

REVIEW OF THE TYPICAL INSTRUMENT FLIGHT

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PHASE 1: KNOW THE WEATHER, AIRCRAFT, AND PILOT

1) Preflight the PILOT

- Logging instrument time
 - **§61.51g(1)** – A person may log instrument time only for that flight time when the person operates the aircraft solely by reference to instruments under actual or simulated instrument flight conditions.
 - **§61.51g(3i-ii), (4)** – Location and type of each approach, NAME of safety pilot if required, flight simulator may be used by a person to log instrument time provided an authorized instructor is present during the simulated flight.
- Basic Currency Requirements
 - Current Medical Certificate
 - 90 day 3 T/O and Landings (D&N)
 - Night currency: 3 takeoffs and landings to a full stop, 1 hour after sunset to 1 hour before sunrise in same category, class, and type if it's required.
 - Flight Review every 12 calendar months
- Definitions/Uses of Night
 - Sunset (**§91.209**): **beacons** go on (plane and airport)
 - Evening civil twilight: Generally 30 minutes after sunset (30 minutes before sunrise), this is used for **logging** night flight
 - **§61.57b** – 1 hour after sunset to 1 hour before sunrise is considered NIGHT for the purposes of currency and passenger night flights
 - If not night current, **must be on the ground** no later than 59 minutes after sunset if carrying passengers
 - This time however is where we **can gain our night passenger currency** by performing:
 - 3 takeoffs and landings to a full stop, acting as sole manipulator of the controls, and aircraft was same category, class, and type if type was required
- Requirements to act PIC under IFR: **§61.57c** - within 6 months:
 - Conduct 6 instrument approaches, intercept and track navigational courses, and perform holding procedures.
 - Have an additional six months after PIC currency expires (6 months) to complete these requirements before an Instrument -- Proficiency Check (IPC) is required (**§61.57d**)
 - Safety pilot must be rated in the same category and class of aircraft, with a current medical and private pilot cert.
- Self-Assessment: Are you fit for flight?

DECIDE MODEL

Detect
Estimate
Choose
Identify
Do
Evaluate

I'M SAFE CHECKLIST

Illness
Medication
Stress
Alcohol
Fatigue
Emotion/Eating

2) Preflight the FLIGHT

- Use sources like TV weather, online weather, aviationweather.gov, etc., for BIG PICTURE weather, but when it comes time to file a flight plan use an approved source listed below...
 - DUATS
 - Contracted to CSC (Computer Sciences Corp)
 - Click: www.duats.com
 - Requires one-time registration for a Username and Password
 - Flight Service Station (FSS)
 - Contracted to Lockheed Martin
 - Call: 1(800) WX-BRIEF
 - Requires N-Number and/or Pilots name
 - the following briefing types are available:
 - Outlook (for flights more than six hours away)

- Standard (for most flights)
- Abbreviated (to update specific items after a standard briefing)

→ Using an approved source listed above provides PROFF to the FAA that you did indeed receive a briefing and TFR check! Should you encounter a sudden TFR, this can help keep you clear of certificate action by having proof that you checked for ADVERSE CONDITIONS prior to the flight.

- There are recommended items and required items. What are required items for preflight?

MUST KNOW FOR FLIGHT §91.103

NOTAMS

Weather

Known traffic delays

Runway Lengths

Alternates if needed

Fuel requirements (incl. alternate) Instrument Interpretation

Takeoff/Landing Distances Aircraft Control

3) Preflight the AIRCRAFT

- Required Equipment §91.205

ALL AIRPLANES IF DAYTIME

Tachometer

Oil pressure gauge

Magnetic compass

Air speed indicator

Temperature gauge

Oil temp gauge

Fuel gauges

Landing gear position lights

Altimeter D-DME above 24.000'

Manifold pressure gauges (altitude engine)

ELT

Seat belts

ALL AIRPLANES IF NIGHTTIME

Fuses (one full set, 3 of each kind)

Landing light

Anti-collision lights

Position lights

Source of electrical power

AIRPLANES FLYING IFR

Daytime, Nighttime (if night IFR), and...

