

HOW TO PREPARE AN APPROACH. WHAT THE TEXT BOOKS DON'T MENTION.

INTRODUCTION

This packet is designed to provide you with a better understanding of what pilot actions you need to take to efficiently and safely prepare an instrument approach while flying IFR single pilot. The key to obtaining this skill is to be able to prioritize the myriad of small tasks into an effective sequence. Most text books deal with IFR regulations, and systems, but do not spend much time addressing strategies for organizing information in flight. The first couple sections attempt to outline these concerns. Once you have a good idea as to what you have to do, continue to the next sections which compare and contrast the Jeppesen and NOS approach plate information layouts. With an idea of what you need to do and of what you are looking at on the paper, we continue the discussion by examining the instrument brief. Finally, I have included a list of automatic prompts, mental strategies, memory aids, basic instrument flight techniques, and comparison of Jeppesen and NOS symbology that answer many of my many of my clients' most frequently asked questions.

Good Luck!

THE MENTAL PROCESS

SEQUENTIAL CONCERNS DURING EXECUTION OF AN APPROACH

- 1) Which approach should I expect?
 - A. I have a weather forecast and don't expect changes.
 - a. Select appropriate plate.
 - b. Get AWOS/ATIS when have a chance.
Place on standby com. OTHERWISE if...
 - VS B. The weather is unpredictable.
 - a. Get the AWOS/ATIS with out delay.
 - b. Then select the appropriate plate.
- 2) What is my inbound navaid and course?
 - A. Find and set up NOW in number 1 NAV and OBS Active. Use number two for any transition operations currently needed.
 - B. Copy inbound nav to number 2 Nav standby position workload permitting.
- 3) Where is the FAF & what navaid needs to be set to find the FAF?
 - A. Use an accessory, ie DME/GPS/Markers/ADF-NDB

4. How low? (DA/MDA, stepdowns)
5. How long? (To the MAP)
6. What if? (Missed procedures)
7. Who to? (...Talk to)
8. How bright? (Approach lights)
9. How fine? (Double checks)

CHART SEQUENCE COMPARISON

JEPP APPROACH PLATE BRIEFING POINT SEQUENCE (SINGLE PILOT)

1. Title of approach and location
- BRIEFING STRIP**
2. Inbound navaid and course
 3. Final Approach Fix name, type, and crossing height
 4. Lowest DA/MDA
 5. Height above TDZ
 6. Field Elevation
 7. MSA
 8. Missed Text (Visual learners skip)
 9. Notes
- PLAN VIEW**
10. Highest Obstacle
 11. IAF
 12. FAF (Relocate as needed)
 13. Missed track and hold entry (May skip and return when review hieroglyphics)
- PROFILE**
14. Stepdowns
 15. Timing to MAP
 16. Missed Procedure hieroglyphics
- ARRIVAL MINIMA**
17. (DA, MDA, vis mins if need to recheck)
- AIRPORT PLATE**
18. Runway info

NOS APPROACH PLATE BRIEFING POINT SEQUENCE (SINGLE PILOT) (NEW PLATE STYLE)

1. Title of approach and location
- NEW BRIEFING STRIP**
2. Inbound navaid and course
 3. Runway length, TDZE, Field Elevation

4. Take off mins and alternate notes (for details go to index at beginning of packet)
5. Approach lighting type
6. Missed notes (Skip if visual learner)
7. ATIS, AWOS
8. CTAF, Tower

PLAN VIEW

9. IAF, FAF name, type, and identifier resources
10. Missed track and hold entry (May skip and return when review hieroglyphics)
11. MSA

PROFILE

12. Missed Hieroglyphics
13. Stepdowns
14. Runway length
15. Timing FAF to MAP (for FPM target VSI go to plate at back of packet)

ARRIVAL MINIMA

16. DA, MDA, min vis

**NOS APPROACH PLATE BRIEFING POINT SEQUENCE (SINGLE PILOT)
(OLD PLATE STYLE)**

1. Title of approach and location

PLAN VIEW (Top Corner)

2. ATIS, AWOS
3. CTAF, Tower

PLAN VIEW (Diagram)

4. Inbound navaid and course
5. IAF, FAF name, type, and identifier resources
6. Missed track and hold entry (May skip and return when review missed textual procedures)
7. MSA

PROFILE

8. Stepdowns
9. Missed Approach Textual procedure

ARRIVAL MINIMA

10. DA, MDA, min vis
11. Take off mins and alternate note (for details, go to index at beginning of packet)

AIRPORT DIAGRAM

12. Runway length, TDZE, Field Elevation
13. Approach lighting type codes, (refer to table at beginning of packet)
14. Timing FAF to MAP (For FPM VSI target refer to rate of descent plate at back of packet)

BRIEFING AND EXECUTING

SINGLE PILOT MENTAL BRIEF AND EXECUTION SEQUENCE

Determine approach in use before departure or as soon as possible once in cruise.

- A. Set weather in standby com, standby position,
- B. CTAF or Tower in standby com, active position.

Determine Inbound navaid and course

. Set up in number 1 NAV and OBS.

Final Approach Fix

- A. Determine name, type, and crossing height.
- B. Locate in the plan view diagram.
- C. Load identification navaid in number two NAV.
 - a. Place in Active position if no transition radial needed.
 - b. Place in Standby if transition radial will be used.
- D. Determine what procedure connects the IAF to the FAF.

Confirm Lowest DA/MDA.

Check if need different altitude at plate bottom.

Confirm DA Height above TDZ.

Confirm Field Elevation value.

Confirm MSA highest sector.

Skip missed approach textual briefing if visual learner, review if textual learner.

Notes Review fine print.

Confirm Highest Obstacle.

Locate IAF.

- A. If VOR based, insure transition navaid and radial is programmed.
- B. If GPS based, insure sequence programmed.

Stepdowns.

- A. Summarize altitudes
- B. Note important distances
 - a. to/from FAF.
 - b. and to/from GPS/DME info source point.

Timing FAF to MAP.

Determine time and FPM at ground speed.

Missed procedure.

- A. Check hieroglyphics
 - a. Left, right, straight directions.
 - b. Navaid, and radial to use.
 - c. Altitude to seek.
 - d. Hold point and entry type.
- B. Load navaid into number 1 or 2 standby, and understand sequence, at a very minimum.

Runway lengths and lights.

- A. Understand runway dimension/type
- B. Check PCL is ready.

Double check.

- A. Identification of nav aids
- B. Precession checked
- C. Altimeter update
- D. Frequency change prepositioned
- E. PCL prepositioned

SINGLE PILOT JEPP VERBAL BRIEFING

“We will shoot the ILS 23 into Frederick.”

“Weather is set, standing by on 24,85 CTAF is set, standing by 22,72.”

“Inbound nav is the localizer 110.3. No DME. Set active nav 1.”

“Inbound course is set 228 OBS 1.”

“FAF is at Ricke at 1600, a marker beacon. Set markers.”

“Shooting straight in, we have more than minimum vis, down to 600 feet which is 300 over a 300 foot field.”

“MSA highest at 3400, at the top of the plate.”

“Note PCL is on CTAF, set and standing by.”

“Highest Obstacle is at 2000 on the left side near Ricke”

“IAF is at EMI, to join the Loc. at Numbe.

117.9 transition nav active in number 2

292 transition radial is being naved off OBS 2”

“Stepdowns,

2800 until we catch the Glide Path

1600 through the markers.”

“Time out of the markers is 2:20 at 100 kts.”

“If we don’t see the Odals or the Reils,

we’ll be runway heading to 1300 then left up to 2800.

Catch the 47radial off FDK to Ricke for a Parallel entry.

FDK 109.0 set standing by number 1.”

“Runway is 5200 feet long, with left traffic.”

“Localizer is Identified. There is no Precession. Altimeter is set. CTAF/PCL is ready.”

“We’re 6 from Numbe, slow to 20.” Start Descent checklist.”

SINGLE PILOT NOS VERBAL BRIEFING NEW PLATE STYLE

“We will shoot the ILS 23 into Frederick.”

“Inbound nav is the localizer 110.3, no DME. Set active nav 1.”

“Inbound course is set 228 OBS 1.”

“Runway’s 5200 feet long at 300 feet, with ODALS.”

(Skip missed procedure text)

“Weather is set, standing by on 24,85 CTAF is set, standing by 22,72. It is the PCL”

“FAF is at Ricke at 1600, a marker beacon. Set markers.”

“IAF is at EMI, to join the Loc. at Numbe.

117.9 transition nav active in number 2

292 transition radial is being naved off OBS 2”
 “MSA highest at 3400, at the top of the plate.”
 “Missed procedure.
 Climb runway heading to 1300 then left up to 2800.
 Catch the 47radial off FDK to Ricke for a Parallel entry.
 FDK 109.0 set standing by number 1.”
 “Stepdowns,
 2800 until we catch the Glide Path
 1600 through the markers.”
 “Shooting straight in, we have more than minimum vis, down to 600 feet which is 300
 over a 300 foot field.”
 “Runway is 5200 feet long, with left traffic.”
 “Time out of the markers is 2:20 at 100 kts.”

