Pilot New Hire
Systems Integration Training



Modules 2 & 4
Flight Deck Familiarization
Checklist Usage



Introductions

Names

Discuss Previous Experience

Exchange Telephone Numbers and/or Emails

Success Tips

Maintain a Positive Mental Attitude!

Compartmentalize

- Put life problems in a “mental box” one hour prior to show time.
- Tell your instructor or management if you have unmanageable training distractors.

Work together chair flying profiles and rehearsing callouts

Plan your sleep periods

- Turn off all distractions
- Use the hour prior to going to sleep to study for your next lesson.

Eat sensibly

- Avoid large meals immediately prior to scheduled simulator times.
- Try to avoid sugar “rush” and “crash”, it’s a marathon – not a sprint.

Exercise daily

Learning Objectives

- Required Documents and Manuals
- Flight Deck Layout
- System Controls, Switches, Displays and Navigation/Autopilot
- Checklists

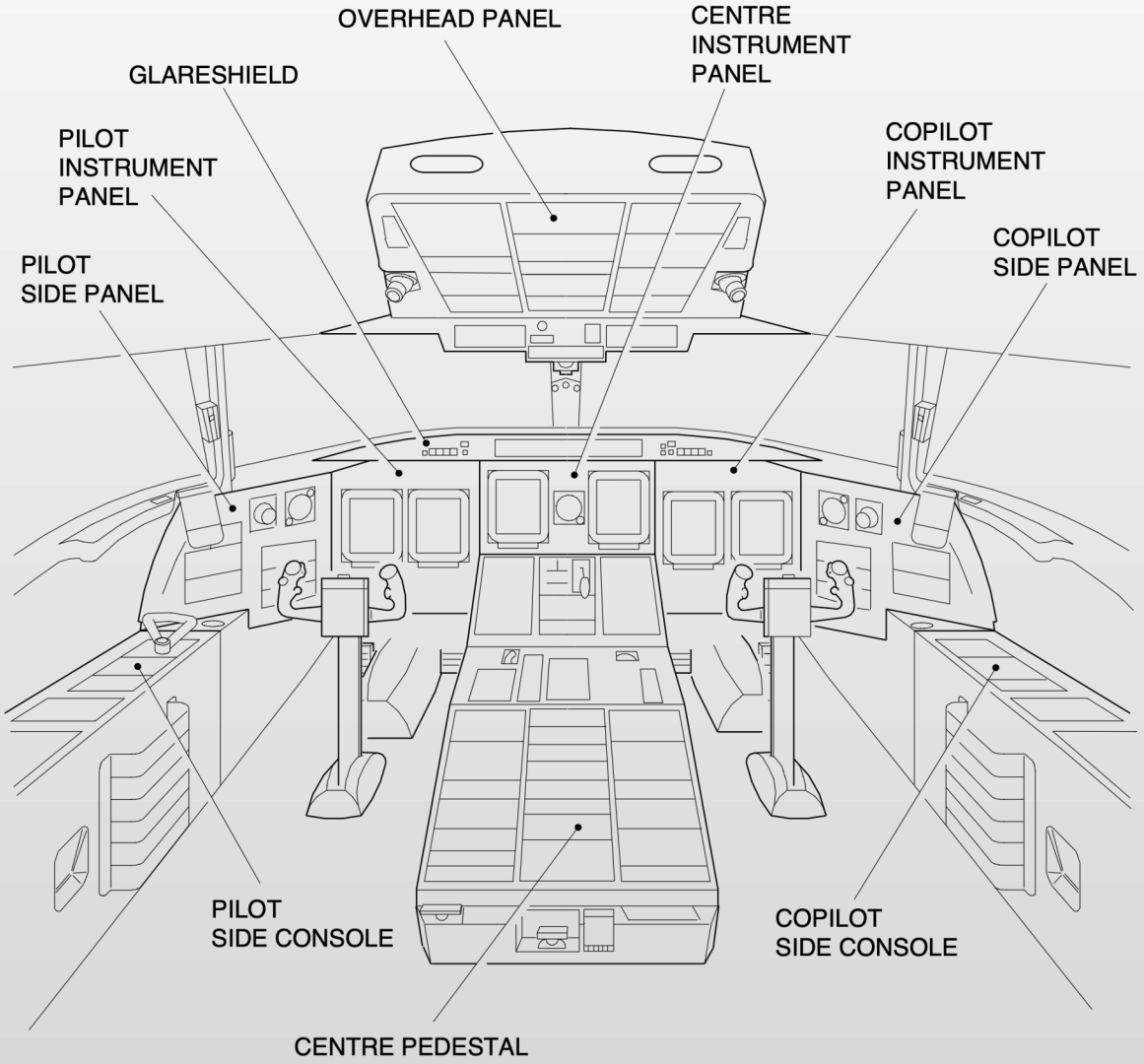
Required Documents and Manuals
GOM 1-2.11.1 – Carried in Hard Copy

- One Normal Checklist
- Two Immediate Action Checklists
- One Aircraft Maintenance Flight Log
- One Airworthiness Certificate
- One Aircraft Registration
- One QRH Volume 1
- One QRH Volume 2

Required Documents and Manuals
GOM 1-2.11.1 – Carried Electronically

- Minimum Equipment List (MEL)
- Nonessential Equipment Furnishings (NEF)
- Configuration Deviation List (CDL)
- Airplane Flight Manual (AFM)

