A G3X Touch Primer, with GFC 500 AutoPilot

Standard view of the G3X Touch, and the 507 (GFC 500)

A personal 'Dummies' /Cheat Sheet Orientation to the G3X and GFC 500

You can find this PDF at www.N78HF.com, then the Documents Page

This version was last saved on :August 1, 2024

A G3X Touch Primer,
with GFC 500 AutoPilot

G3X Touch User-definable Configuration Note:

THIS screen below shows:

ROUND Gauges, and **FULL** Screen Mode

But you can also mix-n-match to have

TAPES (example on p7) and **SPLIT Screen** (example on p6)

You can switch between Round and Tape gauges as shown on p7 (Menu/More_Options/Gauges), and you can switch between Full and Split screen with 1 touch (as I often do in flight) simply by tapping the Split/Full icon in the upper right corner of the screen, or just tapping the inset to see that inset as a full half screen!

<u>Simplified 4-part breakdown</u>.....

Com/Nav System (CNS)

AFCS ("AutoPilot")

PFD

MFD Pages

For starters, I like THIS breakdown better than the more detailed one on the next page because it is less cluttered.

The Chapter breakouts are using the numbering on the next page, so we use that for the rest of this document 😊..

A G3 Primer, with GFC 500

(1,2,3) The **CNS** (Communication, Navigation System) can be re-arranged if you want, as shown later on page 35		Touch Screen ?:
1)	Com radios (up to 2, I only have 1): Active and Standby	Stby:
2)	Navigation Waypoints. Can be Configured by CNS on on page 35:	
3)	Transponder Interface	Freq & Ident
4)	Full/Split Screen Toggle Button – always right there	Icon
5)	AFCS (Automated Flight Control System, aka 'auto pilot') Command bar	Anywhere: 507 equivalent
6)	IAS	
7)	Attitude Indicator, with CDI and VDI	
8)	Altimeter & VSI	Altitude & Barometer
9)	Left & Right Inset. You can set which 2 of 9 choices	Anywhere to send to split MFD
10)	HSI	HDG & (CRS?)
11)	Timer/ OAT /Local Time	Timer
12)	NRST and Direct button	
13)	MENU and BACK button	

Be forewarned : "The unavoidable step-child of POWER & FLEXIBILITY, is Complexity & Confusion".

A G3 Primer, with GFC 500

You can find this PDF at www.N78HF.com, then the Documents Page

Being dumped in front of a G3X is like a 10 yr old being dumped in the middle of Disney World.

These notes are like a Cheat Sheet/Crib/Quick-Reference guide or 'birds eye view map' to give you a visual clue for

> **"Oh, now that I SEE that, and where it is, it will be easier to remember how to use it, and get to it when I need it"**
>
> *These are the screen shots and explanations you would get if you sat in the cockpit for hours, taking pictures and making notes of "what option is where?"*

Some Philosophy/Insight about the "G3 System"

The G3 is a bit like Off Track Betting. OTB is a place where you can have drinks and bet on the horses – even where betting is illegal. That's because they don't actually TAKE your bets, they are a 'courier service' that has people at the track that simply relay your request on your behalf, and return the results/winnings. The G3 is a bit like that: In and of itself IT does NOTHING – it is a 'front office', 'liaison' or 'middleman' for all the OTHER devices (GPS, Radios, Autopilot, Transponder, etc) that actually DO the work.

For example, when you are told to 'Squawk VFR' , you press the G3 Transponder icon and tap the [VFR] button on the G3 screen. The G3 then turns around to a compatible Transponder and tells IT to squawk 1200, whether the Transponder knew that 'VFR' was 1200 or not – the G3 'did the thinking' and the Transponder just did what it was told.

Radios are much the same, with a bit more smarts on the front. The Radio/[FIND] button pulls up a list of airports (from your choice of "Nearest", "from FPL", or "Recent" …) for you to choose from, and from its stored database of frequencies offers you a 'point and click' selection of Tower, Ground, ATIS, Approach, etc. And then just like the VFR button example above, just sends that frequency to the radio. Effectively, the radio is 'dumb' – the G3 does all the thinking, and the radio just does what it's told.

Like an All-in-One TV Remote that controls *everything from one spot*. I seldom touch my 530 GPS, and almost never touch my Radios or Transponder – the G3 does it all for me, so I only interact with the G3. And the G3 full screen interface is sooo much nicer than any physical buttons on the actual devices.

Disclaimer: **Use this information at your own risk These are my personal notes and should be viewed as such. Garmin has not reviewed nor endorsed anything herein, and neither they nor the author make any warranties of any kind (expressed or implied) including Merchantability or Fitness for a particular purpose. Some graphics may be copyrighted by Garmin and are reproduced herein under the federal Fair Use doctrine**

A G3 Primer, with the 530 AutoPilot

Table of Contents *(Uses Heading Style for automatic TOC)*

G3 Overview of Main Screen Choices 2

Main MENU Page 3

G3 Overview and Insets – 4

Section 6 (V Speeds), 10 (Heading) & 8 (ALTitude) 5

Baro Setting 6

Section 7 & 10: AI & HSI 6

Section 2 – Navigation section of CNS bar 8

Section 3 - Transponder 8

Section 11 – Timer Time and Temperature 8

Section 1 – Frequencies 9

Section 9 Insets and MFD Pages 10

Section 12 – NRST and Direct To 18

Autopilot / Automated Flight Control System (AFCS) 19

Overview 19

Simple Scenario, showing the AFCS display on the G3 21

Approaches..: 23

. - - - IFR GPS Approach 24

. - - - IFR – ILS Approaches 24

…… GOING MISSED 27

Using CRS/OBS pointer: 28

ESP: Electronic Stability Protection 29

The GNS 530W specifically 30

Transferring FPL between Foreflight, G3 and GNS 530 31

Configuration Menus 35

Overview / Layout of Screens, Sub-Screens and options 35

PFD Menu 36

"Main Menu" = Menu key x2 37

CNS Data Bar options 38

Power up Master option settings 40

G5 42

Subscriptions/Training/Support 43

Henry@N78HF.com

G3 Overview / MENUs

G3 Overview of Main Screen Choices

I'm using round gauges, but you can easily select to use tapes. In either case the G3 screen can operate in either the Full Screen Mode at left (with your choice of insets in the lower corners) or Split Screen mode with any of the inset choices displayed on half the screen, as shown Exact choices shown on page 10.

Here, we just touched on the lower left Map inset, and that brought it up to Split Screen

FULL SCREEN MODE	SPLIT SCREEN MODE
Note that the left image is using ROUND Gauges for the PFD, *and the right image is using TAPEs – as soon as I replace the screen shot!.* You can select which style you want by pressing the physical MENU button (or tapping on the PFD/HSI), and selecting the MORE option, as shown below	
The MFD can be: Map, Chart, Waypoint, FPL, Terrain, Traffic, Info, or Weather *(Need XM or ADSB In for Traffic/Wx)* Once in Split/MFD mode, the lower right knob allows you to scroll between these choices for the screen to show.	

You can toggle <u>to the Split screen</u> mode (and back) in a few ways

A) In the full screen mode, just tap on the desired **<u>Inset</u>** to make the display split screen (50/50), with *<u>that</u>* Inset now being the Split MFD half of the screen.
   a. Once in split screen mode, you can use the lower right knob to switch to the other MFD pages.

B) Tap on the Full/Split icon in the top right of the Menu Bar to split the screen, and then use the right knob to scroll through the above MFD choices for that half of the screen.

To return <u>to full screen</u>, either

1) Tap anywhere on the PFD side of the screen (that isn't a designated 'button' for something else (like Altitude or AutoPilot)), and you will return to the Full Screen PFD
2) Tap on the Full/Split Toggle icon on the top right
3) Press the physical BACK button on the lower right.

G3 Overview / MENUs

Main MENU Page

The physical MENU button on the lower right will be used a LOT to get to options within each function.

The Physical MENU button is context sensitive: It changes based on the Current Page.

Also: If you PRESS-AND-HOLD the MENU button, it will save a SCR Shot of the current G3 screen to the SD card. You can then either take that SD Card home to your PC, or copy it to your phone and mail it to yourself right from the cockpit. For the iPhone you'll need a $10-$15 card reader, and the FILES app.

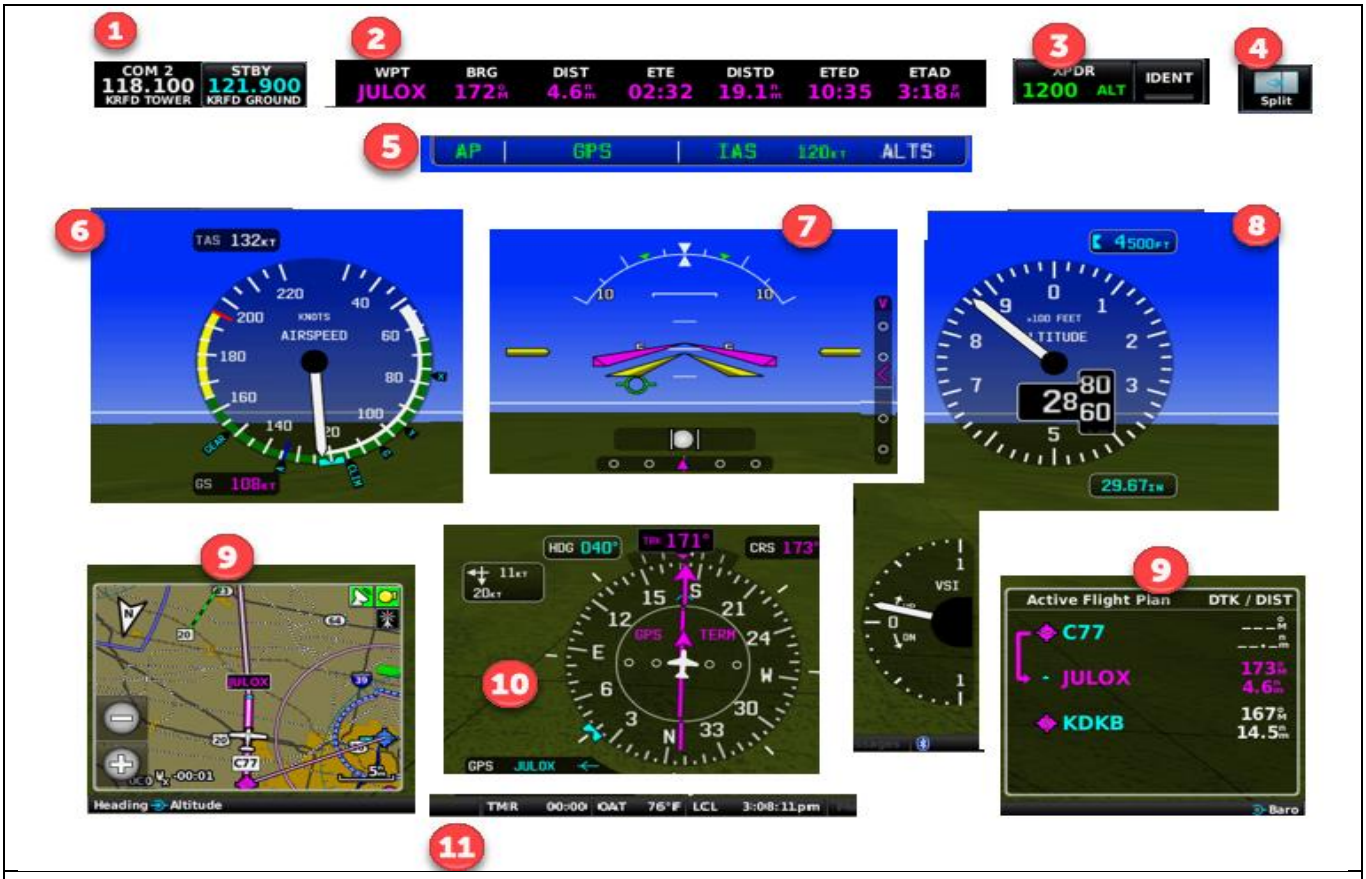
Here, we were in the Full Screen PFD mode when we pressed the MENU button
You can also get here by pressing the H S I at any time

From the [MORE OPTIONS] button, you can change these things

PFD (Rnd vs Tape)	Attitude width	Wind Vector Style (*Arrow or Head/Cross)*	Std Rate Turn *(Show green ticks or not)*	H S I (***HDG*** *or* ***TRK****)*
CDI Scale	SFD Baro Sync	Right Knob Action	Airport Signs	G Meter
Synthetic Vision	Lateral Deviation	Press Toggles Knob	Flight Path Marker *('You are pointed here' dot)*	Pathways *(Highway in sky)*
Traffic				

G3 As its own entity / interface

G3 Overview and Insets –



There are SO many things going on in the G3 Screen, we break them up and discuss them one at a time.

(1,2,3) is the **CNS** (Communication, Navigation System) and can be re-arranged to your liking, per instructions on page 35		Touch Screen ?:
1)	Com radios (up to 2, I only have 1): Active and Standby	Stby
2)	Navigation Waypoints. Can be Configured by CNS on on page 35:	
3)	Transponder Interface	Freq & Ident
4)	Full/Split Screen Toggle Button – always right there	Icon
5)	**AFCS** (Automated Flight Control System, aka 'auto pilot') Command bar	
6)	IAS	
7)	Attitude Indicator, with CDI and VDI	
8)	Altimeter & VSI	Altitude & Barometer
9)	Left & Right Inset. You can set which 2 of (7) choices, as shown in Section 9 on Page 10	Anywhere to full screen, and some inset-dependent direct touch
10)	HS I	HDG & (CRS?)
11)	Timer/ OAT /Local Time	Timer

A beauty of the G3 User Interface is that they designed the core components and built a web of 'hyperlinks' that interconnect them as would be intuitive. For example, you can get to an Airport Frequency from the WPT page, the FPL, or from the Freq FIND button, etc and they all take you to the same, familiar "Airport Frequency' Page

G3 Setting V Speed and Heading

Section 6 (V Speeds), 10 (Heading) & 8 (ALTitude)

V speeds

These are part of the "One time Setup"

If you use gauges, you don't get a ***digital*** readout of your IAS on the G3 – but you DO see the numeric value on the (mandatory) G5 which I think is always on Tape.

You set your V speeds in the Power Up Menu, on page 40
The only time you have a Speed Bug is when you select to change altitudes via IAS

Setting the HDG and ALT

Nearly identical / parallel implementation for both HDG and ALT.
Each appears as both a digitally displayed numeric value, *and* as a graphical bug/marker.

- HDG values appear above/on the HSI,
- ALT values appear above/on the Tape or Gauge

	507 knob		G3 knob		G3 LCD		
	HDG	ALT	HDG	ALT	HDG	ALT	**The HDG and ALT share the same, lower left knob on the G3 (inner for HDG). So Pressing it Syncs the HDG**
Press	✓	✓	✓	✗	✓	✓	Sync to Current value, or PopUp for G3 LCD
Rotate	✓	✓	✓	✓			

Heading

Which appears as

- 'bug/marker' &
- Digital display

ALTitude

Which appears as

- 'bug/marker' &
- Digital display

My NOTE: Notwithstanding the multiple names the Garmin Docs use to describe this Altitude setting, there are only 2 "Altitude Bug Settings", and a third Altitude Display. **The 2 Bug/Settings are:**

- **ABS (Altitude Bug Setting)** Shown above. My Name Garmin seems to use 'multiple names' ☹
- **Baro Reference (aka 'minimums')** set on the PDF Menu page

And the Altitude that the AP tracks/holds at is shown in the AFCS window, which is uniquely called the

- **Altitude Reference**

***N*OTE:** Pressing the ALT button sets the ABS bug, but in-and-of-itself does NOT affect the Altitude Reference that the AP is tracking. Only engaging IAS or VS pokes the ABS value into the Altitude Reference.

Pretty much IGNORE all the other different terms Garmin has for "Altitude Setting" in their Docs. They confuse things by using 3+ different names for this one ABS setting, each time it is referenced for a different context, or a different chapter, as if by a different author.

G3 Setting Attitude Indicator and HSI

Baro Setting (aka “Kollsman Window)

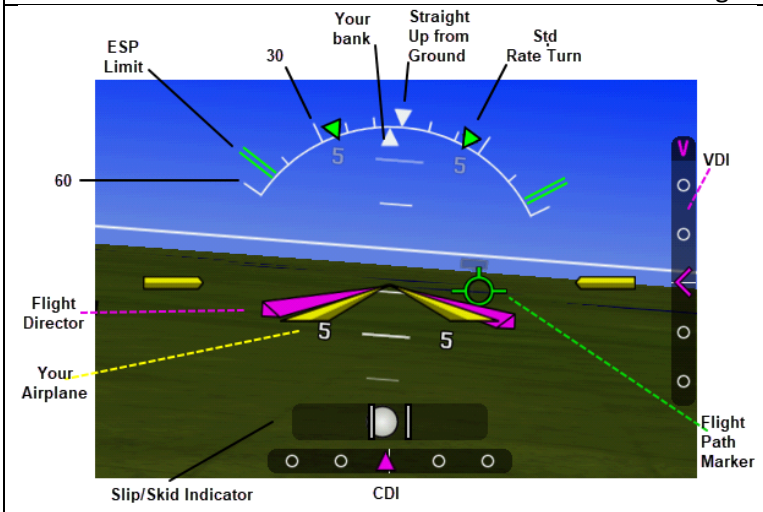
You can set this via the lower right knob, or tap on the Baro value on the G3 Screen to get this pop up, and from there you can just type in the altimeter setting, or [**Set for Field**]

Set for Field uses the GPS to determine your current ‘altitude’ and just makes the Baro setting whatever is needed to put your current altitude at that elevation.

Section 7 & 10: AI & HSI

ATTITUDE INDICATOR

Per Note below.
You should NOT change it from the way your airplane was originally configured. FAA/Liability issues..



The short white tick marks are at 10, 20 degrees, then a big one at 30, then a short one at 45 and then the last tall one at 60

The little green inverted Triangles are the Standard Rate Turn indicators. You can turn these on or off in PFD Menu > More

The parallel green bars are the outer limits of the ESP bank angle, which you can set in the Power Up Men settings in the ESP section

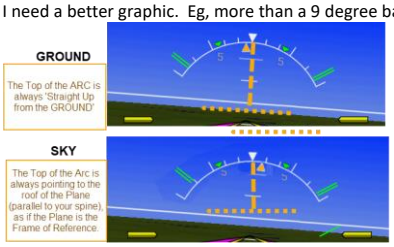
The Flight Path Marker is your Track. In this example, you are crabbing to the left, but your actual ground track is off to the right- where you are actually going.

Technically, you CAN change the style, but this is part of what is ‘certified’ in an Aircraft so you should NOT mess with it! But it is here because it is in the Garmin Certified Pilot guide.

Ground Arc vs Sky Arc

Technically, you have a choice, but “Ground” is the standard and default

I need a better graphic. Eg, more than a 9 degree bank angle…



The Orange triangle is orange only for illustration. In real life, it is white.

You choose between them in the Power Up menu, but per below, you should NOT

The **TOP Triangle** will ALWAYS be fixed to the Arc at the 0-degree mark.

The **BOTTOM Triangle** will ALWAYS be you.
The choice is:

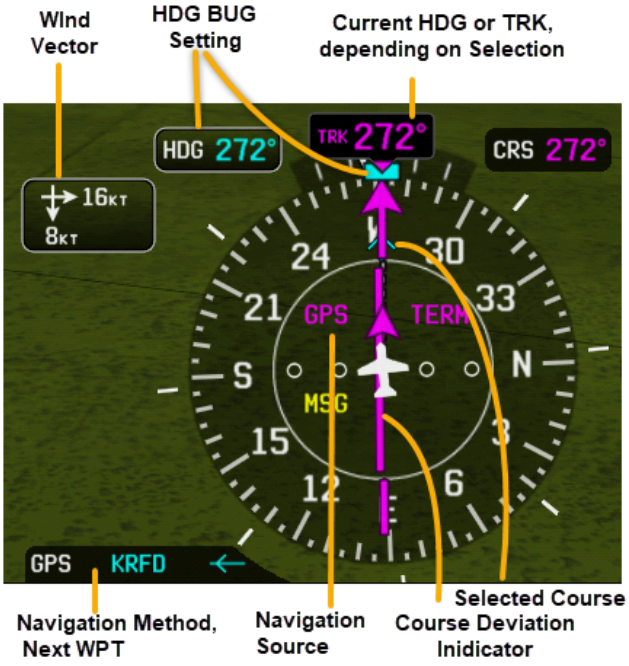
Is the Arc fixed relative to the GROUND or to the airplane (Sky)

GROUND: (default)
The Arc is always fixed to the Ground, and so the Top Pointer is always ‘the real straight up’ (perpendicular to the ground), and it is you - the bottom pointer - that rolls.

SKY:
The Arc always stay horizontal, fixed to you the airplane, and your bank angle is perpendicular to the ground

“Garmin recommends it match the attitude indicator that was removed from the airframe. But if you prefer it from a ground pointer, your dealer can change that in the setup. This is not pilot configurable.

G3 Setting Attitude Indicator and HSI

HSI Section	
	You set the HDG Bug value, per above (knob or tap window) You set the Wind Vector style (single arrow vs Head/Cross) by touching this window or in PDF Menu > More settings. You set the Current HDG or Track in PDF Menu > More (HSI Orientation) NOT SHOWN: Is the Ground Track Marker – a dotted line like the Selected course, but showing your Ground Track on the Compass Rose. (In this image, my Ground Track and my heading overlap) Note: The “Navigation Pointer” in the lower left is more accurately the Pointer assigned in the PFD Menu>Setup. Even on an ILS LOC it may ‘point’ to the FAF

G3 Setting Transponder

Section 2 – Navigation section of CNS bar

You can configure 'what to include and where to put it' in the Main Menu configuration setup simply by pressing the physical G3 Menu button 2x

You can see the starting point of how to change these values in the Data Bar Setup, in the Main Menu > Setup section that starts on page 38

Section 3 - Transponder

If your transponder is current enough, you can both SEE and SET your transponder code from this window.

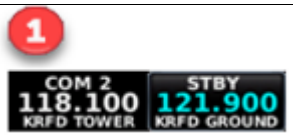
If you tap on the XPDR section (1200 in this example) you get a pop up to type in the value (or [VFR]) and even 'IDENT'

Section 11 – Timer Time and Temperature

If you tap on TMR you get a pop up to START/RESET a timer!

G3 Setting Transponder

Section 1 – Frequencies

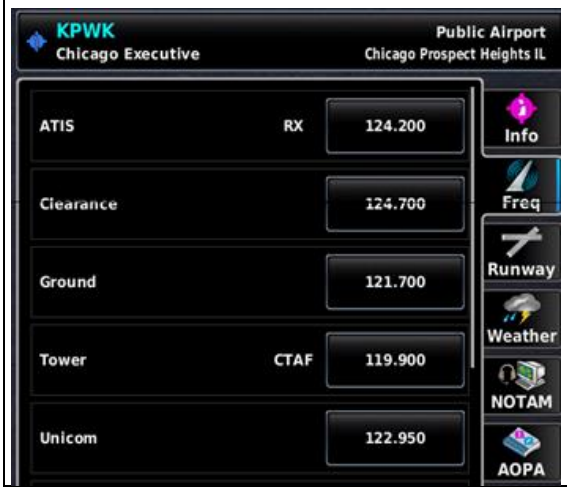
	Tap the STBY Frequency to change the Standby Frequency. On compatible radios, tapping Active will toggle Active/Stby

This starts to get a little more complicated only because you can get to 'Assign a Frequency' from many spots – not just this spot. Ultimately, the COM frequency ends up here, but you can poke that value from many places, like

- The Pop Up keyboard (shown) and just type in a frequency
- Use the FIND button (shown) to find an Airport, and then select which Frequency at that Airport from
  - Recent
  - Nearest
  - FPL
  - User Defined
- From the FPL, select an airport, and then select which Frequency at that Airport
- From the WPT page of the MFD select an airport, and then select which Frequency at that Airport

Then, when you press the **[FIND]** button, you get this pop up menu, to find an airport and then a frequency for that Airport:

And then when you select an Airport, here is a sample of the choices:



And once you select an Airport, the screens are exactly like the MFD WPT screen

G3 INSETS and MFD Pages

Section 9 Insets and MFD Pages

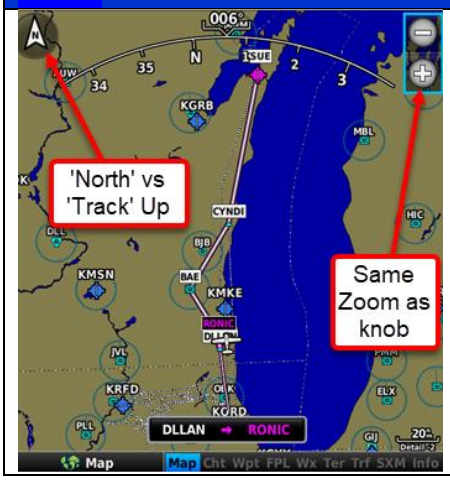
Here are the content choices for PFD **Inset** windows and Split-screen **MFD**

	"Content"	Inset	MFD Page	
1	**Map**	Yes	Yes	
2	**Charts**	NO	Yes	
3	**Waypoint**	NO	Yes	
4	**Flight Plan**	only Right	Yes	
5	**Terrain**	NO	Yes	
6	**Traffic**	Yes	Yes	
7	**Info**	NO	Yes	
8	**Weather**	NO	(Yes)	Only if you have XM or ADSB In, and you can overlay Wx on MAP page
9	**G Meter**	LEFT only	NO	
10	**Nearest**	LEFT only		But if you select as an *Inset*, then TAP the Inset from PFD, it will become a full ½ page MFD
	Video (1)	Yes	Yes	You are NOT SUPPOSED to have Video on Certified Aircraft, but the option appears[HF1]

You select your Insets from the PFD Menu, as shown on page 36

The extra screen shots are what you get when you press the **physical MENU button**, while at each screen.

MAP



When you press the **MENU button**, while looking at MAP:

Map > **Menu**

I Prefer -2
This Value does not show on the map (left)

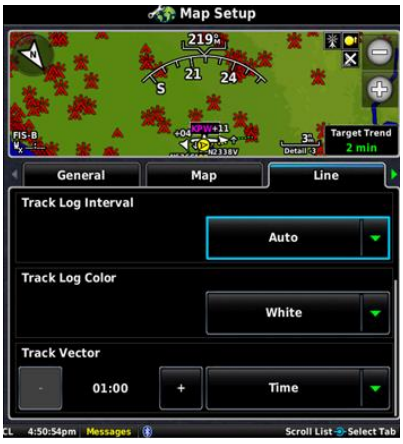
The Map Detail resets every power cycle, and that can NOT be changed 😟

Then the SETUP MAP options:

GENERAL

MAP

LINE



G3 INSETS and MFD Pages

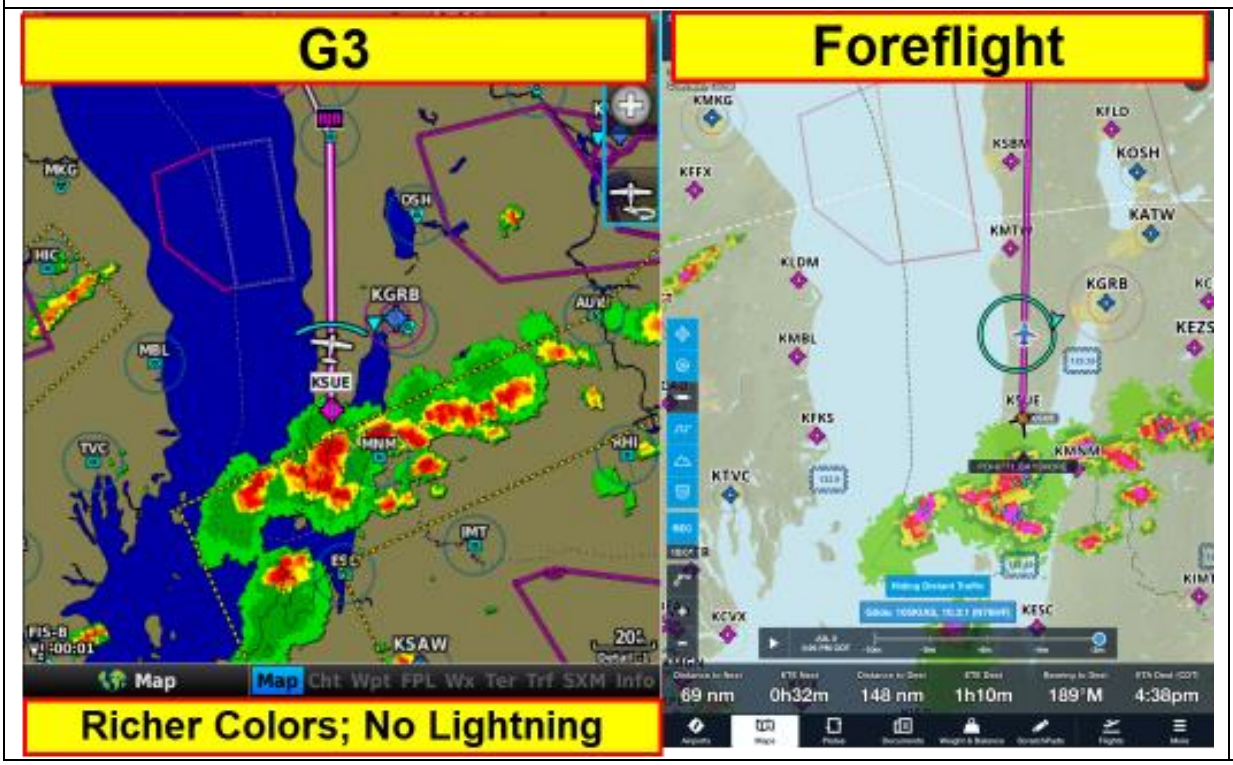
		AKA “Bread Crumb Trail”. I had this on (options above current section shown) and was getting annoyed at all those ‘roads’ clogging up my view, and it was just my breadcrumb line 😟
TRAFFIC 	AIRPORT 	NAVAID
AIRSPACE 	**MISSING *FIS-B WEATHER***	CITY
ROAD 	POINT 	MISCELLANEOUS

G3 INSETS and MFD Pages

Altitude Intercept

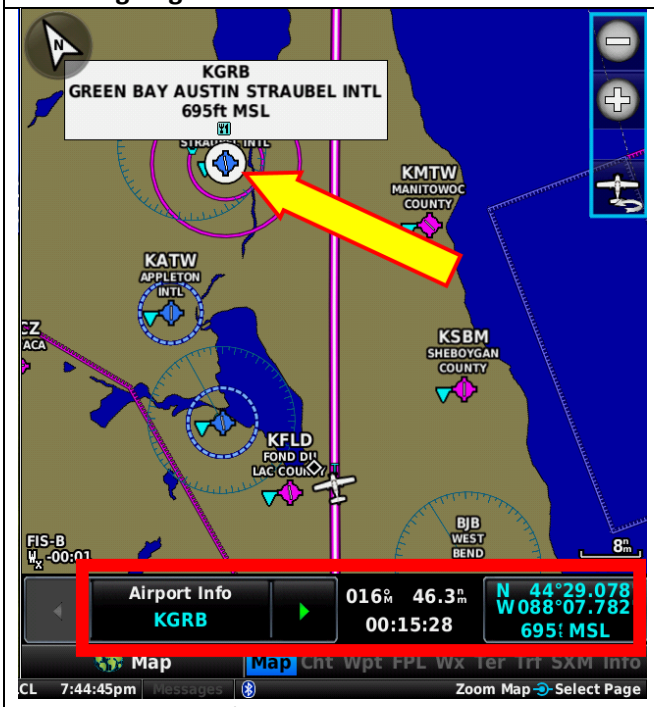
I don't think this even needs an A/P.
It just 'does the math' of how much time (at current VS) to achieve the altitude difference, and then 'where will I be in that many minutes' ?

Weather

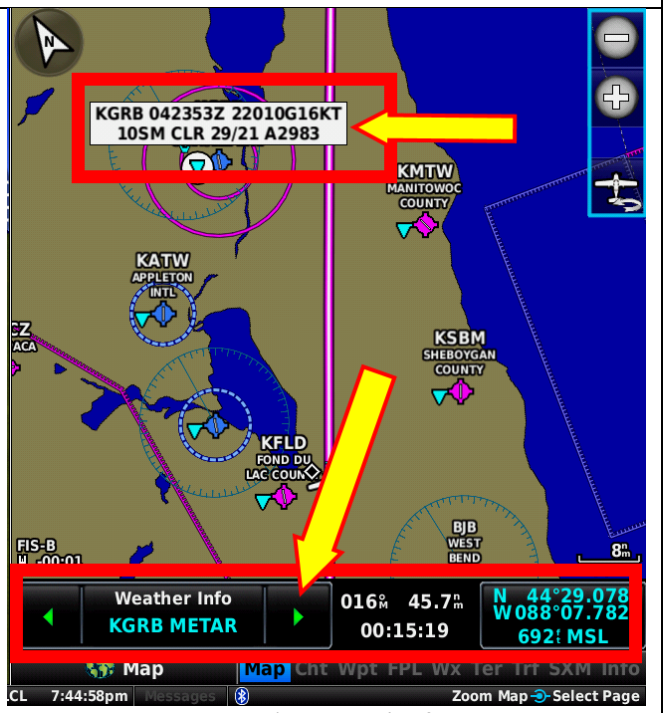


G3 INSETS and MFD Pages

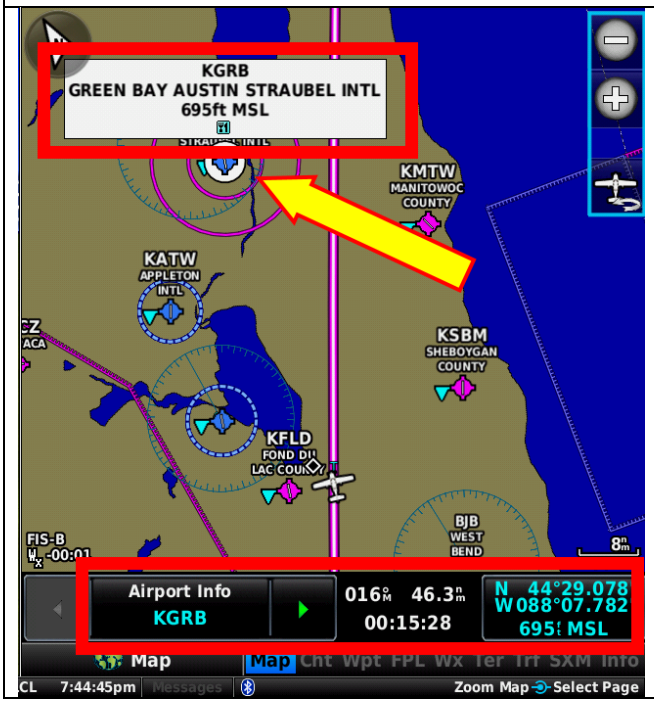
Touching to get Distance and WPT info



You get 'Distance/Bearing' to ANY place you touch.

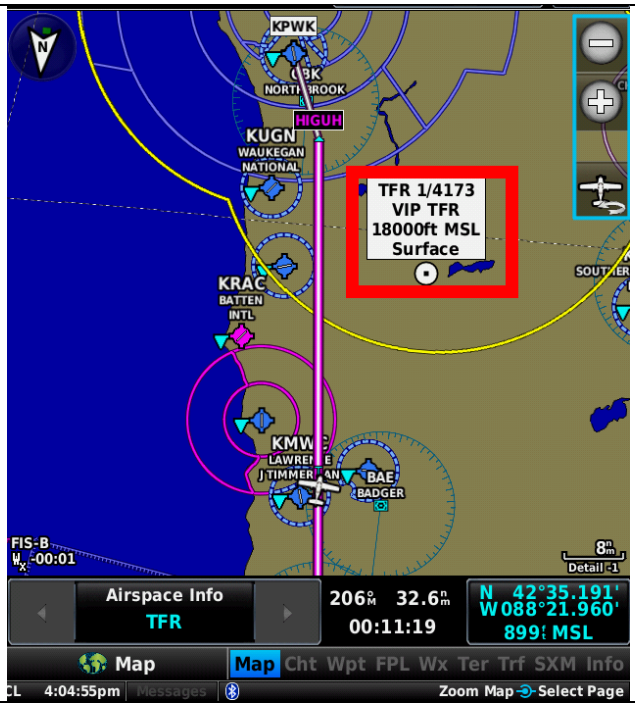


But SOME WPTs have 'More >…' info



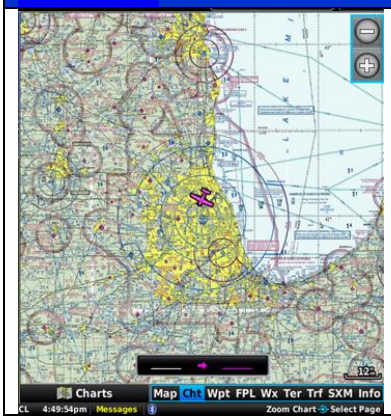
G3 INSETS and MFD Pages

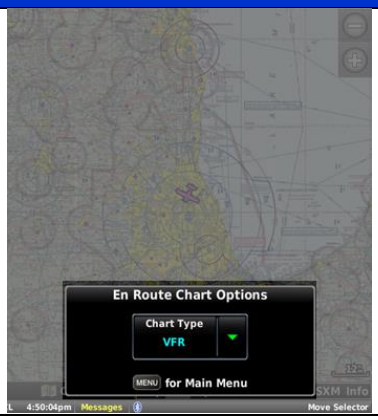
TFRS



G3 INSETS and MFD Pages

CHARTS





VFR
IFR Low
IFR High
Helicopter

WPT *(There are 6 tabs of sub-detail for each waypoint)*

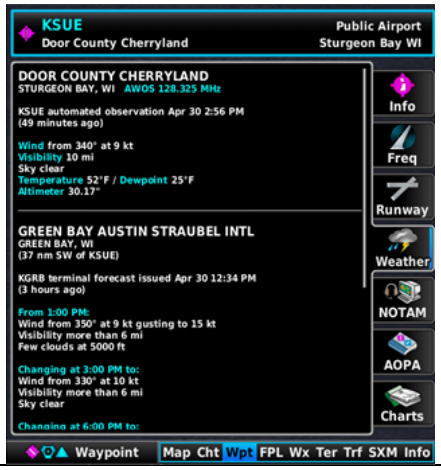
INFO

FREQUENCY

(Same page as used for Freq [FIND])

