



NATIONAL INTERCOLLEGIATE
FLYING ASSOCIATION

NIFA CRM/LOFT Event Flight Operations Manual (FOM)

Master Table of Contents

Notice of Revisions	3
Preface	4
NIFA Mission Statement	4
CRM/LOFT Event Purpose	4
CRM/TEM	4
The NIFA FOM (This Document)	5
Red Book	5
Event Structure and Phases	6
Definitions	7
Briefings	8
Flight Attendant/Passenger Briefing	8
Departure Briefing	8
Runway Position, Departure, First Fix Verification	9
Takeoff Briefing	9
Arrival and Approach Briefing	10
Policies and Limitations	11
Aircraft Lighting	11
Approach Category	11
Automation	11
Fuel	11
GPS Approaches	12
Hot Spots	12
Icing	12
IFR Clearance and Verification	12
Pilots	13
Push to Talk	13
Stable Approach Criteria	13
Thunderstorms	14
Transfer of Controls	14
Visibility	14
Wind	14
Duties and Responsibilities	15
Captain (Pilot in Command) (C)	15
First Officer (Second in Command) (F)	15
Pilot Flying (PF)	16
Pilot Monitoring (PM)	16

Required Reports	16
ATC	16
Dispatch (NIFA Frequency - 132.00)	17
Holding	17
Entry	17
Timed Holds	17
Fuel	17
Coordination with Dispatch	17
Constant Angle Non-Precision Approaches (CANPA)	18
Purpose	18
Calculating Derived Decision Altitude (DDA)	18
Procedure	18
Checklists	19
Initiation	19
Planning	19
Procedure	19
Call and Response	19
Runway Change Items	20
Aircraft Checklist	21
Profiles	22
Takeoff/Climb	22
Precision Approach	24
Non-Precision (CANPA)	26
Go Around	28
Additional Callouts	30
Example Flight Release	31
Release Explanations	36
Additional Resources	38
Generic Score Sheet	38
Threat and Error Management Scoring (TEM)	45
TEM Score System Explanation	46
CANPA Vertical Speed Chart	48
Crosswind Calculator	49
G1000 Manual	50
Redbird Resources	51

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Preface

NIFA Mission Statement

The National Intercollegiate Flying Association was formed for the purposes of developing and advancing aviation education; to promote, encourage and foster safety in aviation; to promote and foster communications and cooperation between aviation students, educators, educational institutions and the aviation industry; and to provide an arena for collegiate aviation competition.

CRM/LOFT Event Purpose

The purpose of this event is to test the contestant's problem-solving ability in a team environment. Teams will be tested on their ability to use Crew Resource Management (CRM) during a "real time" simulated Line Oriented Flight Training (LOFT) scenario. The LOFT scenario will be planned with an even and realistic mix of simple problems and complex situations. Specific simulator or aircraft knowledge will not be tested, and all procedures and checklists required to operate the simulator are contained within this document. The event is designed to test the contestants' ability to work together to solve aeronautical problems, not to diagnose complex aircraft systems problems. Each LOFT scenario will be scripted from the crew's first contact with the other crew members to the final landing or other resolution point. The LOFT scenario will be designed with contingencies for any deviations the contestants make from the proposed plan.

CRM/TEM

Crew Resource Management and Threat and Error Management (CRM/TEM) is a set of skills designed to enhance safety by increasing the efficiency of Flight Crewmembers as they interact in the aircraft, with the goal of improving the management of threats and errors. This is done through effective employment of planning skills to manage threats, execution skills to manage errors, and review skills to manage undesired aircraft states. These skills are supported by the traditional CRM skills of situational awareness, communication, teamwork, leadership/ followership, and decision-making.

The NIFA FOM (This Document)

The purpose of the NIFA Flight Operations Manual is to provide a standardized “one stop” document that includes policies, procedures, scoring, and explanations pertaining to the CRM event. This manual extracts and promotes various industry practices with the intention of being transparent with event expectations. Having these formally outlined standards and expectations allows judges to better objectively score CRM given the dynamic nature of the event. While not all of the policies and procedures outlined in this manual are mandatory, they are **HIGHLY** encouraged. The event judges are expecting and are prepared to score the content contained within this manual. The use of the checklists, profiles, callouts, and procedures in this manual will provide a competing crew with the resources needed to operate the aircraft as intended.

Red Book

A list of the most up to date event information and a complete set of rules can be found on the NIFA website <https://nifa.aero>

- Teams may only enter one crew of two pilots. EACH of the contestants MUST hold an Instrument Rating. A Multi Engine Rating is preferred.
- The route of flight and other pertinent information will be given to the contestants prior to the actual flight.
- The Judge(s) will act as all outside parties (air traffic control, company maintenance, passengers or flight attendant(s), etc.). The contestants must address these third parties the way they would in a real aircraft. For example, they must tune in the correct radio frequency to talk to the appropriate air traffic control facility.
- Scoring: Points will be assessed based on the severity of errors whereas trapped threats/errors earn the opportunity to reduce overall assessed points. The lowest score wins. Actual scoring parameters and penalties for a contest will be pre-determined by the Event Judge(s) with the consent of the Chief Judge.
- Contestants may terminate a flight at any time and accept a disqualification. Prior to any unsafe aircraft state, contestants may ask for guidance from the judges to complete the scenario and receive a “Did Not Finish” score rather than a disqualification.
- Rough and abusive handling of the equipment will result in disqualification.

Event Structure and Phases

The CRM event is conducted in a flight simulator and adjacent briefing spaces. Plan a total of approximately two hours for each crew from arrival to completion. The event is structured into three distinct phases:

- Briefing Phase
 - Crew arrives and checks in/Pilot certificate verification.
 - Crew will have an opportunity to ask a judge any questions about the event.
 - Crew may elect to use their own charts and electronic flight bag or use the provided physical copies so long as the data is current.
 - Crew will then be provided with a flight release package for the day's flight and be given a set amount of time to prepare prior to entering the simulator.
- Flight Phase
 - Crew will be escorted to the simulator which will be prepared for each team.
 - In the interest of time the crew may find the simulator in an "engines running, ready to taxi" state. This does not relieve crews of setup verification and preflight checklist items.
 - Crew will typically divide duties, program avionics, obtain an ATC clearance, brief, and run checklists to start.
 - Crew will conduct the flight from the specified beginning point to a logical conclusion.
- Debriefing Phase
 - A Judge will escort the crew from the simulator to a debrief area.
 - Judges may ask questions or guide a debrief over certain parts of the scenario.
 - Judges may not discuss final scoring but may discuss general performance.

Definitions

AFE - Above Field Elevation
AIM - Aeronautical Information Manual
CA - Captain
CANPA - Constant Angle Non-Precision Approach
CRM - Crew Resource Management
DCF - Discretionary Contingency Fuel - Extra Fuel
FA - Flight Attendant
FAR - Federal Aviation Regulations
FCP - Flight Control Panel (ALT/HDG selectors, selectable guidance modes NAV/HDG/FLC)
FMA - Flight Mode Annunciator (Displays active aircraft guidance modes)
FMS - Flight Management System (where flight plans are loaded, edited, or executed)
FO - First Officer
May - Recommended compliance as appropriate
Must - Mandatory compliance
PAX - Passengers
PF - Pilot Flying
PIC - Pilot in Command
PM - Pilot Monitoring
RVR - Runway Visual Range
Shall - Mandatory compliance
Should - Recommended compliance
SIC - Second In Command
TEM - Threat and Error Management
UAS - Undesired Aircraft State

Briefings

Flight Attendant/Passenger Briefing

Either the Captain or First Officer may brief the Flight Attendants or Passengers if on board. Time management is essential on the ground and this briefing should be conducted while the other crew member is performing another independent preflight task. The acronym SAFETY identifies each major category to brief.

Seatbelts and sterile cockpit
Anticipated weather enroute and on arrival
Filed alternate
Emergency procedures
Taxi time, flight time, and anticipated delays
Your questions

Departure Briefing

The Pilot Flying (PF) should conduct the departure briefing prior to accomplishing the Preflight checklist. The acronym WARTS identifies each major category to brief. The following items should be briefed *when applicable*:

W - Weather/Winds
Takeoff minimums/alternate
Low visibility taxi/takeoff
Cold weather operations
Windshear

A - Abnormal Procedures / Aborts
Division of duties (by the CA)
Aircraft MEL review
Anticipated threats for flight

R - Runway Considerations
Runway length
Surface condition
Airspeed and flap setting

T - Taxi Plan / Terrain
Taxi route / FAA designated hot spots / runway departure position
Runway change plan
Terrain

S - SID / DP / Special Company Procedures

Automation usage

SID speeds / altitude restrictions / climb gradient considerations

Airport / SID NOTAMs

Runway Position, Departure, First Fix Verification

Verification Initiated by the Captain and repeated by the First Officer - Verify and verbalize:

- The FMS/GPS selected runway/intersection takeoff position matches the latest ATC assigned takeoff position. Confirm the takeoff runway position by using an outside reference. It is not necessary to see the actual takeoff intersection to complete this procedure. If you are too far from the takeoff intersection to see it, then confirm your current position with taxiway signage and the airport diagram or moving map.
- The FMS/GPS selected departure procedure matches the latest ATC issued departure clearance.
- The FMS/GPS departure first fix matches the first fix on the DP/SID

Example: Prior to holding short of the departing runway. CA: "Runway 01 Full Length, NIFA ONE Departure, First Fix NATYS." FO: "Runway 01 Full Length, NIFA ONE Departure, First Fix NATYS."

Takeoff Briefing

The assigned Pilot Flying (PF) for departure will conduct a takeoff briefing any time prior to taking the runway, with last minute tower instruction reviewed if received. The PF will verbalize the following and confirm the aircraft automation is properly set. The acronym HAAM identifies each major category:

- Heading (initial) and planned mode call after departure (HDG/NAV)
- Altitude (initial)
- Airspeed restriction, if applicable.
- Minimum fuel for takeoff is greater than or equal to the listed amount on the flight release.

Example: Immediately after completing the Runway Position, Departure, First Fix Verification. PF: "Initial heading of 015, heading mode, up to 3,000', restricted to 200 knots, minimum fuel is 50 gallons. 60 gallons on board."

Arrival and Approach Briefing

The acronym NATS identifies each major category of the approach briefing. The following items should be briefed *when applicable*:

N NOTAMS

ATIS

Airport / Approach / STAR NOTAMs

A Arrival / Approach /Automation

Weather / Wind / Low Visibility / Contaminants

Arrival airspeed / altitude restrictions

Instrument approach chart briefing

Missed approach point / procedure

Runway change plan

T Terrain / Taxi Plan

Terrain / obstacle considerations

Taxi plan - turn-off, hot spots, runway crossings, low visibility considerations

S Special Procedures / Company Procedures

Anticipated threats

Policies and Limitations

Aircraft Lighting

- Beacon and Navigation Lights are to remain 'ON' when the aircraft is powered.
- Taxi Lights must be 'ON' anytime the aircraft is in motion on the ground. When the aircraft is stationary the Taxi Lights must be turned 'OFF'. During a line up and wait clearance, the Taxi Lights will be turned 'ON' until the aircraft is stopped in position. Once cleared for takeoff, the Taxi Lights are turned 'ON' until reaching Cruise. On Descent, the Taxi Lights shall be turned back 'ON'.
- Strobe Lights are to be 'ON' from the time the aircraft enters the runway for departure until it is clear of the runway on landing.
- All aircraft lighting must be 'ON' when crossing a runway.
- Landing Lights must be turned 'ON' only after a takeoff or landing clearance is received. Once established in Cruise, or in the event of a Go Around, the Landing Lights must be turned off prior to beginning an approach and the subsequent landing clearance.

