Civil Air Patrol

APOLLO GX-55

Global Positioning System

WEBSITE

- www.upsat.com/index.html

- downloads:
  - GX55 Simulator Program (Basic)
  - GX55 Operations Manual (V3.x)
  - GX55 Quick Start Chart (V2.x)

Overview

- GPS Theory
- GPS Receivers
- Controls and Functions
- Waypoints
- Flight Plans
- Maps/Grids/Search Patterns
- Operational Procedures/Checklists
- "Hands-On" Demo

GPS Theory

- DOD System - initial military use
- 24+ Satellites (12 hr. orbits)
- Permitted civilian use
- Must see 3 satellites (2D Nav)
- Must see 4 satellites (3D Nav)
- Usually see at least 6 satellites…OK

GPS Receivers (calculators)

- Process data from satellites
- Calculate position/altitude continuously
- Displays: Pages and Moving Maps
- Create and execute Flight plans

GPS Receivers (calculators)

- Internal Databases:
  - Airports
  - Navaids (VOR, NDB, etc.)
  - Intersections
  - Terrain Features
  - Airspaces

GPS Receivers (calculators)

- Apollo GX55 also has:
  - SAR Grids (gridded Sectionals)
  - SAR Search Patterns
    - **Parallel Line**
    - **Creeping Line**
    - **Expanding Square**

GPS Receivers (calculators)

- Navigation from “Present Position” to “Next Waypoint”(in database):
  - Bearing
  - Track
  - Distance
  - Ground Speed
  - ETE / ETA
- Instrument Approaches

Controls and Functions

- Buttons
  - Mode Panel
  - Smart Keys
- Large and Small Knobs
  - Flip Pages
  - Select Data Fields
  - Change Data in Selected Fields

Waypoints

- Internal Database
  - Airports (3 ltr. Identifier)
  - VOR's (" " ")
  - Intersections (5 ltr. ")
  - User Created and Stored
- User Created
  - Generic (Name, Lat., Lon.)
  - Mark Position (Autoname, Lat., Lon.)
  - Commence Search Point (Grid Point - xxxyz)

Flight Plans

- Two (2) Waypoints minimum (dep/dest)
- Activate an existing Flightplan (stores up to 30 plans)
- Create a new flightplan
- "Direct To" button

"Direct To" Function (fastest flightplan)

- From "present position" to "selected waypoint"
- "Selected Waypoint"
  - From "Nearest Waypoint" list (NRST) (EMERGENCY)
  - From internal database
    - Airports, NDBs, VORs, etc.
    - User created, e.g. CSPs

Maps/Grids/Patterns

- MAP Pages (press “MAP”)
  - MAP + Nav Info
  - MAP Only
  - SAR MAP
  - MAP Setup

Maps/Grids/Patterns

- GRIDS
  - BASIC Grid (Lat., Lon.)
  - US Grid (Sectional Charts)

- SEARCH PATTERNS
  - Parallel Line
    - **Always starts at a quartergrid corner**
    - **Select “CSP” (xxxyz)**
    - **Set spacing (0.2 to 9.9 NM)**
    - **Set direction (N/S or E/W)**
    - **Activate Pattern (Enter, Enter)**

Maps/Grids/Patterns

- Creeping Line
  - Select “CSP” (any waypoint)
  - Set spacing (0.2 to 9.9 NM)
  - Set initial direction (0 to 359)
  - Set leg length (1.0 to 9.9 NM)
  - Set turns (left/right)
  - Activate Pattern (Enter, Enter)

Maps/Grids/Patterns

- Expanding Square
  - Select “CSP” (any waypoint)
  - Set spacing (0.2 to 9.9 NM)
  - Set initial direction (0 to 359)
  - Activate Pattern (Enter, Enter)

Marking "Present Position"

- Must be on SAR Map page
- Press "MRK" button
- User waypoint will be saved in database with name "SAR XXX" and shown on SAR Map.
- Waypoint "SAR XXX" can be displayed with LAT/LON coordinates

Message Function

- Flashing "MSG" indicator
  - Continues until all messages are read
- Requires immediate attention
  - Warnings
  - Important flight data/info
- Press "MSG" button to read messages

Operational Procedures/Checklist

- Power - on and Initialization
- Create and store any necessary "user waypoints"and/or "CSPs"
- Setup SAR MAP
- Setup "Search Pattern" and "CSP" waypoint
- Create Flight Plan
- Activate Flight Plan

SUMMARY

- GPS - Very Accurate
- GPS Receivers (Becoming User Friendly)
  - Sophisticated displays
  - Large databases
  - Wealth of info/assistance
- Setup before flight !!!
- Positional awareness
- Navigation made easy

Hands-On Demonstration

- Select a “quarter-grid” corner from SFO sectional (at least 3 grids from MEV)
- Prepare user waypoint format (xxxyz),e.g. 182C3 and a name (3 to 5 letters)
- Enter and Store your grid “user waypoint” (CSP)
- Enter and Store any other user waypoints you want to create
- Setup SAR Map
- Setup “search pattern” and “CSP” waypoint

Hands-On Demonstration (con’t)

- Create Flight Plan
- Activate Flight Plan