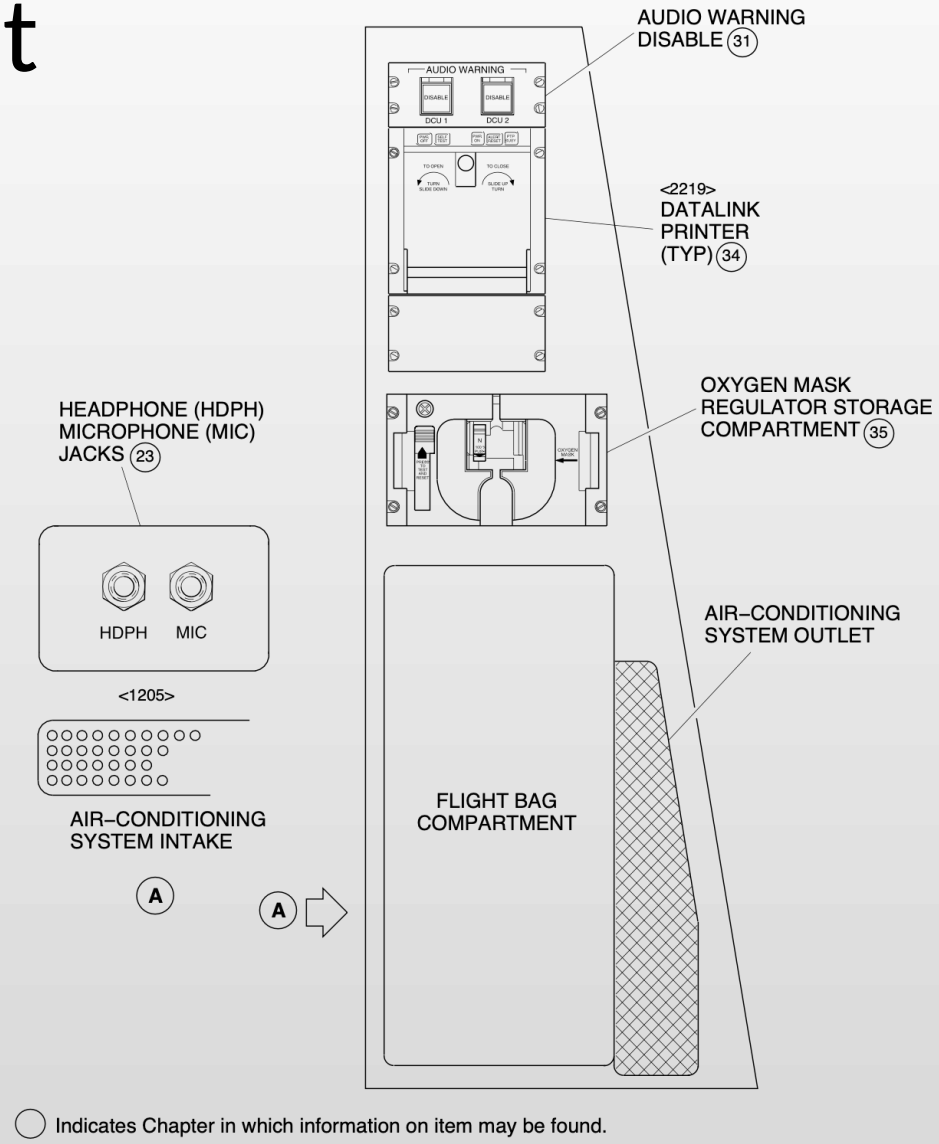
Flight Deck Layout
Panel Names



Flight Deck Layout
FO Side Console

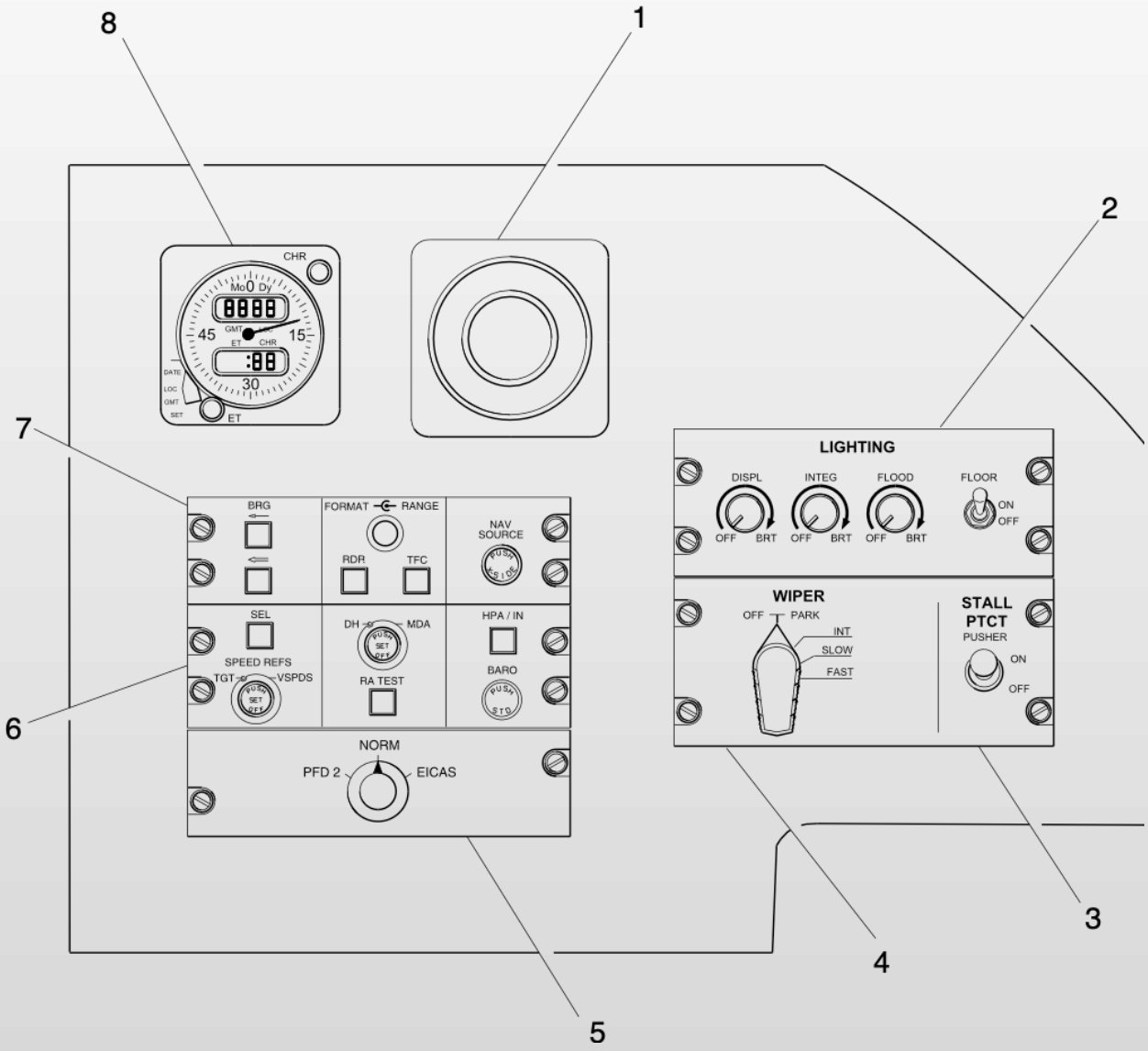
The “DATALINK PRINTER” is usually called the ACARS Printer.

Remember, always verbally confirm BEFORE lifting a plastic guard and pressing a guarded switch such as the DCU switches on the Audio Warning Panel.



Flight Deck Layout
FO Side Panel

1. Air conditioning system gasper
2. Lighting panel
3. Stall protection panel
4. Windshield wiper control panel
5. Display reversionary panel
6. Air data reference panel
7. Display control panel
8. Clock

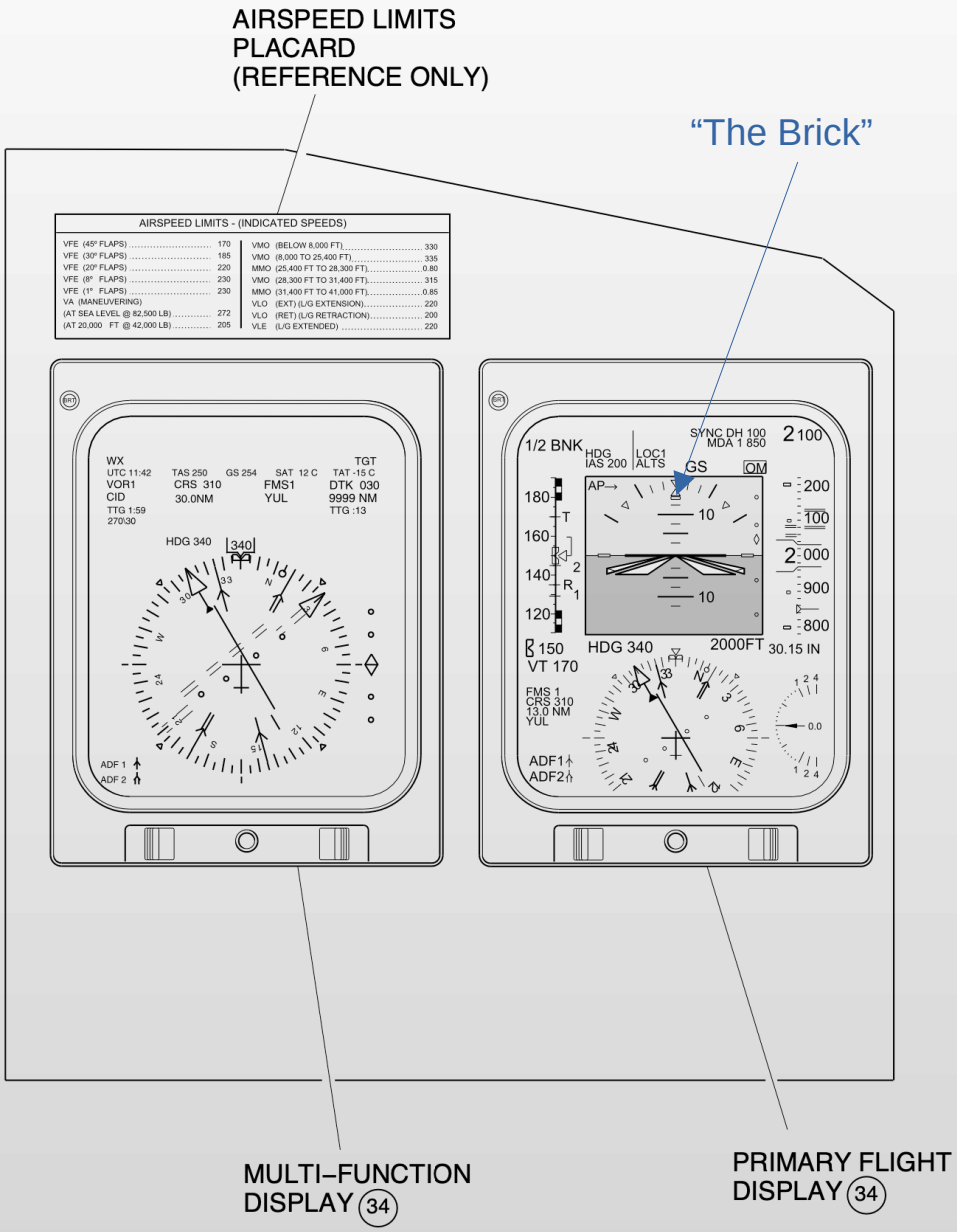


Flight Deck Layout
FO Instrument Panel

You may hear your Multi-Function Display referred to as an “MFD” and your Primary Flight Display as a “PFD”.

The “Brick” is the CRJ’s slip-skid indicator – remembering to keep it centered is extremely important during single engine operations.

We will cover the rest of the panels using the GFS.



Checklists

- Philosophy
- Sequence
- Flow Patterns
- Callouts and Responses
- Normal, Abnormal and Emergency

GoJet Checklist Review

- Two Types of Checklists
  - Read and Do
    - Performed Silently
    - Except for the Safety Check, a flow pattern may be used to place the required item in the proper position.
    - All items will be verified by reading the checklist and carrying out the appropriate action if necessary.
  - Challenge and Response
    - First done as a flow
    - The applicable items are completed from memory (recall) using a flow pattern.
    - **There IS a designated crewmember in the Expanded Checklist for every Challenge and Response Checklist.**

SOP 2-1.5

Checklist Usage, SOP Sec 02

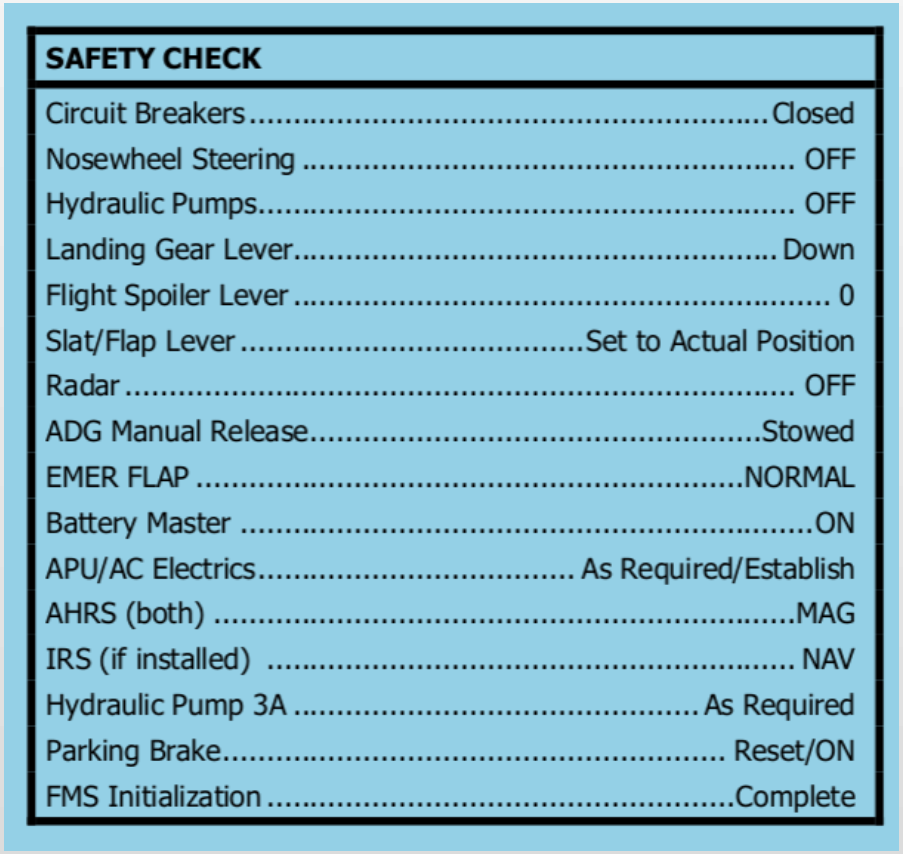
Two types of checklists

- Read and Do Checklists
  - Safety Check, Engine Start – Cross Bleed, Climb Check, After Landing, Terminating Check.
  - May use a flow pattern (except for Safety Check), After performing a “flow”, verify by the checklist
- Challenge and Response
  - First done as a flow (Originating, Before Start, etc.)
  - Memorize proper responses!