Generator/Alternator

Radio (2 way comm. and nav)

Altimeter

Ball

Clock with second hand

Attitude indicator

Rate of turn indicator

Directional Gyro

- Required Documents

Airworthiness Certificate

Registration

Radio license (intern. Flight only)

Operating limitations (placards, POH)

Weight and balance

- Required Airworthiness Compliance

Altimeter, Static System (24 months)

VOR checks every 30 days

Inspections: Annual and 100 hour inspection (for hire only)

AD's (one time and re-occurring)

Transponder (24 months)

ELT (12 months, ½ shelf life of battery, 1 cum hour of use)

→ VOR equipment check types:

- VOT: +/- 4 °. Published in A/FD, tune 108.0MHZ, 180 TO/360 FROM
- Ground checkpoint: +/- 4 °, specific point on airport listed in A/FD

- Airborne checkpoint: +/- 6 °, located over easily identifiable terrain or features on the ground, listed in A/FD
- VOR/VOR: +/- 4 °, dual check in the air
- VOR radial on airway centerline over identifiable ground point: +/- 6°
- Radiated test signal by A & P only

→ **Once the entire Pilot, Flight, and Aircraft preflight is complete, it's time to file a flight plan:**

4) File a Flight Plan

- Unless using Tower Enroute Control (TEC), all pilots intending to operate under IFR **MUST** file an IFR flight plan
 - TEC can be used in specific areas where those routes are listed in the AFD. With TEC, you do NOT need to file an IFR flight plan, simply ask clearance delivery for "Tower Enroute from ____ to ____."

- File your plan with DUATS or FSS

ORDER OF OPERATIONS

- 1) Type of Plan (VFR or IFR)
- 2) Aircraft ID
- 3) Aircraft Type and Equipment
- 4) True Airspeed
- 5) Departure Airport
- 6) Proposed Departure Time
- 7) Altitude
- 8) Route
- 9) Destination
- 10) Time Enroute
- 11) Remarks
- 12) Fuel Onboard
- 13) Alternate Airport(s)
- 14) Number of Souls on board
- 15) Pilots Name & Phone Number
- 16) Aircraft Colors
- 17) Aircraft Home base

- An alternate airport MUST be filed, unless:
 - The airport has an instrument approach, other than a GPS approach and...
 - **1** hour +/- ETA the weather is forecasted to be at or above **2000'** ceiling and **3** miles visibility
 - If airport of intended landing has **no appch** or **only has a GPS appch.**, you **MUST** file an alternate
 - Think **1 – 2 – 3**
- Standard Alternate Minimums
 - **Precision Approach:** 600' and 2 miles visibility at ETA
 - **Non-Precision Approach:** 800' and 2 miles visibility at ETA
 - **Visual Approach:** descent from MEA, approach and landing done in VFR conditions (forecasted ceiling greater than MEA)
- Non-Standard Alternate Minimums
 - Front of Terminal Procedures Publication (TPP) describes these for certain instrument approaches
 - **NOTE:** If the alternate minimums are not standard, they are published in the front of the TPP chart booklet. A white 'A' in a black triangle on an approach chart means that non-standard alternate minimums should be consulted FOR FLIGHT PLANNING. "N/A" after this triangle means that the airport does not qualify as an alternate.
 - **REMEMBER:** These restrictions are for flight planning only. Once you are in the air, if you have to divert, you can divert to any airport that is suitable for IFR

PHASE 2: GET YOUR IFR CLEARANCE

If IFR conditions exist or you intend to carry out a flight under IFR, you cannot enter controlled airspace unless you are following an IFR clearance. Communication with clearance delivery is solely to relay a clearance to the pilot. Clearance delivery does NOT directly control aircraft.

