



Advanced Avionics Workshop

Navigation & Communication

Presentation Outline

- ▶ GMA 345 Audio Panel
 - ▶ Two-channel Monitoring
 - ▶ ICS Isolation
 - ▶ Split Comm
- ▶ GNC 255 Nav/Com
 - ▶ “Buttonology”
 - ▶ Basic Usage
 - ▶ Advanced Features
- ▶ GTN 650
 - ▶ Frequency Monitoring
- ▶ GTX 345 Transponder
 - ▶ “Buttonology”
 - ▶ Basic Usage
 - ▶ Advanced Features
- ▶ Wrap-Up





GMA 345 Audio Panel

Feature Set Overview

- ▶ **Failsafe operation**

- ▶ Failsafe circuit connects pilot's headset and microphone directly to COM 1 in case power is interrupted

- ▶ Monitor multiple COM channels at once

- ▶ Split COM capability

- ▶ Pilot is on COM1, copilot is on COM2

- ▶ Pilot / Crew isolation from passengers

- ▶ Integrated marker beacon receiver

- ▶ Marker beacon lamps are always active



Intercom Control

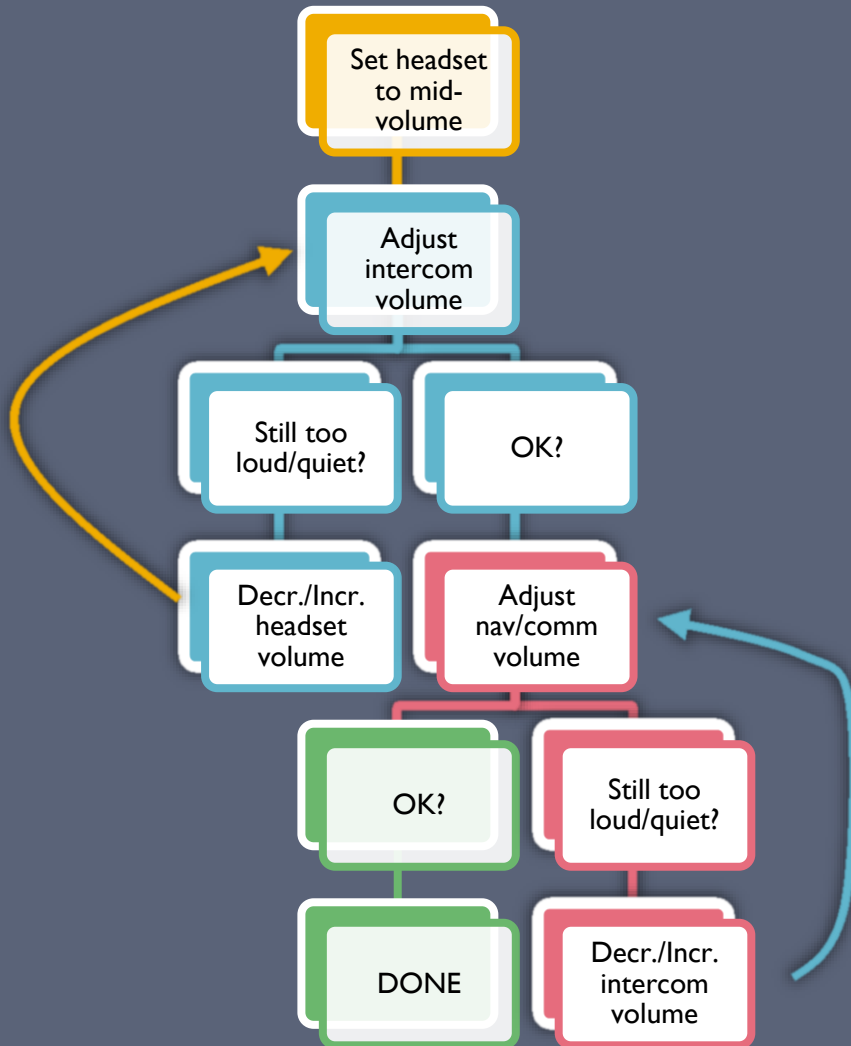


- ▶ Left knob – Pilot’s ICS control
 - ▶ **Inner knob** – Unit on/off and Pilot’s ICS volume
 - ▶ **Outer knob** – Pilot’s music volume
- ▶ Right knob – Copilot & Passenger ICS control
 - ▶ **Inner knob** – Copilot & passenger ICS volume
 - ▶ **Outer knob** – Copilot & passenger music volume