Approach Category

The appropriate approach minimums must reflect the approach category flown.

Automation

The usage of autopilot is prohibited. The usage of a flight director is permitted. The PM must operate the FCP as directed by the PF, and the PM must verbalize that the proper selections have been set as indicated on the FMA. All pilot-induced lateral and vertical changes must be verbalized by the PF and, after referencing the FMA, the PM must verbally confirm the appropriate FMA status.

Fuel

Fuel management is the responsibility of the Pilot-In-Command (PIC). Proper fuel management encompasses the PIC responsibilities for verification, utilization, monitoring, recording, and reconciliation of the fuel load on the aircraft.

The flight crew must confirm that the actual fuel boarded is no more than RAMP fuel + 10 gallons on the most current dispatch release. Any overage within 10 gallons is considered discretionary contingency fuel (DCF). Overages above 10 gallons must be approved by Dispatch.

An aircraft may leave the ramp below the minimum ramp fuel provided the aircraft is airborne with a fuel quantity greater than the listed minimum takeoff fuel on the flight release.

GPS Approaches

LNAV/VNAV and LPV approaches are not authorized. LNAV minimums and non-precision approach procedures must be used for all GPS approaches.

Hot Spots

The Captain shall ensure the First Officer is heads up when approaching hot spots, crossing runways, or anytime the progress of the aircraft is in question. All heads down activities including checklist procedures must be completed clear of all hot spots and runways.

Icing

Aircraft are permitted for flight into known icing conditions provided the anti-ice system is both operational and employed. If the simulator is not equipped with anti/de-icing systems, the Anti-ice systems can be simulated with the positioning of the 'Pitot Heat Switch' to either the 'ON' or 'OFF' position. If icing conditions are not present, the anti-ice system must be switched 'OFF'.

The anti-ice system must be 'ON' when the OAT is 10°C (50°F) or below and visible moisture in any form is present (such as fog with a visibility of 1 mile or less, clouds, rain, snow, sleet, and ice crystals.) The anti-ice system must also be 'ON' for takeoff when the OAT is 10°C (50°F) or below and the runway is contaminated with surface snow, slush, or standing water.

IFR Clearance and Verification

All flights must be operated under Instrument Flight Rules (IFR). It is permissible to depart under Visual Flight Rules (VFR) and activate an IFR flight plan in the air as soon as possible so long as VFR weather and terrain clearances can be safely adhered to. The cancellation of IFR services is limited to after landing and clear of all runways.

When receiving a route clearance, both pilots should monitor and at least one pilot must write down the ATC clearance. After the avionics are programmed, the following clearance verification must occur.

PM: Referencing the written down route clearance, verbalize: the squawk code, departure, route of flight, altitude, and any speed restriction to the PF.

PF: Referencing the FMS/GPS verify: the squawk code, departure, route of flight, altitude, and any speed restriction stated by the PM.

After Verbalization / Verification, independently verify leg by leg the route of flight against the flight plan in the FMS/GPS.

Pilots

Both pilots must have an instrument rating, this is an event rules requirement and can not be waived. An ASEL rating is allowed, but it is strongly encouraged that both pilots have an AMEL rating. If only one pilot is AMEL rated, they should be the PF.

Crew members are expected to arrive at the airplane prepared to depart promptly with minimal delay. The crew, led by the captain should be able to have the aircraft ready for departure in under 20 minutes. Safety should not be compromised in the attempt to rush to depart on time but the aircraft is often on a time critical flight schedule so time is of the essence. Failure to depart in under 20 minutes will result in assessed points.

Push to Talk

Pilots must press the placarded push to talk button to transmit on the selected communication frequency. Pilots must also ensure the level in which they speak inside the simulator is loud enough for all judges to accurately capture communications and decision making.

Stable Approach Criteria

At any altitude, if the following stabilized approach criteria cannot be established and maintained, initiate a go-around. Do not attempt to land from an unstable approach. If a “go-around” is called by any flight crewmember, the go-around must be honored.

No lower than 1,000 feet Above Field Elevation (AFE):

- Be fully configured for landing (gear and landing flaps extended).
- Maintain a stabilized descent rate not to exceed 1,000 fpm.
- Be aligned with the final approach course or intended landing runway.
- Landing checklist completed.

No lower than 500 feet AFE:

- Be on target airspeed.
- The engines are stabilized at the power setting required to maintain the desired airspeed and rate of descent.

Crossing the Runway Threshold:

- Positioned to make a normal landing in the touchdown zone.

Planned Deviations: Some published approaches may require a planned deviation to the lateral/vertical stabilized approach criteria. Some published approaches require higher than standard descent rates. Verbalize all planned deviations during the approach briefing.

Unplanned Descent Rate Exceedance: In the event of a momentary descent rate exceedance, crews may proceed as long as the descent rate exceedance is verbally acknowledged and corrective action is immediately initiated.

Thunderstorms

Takeoffs, approaches, and landings are not normally attempted when thunderstorms are within five (5) miles of the airport unless the runway and flight path are clear of the thunderstorm and its associated gust front.

The following minimum distance should be maintained from cells:

- 5 miles below 10,000'
- 10 miles above 10,000'

The Captain is expected to use sound judgment and to draw upon all available sources to determine an appropriate weather avoidance path. For severe cells, the captain should strongly consider increasing the minimum distance to 20 miles or more to avoid invisible hazards such as hail and turbulence.

Transfer of Controls

Prior to transferring the controls a quick briefing of the aircraft state is recommended. In order to transfer the controls of the aircraft: The current Pilot Flying must state "You have the flight controls." The pilot monitoring must acknowledge immediately by saying, "I have the flight controls," and only thereafter becomes the new pilot flying.

Visibility

- The minimum visibility for takeoff is 1200 RVR.
- The minimum visibility for conducting an instrument approach is 2400 RVR (½ SM) or the applicable approach minimums, whichever is higher.
- If pilot controlled lighting is available, it must be used regardless of the conditions.

Wind

- The maximum tailwind component for takeoff and landing is 10 knots.
- The maximum crosswind component for takeoff and landing is 20 knots.
- Wind gusts are not restrictive in nature but shall be considered by crews.

Duties and Responsibilities

Captain (Pilot in Command) (C)

- The Pilot-In-Command exercises command authority and is responsible for the safety of the aircraft, crewmembers, passengers and cargo from the time of arriving at the aircraft until finishing the assignment and physically departing from the aircraft. The Pilot-In-Command maintains, at all times, a professional and businesslike environment that is conducive to the safe and efficient conduct of the flight.
- Exercises direct responsibility for, and is the final authority as to the operation of the aircraft. In an emergency requiring immediate action, the Pilot-In-Command may deviate from any rule to the extent required to meet that emergency.
- Always retains the authority; however, the Pilot-In-Command both elicits and welcomes participation from other Crewmembers during the conduct of the flight assignment.
- Acts as a mentor and instructor to further the capabilities of their Crew.
- May delegate functions to other Crewmembers, but retains responsibility.
- Informs the Company of the progress or delay of the flight.
- Maintains a high degree of Crew coordination and cockpit discipline and ensures the use of aircraft checklists at all times.
- Calls for checklists and configuration changes on the ground.
- Coordinates all taxi maneuvers and maintains constant vigilance in terminal ramp areas and when crossing taxiways and runways.
- Verifies the correct and sufficient amount of fuel is onboard before each departure.
- Utilizes crew resource/threat and error management principles to ensure the safe and efficient operation of aircraft
- Assesses operational restrictions, and suspends operations whenever an airport condition report indicates that existing abnormal conditions may be hazardous or unsafe
- Designates the pilot flying (PF) the aircraft and that pilot maintains responsibility for aircraft control, navigation, and compliance with ATC clearances and/or instructions.

First Officer (Second in Command) (F)

- Utilizes Crew Resource Management to ensure the safe and efficient operations.
- Must be highly knowledgeable and comply with:
 - Policies, procedures, and directives outlined in the Flight Operations Manual.
 - Appropriate FAA regulations, and other information relating to their duties.
- Is an active participant in the operation allowing for the workload to be reduced on the Captain.
- Responsible for reading checklists, ATC communications, and tasks requested by the Captain on the ground.

Pilot Flying (PF)

- Maintains responsibility for aircraft control, navigation, and compliance with ATC clearances and/or instructions.
- Calls for aircraft configuration changes in the air.
- Calls for checklists in the air.
- Programs the avionics and flight plan when on the ground.
- Directs PM to accomplish necessary tasks such as obtaining the ATIS, changing flight director modes, setting altitude and heading bugs not issued by ATC, tuning or changing navigational aids, etc.
- May at any time zoom in or out any moving map to increase situational awareness.
- Conducts, or delegates to the PM, an Arrival and Approach briefing.
- May transfer the controls to the other pilot assuming PM and PF responsibilities respectively.
- On the ground during taxi operations the PIC is always considered the PF.

Pilot Monitoring (PM)

- Monitors the overall aircraft state and retains situational awareness while conducting assigned tasks.
- The PM will verify that the airspeed is appropriate before accomplishing a configuration change commanded by the pilot flying.
- Reads and executes checklist items as directed by the PF.
- Communicates with ATC.
- Programs the avionics and flight plan in the air but must receive verification from the PF prior to finalizing any changes.
- Automatically selects heading and altitude bugs as directed by ATC as long as the value is verified by the PF.
- Advise the PF of any deviations from normal procedures or profiles.
- Make standard approach callouts.
- Perform tasks requested by the PF.
- On the ground during taxi operations the SIC is always considered the PM.

Required Reports

ATC

- Pilots must comply with the required reports listed in the Federal Aviation Regulations (FAR) as well as in the Aeronautical Information Manual (AIM).
- Pilots shall make any additional reports as requested by the controlling ATC agency.

Dispatch (NIFA Frequency - 132.00)

- When fuel on board exceeds the release fuel by more than 10 gallons.
- When a fuel check shows an unfavorable trend from the planned amount.
- Upon entering a holding pattern.
- Diversion to an alternate airport.
- Emergency declaration - If time permits.

Holding

Entry

When the aircraft is three minutes or less from the holding fix, the Pilot Flying is expected to start a speed reduction to both conserve fuel and to cross the holding fix at or below the maximum holding airspeed. Pilots must utilize AIM recommended entries to remain on the protected side of the holding pattern.

Timed Holds

If the abeam position cannot be determined, start timing when the outbound turn is completed. The length of the outbound leg must be adjusted to ensure the inbound leg meets the required time.

Fuel

To compute the maximum holding time available, determine the fuel required by adding the following:

- Fuel burn from present position to destination to include maneuvering and approach.
- Fuel burn to the alternate.
- FAA reserve fuel.
- Other factors that increase the minimum fuel requirement.

Subtract the fuel required from the fuel on board. Divide the holding fuel available by the rate of fuel consumed during the hold. The resultant time does not include unanticipated delays. The PIC, in conjunction with the dispatcher, has the final decision on how long a flight holds at a particular fix. The flight normally lands with at least the FAA minimum reserve fuel on board. The FAA minimum reserve fuel should not be considered usable for holding.

