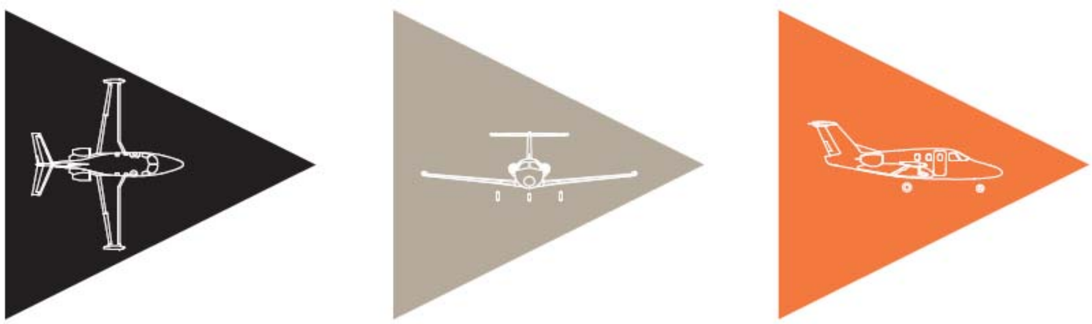
ECLIPSE 500

FLIGHT TRAINING
AND STANDARDS MANUAL



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LOG OF REVISIONS

Original Issue……………………………………………………………December XX, 2006

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Table of Contents

1. INTRODUCTION

The material in this Flight Training and Standards Manual is provided as a reference document for use by all Eclipse 500 pilots. It provides guidance for Eclipse 500 normal flight operations, abnormal flight operations, and flight training operations. Additionally, it provides specific material intended to give each pilot the higher order pilot skills required to become proficient in single pilot resource management and flight operations. The intent of this manual is to promote standardization in all Eclipse 500 flight procedures with the ultimate goal of safe flight operations in today's National Airspace System (NAS).

This manual is organized into four sections that cover the following topics:

- **Single Pilot Resource Management and Operations**
- **Normal Operations**
- **Abnormal Operations**
- **Flight Training Operations**

Single Pilot Resource Management and Operations

This section encompasses a broad spectrum of procedures and techniques for the single pilot in both preflight planning and in-flight operations. The material contained in this section will help the pilot understand what key elements must be integrated in order to be an effective single pilot manager and operator. These elements include airplane control, flight automation, PFDs / MFD, standard operating procedures, airplane systems, resource management, risk management, and decision making. At the end of this section is a list of safe practices that every pilot should embrace to uphold a commitment to safety.

Normal Operations

This section covers all operations that would be encountered during normal preflight and flight. This section includes an expanded explanation of all the normal checklists, and the techniques to accomplish those checklists in an organized and standardized pattern. This section also gives the procedures and profiles for all the normal maneuvers performed from takeoffs to approaches and landings in both VMC and IMC. Included are guides for single pilot "self briefings" in order to instill the self-discipline of situational awareness and safety consciousness.

Abnormal Operations

This portion provides standards and procedures for selected events that would not be seen in normal operations. The events cover topics such as rejected takeoffs, single engine operations, flap malfunctions, cabin smoke and fires, emergency descents, rapid decompressions, upset recoveries, and emergency evacuations. This section also includes a discussion on emergency procedures management and standards to follow in any abnormal situation.

Flight Training Operations

This section provides guidance as to how the airplane should be configured and flown during initial and recurrent type rating training. These training maneuvers include but are not limited to the maneuvers required in the Airline Transport Pilot and Type Rating Practical Test Standards (PTS) for the Eclipse 500 FAA type rating. It provides specific guidance concerning the conduct of each maneuver, tolerances and safeguards when conducting flight training in the actual airplane or simulator.

Revisions

Revisions are issued by Eclipse Aviation as necessary to keep the Flight Training and Standards Manual current. It is the responsibility of the owner of this Flight Training and Standards Manual to maintain its currency. With each revision to this manual, the owner of the manual must annotate the revision number along with the date of the revision on the Log of Revisions page. The Log of Revisions Page must be retained at all times in this manual.

Immediately following the Log of Revisions page is a List of Effective Pages. A re-issue of the Flight Training and Standards Manual or the revision of any portion thereof will include a new List of Effective Pages. The List of Effective Pages enables the user to determine the currency of each page.

The revised portion of text on a given page is indicated by a solid revision bar located adjacent to the area of change.

If the holder of this Flight Training and Standards Manual would like to recommend a change to any of this material, it should be made in writing to:
Flight.training@eclipseaviation.com

Or mail to;
Eclipse Aviation, Flight Training
2506 Clark Carr Loop SE
Albuquerque, NM 87106

2. SINGLE PILOT RESOURCE MANAGEMENT AND OPERATIONS

The Eclipse 500 pilot must employ higher order piloting skills to safely operate the aircraft through its full range of capabilities. In addition to physical and motor skills associated with normal and abnormal operations, pilots must be competent in risk management and single pilot resource management (SRM) procedures.

Risk Management Definitions

Risk is present in all human activity. Risk can be managed effectively through use of simple procedures and tools. The Eclipse 500 pilot can effectively employ *risk identification, risk assessment, and risk mitigation* procedures to minimize risk during pre-flight planning and in-flight operations. The following guidance regarding this process assumes that the pilot has a basic knowledge of risk management obtained through the Eclipse 500 type rating training or through some other source.

Risk Identification

During pre-flight planning, the Eclipse 500 pilot should consider all potential hazards that may affect the flight. The pilot must then determine which of those hazards will become risks as a result of some triggering event.

Example:

A mountain next to an airport is a hazard but may not become a risk until the pilot attempts to complete a night circling approach to that airport during IMC conditions.

Once risk identification is complete, the pilot should conduct a risk assessment.

Risk Assessment

The Eclipse 500 pilot should fully assess all identified risks by determining *risk severity* and *risk likelihood*. Risk severity describes the potential consequences of a given risk while risk likelihood refers to the probability of a given event occurring.

It is then possible to classify each identified risk since each combination of risk severity and risk likelihood results in a cumulative level of risk that may be identified as high, medium, or low.

Example:

An engine out on takeoff may be a high risk at gross weight at high density altitude with inhospitable terrain. At sea level and light weight with flat terrain, the overall risk may be low. In both cases, the low risk likelihood of an engine out on takeoff makes this risk manageable.

Once risk assessment is complete, the pilot must address all high risk areas and most medium risk areas through risk mitigation.

Risk Mitigation

Through effective use of technology and procedures, most risks can be effectively mitigated. Eclipse 500 pilots can use the aircraft's advanced technology to their advantage during risk mitigation.

Example:
Pilots may take on a reduced fuel load to reduce takeoff weight, and potential engine out risk, during a takeoff from a high density altitude airport.

The objective should be to reduce risk likelihood and/or severity from high or moderate levels to low or moderate levels. Moderate risks can be accepted, providing the pilot is willing to accept them on behalf of him/her and his/her passengers. However, the pilot should ensure that all available steps have been taken to reduce risk likelihood and or severity, regardless of the risk level.

In rare cases, if risks can not be mitigated or accepted, the pilot may need to cancel or delay a flight, or shift to another transportation mode. Advanced risk planning is therefore essential.

Risk Management Tools

The risk management process can be simplified through use of a risk management tool and a risk assessment matrix. Eclipse Aviation has developed a risk management tool (Figure 1 on pg. 9) for Eclipse 500 pilots to use in identifying, assessing and mitigating risk. The tool is accompanied by a risk assessment matrix developed by the FAA to classify risk severity and likelihood to arrive at an overall level of risk for each risk factor identified.

The risk management tool uses the well known industry/FAA PAVE (Pilot, Aircraft, EnVironment, External Factors) model to identify risks. Using the tool and the risk assessment matrix, the pilot can then assess and classify risks for each PAVE category and element. The tool (second page) then uses the less well known FAA developed TEAM (Transfer, Eliminate, Accept, Mitigate) model to mitigate risk.

Risk Management Procedures

1. Eclipse 500 pilots will use the risk management tool and assessment matrix and the following procedures on all training and mentoring flights.

Eclipse Aviation strongly recommends that pilots continue to use these tools and procedures during normal operations until they are comfortable with their use and can effectively identify, assess, and mitigate risk without reference to them.

2. Pilots should conduct preliminary pre-flight planning procedures prior to a proposed flight so that applicable data can be gathered for risk management purposes. For example, weather, weight and balance, performance data, and other information will be needed to accurately identify, assess, and mitigate risks. Final preparation and planning (route planning, fueling, filing flight plan, etc.) should be deferred until the risk identification and risk assessment process is completed.

3. Following pre-flight planning, the pilot should use the risk management tool to identify and record potential hazards for the proposed flight and then identify and record the risks of those hazards.

4. Following risk identification, the pilot should use the risk management tool to assess identified risks by determining their potential severity and likelihood, using the categories on the risk assessment matrix. The pilot will then classify risks as high, medium, or low, using the matrix.

5. Following risk assessment, the pilot should review all aspects of the proposed flight to determine options with regard to risk mitigation. For example, the pilot could select a different route, change departure times, change the fuel load or take other steps.

6. The pilot should then complete the risk mitigation portion of the risk management tool to execute decisions regarding mitigation. All risks classified as high must be mitigated to reduce the severity and/or likelihood of the risks. Medium risk areas should also be mitigated to the extent possible and pilots must be willing to accept any residual risks. Low risk areas do not require mitigation but any risk which can be readily mitigated should be.

7. Following completion of the risk management tool, remaining pre-flight preparation should be accomplished.

8. In flight, Eclipse 500 pilots must continue active risk management procedures. New hazards and risks may be identified, requiring the pilot to assess them and potentially take action to mitigate them. The advanced technology in the Eclipse 500 will be useful in mitigating risk and the pilots should employ effective SRM procedures as outlined in the next section.

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RISK ASSESSMENT MATRIX HANDOUT
HO-1-RA

RISK ASSESSMENT MATRIX				
	Severity			
Likelihood	Catastrophic	Critical	Marginal	Negligible
Frequent				
Probable				
Occasional				
Remote				

	Severity Scale Definitions
Catastrophic	Accident with serious injuries and/or fatalities. Loss (or breakdown) of an entire system or sub-system.
Critical	Accident or Serious Incident with injuries and/or moderate damage to aircraft. Partial breakdown of a system or subsystem.
Marginal	Accident or Incident with minor injury and/or minor aircraft damage. System Deficiencies leading to poor air carrier performance or disruption to the air carrier schedules.
Negligible	Less than minor injury and/or less than minor system damage. Little or no effect on system or subsystem.

	Likelihood Scale Definitions
Frequent	Will be continuously experienced unless action is taken to change events.
Probable	Will occur often if events follow normal pattern.
Occasional	Potential for infrequent occurrence.
Remote	Not likely to happen (but could).

	Risk Classification
Red	High Risk - Unacceptable; requires action.
Yellow	Medium Risk - May be acceptable with review by appropriate authority; requires tracking and probable action.
Green	Low Risk - Acceptable without further action.

Figure 1

Resource Management

Single pilot resource management (SRM) was developed as a doctrine by the FAA under the FAA/Industry Training Standards (FITS) program. It builds on the concepts of crew resource management (CRM) pioneered by the airline community and is tailored for single pilot operation of technically advanced aircraft (TAA). SRM integrates risk management (described in the previous section), automation management, task management, and situational awareness.

SRM also balances two important elements: workload drivers and pilot resources available. The Eclipse 500 pilot's task is to use SRM techniques and procedures to ensure that resources always exceed the work load imposed on the pilot.

Automation Management

The autopilot, auto-throttle, flight management system (FMS), and cockpit displays and sensors are important tools for SRM as well as for precise navigation. The pilot must clearly understand the flight automation modes and be able to select confidently from among the various modes.

Autopilot

The autopilot can provide workload relief and precise lateral and vertical navigation. To be effective, it must be properly managed.

The pilot should use the autopilot in high workload situations such as high traffic density in terminal areas where communications and navigation demands are most likely to be high. It also should be used for instrument approaches at or near minimums. Using the autopilot enables the pilot to devote more time to other aspects of flight management, such as situational awareness and traffic surveillance. However, when pilot workload is light, hand flying helps to maintain proficient flying skills.

Autopilot Mode Awareness

The pilot should remain aware of what the autopilot is doing and about to do. The only reliable indications of autopilot active and armed pitch and roll modes and mode changes are displayed on the Flight Mode Annunciator (FMA) at the top of the Primary Flight Display (PFD). Make a practice of scanning the FMA as you would scan any other instrument or synoptic page.

It is good practice to monitor the FMA for proper response to mode selection every time a different autopilot mode is selected. Autopilot mode changes are a two-step process:

1. Select the action on the ACP

2. Verify that the action has occurred on the FMA

Some modes changes occur automatically as the flight progresses. These changes should be monitored as well. This provides confidence that the autopilot will perform as expected. On an approach with the autopilot engaged, FMA changes should be called out as they are annunciated.

Automation Distraction

Although flight automation has been shown to decrease human error, it has introduced new types of human error:

1. Lack of vigilance. People generally do not make good systems monitors. People may neglect active monitoring tasks. Automation also provides a very high potential for distraction from more important activities. For example, if the pilot's autopilot, PFD and / or MFD proficiency is marginal, there is a natural tendency to spend too much time head down trying to "sort it out".

2. Complacency. This is related to lack of vigilance. People tend to neglect automated systems in favor of other tasks by shifting their attention. They may place too much trust in the automation and take themselves "out of the loop."

3. Slower manual reversion. People who are complacent or placing too much trust in the automation will take longer to re-orient themselves to their present situation after automation failure. The farther "out of the loop" the person is, the longer it will probably take to get back "in the loop."

4. Lack of trust in automation. This is the flip-side of over-trust and complacency. Automation cannot be used to its best advantage if it is not trusted. Some of this lack of trust may also come from lack of proficiency in the use of automation.

PFD / MFD Management

Apart from the flight controls, the primary interfaces between the pilot and the Eclipse 500 are the airplane computer systems. The primary flight display and the multi-function displays provide capacities for display and functionality that do not exist in older airplanes. This requires that the pilot develop and maintain the ability to recall displays and functionality with ease and confidence.

Automation Policy

Automation is a tool to be mastered and used by the pilot. It is always the pilot's responsibility to manage workload, set priorities, and use automation as a tool to improve situational awareness. It is important for the pilot to manage the automation and to be continuously aware of automation modes, the potential for input or programming errors, and the possibility of automation failure. Eclipse recommends adoption of the following automation policies:

1. Use automation appropriate for your circumstances and conditions of flight. Differing circumstances may require different levels of automation.

2. If any autopilot function is not operating as expected, disconnect it.

3. If the automation does something unexpected, revert to manual flight or to a lower level of automation.

4. If you do not fully understand what the automation is doing, revert to manual flight or to a lower level of automation.

5. When conducting a self-briefing, briefing another pilot, or transferring the controls to another pilot, include the current or intended level of automation in the briefing. Plan ahead for how you intend to use automation.

6. Be aware of too much heads-down time.

Task Management

Although the Eclipse 500 provides the pilot with advanced technology important for effective SRM, the pilot will also find that the use of effective procedures will lower workload and assist with task management.

Sterile Cockpit

Eclipse encourages the use of the "sterile cockpit" concept in ground and flight operations in order to minimize distractions. Air carriers are required by law to regulate the performance of pilot duties during critical phases of flight. This rule prohibits crew members from engaging in any activities other than those required for the safe operation of the aircraft during taxi, takeoff, landing, and all flight operations below 10,000 feet except cruise flight.

This "sterile cockpit" rule prohibits such activities as calling for ground transportation, eating meals, filling out paperwork or reading publications that are not required for the safe operation of the aircraft, engaging in non-essential conversation with passengers or other pilots, etc.

Standard Operating Procedures (SOP)

The Eclipse 500 pilot will find work load drivers (weather, ATC, automation, etc.) easier to manage if proper SRM procedures are used. These procedures include a number of techniques, including:

1. Using an orderly cockpit flow to accomplish key tasks, using the normal checklist to verify accomplishment, rather than as a "do list".

2. Use emergency checklists as "do lists."

3. If you interrupt a checklist and cannot recall where it was interrupted, start over at the beginning of that checklist.

4. Using standard avionics and systems setups to minimize time required for changing radio frequencies, and other tasks.

5. Using any change in phase of flight as a cue to begin accomplishing required tasks for the next phase. For example, use the Before Start checklist to program the FMS with the entire flight plan; use the Before Descent checklist as a cue to prepare for arrival into the terminal area.

6. In high-workload times, consider leaving the keyboard out and using it for direct data entry.

7. In low workload times, consider using the knobs for data entry. Routine use of both keyboard and knobs will improve proficiency in both modes of input.

8. Perform data entry as much as possible with the autopilot engaged.

9. At every opportunity, fly an instrument approach at your destination.

Task Management by Phase of Flight

Pre-flight

1. Obtain a thorough weather briefing.
2. Plan your route and alternates accordingly.
3. Always have an alternative plan.
4. Plan fuel burn carefully and realistically. If your mission pushes the limits of range or may result in encountering ATC or weather challenges while in a low fuel state, plan a fuel stop enroute.
5. Self-brief ("chair-fly") the flight in advance.

6. Do your homework. You should be able to fly the mission with no surprises caused by inadequate planning, and you will be more prepared to handle any real-time surprises that come your way during flight.

Before taxi

1. Obtain ATIS/AWOS/ASOS and ATC clearance.
2. Set up ACP:
    - HDG SEL – first assigned heading; otherwise runway heading
    - ALT SEL – initial cleared altitude
    - SPD SEL – as planned
    - BARO – set
3. Set up PFD:
    - COM 2 – all ground, including ATIS, clearance, ground control
    - COM 1 – all flight, including tower and departure control
    - XPDR – set code
    - NAV – tune all four frequencies in the order you intend to use them
4. Set the CDI (L1) to initial course.
5. Set the bearing pointer (L2) to navaid that will offer the most SA.
6. Have taxi diagram out and available in the cockpit.
7. Self-brief the taxi plan before contacting ground control.
8. Perform taxi check before moving, or wait until runway end.
9. Perform departure briefing – expected runway, taxi route, takeoff flap position, departure procedure (SID, obstacle departure), weather/radar/anti-ice/MEL considerations, noise abatement, rejected takeoff procedure, engine failure after takeoff plan, immediate return to airport plan.

Taxi

1. Maintain the sterile cockpit rule.
2. Do not perform checklists while moving.
3. If CDI course guidance is not needed immediately after takeoff, consider setting the CDI to the takeoff runway alignment.
4. Stop all extraneous activities when approaching a taxiway or runway intersection.

Before Takeoff

1. Conduct a takeoff briefing prior to entering the active runway – flap position, speeds, initial heading/altitude as a minimum.

Takeoff

1. Set HDG SEL to assigned heading. Leave at runway heading if no heading is assigned.
2. After takeoff and cleanup, at or above 1000 feet AGL, engage autopilot, engage HDG. Check FMA for:
    - HDG (green engaged)
    - PITCH (green engaged)
    - ALT (white armed)
3. Complete After Takeoff checklist.
4. Use pitch wheel to maintain desired vertical path.

Climb

1. Use autopilot in HDG and PITCH mode.
2. Use pitch wheel to maintain desired vertical path.
3. Autopilot will capture pre-selected altitude if in PITCH mode with ALT armed.
4. Initiate climbs from ALT HOLD mode by setting cleared altitude using ALT SEL, pressing ALT to toggle to PITCH mode, then verifying FMA for:
    - HDG (green engaged)
    - PITCH (green engaged)
    - ALT (white armed)
5. Use pitch wheel to maintain desired vertical path.

Cruise

1. Use autopilot in HDG and ALT mode.
2. Frequently scan FMA.
3. Frequently scan CAS messages and synoptic pages.
4. Continually monitor flight progress and fuel consumption against targets – watch for trends.
5. Continually monitor and evaluate enroute, destination, and alternate weather.
6. Continually evaluate diversionary airports should problems arise.
7. Perform descent planning in cruise – stay ahead of the game:
    - Obtain destination weather through FSS or ATIS
    - Review all STARs for familiarization. Brief a particular STAR if expecting it
    - Review all approaches for familiarization. Brief a particular approach if expecting it
    - Set up the approach as much as possible, before or as you brief it

- If planning a visual approach to an ILS runway, brief and set up the ILS
- Review airport diagram and brief a taxi plan
- Brief the passengers as necessary
- Perform descent checklist at or before start of descent

Descent

1. Initiate descent by setting cleared altitude using ALT SEL, pressing ALT to toggle to PITCH mode, then verifying FMA for:
    - HDG (green engaged)
    - PITCH (green engaged)
    - ALT (white armed)
2. Use pitch wheel to maintain desired vertical path.
3. Autopilot will capture pre-selected altitude if in PITCH mode with ALT armed.
4. Use throttles to maintain target airspeed.
5. Monitor and correct your descent plan to arrive 30 NM from airport at 10000 feet AGL or as cleared by ATC.

Approach and landing

1. Use autopilot in HDG and ALT modes while maneuvering.
2. Use pitch wheel for vertical adjustments after toggling from ALT to PITCH mode.
3. Verify FMA ALT (white armed) annunciation during every altitude change.
4. Verify approach briefing and cockpit setup are complete. Re-brief if there are any changes.
5. Use autopilot in HDG to intercept and track final approach course.
6. Set the approach navaid and inbound course on the CDI when issued your first radar vector.
7. If navigating direct to a fix, such as a VOR or FMS waypoint, consider tracking to the fix using the bearing pointer (L2) so the approach navaid and course can be set on the CDI (L1).
8. Frequently scan FMA.
9. Apply sterile cockpit rule at 10,000 feet, or any time workload is heavy or increasing.
10. If in VMC and not needing the CDI for navigation, set CDI course to runway alignment for orientation.
11. Fly a stabilized approach. Stabilize by 1000 feet HAT in IMC, 500 feet HAT in VMC, and be wings level on final at 500 feet HAT (straight in) or 300 feet HAT (circling):
    - Only small heading or pitch changes are required to stay on desired flight path
    - Aircraft is properly configured for the type of approach

- Speed is no greater than Vref + 20 and no less than Vref
- Sink rate does not exceed 1000 feet per minute
- All checklists are complete

12. Disconnect autopilot no lower than 400 feet.

Taxi

1. Maintain the sterile cockpit rule.
2. Taxi completely clear of the active runway before performing extra duties.
3. Have taxi diagram out and available in cockpit.
4. Have a taxi plan before contacting ground control.
5. Ask for progressive taxi if you are unfamiliar or uncomfortable.
6. Do not perform checklists while moving.
7. Stop all extraneous activities when approaching a runway or taxiway intersection.

Available Resources

Managing work load drivers is the more reactive part of task management. The Eclipse 500 pilot will find that SRM will be more effective by proactively managing all available resources.

The major resources to be managed and used in preflight planning and while en route include:

Internal

- Pilot knowledge
- Fuel/range/endurance
- PFD/MFD
- External sensors (weather data link, etc.)
- FMS
- Auto flight
- Checklists
- Charts
- Standard Operating Procedures (SOP's)
- Cockpit organization
- Passengers

External

- Air Traffic Control
- FAA Flight Service Stations
- Dispatch services such as JetComplete
- Other airplanes
- Fixed Base Operators (FBO's)

The quality of operational decisions and therefore the ongoing safety of the flight is the result of how well these resources are managed.

Two pilot crews have the advantage of workload sharing, and monitoring and cross checking critical activities. The single pilot must compensate with training, currency, proficiency and the habit of planning ahead.

The anthem is, "Do things when they can be done; don't wait until they must be done." Do as much as possible before takeoff. Prepare for the approach at altitude rather than during descent when the workload is increasing. Use flight automation for workload relief and precision.

Situational Awareness

The other crucial element of SRM is maintaining situational awareness (SA). SA may be defined as knowing where one is, in four dimensions, relative to weather, terrain, traffic, airspace, route, fuel remaining, aircraft status, and external events.

The Eclipse 500 pilot has advanced automation available to assist with SA. The MFD is especially useful in maintaining SA for aircraft status, weather, terrain, traffic, airspace, and route.

For some Eclipse 500 pilots, this may be the first turbine powered aircraft they have operated. Accordingly, maintaining SA of fuel status is a crucial element of SRM. Like all turbine aircraft, the Eclipse 500 has range and endurance characteristics which change significantly with altitude. As a result, pilots need to constantly be considering the impact that ATC driven altitude changes will have on range and endurance remaining.

SRM Procedures

Eclipse 500 pilots will find that SRM proficiency will improve steadily as experience is gained. The following inventory of procedures will provide a starting point for pilots to use in obtaining SRM mastery.

General Procedures and Good Practices

1. Fly only when physically, mentally and emotionally fit.
2. Acknowledge one's current limitations and operate within them.
3. Operate with the well-being and comfort of the passengers foremost in mind.
4. Never knowingly operate in violation of an FAR unless the situation dictates and an emergency has been declared.
5. Maintain a thorough knowledge of airplane systems and procedures.
6. Accomplish pre-flight planning thoroughly, using all appropriate resources.
7. Seek advice and support when approaching the limit of one's personal comfort zone.
8. Develop a target for every parameter of flight and strive to achieve it. (e.g., airspeed, altitude, heading, runway centerline etc.)
9. Maintain proficiency in both manual flight and auto flight.
10. Avoid distractions during climb and descent.
11. Maintain a sterile cockpit below 10,000 feet AGL during departure, arrival, and ground operations.
12. Conduct thorough takeoff and approach briefings appropriate to the circumstances, even when alone.
13. Fly a stabilized approach
14. Practice good checklist discipline.
15. Use Normal checklists every time without skipping items.
16. When called for, use Emergency checklists to completion.

17. Autopilot:
    - Use the autopilot when other operational tasks could distract from positive airplane control and for precise navigation.
    - Use the flight director as desired for precise manual airplane control and to monitor autopilot performance.
    - When flying manually using the flight director, keep it zeroed or turn it off.
18. In flight, continuously ask yourself these questions:
    - Where am I now?
    - Where am I going?
    - What should I be doing now?
    - What should I be doing next?
19. At every opportunity, fly an instrument approach at the destination.
    - Alternate precision and non-precision approaches.
    - Alternate autopilot coupled and manually flown approaches.

Indications of loss of SA

Several sources identify a number of indicators of loss of situational awareness or links in a developing error chain. The existence of any one of these indicators does not *necessarily* indicate an impending problem, but taken individually or in combination these indicators may indicate a need to re-assess your situation and take action to improve your situational awareness and develop alternative courses of action. Be alert for any of the following indications:

- Failure to meet targets
- Using an undocumented procedure
- Deviating from SOP
- Violating limitations or minimums
- No one flying the airplane
- No one looking out the window
- Communications
- Ambiguity of information
- Unresolved discrepancies
- Preoccupation or distractions
- Confusion or empty feeling

3. NORMAL OPERATIONS

a. Flight Planning

In preparation for any flight the Eclipse pilot should have the following information available before the briefing. Reference materials, at minimum, include the AIM and the AFM. The AFM section 5 (Performance) contains data for each phase of flight. Frequent reference to this section is encouraged until the pilot develops known parameters and rules of thumb within which he/she is confident that the airplane can operate safely (e.g., density altitude and runway length for takeoff and landing).

Weather/ NOTAMS (reference AIM)

Refer to any authorized source you are comfortable with. In addition to the many web sites available, you can simply call a flight service station (1-800-WXBRIEF).

At a minimum, gather FA, METAR, TAF, winds aloft, AIRMETS/SIGMETS, as well as local, distant and FDC NOTAMS

Weather and NOTAMS should cover origin, destination, enroute, and any potential alternate airport.

Airport information (reference A/FD)

Be familiar with planned and potential airports you may use.
At a minimum know runway, length, width, pattern altitude and direction, lighting, comm/nav frequencies, servicing facilities (fuel, O2, maintenance, etc).

Airspace (reference Sectional or WAC VFR chart, Hi/Low IFR Enroute charts)

Know types of airspace you may use.
Class A/B/C/D/G, Restricted areas, MOAs, Prohibited areas, Alert areas, ADIZ

Terrain/Obstacles (reference VFR chart, IFR Enroute chart)

Know the highest terrain/obstacle that may affect you on the flight.

When operating IFR, find MSA, MRA, MOCA, and MEA altitudes. Keep in mind that adequate terrain clearance can be assured only under the following conditions:

Operating above charted minimum IFR altitudes (MEA)

Operating in radar contact at or above the MVA. In extreme cold weather in the U.S., the MVA may not provide standard terrain separation. If in doubt, request an altitude above the MVA.

Conducting an instrument approach in compliance with an IAP

Departing an airport in compliance with specific ATC climb instructions

Departing an airport in compliance with a published Obstacle Departure Procedure (DP)

Performance data (reference AFM, chapters 5 and 6)

Compute the following data using applicable charts/graphs/tables

Weight and CG

Takeoff distance

Rejected takeoff distance

Single engine climb speed, rate and gradient

Single engine service ceiling

Landing distance

V speeds (Vr, Vxse, Vyse, Vref)

Cruise altitude, speed, fuel flow

b. Normal Checklists

The normal checklists for the Eclipse 500 include:

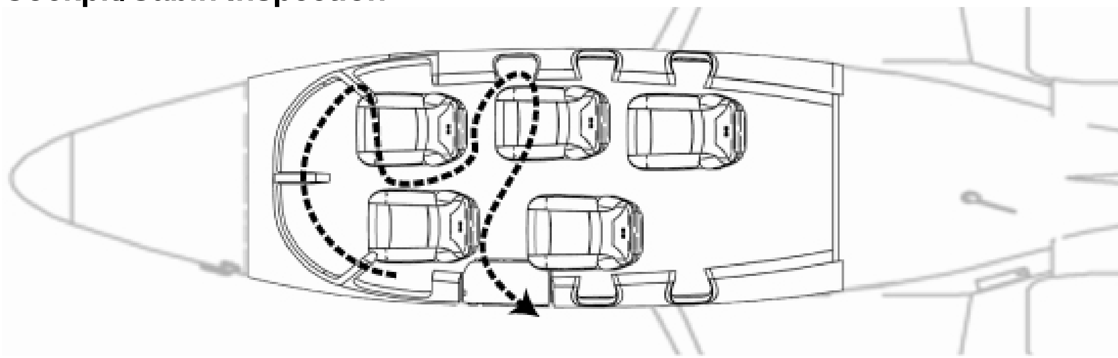
Preflight Inspection
Before Start
Start
After Start
Before Taxi
Taxi
Before Takeoff
After Takeoff
Climb
Descent / Approach
Before Landing
After Landing
Shutdown

This section provides the normal operating procedures for the aircraft. Included are all the procedures required by regulation, as well as those procedures determined to be necessary for the safe operation of the aircraft.

Normal checklists are designed to be a memory aid in performing tasks that, if not completed, would effect the normal operation of the flight. They are not designed to be ‘do’ lists, but rather the pilot does the normal preflight and in-flight tasks from memory using logical and organized patterns then references the checklist to confirm all the proper tasks have been accomplished. The pilot should refer to the checklists only when conditions permit its safe use (i.e. not while taxing nor during times of high workload).

PREFLIGHT INSPECTION

Cockpit/Cabin Inspection



1. Engine Start Selector Switches **OFF**

- Ensure both switches are OFF. If power is applied to the aircraft with an engine selector switch in the ON/START position, the engine may start.

2. Gear Handle **DOWN**

- Before applying power to the aircraft verify that the landing gear handle is in the down position.

3 .Control Gust Lock **REMOVE AND STOW**

- Remove gust lock straps and stow in a secure location.

4. START BATT Switch **ON**

- The START BATT switch will supply power for the rest of the interior and exterior lighting preflight check. If ground power is connected, the pilot should select both the START BATT and SYS BATT switches to ON to keep both batteries charged. If ground power is available it should be used to maintain battery life as well as aid in the exterior lighting check.

- Without ground power connected, only the START BATT switch should be selected on. This will limit battery power depletion during the exterior preflight check.

5. DC Voltage **CHECK 23 VDC MINIMUM FOR BATTERY START, 25 DC MINIMUM FOR GPU START**

- If battery voltage is too low, external power will be necessary to start first engine.

6. External Lights **CHECKED**

- position
- landing
- strobe/beacon
- ice prot insp
- TAXI/RECOGNITION

- Verify operation of the exterior lights during walk around. Only the left landing light will operate when operating on battery power only. Taxi lights are also load shed in this situation. To verify operation of all aircraft lighting, external power must be connected with both battery switches selected ON.

7. Parking Brake **SET**

- Depress toe brakes prior to pulling parking brake handle. If power is applied to the aircraft a PARKING BRAKE status message will appear on the MFD. This message is displayed as a function of the position of the parking brake handle. If the toe brakes have not been depressed prior to pulling the parking brake handle a PARKING BRAKE status message will appear but the parking brake is NOT set.

8. Portable Fire Extinguisher **ABOARD**

- Check to assure pin is present and properly installed with a plastic retaining strap. Check for inspection/expiration date.

9. Emergency Gear Release Handle **STOWED, COVER CLOSED**

- The emergency gear release handle cover should be stowed flush with the aircraft floor panel. Assure that the carpet will not interfere with the operation of the release handle door.

10. Fuel Quantity and Balance **CHECKED**

- Verify by selecting the FUEL system synoptic page on the MFD.
- The aircraft should be parked on a level surface prior to fueling and fuel quantity & balance check.

11. START BATT switch **OFF**

- Before executing the exterior preflight check, turn off the battery switches. However, if ground power is connected, both battery switches may be left on for the remainder of the exterior preflight check at the option of the pilot.

- Do not leave aircraft unattended with battery switches on.

12. Emergency Exit Pin **REMOVE**

- Stow the pin in a location where it will not be bent.

13. Emergency Exit **CLEAR AND SECURE**

- A clear path to the emergency exit should ALWAYS be maintained for ALL persons on board the aircraft while on the ground and in flight. Items on the aircraft shall be stored in a manner as to not interfere with the operation of the emergency exit.

14. Documents **ABOARD**

- Airworthiness certificate, Registration, AFM containing weight and Balance and all applicable supplements, radio station license (international operations). RVSM documentation and Minimum Equipment List, if applicable.

EXTERIOR INSPECTION

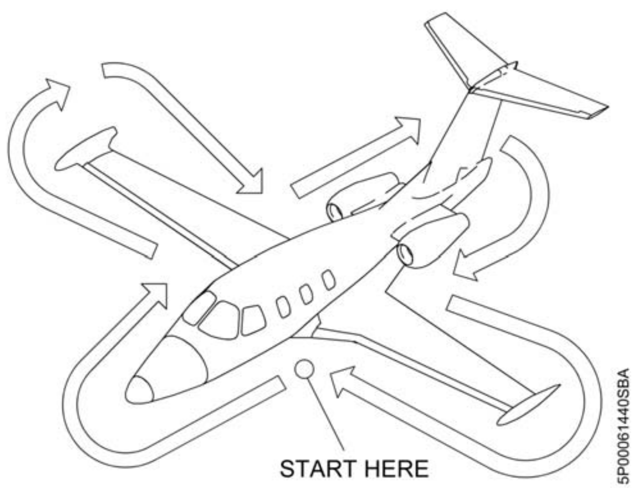
During the exterior inspection, make a general check for the condition, security and cleanliness of the aircraft and components.

Pay special attention to:

- any damage to and the condition of tires and flight controls
- any evidence of fuel, oil and brake fluid leakage
- security of access panels and doors
- any blockage of ventilation inlets, exhausts and drain ports.

Ensure all covers, tie downs, and chocks are removed and stowed.

The Exterior Inspection is designed so that the walk-around inspection begins at the crew door and transits around the aircraft in a clockwise direction.



CABIN DOOR

1. Door Seal **CONDITION**

- Ensure the seal is intact. The door seal is an essential component and is directly responsible for maintaining cabin pressurization. If a door seal becomes worn, cracked or broken, have it replaced prior to flight.

- Ensure that the lower cabin door cables are fully extended before stepping on the steps. Failure to do so may cause damage to the door mechanism.

2. Exterior Handle **STOWED**

- Check condition of locking pins. Visually inspect each pin to assure that it is not bent or damaged.

LEFT NOSE

1. Windshield and Cockpit Side Window **CHECK**

- Ensure windshield is free of bugs, grime and deformities.

NOTE

The windshield should not be cleaned with any petroleum-based substance. A 50/50 mixture of isopropyl alcohol and de-mineralized water is the only approved cleaning agent.

2. Left Static Port **CHECK**

- No blockage. Verify left static port is free of bugs and other debris.

NOTE

DO NOT touch any port; oil from your finger will provide an adhesive surface for dirt to collect around port openings.

3.Nose Access Panel **CONDITION, SECURITY**

- Ensure all fasteners are present and panel is mounted flush with aircraft surface.

4. Pitot/Static Probe **CHECK**

- No blockage. Verify Pitot/Static probe is free of bugs and other debris.

NOTE

DO NOT touch any probe; oil from your finger will provide an adhesive surface for dirt to collect around port openings.

5. Pitot/AOA Probe **CHECK**

- No blockage. Verify Pitot/AOA probe is free of bugs and other debris

NOTE

DO NOT touch any probe; oil from your finger will provide an adhesive surface for dirt to collect around port openings.

6. Oxygen Servicing Port Door **SECURED**

- Verify oxygen level is sufficient for the flight. Oxygen bottle pressure may also be verified in the cockpit. The service port door should be tightly secure and flush with the skin of the aircraft.

NOTE

The red line on the oxygen service gauge is displayed differently from the red line on the oxygen pressure gauge in the cockpit. The service port gauge has a red line at the high pressure end to define the maximum pressure capacity of the oxygen bottle. The interior gauge has a redline to indicate the lowest usable pressure.

7. Oxygen High Pressure Burst Disk **CONDITION**

- Verify blowout disc is visible and is intact. A blown disk indicates that the oxygen system has been improperly serviced and the aircraft's oxygen system must be inspected before flight.

NOTE

It is advisable that during the filling operation all servicing personnel should maintain a clear area immediately in front of the indicator disk.

8. Nose Gear, Doors and Tire **CONDITION, SECURITY**

- Verify tire has sufficient tread depth. If tire pressure is low fill the tire to the appropriate pressure. The nose gear actuator should be retracted and the downlock proximity sensor should be firmly attached to its mounting surface.

9. Nose Gear Hard Landing Indicator **CONDITION**

- Verify hard landing indicator tab is not bent.

NOTE

A bent tab indicates a hard landing and the aircraft's landing gear requires inspection prior to flight.

RIGHT NOSE

1. **Radome** **CONDITION, SECURITY**

- The radome should be free of cracks, chips, and scratches. A damaged radome will impair radar signal quality.

2. VCS Inlet door **CONDITION, SECURITY**

- Verify air conditioning door hinges allow free and unobstructed operation of the door. If the air conditioning system is running the door will be open.

3. VCS Outlet Door **CONDITION, SECURITY**

- Verify air conditioning door hinges allow free and unobstructed operation of the door. If the air conditioning system is running the door will be open

4. Pitot/AOA Probe **CHECK**

- No blockage. Verify Pitot/AOA probe is free of bugs and other debris

NOTE

DO NOT touch any probe, oil from your finger will provide an adhesive surface for dirt to collect around port openings.

5. Right Static Port **CHECK**

- No blockage. Verify right static port is free of bugs and other debris.

NOTE

DO NOT touch any port; oil from your finger will provide an adhesive surface for dirt to collect around port openings.

6. Windshield and Cockpit Side Window **CHECK**

- Ensure windshield is clean and free of scratches, bugs, grime and deformities.

NOTE

The windshield should not be cleaned with any petroleum-based substance. A 50/50 mixture of isopropyl alcohol and de-mineralized water is the only approved cleaning agent.

RIGHT WING

1. Emergency Exit and Handle **CONDITION, SECURITY**

- Verify emergency exit is tightly sealed with the airframe. The handle should be stowed flush with the airframe.

2. Landing/Taxi Light **CONDITION**

- Inspect Landing/Taxi Light lens scratches, cracks, and interior moisture.

3. Wing De-Ice Boot **CONDITION**

- Inspect boot for cracks, holes, chips, and wear. A damaged boot may not inflate/deflate properly which could result in the inability to shed ice. In addition, a damaged boot may not be held tight against the wing which could result in a significant loss in aircraft performance.

4. Main Gear (Front) **CHECK**

a. No External Damage
b. Actuator Condition
c. Tire Condition
d. Wheel Condition
e. Brake Condition (wear indicator)
f. Sensors (WOW and downlock)

g. Side Brace Condition
h. Strut Extension / Hard Landing Indicator
i. Gear Door

- All landing gear components should be free of damage and should be inspected thoroughly prior to flight. The gear wells should be inspected for anything that would restrict free landing gear operation. The tire should have sufficient tread depth and if necessary be filled to the proper pressure. Brake wear indicator pins should be inspected and should not be flush with their mounting surface. Brake lines should be firmly attached in a manner that will not cause any pinching during gear cycles. Brake line fittings should show no evidence of leakage. A leak will be indicated by yellowish brake fluid dripping from brake line fittings. Both WOW and Downlock sensors should be firmly mounted to their mounting surface. The hard landing indicator should be properly seated in its grove. The landing gear over-center brace should be fully extended and the landing gear door should be inspected for signs of damage.

NOTE

A displaced landing gear ring (red groove visible) indicates a hard landing and the aircraft's landing gear requires inspection prior to flight.

5. Under Wing **CONDITION**

- Ensure lower wing surface is free of dents and deformities. Inspect for ice and other contaminants adhering to the wing. These contaminants must be removed prior to flight as they can significantly reduce aircraft performance.

6. Fuel Drains (3) **CHECK**

- Inspect fuel drains for obstructions and fuel leaks prior to flight.

7. Fuel Vents (2) **CHECK**

- Inspect fuel vents for obstructions.

8. Wing Tip **CONDITION**

a. Taxi / Recognition and Anti-Collision / Position Lights
b. Fuel Filler Cap
c. Static Wick

- Inspect wing tip condition with emphasis on the light fixtures, fuel filler cap and seal, as well as the condition of the static wick. Note that fuel may not be visible if tank is less than full.

9. Over Wing **CONDITION**

- Ensure over wing surface is free of dents and deformities. Inspect for ice and other contaminants adhering to the wing. These containments must be removed prior to flight as they can significantly reduce aircraft performance.

10. Aileron **CHECK**

- Inspect aileron surfaces for damage, deformities and contamination which can cause loss of aileron effectiveness.

11. Flap **CHECK**

a. No External Damage
b. Actuator Condition
c. Fairings
d. Tracks

- Inspect flap surface for damage, deformities and contamination. All flap actuators should be free of debris.

12. Main Landing Gear (Rear) **CHECK**

a. No External Damage
b. Actuator Condition
c. Tire Condition
d. Wheel Condition
e. Sensors (WOW and downlock)
f. Side Brace Condition
g. Gear Door

- All landing gear components should be free of damage and should be inspected thoroughly prior to flight. The landing gear wells should be inspected for anything that would restrict free landing gear operation. The tire should have sufficient tread depth and if necessary be filled to the proper pressure. Brake wear indicator pins should be inspected and should not be flush with their mounting surface. Brake lines should be firmly attached in a manner that will not cause any pinching during gear cycles. Brake line fittings should show no evidence of leakage. A leak will be indicated by yellowish brake fluid dripping from brake line fittings. Both WOW and downlock sensors should be firmly mounted to their mounting surface. The hard landing indicator should be properly seated in its grove. The landing gear over-center brace should be fully extended and the landing gear door should be inspected for signs of damage.

NOTE

A displaced landing gear ring (red groove visible) indicates a hard landing and the aircraft's landing gear requires inspection prior to flight.

13. Right OAT Probe **CONDITION**

- Inspect OAT probe for signs of damage.

14. Rotating Beacon (Upper) **CHECK**

- Inspect lens/mounting rotating beacon fixture for signs of damage.

RIGHT ENGINE AND NACELLE

1. Ram Air Flapper Door (RAFD) **CONDITION**

- Inspect ram air flapper door for signs of damage.

2. Fire Extinguisher Pressure Indicator **GREEN**

- Check PhostrEx canister pressure by viewing the pressure gauge on the top of the engine pylon. The pressure should be in the green arc (see note for cold weather operations)

NOTE

If the outside air temperature is -10°C or lower and the aircraft has been soaked at or near that temperature, the fire canister pressure reading may be at or below the green band on the canister pressure gauge. For outside air temperatures below -10°C refer to AFM Figure 4-2

3. Engine Inlet **CONDITION**

- Inspect engine inlet for damage. Ensure all surfaces of the engine inlet are free of dents and other deformities that would diminish airflow and anti ice capability.

4. Engine Fan **CONDITION**

- Inspect fan hub/blades for damage. Fan should rotate freely via the hub.

NOTE

Do not touch the fan blades as oil from the fingertips will contaminate the blades. The pilot should only rotate the fan by placing their hand on the hub and rotating.

5. Nacelle Skin **CONDITION**

- Inspect engine nacelle for damage. All surfaces at fasteners should be secure and flush with the surface of the nacelle.

6. Oil Level and Servicing Door **CHECK, SECURITY**

- Check that engine oil levels are between MIN and MAX on the sight gauge. Significant ramp slope may affect oil level indications. If additional oil is required, use the same brand Type II oil previously used. If necessary, refer to the engine log for the brand name.

NOTE

Use only approved turbine engine oils; do not mix brands or types.

7. Drain Lines (4) **CLEAR**

- Inspect all drain lines for obstructions and signs of damage.

8. Engine Exhaust and Bypass Duct **CONDITION**

- Inspect engine exhaust and bypass duct for blockage and damage. Care should be taken when inspecting these components after engine operation as they will remain hot.

9. Variable Outlet Ram Exhaust (VORE) CONDITION

- Inspect the variable outlet ram exhaust for damage/blockage.

10. Pylon Panels CONDITION

- Inspect both upper and lower surface of the pylon panels for damage. All pylon surfaces should be smooth and free of deformities.

FUSELAGE

LOWER FUSELAGE

1. VCS Drain FWD CLEAR

- Inspect forward VCS drain for blockage and damage.

2. Antennas CONDITION

- Inspect all antennas for damage.

3. VCS Drain AFT CLEAR

- Inspect aft VCS drain for blockage and damage.

4. Pressurization Outflow Static Ports L/R CLEAR

- Inspect pressurization outflow ports damage which could result in a reduction of proper airflow.

UPPER FUSELAGE

1. Antennas CONDITION

- Inspect all antennas for damage.

EMPENNAGE

1. Tailstrike Fitting and Bumper Block CONDITION

- Inspect tailstrike fitting and bumper block for wear or structural damage.

2. Right VOR Antenna CONDITION

- Inspect VOR antenna for damage to the antenna and mounting surface.

3. Right Horizontal Boot CONDITION

- Inspect boot for cracks, holes, chips, and wear. A damaged boot may not inflate/deflate properly which could result in the inability to shed ice. In addition, a damaged boot may not be held tight against the stabilizer which could result in a significant loss in aircraft performance.

4. Tail Cone and Anti-Collision Lights CONDITION

- Inspect anti-collision light/tail cone light for damage to lens and internal components.

5. Rudder, Trim Tab **CONDITION**

- Inspect rudder and trim tab and their hinge points for damage. All surface edges should be inspected for signs of binding.

6. Aft Position Lights **CONDITION**

- Inspect aft position lights for damage to lens and internal components.

7. Right Elevator, Trim Tab and Static Wicks (2) **CONDITION**

- Inspect static wicks; replace before flight if broken or missing.

8. Left Elevator, Trim Tab and Static Wicks (2) **CONDITION**

- Inspect static wicks; replace before flight if broken or missing.

9. Left Horizontal Boot **CONDITION**

- Inspect boot for cracks, holes, chips, and wear. A damaged boot may not inflate/deflate properly which could result in the inability to shed ice. In addition, a damaged boot may not be held tight against the stabilizer which could result in a significant loss in aircraft performance.

10. Left VOR Antenna **CONDITION**

- Inspect VOR antenna for damage to antenna and antenna surface.

11. Identification Plate **CONDITION**

- The identification plate should be firmly attached to the aircraft. The data on the identification plate should be consistent with the aircraft's documentation.

LEFT ENGINE AND NACELLE

1. Pylon Panels **CONDITION**

- Inspect both upper and lower surface of the pylon panels for damage. All pylon surfaces should be smooth and free of deformities.

2. Variable Outlet Ram Exhaust (VORE) **CONDITION**

- Inspect variable outlet ram exhaust for damage/blockage.

3. Engine Exhaust and Bypass Duct **CONDITION**

- Inspect engine exhaust and bypass duct for blockage and signs of damage. Care should be taken when inspecting these components after engine operation as they will remain hot.

4. Drain Lines (4) **CLEAR**

- Inspect all drain lines for obstructions and signs damage.

5. Oil Level and Servicing Door **CHECK, SECURITY**

- Check that engine oil levels are between MIN and MAX on the sight gauge. Significant ramp slope may affect oil level indications. If additional oil is required, use the same brand Type II oil previously used. If necessary, refer to the engine log for the brand name.

NOTE

Use only approved turbine engine oils; do not mix brands or types.

6. Nacelle Skin **CONDITION**
- Inspect engine nacelle for damage. All surfaces at fasteners should be secure and flush with the surface of the nacelle.

7. Engine Fan **CONDITION**
- Inspect fan blades for damage. Fan should rotate freely via the hub.

NOTE

Do not touch the fan blades as oil from the fingertips will contaminate the blades. The pilot should only rotate the fan by placing their hand on the hub and rotating.

8. Engine Inlet **CONDITION**
- Inspect engine inlet for damage. Ensure surfaces of the engine inlet are smooth and free of dents and other deformities that would diminish airflow and anti ice capability.

9. Engine Cover Stowage Door **SECURITY**

10. Fire Extinguisher Pressure Indicator **GREEN**
- Check Phostrex canister pressure by viewing the pressure gauge on the top of the engine pylon. The pressure should be in the green arc (see note for cold weather operations)

NOTE

If the outside air temperature is -10°C or lower and the aircraft has been soaked at or near that temperature, the fire canister pressure reading may be at or below the green band on the canister pressure gauge. For outside air temperatures below -10°C refer to AFM Figure 4-2

11. Ram Air Flapper Door (RAFD) **CONDITION**
- Inspect the ram air flapper door for damage.

LEFT WING

1. Left OAT Probe **CONDITION**
- Inspect OAT probe for damage.

2. Over Wing Condition **CHECK**

- Inspect over wing surface for dents and deformities. Inspect for ice and other contaminants adhering to the wing. These contaminants must be removed prior to flight as they can significantly reduce aircraft performance.

3. Flap **CHECK**

a. No External Damage
b. Actuator Condition
c. Fairings
d. Tracks

- Inspect flap surface for damage, deformities and contamination. All flap actuators should be free of debris.

4. Main Gear (Rear) **CHECK**

a. No External Damage
b. Actuator Condition
c. Tire Condition
d. Wheel Condition
e. Sensors (WOW and downlock)
f. Side Brace Condition
g. Gear Door

- All landing gear components should be free of damage and should be inspected thoroughly prior to flight. The landing gear wells should be inspected for anything that would restrict free landing gear operation. The tire should have sufficient tread depth and if necessary be filled to the proper pressure. Brake wear indicator pins should be inspected and should not be flush with their mounting surface. Brake lines should be firmly attached in a manner that will not cause any pinching during gear cycles. Brake line fittings should show no evidence of leakage. A leak will be indicated by yellowish brake fluid dripping from brake line fittings. Both WOW and Downlock sensors should be firmly mounted to their mounting surface. The hard landing indicator should be properly seated in its grove. The landing gear over-center brace should be fully extended and the landing gear door should be inspected for signs of damage.

NOTE

A displaced landing gear ring (red groove visible) indicates a hard landing and the aircraft's landing gear requires inspection prior to flight.

5. Aileron **CHECK**

- