



VICTORIA FLYING CLUB

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VICTORIA FLYING CLUB

Pilot Navigation

- Review Navigation (Groundschool)
- Definition and Motivation
- **Pilot Navigation**
- Summary and Questions
- Pre-Flight Briefing



Review Navigation

- What information is required to prepare a cross-country flight and where can it be obtained?
- What elements of a navigation log are filled in before and during the flight, respectively.
- What is the purpose of flight planning and preparation and how does it relate to the actual flight?
- What is a flight plan and itinerary, respectively?



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Definition and Motivation

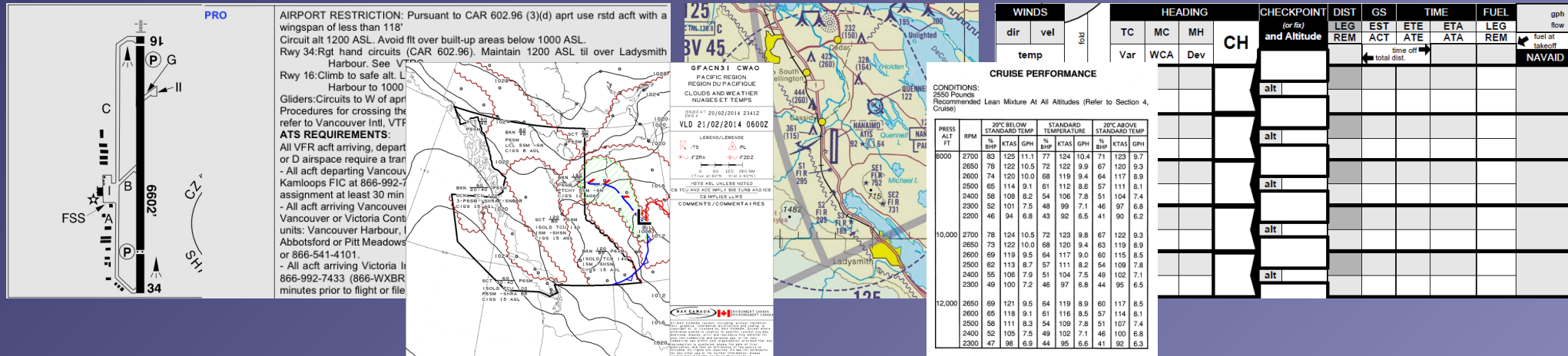


- *The process or activity of accurately ascertaining one's position and planning while following a route.*
- **Essential skill** to safely and efficiently travel from departure to destination
- Navigation **planning** establishes a level of **situational awareness** including potential options *before the flight*
- Supports **decision making** *during the flight*



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Preparation



- **Charts, CFS, Weather** (SWC, GFA, FD, METAR, TAF, AIRMET, SIGMET, PIREP), **NOTAM, W&B, Performance, Navigation Log, Flight Plan, FIC Briefing & Flight Planning**
- **Aircraft** (CoR, CoA, W&B, Insurance, Journey Log, POH, Checklists), **Survival Equipment**
- **Pilot** (License, Ratings, Medical), *IMSAFE*



Navigation Log

WINDS		fold	HEADING				CHECKPOINT (or fix) and Altitude	DIST	GS	TIME		FUEL	gph flow fuel at takeoff NAVAID
dir	vel		TC	TH	MH	CH		LEG REM	EST ACT	ETE ATE	ETA ATA	LEG REM	
temp			WCA	Var	Dev								
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Navigation Log (Route)

[illegible]



Navigation Log (Aircraft)

[illegible]



Navigation Log (Weather)

[illegible]



Navigation Log (Calculation)

[illegible]