RUNWAY

WEATHER



NOTAM/ AOPA/CHARTS

MENU Button

G3 INSETS and MFD Pages

FPL

First: A Categorical overview about Flight Plans, as they relate to INTERNAL vs EXTERNAL Navigators (GPS)

The behavior and options differ categorically if you are using the *INTERNAL* G3 GPS, vs an *EXTERNAL* Navigator (a GNS 530W in my case). Garmin tells us that the Internal GPS is NOT certified for IFR operations and will *not* do Approaches; hence it is there mostly for backup.

As a PRACTICAL matter:

I assume that most pilots are flying with an iPad, using Foreflight, Garmin Pilot or equivalent.

With Foreflight *(and certainly Garmin's own version I presume)*, we can almost instantly/seamlessly copy a FPL from the iPad to the External Navigator (e.g., GNS 530) and have it become the FPL for navigation (eg, AutoPilot) within the 2-3 seconds it takes to press 2 icons on the iPad to send the FPL, and 2 on the 530 to accept & activate it.

Therefore, I am not detailing all the options for using the *Internal* FPL/GPS source.

Note that the moment you do Activate a FPL from the External Navigator, it also fills/copies those waypoints as the Internal FPL, if the EXTERNAL Navigator is selected (from the PFD Menu Options)

First, the main screen with the FPL as an inset.

Tap on FPL Inset to bring to split screen

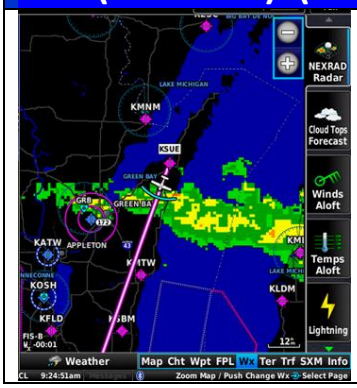
(Not the same FPL as shown at left)

The MOST IMPORTANT thing about the ABOVE screen is that each Waypoint on the FPL is a 'hyperlink' to that Waypoint on the WPT Inset page.

You CAN customize the layout of the MFD, but not as an inset

G3 INSETS and MFD Pages

Wx (Weather) (*There are 5+ tab sub-pages for Wx)*

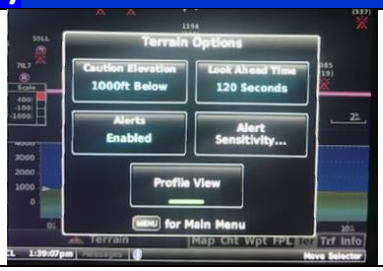


I don't have screen shots for them, but they exist.

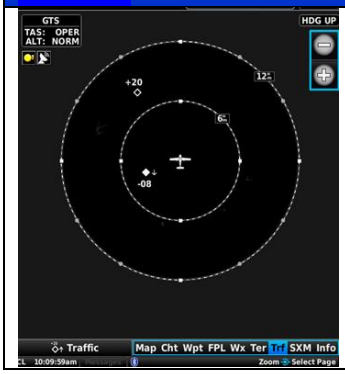
Mostly, I get Wx as an overlay on my MAP page

Need to get Screen Shots for Tops, etc.

Terrain (missing for now)



Traffic



Menu Options

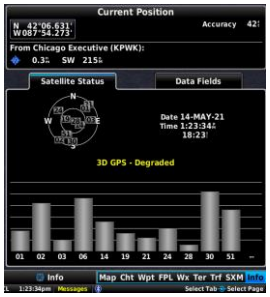
SXM (missing)

I don't have SXM

So I can't get screen shots 😟

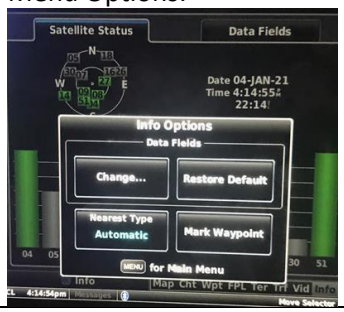
Info

Satellite Status



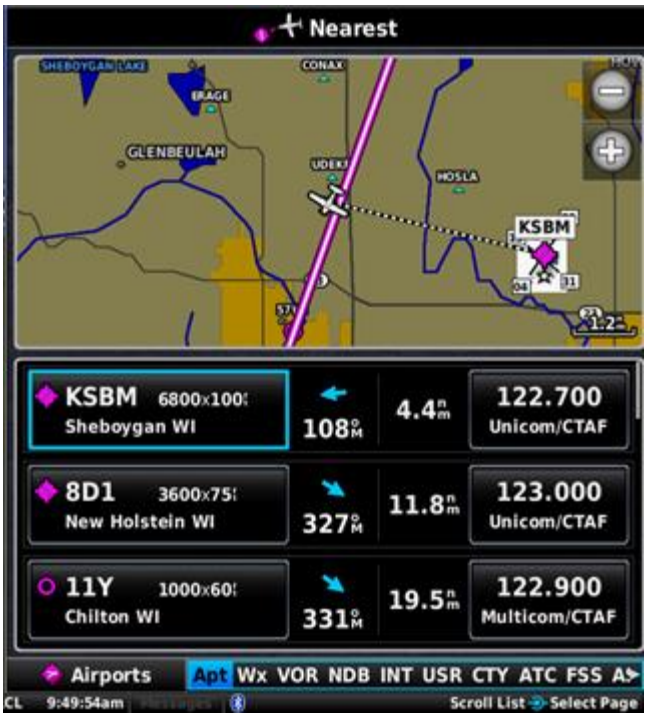
Data Fields

Menu Options:



Section 12 – NRST and Direct To

NRST



But **DIRECT TO** apparently only works when you have selected the INTERNAL GPS SOURCES.

When I was flying on my external GNS 530 GPS and pressed this Direct TO, the message

> "Must switch to Internal Navigator."

appeared, as if to say

> "I can't tell the external navigator what to do, you have to do that manually."

Autopilot / Automated Flight Control System (AFCS)

Overview

IN my case, a GFC 500, with a 507 'Head'

Note: The Term "AutoPilot" is ambiguous, when you get down into the many components of what is collectively called 'The AutoPilot'. Servos, Flight Director, User Input are all part of the now-entrenched term 'autopilot', even to the sad point that the 507 (and the world) labels the button to specifically 'Engage servos, and follow the FD' as *the* "AutoPilot" button.
In programming circles, this is called an 'overcrowded namespace.'

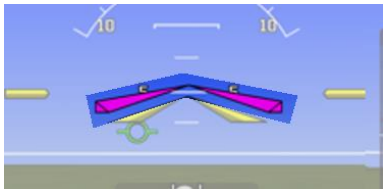
Hence the new term "**AFCS** (Automated Flight Control System)" to uniquely define the *overall collection* of components! But, sadly, many people including Garmin documentation often fall back to the 'well, you know what I mean…' and use ambiguous terms.

MY Explanation:

The "Brains" of the **AutoPilot** are buried away somewhere in the circuits. The **instructions/input** to the AutoPilot are typically through the 507 Mode Controller (or via the G3 touch screen). However they get there, the "AutoPilotBrain (APB)" combines the input from the sensors (GPS, AHRS, Magnetometer) with those instructions from the user - and generates the **Flighgt Director.** The visual representation of the Flight Director is the **Flight Director Command Bars**, though Garmin (and everyone) often uses the two terms interchangeably.The FD is what the APB would like to do (Pitch/Roll) in order to move the plane where the inputs (HDG, NAV) are telling it to go.

IF you engage the Servos (by pressing the [AP] button on the 507), then the servos will follow the FD instead of the pilot having to do such.

507 Mode Controller/Head



Flight Director (FD) Bars

In software programming ciricles, we call this 'namespace overload': Too many words to describe overlapping functionality. Given the above 'my explanation':
The **AFCS** (Automated Fligth Control System) is the web that encompasses

- The "BRAINS" (I think this is what Garmin identifies as the GFC 500 product per se)
- The input (507 or G3). *You don't need the graphic G3, but you do need the physical 507.*
- The **Flight Director** for visual output. *On a G5, if you don't have a G3*
- The **Servos** that follow the FD to 'make it happen'

To be UN-Ambiguous, the [AP] Button on the 507 *should* be labeled (Engage) 'Servo
is too entrenched to not be used here, however misrepresentative that one catch-al
situations.

You can do the same thing from the G3 screen as you can from the physical buttons:

Touch anywhere on the AFCS and you get the following pop up that replicates the functionality of the physical 507:

Sorry it's so small but trust me: It's just the same buttons as on the 507

G3 Overview and Crib Notes - AUTOPILOT

Overview of Input (via the 507)

Lateral:

[HDG]: Just go in the direction set by the HDG Bug
Displays as "HDG" in AFCS window on G3/Lateral section

[NAV]: Follow the Magenta line of the FPL
Displays as "GPS" in AFCS window on G3/Lateral section. *(or LOC for ILS, or VOR or BC)*

If HDG and NAV are selected, it will follow the heading until you intercept the magenta line, then covert automatically to just NAV.

[APPR]: Is basically NAV, but with veritical guidance to detect/intercept/follow the Glide Slope (Called a Glide PATH for GPS)

[LVL] is a 'mode' but 'LVL' does not show anywhere. You see ROL and PIT on the annunciator display.
The exception is that if ESP takes over because you are about to kill yourself, "LVL" will appear in the AFCS window momentnarily, before becoming "ROL" and "PIT"

Vertical:

[ALT] Will hold-or-go-to the current "Altitude Reference" altitude shown in the AFCS bar.
Warning: If you Press-Hold the ALT button, and engage the AP (Servos), you will NOT hold at the current altitude! You will have only set the ABS (Altitude Bug Setting) to your current altitude. You also need to 'poke' this value to the AFCS 'Altitude Reference' which is what the AP tracks. So you must also press [IAS] or [VS] to tell the AP to *Go To* that altitude and make *that* altitude the new Altitude Reference. Yes, "Going TO' the altitude that you are already at is a short trip, but that seems to be the only way to set the critical Altitude Reference value.

[IAS] [VS] Implement what is otherwise called "Altitude Pre-Select Intercept", to have the AP climb/descend to a designated altitude, and then hold at that Altitude.
To use this, you first set a new value for the ABS –(Altitude Bug Setting) via the 507 or G3 which is the final altitude, and then instruct the AP to get there by pitching up/down to maintain either a) Constant Airspeed (the IAS button), or b) a constant vertical speed (the VS button). When the Altimeter value matches the Altitude Bug, the AP levels the plane and sets the Altitude Reference in the AFCS to that altitude (which is the ABS). The ABS is now 'just a marker' of no importance to the AP.
When you press [IAS] OR [VS], the default value will be your current IAS or VS – keeping you level.
You then roll the Nose Up/Dn scroll wheel to climb/descend at the desired rate.

It is suggested that you use IAS, set at V_{cc} (optimal Cruise Climb) for climb, and VS at 500 fpm for descent.