1) Contact Clearance Delivery

- At a **Towered** Airport
 - Once in the aircraft and ready to *TAXI*, call clearance delivery
 - The frequency will be listed on the airport diagram or in the AFD
 - Contact “Clearance Delivery”, or, at many airports, contact “Ground” when ground and clearance are combined
- At a **Non-Towered** Airport
 - Once in the aircraft and ready to *DEPART*, call clearance delivery
 - The frequency will be listed on the airport diagram or in the AFD
 - If a frequency is listed or there is no response, call the national clearance phone number at (888) 766-8267
- The communication will go as follows:
 - You say...
 - ▶ “Los Angeles Clearance, Cessna 995JA at Santa Monica with information Charlie, ready to copy IFR clearance to Palo Alto.”
 - Controllers say...
 - ◀ “Cessna 995JA, Los Angeles Clearance, cleared to the Palo Alto airport via as filed, climb and maintain 3 thousand, expect 10 thousand 5 minutes after departure, departure frequency 125.2, squawk 4567.”

2) Record Clearance

IFR Clearance

Clearance limit.....“Cleared to the **Palo Alto** airport”
 Route of flight“Via **As Filed**”
 Altitude.....“Climb & maintain **3,000, expect 10,000 5 min after departure**”
 Frequency for Departure.....“Departure frequency **125.2**”
 Transponder code.....“Squawk **4567**”

3) Read Back the Clearance

- Read back the ENTIRE clearance as follows:
 - You say...
 - ▶ “Cessna 995JA, cleared to the Palo Alto airport via as filed, climb and maintain 3 thousand, expect 10 thousand 5 minutes after departure, departure frequency 125.2, squawk 4567.”
 - At a **Towered** Airport
 - Read back the FULL clearance, then request taxi clearance
 - At a **Non-Towered** Airport
 - Read back the FULL clearance, then make sure to depart prior to clearance void time!
 - If you were unable to depart prior to “clearance void time”, make sure to **CALL & CLOSE!**

4) Run-Up and Instrument Check

- Be sure to conduct a RUN-UP check and Instrument check prior to departure
 - This is ALWAYS important, however if taking to the skies in IMC, this becomes imperative, as if you have an issue in the air, you no longer have visual reference to aid your emergency planning
- Now you are ready for departure. Remember, §91.173 says “No person may operate on controlled airspace under IFR unless that person has (a) filed an IFR flight plan; and (b) received an appropriate ATC clearance

PHASE 3: DEPARTURE

1) Check for Minimum Climb Gradients

- Many instrument departures have a minimum climb gradient you must be able to achieve
- This number is generally given in a FOOT/Nautical Mile quantity on the DP/ODP
- We use FPM (or $\frac{FT}{MIN}$), not $\frac{FT}{NM}$, so we must convert using either...
 - The table on back cover of Terminal Procedures Publication
OR...
 - The formula: $\frac{Ground\ Speed}{60} \times \left(\frac{FT}{NM}\right) Requirement = FPM\ Climb$
 $\rightarrow EX: \frac{100\ KIAS}{60} \times \left(\frac{300\ FT}{1\ NM}\right) Requirement = 500\ FPM$
- If you do not meet the climb requirement after calculating aircraft performance, you may NOT accept and fly the departure procedure

2) Fly the Departure Procedure

- An instrument departure procedure (DP) is a coded ATC departure procedure designed to simplify clearance delivery, reduce communications, and departure delays
- In order to accept a DP, you must have either the **textual** or **graphic description**.
- DPs found in the U.S. Terminal Procedures books
- While not required, pilots are encouraged to use DPs when available.

3) Contact Departure

- Minimum Takeoff Conditions
 - Remember, as Part 91 operation, takeoff minimums do not apply to us...however, if the BOEING ain't going, I ain't going!
- At a **Towered** Airport
 - Tower will instruct you to contact departure
- At a **Non-Towered** Airport
 - Make sure to make regular announcements on the CTAF
 - Contact departure upon entering controlled airspace
 - If you were unable to depart prior to "clearance void time", make sure to CALL & CLOSE!
- The communication will go as follows:
 - You say...
 - ▶ "LA departure, Cessna 995JA is 1200' climbing 3,000'."
 - Controllers say...
 - ◀ "Cessna 995JA radar contact, climb and maintain 10,000."
 - You say...
 - ▶ "Climb and maintain 10,000 Cessna 995JA."