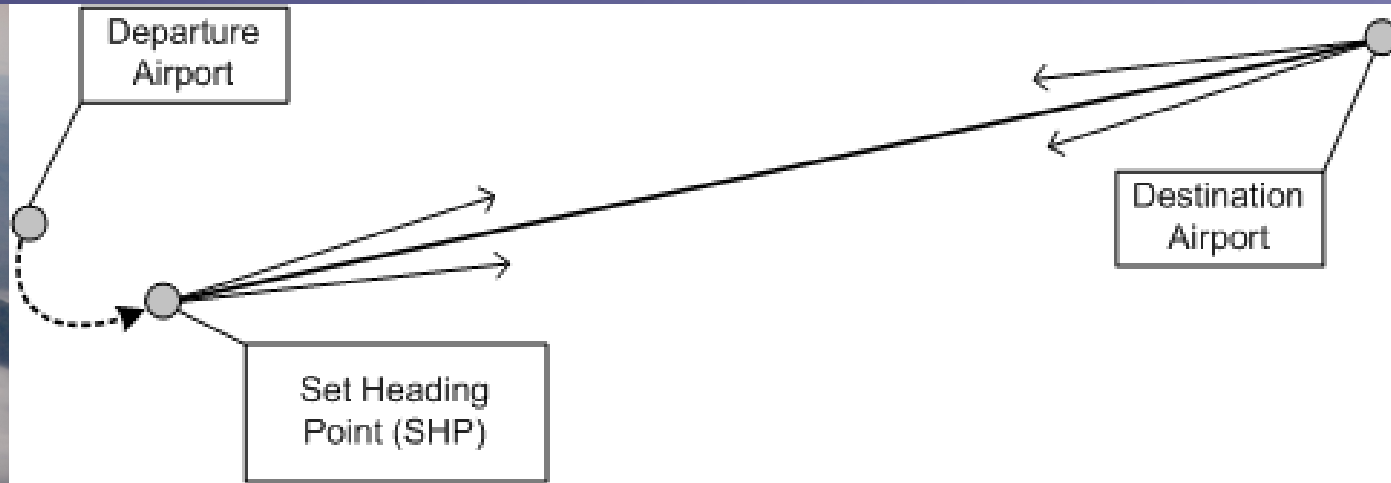
The map displays the Strait of Georgia and surrounding regions, including parts of British Columbia and Vancouver Island. Key locations and features include:

- Locations and Departures:**
 - Vesuvius Bay
 - Ganges
 - Samuel Isl
 - East Pt
 - Beaver Pt
 - Moresby Isl
 - Stuart
 - Stuart Departure
 - D'Arcy Isl
 - Cordova Bay
 - Cordova Bay Departure
 - Finlayson
 - Brentwood
 - Brentwood Departure
 - Shawnigan Lake
 - Shawnigan Lake Departure
 - Cowichan Bay
 - Cowichan Bay Departure
 - Somenos Lake
 - Sooke Lake
- Navigational Aids and Frequencies:**
 - CYA 145(H)
 - CYA 110(H)
 - VIC TML 127.8 C
 - ABV 25
 - VIC TWR 119.1 D (MODE C)
 - Q/T NO CONTACT E (MODE C)
 - ABV 12
 - NO CONTACT E
 - ABV 7 AGL
 - VIC TWR 119.7 C SFC
 - ABV 30
- Other Features:**
 - ACTIVE PASS
 - UNITED CAN
 - CZ C TO 2500 ASL
 - E700



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Geographic Point Procedure

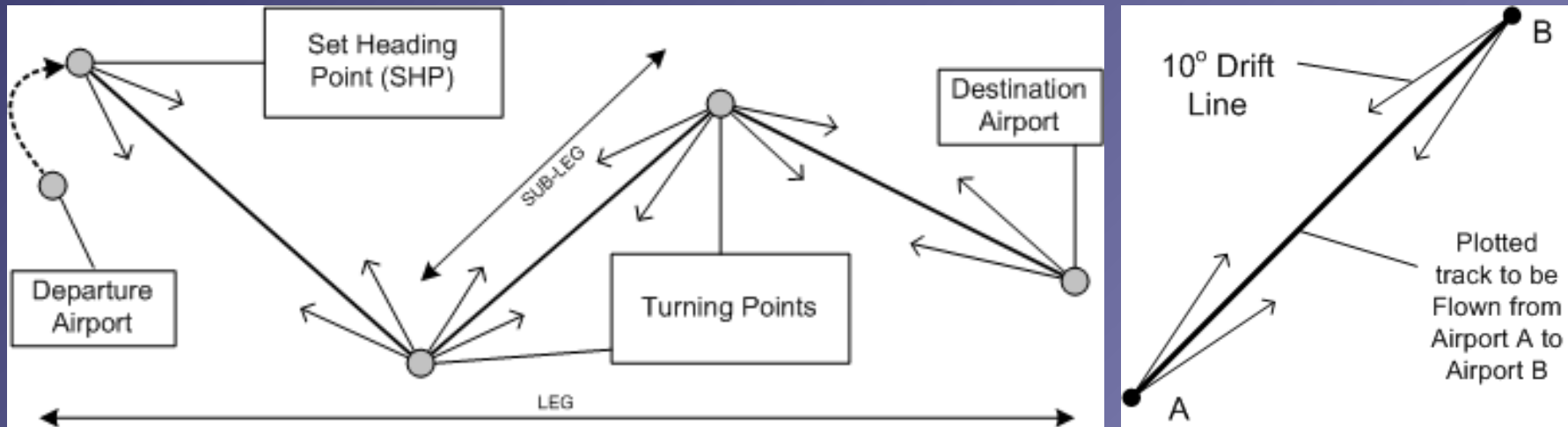


- Fly departure to **Set Heading Point**
- 5 T's – *Time, Turn, Throttle (Mixture), Tune, Talk*
- Enter **Actual Time Over (ATO)** into navigation log
- Establish planned **heading** – heading indicator
- Crosscheck **visual** angle, **chart** and **navigation log**