[VNAV] save for a later date…

Fom the YOKE button		
Takeoff (Yoke) (P 338)	Commands a constant pitch angle and wings level on ground in preparation for takeoff	
Go Around (Yoke)	Commands a constant pitch angle and wings level in the air. Will activate 'Altitude Select' if ABS is > 100' current altitude. But you must manually press the OBS (UN suspend) button on the GPS.	

G3 Overview and Crib Notes - AUTOPILOT

1	AP	HDG	ALT 6,000 ft	
2	AP	GPS HDG	IAS | 115kts ALTS	
3	AP	GPS	ALTS ALT	
4	AP	GPS	ALT 2,900 ft	
5	AP	GPS	ALT 2,900 ft GP	
6	AP	GPS	GP	

Simple Scenario, showing the AFCS display on the G3 ...

Unfortunately, the GREEN on BLUE does not PRINT very crisply ☹. The White Outline is only here to PRINT better, not on the G3
ACTIVE is in GREEN, ARMED/STBY is in WHITE

	Lateral	Vertical
1	**HDG** Press HDG and FD will follow HDG Bug	**ALT 2500 Ft** Press ALT and [VS] or [IAS] 'to get there' and AP will go to and hold that altitude (2500 ft per example)
2	**GPS HDG** With a FPL in the GPS, and a magenta line that we are not yet on but 'pointed toward' via HDG, Press NAV. **HDG** remains **Active** and **GPS** (Nav) is **armed** For consistency, the white/armed *should* be on the right, but for legacy reasons, Garmin puts it on the left.	**IAS 115 Kts ALTS** Climbing to 6,000' (via specific airspeed): • Rotate/set the ALT Bug to 6,000' • Press IAS • Rotate Thumbwheel to nose UP until display shows 115Kts *(my Vcc (Cruise Climb speed)). Puts a bug at 115Kts on G3 airspeed display.* Servos will now pitch the plane to maintain 115Kts **IAS** is **Active**, **ALT S**elect is **Armed**
3	**GPS** When you *do* intercept the Magenta line, HDG is automatically DISabled, and GPS/NAV is ENabled and you are flying the Magenta line thereafter.	**ALTSs ALT** You get an audio beep and flash at 1,000' before altitude. As you get within 200' of your final altitude, the Active text flashes to indicate the imminent transition to Alt hold.
4	Just waiting for the Vertical stuff to happen ☺	**ALT 600 Ft** At 6,000' you level off and you are again in ALT Hold mode
	GPS	To simplify the example and use fewer diagrams, assume you have similarly descended to 2900' for the IAF – just like in Step1 - and are now waiting to intercept the Glide Path.
	On your External Navigator, **Load and Activate** the Approach (GNS 530 in my case) You Press **APPR** on the 507, to begin your Approach The CDI and the VDI in in the center of the G3 come alive, but that's a separate storyboard.	
5	**GPS** Automatically Disables [NAV]. No change in AFCS display, unless you are intercepting a LOCalizer, in which case "GPS" becomes "LOC".	**ALT 2900 Fts GP** Glide PATH (GS for an ILS) is now Armed, and waiting to intercept. The VDI will show the GP above the center point
6	**GPS** No change in AFCS display.	**GP** At Glide Path intercept (the dot on the VDI is centered) you have intercepted the GP and 'following the GP' is the vertical command for the AP

AFCS VERTICAL MODES

Vertical Mode	Control	Annunciation	Reference Range	Reference Change Increment
Pitch Hold	(default)	PIT	20° Nose Up 15° Nose Down	0.5°
Selected Altitude Capture	*	ALTS		
Altitude Hold	**ALT** Key	ALT nnnnn		10 FT
Vertical Speed	**VS** Key	VS nnnn	-2000 to +2000 FPM	100 FPM
IAS Hold	**IAS** Key	IAS nnn	80 to 185 KIAS (92 to 213 MPH IAS)	1 KT (1 MPH)
Vertical Path Tracking (VNAV)	**VNAV** Key	VNAV		
VNAV Target Altitude Capture	**	ALTV		
Glidepath	**APR** Key	GP		
Glideslope		GS		
Takeoff or Go Around	**GA** Button	TO or GA	7°	
Level (LVL)	**LVL** Key	LVL	Zero Vertical Speed	
ESP High Pitch Engagement			ESP High Pitch Attitude engages at 20° nose up	
ESP Low Pitch Engagement			ESP Low Pitch Attitude engages at 15° nose down	
ESP High Airspeed Engagement			ESP High Airspeed engages at 198 KIAS (228 MPH IAS)	
ESP Low Airspeed Engagement			When above 200 FT AGL, ESP Low Airspeed engages at 70 KIAS (81 MPH IAS). (This mode only available if height above terrain is available from a compatible Garmin GPS).	

* ALTS arms automatically when PIT, VS, IAS, or GA is active, and when VNAV is active if the Selected Altitude is to be captured instead of the VNAV Target Altitude.

** ALTV arms automatically if the VNAV Target Altitude is to be captured instead of the Selected Altitude.

AFCS LATERAL MODES

Lateral Mode	Control	Annunciation	Maximum Roll Command Limit
Roll Mode	(default)	ROL	30°
Heading Select	**HDG** Key	HDG	30°
Track Select	**TRK** Key	TRK	30°
Navigation, GPS Arm/Capture/Track	**NAV** Key	GPS	30°
Navigation, VOR Enroute and Approach Arm/Capture/Track		VOR	30°
Navigation, LOC Arm/Capture/Track (No Glideslope)		LOC	30°
Backcourse Arm/Capture/Track		BC	30°
Approach, GPS Arm/Capture/Track (Glidepath Mode Automatically Armed, if available)	**APR** Key	GPS	30°
Approach, ILS Arm/Capture/Track (Glideslope Mode Automatically Armed)		LOC	30°
Takeoff or Go Around	**GA** Button	TO or GA	Wings Level
LVL (Level)	**LVL** Key	LVL	Wings Level
ESP Roll Attitude Engagement	ESP Roll Attitude engages at 45°		

Approaches..:

In the 'Old Days' APPR mode used the more sensitive CDI from an ILS signal. But now we're using "to within 10 ft GPS" to begin with, not a VOR or such, so 'heightened sensitivity' when you switch to APPR mode is moot. We're already more sensitive in transit than we ever were with the best ILS.
So there is no reason not to activate APPR mode as soon as you are directed/cleared to the Approach. It does the same thing as NAV does, but also engages vertical descent control.
And even with ILS/VTF, the APPR mode will do turn anticipation onto the localizer!

Reminder about all 'Approaches' and Foreflight: Waypoints are just a numeric Lat/Lon, whether they are also known by a name (e.g., "KPWK") or not, and all devices (Foreflight, GPSs) understand Lat/Lon wpts.

"Procedures" however are an encapsulated set of instructions, usually including Altitude assignments, and these are NOT universally understood between devices.

So an IFR 'Approach' on Foreflight shows up as a single 'bubble' on the FPL screen, but when it transfers that to the Panel, the recipient (e.g., the GNS 530) does not necessarily know how to interpret that, which means that it will put it in its FPL either not at all or even worse: Wrong.
So you should do one of two things:

1) **If your Navigator DOES have the Approach built in:**
   a. Load and Activate the Approach ON THE NAVIGATOR DIRECTLY.
   b. You can also follow on your Foreflight by *selecting the Approach on your iPad after you have sent it to the panel*. Or, you may 'Load from Panel' on FF if the panel elects to send it.
   Example: the RNAV 16 at HIGUH at KPWK includes a Procedure Turn, which I don't want. But even if I tap 'Remove Hold/PT' on the procedure bubble in the FF FPL before I send to Panel, my 530 includes the PT.
   But if I Select the approach directly on the 530, it asks me up front "Remove Hold/PT" !

2) **If your Navigator does NOT have the desired Approach built in:**
   (eg, Visual Approaches that Foreflight does, but my 530 does not),
   a. Expand the 'Approach bubble' on the ForeFlight FPL by doing a 'Tap and hold' on that Approach Bubble in the Foreflight FPL Edit tab, and select 'Expand'. This will convert the encapsulated full approach into just the lat/lon waypoints
   b. NOW you can send this FPL to the Panel, which will understand the Lat/Lon waypoints of the Approach, but with OUT any vertical information.

TO/GA: A yoke-mounted TOGA button will set the G3 to +7 deg nose up, and override APPR mode (AP follows FD).
If you are going missed You need to MANUALLY press the GNS 530's OBS/UN-suspend button to sequence to the next waypoint, the missed approach.
But GA *does* arm the Selected Altitude Capture mode, when the ABS (bug) is > 100' above current altitude. So if the MA instructions say 'climb to 1500', you may want to set the ABS to 1500 so you will automatically climb-and-level at 1500 when you press to/GA 😊.

There is a separate section on MISSED, below

. - - - IFR GPS Approach

Incredibly easy: Just set everything up like you normally would, using the EXTERNAL GPS (530) as your G3 GPS source, and then – as usual – select PROCEDURES/APPROACH/etc on the 530 - and ACTIVATE when Cleared for the APPROACH

Then, just select APPRoach mode on the 507.
You could even do this 20nm from the IAF.

APPR mode mostly just engages vertical navigation (notably including GP capture) in ***addition*** to the Lateral navigation.

Special Case: Normally, you will be assigned an Initial Approach Fix (RFD 25: "Direct TONGE")**.** But sometimes they will vector you INSIDE the IF (intermediate Fix) to a point just ahead of the FAF (eg, "SUGEE" at RFD) and tell you "Continue heading and join the Final Approach Course…" The 530/507 is not specifically designed for this.
It DOES have a "Vectors to Final" option on the 530, but that deprecates the approach to LNAV! ☹ So you do this

- 507 AP is in **HDG** Mode
- Load and Activate the Approach on the 530, for the nearest IAF offered on the 530 (often includes the IF),
  - Select the FAF and press DIRECT TO
  - The 530 will output navigation instructions, but with the 507 in the HDG mode, these navigation instructions are ignored.
- When you are nearly aligned with the Approach Course (extended centerline), Press **APPR** on the 507
  - This will disable HDG mode and start obeying the 530 GPS Approach instructions.
- This is now a standard RNAV approach.

Anomaly: as of 7/31/24: When I did the above on an IPC at RFD Rwy 19 (Direct CAGRA (FAF)), the 530 FPL highlighted the segment *between* the FAF (CAGRA) and the *next* waypoint (JUNUP) as if it were already between those two, and the G3 "Next Waypoint" was showing JUNUP ☹.
The VDI and everything else seemed correct, only the "Next Waypoint" display on the G3 was wrong.

. - - - IFR – ILS Approaches

Only *slightly* more complicated that GPS. In this explanation/example, we will assume VTF (Vectors To Final)

Overview: Just set your HDG bug for the 'VTF' and select/press HDG on the 507 to engage HDG mode.

Then set up your Navigator (e.g, GNS 530) for the ILS, Load and Activate, Toggle Nav Freq to Active,

Press [APPR] on the 507.

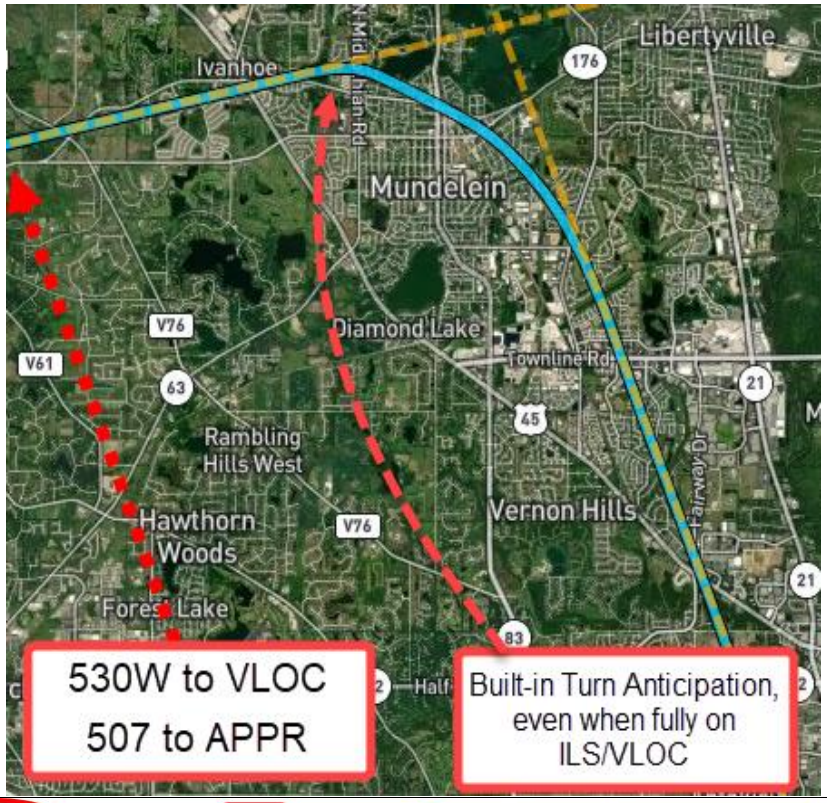
The GFC 500 + G3 do all the rest, *including turn anticipation*. What follows is just storyboard illustration.