“Localizer is Identified. There is no Precession. Altimeter is set. CTAF/PCL is ready.”
 “We’re 6 from Numbe, slow to 20.” Start Descent checklist.”

BACKUP STRATEGIES

AUTOMATIC PROMPTS

The following are ATC instructions and pilot actions which should automatically cause a preparatory reaction.

ATC INTRUCTIONS	PILOT REACTION
1. “These are radar vectors for”	Set inbound nav and course
2. “Frequency change is approved”	Flip the transmitter
3. “Cleared for the ‘-----‘ transition”	Load source navaid and radial in number 2 Set final in number1 one reaching transition source navaid.
4. “Expect the ...”	Get the plate ready, get the weather, load the inbound nav and course in number 1

FLIGHT ACTION	PILOT REACTION
1. Departure	C OFF
2. Reaching Top of Climb	Cruise check Where is my clearance limit? Which approach can I expect?
3. Passing a fix	T OFF

- | | | |
|-----|---|---|
| 4 | Receiving first step-down descent instruction | Inbound nav and course is set
Complete initial descent checklist |
| 5 | Arriving at the IAF | Set 20" (Slow to low cruise)
Complete initial descent checklist |
| 6. | Passing the IAF | Switch number 2 navaid and radial from transition operation to identification operation |
| 7. | Turning final course inbound
NO PT or PT Course reversal
outbound | Confirm
Navaid and Course
Identification
Precession
Altimeter |
| 8. | Arriving at the FAF OR
One dot below Glide Path | Final Descent Check |
| 9. | Passing the FAF OR | 15"
5 to 7 degrees total nose down on attitude indicator.
Switch #2 navaid and radial from identification operation to either:
a missed approach operation,
or
a final course back up operation. |
| 10. | Glidepath intercept

(This is FAF of ILS) | 15"
3 to 5 degrees total nose down on attitude indicator.
Switch #2 navaid and radial from identification operation to either:
a missed approach operation
or
a final course back up operation |

ILS APPROACH

PILOT REACTION

- | | | |
|----|-------------------------------------|---|
| 1. | Outside FAF, one dot CDI deflection | 3 second standard rate turn |
| 2. | Inside FAF, one dot CDI deflection | 3 second half standard rate turn |
| 3. | Last few hundred feet to DA | Wings level, step on CDI needle for slight deflections. |

- | | | |
|----|------------------------|--|
| 4. | One dot low | Level Attitude Indicator until zero momentarily. |
| 5. | Reintercept GS. | Attitude 3 to 5 degrees nose down. |
| 6. | One dot high | Double pitch down. to 5 to 10 degrees total nose down. |
| 7. | Marker beacons set off | Start timing |

CALL OUTS

Localizer or VOR course intercept	“Final’s alive. No flags”
Glide Path Intercept	“Glide path alive, No flags”
Passing FAF	“FAF. Time _____ minutes _____ seconds”
Normal Climb or Descent	“1000 to go, 500, 400, 300, 200, 100 to go , level off.”
Approach descent	“1000 over DA/MDA, 500 over DA, 400, 300, 200, 100... MDA, level off OR DA, field in sight OR Field not in sight, go missed.”

DOUBLE CHECKS

T OFF:

“Turn, Time, Twist, Throttle, Talk, Tires, Tune”

C OFF:

“Climb, Course, Clean, Call, Confirm, Cruise Check, Clearance Limit”

(Note: Throttle and Tires note only relate to power settings, and landing gear, but should prompt the pilot to evaluate the need for an initial or final descent check list.)

TB10 Initial Descent Check:

“Greens, GPS/Nav , Lights, Pump, Selector, Mags, Breakers, Belts”

TB10 Final Descent Check:

“Two Up, Two Down, Three Green, No Red, Gear’s down”

(Note: Greens refer to annunciators for pump, taxi and or landing light, and possibly pitot heat, not gear down lights. “Gear’s down” is done by confirming the absence of a gear handle on board the plane. ie Make sure you did not forget that you are in a Trinidad or Arrow. “Three greens” also eliminates the needs to be heads down reviewing

switch breakers during a high work load period such as FAF passage, as these lights are just over the six pack.)

