

GX55 GPS Exercises

The purpose of this document is to give you some useful hands-on practice with the Apollo GX55 GPS unit installed in most CAP airplane. The exercises can be done in the airplane with the actual GPS unit or on the PC-based simulator.

These exercises are not intended to replace any of the user documentation that comes with the GPS or the simulator. They are intended to familiarize you with many of the practical GPS tasks that you may perform on an actual CAP mission as a Mission Pilot or Mission Observer. A level of basic familiarity with the GX55 unit is assumed.

Some exercises may seem a bit contrived, and this is intentional. When you can do these exercises, you should be able to perform the necessary tasks on the GPS during an actual CAP mission. (Just like so many maneuvers that pilots have to practice, but would probably never actually do in normal flight operations.) The exercises use airports and other waypoints in Minnesota, but can be easily modified for use elsewhere.

The basic PC GX55 simulator is available free for download from Garmin at <http://www.garmin.com/products/gx55/>

Garmin offers a more advanced simulator for purchase, but all of the exercises here can be done using the basic simulator.

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Important Note:

After you start the GX55 simulator program, but before clicking the ON button, be sure to click "Options" on the menu bar and verify that SAR is checked. This enables the Search-and-Rescue functions of the GPS simulator. You should only need to do this the first time you start the simulator on your PC. (On the real GPS unit this function is already turned on.)

Exercise

Create user waypoints

- Lat/Long
 - **UWP1** 45° 38.22' N 93° 28.12' W
 - **UWP2** 45° 31.89' N 93° 20.71' W
 - **UWP3** 45° 23.90' N 93° 09.91' W
- Radial/Distance
 - **UWP11** STC airport 238° bearing 31.4 nm
 - **UWP12** DWN VOR 330° bearing 27.8 nm
 - **UWP13** WHISK INT 264° bearing 83.1 nm
- US Grid
 - Grid 474C3 (MSP sectional)
 - Grid 323D4 (GRB sectional)
 - Grid 89B2 (OMA sectional)

Solution

Create user waypoints based on Lat / Long

- Press the NAV button, then the DB smart key
- Turn the large knob until the screen reads "**Create User Wpt by Lat/Lon**"
- Press the ENTER button
- (Turn the large knob to move the cursor from one field to the next.)
- Turn the small knob to change the value under the cursor.)
- Enter a user waypoint name of **UWP1**
- Move the cursor to the latitude line and enter **45 38.22 N**
- Move the cursor to the longitude line and enter **093 28.12 W**
- Press the ENTER button

Repeat this process for the other two Lat/Long user waypoints.

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Create user waypoints based on Radial / Distance

- Turn the large knob until the screen reads "**Create User Wpt by Radial/Dist**"
- Press the ENTER button
- Turn the large knob one click to the left so that **CHG?** is blinking in the **Ref Wpt** field
- Press the ENTER button
- **AIRPORT** is blinking
- Use the large and small knobs to enter **STC** as the airport identifier
- Press the ENTER button
- Enter **238.0°** and **031.4** nm and press the ENTER button
- Enter **UWP11** as the waypoint name and press the ENTER button again

Note:

The screen will display the coordinates of this waypoint as Lat/Long, rather than as a Radial/Distance. This is how the GPS stores waypoints. You are no longer able to see the position as a Radial/Distance.

Repeat this process for the other two Lat/Long user waypoints.

With AIRPORT blinking, turn the small knob until the value changes to **VOR** or **INT**
Then follow the same steps as you did for an airport

Create user waypoints based on US Grids

- Press the MAP button
- Turn the large knob one click to the left so the data screen appears
- Turn the small knob one or two clicks to the left so the **SAR MAP** screen appears
- Press the SEL button and use the large knob to move the cursor to the **POSITION** field
- Turn the small knob until **MSP** appears
- Press the ENTER button

- Press the NAV button, then the DB smart key
- Turn the large knob until the screen reads "**Create User Wpt by US GRID**"
- Press the ENTER button
- Enter **474C3** as the waypoint name and press the ENTER button
- The name of the waypoint is **474C3**

Repeat this process for the other two US GRID waypoints

(Be sure to go to the **SAP MAP** screen each time and change the POSITION value, so you are on the correct sectional chart.)