PHASE 4: ENROUTE PROCEDURES

1) Flying the Assigned Route

- The longer the flight, the greater the chance of re-routing – be prepared to copy new clearances
- Altitudes
 - **MEA:** *Minimum En-route Altitude* is the lowest published altitude between radio fixes guaranteeing navigational signal reception and obstruction clearance
 - **MOCA:** *Minimum Obstruction Clearance Altitude* ensures obstacle clearance and reliable navigation within 22 NM of facility
 - **MAA:** *Maximum Authorized Altitude* is the max usable altitude for adequate reception of nav aids
 - **MRA:** *Minimum Reception Altitude* is the lowest altitude at which an intersection can be determined
 - **MCA:** *Minimum Crossing Altitude* is the lowest at which an aircraft must cross a fix when proceeding in the direction of a higher minimum en-route IFR altitude.
 - **OROCA:** *Off Route Obstacle Clearance Altitude* provides obstacle clearance, but may not provide signal coverage from ground based nav aids, ATC radar, or communications
 - **MSA:** *Minimum Safe/Sector Altitudes* are found on approach plates and provided 1000' terrain clearance within 22NM of the airport, used for emergency purposes.
- General Instrument Flying Altitudes
 - 0-179° = even thousands, 180-359° = odd thousands
 - Remember, controllers my place you on an “opposite” altitude
 - You may also request a “Block” altitude, where you can use a chunk of airspace
 - The communication will go as follows:
 - You say...
 - ▶ *“Miami Center, Cessna 995JA request block 10,000 to 12,000.”*
 - Controllers may say...
 - ◀ *“Cessna 5JA, maintain block 10,000 to 12,000.”*
 - You say...
 - ▶ *“Maintain block 10,000 to 12,000 Cessna 5JA.”*
 - You now have clearance to fly at any altitude within this block and may change altitudes therein without informing ATC
 - *NOTE: Informing ATC of an altitude change within the block will automatically revoke you block clearance*
- Obstruction Clearance requirements
 - In **non-mountainous** terrain, we are guaranteed 1,000' obstacle clearance on charted alts
 - In **mountainous** terrain, we are guaranteed 2,000' obstacle clearance on charted alts

2) Comply with Enroute Regulations

- Phraseology for enroute altitude requests
 - **“Climb/descend and maintain (altitude)”**: Begin climb or descent upon receipt of the clearance. Climb or descend at an optimum rate until within 1,000 feet of the assigned altitude. Then attempt to climb or descend at 500 feet per minute. Advise ATC if you cannot climb or descend at a minimum of 500 FPM.
 - **“Climb/descend at pilot’s discretion”**: You may begin the climb or descent at any time you wish. You may also climb or descend at any rate and level off at an intermediate altitude. However, once you leave an altitude, you may not return to it without further clearance.
 - **“Cross (fix) at” or “At or above/below (altitude)”**: Climb/descend at pilots discretion, however you must cross the fix at said altitude
 - **“Cruise (altitude)”** - This term assigns a block of airspace from the MEA to the altitude specified. Climb or descent within the block is at the pilot’s discretion without announcement to ATC. Once you verbally report leaving an altitude, you cannot return to that altitude without further clearance. The term “Cruise” also implies clearance to fly any published instrument approach upon arrival at your destination airport.
 - **“Resume own-nav”**: Used by ATC to advise a pilot to resume his/her own navigational responsibility. It is issued after completion of a radar vector or when radar contact is lost while the aircraft is being radar vectored.

3) Think Ahead

- ALWAYS plan for the un-planned. The best way to do this is by maintaining situational awareness of where you are (Even/especially when under radar vectors) and what the weather is ahead and behind you.
- As we approach an airport, get current ATIS/ASOS at intended airport, figure out an approach to shoot, or if one is in effect, set up for that approach and BRIEF THE APPROACH
- Notify ATC of your intentions for the approach: what kind of approach, how it will terminate (practice approach to missed vs. full stop)

- Enroute Rules of thumb...

FUNDAMENTAL SKILLS OF INST FLYING

Instrument Cross Check
Instrument Interpretation
Aircraft Control

ERRORS OF INST SCAN

Fixation
Omission
Emphasis

- Compass Errors

COMPASS ERRORS

Variation (True vs. Magnetic)
Deviation (magnetic interference)
Magnetic dip (pulls towards earth)
Oscillation (turbulence, combination)
Northerly Turning Errors (UNOS)
Acceleration Errors (ANDS)

- ANDS and UNOS:

ACCELERATION ERRORS

Accelerate
North
Decelerate
South

NORTH TURNING ERRORS

Undershoot
North
Overshoot
South

- Lost Communications §91.185

- If failure occurs in VFR conditions, or if VFR conditions are encountered after the failure...
 - Continue the flight under VFR, squawk (assuming not a full power failure) VFR, and land as soon as practicable
→ *The key to real-world IFR lost coms is to EXIT the heavily communication-reliant IFR system, by becoming a VFR aircraft*
- If failure occurs in IFR conditions, choose the following altitude and route...

ALTITUDE

FLY HIGHEST OF THE FOLLOWING:
Minimum Enroute Altitude
Expected altitude
Assigned

ROUTE

FLY IN ORDER OF:
Assigned
Vectored
Expected
Filed

- Amplified and Emergency Procedures

LOST PROCEDURES

Climb.....To see more/clear terrain
Call.....Contact controller/121.5 for help
Conserve.....Save fuel

TRANSPONDER CODES

1200 – VFR
7500 – HIJACK
7600 – LOST COMM
7700 – EMERG
7777 – Military intercept

- Enroute Reports

MANDATORY REPORTS TO ATC

Missed Approach

Altitude Changes when VFR on top

True Airspeed change +/- 10 knots or 5%

Holding: time and altitude when entering or leaving the holding fix

Cannot maintain a 500fpm climb/descent

Altitude and time when at holding fix or CLEARANCE LIMIT

Leaving an assigned altitude

Lost comm. or nav, equipment

Safety of flight, including un-forecasted weather

NON-RADAR MANDATORY REPORTS

Compulsory Reporting Points (Shaded fix on Low Enroute)

Inbound at Final Approach Fix (FAF) or Outer Marker (OM)

A: ETA Error of 3 minutes or more

STRUCTURE OF A POSITION REPORT

ID

Position

Time & Type of flight plan

Altitude

Name of next fix

ETA at that fix

Supplemental Information

- Additional enroute regulations and terms

VOR SERVICE VOLUMES and FREQUENCIES

- VHF Frequencies between 108.0-117.95 MHz
- Terminal VOR: 1,000'-12,000' 25NM radius
- Low Altitude VOR: 1,000'-18,000' 40NM radius
- High Altitude VOR: 1,000'-14,500' 40NM; 14,500'-18,000' 100NM; 18,000'-45,000' 130NM; 45,000'-60,000' 100NM radius

MODE C TRANSPONDER REQUIREMENTS §91.215

- Class A, B, and C airspace
- Within 30 NM of class B
- Above the ceiling within the lateral boundaries of class B or class C up to 10,000' MSL
- ALL airspace at and above 10,000' MSL, excluding that airspace below 2,500' AGL
- there are a couple more less obvious ones, but these are the main ones we will deal with on a daily basis

OXYGEN REQUIREMENTS §91.211

- Cabin pressure altitudes of 12,500' up to and including 14,000' MSL, required minimum flight crew provided and use O2 for that portion of the flight greater than 30 minutes
- Cabin pressure altitudes above 14,000' minimum flight crew provided and use O2 entire flight
- Cabin pressure altitudes above 15,000' O2 available to passengers