POINTERS

TB10 POWER SETTINGS

Initial Climb power	Full throttle, prop forward, Take Off Flaps, Pitch 75-80 kts
Cruise Climb Power	Full throttle, prop forward, Flaps retracted. Pitch 85 to 90 kts/min 500FPM
Cruise Power	Initially 23" and 2400 RPM then by performance table
Low Cruise	20" and top
Hold Speed	20" and top
Loiter and delay speed	20" and top (feeling rushed)
Cruise descent	20" and top
Steep descent	20" squared

(Never lower flaps unless gear confirmed down & locked/fastened)

Approach descent	15" and top	105 – 100 kts kts, Clean
MDA level off	15" and top	95-90 kts
Short Final Descent	Idle, flaps full,	75-80 kts

Fuel changes: On the half hour exclusively until last half hour per tank, then on the quarter hour exclusively

Timers: Zero on the half hour, mentally add minutes and announce target time during approaches

Cruise: Pitch for altitude, power for airspeed (set)

ILS

Established: Pitch for glide path, power fixed for approach speed
Some minor power applications are acceptable to aid with glidepath

Not Established: Pitch and power for glidepath

If unable to re-establish promptly before full scale Glide Slope deflection, go missed.

Last several hundred feet: Eyes on six pack. AVOID briefing missed, getting weather, checking runway info, programming frequencies

ILS Reverse Sensing:	<u>VOR</u>	<u>HSI</u>
Inbound on front course.	Never	Never
Inbound on back course, Outbound on back course, & Outbound on front course.	Always	Not if keep HSI pointing to the station

VOR

Just missed over a VOR?	Shallow intercepts, you can't be too far away
VOR needle suddenly strongly deflected	You are nearing VOR
Direct or teardrop hold entry	Set inbound course and dead reckon
Parallel hold entry	Set outbound course, and track CDI until reverse, then twist OBS
Determining correct hold entry	Stay on protected side, make simplest turn outbound.
Procedure turn length	Long enough to get under the glide path without exceeding 10 mile protected area. Two minutes at 90 Kt One and a half at 120 Kt One minute at 150 Kt ground speed
Suspect VOR reverse sensing	Keep DG and OBS headings within 90 degrees of one another
Partial Panel	Timed turns are optimized for short heading changes. Control bank at standard rate exactly Compass turns optimized for long turns. Control bank at just short of standard rate

Once on final course, keep turn coordinator wings level, use three second bank technique for every dot CDI deflection. Keep eyes on the flight gauges, DO NOT brief the approach beyond this point

Use GPS track info as compass where possible.

JEPP/NOS SYMBOLOGY COMPARISON

Procedure turn vs holding pattern	Procedure turns are in thick black (Jepps and NOS) Missed holding Patterns are in thin black (Jepps) or Dotted lines (NOS) If missed holding pattern and procedure turn are collocated, no thin black racetrack will appear. Only occurs when PT is a race track type reversal.
Missed Approach track	Dashed lines (Jepp) Dotted lines (NOS)
Hook type Procedure Turn	Jepp line exits at a 45, extends and curves 180 degrees like a hook NOS line exits at a 45 degree
Race track course reversal PT leg length	NOS labels DME by holding pattern in Plan view, Jepp does not. Both label the distance, or time on the edge of the level flight line in the profile view
Feeder line	Solid black radial line for transition operations
Identifier line	Thin black radial line for identification operations
Highest Obstacle	Jepps only. Depicted by solid black arrow in Plan View
FAF	Both use the Maltese cross to show the FAF in the profile view.
Localizer DME info	Jepps labels “loc dme” on frequency/Morse ID box in plan view. Jepp further labels DME dist off localizer intersections in profile view such as “HOLOE D6.6 ICBE” NOS only labels DME dist off localizer intersections in profile view. Such as “JACOX Int I-RRV 24.4 DME”

Right vs Left Pattern

In the plan view of the Jeppesen airport diagram plate, an inset box will denote any right traffic patterns. For NOS, open up your AFD.

Take Off Mins and Alternates

NOS marks a T in a shield or a A in a triangle if nonstandard mins exists. Then you must go to the appropriate index for details. NOS has the ANA symbol if that approach can not be used for a listed alternate.

Jepp has a section on the airport diagram plate at each airport which details that field's take off and alternate mins, or if not authorized.

VORTAC, VORDME, VOR

Jeppesen makes no distinction between VORDME and VORTAC as it is a civilian publisher. VORTACs appear as VORs (a small compass rose) with a DME (a scopelike symbol inset) In the frequency box Jepp further places a D to denote DME, and labels the output capacity as L or H (Low or High output)