Both “Inner” and “Intercom” begin with an “I”



Intercom/Radio Adjustment



► Volume adjustment

► One recommended method is shown to the left

- 1) Set headset to mid-volume
- 2) Adjust the intercom to a comfortable level
- 3) Adjust nav/com volume to a comfortable level
- 4) Fine-tune with the headset volume

COM Options & ICS Isolation



▶ COM Muting & Split COM

- ▶ COM Muting: Press and hold COM1 or COM2 to toggle COM muting
 - ▶ Monitored channel will auto-mute when the primary channel is receiving
- ▶ Split COM: Press both COM1 and COM2 MIC buttons
 - ▶ Pilot is on COM1, copilot is on COM2

▶ ICS Isolation

- ▶ PILOT: Pilot is isolated from everyone else, and COM channels are dedicated to the pilot.
- ▶ CREW: Pilot and copilot share a common ICS channels; passengers can only talk between themselves.

Audio Channel Selection

Additional audio source selector buttons



Primary audio selector buttons

▶ COM 1/2 MIC

- ▶ Selects a COM channel for both transmit & receive

▶ COM 1/2

- ▶ Selects an additional COM channel for audio monitoring (no mic)

- ▶ When multiple COM *receive* channels are selected, audio input for that channel remains active regardless of which channel is selected for *microphone use*



► Audio Playback

- ## ► Audio Playback

► Music

- ## ► Music

Bluetooth



▶ Limitations

- ▶ *Can only connect to one device at a time*

▶ Capabilities

- ▶ Supports up to 10 devices
 - ▶ *The least recently connected device gets overwritten beyond 10 devices*
- ▶ Can be used for phone or music
- ▶ Can provide an audio input to certain cameras

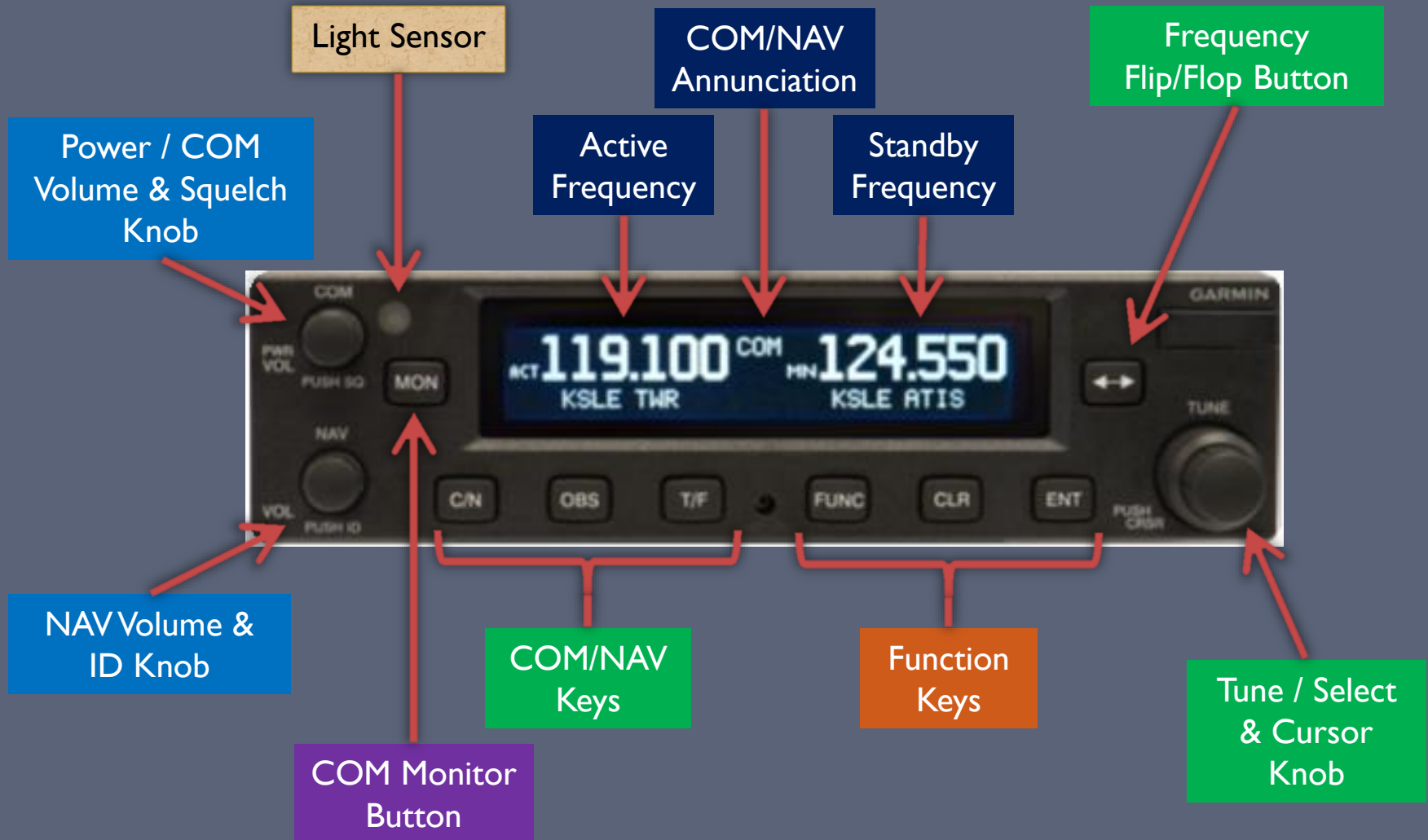
▶ Other Notes

- ▶ When using a phone for both music and phone calls, the music is muted until the phone call is complete
- ▶ Entering pairing mode will forcefully disconnect a device currently connected to the GMA 345



GNC 255 Nav/Com Radio

GNC 255 Buttonology



Basic Functionality

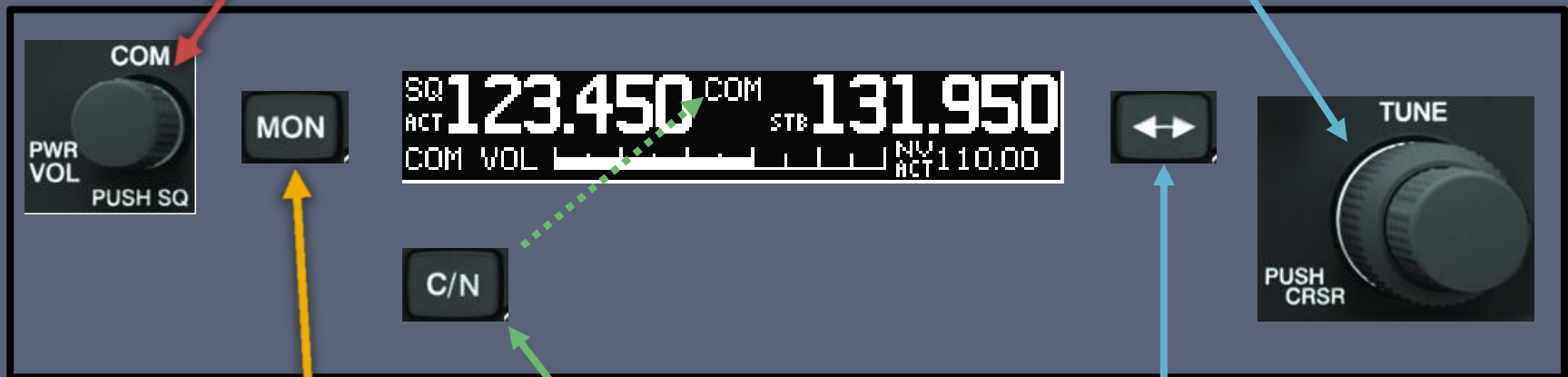
- ▶ Displays either COM or NAV frequencies, but not both at once
 - ▶ But both COM and NAV frequencies are always active, just as with the GTN 650
- ▶ Tuning frequencies works in the usual Garmin manner
 - ▶ Outer knob controls MHz (left-of-decimal values)
 - ▶ Inner knob controls KHz (right-of-decimal values)
 - ▶ Tune Standby frequency, then flip-flop to make it Active
- ▶ COM and NAV frequencies are identified from a database, based on the facility that you are closest to
 - ▶ For example, if you tune Danbury Ground while at another airport, the frequency identifier will show the airport that you are nearest to that uses that frequency.



COM Controls

TURN: Power / Volume
PUSH: Squelch Mode

TURN: Tune Standby Frequency
PUSH: Toggle Look-Up Function



Toggle between
COM & NAV Tuning

Active/Standby
Frequency Flip-Flop

Transmit/Receive on Active Frequency
&
Receive-Only on Standby Frequency

NAV Controls

TURN: Volume
PUSH: Morse ID

TURN: Tune Standby Frequency
PUSH: Toggle Look-Up Function



Toggle between
COM & NAV Tuning

Display graphical OBS &
decoded morse ID

Display
Distance/Speed/Time to
selected NAVAID

Active/Standby
Frequency Flip-Flop

Utility Functions

TURN: Selection
PUSH: Enter Edit Mode

RX 127.750 COM
ACT NAV FREQUENCY LIST
ICS CONFIGURATION
SYS CONFIGURATION

FUNC

CLR

ENT



Toggle Function
Mode On/Off

Erase Information, Cancel
Entry, Reset Timers

Save Selected Values,
Confirm Prompt, Save
Standby Frequency

Advanced Features

- ▶ Pressing the FUNC button toggles into/out of Function Mode
 - ▶ Below is a subset of the functions available
- ▶ COM
 - ❖ Recall recently-used and user-saved frequencies
 - ▶ Look up nearest Airport (APT), ATC (ACC), FSS, and Weather (WX) frequencies
- ▶ NAV
 - ▶ Recall recently-used and user-saved frequencies
 - ▶ Look up nearest VOR frequencies
- ▶ Timers
 - ❖ Configure / Run Count-Up & Count-Down timers

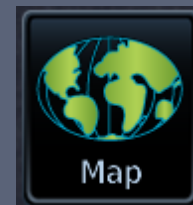




GTN 650

Communication Capabilities

Communication



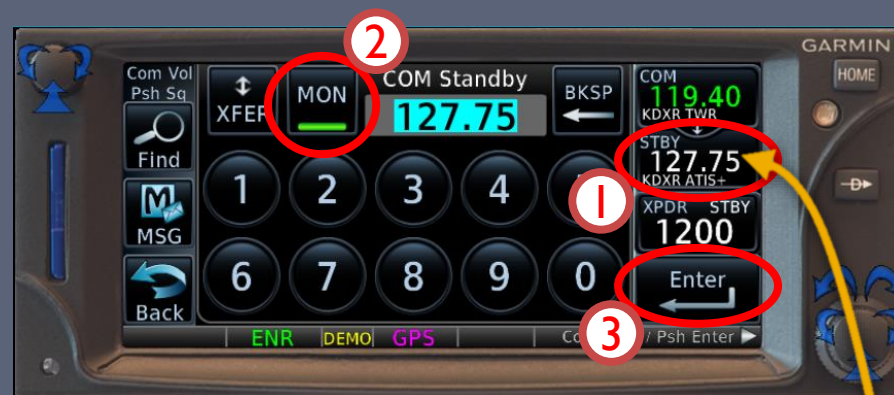
▶ Emergency Frequency

- ▶ Press and hold the volume knob for approximately 2 seconds
 - ▶ Also sets 7700 in transponder (55H)