4) Holding

- The overarching goal of a hold is to either place an aircraft on an approach or control aircraft separation
- From a flying standpoint, your goal is to **STAY ON THE HOLDING SIDE** within the safe boundaries
- Standard holds require **RIGHT** turns and are used when no direction is specified in a clearance
 → *NOTE: This is opposite of a standard traffic pattern where LEFT turns are standard*
- Published Holds
 - These are holds depicted on approach plates and enroute charts
- Non Published Holds
 - These are holds issued by controllers typically NOT found on charts
 - The communication will go as follows:
 - ▶ Controllers say...
 - ◀ "Cessna 995JA, hold 10 miles north of the Van Nuys radial 350, maintain 7,000, right turns, expect further clearance 1304 Zulu time."
 - ▶ You say...
 - ▶ "Roger, hold 10 miles north of the Van Nuys radial 350, maintain 7,000, right turns, expect further clearance 1304 Zulu time, Cessna 5JA"

- Required information for issuing non-published holding clearances

NON PUBLISHED HOLDING PATTERN

Direction of hold....."hold 10 miles **north**"
Fix....."of the **Van Nuys**"
Radial/Course....."radial **350**"
Altitude....."maintain **7,000**"
Turns....."**right** turns"
EFC time....."expect further clearance **1304 Zulu** time"

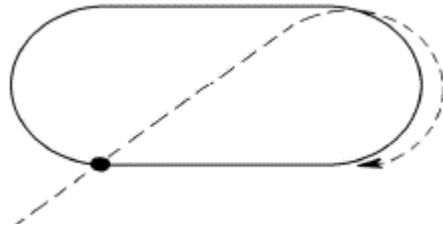
- **Direction:** The geographic direction from the holding fix where the holding course will be found. This direction is expressed as one of the eight cardinal compass directions. The direction given is not the side of the course where the holding airspace is located, that will be determined by the type of turn (left or right).
- **Fix:** The name of the fix at which to hold. The fix name may be omitted if it is clearly stated as the clearance limit at the beginning of the clearance.
- **Radial/Course:** The radial, course, bearing, airway, or other flyable route that will serve as the inbound leg.
- **EFC Time:** The time at which you may reasonably expect to depart the hold. The EFC time is also the time you would leave the holding fix if two-way radio communications
 → *NOTE: When receiving holding instructions, the radial you are given to hold ON represents your outbound course in the hold*
 → *In order to find the course you will need to fly inbound to the fix, find the reciprocal of the outbound course (radial)*

- Entering a hold
 - You are established in a hold as soon as you cross the fix for the first time
 - When choosing an entry procedure, choose the one that requires the least amount of turning AT the fix

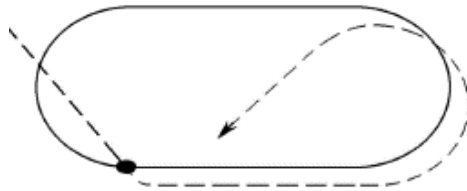
DIRECT



- 1) Proceed direct to the fix
- 2) Upon crossing the fix, make a turn to the outbound heading and join the outbound course
- 3) Begin timing upon crossing the fix outbound (flag flip), or if not a VOR, upon wings level on heading

TEARDROP

- 1) Proceed direct to the holding fix
- 2) Upon crossing the fix, turn 30° from the outbound course on the **holding side**
- 3) Fly this heading for approximately 1 minute, then make a turn inbound to intercept the inbound course

PARALLEL

- 1) Proceed direct to the fix, upon crossing the fix turn to the outbound course to parallel the holding pattern on the unprotected side of the hold
 - 2) Time for one minute, then make a big turn towards the holding side of the hold
 - 3) When entering a hold, outbound timing begins the ABEAM POSITION or WINGS LEVEL
- The “Abeam Position” when holding over a...
 - **VOR**: *off flag* (OBS set to holding course)
 - **NDB**: relative bearing *090°* or *270°* plus or minus wind correction angle
 - **Outer Marker (OM)**: *wings level*
 - **An intersection** (two radials): *wings level* or *centered needle* if 90°
 - Adjust outbound leg so that **inbound leg is 1 min** or specified **DME**
 - Holding Maximum Airspeed Restrictions
 - Up to 6000' = 200 KIAS
 - 6001'-14,000' = 230 KIAS
 - 14,001'- above = 265 KIAS

