	6.204444444,
" Bergen-flesland - ATIS - 125.25 ",	60.29361111,	5.218055556,
" Oslo-gardermoen - ATIS - 126.125 ",	60.20277778,	11.08388889,
" Le Touquet - ATIS - 123.13 ",	50.51472222,	1.6275,
" Bordeax-merignac - ATIS - 131.155 ",	44.82861111,	-0.715277778,
" Toulouse-blagnac - ATIS - 123.13 ",	43.635,	1.367777778,
" Figari - ATIS - 118.73 ",	41.50222222,	9.096666667,
" Chamberyaix - ATIS - 127.1 ",	45.63916667,	5.88,
" Lyon-satolas - ATIS - 126.18 ",	45.72555556,	5.081111111,
" Grenoble St-geoirs - ATIS - 133.855 ",	45.36305556,	5.332777778,
" Cannes-Mandelieu - ATIS - 130.48 ",	43.54638889,	6.954166667,
" Marseille Marignane - ATIS - 125.355 ",	43.43666667,	5.215,
" Nice Cote D'Azur - ATIS - 136.58 ",	43.66527778,	7.215,
" Beauvais-tille - ATIS - 118.38 ",	49.45444444,	2.112777778,
" Paris Le Bourget - ATIS - 120 ",	48.96944444,	2.441388889,
" Paris CDG - ATIS - 127.13 ",	49.00972222,	2.547777778,
" Paris Orly - ATIS - 131.355 ",	48.72333333,	2.379444444,
" Breat-guipavas - ATIS - 129.355 ",	48.44722222,	-4.421666667,
" Dinarpleurtuit-st Malo - ATIS - 124.58 ",	48.58777778,	-2.08,
" Deauville-saint Gatien - ATIS - 119.18 ",	49.36333333,	0.16,
" Rennes St Jacques - ATIS - 136.405 ",	48.07194444,	-1.732222222,
" Nantes - ATIS - 126.93 ",	47.15694444,	-1.607777778,
" Baselmulhouse Euroairport - ATIS - 127.88 ",	47.59,	7.529166667,
" Samedam - ATIS - 136.6 ",	46.53444444,	9.884166667,

Initially, most users will see Figari – ATIS – 118.73 because vorilsLite location defaults to 0N 0E until the device location is available. Figari is closer to the default location than Mount Pleasant.