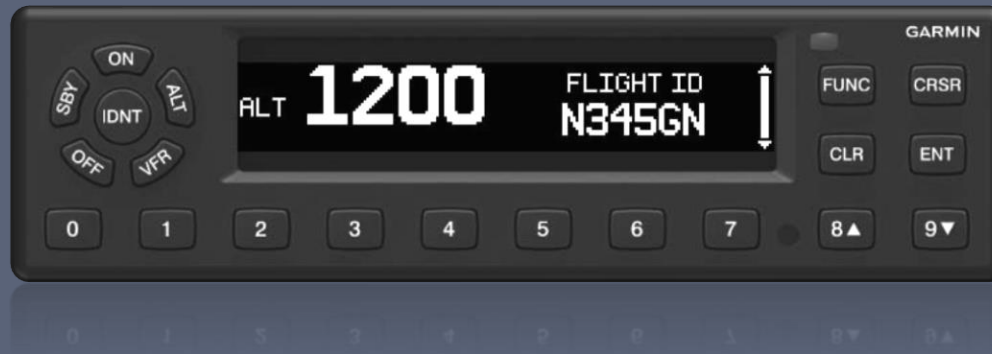


▶ Comm. Monitoring

- ▶ Receive/transmit on active frequency and simultaneously monitor standby frequency
 - 1) Tap on the Standby frequency
 - 2) Select "MON"
 - 3) Tap "Enter" to close screen