Coordination with Dispatch

Close coordination with dispatch during a hold is important. Advise dispatch when you have entered a hold. (e.g. "have entered a hold, EFC xxxx, fuel on board xxxxx, We can hold until xxxx.").

Constant Angle Non-Precision Approaches (CANPA)

Purpose

The purpose of CANPA is to create a continuous stabilized descent from the final approach fix all the way to landing. The removal of multiple or prolonged level offs enhances overall safety all while replicating the familiarity of a precision approach.

Calculating Derived Decision Altitude (DDA)

Derived Decision altitude is calculated by taking the Minimum Descent Altitude (MDA) of a non-precision approach and adding 50'. This newly derived minimum in essence makes a hard 'Decision Altitude' to either continue or discontinue the approach.

Procedure

- 1.) When performing a non-precision approach, the pilot is to plan the descent from the FAF to the DDA (Derived Decision Altitude (MDA+50')) following a constant angle. The pilot must use any information available in order to be as precise as possible when determining the descent rate. Note VNAV information is advisory in nature only.
 - Each approach has a different approach slope angle. Reference the glide path angle and ground speed chart, either published on the instrument approach chart or attached in this manual, to interpolate the required baseline rate of descent.
 - A rule of thumb for a 3 degree glide slope is to multiply the ground speed by 5 to get an approximate vertical speed. The stronger the headwind or shallower the glide path angle, the lower the vertical speed will need to be.
- 2.) All Step-down constraints must be adhered to; vigilance must be exercised to ensure the aircraft does not "duck" any constraints.
 - Crews should monitor distance measuring equipment when available to cross check the expected altitude with the aircraft's current altitude. Adjustments in vertical speed may frequently be necessary to remain on a safe and constant glide path.
- 3.) Upon arrival at the DDA (MDA + 50'):
 - If the approach lights or runway environment is not in sight, a missed approach must be executed.
 - If the approach is continued, the pilot should transition to visual glide path information once it becomes available.

Checklists

Initiation

Checklist initiation and completion on the ground, the captain calls for the checklists and the first officer reads the checklists. In flight, the PF calls for the checklists and the PM reads the checklists. If a checklist is required but has not been called for, the other pilot should query the pilot responsible for calling for the checklist.

Planning

Whenever possible, accomplish checklists before or after high workload times. Normally checklists are not called for until all associated procedural items are completed and there is an expectation that the checklist can be completed without interruption.

Procedure

If checklist tasks are not complete, the checklist will be read up to the last completed task. When the remaining task(s) has been completed, the checklist will be continued. Crewmembers may need to suspend a checklist for a short time to accomplish other tasks. The checklist should not be stowed prior to completion. If the interruption is short, continue the checklist with the next step. If a crewmember is not sure where the checklist was interrupted or the interruption is for an extended period of time, re-accomplish the checklist from the beginning. After resuming the checklist, all checklist challenges and responses must be made by the designated pilot(s) before calling the checklist complete and stowing the checklist. When all items of the checklist have been completed satisfactorily, the pilot reading the checklist shall announce “___ CHECKLIST COMPLETE” and may stow the checklist.


The crewmember responding to a checklist challenge must confirm the task or procedure was completed by: Visually verifying the checklist item, or observing the item was completed, or confirming completion with the crewmember who accomplished the procedure. When responding to a checklist item, a visual verification must be accomplished, when possible.


Call and Response

Located on the right side of specific checklist response items are designators indicating which crewmembers must verbalize a response. Items that do not have designators are to be accomplished silently. The following designators are used:

-
- C - Captain
 - F - First Officer
 - C&F - Captain and First Officer
 - PF - Pilot Flying
 - PM - Pilot Monitoring
-
- As Req'd - Means alternatives are available. Respond with the actual position of the control. For example, "Anti-ice....OFF."
 - Ckd - Means that controls or other systems have been evaluated/tested for proper system operation.
 - Complete - Indicates the associated procedure and/or procedural task in its entirety has been completed.
 - Set - Indicates panel switches, knobs, or bugs are verified to be in the correct position or the correct value has been entered.
 - Verified - Indicates the challenge items are correctly entered, annunciated, or have otherwise been confirmed to be correctly displayed.
 - Xckd (cross checked) - Indicates the associated value or setting has been confirmed to have been entered correctly at all locations, as specified.

Runway Change Items

In the event a runway, intersection, departure, or performance data change occurs after completing a checklist, the captain should call for the runway/ departure change items. After the necessary procedural steps are accomplished, the first officer will verbalize each change item from each of the previously completed checklists, identified by the symbol , by stating the challenge to the item. The designated crewmember(s) will respond with either: "NO CHANGE" for an item, or the appropriate checklist response for the item that changed.

In the event a runway or arrival change occurs after completing a checklist, the pilot flying (PF) should call for the runway/arrival change items. After the necessary procedural steps are accomplished, the pilot monitoring (PM) will verbalize each changed item () (if not previously briefed) by stating the challenge to the item. The designated crewmember(s) will respond with either: "NO CHANGE" for an item, or the appropriate checklist response for the item that changed.

Example C: "Preflight and Taxi Checklist, Runway Change Items."

Example PF: "Descent Checklist, Runway Change Items."

Aircraft Checklist

Preflight

Seats	Set (C&F)
Parking Brake	Set (C)
Landing Gear Lever	Down (C)
Flaps	Up (C)
L & R Magnetos	Both (C)
Battery Master	On (C)
Alternators	On (C)
Exterior Lighting	As Req'd (C)
Avionics Master	On (C)
Propellers	Full Forward (C)
Mixtures	Rich (C)
■ Altimeters	Xc'd (C&F)
Flight Release	On Board (C)
■ Clearance & Flight Plan	Verified (C&F)
■ Radios & Transponder	Set (F)
■ Departure Briefing	Complete (C)
Flight Attendant/Pax Briefing	Complete (C)
Fuel Required	Onboard ____ (C&F)

Taxi

■ Flaps	Set T/O (C&F)
■ Trim	Centered & Set T/O (C&F)
Flight Controls	Ckd (C&F)
Anti-Ice	As Req'd (C)

Before Takeoff

Cabin	Notified (F)
■ Flaps	Set T/O (C&F)
Propellers	Full Forward (C)
Anti-Ice	As Req'd (C)
■ Runway Position, Departure, First Fix... ..	Verified (C)
■ Takeoff Briefing	Complete (F)

Climb Checklist

Flaps	Up (F)
Landing Gear	Up (F)
Climb Power	Full Throttle (PF)
Propellers	2500 RPM (PF)

Cruise

Cruise Power (24" MP/2,400 RPM)	Set (PF)
Land/Taxi Lights	Off (PM)

Descent

Aircraft Lights	As Req'd (PM)
■ Altimeters	Xc'd (C&F)
■ Minimums	As Req'd (C&F)
■ Approach Briefing	Complete (PF)
Cabin Notification	Complete (PM)

Approach

■ Flight and Nav Instruments	Verified (C&F)
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Landing Checklist

Landing Gear	Down, 3 Green (C&F)
Flaps	Full (C&F)
Propellers	Full Forward (C&F)
Mixtures	Rich (C&F)

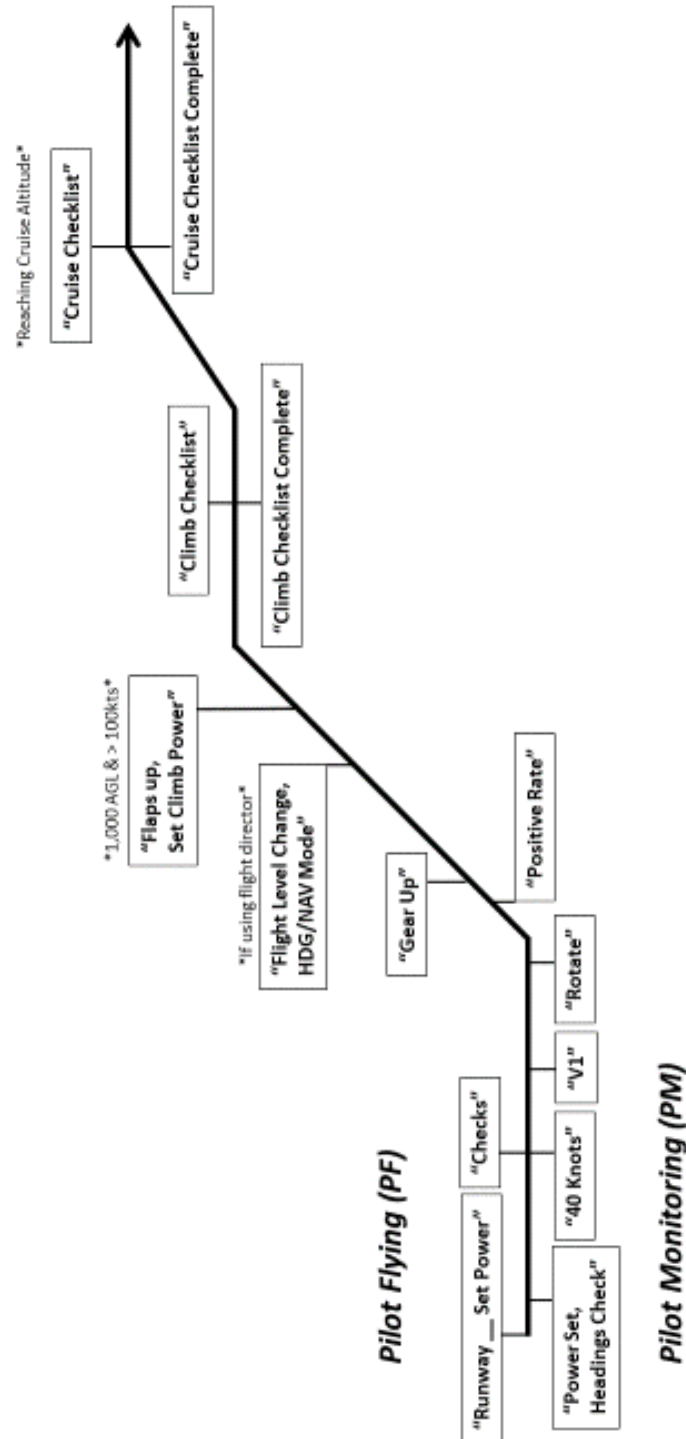
After Landing

Flaps	Up (F)
Aircraft Lights	As Req'd (C)

Profiles

Takeoff/Climb

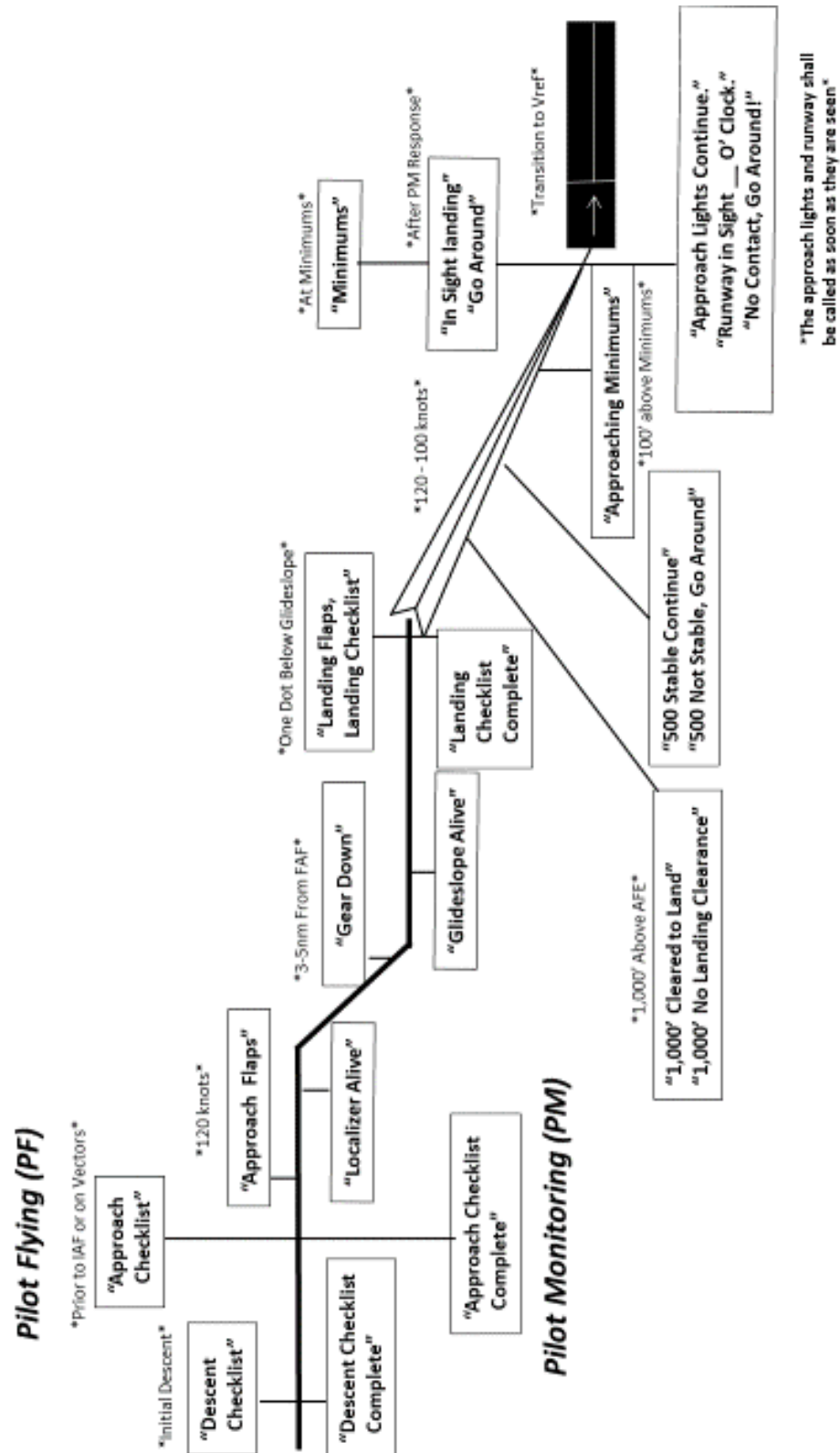
TAKEOFF & CLIMB PROFILE



Pilot Flying (PF)	Pilot Monitoring (PM)
Within sight of the departing runway CA initiates the runway position, departure, first fix verification. PF then provides the takeoff briefing.	Alert the cabin of an imminent departure.
Prior to entering the departing runway “Before Takeoff Checklist”	PM will complete the items on the checklist.
“Runway __ Set Power” Verify runway markings match the intended runway for takeoff. Advance power levers to takeoff power. With takeoff power set, hand is kept on power levers until V1.	“Power Set, Headings Check” After initial setting by PF, may adjust if needed to meet takeoff power setting. Verify the aircraft heading matches that of the runway.
Verify the airspeed matches that of the standby instrument, if installed.	“40 Knots” Verbalize the speed indication to the PF.
	“V1, Rotate” when the appropriate speeds are reached. They can be the same speed or several knots different depending on aircraft and runway conditions.
PF will initially rotate the aircraft and pitch to achieve the maximum sustained rate of climb.	
	“Positive Rate” when the altimeter and VSI indicate a positive rate of climb.
“Gear Up” in response to positive rate callout. Above 400’ AGL, follow the departure procedure per ATC clearance.	PM will select the gear lever up.
if using the flight director “Flight Level Change, HDG (or) NAV Mode” PF is requesting the flight director sync to the pitch required to maintain the current airspeed and the lateral guidance desired for navigation.	PM will select the appropriate buttons on the FCP to achieve the appropriate vertical and horizontal guidance on the flight director.
When the aircraft climbs above 1,000’ AGL and is above 100 knots. “Flaps Up, Set Climb Power”	PM will move the flap lever to the up position and adjust the prop controls to 2500 RPM however PF retains control of the power levers (throttles).
When the aircraft is above 1,500’ AGL. “Climb Checklist”	PM will complete the items on the checklist
When the aircraft reaches final cruise altitude and after any intermediate level-offs. “Cruise Checklist”	PM will complete the items on the checklist to include initial cruise power setting however PF retains control of power levers (throttles) and maintaining appropriate airspeed.

Precision Approach

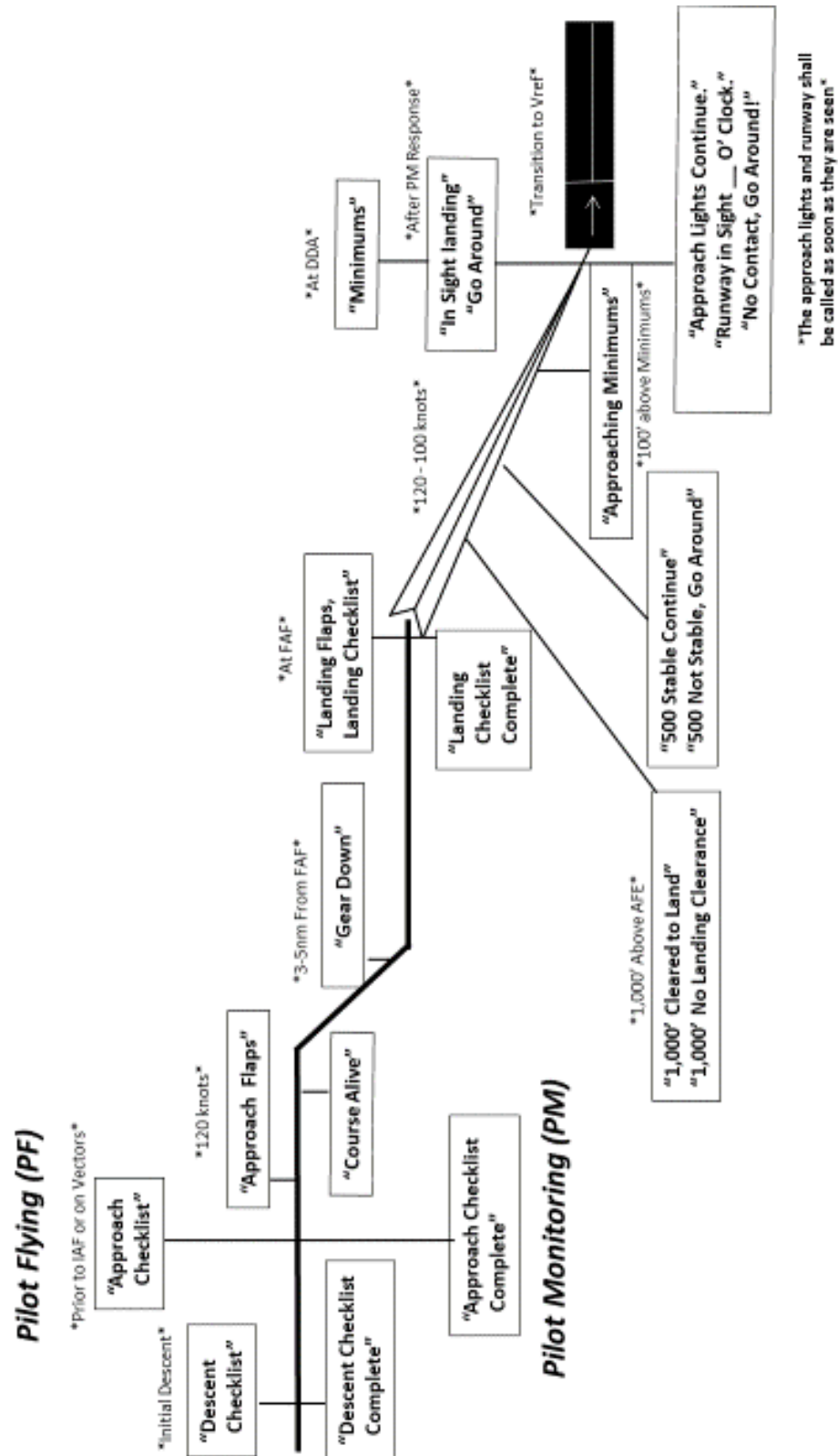
PRECISION APPROACH PROFILE



Pilot Flying (PF)	Pilot Monitoring (PM)
Prior to any fixes on the approach or while receiving vectors to the final approach course, verify the CDI is set to the appropriate navigational source. “Approach Checklist”	Ensure the CDI is set to the appropriate navigational source for the approach. NAV or GPS (Green / Magenta). PM will complete the items on the Approach Checklist.
If necessary, complete course reversal (procedure turn/holding pattern as depicted) when cleared for the approach by ATC.	
When approximately 2-3 miles prior to intercepting the intermediate approach course. “Approach Flaps”	PM will move the flap lever to the approach flap position.
	“Localizer Alive” when the course indicator moves off full scale deflection.
Approximately 3-5 miles from the FAF “Gear Down”	PM will select the gear lever down
	“Glideslope Alive” when the glideslope indicator moves off full scale deflection.
When one dot below glideslope. “Landing Flaps, Landing Checklist”	PM will move the flap lever to the landing flap position and complete the items on the checklist.
Maintain 100 - 120 knots while descending on the glideslope.	Once established on the glideslope, PM will set the missed approach altitude.
	“1,000’ Cleared to Land” or “1,000’ No Landing Clearance” when 1,000’ above field elevation state if a landing clearance has been received by ATC or if at an uncontrolled airport make an applicable CTAF radio call.
	“500 Stable Continue” or “500 Not Stable, Go Around” 500’ AFE reference the stable approach criteria and determine if the approach should be continued.
	“Approaching Minimums” 100’ above minimums
At the approach minimums state “Minimums”	Reply to the PF by stating the appropriate callout: “Approach Lights Continue.” “Runway in Sight __ O’ Clock.” “No Contact, Go Around!” *The approach lights and runway shall be called as soon as they are seen. This may be well prior to minimums*
State the appropriate action “In Sight Landing” If landing is desirable, reduce the airspeed to VREF. “Go-Around” - Execute the Missed Approach/Go-Around Profile.	Provide deviation callouts as necessary and ensure the PF retains situational awareness during the maneuver.

Non-Precision (CANPA)

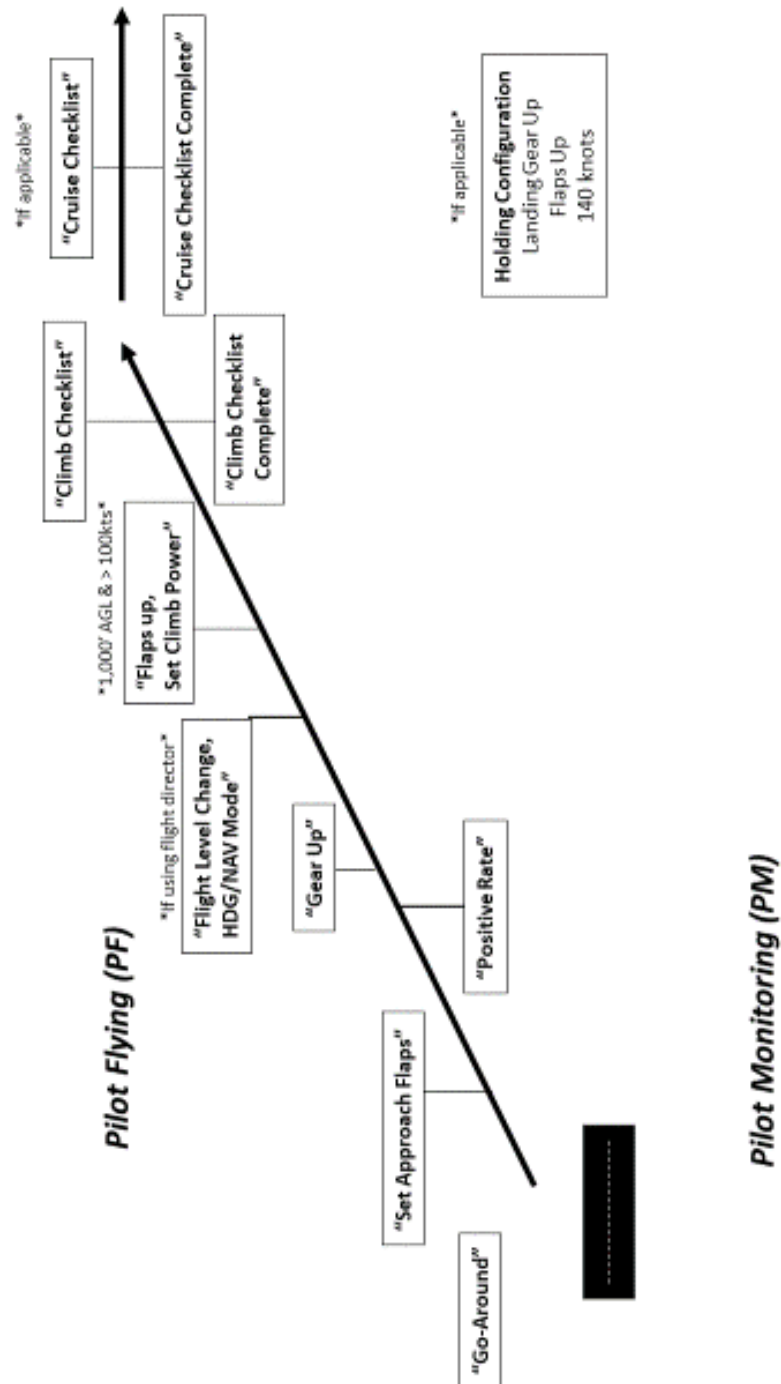
NON-PRECISION APPROACH PROFILE (CANPA)



Pilot Flying (PF)	Pilot Monitoring (PM)
Prior to any fixes on the approach or while receiving vectors to the final approach course, verify the CDI is set to the appropriate navigational source. “Approach Checklist”	Ensure the CDI is set to the appropriate navigational source for the approach. NAV or GPS (Green / Magenta). PM will complete the items on the Approach Checklist.
If necessary, complete course reversal (procedure turn/holding pattern as depicted) when cleared for the approach by ATC.	
When approximately 2-3 miles prior to intercepting the intermediate approach course. “Approach Flaps”	PM will move the flap lever to the approach flap position.
	“Course Alive” when the course indicator moves off full scale deflection.
When approximately 3-5 miles from the FAF. “Gear Down”	PM will select the gear lever down
Just prior or immediately after the FAF “Landing Flaps, Landing Checklist”	PM will move the flap lever to the landing flap position and complete the items on the checklist.
Maintain 100 - 120 knots while descending on the constant angle ‘glidepath’.	Once established on the constant angle path, PM will set the missed approach altitude.
	“1,000’ Cleared to Land” or “1,000’ No Landing Clearance” when 1,000’ above field elevation state if a landing clearance has been received by ATC or if at an uncontrolled airport make an applicable CTAF radio call.
	“500 Stable Continue” or “500 Not Stable, Go Around” 500’ AFE reference the stable approach criteria and determine if the approach should be continued.
	“Approaching Minimums” 100’ above the derived minimums $DDA = (MDA + 50')$
At the derived minimums state “Minimums”	Reply to the PF by stating the appropriate callout: “Approach Lights Continue.” “Runway in Sight __ O’ Clock.” “No Contact, Go Around!” *The approach lights and runway shall be called as soon as they are seen. This may be well prior to minimums*
State the appropriate action “In Sight Landing” If landing is desirable, reduce the airspeed to VREF and monitor visual glidepath information. “Go-Around” - Execute the Missed Approach/Go-Around Profile.	Provide deviation callouts as necessary and ensure the PF retains situational awareness during the maneuver.

Go Around

GO-AROUND PROFILE



A missed approach or go-around must be executed after **“No Contact, Go Around”** is stated but may also be executed at any point on the approach when the aircraft is not stabilized or in an unsafe position. When either pilot states **“Go-Around”** it must be executed.

“Go Around” Push the power toward max power and pitch the aircraft initially to a 10 degree nose up attitude establishing a climb.	Provide deviation callouts as necessary and ensure the PF retains situational awareness during the maneuver.
After a climb attitude has been achieved “Set Approach Flaps”	PM will ensure power is set (if needed, make final adjustment to reach full power setting) and set the flap lever to approach flap position if not already there.
	“Positive Rate” when the altimeter and VSI indicate a positive rate of climb.
“Gear Up” in response to positive rate callout. Follow the missed approach procedure or instructions directed by ATC.	PM will select the gear lever up and advise ATC of the missed approach.
if using the flight director “Flight Level Change, HDG (or) NAV Mode” PF is requesting the flight director sync to the pitch required to maintain the current airspeed and the lateral guidance desired for navigation.	PM will select the appropriate buttons on the FCP to achieve the appropriate vertical and horizontal guidance on the flight director.
When the aircraft climbs above 1,000’ AGL and is above 100 knots. “Flaps Up, Set Climb Power”	PM will move the flap lever to the up position and adjust the prop controls to 2500 RPM however PF retains control of the power levers (throttles).
When the aircraft is above 1,500’ AGL. “Climb Checklist”	PM will complete the items on the checklist
If applicable, prepare for holding or complete the cruise checklist. All holds must be at 140 KIAS with the flaps and landing gear up, unless otherwise instructed by ATC.	

Additional Callouts

- The captain should repeat the taxi clearance after the first officer has read the clearance back to ATC.
- Crossing a runway during taxi
 - CA: “CLEAR LEFT”
 - FO: “CLEAR RIGHT”
- Both pilots should verify the altitude specified in the clearance has been set correctly by stating the altitude and pointing at the altitude set in the altitude alerter.
- Prior to activating a lateral or vertical path change in the FMS/GPS the
 - PF: shall verify the modification with the PM by stating “CONFIRM”
 - PM: After reviewing the modification to the lateral or vertical path change shall verify the change by stating: “EXECUTE”
- 1,000 feet above or below each assigned altitude
 - PM: “OUT OF ____ FOR ____”
- Any deviation from planned flight path (1 dot)
 - PM: “LOCALIZER” or “COURSE” “GLIDESLOPE” or “GLIDE PATH”
- Prolonged airspeed deviation greater than 5kts from desired IAS
 - PM: “SPEED +/- ____”
- Unplanned descent rate exceeding 1,000FPM.
 - PM: “SINK ____”

Note: Momentary speed deviations due to wind gusts are not required to be stated provided the aircraft returns to the desired speed. The PM should clearly state the parameter exceedance such as the calls listed above or equivalent.

Example Flight Release

A	Release Number 00	Date 24FEB23	IFR	Callsign: N1FA
	Dispatcher Jason Preston		Desk 01	(248) 434-5508

Dispatch Remarks
Additional fuel for NIFA metering delays
Precautionary alternate for possibly low visibility

B

Flight Crew

	Name	Contestant ID	Certifications
Pilot In Command	_____	_____	ASEL/AMEL/IR
Second in Command	_____	_____	ASEL/AMEL/IR

C

Cabin Occupants

FA	John Smith	0001
CEO	Jane Doe	0002
Passenger	Jake Doe	0003

N1FA

ORG	DST	TAXI	B/O	ALTF	RESV	HOLD	XTRA	MINF	RAMP
MKE	OSH	03	16	07	23	05	05	51	59
		06	32	14	45	10	10		

D

E

ALT GRB

Filed Flight Plan

FPL-N1FA

BE58-G1

KMKE2106

N0170 F050 MKE8 BAE V217 LEWKO DCT KOSH

KOSH0032

KGRB

STS/NONRVSM PBN/C2D2O2S2 REG/N1FA PER/B

G

H

Minimum Equipment List

ITEM	DESCRIPTION	EXPIRES ON
32-00-01	Autopilot	06June23

I

Scheduled Taxi: 2100z
Scheduled Departure: 2106z

J

Scheduled Landing: 2138z
Scheduled Park: 2145z

Legs

K

Waypoint Lat - Long	TIME TREM	DIST DTGO	IAS TAS	ALT	FRMG
KMKE N 42°56.82' W 087°53.82'	---- 00:32	---- 80	---- ----	----	56
TOC	00:04 00:28	07 73	160 170	050	54
BAE (Badger) N 43°07.01' W 088°17.06'	00:05 00:23	12 61	160 170	050	51
HAWKEN N 43°18.00' W 088°16.39'	00:04 00:19	11 50	160 170	050	49
CANUL N 43°36.61' W 088°15.25'	00:07 00:12	19 31	160 170	050	46
HISUB N 43°41.98' W 088°14.91'	00:02 00:10	05 26	160 170	050	45
LEWKO N 43°53.47' W 088°14.20'	00:05 00:05	11 15	160 170	050	42
TOD	00:02 00:03	06 09	160 170	050	41
KOSH N 43°59.06' W 088°33.42'	00:03 00:00	09 00	160 170	---- ----	40

Weather & Notams

Query ran at UTC: 24 Feb 2023 2030 UTC

KMKE 241952Z 05008KT 7SM BKN110 BKN250 M05/M13 A2970 RMK AO2 T10501133

KMKE 241732Z 2418/2524 36004KT P6SM FEW130 SCT250
FM242100 04005KT P6SM BKN100
FM250400 10005KT 5SM BR VCSH OVC060
FM250700 VRB04KT P6SM OVC040
FM251500 27008KT P6SM SCT220

L

!MKE 02/339 MKE NAV ILS RWY 25L DME NOT MNT 2302220524-2303282000EST
!MKE 02/340 MKE NAV ILS RWY 07R DME NOT MNT 2302220525-2303282000EST
!MKE 02/419 MKE RWY 07L RWY END ID LGT U/S 2302232206-2303022359
!MKE 02/437 MKE RWY 01R FICON 20 PCT ICE OBS AT 2302241600.
2302241600-2302251600
!MKE 02/440 MKE RWY 13/31 CLSD 2302241658-2302252359
!MKE 02/442 MKE RWY 07L FICON 10 PCT ICE AND 10 PCT WET OBS AT 2302241841.
2302241841-2302251841
!MKE 02/438 MKE TWY ALL FICON PATCHY ICE OBS AT 2302241653.
2302241653-2302251653
!MKE 02/377 MKE OBST STACK LGT (ASN UNKNOWN) 430149N0875525W (4NM N MKE)
977FT (400FT AGL) U/S 2302222012-2303222359

!FDC 1/3760 MKE ODP GENERAL MITCHELL INTL, MILWAUKEE, WI.
TAKEOFF MINIMUMS AND (OBSTACLE) DEPARTURE PROCEDURES AMDT 8A...
TAKEOFF MINIMUMS: RWY 1L, 1R, 7L, 13, 19L, 19R, 25L, 25R, STANDARD. RWY 7R, 300-1
1/2 OR STANDARD WITH MINIMUM CLIMB OF 293 FT PER NM TO 1100.
ALL OTHER DATA REMAINS AS PUBLISHED. 2112011642-2312011642EST

!FDC 2/4541 MKE SID GENERAL MITCHELL INTL, MILWAUKEE, WI.
MITCHELL EIGHT DEPARTURE...
TAKEOFF MINIMUMS: RWY 19R STANDARD. 2212131517-2412131516EST

!FDC 3/0809 MKE IAP GENERAL MITCHELL INTL, MILWAUKEE, WI.
RNAV (GPS) RWY 19L, AMDT 1...
LNAV MDA 1180/HAT 506 ALL CATS, VIS CATS C/D 1 3/8.
VDP 1.4 NM TO RWY 19L. TEMPORARY CRANES UP TO 879FT MSL BEGINNING 3614FT
SOUTHWEST OF RWY 19L (2022-AGL-10227 THRU 10229-NRA).
2301041450-2307151449EST

KOSH 241953Z 27014G24KT 4SM BLSN BKN090 M09/M14 A2971 RMK AO2 T10891144

KOSH 241135Z 2412/2512 VRB04KT P6SM SKC
FM242200 00000KT P6SM BKN090
FM250400 VRB04KT 4SM -SHSN BR BKN040
FM250500 VRB04KT 3SM -SHSN BR OVC030
FM251100 VRB04KT P6SM OVC035



!OSH 01/167 OSH COM REMOTE COM OUTLET 122.25 CHANGED TO 122.3
2301242213-PERM
!OSH 02/110 OSH COM REMOTE COM OUTLET 122.3 U/S 2302271400-2302271900
!OSH 02/183 OSH RWY 05/23 CLSD 2302241849-2302272100EST
!OSH 02/184 OSH RWY 27 FICON 5/5/5 30 PCT 1/8IN SLUSH OBS AT 2302241850.
2302241850-2302251850
!OSH 02/164 OSH TWY P, P1, P2, P3, P4, P5 CLSD 2302232113-2302272100
!OSH 02/181 OSH TWY ALL FICON PATCHY 1/4IN SLUSH OBS AT 2302241847.
2302241847-2302251847
!OSH 02/182 OSH APRON ALL FICON PATCHY 1/4IN SLUSH OBS AT 2302241848.
!OSH 01/046 OSH OBST TOWER LGT (ASR 1039441) 435624.90N0885605.30W (16.5NM W
OSH) 1452.1FT (503.0FT AGL) U/S 2301052155-2304050500

KGRB 241953Z VRB03KT 10SM CLR M08/M14 A2970 RMK AO2 T10781144

KGRB 241829Z 2418/2518 27004KT P6SM SCT035
TEMPO 2419/2422 BKN035
FM242200 VRB03KT P6SM BKN100
FM250500 17003KT P6SM OVC060
FM250800 18003KT 1SM -SHSN OVC030
FM251100 22004KT P6SM -SN BKN025
FM251600 25008G15KT P6SM SCT030



!GRB 02/578 GRB RWY 24 FICON 5/5/5 30 PCT 1/8IN DRY SN OBS AT 2302240923.
2302240923-2302250923
!GRB 02/580 GRB RWY 36 FICON 5/5/5 30 PCT 1/8IN DRY SN 3FT BERMS OBS AT
2302240923. 2302240923-2302250923
!GRB 02/530 GRB TWY C CLSD 2302231555-2303172359EST
!GRB 02/579 GRB TWY ALL FICON PATCHY COMPACTED SN AND PATCHY 1/8IN DRY SN
3FT BERMS BA GOOD TO MEDIUM OBS AT 2302240923. 2302240923-2302250923
!GRB 01/003 GRB OBST CRANE (ASN UNKNOWN) 443010N0880343W (3.11NM E GRB)

!FDC 3/8225 GRB IAP GREEN BAY/AUSTIN STRAUBEL INTL, GREEN BAY, WI.
RNAV (GPS) RWY 24, AMDT 1B...
LNAV MDA 1280/HAT 598 ALL CATS, VIS CAT C/D 1 3/4.
CIRCLING CATS A/B MDA 1280/HAA 585, CATS C/D MDA 1400/HAA 705, VIS CAT C 2, CAT
D 2 1/4.
VDP 1.7 NM TO RW24.
TEMPORARY CRANE 1050 MSL 2.3NM NE OF RWY 24 (2023-AGL-234-OE AND
2023-AGL-235-OE). 2301311400-2309142241EST

!FDC 3/8226 GRB IAP GREEN BAY/AUSTIN STRAUBEL INTL, GREEN BAY, WI.
ILS OR LOC RWY 36, AMDT 9B...
ILS OR LOC RWY 6, AMDT 21E...
RADAR 1, AMDT 9F...
RNAV (GPS) RWY 18, AMDT 1C...
RNAV (GPS) RWY 36, AMDT 3B...
RNAV (GPS) RWY 6, AMDT 2B...
VOR-A, ORIG-C...
CIRCLING CATS A/B MDA 1280/HAA 585, CATS C/D MDA 1400/HAA 705, VIS CAT C 2, CAT
D 2 1/4.
TEMPORARY CRANE 976 MSL 3.1NM NE OF GRB AIRPORT (2023-AGL-234-OE AND
2023-AGL-235-OE). 2301311400-2309142241EST

Area Weather

SIGMET ROMEO 2 VALID UNTIL 242300
SIGMET
WI MN IA IL MI IN
FROM 20N MSP TO 20ESE DSM TO 70NE IND TO 20NE DXO
OCNL SEV TURB ABV 080. DUE TO STG LOW LVL WNDS AND STG UDDFS RPTD BY
ACFT. CONDS CONTG BYD 2300Z.



By signing below I certify that I have reviewed the release in order to determine that the flight
can be made safely as planned. I meet the certification requirements of this event and
understand that once seated inside the simulator event scoring will commence.



PIC

_____/_____/_____/_____/_____
Signature / Name / Team / ID / Time

SIC

_____/_____/_____/_____/_____
Signature / Name / Team / ID / Time

Release Explanations

A: The release number indicates the currency of the data. Any changes will update the release number.

B: Dispatcher remarks can highlight key or non standard information to flight crews. The dispatcher's information is listed in this section so that in the event an issue arises on the ground dispatch can be contacted. If dispatch needs to be contacted in flight, crews should utilize the NIFA frequency.

C: Contestants should fill in their name, contestant ID, and circle their appropriate ratings.

D: Fuel and time chart -

ORG	DST	TAXI	B/O	ALTF	RESV	HOLD	XTRA	MINF	RAMP
MKE	OSH	03	16	07	23	05	05	51	59
		06	32	14	45	10	10		
ALT GRB									

ORG - Origin DST - Destination TAXI - Fuel used for the taxi
B/O - Fuel burned enroute to the destination ALTF - Fuel required to fly to the alternate
RESV - Reserve fuel * HOLD - Fuel for anticipated ATC delays or expected holding *
XTRA - Extra fuel that can be burned without impacting other restrictive fuel totals
MINF - Minimum fuel level to become airborne with *
RAMP - Expected fuel level prior to departing the ramp *

The first line of numbers is the fuel quantity in gallons whereas the second line of numbers is the corresponding value in time. EXAMPLE: B/O "16" is 16 gallons and "32" is 32 minutes.

*See FOM [1-11](#) and [1-17](#) for more information.

E: Alternate airport identifier if one is filed.

F:

FPL-N1FA - Identifies the flight plan to the assigned callsign
BE58-G1 - Type of aircraft
KMKE2106 - Departure airport and wheels up time in zulu (2106z)

G:

N0170 F050 MKE8 BAE V217 LEWKO DCT KOSH - Filed TAS (170KTAS), Filed altitude (5,000'), Filed route of flight
KOSH0032 - Destination and estimated time enroute (00:32)
KGRB -Filed alternate

H:

STS/NONRVSM PBN/C2D2O2S2 REG/N1FA PER/B - FAA filing codes and equipment, Registration, and Approach category.

I: Minimum equipment list items. These items are deferred/unusable in the simulator. If a new discrepancy is discovered the items must be added to the MEL and a revised release must be issued prior to departure.

J: Scheduled times for reference.

K: The legs page is used to verify the filed flight plan to the FMS/GPS as well as a reference to monitor the progress of the flight. The legs page shows a list of waypoints and their names, time and distance to the checkpoint, planned indicated and true airspeeds, planned altitude, total distance remaining, and fuel remaining in gallons. This sheet is solely for planning and situational awareness purposes and does not require a revision if a route change occurs.

L: Shows weather and notams at the departure airport.

M: Shows weather and notams at the destination airport.

N: Shows weather and notams at the filed alternate.

O: Includes pertinent weather in the surrounding areas, AIRMETs, SIGMETs, nearby METARs, TAFs, and NOTAMS.

P: Portion to be signed after reviewing the flight release, all questions have been answered, and the contestants are ready to begin the event.

Additional Resources

Generic Score Sheet

The following generic score sheet gives examples of basic penalty points that will be assessed for errors made during the LOFT. The actual point values for any error will be adjusted to account for the risk introduced by that error in the event scenario. All event specific penalties and point values are finalized by the chief judge. All teams will be given the same penalty points for the same error or omission. This sheet is intended as a general guide for preparation and is not absolute.

EVENT	PENALTY POINTS
<u>Flight Attendant Briefing (Item NOT covered)</u>	
Emergency Procedures	25 points
Sterile Cockpit	10 points
Taxi Length, Flight Time, Delays	10 points
Enroute Weather	10 points
Destination Weather	10 points
<u>Passenger Briefing (Item NOT covered)</u>	
Emergency Procedures	25 points
Sterile Cockpit	10 points
Taxi Length, Flight Time, Delays	10 points
Enroute Weather	10 points
Destination Weather	10 points
Flight Attendant/Passenger Briefing Not Completed	100 points
<u>Departure Briefing (Item NOT covered)</u>	
Crew Duties - Per FOM	30 points
Wind	10 points
Runway Condition	10 points
Airspeeds	10 points
Flap Setting	10 points
Rejected Takeoff	20 points
Clearance/DP	30 points
Terrain/Obstacles/Threats	30 points
<u>Clearance (Item NOT covered)</u>	
Clearance verification not completed	50 points
Clearance limit	30 points
Route	30 points
Altitude	30 points
Frequency	30 points
Transponder code	30 points

Preflight

Preflight Checklist not completed	50 points
Preflight Checklist not called complete	25 points
Comm radios not set-up	10 points
NAV radios not set-up	10 points
Incorrectly set OBS/HSI ($\pm 3^\circ$)	10 points
Incorrectly set nav frequency	10 points
Fails to preset before taking the active runway	10 points
NAVAID(s) not identified	30 points
Transponder code not preset	10 points
Altimeter not set	30 points
Altitude alerter not set	30 points

Taxi

Heads down in hotspot	50 points
Failure to hold short of a assigned taxiway	100 points
Failure to hold short of a assigned runway	200 points
Failure to clear both directions crossing a runway	50 points
Taxi checklist not completed	50 points
Taxi checklist not called complete	25 points
Runway position departure first fix verification not completed	50 points
Takeoff briefing not completed	50 points

Takeoff

Before takeoff checklist not completed	50 points
Before takeoff checklist not called complete	25 points
Improper takeoff procedure	20 points
Missed callouts:	
"Runway XX"	5 points
"Set Power"	5 points
"Power Set"	5 points
"Headings Check"	5 points
"40 Knots"	5 points
"V1/Rotate"	5 points
"Positive Rate"	5 points
"Gear Up"	5 points

Climb

Climb checklist not completed	50 points
Climb checklist not called complete	25 points
Heading Bust ($\pm 20^\circ$)	100 points
Altitude Bust ($\pm 200'$)	200 points
Improper climb procedure	10 points
Fails to switch to departure	10 points
Fails to make a crossing restriction	200 points
"1,000 feet to level off" not called	10 points
Fails to set altitude alerter properly	100 points
Fails to identify altitude alerter change	50 points
Fails to keep CDI within $\frac{1}{2}$ scale during DP	100 points
Full-scale CDI deflecting during DP	200 points

En-route navigation once cleared on course:

Proper VOR's not selected	10 points
TO/FROM indication not proper	10 points
VOR's not identified	30 points
HSI/OBS not set properly ($\pm 3^\circ$)	10 points
"Course alive" not called	10 points
Fails to intercept course within 10 nm	20 points
Pass $\frac{1}{2}$ waypoint of airway and fails to switch VOR's	15 points

Cruise

Cruise checklist not completed	50 points
Cruise checklist not called complete	25 points
Heading Bust ($\pm 20^\circ$)	100 points
Altitude Bust ($\pm 200'$)	200 points
"1,000 feet to level off" not called	10 points
Fails to set altitude alerter properly	100 points
Fails to identify altitude alerter change	50 points
Proper VOR's not selected	10 points
TO/FROM indication not proper	10 points
VOR's not identified	30 points
HSI/OBS not set properly ($\pm 3^\circ$)	10 points
"Course alive" not called	10 points
Fails to switch VORs crossing changeover point on airway	15 points
Fails to identify VOR's	50 points
Excessive airway deviation ($> \frac{1}{2}$ scale)	40 points
Fails to keep CDI within $\frac{1}{2}$ scale	100 points
Full-scale CDI deflection	200 points
Fails to preset any change in course (within 3 minutes)	20 points
Fails to set 29.92 at FL180	200 points

Approach Briefing (Item NOT covered)

Name of Airport	10 points
Approach Chart Index Number/Date	10 points
NAVAIDS and Frequencies	10 points
Final Approach Course	10 points
Initial Approach Altitude(s)	10 points
Glideslope Intercept Altitude	10 points
FAF/Crossing Altitude	10 points
Decision Altitude	10 points
Airport Elevation/TDZE	10 points
Minimum Safe Altitude	10 points
Missed Approach Procedure	10 points
Weather Minimums	10 points
Approach Speed	10 points
Runway Length and Exit Plan	10 points
Appropriate NOTAMs	10 points
Threats/Crew Duties	30 points
No approach briefing conducted	200 points
Wrong approach briefed	200 points

Approach not programed prior to briefing	100 points
Radios not pre-tuned for approach	10 points

Arrival

Descent checklist not completed	50 points
Descent checklist not called complete	25 points
Heading Bust ($\pm 20^\circ$)	100 points
Altitude Bust ($\pm 200'$)	200 points
"1,000 feet to level off" not called	10 points
Fails to set altitude alerter properly	100 points
Fails to identify altitude alerter change	50 points
Fails to get or consider weather/NOTAMs	350 points
Gets weather/NOTAMs after choosing to divert (if applicable)	100 points
Fails to set local altimeter setting descending below FL180	200 points
Deviate from controller vectors	100 points
Fails to include passengers in decision-making if diverting	50 points
Arrival not announced to flight attendant/passengers	30 points
Fails to keep CDI within $\frac{1}{2}$ scale	100 points
Full-scale CDI deflection	200 points

Approach Checklist

Approach checklist not completed	50 points
Approach checklist not called complete	25 points
NAVAID not identified	50 points
OBS/HSI not set-up	10 points
Improper navigation source selected	100 points

Precision Approach

Procedure Turn (if applicable):

Fails to do procedure turn	100 points
Time not used for procedure turn	20 points
Improper procedure turn	50 points
Exceeds 10 nm from the FAF/FAP	50 points
Incorrect course set inbound from procedure turn	30 points
"Approach Flaps" not called	10 points
Approach flaps not set	10 points
Airspeed Bust (± 20 knots)	100 points
"Localizer Alive" not called out	10 points
Localizer not intercepted	50 points
Reverse Sensing	30 points
"Glideslope Alive" not called out	10 points
Glideslope not intercepted	50 points
Altitude alerter and/or minimums bug not set correctly	30 points
"Set Landing Flaps. Landing Checklist" not called	25 points
Landing checklist not completed	50 points
Landing checklist not called complete	25 points
Excessive localizer and/or glideslope deviations:	
Prior to FAF	50 points
After FAF	150 points

Full scale localizer and/or glideslope deviations:	
Prior to FAF	100 points
After FAF	300 points
Missed Callouts:	
"1000 cleared to land / no landing clearance"	10 points
"500 stable continue / 500 not stable go around"	10 points
"Approaching minimums"	10 points
"Minimums"	10 points
"Runway in sight" "Approach lights" "No Contact"	10 points
"In sight landing" or "Go Around"	10 points
"Go-Around"	10 points
Land without landing flaps set	30 points
Unable to land from the approach due to pilot error	50 points
Failure to turn on pilot-controlled lighting	75 points

Non-Precision Approach

Procedure Turn (if applicable):	
Fails to do procedure turn	100 points
Time not used for procedure turn	20 points
Improper procedure turn	50 points
Exceeds 10 nm from the FAF/FAP	50 points
Incorrect course set inbound from procedure turn	30 points
"Approach Flaps" not called	10 points
Approach flaps not set	10 points
Airspeed Bust (± 20 knots)	100 points
"Course Alive" not called	10 points
Approach Course not intercepted	50 points
Reverse Sensing	30 points
Fails to start time at FAF/FAP	20 points
Altitude alerter and/or minimums bug not set correctly	30 points
"Set Landing Flaps. Landing Checklist" not called	10 points
Landing Checklist not completed	50 points
Landing Checklist not called complete	25 points
Excessive course deviations:	
Prior to FAF	50 points
After FAF	150 points
Full scale course deviations:	
Prior to FAF	100 points
After FAF	300 points
Descent below a stepdown fix	150 points
(-50 feet for 5 seconds, -100 feet for 1 second)	
Improper CANPA procedures / Constant level off	150 points
Failure to calculate correct DDA	100 points
Descent below MDA/DDA	300 points
(-50 feet for 5 seconds, -100 feet for 1 second)	
Missed Callouts	
"1000 cleared to land / no landing clearance"	10 points
"500 stable continue / 500 not stable go around"	10 points
"Approaching minimums"	10 points
"Minimums"	10 points

"Runway in sight" "Approach lights" "No Contact"	10 points
"In sight landing" or "Go Around"	10 points
"Go-Around"	10 points
Land without landing flaps set	30 points
Unable to land from the approach	50 points
Failure to turn on pilot-controlled lighting	10 points

Go-Around

Continuing below DA/MDA/DDA before calling for MAP	300 points
Go-Around not executed in a timely manner	100 points
"Go Around Set Approach Flaps" not called	10 points
"Positive Rate/Gear Up" not called	10 points
Improper Go-Around power setting	10 points
Improper Go-Around configuration	20 points
"Flaps Up" not called	10 points
Improper execution of missed approach procedure/instructions	100 points
Should have gone missed but didn't	350 points
Turn started too early/late during go around	20 points
Missed approach not set up during the approach/brief	100 points
Missed approach not set up properly by PM	50 points
Hold not discussed properly/timely manner	30 points
ATC not notified of missed approach	50 points
Heading Bust ($\pm 20^\circ$)	100 points
Altitude Bust ($\pm 200'$)	200 points
"1,000 feet to level off" not called	10 points
Fails to set altitude alerter properly	100 points
Fails to identify altitude alerter change	50 points
Fails to keep CDI within $\frac{1}{2}$ scale	100 points
Full-scale CDI deflection	200 points
Reverse Sensing	30 points
Climb checklist not completed	50 points
Climb checklist not called complete	25 points

Holding

Improper configurations	10 points
Fails to get EFC time	100 points
Gets EFC time after entering hold	50 points
Improper holding pattern entry	100 points
Reverse sensing	30 points
Wrong radial/bearing	100 points
Hold on wrong side (Incorrect turn direction)	100 points
Fails to start time/hold to wrong distance	100 points
Fails to report entering hold to ATC and Dispatch	30 points
Airspeed Bust (± 20 knots)	100 points
Altitude Bust ($\pm 200'$)	200 points
Fails to calculate current holding fuel available	30 points
Exceed allotted holding fuel	300 points

General/All phases of flight (Per Occurrence)

Exceeds allotted time on the ground	20 points/min
Improper transfer of controls	100 points
PF performs PM assigned duty	30 points
Failure to comply with a company limitation or procedure	300 points
No distinct leader in the cockpit	300 points
Failure to utilize CRM concepts	300 points
PF or PM miss a callout listed under "additional callouts"	10 points
Improper/failure to use anti-ice systems in icing conditions	100 points
Prolonged anti ice system usage when not required	50 points
Improper/failure to use aircraft lighting per policy	10 points
Improper/failure to callout FMA changes	10 points
Fails to cancel IFR at non-towered airport	200 points
ATC not notified of cruise speed changed > 5% or 10 knots	100 points

Errors that result in an Undesired Aircraft State (UAS)

(Points will be assessed once per occurrence, either as UAS or within a phase of flight)

Safe outcome of flight seriously in doubt	DQ
Crash	DQ
Rough handling of the simulator	DQ
Gross navigational error/Loss of separation due to pilot error	500 points
Deviation from ATC clearance (per deviation)	300 points
Rate of descent is twice AGL altitude	300 points
Exceed basic aircraft limitation	300 points
VFR into IMC without a clearance	300 points

Threat and Error Management Scoring (TEM)

Threat and Error Management (TEM) is a conceptual model that is widely accepted as an industry best practice and in use by many airlines and flight operations. It is very effective as a safety tool and risk assessment, especially in a crew flying environment. In order to provide the most realistic simulation in the CRM/LOFT Event, NIFA has transitioned to a scoring method that evaluates TEM as well as operational crew actions. The three components of TEM are: threats, errors, and undesired aircraft states. TEM assumes that flying has inherent risk and human error is inevitable. However, accepting errors is different than allowing errors to happen. Accepting that an error may occur allows a crew to focus on threat management to reduce the potential for an error and allow error management to mitigate the negative consequences of that error. CRM emphasizes how to communicate and manage resources while TEM emphasizes what to communicate and manage.

Threats are not caused by the crew but come at them externally from either the operation (malfunctions, dispatch errors, delays, time pressures) or the environment (weather, ATC, terrain, traffic). The mindset of a pilot could be a threat as well (distraction, fatigue, complacency). Threats can be anticipated or unexpected. Response to an unexpected threat should include consideration of time available to communicate and make a plan or if there needs to be immediate action and communication. Proper recognition of threats occurs through effective briefings, preparing and stating plans, and having good situational awareness.

Errors are actions or omissions by the crew. Examples include aircraft handling, procedural (checklists, callouts, profiles) and communication errors. Trapping small errors before they develop into bigger problems is done by detecting and responding correctly to an error. Techniques include monitoring and cross-checking between the crew, managing and delegating workload.

An undesired aircraft state (UAS) is a condition of reduced or compromised safety. Like an error, a UAS can be properly managed, incorrectly handled, or even go undetected. Examples of UAS can be deviation from a clearance, improper aircraft configuration, or exceedance of an aircraft limitation.

The following list of TEM countermeasures can be thought of as tools for a crew to use throughout all phases of flight to continuously plan, execute, and review the situation. Working together creates a shared mental model for both pilots to be included in what's going on and aware of what their duties are.

Situational Awareness: Anticipate, pre-set, consider all resources

Effective Communication: Inclusive, receptive, inquiring, advocating for an alternative

Planning/Decision-making: Make a plan, consider threats, consider relevance, re-evaluate

Effective Leadership: Cooperative, active participation, asserting, have an open environment

Workload and Automation Management: Defined roles, balance needs to situation, prioritize

Monitor/Crosscheck: Between pilots, between systems, after making input or change

Crew Self-Critique: Accept and give constructive feedback

TEM Score System Explanation

TEM Points are awarded in the following 6 categories throughout all phases of flight:

Situational Awareness: Anticipate, pre-set, consider all resources

Effective Communication: Inclusive, receptive, inquiring, advocating for an alternative

Planning/Decision-making: Make a plan, consider threats, consider relevance, re-evaluate

Effective Leadership: Cooperative, active participation, asserting, have an open environment, set PF/PM duties

Workload and Automation Management: Defined roles, balance needs to situation, prioritize

Monitor/Cross-check: Between pilots, between systems, after making input or change

The TEM points for each flight phase will be added to the event-based CRM procedures score for that flight phase. Negative points are given for Fair/Acceptable and Excellent TEM skills which reduce the overall penalty score accumulated by the crew. In other words, if a point-scoring error is committed but the crew promptly traps and mitigates that error it will have less of an impact on the crew's overall score than if the same error was not noticed and corrected. Points in each of the 6 categories are based on the following:

- Does not demonstrate, none observed (4 points)
- Meets minimum standard (0 points)
 - CRM/TEM skills provide some added measure of safety
 - Proficiency occasionally falls below what would be expected
 - Threats are not always identified and preparations are occasionally ineffective
 - Errors are eventually identified and corrected
- Fair or acceptable (-2 point)
 - CRM/TEM skills are effective and to the standard expected
 - Threats are always identified, preparations are occasionally made
 - Errors are identified and corrected in a timely manner
- Excellent (-4 points)
 - Exceptional CRM/TEM skills and clearly effective
 - Threats are always identified and prepared for
 - Errors are identified and corrected immediately

Each Non Critical Phase	4 = None; 0 = Meets minimum standard; -2 = Acceptable/Expected, -4 = Excellent	
Situational Awareness		
Effective Communication		
Planning/Decision-making		
Effective Leadership		
Workload/Automation Mgmt		
Monitor/Cross-check		

During critical phases of flight these point totals will be doubled (8, 0, -4, -8) since at these times CRM skills are more impactful to the success of the flight. The critical phases of flight are climb/DP, descent/arrival, approach (precision and/or non-precision), and missed approach.

Each Critical Phase	8 = None; 0 = Meets minimum standard; -4 = Acceptable/Expected, -8 = Excellent	
Situational Awareness		
Effective Communication		
Planning/Decision-making		
Effective Leadership		
Workload/Automation Mgmt		
Monitor/Cross-check		

Note: Takeoff and Landing, although critical phases of flight, are not scored as such due to simulator and crew familiarity limitations within the event.

CANPA Vertical Speed Chart

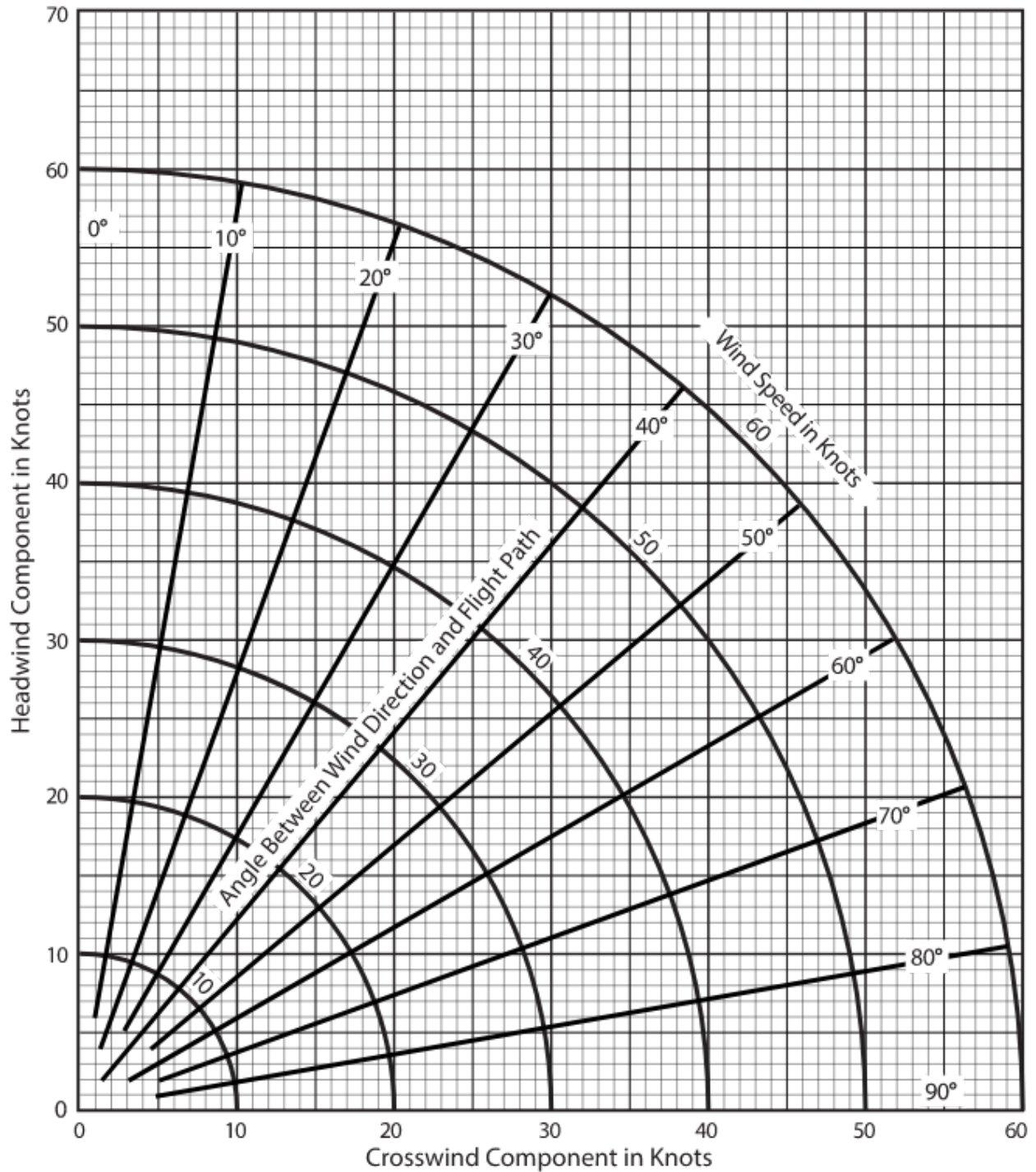
		Ground Speed (knots)																	
		70	75	80	85	90	95	100	105	110	115	120	125	130	135	140			
Anglie	2	248	265	283	301	318	336	354	371	389	407	425	442	460	478	495			
	2.1	260	279	297	316	334	353	371	390	409	427	446	464	483	501	520			
	2.2	272	292	311	331	350	370	389	409	428	448	467	486	506	525	545			
	2.3	285	305	325	346	366	387	407	427	448	468	488	509	529	549	570			
	2.4	297	318	340	361	382	403	425	446	467	488	509	531	552	573	594			
	2.5	310	332	354	376	398	420	442	464	486	509	531	553	575	597	619			
	2.6	322	345	368	391	414	437	460	483	506	529	552	575	598	621	644			
	2.7	334	358	382	406	430	454	478	501	525	549	573	597	621	645	669			
	2.8	347	371	396	421	446	471	495	520	545	570	594	619	644	669	693			
	2.9	359	385	410	436	462	487	513	539	564	590	616	641	667	693	718			
	3	371	398	425	451	478	504	531	557	584	610	637	663	690	716	743			
	3.1	384	411	439	466	494	521	548	576	603	631	658	685	713	740	768			
	3.2	396	425	453	481	509	538	566	594	623	651	679	708	736	764	792			
	3.3	409	438	467	496	525	555	584	613	642	671	700	730	759	788	817			
	3.4	421	451	481	511	541	571	601	631	662	692	722	752	782	812	842			
	3.5	433	464	495	526	557	588	619	650	681	712	743	774	805	836	867			
	3.6	446	478	509	541	573	605	637	669	700	732	764	796	828	860	892			
3.7	458	491	524	556	589	622	654	687	720	753	785	818	851	884	916				
3.8	471	504	538	571	605	639	672	706	739	773	807	840	874	907	941				
3.9	483	517	552	586	621	655	690	724	759	793	828	862	897	931	966				
4	495	531	566	601	637	672	708	743	778	814	849	884	920	955	991				

Vertical Speed in FPM

Angle

Vertical Speed in FPM

Crosswind Calculator



G1000 Manual

https://static.garmincdn.com/pumac/190-00498-07_0A_Web.pdf

Note: This link is intended to provide a resource to clarify questions regarding a G1000 system. Contestants are not expected to know everything contained in this manual and it may be used during the event as a guide for unfamiliar crews.

Redbird Resources

The 2023 CRM/LOFT event will be conducted using a Redbird configured as a **G1000 Baron 58** (BE58-G)

Panel Layouts:

<https://simulators.redbirdflight.com/products/fmx#aircraft-configurations>

Performance Values:



Multi-Engine Performance

Aircraft Model	V _{SO}	V _{S1}	V _X	V _Y	V _A	V _{NE}	V _G	V _{MCA}	KTAS @ Cruise / 75% power setting	Rate of Climb (fpm) @ (V _Y) / Full Power	Single Engine Rate of Climb (V _{SE})
Beechcraft (BE55) Baron	73 KIAS	79 KIAS	91 KIAS	107 KIAS	157 KIAS	224 KIAS	120 KIAS	78 KIAS	168 KTAS	1725 fpm	400 fpm @ 100 KIAS
5000' -->									180 KTAS	1250 fpm	125 fpm @ 100 KIAS
Beechcraft (BE58) Baron	74 KIAS	84 KIAS	92 KIAS	105 KIAS	156 KIAS	223 KIAS	115 KIAS	84 KIAS	188 KTAS	1725 fpm	395 fpm @ 101 KIAS
5000' -->									203 KTAS	1325 fpm	150 fpm @ 101 KIAS

Note: Use BE58 for reference.