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Exercise

Create flight plans

- **FP1:** PNM airport → CBG airport → 21D airport → land at OEO airport
- **FP2:** STC airport → DWN VOR → CLAPS INT → land at AXN airport
- **FP3:** FCM airport → HCD airport → RWF airport → land at ILL airport

Solution

Create FP1: PNM airport → CBG airport → 21D airport → land at OEO apt

- Press the NAV button, then press the FPL smart key
- Turn the large knob until the screen reads "**Press SEL to Create a New Flight Plan**"
- Press the SEL button
- Enter **FP1** as the name of the flight plan and press the ENTER button
- The screen now reads "**Turn Small Knob to Ins Wpts or SEL for Options**"
- Turn the small knob one click to the right, and press the SEL button
 - **Ins?** is blinking in the top left position. Press the ENTER button
AIRPORT is blinking. Enter airport **PNM** and press the ENTER button
 - **Ins?** is blinking in the top right position. Press the ENTER button
AIRPORT is blinking. Enter airport **CBG** and press the ENTER button
 - **Ins?** is blinking in the top right position. Press the ENTER button
AIRPORT is blinking. Enter airport **21D** and press the ENTER button
 - **Ins?** is blinking in the top right position. Press the ENTER button
AIRPORT is blinking. Enter airport **OEO** and press the ENTER button
- Press the SEL button. Flight plan FP1 is now stored in the database

Repeat this process to enter flight plans **FP2** and **FP3**

Note:

FP2 uses a VOR and an INT as waypoints, rather than all airports.

With **AIRPORT** blinking, turn the small knob to change the value to **VOR** or **INT** and then enter the name of the VOR or INT

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Exercise

Edit flight plans (active and inactive)

- Edit **FP1** waypoints
 - Insert UWP1 between PNM and CBG airports
 - Insert UWP2 between 21D and OEO airports
 - Change 21D airport to UWP3
 - Change OEO airport to ANE airport
 - Remove CBG airport from the flight plan
- New **FP1**: PNM airport → UWP1 → UWP3 → UWP2 → ANE airport
- Make a copy of **FP3**. Name the copy **FP4**.
- Activate **FP3** and then modify the active flight plan:
 - Insert a stop at Glencoe airport (GYL or Y29) between FCM and HCD

Solution

Edit FP1 waypoints

- Press the NAV button, then press the FPL smart key
- Turn the large knob to the right until the **FP1** flight plan is displayed

Insert UWP1 between PNM and CBG airports

- Turn the small knob to the right until the "**PNM to CBG**" screen is displayed
- Press the SEL button and move the cursor over **CBG** so it blinks **Chg?**
- Turn the small knob to change **Chg?** to **Ins?** and press the ENTER button
- Turn the small knob until **USER** is blinking
- Move the cursor to the waypoint name field (large knob)
- Turn the small knob until **UWP1** appears
- Press the ENTER button
- The top of the screen now reads "**PNM to UWP1**"

Insert UWP2 between 21D and OEO airports

- Turn the small knob until the "**21D to OEO**" screen is displayed
- Press the SEL button and move the cursor over **OEO** so it blinks **Chg?**
- Turn the small knob to change **Chg?** to **Ins?** and press the ENTER button
- Turn the small knob until **USER** is blinking
- Move the cursor to the waypoint name field (large knob)
- Enter **UWP2** as the waypoint
(Either enter each letter, or press SEL and then use the small knob to cycle through the list of waypoints.)
- Press the ENTER button
- The top of the screen now reads "**21D to UWP2**"

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Change 21D airport to UWP3

- With the "**21D to UWP2**" screen still on display, press the SEL button
- **21D** changes to a blinking **Chg?**
- Press the ENTER button
- **USER** is blinking. Change the value to **UWP3**
- Press the ENTER button
- The top of the screen now reads "**UWP3 to UWP2**"

Change OEO airport to ANE airport

- Turn the small knob until the "**UPW2 to OEO**" screen is displayed
- Press the SEL button and move the cursor over **OEO** so it blinks **Chg?**
- Press the ENTER button
- Turn the small knob until **AIRPORT** is blinking
- Move the cursor to the waypoint name field (large knob)
- Enter **ANE** as the airport
- Press the ENTER button
- The top of the screen now reads "**UWP2 to ANE**"