In the event that the reading of a checklist is interrupted for any reason, the checklist shall be restarted and completed in its entirety, unless the Captain and First Officer are both certain of the point of interruption.

Safety Check

- Read and Do
- Performed
  - Every First Flight of the Day
  - After a Crew Change
  - Anytime electrical power has been interrupted or control panel switch selection is questionable.
- No Flow Allowed!
- Check Aircraft Log to make sure you have the correct aircraft and that it matches the ship number, no open write-ups, an airworthiness sign off, etc. Any doubts – call maintenance.



SAFETY CHECK	
Circuit Breakers	Closed
Nosewheel Steering	OFF
Hydraulic Pumps	OFF
Landing Gear Lever	Down
Flight Spoiler Lever	0
Slat/Flap Lever	Set to Actual Position
Radar	OFF
ADG Manual Release	Stowed
EMER FLAP	NORMAL
Battery Master	ON
APU/AC Electrics	As Required/Establish
AHRS (both)	MAG
IRS (if installed)	NAV
Hydraulic Pump 3A	As Required
Parking Brake	Reset/ON
FMS Initialization	Complete

SOP 2-4

Safety Check Practice

SAFETY CHECK	
Circuit Breakers	Closed
Nosewheel Steering	OFF
Hydraulic Pumps	OFF
Landing Gear Lever	Down
Flight Spoiler Lever	0
Slat/Flap Lever	Set to Actual Position
Radar	OFF
ADG Manual Release	Stowed
EMER FLAP	NORMAL
Battery Master	ON
APU/AC Electrics	As Required/Establish
AHRS (both)	MAG
IRS (if installed)	NAV
Hydraulic Pump 3A	As Required
Parking Brake	Reset/ON
FMS Initialization	Complete

SOP 2-4

Checklist Review

- The responses to all checklists are based on the following guidelines:
  - If the challenge is for panel status, the response is “Checked”
  - If the challenge is for a switch, state the position of the switch (e.g., “Hydraulic Pump 3A - OFF”)
  - If the challenge is for a system status, state the status (e.g., “APU - ON”)
  - If the challenge ends with the word “Test”, the response is “Complete”
- Checklist Interruption
  - In the event that the reading of a checklist is interrupted for any reason, the checklist shall be restarted and completed in its entirety, unless the Captain and First Officer are both certain of the point of interruption.

SOP 2-1.1

Originating Check

- Performed
  - Every First Flight of the Day
  - The Captain's first flight on the aircraft
  - Aircraft unattended by flight or cabin crew for any extended period of time
  - Maintenance has been done to the aircraft
- Items with an * are First Flight of the Day Only
- Challenge and Response

ORIGINATING CHECK		
Aircraft Logbook & Documents	Checked	BOTH
Emergency Equipment	Checked	CA
Safety & External Walkaround Checks	Complete	BOTH
Gear & Safety Pins	Removed/On Board	BOTH
Pedals, Seat & Harness	Adjusted	BOTH
Audio Warning Panel	Checked	F/O
Electrics	Checked	CA
*Fire Test	Complete	CA
Lights	Checked	CA
Fuel	Checked	CA
Bleeds	Checked	CA
APU	As Required	CA
Start Panel	Checked	CA
Hydraulics	Checked	CA
ELT	ARM/RESET	CA
Pressurization	Checked	F/O
Air-Conditioning	Checked	F/O
*Ice Detector Test	Complete	F/O
Windshield Heat	LOW	F/O
Emergency Lights	ARMED	F/O
Standby Compass	Checked	F/O
*Stall Test	Complete	F/O
Nosewheel Steering	OFF	CA
Clocks	Set	BOTH
EFIS Control Panels	Checked	BOTH
Instrument Panels	Checked	BOTH
EICAS & Standby Instrument	Checked	CA
*Anti-Skid Test	Complete	CA
*MLG Bay Overheat Test	Complete	CA
Upper Pedestal	Checked	CA
Thrust Lever Quadrant	Checked	CA
Avionics	Checked	CA
Starlink Power	On and Dark	CA
Trims	Checked	CA
Yaw Dampers	ENGAGED	CA
Source Select Panel	NORMAL	CA
Lower Pedestal	Checked	CA
FMS	SET	CA/F/O
RVSM Qualified	CHECKED	CA

SOP 2-6

Checklists
Originating Check Flow 1 of 2

- Captain
  - Documents and Logbook
    - VOR Check Done for the Day?
    - Open Write Ups?
    - Cabin deferrals, brief FA
  - Emergency Equipment
  - Adjust Seat
  - Nosewheel Steering Off
  - Clock
  - EFIS Control Panels
  - Instrument Panels
  - EICAS & Standby Instrument
  - Electrics
  - *Fire Test
  - Lights
  - Fuel

FMX 1-1.3

- First Officer
  - Review Logbook
  - External Walkaround
  - Adjust Seat
  - Initialize ACARS, Get ATIS
  - Audio Warning Panel
  - Clock
  - EFIS Control Panels
  - Instrument Panels
  - Pressurization
  - Air-Conditioning
  - *Ice Detector
  - Windshield Heat
  - Emergency Lights
  - Standby Compass
  - *Stall test

SOP 2-6, SOP 1-11, GOM 1-2.11

Checklists
Originating Check Flow 2 of 2

- Captain
  - Bleeds
  - APU
  - Start Panel
  - Hydraulics
  - ELT
  - *Anti-Skid Test
  - *MLG Bay Overheat Test
  - Upper Pedestal
  - Thrust Lever Quadrant
  - Avionics
  - Trims
  - Yaw Dampers
  - Source Select Panel
  - Lower Pedestal
  - FMS
  - RVSM
- First Officer
  - Clock
  - EFIS Control Panels
  - Instrument Panel

SOP 2-6, SOP 1-11, GOM 1-2.11

Checklists
Originating Check Practice

SOP 2-6, SOP 1-11, GOM 1-2.11

ORIGINATING CHECK		
Aircraft Logbook & Documents	Checked	BOTH
Emergency Equipment	Checked	CA
Safety & External Walkaround Checks	Complete	BOTH
Gear & Safety Pins	Removed/On Board	BOTH
Pedals, Seat & Harness	Adjusted	BOTH
Audio Warning Panel	Checked	F/O
Electrics	Checked	CA
*Fire Test	Complete	CA
Lights	Checked	CA
Fuel	Checked	CA
Bleeds	Checked	CA
APU	As Required	CA
Start Panel	Checked	CA
Hydraulics	Checked	CA
ELT	ARM/RESET	CA
Pressurization	Checked	F/O
Air-Conditioning	Checked	F/O
*Ice Detector Test	Complete	F/O
Windshield Heat	LOW	F/O
Emergency Lights	ARMED	F/O
Standby Compass	Checked	F/O
*Stall Test	Complete	F/O
Nosewheel Steering	OFF	CA
Clocks	Set	BOTH
EFIS Control Panels	Checked	BOTH
Instrument Panels	Checked	BOTH
EICAS & Standby Instrument	Checked	CA
*Anti-Skid Test	Complete	CA
*MLG Bay Overheat Test	Complete	CA
Upper Pedestal	Checked	CA
Thrust Lever Quadrant	Checked	CA
Avionics	Checked	CA
Starlink Power	On and Dark	CA
Trims	Checked	CA
Yaw Dampers	ENGAGED	CA
Source Select Panel	NORMAL	CA
Lower Pedestal	Checked	CA
FMS	SET	CA/F/O
RVSM Qualified	CHECKED	CA

Checklists
Before Start

- Performed
  - After ATC Clearance and aircraft refueling is completed.
- Challenge and Response

BEFORE START CHECK	
EFB Checklist ..... Complete	BOTH
Logbook & OFP Review ..... Complete	BOTH
Crew O_2 & Masks/Smoke Goggles ..... Checked (Qty)	BOTH
Passenger Signs ..... ON	F/O
LDG ELEV ..... Set	F/O
Altimeters ..... (----) Set/Cross Checked	BOTH
FMS ..... Set/AUTOTUNE	BOTH
Radios/Navaids ..... Set for Departure	CA
ADSB ..... GJS _____ ..... Set	CA
Thrust Reversers ..... Armed	CA
Departure briefing ..... Complete	CA

	Oxygen Bottle Size	
Number of Crew	77 cu ft	50 cu ft.
2	810	1180
3	1110	1630

SOP 2-8, EDG 1-2.7

Checklists
Before Start Flow

- Captain
  - Determine PF/PM
  - Oxygen Masks
  - Oxygen Quantity
  - Altimeters
  - FMS
  - Radios / Navaids
  - Thrust Reversers
  - If PF:
    - Departure Briefing
    - Verify Legs
- First Officer
  - Oxygen Mask
  - Passenger Signs
  - Landing Elevation
  - FMS
  - If PF:
    - Departure Briefing
    - Verify Legs

SOP 2-8, SOP 1-11, GOM 1-2.11

Checklists
Before Start Practice

BEFORE START CHECK	
EFB Checklist.....Complete	BOTH
Logbook & OFP Review .....Complete	BOTH
Crew O_2 & Masks/Smoke Goggles.....Checked (Qty)	BOTH
Passenger Signs.....ON	F/O
LDG ELEV ..... Set	F/O
Altimeters.....(----) Set/Cross Checked	BOTH
FMS .....Set/AUTOTUNE	BOTH
Radios/Navaids .....Set for Departure	CA
ADSB ..... GJS _____.....Set	CA
Thrust Reversers.....Armed	CA
Departure briefing ..... Complete	CA

SOP 2-8, SOP 1-11, GOM 1-2.11

Checklists
Cleared to Start

- Performed
  - After flight deck door is closed.
  - Prior to push
- Prior to any aircraft movement the CA will confirm that all passengers are seated
- The Rotating Beacon will be used to notify the ground crew that the cabin and flight crew are prepared for pushback
- Challenge and Response

CLEARED TO START CHECK	
Personal Electronic Devices.....OFF	BOTH
APU/AC Electrics.....ON/Checked	CA
Papers.....On Board	CA
Doors.....Closed/Locked	CA
Beacon.....ON	CA
Fuel pumps & Qty..... ON, (Qty)	CA
Hydraulic pumps..... AUTO/ON	CA
Parking brake.....As required	CA

Note: This is your last chance to make sure that the nose wheel steering is off, ground power removed, beacon is on, and the seat belt and no smoking signs are on prior to aircraft movement. Checking events have ended here.

SOP 1-2.9.7, SOP 2-9

Checklists
Cleared to Start Flow

- Captain
  - Personal Electronic Devices Off
  - Papers on Board
  - Fuel Pumps On
  - Hydraulic Pumps Auto/On
  - Beacon On
  - Nosewheel Steering Off
  - APU/AC Electrics On
  - Let the FO know if you will do a single or dual engine taxi, then ask the FO to call for push.
- First Officer
  - Personal Electronic Devices Off

SOP 2-8, SOP 1-11, GOM 1-2.11

Checklists
Cleared to Start Practice

CLEARED TO START CHECK	
Personal Electronic Devices.....OFF	BOTH
APU/AC Electrics.....ON/Checked	CA
Papers.....On Board	CA
Doors.....Closed/Locked	CA
Beacon.....ON	CA
Fuel pumps & Qty..... ON, (Qty)	CA
Hydraulic pumps..... AUTO/ON	CA
Parking brake.....As required	CA

SOP 1-2.9.7, SOP 2-9

Normal Start

Usually, the right engine is started first. On the first flight of the day, however, the left engine is started first to verify the fuel check valve.

The following engine instrument verification is required (silent):

Oil pressure : Verify increasing

ITT : Verify below 120°C

N_2 20%: L or R thrust lever to IDLE

L or R AUTO IGNITION msg: Appears

Fuel flow: Verify increasing

Light-off : Verify increase in ITT (if looks like it may exceed 815°C, abort and call for QRH **2 START ABORT**, if it exceeded 815°C then call for QRH **Engine Hot Start**)

N_2 50%: Verify L or R ENGINE START status message disappears
(if not call for QRH 2 **NO STRTR CUTOUT**)

L or R AUTO IGNITION msg: Disappears

Note: Many Checklists have (On the ground) or (In flight), make sure you use the correct checklist.

The following parameters indicate a **stable engine** at ISA:

N_2 : 55 – 65% rpm

Fuel flow : Approximately 480 lbs/hr

Oil pressure: Greater than 25 psi

Engine Starts and Malfunctions

Other ways of starting engines and engine start malfunctions will be discussed and practiced in the next lesson.

Homework:

Please review Starter Limitations, External Air start and Cross Bleed Start procedures in QRH 1.

Also review Low Oil Press, Start Abort, Hot Start, No Starter Cutout in QRH 2. What checklist will you call for if the engine does not accelerate to IDLE values?

Checklists
After Start

- Performed
  - After engine(s) stabilizes.
  - Prior to taxi
- After starting an engine, all items in the after start checklist shall be accomplished, even if the Captain elects to utilize one-engine taxi procedures.
- Items marked with a (D) are delayed engine start items. The items marked with a (D) shall be accomplished again after starting the second engine.

AFTER START CHECK	
*Fuel Check Valve ..... Checked	CA
Bleeds/Packs ..... AUTO/ON	F/O
(D) Anti-ice ..... As Required	F/O
Probes ..... ON	F/O
Transponder/TCAS ..... ON/AUTO	F/O
(D) APU/Electrics ..... As Required/Checked	CA
(D) Flex Thrust ..... As Required	BOTH
Flaps ..... (--°) Indicating	BOTH
Flight Controls ..... Checked	F/O
----------	---------
Rudder ..... Checked	CA
Nosewheel Steering ..... ARMED	CA
Brake Temp ..... Checked	CA
Takeoff Data ..... SET	F/O

SOP 2-10

Checklists
After Start Flow

- Captain
  - *Fuel Check Valve
  - Monitor push team and direct their disconnect once you have at least one engine started.
  - Call for Flaps and After Start
  - Once push team is clear
    - Rudder Check
    - Nosewheel Steering On
    - Brake Temperature
- First Officer
  - Has started one or both engines as directed by the Captain
  - Anti-Ice as required
  - Probes on
  - Transponder on PF position
  - Flaps when directed by the Captain
  - Flight Controls Checked

SOP 2-10

Checklists
After Start Practice

AFTER START CHECK	
*Fuel Check Valve ..... Checked	CA
Bleeds/Packs ..... AUTO/ON	F/O
(D) Anti-ice ..... As Required	F/O
Probes ..... ON	F/O
Transponder/TCAS..... ON/AUTO	F/O
(D) APU/Electrics .....As Required/Checked	CA
(D) Flex Thrust..... As Required	BOTH
Flaps .....(--°) Indicating	BOTH
Flight Controls ..... Checked	F/O
----------	---------
Rudder ..... Checked	CA
Nosewheel Steering .....ARMED	CA
Brake Temp .....Checked	CA
Takeoff Data ..... SET	F/O

SOP 2-10

Taxiing

- **Taxi Diagrams Out and On**
- **Write Down ALL Clearances**
- **FO performs the Before Takeoff Check when CA asks for it.**

Checklists
Before Takeoff

- Above the line is normally performed during taxi after flight attendant reports “Cabin Secure”. In low-visibility, high threat, etc. perform with aircraft stopped and parking brake set.
- Below the line is completed when cleared to line up and wait or cleared for takeoff
- Challenge and Response

BEFORE TAKEOFF CHECK	
Flight Attendant ..... Advised	F/O
T/O Fuel Qty/Balance ..... _Req _OB/CHKD	FO/CA
Fuel Crossflow ..... MAN/Off	F/O
Radar/Terrain ..... As Required	F/O
Flaps ..... (_°) Set for Takeoff	BOTH
Trims ..... Engaged, Zero & (_._)	CA
Flight Instruments ..... Checked	BOTH
Runway Change Check ..... Complete/Not Required	F/O
Takeoff Briefing ..... RWY_ /Complete	PF
----------	---------
CONFIRM RUNWAY_____/HDG Bug Set ..... CONFIRMED/SET	FO/CA
Lights & Strobes ..... ON	CA
Ignition/Anti-ice ..... As Required	F/O
CAS ..... Checked/Clear	FO/CA
T/O Config ..... OK	CA

SOP 2-13

Checklists
Before Takeoff Flows

- Captain
  - Above the Line
    - Flaps
  - Below the Line
    - Lights & Strobes
    - CAS
- First Officer
  - Above the Line
    - Fuel Crossflow Manual
    - Call Flight Attendant, hear “Cabin Secure”
    - Transponder / TCAS
    - Radar / Terrain
    - Flaps
  - Below the Line
    - Ignition / Anti-Ice
    - CAS

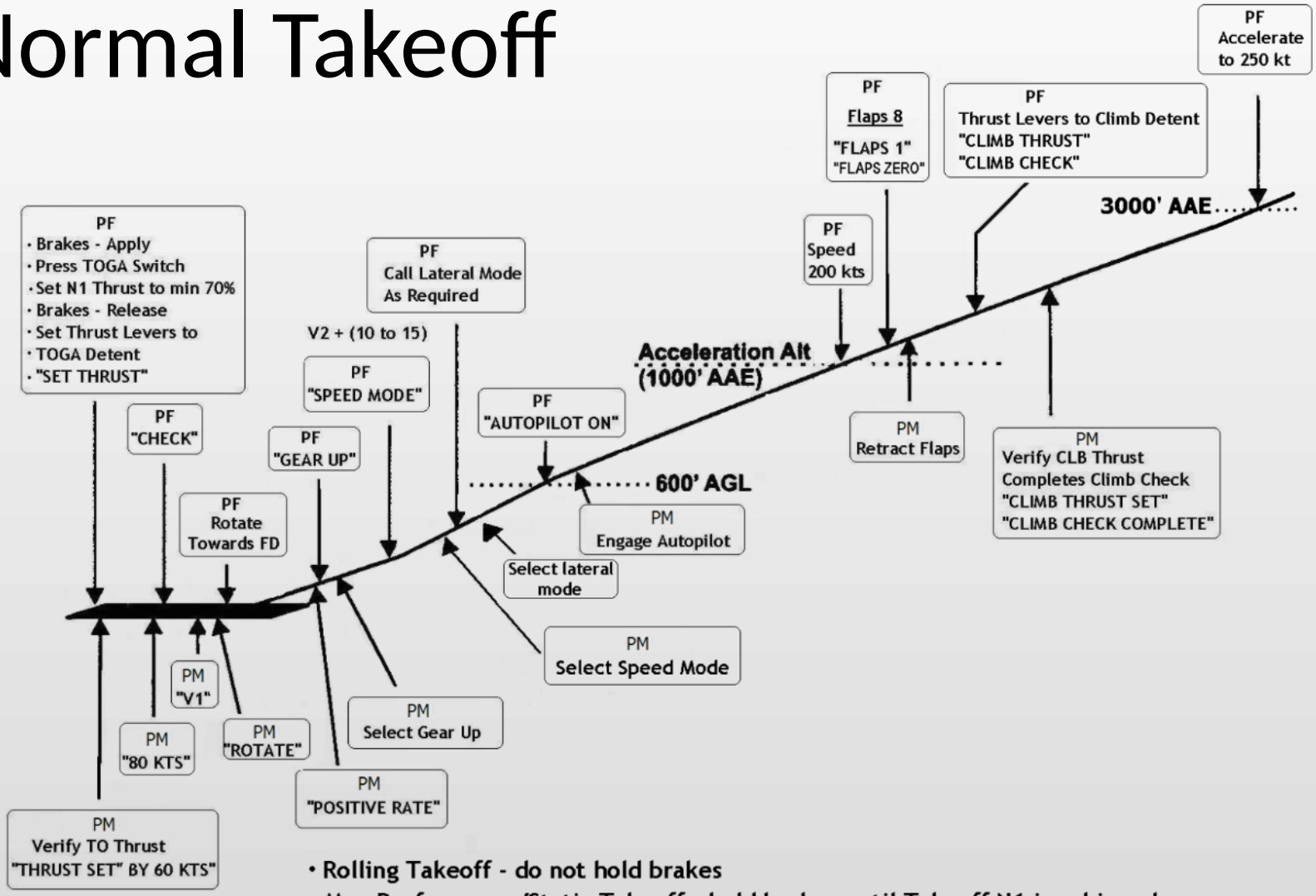
SOP 2-13

Checklists
Before Takeoff Practice

BEFORE TAKEOFF CHECK	
Flight Attendant .....Advised	F/O
T/O Fuel Qty/Balance ..... _Req _OB/CHKD	FO/CA
Fuel Crossflow .....MAN/Off	F/O
Radar/Terrain .....As Required	F/O
Flaps..... (_°) Set for Takeoff	BOTH
Trims .....Engaged, Zero & (_._)	CA
Flight Instruments.....Checked	BOTH
Runway Change Check .....Complete/Not Required	F/O
Takeoff Briefing .....RWY_ /Complete	PF
----------	---------
CONFIRM RUNWAY_____/HDG Bug Set.....CONFIRMED/SET	FO/CA
Lights & Strobes..... ON	CA
Ignition/Anti-ice .....As Required	F/O
CAS ..... Checked/Clear	FO/CA
T/O Config .....OK	CA

SOP 2-13

Normal Takeoff



- Rolling Takeoff - do not hold brakes
- Max Performance/Static Takeoff - hold brakes until Takeoff N1 is achieved
  or
  hold brakes until 75% N1 is achieved

SEP14

Checklists
Climb Check

- Silent Read and Do except for confirming Altimeters.
- Normally completed after the aircraft is clean and climb power is selected.

CLIMB CHECK	
Landing Gear.....UP	PM
Flaps .....ZERO	PM
Fuel Crossflow..... AUTO	PM
Bleeds & APU ..... SET	PM
Thrust Reversers ..... OFF	PM
CAS .....Checked/Clear	PM
Prior to 29,000' Altimeters .....Checked	BOTH

SOP 2-15.3

Checklists
Climb Speeds

Sea Level to 10,000’	250 KIAS
10,000’ and above	Long Range Climb - 250 KIAS/M 0.70✸
	Normal Climb - 290 KIAS/M 0.74
	High Speed Climb - 320 KIAS/M 0.77

- *Use of Long Range Climb is prohibited above FL320
- The minimum all engines operating climb speed/Mach above grid MORA is 250 KIAS to FL320, then accelerate in the climb to attain no less than Mach 0.74 by FL350
- Above FL350, climb at NO LESS than Mach 0.74
- If unable to maintain the minimum climb Mach specified above, and unable to maintain a minimum rate of climb of 500’ per minute, level-off and/or request a lower altitude from ATC. The aircraft has reached its effective service ceiling for the current conditions.

SOP 2-15.5

Checklists
Cruise Speeds

- Below 15,000 MSL – applicable approach speed
- Above 15,000 MSL: At no time should the aircraft be flown at less than **Mach .70** or driftdown speed, whichever is higher.
- The driftdown speed is based on the aircraft's weight and altitude and may be found in the speed cards located in the CRJ QRH Volume 1. This will provide adequate protection from stall while maneuvering up to at least 1.3g.

SOP 1-6.3.3, 2-16.2

Checklists
Cruise Checks

- Cruise Fuel Check: As stated in GOM 3-2.2.17, Captains on flights scheduled for flight times of one (1) hour or more must record the actual fuel burn and actual time from brake release on the flight plan at the first fix beyond the top of climb (ToC)
- Cruise Altimeter Check: When operating in RVSM airspace, both primary and stand-by altimeters should be cross-checked at least once per hour. At a minimum, the two primary altimeters should agree with a maximum difference of 200’ or less. If there is a difference greater than 200’, the altimetry system should be reported to ATC as being suspect, and a discrepancy entered in the aircraft logbook.
- ATC Shortcuts: No GoJet aircraft shall be operated more than 50nm off any shoreline during normal operations.

SOP 2-16.5, 2-16.7, 2-16.9,

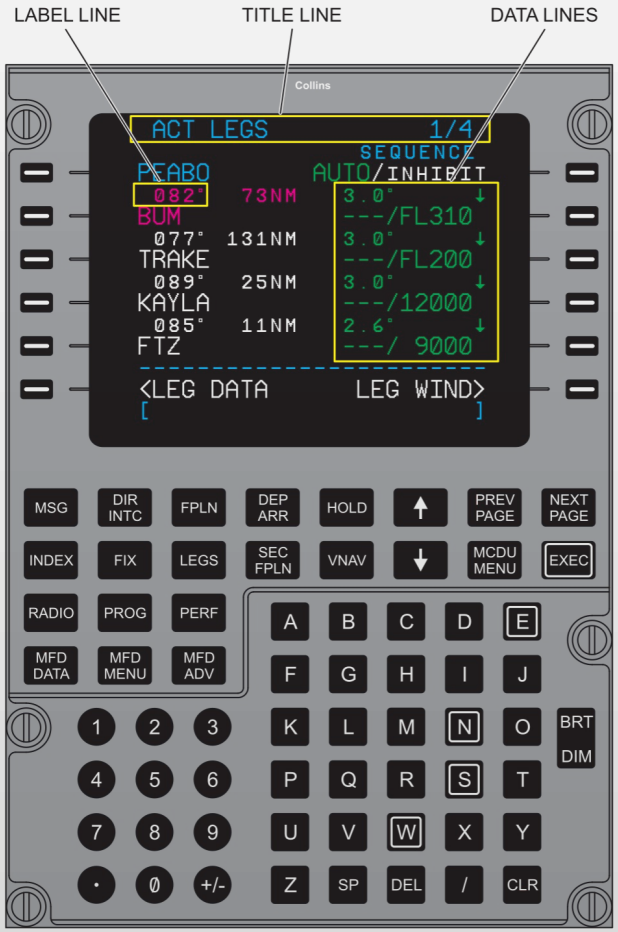
FMS Entries & Reroutes

For this lesson FMS Initialization and Flight Plan Entry will be Instructor Demonstration.

Next lesson and follow-on lessons, each PM will set up the FMS, please let your instructor know when you start programming the FMS so your entries can be observed.

The following slides will introduce:

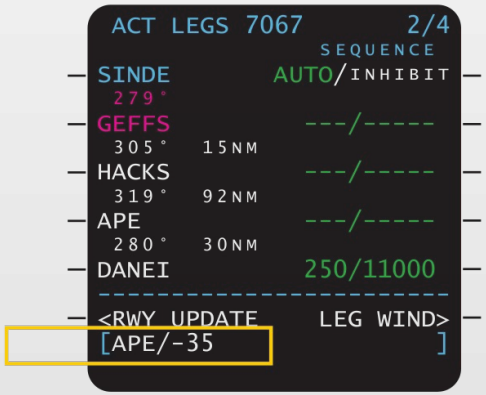
- FMS Waypoints
- FMS Tracking
- FMS Holding



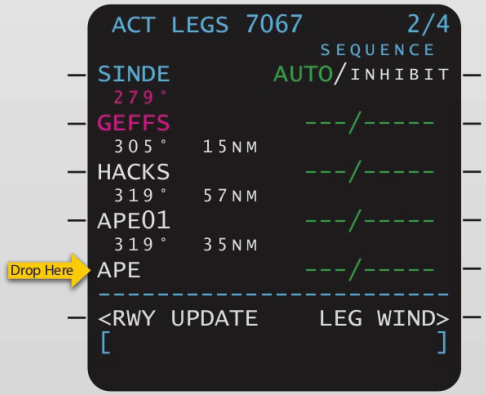
FMS – Waypoints

Along Course Waypoints

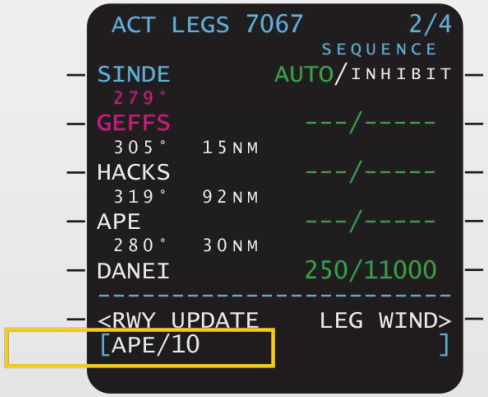
1. Create the waypoint, 35 nm this side of APE in the scratchpad:
   APE/-35



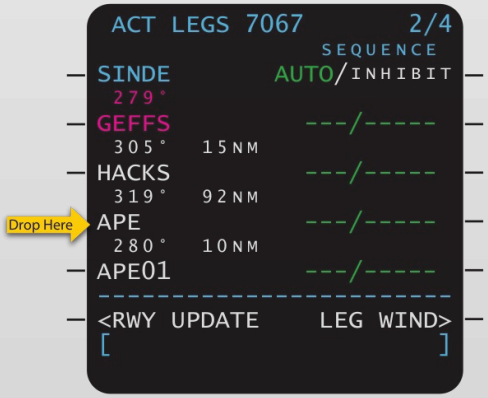
2. Drop on top of the waypoint on which it was based:
   The FMS will "auto-place" the waypoint where it belongs.



3. Create the waypoint, 10 nm on the other side of APE in the scratchpad:
   APE/10



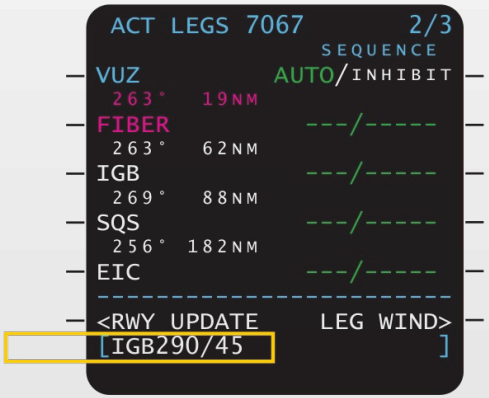
4. Drop on top of the waypoint on which it was based:
   The FMS will "auto-place" the waypoint where it belongs.



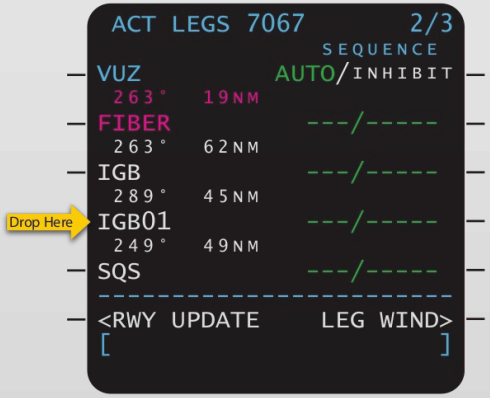
FMS – Waypoints

Place/Bearing/Distance

1. Create a waypoint on the IGB VOR Radial 290 at 45 DME:
   IGB290/45

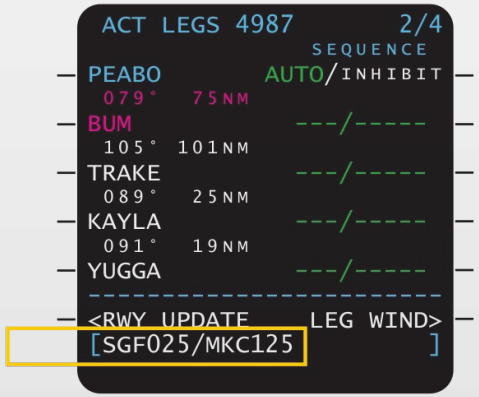


2. Drop the waypoint where it belongs:
   The FMS will **not** "auto-place" the waypoint.

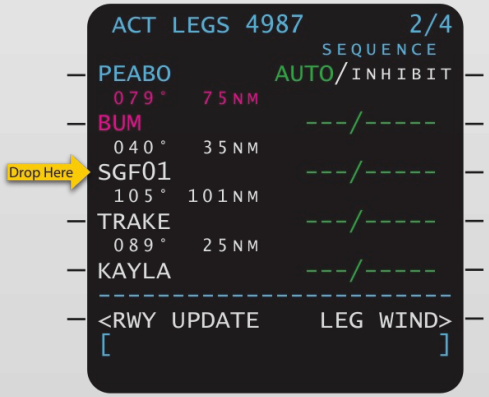


Place Bearing/Place Bearing

1. Create a waypoint at the crossing of the SGF VOR Radial 025 and the MKC VOR Radial 125:
   SGF025/MKC125

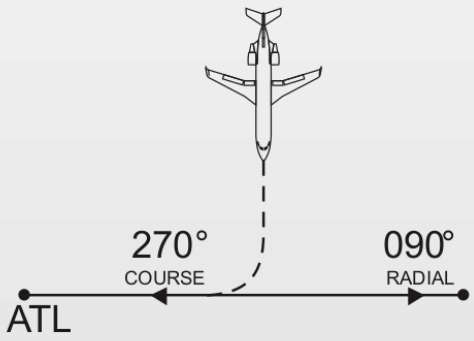


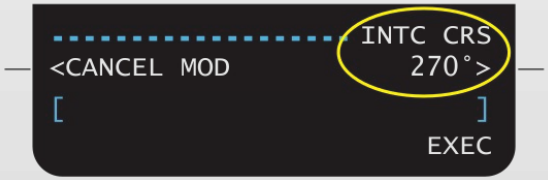
2. Drop the waypoint where it belongs:
   The FMS will not "auto-place" the waypoint.



FMS – Tracking

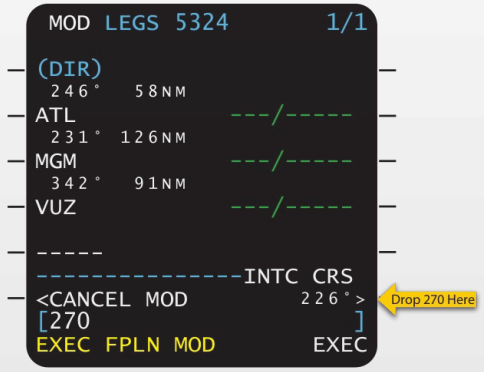
Track a Radial Inbound



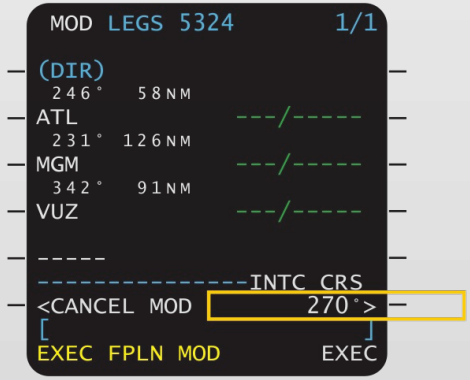


Example: "Fly heading 180. Intercept and track inbound on the ATL 090 degree radial."

1. On the LEGS page:
   Place the fix in the TO line (line select 2L).



2. On the INTC CRS line (line select 6R):
   Place the inbound course (in this case, 270).

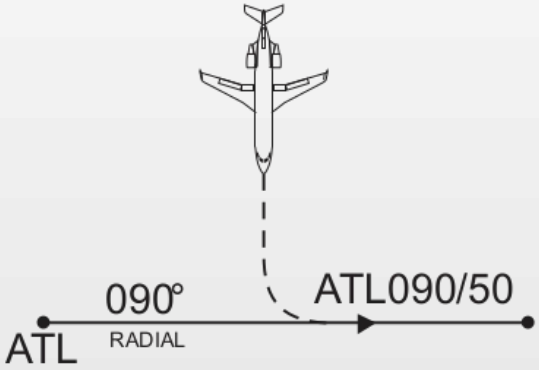


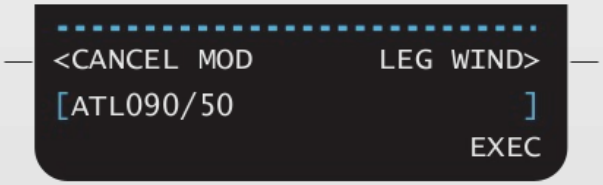
Tracking the 090 degree radial inbound results in a 270 degree course.

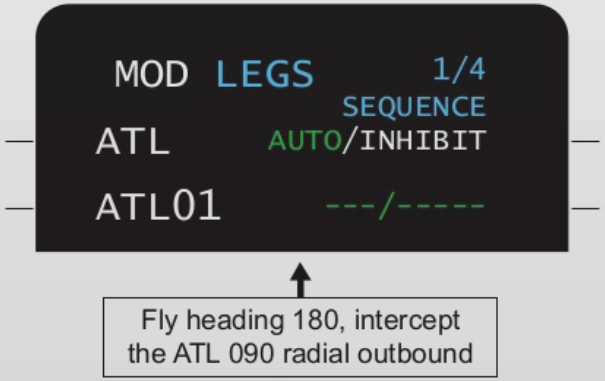
When you first put something in the TO line (line select 2L), the FMS assumes you want to fly direct to that fix. If you do not want to fly direct, you must define how you want to arrive at that fix.

FMS – Tracking

Track a Radial Outbound



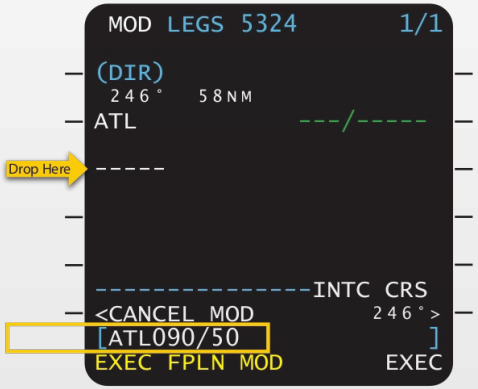




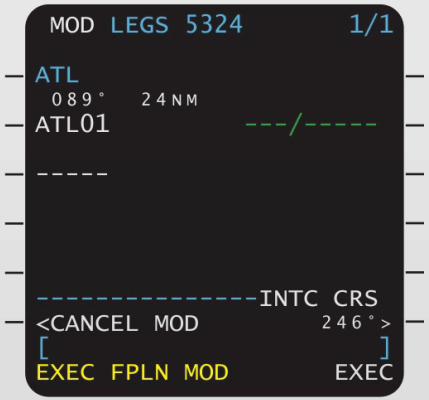
Example: "Fly heading 180. Intercept and track outbound on the ATL 090 degree radial."

On the LEGS page:

1. Create a waypoint on the intended radial that is far enough out that you will not reach it.
2. ATL090/50



3. Insert the waypoint directly after the NAVAID upon which the radial is based.



4. If the intercept will be after the NAVAID, put it behind you by dropping it in the FROM line (line select 1L).

The FMS cannot track away from a waypoint. To track outbound, you must create a fix that lies along the intended course. The distance is arbitrary, but must be far enough that it will never be reached.

FMS – Holding

Holding at a Waypoint on the Flight Plan

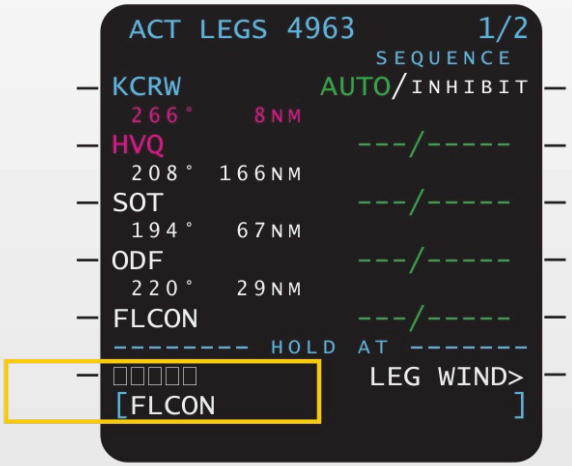
The only holds pre-programmed into the FMS are those that are part of Instrument or Missed Approach Procedures. When a hold waypoint is selected, the FMS defaults to hold on the inbound or current heading, right-hand turns, and 1.0 or 1.5 minutes legs, depending on altitude. These defaults could appear very similar to the published hold.

Always verify that the selected holding course, turn direction, and leg length match your clearance.

S.A.F.E: Speed, Altitude, Fuel, EFC

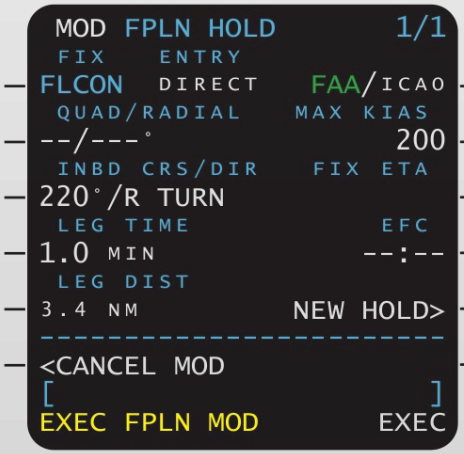
From the LEGS page:

1. Select the HOLD function key on the CDU.
2. The HOLD AT field will display at line select 6L.



If one or more holds are already programmed into the FMS, the ACT FPLN HOLD page or ACT HOLD LIST page will be displayed. In this case, push NEW HOLD.

- Select the waypoint from the flight plan (in this case FLCON) and drop it on the HOLD AT line (line select 6L).



FMS – Holding

Holding at a Waypoints Not on the Flight Plan

From the LEGS page:

1. Push the HOLD key

2. If the ACT FPLN HOLD page or the ACT HOLD LIST page is showing, push NEW HOLD.

3. Insert the waypoint in the HOLD AT prompt.

4. Select the waypoint the HOLD will precede.

5. Change the defaults to match your clearance as required.

FMS – Holding
Present Position Holding

From the LEGS page

1. Push the HOLD key.

2. If the ACT FPLN HOLD page or the ACT HOLD LIST page is showing, push NEW HOLD.

3. Push the PPOS line select key to show the HOLD page with the present position as the holding fix.

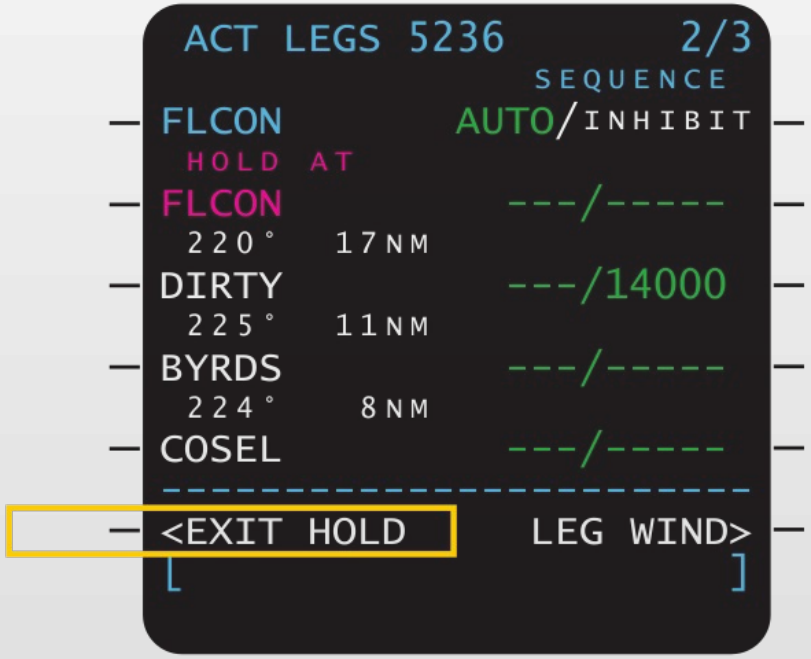
4. Change the defaults to match your clearance as required.

FMS – Holding
Exit Holding

From the LEGS page:

1. Select EXIT HOLD (line select 6L); or

2. Place another waypoint in the flight plan on the TO line (line select 2L).



Checklists
Descent

- The Banana Bar and the Snowflake are your friends, use them. Otherwise, plan 3 miles per thousand feet and advance the TOD point by 2 miles for each 10 knots of tailwind, and by 2 miles for each 1,000 feet of anti-ice use.
- Normally, descent is initiated with partial cruise thrust at high altitude (approximately 80% N 2) and in the clean configuration (no flight spoilers).
- If a descent at “pilot’s discretion” is given by ATC and the altitude change is 6,000’ or less, the PF shall initiate the descent immediately unless the immediate descent would take you into inclement weather.
- Unless otherwise instructed by ATC, plan to arrive at 10,000 AGL, 30 miles from the airport at 250 KIAS.

SOP 1-9.11.1, 2-16.5, 2-16.7, 2-16.9

Checklists
Descent Speeds

Descent Speed Schedule	
10,000’ and above	Long Range Descent – M 0.70/250 KIAS
	Normal Descent – M 0.74/290 KIAS
	High Speed Descent – M 0.77/320 KIAS
Below 10,000’	250 KIAS

SOP 2-16.5, 2-16.7, 2-16.9,

Checklists
In Range

- Normally performed after descending below 18,000’.
- Challenge and Response

IN RANGE CHECK		
Cockpit Door	Closed/Locked	PM
Sterile Light	ON	PF/PM
LDG ELEV	Set	PM
Fuel	Checked	PF
Altimeters	(----) Set/Cross Checked	BOTH
Radar/Terrain	As Required	PM
CAS	Checked/Clear	BOTH
Landing Data	Set/Checked	BOTH
Approach Briefing	Complete	PF
Category II Approach	As Required	Captain

SOP 2-13

Checklists
In-Range Flows

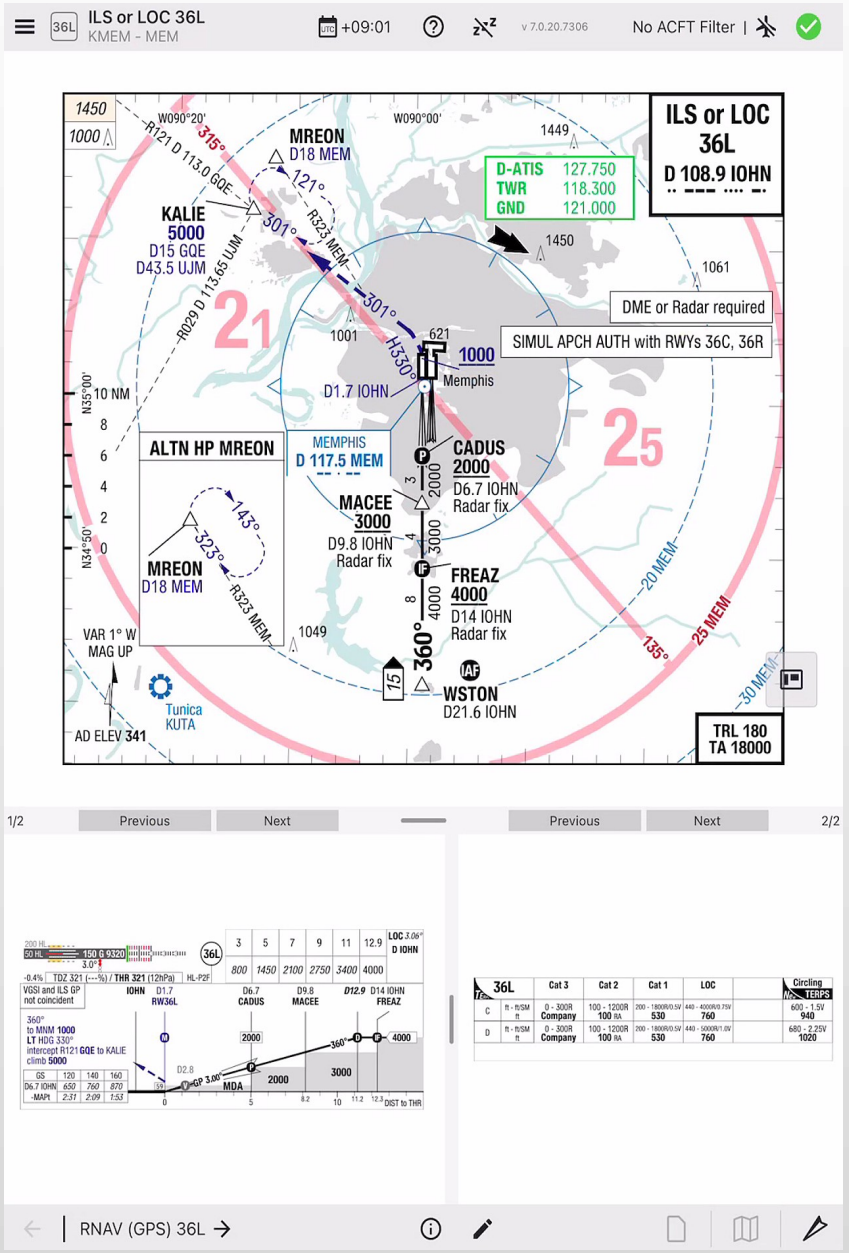
- At or before the In-Range Check
- † FMS arrival and approach programming
- ‡ Transfer of controls to PM is optional during low workload and low threat environments with the autopilot engaged.
- Note: The approach should be loaded in the FMS, when available, to aid in situation awareness, but must be loaded in the FMS when the FMS is used to navigate the approach procedure (i.e., GPS approach, VOR approach in white needles, etc.).
- Vref may be inserted as a speed constraint on the LEGS page abeam the runway or missed approach point, depending on the approach flown.
- • With PF concurrence, execute the FMS modification if appropriate.
    - It is mandatory that both pilots verify all FMS lateral and vertical programmed information against the current published procedures.
    - If a discrepancy exists between the FMS and the published procedure, the published procedure must be used.
    - As a general rule, any time the NAV data is selected to FMS (white needles) the respective radio should be in AUT (autotune).
    - Any changes to an approach after the initial briefing should be re-briefed in accordance with this section

Approach Preparation	
PF	**PM**
—	Get ATIS
—	Set landing data: V_{REF}, V_{2GA}, V_T
—	Preset approach frequencies on RTUs
Select bearing pointers (if applicable)	
Set final course	
Set DDA/MDA	
—	† Program the FMS
‡ Transfer control to PM, do not transfer Flight Director	‡ Take control
Brief approach and verify FMS & RTUs	—
‡ Take control	‡ Transfer control to PF