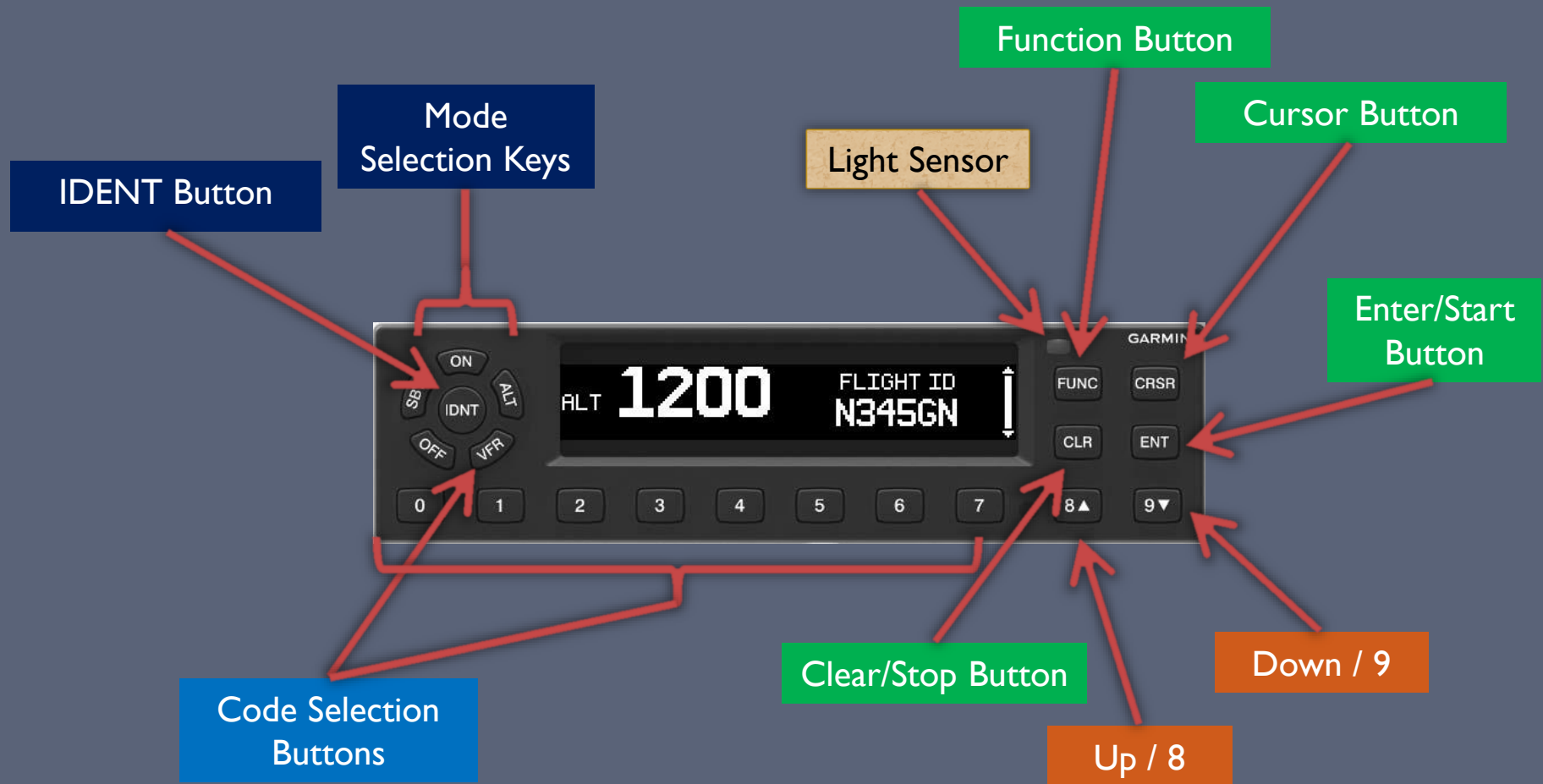


White text: frequency monitoring is active
Cyan text: inactive standby frequency



GTX 345 Transponder

GTX 345 Buttonology



Basic Features

Mode Selection Keys

- ▶ Off
 - ▶ Powers off the unit
- ▶ Stby
 - ▶ Selects standby mode
- ▶ On
 - ▶ Selects Mode A (altitude not reported)
- ▶ Alt
 - ▶ Selects Mode A & C/S

Code Selection

- ▶ VFR
 - ▶ Sets the transponder to squawk 1200
- ▶ 0-7
 - ▶ Used to set the squawk code. Code is activated when the 4th digit is entered.
 - ▶ Pressing CLR moves the cursor back one digit
 - ▶ Resets to the previous code when the first digit is cleared



Function Keys

Function Selection

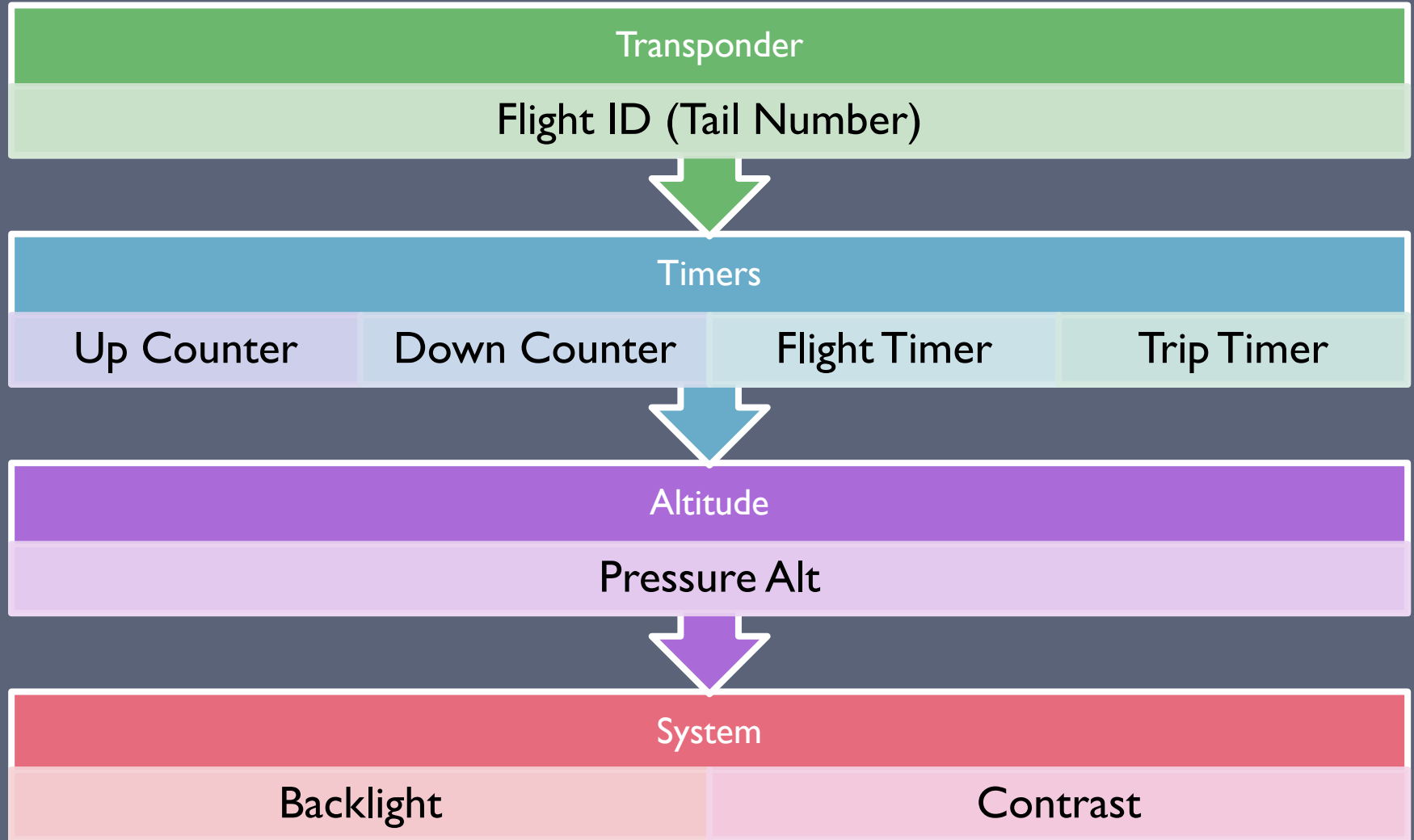
- ▶ **FUNC**
 - ▶ Cycles through the display function menu groups
- ▶ **8^**
 - ▶ Navigates up the current menu group
- ▶ **9v**
 - ▶ Navigates down the current menu group