Remove CBG airport from the flight plan

- Turn the small knob until the "**UPW1 to CBG**" screen is displayed
- Press the SEL button and move the cursor over **CBG** so it blinks **Chg?**
- Turn the small knob to change **Chg?** to **Del?** and press the ENTER button
- Press the ENTER button
- The top of the screen now reads "**UWP3 to UWP2**"

Turn the small knob to cycle through the screens of **FP1** and verify that the sequence is now: **PNM** airport → **UWP1** → **UWP3** → **UWP2** → **ANE** airport

Make a copy of FP3. Name the copy FP4

Note:

What you have to do is create an empty **FP4** and then copy **FP3** into it.

You cannot do the equivalent of a "Save As ..."

- Press the NAV button, then press the FPL smart key
- Turn the large knob until the screen reads "**Press SEL to Create a New Flight Plan**"
- Press the SEL button
- Enter **FP4** as the name of the flight plan and press the ENTER button
- The screen now reads "**Turn Small Knob to Ins Wpts or SEL for Options**"
- Press the SEL button
- Turn the small knob until **Copy Plan?** is blinking, and press the ENTER button
- ***Active*** is blinking
- Turn the small knob until **FP3** is blinking, and press the ENTER button

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Activate FP3 and then modify the active flight plan.

Insert a stop at Glencoe airport (GYL or Y29) between FCM and HCD

- Press the NAV button, then press the FPL smart key
- Turn the large knob until the **FP3** flight plan is displayed
- Press the SEL button
- Turn the small knob (if necessary) until **Activate?** is blinking
- Press the ENTER button. This copies **FP3** to the active flight plan

- Press the NAV button, then press the FPL smart key
- Turn the large knob until the ***Active*** flight plan is displayed
- Turn the small knob until the **"FCM to HCD"** screen is displayed
- Press the SEL button and move the cursor over **HCD** so it blinks **Chg?**
- Turn the small knob to change **Chg?** to **Ins?** and press the ENTER button
- Turn the small knob (if necessary) until **AIRPORT** is blinking
- Move the cursor to the waypoint name field (large knob)
- Enter **GYL** as the airport (or **Y29**, depending on the age of your database)
- Press the ENTER button
- The top of the screen now reads **"FCM to Y29"**
- Turn the small knob one click to the right to display the next leg of the plan
- The top of the screen now reads **"Y29 to HCD"**

Note:

This change is not saved in the **FP3** flight plan – only in the currently active flight plan. If you want to make this a permanent change to **FP3**, you must edit that flight plan directly.

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Exercise

Get a list of the 20 nearest airports.
Pick the 3rd closest one and go Direct-To it.

Get a list of the 20 nearest VORs.
Pick the 5th closest one and go Direct-To it.

Solution

Fly direct to the 3rd closest airport

- Press the NRST button
- **AIRPORT** is displayed on the middle line of the screen
- Turn the small knob to the right until the screen reads "**Near 3 to PPos**"
- Press the D button, then press the ENTER button
- Press the MAP key to confirm that you are now on a direct course to that airport

Fly direct to the 5th closest VOR

- Press the NRST button
- Turn the large knob until **VOR** is displayed on the middle line of the screen
- Turn the small knob to the right until the screen reads "**Near 5 to PPos**"
- Press the D button, then press the ENTER button
- Press the MAP key to confirm that you are now on a direct course to that VOR

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Exercise

Show how to display airports and VORs on the moving map:




- Location and name
- Location only
- No display

Solution

- Press the MAP button
- Turn the large knob until either map is displayed with the sequence of smart keys:
MSG – APT – VOR – INT
- Press the APT or VOR smart keys to cycle through the 3 levels of display
- See the table below for details

Note:

Waypoint identifiers in the active flight plan are always displayed.

	Waypoint identifier and location symbol both displayed.
	Only waypoint location symbol displayed.
	No waypoint information displayed

Exercise

Display the current (ongoing) GPS position of the airplane (in Lat/Long).

Solution

Press the NAV button

Turn the large button to the right until the screen reads "**GPS Position**"

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Exercise

Capture the current Lat/Long of your airplane.
Save this as a user waypoint.

Solution

- Press the MAP button
- Turn the large knob until the second large map (the SAR map) appears on the screen with the sequence of smart keys: **MSG – GRD – MRK – PAT**
- Press the MRK smart key to capture the current Lat/Long position
- The default name of this new user waypoint is **SAR000**
- Change this name to the name of your choice and press the ENTER button
- The new user waypoint is now saved in the GPS database

Note:

This is also a very handy way to save your current Lat/Long position on the screen so you can write it down and call it in to Mission Base, even if you don't save it as a waypoint.

Exercise

Find the 3-letter identifier of the Buffalo, MN airport.
(The 3-letter identifier of the Buffalo airport on the sectional chart has changed since the GX55 database on the simulator was created.)

Solution

To find the old identifier – the one the simulator knows – create and activate a flight plan from Maple Lake (MGG) to ANE and notice the identifier of the Buffalo airport on the map as you fly by it.

This is useful when you need to find the old identifier of an airport for planning purposes, but you don't have an old sectional chart.

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Exercise

Set up search patterns

- Parallel line (grid) search of US Grid 505B2 on the MSP sectional
- Creeping line search from STC airport to LJF airport
- Expanding square search starting over User Waypoint UWP12

Solution

Parallel line (grid) search of US Grid 505B2 on the MSP sectional

- Press the MAP button
- Turn the large knob one click to the left so the data screen appears
- Turn the small knob one or two clicks to the left so the **SAR MAP** screen appears
- Press the SEL button and use the large knob to move the cursor to the **POSITION** field
- Turn the small knob until **MSP** appears
- Press the ENTER button

- Turn the large knob until the second large map (the SAR map) appears on the screen with the sequence of smart keys: **MSG – GRD – MRK – PAT**
- Press the PAT smart key
- **Parallel Line** is blinking. Press the ENTER button
- Press the SEL button
- Enter the US Grid **505B2**
- Move to the next field and turn the small knob to set **Spacing** of **1.0** miles
- Move to the next field and turn the small knob to set **Direction** to **E / W**
- Press the ENTER button
- Press the ENTER button again

The simulator will position you at the start of the search pattern.

You may need to use the small knob to zoom in or out to see the pattern clearly.

Note:

When you actually fly such a search pattern in an airplane, you must navigate to the Grid and then enter the search area. Remember that the first point of the search pattern is labeled **0**, not **1**. This is because the numbers refer to the turns, not the legs of the pattern.

Creeping line search from STC airport to LJF airport

- Press the MAP button
- Turn the large knob until the second large map (the SAR map) appears on the screen with the sequence of smart keys: **MSG – GRD – MRK – PAT**
- Press the PAT smart key – **Parallel Line** is blinking
- Turn the small knob so that **Creeping Line** is blinking
- Press the ENTER button
- Press the SEL button – **Ins?** is blinking

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- Press the ENTER button and enter the airport ID of **STC**
- Press the ENTER button
- Turn the small knob to set **Spacing** to **0.7** miles
- Move to the Direction field and enter **215**
(You must determine this direction yourself; the GPS does not ask you for a destination or search end point – only a direction of the creeping line.)
- Press the ENTER button (once)
- Turn the small knob to move to the next screen and press the SEL button
- Enter **Leg Length** of **4.2** and **Turns** of **LEFT**
- Press the ENTER button
- Press the ENTER button again

The simulator will position you at the start of the search pattern.

You may need to use the small knob to zoom in or out to see the pattern clearly.

Expanding square search starting over user waypoint **UWP12**

- Press the MAP button
- Turn the large knob until the second large map (the SAR map) appears on the screen with the sequence of smart keys: **MSG – GRD – MRK – PAT**
- Press the PAT smart key – **Parallel Line** is blinking
- Turn the small knob so that **Expanding Square** is blinking
- Press the ENTER button
- Press the SEL button – **Ins?** is blinking
- Press the ENTER button – **AIRPORT** is blinking
- Turn the small knob until **USER** is blinking
- Turn the large knob to the right and press the SEL button
- Turn the small knob until **UWP12** is displayed
- Press the ENTER button
- Turn the small knob to set **Spacing** to **0.7** miles and Direction to **117**
- Press the ENTER button
- Press the ENTER button again

The simulator will position you at the start of the search pattern.

You may need to use the small knob to zoom in or out to see the pattern clearly.