SOP 2-18.1

Approach Briefing

Please brief this approach:

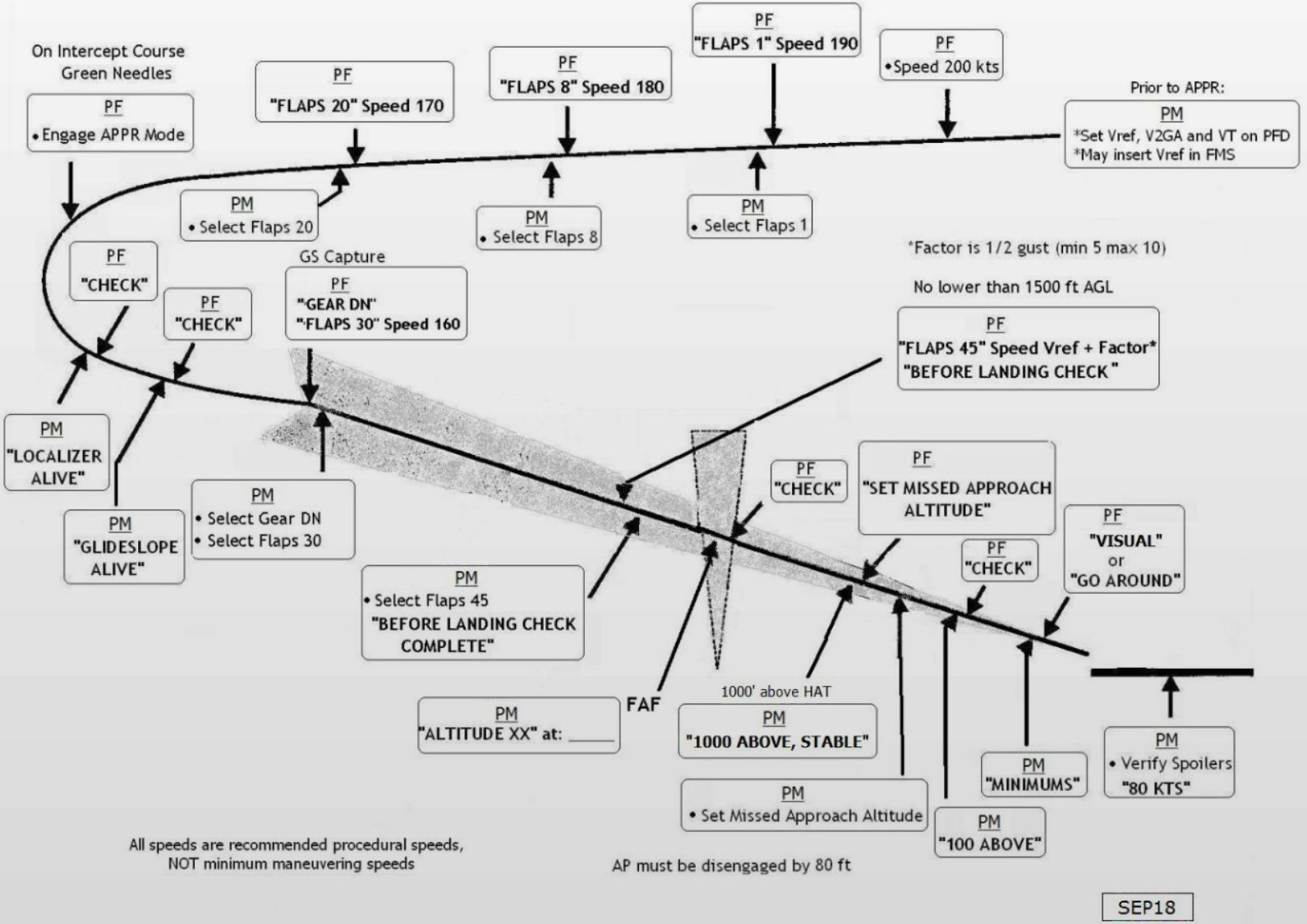


Checklists
In Range Practice

IN RANGE CHECK		
Cockpit Door	Closed/Locked	PM
Sterile Light	ON	PF/PM
LDG ELEV	Set	PM
Fuel	Checked	PF
Altimeters	(----) Set/Cross Checked	BOTH
Radar/Terrain	As Required	PM
CAS	Checked/Clear	BOTH
Landing Data	Set/Checked	BOTH
Approach Briefing	Complete	PF
Category II Approach	As Required	Captain

SOP 2-13

ILS Approaches



Checklists
Before Landing

- Normally performed after final gear and flaps selection
- Pilot Monitoring Flow
  - Flight Attendant Chime (just press the Chime button, you do not have to select PA first)
  - Arm Thrust Reversers

BEFORE LANDING CHECK	
Flight Attendant ..... Advised	PM
Thrust Reversers ..... ARMED	PF
Landing Gear ..... Down	Both
Flaps ..... (--°) indicating	Both
Flight Spoilers ..... Stowed	Both

SOP 2-21

Checklists
Before Landing Practice

BEFORE LANDING CHECK	
Flight Attendant ..... Advised	PM
Thrust Reversers ..... ARMED	PF
Landing Gear ..... Down	Both
Flaps ..... (--°) indicating	Both
Flight Spoilers ..... Stowed	Both

SOP 2-21

After Landing

Taxi Diagrams Out and On

Write Down ALL Clearances

FO performs the After Landing Checklist when CA asks for it.

On the first shutdown of the day, the fuel check valve verification will be accomplished. Normally this task should be performed by the F/O.

Left Engine ..... Shut down

L & R BOOST PUMPS switchlights..... OFF

Ensure L FUEL LO PRESS and L & R FUEL PUMP caution message display.

If after two (2) minutes and the FUEL LO PRESS caution message is still not displayed:

Ensure engine hazard area is clear

Left engine ..... Dry motor (30 seconds max)

L FUEL LO PRESS caution message should be displayed during motoring as the residual fuel pressure is reduced.

Checklists
After Landing

- Performed by the FO when the aircraft is clear of the active runway.
- Read and Do

AFTER LANDING CHECK	
APU ..... As Required	F/O
Radar ..... OFF	F/O
Flaps ..... Up	F/O
Lights & Strobes ..... As Required	F/O
Probes ..... OFF	F/O
Trims ..... Zero & 7.0	F/O

SOP 2-22

Checklists
After Landing Practice

AFTER LANDING CHECK	
APU ..... As Required	F/O
Radar ..... OFF	F/O
Flaps ..... Up	F/O
Lights & Strobes ..... As Required	F/O
Probes ..... OFF	F/O
Trims ..... Zero & 7.0	F/O

SOP 2-22

Checklists
Shutdown Check

- Taxiing in just short of gate, FO reaches up to seat belt sign.
- As the parking brake is set, the seat belt sign is turned off.
- Once the chocks are in, the seat belt sign is selected on and off, letting the FA know it is safe to open the main cabin door.
- Challenge and Response

SHUTDOWN CHECK		
Chocks & Brakes	As Required	CA
Electrics	Set	CA
*Fuel Check Valve	Checked	CA
Thrust Levers	Shut Off	CA
Transponder	STBY	F/O
Seat Belts	OFF	F/O
Anti-ice	OFF	F/O
Fuel Pumps	OFF	CA
Hydraulic Pump 3A	As Required	CA
Beacon	OFF	CA
Nosewheel Steering	OFF	CA

SOP 1-6.9.11, 2-23

Checklists
Shutdown Check Flow

- Captain
  - Chocks & Brakes
  - Electrics
  - *Fuel Check Valve
  - Bleed Valves Closed
  - Thrust Levers Shut Off
  - Bleed Valves Auto
  - Fuel Pumps Off
  - Hydraulic Pump 3A Off
  - Beacon Off
  - Nosewheel Steering Off
- First Officer
  - Transponder Standby
  - Seat Belts Off
  - Anti-Ice Off

SOP 2-23.1

Checklists
Shutdown Check Practice

SHUTDOWN CHECK	
Chocks & Brakes.....As Required	CA
Electrics..... Set	CA
*Fuel Check Valve.....Checked	CA
Thrust Levers .....Shut Off	CA
Transponder..... STBY	F/O
Seat Belts..... OFF	F/O
Anti-ice ..... OFF	F/O
Fuel Pumps ..... OFF	CA
Hydraulic Pump 3A.....As Required	CA
Beacon ..... OFF	CA
Nosewheel Steering ..... OFF	CA

SOP 2-22

Checklists
Terminating Check

- Can be performed by either pilot
- Read and Do
- As you leave the aircraft, make sure that the battery is off, the flight deck dome light and the cabin exit signs are not illuminated.

TERMINATING CHECK		
Recirc Fan	OFF	CA
Chocks & Brakes	In & ON	CA
Starlink Power Switch	OFF ILLUMINATED	CA
Thrust Reversers	OFF	CA
IRS 1 & 2 (if equipped)	OFF	CA
Emergency Lights	OFF	CA
Windshield Heat	OFF	CA
CARGO Switch	OFF	CA
Hydraulic Pumps	OFF	CA
External Lights	OFF	CA
APU START	OFF	CA
APU PWR/FUEL	OFF	CA
DC Service	OFF	CA
External AC Power Switch	OFF	CA
Battery Master	OFF	CA
Dome Lights	OFF	CA
Boarding Lights	OFF	CA

SOP 2-24

Checklists
Terminating Check Practice

TERMINATING CHECK		
Recirc Fan	OFF	CA
Chocks & Brakes	In & ON	CA
Starlink Power Switch	OFF ILLUMINATED	CA
Thrust Reversers	OFF	CA
IRS 1 & 2 (if equipped)	OFF	CA
Emergency Lights	OFF	CA
Windshield Heat	OFF	CA
CARGO Switch	OFF	CA
Hydraulic Pumps	OFF	CA
External Lights	OFF	CA
APU START	OFF	CA
APU PWR/FUEL	OFF	CA
DC Service	OFF	CA
External AC Power Switch	OFF	CA
Battery Master	OFF	CA
Dome Lights	OFF	CA
Boarding Lights	OFF	CA

SOP 2-24

Debrief

- ✓ What do you think you need to work on?
- ✓ Instructor Feedback
- ✓ Training Completion Form
- ✓ Attendance Form