Interaction

- ▶ **ENT**
 - ▶ Acknowledges/starts selections
- ▶ **CLR**
 - ▶ Stop/Restarts the timers
 - ▶ Cancels the previous key-press



Display Functions





Summary

Nav/Com Tips – GMA 345 Audio Panel

- ▶ Use the audio playback feature to replay the audio instead of asking ATC to repeat themselves
 - ▶ Incoming transmissions will stop audio playback, so you won't miss anything
- ▶ Don't forget about crew isolation – it's easier than trying to get your passengers to stop talking when you need to hear a radio transmission
- ▶ If your passengers want to listen to music but you don't want to be distracted by it, you can “mute” the music by turning down the pilot-side music volume fully counterclockwise.



Nav/Com Tips – GTX 345 Timers

- ▶ Make use of the automatic flight timers
 - ▶ Use the **flight timer** to keep track of how long you've been flying since your *last takeoff*
 - ▶ Use the **trip timer** to keep track of how long you've been flying since your *last refueling*
 - ▶ Be sure to reset the **trip timer** after refueling



Final Take-Aways

- ▶ You can learn the basic operation of the radios in 20 minutes or less and never have a need for the extra capabilities.
 - ▶ But once learned, the extra capabilities can save you effort so you can spend more time aviating and navigating.
- ▶ *As with all advanced technology, you must spend time practicing and using it or it will become more of a distraction than a help.*
 - ▶ Never use a new-to-you feature for the first time in a high workload environment!
 - ▶ Learning is best accomplished with a competent safety pilot.



More Information

▶ Flying 20 Club “Library”

- ▶ GMA 345 Manual
- ▶ GNC 255 Manual
- ▶ GTX 345 Manual

▶ FAA

- ▶ Advanced Avionics Handbook (FAA-H-8083-6)