PHASE 5: APPROACH, MISSED APPROACH, AND LANDING

1) Set up for the approach

- Approach Plate Briefing
 - Final checklists
 - At the Final Approach Fix, remember...
- SIX T's
- Turn Time Twist Throttle Talk Track
- TURN for the final approach course
 - Start TIMER
 - TWIST CDI/Heading Bug for final approach course
 - THROTTLE to recommended final descent setting
 - TALK to tower if needed for landing clearance
 - TRACK the final approach course

2) Prepare for / fly the missed approach (if applicable)

- We categorize field conditions based off ceiling and visibility as follows:
 - VFR if greater than 3,000 AGL and greater than 5 SM
 - MVFR 1,000 to 3,000 AGL and/or 3 to 5 miles
 - IFR 500 to 999 AGL and/or 1 mile to less than 3miles
 - LIFR below 500 AGL and/or less than 1 mile
- §91.175c says we may NOT descend below MDA or DH unless...
 - 1) The aircraft is in a position for **normal rate of descent** to a landing on the **intended runway**
 - 2) The **flight visibility** is at or above the visibility required to complete the approach
 - 3) At least **one of the following** visual references for the intended runway is distinctly visible and identifiable to the pilot:
 - The approach light system*
 - The threshold
 - The threshold markings
 - The threshold lights
 - The runway end identifier lights
 - The visual approach slope indicator
 - The touchdown zone or touchdown zone markings
 - The runway or runway markings
 - The runway lights

** You may not descend below 100 feet above the touchdown zone elevation using the approach lights as a reference unless the red terminating bars or the red side row bars are also distinctly visible and identifiable*
- At the Missed Approach Point (MAP)
- When going Missed, the priority if to get away from the ground!

GO AROUND/MISSED APPROACH

Cram.....FULL power, mixture SET
Climb.....Climb at V_Y (or V_X if applicable)
Clean.....Flaps UP (incrementally) gear UP
Cool.....Cowl Flaps OPEN
Call.....Announce "Missed Approach"

3) Ensure the flight plan is closed

- REMEMBER: all flight plans (VFR or IFR) must be closed/canceled or Search & Rescue will be looking!
- Upon safely landing, or changing to VFR when landing is assured...
 - At **Towered airports**: IFR closing is done AUTOMATICALLY by the controllers
 - At **Non-Towered airports**: WE MUST CLOSE OUR FLIGHT PLAN!
 - Use either the clearance delivery frequency, approach controller frequency, or clearance phone number to close your IFR flight plan

Appendix 1: NOTAMS

Types of NOTAMS

- **FDC:** Flight Data Center NOTAMS are regulatory in nature (IE changes to an instrument approach procedure or airway) and include Temporary Flight Restrictions (TFRs)
- **CENTER AREA:** An FDC NOTAM issued for a condition that is not limited to one airport, therefore it is filed under the Air Route Traffic Control Center (ARTCC) that controls the airspace involved. TFRs, airway changes and laser light activity are examples of this type of NOTAM.
- **NOTAM D:** A NOTAM given (in addition to local dissemination) distant dissemination beyond the area of responsibility of the Flight Service Station. This type of NOTAM now includes (U) NOTAMs and (O) NOTAMs
- **U NOTAMs:** are unverified NOTAMs which are those that are received from a source other than airport management and have not yet been confirmed by management personnel. This is allowed only at those airports where airport management has authorized it by Letter of Agreement.
- **O NOTAMs:** are other aeronautical information which does not meet NOTAM criteria but may be beneficial to aircraft operations.
- **CLASS I (ICAO):** NOTAMs distributed by means of telecommunication.
- **CLASS II (ICAO) OR PUBLISHED NOTAMS:** NOTAMs distributed by means other than telecommunications. In the United States these NOTAMs are published in the Notices To Airmen Publication (NTAP) which is issued every 28 days.
- **INTERNATIONAL:** Any NOTAM intended for distribution to more than one country would be considered an international NOTAM. However, a FSS does not have access to all international NOTAMs. For our purposes I will limit the definition to international NOTAMs that we at a FSS have access to. This would include NOTAMs stored in ICAO format in the United States NOTAM System (USNS) or published in the International NOTAMS section of the NTAP. The USNS stores international NOTAMS separately from domestic NOTAMs, but only for selected locations both inside and outside the United States. These NOTAMs are not included in a standard weather briefing unless specifically requested.
- **DOMESTIC:** NOTAMs that are primarily distributed within the United States although they may also be available in Canada. Domestic NOTAMs stored in the USNS are coded in a domestic format rather than an ICAO format.
- **CIVIL:** Any NOTAM that is part of the civil NOTAM system which includes any NOTAM this is not part of the military NOTAM system.
- **MIITARY:** Any NOTAM that is part of the military NOTAM system which primarily includes NOTAMs on military airports and military airspace.
- **NOTAM L:** A NOTAM given local dissemination by voice and other means, such as telatograph and telephone, to satisfy local user requirements. This type of NOTAM is now used only in the military NOTAM system. All NOTAMs previously considered NOTAM (L)s in the civil NOTAM system are now considered NOTAM (D)s.

Appendix 2: WEATHER SOURCES AND REPORTING SYSTEMS

Sources

- AviationWeather.gov
- DUATS (Direct User Access Terminal Service)
- FSS (1-800-WX-BRIEF)

Advisory (Synopsis / Adverse Conditions)

- AIRMET → Hazardous to light aircraft
ISSUED FOR...
 - 6 hrs. or intermittent
 - Moderate icing
 - Moderate turbulence
 - Surface winds \geq 30kts.
 - Large area ceil $<$ 1,000 or vis $<$ 3SM*TYPES OF AIRMETS...*
 - **Airmet Sierra** = Mountain Obsc
 - **Airmet Tango** = Turb, sfc winds, LL shear
 - **Airmet Zulu** = Ice
- SIGMET → Hazardous to ALL aircraft
ISSUED FOR...
 - Severe conditions (ice, turb (and CAT), dust/sand (if vis $<$ 3, volcanic ash)*TYPES OF SIGMETS...*
 - Convective Sigmet
 - Sigmet
 - Tornado or Severe TS with Sfc wind $>$ 50
 - Hail $>$ $\frac{3}{4}$ diameter
 - Heavy precip affecting \geq 40% of 3,000 ft² area
- Surface Analysis Chart (Every 3hr.)
 - H/L press, Fronts
 - Temps/Dew/Wind
 - Local WX, vis obscurations
 - Sky cover
- Weather Depiction Chart (Every 3hr.)
 - METARs
- Radar Summary Chart (Every 1hr. at 35 past)
 - Show Areas of and characteristics of precip
- Significant Weather Prognostic Charts (4 Updates–12/24; 3 Updates–36/48)
 - Significant along top row: turb, frz lvl, IFR/MVFR WX
 - Surface along bottom: pres syst, fronts, precip
- Severe Weather Outlook
- Stability Charts

Forecasts

- Freezing Level Charts
- Winds/Temps
 - 2 updates
 - 1,500ft of station, no info
- TAF (Terminal Aerodrome Forecasts)
 - 5 SM radius
 - 4 updates, valid 30 hrs.
- FA (Area Forecast)
 - 6 areas nationwide
 - 3 updates, valid 18 hrs.

Observations (Current Conditions)

- PIREPS
- METAR (Aviation Routine WX Report)
- Radar Weather Report (Every 1hr. at 35 past)

Enroute Weather Services

Popular Sources

- **FSS:** 122.2
- **ATIS:** Automatic Terminal Information Service; Updated Every Hour
- **AWOS/ASOS:** Automated Weather/Surface Observation System; Updated Minutely
- **HIWAS:** Hazardous In-flight Weather Advisory Service

Mostly Mundane Sources

- **PATWAS:** Pilot's Automatic Telephone Weather Answering Service
- **TIBS:** Telephone Information Briefing Service
- **TWEB:** Transcribed Weather Enroute Broadcast