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Flying Legs

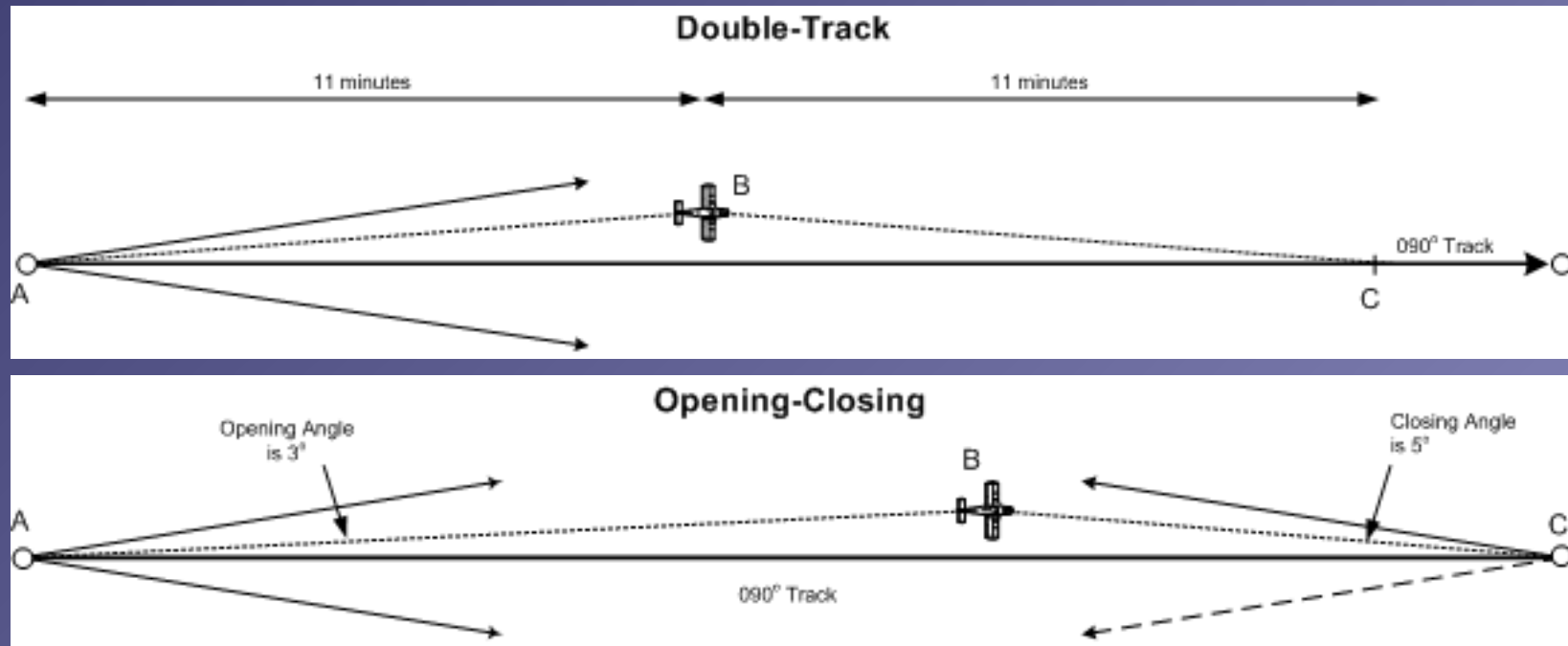


- Update **ETA** and *next* **ETO** at each waypoint
- Maintain *accurate* **heading** and observe **track**
- Correct **drift** as required – update heading
- Check **groundspeed** – update ETA and next ETO
- Perform **OPS / cockpit checks** every **15 / 30 min**



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Track Error Corrections



- Visual Alteration Method
- Double Track Error Method
- Opening Closing Angle Method
- Drift Compensation Method