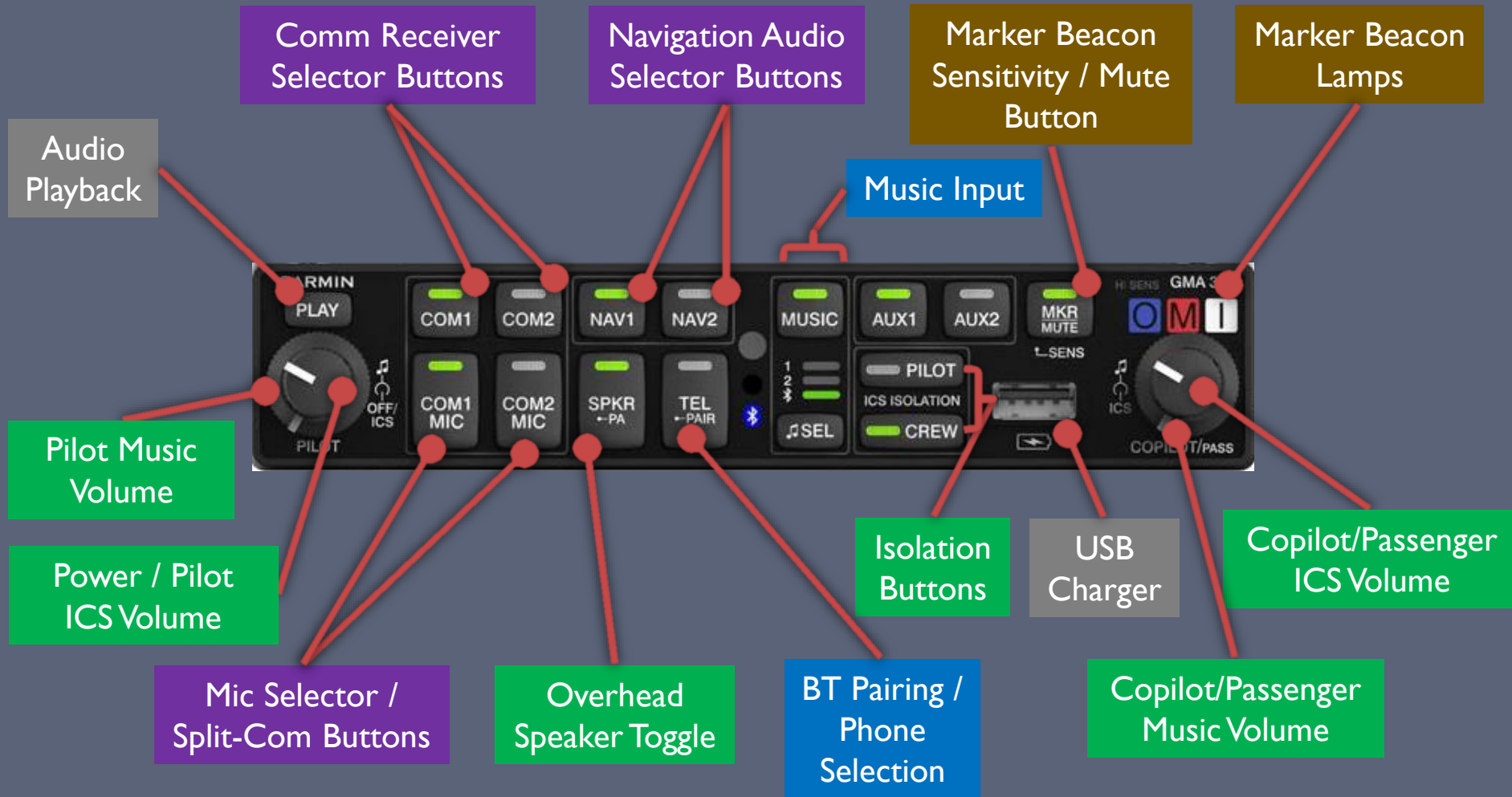
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GMA 340 Buttonology



Function Modes

- | | | | |
|------------------------|--|---|---|
| ▶ Flight ID |  | « Aircraft N-number | |
| ▶ Pressure Altitude* |  | « Current pressure alt. | |
| ▶ Flight Timer* |  | « Airborne flight timer | |
| ▶ Altitude Monitor |  | « Alerts >250' from set alt. | |
| ▶ OAT/Density Altitude |  | « OAT & density alt. | |
| ▶ Count Up Timer* |  | « Stopwatch | |
| ▶ Count Down Timer* |  | « Count-down timer | |
| ▶ Trip Timer* |  | « Flight timer since last reset | |
| ▶ Backlight & Contrast |  | | |
| ▶ ADS-B Status |  |  |  |

▶ *The most useful functions