G1000 SIMULATOR TUTORIAL

FOR

MISSION OBSERVERS

AND

CO-PILOTS

FOR A

PARALLEL GRID SEARCH

MIAMI 4D

USING

CROSS TRACK FLIGHT PLAN METHOD

South of Lakeland Airport Florida (KLAL)

Start Southwest Corner

East-West Tracks
The simulated aircraft can be anywhere, and is shown at Marco Island Airport (MKY), FL.

Move the simulated aircraft to Lakeland Airport (KLAL), FL. Press the ENTER key twice to get the DEMO MODE page. If necessary, use the outer FMS knob to highlight WAYPOINT.
GENERATE WAYPOINTS P1, P2, P3, & P4:

P1 = N 27 deg 45.0 min W 082 deg 07.5 min
P2 = N 27 deg 45.0 min W 082 deg 00.0 min
P3 = N 27 deg 52.5 min W 082 deg 00.0 min
P4 = N 27 deg 52.5 min W 082 deg 07.5 min

NOTE:

When entering waypoints into the REFERENCE WAYPOINT field, first turn the inner FMS knob one click clockwise before turning this knob counter clockwise. If the inner FMS knob is first turned counter clockwise it will produce a drop down menu that you will need to clear this menu by pressing the CLR key.

Use the outer FMS knob to move to the WPT pages. Then use the inner FMS knob to move to WPT page 5 (WPT – USER WPT INFORMATION).
Press the NEW soft key to enter a new USER waypoint.

Using the inner and the outer FMS knobs enter G1 as a USER waypoint. This waypoint is the Commence Search Point and the Southwest corner of Miami Grid 4D.
Press the ENTER key to accept G1 as a new USER waypoint.

Turn the Outer Knob one click counter-clockwise to highlight the Lat-Long field.
Turn the Inner FMS Knob one click clockwise to highlight only the “N’.

Use the Inner and the Outer FMS Knobs to set the Latitude to 27 deg 45.0 min and the Longitude to 082 deg 07.5 min.
Press the ENTER key to accept the Latitude and Longitude settings for G1.

Press the NEW soft key to enter a new USER waypoint.
Using the inner and the outer FMS knobs enter G2 as a USER waypoint. This waypoint is the Southeast corner of Miami Grid 4D.

Press the ENTER key to accept G2 as a new USER waypoint.
Turn the Outer Knob one click counter-clockwise to highlight the Lat-Long field.

Use the Inner and the Outer FMS Knobs to set the Latitude to 27 deg 45.0 min and the Longitude to 082 deg 00.0 min.
Press the ENTER key to accept the Latitude and Longitude settings for G2

Press the NEW soft key to enter a new USER waypoint.
Using the inner and the outer FMS knobs enter G3 as a USER waypoint. This waypoint is the Northeast corner of Miami Grid 4D.

Press the ENTER key to accept G3 as a new USER waypoint.
Turn the Outer Knob one click counter-clockwise to highlight the Lat-Long field.

Turn the Inner FMS Knob one click clockwise to highlight only the “N’.
Use the Inner and the Outer FMS Knobs to set the Latitude to 27 deg 52.5 min and the Longitude to 082 deg 00.0 min.

Press the ENTER key to accept the Latitude and Longitude settings for G3
Press the NEW soft key to enter a new USER waypoint.

Using the inner and the outer FMS knobs enter G4 as a USER waypoint. This waypoint is the Northwest corner of Miami Grid 4D.
Press the ENTER key to accept G4 as a new USER waypoint.

Turn the Outer Knob one click counter-clockwise to highlight the Lat-Long field.
Turn the Inner FMS Knob one click clockwise to highlight only the ‘N’.

Use the Inner and the Outer FMS Knobs to set the Latitude to 27 deg 52.5 min and the Longitude to 082 deg 07.5 min.
Press the ENTER key to accept the Latitude and Longitude settings for G4
Press in the inner FMS knob to remove the cursor. Then turn the outer FMS knob counter clockwise to return to the MAP page. For the real airplane press the CLR key until MAP home page appears.

Click on the range knob to increase the range to 30 nm to see if the layout of the newly generated USER waypoints looks correct. You will not see waypoints 1 and 2 on your computer. These are waypoints the author added at an earlier time.

**NOW WE NEED TO BUILD THE FLIGHT PLAN:**

G2 > G3 > G4 > G1 > G2

**NOTE:**

When entering waypoints into the flight plan first turn the inner FMS knob one click clockwise before turning counter clockwise. If the inner FMS knob is first turned counter clockwise it will produce a drop down menu that you will need to press the CLR key to get rid of this menu.
Press the FPL key to bring up the flight plan page:

Press the inner FMS knob to bring up the cursor.
Press the CLR key to remove KLAL from the flight plan. The simulated flight will be leaving from KLAL, but this waypoint is not desired or needed.

Press the ENTER key to remove KLAL from the flight plan.
Turn the inner FMS knob clockwise to bring up the waypoint information page.