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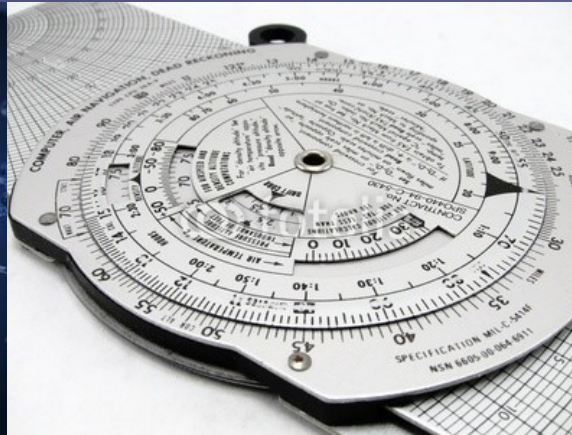
1 in 60 Rule





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Groundspeed Check



- **30 NM, 30 min** → **60 kts**
- **30 NM, 15 min** → **120 kts**
- **30 NM, 20 min** → **90 kts**
- **10 NM, 5 min** → **120 kts**
- **5 NM, 2.5 min** → **120 kts**





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OPS / Cockpit Checks

Magnetic Compass



Heading Indicator



*Fuel, Oil,
Vacuum, Current*

- Assure **navigation**al performance
- Check **power plant**, **fuel** and **electrical** systems
- **Magnetic Compass, Heading Indicator** – Cross Check
- **Engine Instruments** (Fuel, Oil) – Check
- **No Discharge** (Ammeter) – Check



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Flight Plan / Itinerary

NAV CANADA		CANADIAN FLIGHT PLAN / ITINERARY PLAN / ITINERAIRE DE VOL CANADIEN		ICAO FLIGHT PLAN PLAN DE VOL OACI	
PRIORITY / PRIORITE <<≡ FF →		ADDRESSEE(S) / DESTINATAIRE(S) _____ _____ _____ <<≡			
FILING TIME / HEURE DE DEPOT _____ _____		ORIGINATOR / EXPEDITEUR _____ <<≡			
SPECIFIC IDENTIFICATION OF ADDRESSEE(S) AND/OR ORIGINATOR / IDENTIFICATION PRECISE DU(DES) DESTINATAIRES(S) ET/OU DE L'EXPEDITEUR _____					
3 MESSAGE TYPE TYPE DE MESSAGE <<≡ (FPL		7 AIRCRAFT IDENTIFICATION IDENTIFICATION DE L'AERONEF _____ _____		8 FLIGHT RULES REGLES DE VOL _____ _____	
9 NUMBER / NOMBRE _____ _____		TYPE OF AIRCRAFT / TYPE D'AERONEF _____ _____		10 EQUIPMENT / EQUIPEMENT _____ _____	
13 DEPARTURE AERODROME / AERODROME DE DEPART _____ _____		WAKE TURBULENCE CAT. CAT. DE TURBULENCE DE SILLAGE _____ _____		15 CRUISING SPEED VITESSE DE CROISIERE _____ _____	
15 CRUISING SPEED VITESSE DE CROISIERE _____ _____		ALTITUDE / LEVEL / NIVEAU _____ _____		ROUTE / ROUTE _____ _____	



- Required for **advisory, control and alerting** service
- Required for all flights beyond **25 NM** of departure
- **Filing** with **FIC** at least **30 min** before departure
- **Closing** with **FSS** in-flight, control tower or **FIC**
- **SAR** times (**1 / 24 h** after ETA or as specified)



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Diversions



- *Circle, Circle, Line, Heading, Distance, Time*
- *Make a call and you'll be fine*
- **Fuel** (reserve) required and **weather** for alternate
- Consider **departure aerodrome** and **reciprocal track**
- Use physical features for **visual navigation** (roads, rivers)
- Support with **all means of navigation** (GPS, VOR, NDB)



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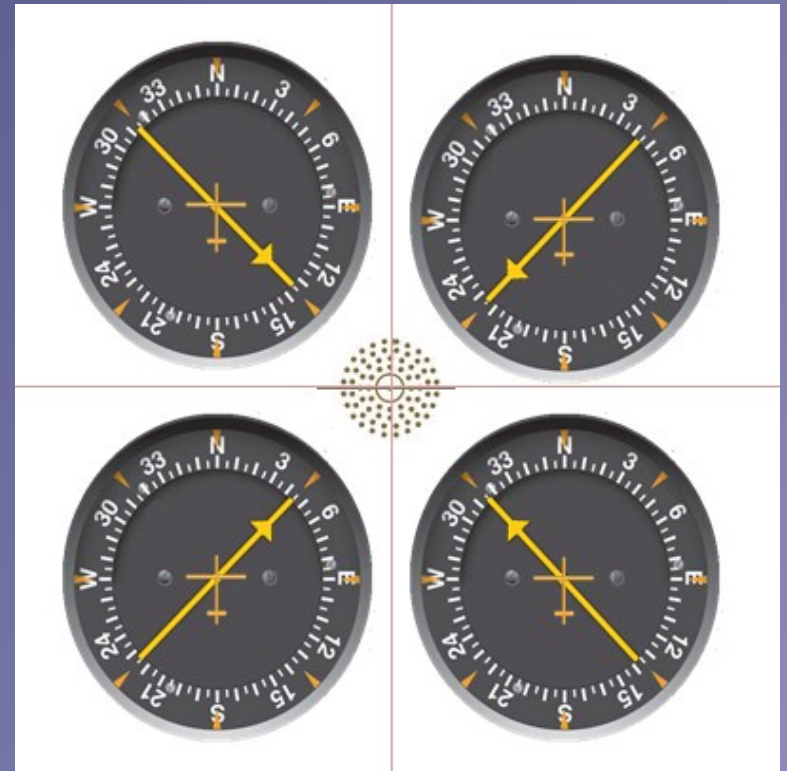
Diversions