Example: "78HF, fly heading 082 and intercept the Localizer..for ILS 16"	
G3/507:	Set your Heading Bug to 082, and engage [HDG] on the 507. Your lateral AFCS is now "HDG"
Navigator (eg, GPS):	Select the Approach Runway, and VTF This will make a straight line extending out from the extended centerline. The GNS 530 will load the Localizer frequency into the NAV *Standby*. **Toggle to Active** **Then ACTIVATE VTF.** ***(530 will automatically go to VLOC from GPS when inbound, prior to FAF)***
G3/507:	Press [APPR] This will Arm the approach, while you are still in HDG mode and will automatically switch to LOC mode when you intercept the localizer

ILS VTF to ILS 16 at PWK. Set HDG to ~ 090, activate HDG and APPR and sit back..

G3 Overview and Crib Notes - AUTOPILOT

Overview of full "VTF", showing automatic Turn Anticipation



Step 1)
HDG is Active, LOC is Armed ;
ALT Hold Active GS Armed

2)
As you fly inboud, you will pick up the LOCalizer

Note: the AP is simultaneously on **HDG** and **APPR**

HDG is primary (**Green**); **LOC** is Standby (White)
ALT is primary (**Green**); **GS** is Standby

G3 Overview and Crib Notes - AUTOPILOT

3)
Still officially on HDG mode at 082, but the AP is now turning 112 in Turn Anticipation to intercept the Localizer.

. 4) Much like GPSS/Roll Steering would be, we roll into the localizer and the AP switches to NAV/LOC

LOC Active (**Green**), **GS** still in Standby

GS will become ACTIVE at Pamme

From Garmin: Yes, it is called **turn anticipation**, and all of this is derived from the navigator and sent to the G3X and then the GFC 500 on the CAN buss. Yes, it is best to allow the system to do the roll steering and turning for you. That is what it is made for, for smooth transitions.

…… GOING MISSED

Going Missed

Before you decide to Go Missed, the following should have been configured previously:

- A/P: APPR + AP engaged
- Gear: Down
- Flaps: 1 notch (of 2)
- Mixt: Rich
- Prop: In at ~2500
- G3 ALT Bug: Set for initial MA Altitude

If you decide to Go Missed, here's your sequence:
(Left hand is on the yoke where TOGA is, Right hand is (always) on the Throttle)

- Press TO/GA
  - Will immediately set FD to +7deg, Servos will follow
  - G3 will not let you stall:
    - it will nose down from +7 if you can't maintain minimal airspeed
- Power in Full
- Gear up
- Flaps up
  - Once the gear is up (3 seconds), that will more than compensate for the lost lift from the 1st notch of flaps. In addition, it takes another 1-2 seconds for flaps to retract.,

So "Wait until airspeed is established before retracting Flaps" seems moot.

Autopilot/Navigation:
Once you are passed the RWY waypoint, the GNS will make the MA hold be the next waypoint, but it will **SUSP**end sequencing. You then

- Press the CDI on the GNS 530 to **UN-SUSPend**, and the MA hold is your next waypoint, which the autopilot will take you to, laterally.
- The GA automatically sets **ALTS** (climb-and-hold at **S**elected **ALT**itude)
  - So your vertical navigation is also now set
  - So if your MA instructions are "Climb to xxx Altitude and go straight to the MA hold WPT", you are set!
    - Note: For many – but not all – Holds, you climb and go direct to the Hold. But at PWK, you climb-then-turn-then go to the hold. I am not sure how this system handles that

G3 Overview and Crib Notes - AUTOPILOT

Using CRS/OBS pointer:

Using CRS/OBS pointer: (p 100 & 367 of PFD)
I use this 'trick' make 'extended centerlines' to an airport. I believe that this is ONLY useful when hand flying a landing. It cannot be used while the AP is engaged and following a FPL
The CRS indicator is intrinsically tied to the use of the OBS (Omni Bearing Selector) mode. I THINK the CRS knob label even disappears if not engaged properly (and the knob becomes inop)

Enabling Omni-bearing Selector (OBS) Mode suspends the automatic sequencing of waypoints in a GPS flight plan, but retains the current "active-to" waypoint as the navigation reference even after passing the waypoint.

While OBS Mode is enabled, a course line is drawn through the "active-to" waypoint on the moving map.
If desired, the course to/from the waypoint can now be adjusted.
USING the External (530) GPS:

1) Press OBS (Omni Bearing Selector) on the 530.
    a) This Suspends WPT sequencing, and puts a CRS line through the currently-active waypoint
2) Rotate the now-visible-and-active CRS knob (G3 Lower right, (outer?)) to the "Rwy Heading

Using the INTERNAL GPS (these have not been tested, and are contradictory)

1) While navigating a flight plan or Direct-to, touch CRS on the upper-right corner of the HSI on the PFD
2) Touch Ye s on the 'Set OBS and hold?' window.
3) Touch Sync Course or enter the desired course to/from the waypoint using the keypad and touch Enter.
4) To cancel OBS Mode and return to automatic waypoint sequencing, touch OBS on the PFD.
5) Touch Release OBS Hold.

Or:

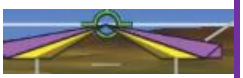
1) From the Active Flight Plan Page, press the MENU Key2
2)) Touch Set OBS and Hold.
3) Touch Sync Course or enter the desired course to/from the waypoint using the keypad, and press ENTER
4) To cancel OBS Mode and return to automatic waypoint sequencing, press the MENU key.
5) Touch OBS Course
6) Touch Release OBS Hold

ADJUSTING THE OBS COURSE
Presss OBS on the PFD, enter the desfire course using the key bad and touceh ENTER
OR Turn the PCD know associated with the course.

To adjust the OBS course, first select [OBS] on the GNS.
On G3X press the CRS button on the upper right of the HSI
This will bring up an option to either manually type in the desired course or you can use lower right hand knob and select the proper course. Best Regards,*Matthew Clark*Aviation Pilot Instructor

FLIGHT DIRECTOR : Warning on Terminology and Confusion

The GMC **507** is the **AFCS** mode controller, that provides a user interface for the **autopilot** and **flight director** function of the G3X system *(p6 of G3X Touch PDF manual)*
Depending how you parse that sentence ("**autopilot** and **flight director"**) are one and the same , or two separate entities. Since no one uses the 'Oxford comma' before the word 'and', it is ambiguous as to the author's intent.
To make things worse, the term **Flight Director** is often used in reference to its visual representation, the **Flight Director Command Bars (**purple). I would say that

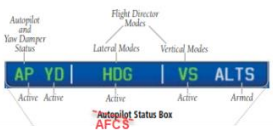


The FD Command Bars are what the 'brains of the Auto Pilot would LIKE the airplane to do'.
If AP is engaged, it will activate the servos and move the control surfaces for you.
If the AP/Servos are NOT engaged, it will still SHOW the FD Command bars and you probably want to hand-fly the plane following the FD Command bars.

And p 48 calls the '*Annunciator* display' the "*AFCS* Status Box"that p 310 calls the '*Autopilot* Status box',

(which is 'obious' if you already know what they're talking about, but confusing as hell if trying to follow along for the 1st time)

Note: Garmin docs are very confusing when frequently intermingling the terms AutoPilot/Servos/AFCS/ Flight Director

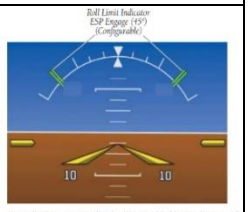


G3 – AUTOPILOT : ESP

ESP: Electronic Stability Protection

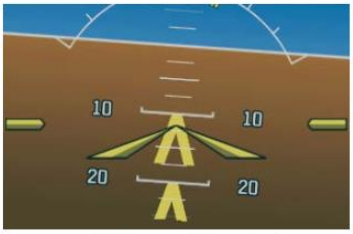
Always operates in the background, when you are NOT on AP (if you *are* on AP, there's no need to protect you because the AP is flying the plane!). In both the ROLl and PITch axis, ESP will start to engage to servos to resist your movement outside of the specified limits for ROLl and PITch. Much like automotive "Lane Assist" in cars that nudge you back into your lane if you start to drift.
Knowing that Take Offs and Landings often require such normally-abnormal bank and pitch, ESP will not engage until 500' AGL on take off, nor below 200'AGL on landing.

Roll Limit Indicators displayed on the roll scale are configurable between 45º and 60º right and left, indicating where ESP will engage. As roll attitude exceeds the configured limit, ESP will engage and the Roll Limit Indicators will move to 15º less than the configured ESP bank limit. The Roll Limit Indicator now indicates where ESP will disengage as roll attitude decreases.



ESP Roll Engagement Indication (ESP Enabled but NOT Engaged)

ESP **pitch** engagement is configurable between 10º and 25º nose-up and between 5º and 25º nose-down. Once engaged, the torque applied by ESP is at its maximum when pitch is 5º more than the configured nose-up and nose-down pitch limits, and tapers to the minimum applied torque when pitch is 5º less than the configured nose up and nose-down pitch limits. When beyond 5º of the configured pitch limit, the maximum torque is held until the aircraft returns inside the protected envelope. The opposing force increases or decreases depending on the pitch angle and the direction of pitch travel. This force is intended to encourage movement in the pitch axis in the direction of the normal pitch attitude range for the aircraft. The presence of yellow chevrons indicate that ESP is engaged in these nose-up/ nose-down conditions.



ESP Engaged (Nose-Low)

ESP Engaged (Nose-High)

Can be disabled from the main PFD window with a touch of a button for flight training situations.

ESP:

Automatically Engages > 500' AGL,
Automatically DISengagues < 200' AGL
To manually DIS able:

- HOLD the yoke AP Disconnect Button (TEMP while held)
- HOLD the yoke TO/GA Button (TEMP while held)
- G3: bring up AP panel, tap [ESP] to disconnect (Permanent)
- On G5: Press Knob> ESP > Enable/Disable (Permanent)

ESP will automatically invoke LVL if you are outside of the ESP envelope for more than 10 seconds in any 20 seconds

The automatic Engagment of "ESP" and "ESP->LVL" are 2 different thresholds

When ESP has been engaged for more than ten seconds (cumulative; not necessarily consecutive seconds) of a 20-second interval, the autopilot can be configured to engage with the flight director in Level Mode, bringing the aircraft into level flight. An aural "Engaging Autopilot" alert is played and the flight director mode annunciation will indicate 'LVL' for vertical and lateral modes. Level mode as activated by ESP is limited by altitude. ESP will be locked out of automatically activating Level mode after the aircraft descends below 1500 feet AGL as well. Manually selected Level mode is not limited by altitude at all.

	ESP	LVL	Notes
Climb	>500' AGL	> 2,000' AGL	ESP is InOp until 500'AGL, LVL is InOp until 2,000' *"Suggestions start at 500, takeover at 2,000"*
Descent	>200' AGL	> 1,500' AGL	LVL is InOp below 1,500 ESP is InOp below 200' AGL, *"Takeover stops at 1,500, Suggestions stop at 200"*

Auto Pilot

The GNS 530W specifically

CDI Deflection for WAAS GPS (updated every 1/5th of a second)
I think this is largely moot in a world of Waas GPS, and no longer VORs from 50 nm away..

Enroute	2.0 nm
Term	1.0
APPR	0.3

Historically, "CDI" (Course Deviation Indicator) *was* how you navigated (via VOR or Localizer), though that now seems just a subset of the bigger picture which includes GPS, but "CDI" as the 'Navigation Source" is the terminology we live with. Now CDI is either a) GPS or b) V/LOC which include both VOR and LOCalizer.

OBS Button

e.g., at the Missed Approach Point, the Garmin goes into 'suspend' mode, waiting for the pilot to tell if it they landed, or if it should continue on to the Hold (next spot on the flight plan)

If you miss an approach the unit automatically goes into suspend over the MAP. Hit the OBS to UN suspend and initiate the missed approach procedure, and enter the hold.

Note for ILS Approaches: the GNS will automatically go into V/LOC mode (vs. GPS mode) without having to press the CDI button.
This happens when you are

- 1.2 nm left or right of course ***and***
- 2 to 15 nm from FAF.