Turn the Inner FMS Knob one click clockwise, and the letter K will appear.
Use the Inner and Outer FMS knobs to enter the USER waypoint G2.

Press the ENTER key to accept the waypoint G2 as new User Waypoint.

The USER waypoint G2 is shown loaded into the flight plan.
Turn the inner FMS knob clockwise to bring up the waypoint information page.

Turn the Inner FMS Knob one click clockwise, and the letter K will appear.
Use the Inner and Outer FMS knobs to enter the USER waypoint G3.

Press the ENTER key to accept the waypoint G3 as new User Waypoint.

The USER waypoint G3 is shown loaded into the flight plan.
Turn the inner FMS knob clockwise to bring up the waypoint information page.

Turn the Inner FMS Knob one click clockwise, and the letter K will appear.
Use the Inner and Outer FMS knobs to enter the USER waypoint G4.

Press the ENTER key to accept the waypoint G4 as new User Waypoint.

The USER waypoint G4 is shown loaded into the flight plan.
Turn the inner FMS knob clockwise to bring up the waypoint information page.

Turn the Inner FMS Knob one click clockwise, and the letter K will appear.
Use the Inner and Outer FMS knobs to enter the USER waypoint G1.

Press the ENTER key to accept the waypoint G1 as new User Waypoint.

The USER waypoint G1 is shown loaded into the flight plan.
Turn the inner FMS knob clockwise to bring up the waypoint information page.

Turn the Inner FMS Knob one click clockwise, and the letter K will appear.
Use the Inner and Outer FMS knobs to enter the USER waypoint G2.

Press the ENTER key to accept the waypoint G2 as new User Waypoint.

The second USER waypoint G2 is shown loaded into the flight plan.
Use the Outer FMS Knob to high light the G1 waypoint.

Press the DIRECT-TO key.
Press the ENTER Key to accept G1 as the direct-to waypoint.

Press the ENTER Key again to load G1 as the direct-to waypoint.
Press the FPL key to remove the flight plan display.

As a Mission Observer or Mission Co-Pilot your job is done at this point.

Press the MENU key twice to get the DEMO MODE page.
Set TRK MODE to TRK FPL.
Move the cursor down to AIR SPEED using the Outer FMS Knob.

Using the Inner FMS knob change the AIR SPEED to 100 KT.
Press the ENTER key to accept the 100 KT setting.

Return the cursor to the TRK MODE position by using the Outer FMS knob.
The aircraft is shown making the 111 deg left turn on auto pilot in NAV Mode at G1. The aircraft could have made a 249 deg right turn on auto pilot in Heading Mode. This would have allowed a direct over flight of G1.

**Simulator in TRK FPL Mode = real airplane auto pilot in NAV Mode.**

**Simulator in MANUAL Mode = real airplane auto pilot in Heading Mode.**

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The aircraft is shown on the first track with the auto pilot in NAV Mode.
Change TRK MODE to Manual by turning Inner FMS knob counter-clockwise. This is equivalent to putting the real aircraft’s auto pilot in Heading Mode. Then move the cursor down to HEADING using the Outer FMS knob.

Set the HEADING to 275 deg. If the turn is early, reset the HEADING to 295 deg and if late to 255 deg. Correct to 275 deg when the desired cross track error of 1 nm is reached.
Target Values:

The 1\textsuperscript{st} search leg: \( XTK = 0.0 \text{ nm}; \ DTK = 95 \text{ deg}; \ TRK = 95 \text{ deg} \)

The 2\textsuperscript{nd} search leg: \( XTK = 1.0 \text{ nm}; \ DTK = 95 \text{ deg}; \ TRK = 275 \text{ deg} \)

The 3\textsuperscript{rd} search leg: \( XTK = 2.0 \text{ nm}; \ DTK = 95 \text{ deg}; \ TRK = 95 \text{ deg} \)

The 4\textsuperscript{th} search leg: \( XTK = 3.0 \text{ nm}; \ DTK = 95 \text{ deg}; \ TRK = 275 \text{ deg} \)

The additional 5 deg, (90 + 5) and (270 + 5), is the magnetic variation in Miami Grid 4D.

**MARK A TARGET**

Press the RANGE-PAN knob when the aircraft flies over the target. This will put a white cross on the MFD. Do not toggle the RANGE-PAN knob after marking. This will change the marked location. Write down the Latitude and Longitude of the marked location. It is displayed upper left corner of the MFD.

If you want to name the marked target, press the ENTER key to go direct to the USER WAYPOINT page. Using Inner and Outer FMS knobs to name the marked target and press the ENTER key.
Press the PAN-RANGE knob over the target, and then press the ENTER key to go direct to the USER WAYPOINT page.

Name the marked target using the Inner and Outer FMS knob.

Press the ENTER key to save the location of MARK.
Press the FMS knob and then hold the CLR key to return to the MAP page. The holding of the CLR key does not work on the G1000 Trainer. Use the Outer FMS knob.