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Navigational Aids



- GPS – map and direct to (mounted, portable)
- VOR – radial inbound or outbound, fix
- NDB – bearing to station



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Low-Level Navigation



- *Restricted field of view* and *limited navigational cues*
- Requires *accurate tracking* and *timing*
- Remain clear of **obstacles** – look outside
- Use **shorelines**, **rivers**, **roads**, **railways**
- Consider **precautionary landing** or **special VFR**



Navigational Assistance

- *Steady heading* – crosscheck MC and HI
- Navigation **errors** – heading, drift, landmarks
- **Circle of uncertainty** – last known position
- Watch to **ground to map** versus map to ground
- Proceed to **major landmarks**, consider **climb**
- Request **assistance** – Vectors, DF Steer
- Consider GPS, VOR, NDB for support (CFIT)
- Declare emergency if necessary (7700, ELT)



Summary / Quiz

- What preparation items need to be completed before commencing a cross-country flight?
- Which elements of a navigation log are filled in during the flight and why is an up-to-date log necessary?
- What are the problems associated with attempting to obtain a ground speed check within a few minutes after setting heading?
- What track error correction methods are available to you and how can they be used?



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Pre-Flight Briefing

- Exercise
- Training Area
- Departure and Arrival Procedures
- Weather Briefing / NOTAMs
- Aircraft and Documents
- Time and Fuel Requirements
- Safety Considerations and Responsibilities



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Pilot Navigation (Ex. 23,

LP. 3, (4), 5, (6, 7, 20, 22, 24), 26)

- Objective
- Review
- Motivation
- Howto
- Summary / Questions
- Preflight Briefing



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Charts

- VNC, VTA, WAC
- Route Selection, Chart Preparation
- Markings and Folding
- Drift Lines, Angles



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Departure, Destination, Alternate

- CFS



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Route and Altitude

- Distance, Economy, Weather / Wind, Navigation Aids, Comfort, Oxygen, Performance Limitations, Gliding Distance



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NOTAM



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Weather

- GFA, SWC, FD
- METAR, TAF, SIGMET, AIRMET, PIREP
- Briefing, FIC
- Current Situation and Forecast



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Navigation Log

- Log Keeping
- Time Off and Flight Plan Opening Time
- Set Heading Time
- Compass Headings and Waypoint Times
- ETA for Waypoints and Destination
- ATA (Time Over) for Waypoints and Destination
- Revised GS and ETA



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Flight Plan / Itinerary

- SAR times (long versus short plans, roundtrips)



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Documents

- CoR, CoA, W&B, Insurance, Journey Log, MEL
- License, Medical, IMSAFE
- POH, Checklists, Charts



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Departure, Enroute and Arrival

- Overhead, Geographic Point, En-Route Climb
- GUMPS, OPS Checks, Ground Speed Check
- Position Reports, PIREPs
- Map/Chart Reading:
 - Orientation, Anticipation, Confirmation, Pin-Pointing
- Desired, Actual Track / Error, Angles (10-25NM)
- Double Track Error Method, Visual Alteration, Opening Closing Angle Method, Drift Compensation Method
- Lookout / Scanning and Traffic Awareness (Crew, Systems, Weather)



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Diversion

- Situational Awareness and Decision Making
- Online Planning
- Priority: Aviate, Navigate, Communicate, Manage
- Circle, Circle, Line, Heading, Distance, Groundspeed, Time – You'll Be Fine (Consider Leg-Size)
- Reciprocal Track and Wind Correction
- Estimations: Track, Distance, Groundspeed, Time, Heading
- Multiples of 60KIAS, Multiples of leg section
- Communication (FSS)
- Circle of Uncertainty, Low-Level Navigation
- Emergency Procedures, Triangles