The **Glide Path does not calculate until the FAF is the active waypoint of your approach**.

Transferring FPL between Foreflight, G3 and GNS 530

This has NOTHING to do with Garmin's "Flight Stream".
This is strictly a **Bluetooth** connection that seems to engage the Garmin Connext system

1x, INITIAL SETUP

Bluetooth paring can be initiated from either end.
Make sure your **iPad > Settings** has Bluetooth turned on..

G3
Main Menu, (Menu button, x2)
Setup,
Bluetooth

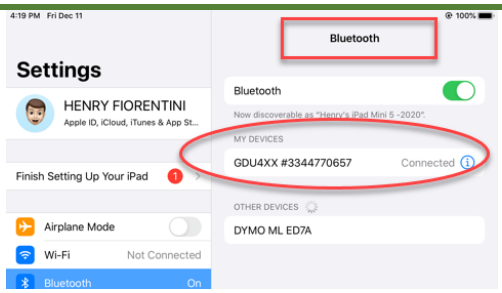
iPad
Go to: Settings, then Bluetooth

The BT for FPL sharing is a separate BT from the ADSB In.

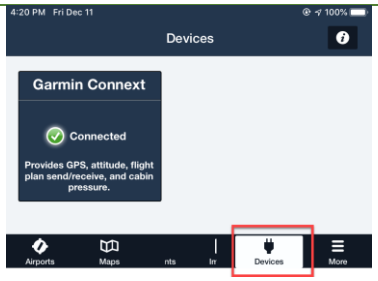
- **The FPL is the GDU4xxx** and the
- **ADSB In is the GDL52R,**

Find and select both of the GDU4x and the GDL52R
I recall that the GDL52R (ADSB) will pair automatically within 3 minutes, but I think you have to do the GDU4xx (FPL) explicitly

The usual BT 'handshaking / connection/verification' takes place, wherein a 6 digit code is displayed on one of the devices, and you confirm "Yep, that's' the device I want to pair with" on the other device



iPad
After this pairing, you confirm that
"Yep, FFM is talking to the Garmin" by going to FFM:
MORE > Devices
As shown at right
Tapping this icon will bring up the status of this device, much as the Stratus would show battery, signal strength, etc.
Make sure that you get traffic and Wx, as FFM may see the FPL BT as a 'device' but you need to ensure that it is seeing the ADSB one, too!



Current Apple behavior is that once this 'pairing' has happened, it will stay in the iPad library of pairings until you explicitly delete it, so this pairing should happen automatically every time you step into the cockpit -Note: Stratus is Wi-Fi, not Bluetooth, so this will not conflict with Stratus connections.

Via this BT connection, FFM can also **receive** ADSB information, which will override a portable ADSB source such as a Stratus. So if you have a panel-mounted ADSB In (extra cost), you don't need a Stratus, except as a backup. But that ADSB connection does NOT work the other way: Information from a Stratus/Sentry will NOT go to the G3. So if you want to display Traffic and Wx on the G3, you need to buy the ADSB In box, antennas, cabling and labor (budget about $3k)

Auto Pilot

Auto Pilot

iPad ← → G3/ EXTERNAL (530)

Per note at the beginning of APPROACH Section:
Do NOT send a FPL to the Navigator with an Approach
unless the Navigator has zero knowledge of that Approach on its own
- and even then only if you have EXPANDED it to the individual Lat/Lon Wpts.

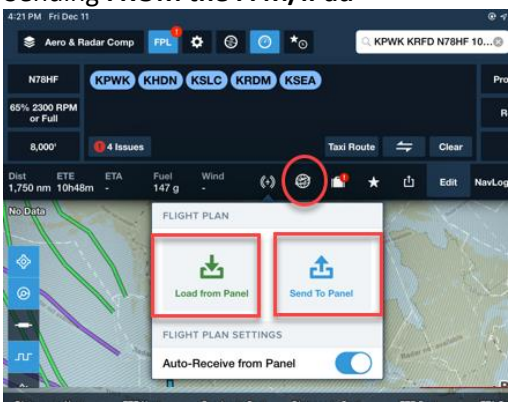
Because of the elegance of using Foreflight to communicate with even an old GNS 530 External Navigator, EXTERNAL is the only scenario I am discussing for now.

Basically, you can do most/ALL your Flight Planning on the iPad/ForeFlight, even while flying.

Transfer from iPad to G3

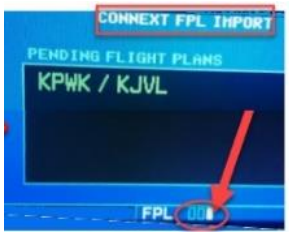
Technically, this must be going through the G3 as 'middleman', but effectively the G3 is just a pass-through between the iPad and the GNS 530

Sending **FROM the FFM/iPad**



Click the funny circular FFM icon (in red circle) and press **SEND TO PANEL**

I also enable 'Auto Receive' to make it easier to update the iPad with any G3 /530 changes, like Adding an Approach



Instantly the moment you press [Send to Panel] on FF, this screen appears on the G3 (new, 3rd FPL page)

From here, just press the lower/right knob to select, then ENTER button (right side).

This will bring this FPL into the primary FPL page on the 530, and 'ACTIVATE'? will be highlighted, and you just press Enter once more,and that FPL is now 'THE' FPL for the G3!

Receive **FROM the G3/530 to the FFM/iPad**

This happens automatically whenever the G3 FPL changes…

It SEEMS that it asks for explicit confirmation the 1st time, but then just does it without asking thereafter.

Auto Pilot

Per the above, it is SO GREAT to set the G3 to EXTERNAL and have the FF and 530 effectively talk to each other seamlessly, that I am ignoring this section for the time being..

G3 Internal ← → GNS 530W

Transferring FPL from G3 (internal) **to GNS 530W**

On the G3:

First: You MUST have the INTERNAL GPS selected as the SOURCE for the menu option at right to show up.

Next Go to the FPL on the MFD page (if FPL is one of your insets, you can just tap it), and *press the MENU hard key button*

Finally: Select "Send to Navigator

On the GNS 530

First Press the [FPL] button along the bottom of the 530, and rotate the knob to "Page 3" (which does not exist prior to the G3 installation!)

Next, when the G3 'Sends to Navigator', that FPL shows up as shown at left

Select it with the knob and ENTER and then accept it as a Flight Plan (last step, not shown)

Transferring FPL from GNS 530W to G3 (internal)

I don't think you can do this.
I think the G3 can only receive a FPL from the iPad, OR it can show the External Navigator (530W)

I actually don't think you CAN do B… You can 'emulate' it as shown on page 39 by going to the FPL page and selecting External Navigator, and the FPL on the 530 shows up on the G3 screen 'As If' it were 'the' internal FPL, but in reality it is just a 'pointer/shortcut' to the 530. But those waypoints are never copied into the G3 per se. Which is to say that I don't think you could add 3 waypoints to the 530 FPL and then decide "Oh, I want to fly that FPL with the convenience of the G3 FPL/Navigations, so I'll just transfer all those FPL waypoints on the 530 to the G3, and manipulate the FPL on the G3 thereafter – don't think THAT can happen!

G3 APPENDIX: MENU button (same as HSI tap) for PFD Options

Configuration Menus

Overview / Layout of Screens, Sub-Screens and options

These are the places wherein you can change/adjust settings.
For the MFD pages, it also shows you the typical 'in flight display' of what that page shows.
What follows are detailed screen shots of each for you to "see what you're looking for? Here it is!".

Main Screen / PFD

HSi or **MENU** button — Brings you to PFD OPTIONS:
GPS Source (Internal or External),
IFR MINimums
[MORE]: (Round vs Tape), Hwy in the Sky, Traffic

AFCS — AutoPilot options, much the same as on the 507 head

Bug windows: tap on HDG/Alt/ Baro windows to get pop up keypads

CNS — 'top row' Command/Navigation bar.
Select a new Com **Frequency**
Set **Transponder** Freq/ident.

MFD pages

can occupy ½ of the main screen. You can scroll through these pages via the knob, in the order shown:
Map, Charts, Waypoints, FPL, Terrain, (Video), Info, (Weather). *(installation dependent)*
And from here you can hyperlink to Airport **Frequencies**, **Runways**, **IFR** charts, etc.
These are detailed above with the MFD screen, Configuration being a sub section of each MFD page documentation.

Main Menu key (x2)

More infrequent system adjustments
Most notable is Bluetooth setup (for connecting to ForeFlight) and configuring the CNS Data bar layout.

Main Menu key (during Power Up)

Very Infrequent settings. Most for the Avionics Installer. Notable exception is setting V-speeds

G3 APPENDIX: MENU button (same as HSI tap) for PFD Options

PFD Menu

Get here by either

- **Pressing the physical MENU button (when on the 'main screen', not an MFD screen)**
- **Tapping the HSI**

Most notably, this is where you go to

- Set the default INSET Windows.
- Change the Navigator/FPL/GPS source from Internal to External
    - Though this can be toggled in many conveniently placed places
- Change Tape vs Round Gauges

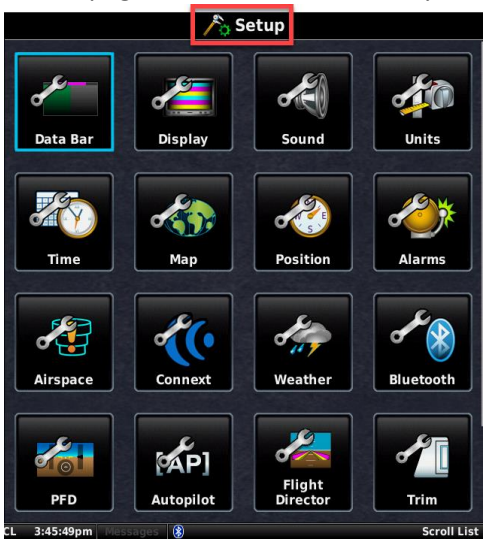
The MORE option is also available in the Main Menu SETUP option below, shown on page 39on page 39

G3 APPENDIX: Main MENU key x2

"Main Menu" = Menu key x2

Explicit way to get to many of the pages described above that you

normally would access from the PFD screen. *Plus* various 'only once in a while' configuration settings.



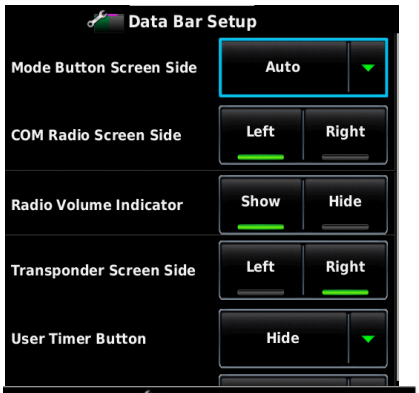
Most notable is a MAJOR Sub-Menu: **SETUP** (bottom row, 2nd column at right)

From **[SETUP]** you can set the following items which I have summarized here according to subjective 'importance':

- **BlueTooth Setup**
  - 'master menu' of BT pairing & devices.
- **CNS Data Bar Layout**
  - How to set every cell in the CNS bar
- Display
  - Startup position, color, knob action
- Sound
  - Message & Alert alarms
- Units
  - F or C, Metric or English
- Time
  - Time Zone, display format.
- Position
  - Technical hh:mm.ss format choices
- Alarms
  - To set for upcoming waypoints, etc
- Airspace
  - What to show as B,C, D etc airspace
- **PFD**
  - The 'PFD/more' screen
- AutoPilot
  - Technical: Roll & Pitch Torque, Gain, etc
- Flight Director
  - Command bar style, TO/GA pitch
- Trim
  - Technical: Torque, min/max IAS
- Navigation
  - For Certified: Source (Int/Ext) and xxx
- Map
  - 12+ SUB sections on almost EVERY style setting on your map MFD Page
- Keyboard
  - QWERTY or ABCDE

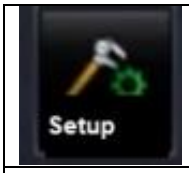
G3 APPENDIX: Main MENU key x2

CNS Data Bar options



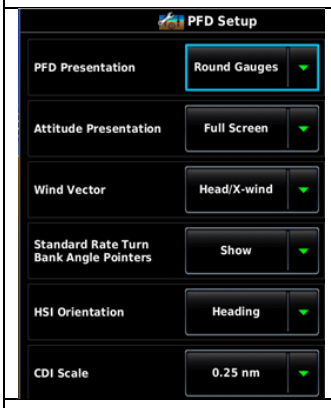
that you can have across the top of your main screen include:
Bearing ; Climb ft/nm; Climb % ; XTrk Err ; Density Alt ; Desired Trk ; Dist to Dest ; Dist to Next ; Enroute ; Safe Alt; Flt Lvl ; Timer ; G Meter ; ;Mach # ; MSA ; Next Wpt ; OAT ; Ram Tmp ; Time to Dest ; ; Time to Wpt ; Time at Arrival ; Time at Wpt ; Time to Vnav ; Vert Speed ; Time

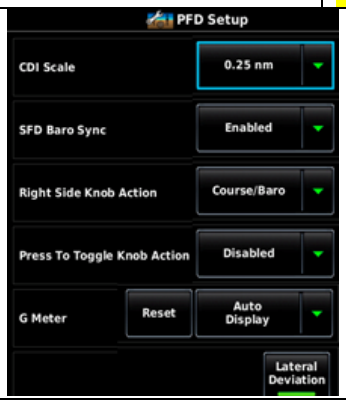
G3 APPENDIX: Main MENU key x2



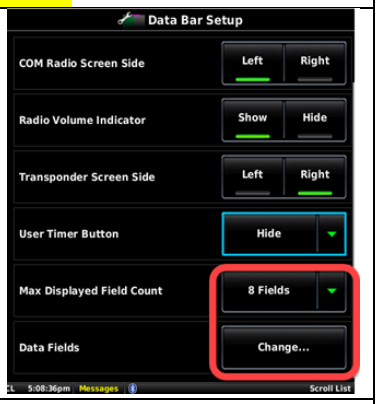
Then

PFD:





DataBar



Alarms:

G3 APPENDIX: Power Up MENU

Power up Master option settings

NOTE: *With VERY FEW exceptions, there is NO REASON for the Pilot to be here.*
In my case, I wanted to add custom V-Speed bugs to my display and change the Backlight display settings.

But things like how much Torque the Servos should apply, or the ESP limits ***these are NOT things that the Pilot should be messing with***.

Hold in the MENU button while powering up…

"**Aircraft** " (2nd Row, 5th column)

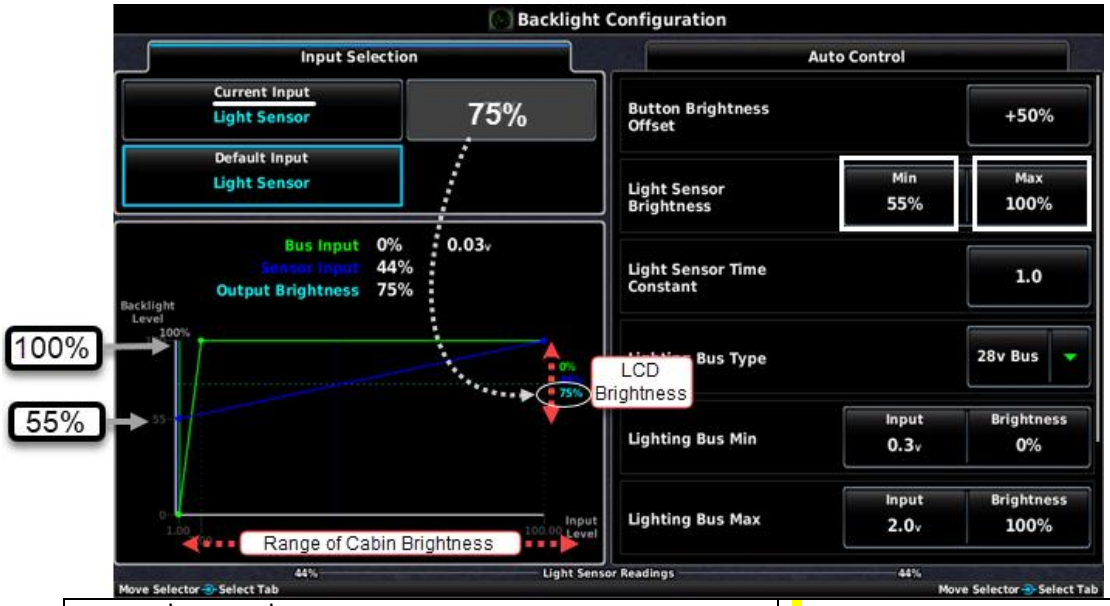
- Aircraft
  - Identifier (N#)
  - Type
  - Fuel
  - Map Symbol
  - Fuel Flow

Reference Speed

- Vne i
- Vne t
- Vno
- Vso
- Vs1
- Vx
- Vy
- Vmc
- Vyse
- Vg
- Sink Rate
- Vr
- Vcustom1, 2 & 3

G3 APPENDIX: Power Up MENU

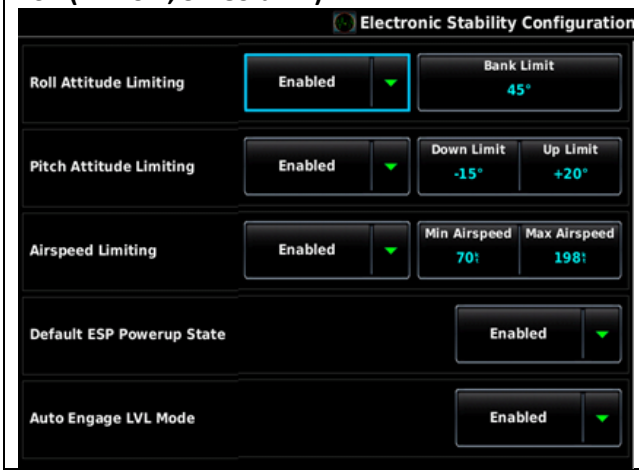
Backlight: 3rd Row, 3rd Column:



So in my settings, the LCD Brightness will go from a minimum of 55% (totally dark cabin) to a maximum of 100% of LCD brightness in the 'brightest' of cabins.

(If 100% is TOO Bright, we could move the 100 down to 95 or 90 as upper limit

ESP (2nd row, 3rd Column)



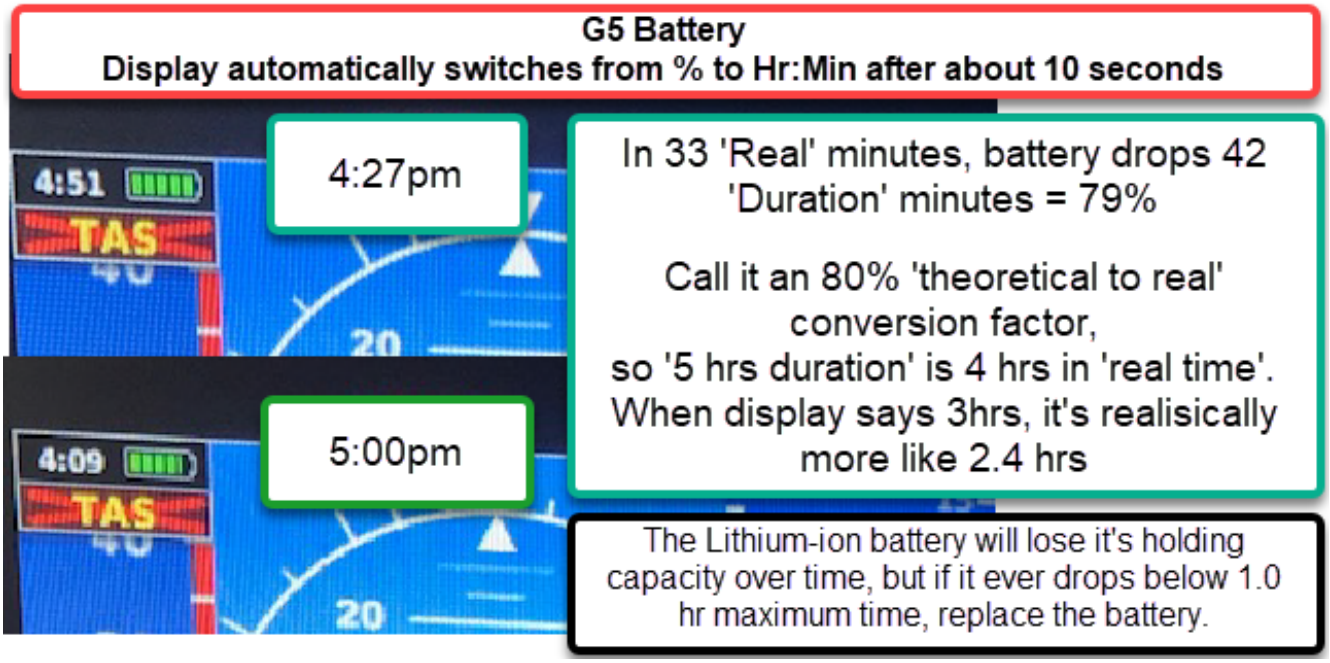
!

G5

The mandatory 'standby/backup' for the G3X is the G5

It's pretty much a 3.5" PFD that mimics the G3 PFD 😊

To test the battery life, wait until the G5 powers down, then press/hold the power button in the lower left. Then….



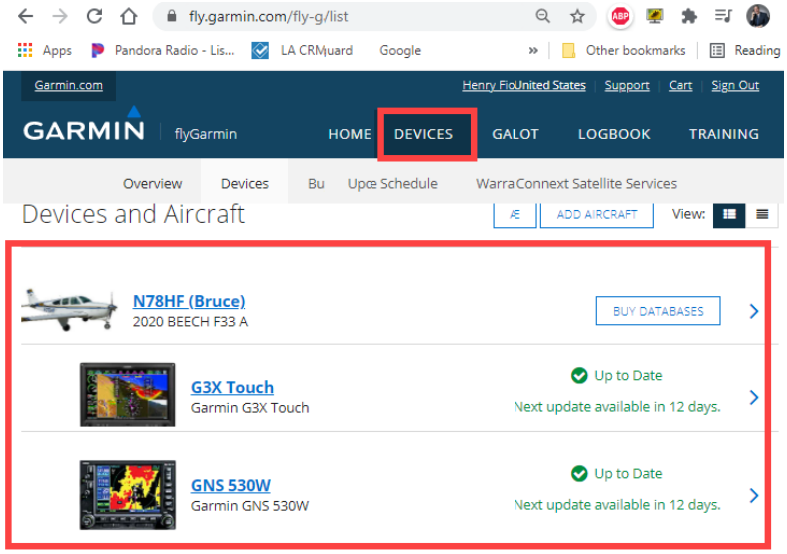
Should always Start Above 1.0- 1.25 Hrs… If not, it's time to replace the battery.

Subscriptions/Training/Support

Subscriptions:

I found them to be a much better deal than Jeppesen. I get my G3 and my GNS 530 from Garmin now:
A little confusing, but basically

- Log into the FlyGarmin.com website (Picture below)
  - Go to “Devices”
- From there, you select your card to update, it will launch your desktop Garmin app to finish the process.
  - You need to do a 1-time download/install of the desktop Garmin app.



Note that the SD Card for the G3 is just a ‘one time transfer’ of data from the SD card to the G3 internal memory.
After that, you can remove the SD card if you want. I leave mine in for making screen shots, and just have an extra SD card at home to swap out when it’s time to do an update.

But the Data card for the GNS 530 is the active, used memory card for the 530. That must stay installed during flight.

SUPPORT

Garmin 866/739-5687 G3Xpert@Garmin.com (sic) 866/854-8433
AviationTraining.Webinar@Garmin.com

Garmin 866/739-5687	G3Xpert@Garmin.com	866/854-8433

See the separate DOC for ***GarminSubscriptions2021.doc***

https://www.garmin.com/en-US/aviation/webinars/
/www.garmin.com/en-US/aviation/webinars/ **Aviation Webinars** Each year, Garmin hosts a series of aviation webinars focusing on our latest generation of avionics, portable navigation solutions and more. These webinars are a great way for aircraft owners and pilots to learn more about Garmin aviation products and services before purchase as well as best practices for operation. To view recordings of previous training webinars, please visit our YouTube channel. **Dates** / **Time** / **Topic** / **Registraton Link** Dec 1, 2020 / 4 p.m. CDT / FltPlan.com: Planning and Filing a Trip to Mexico and the Caribbean / REGISTER HERE Dec 3, 2020 / 10 a.m. CDT / Garmin Flight Display Solutions: G500 TXi & G600 TXi / REGISTER HERE
https://youtu.be/b3V4ZeCi4Oo http://www.bristellaircraft.com/garmin-gx3-touch-videos/

(Ed Note: Typically the G3 Scr shots are : Resized to 50%, then saved as .PNG)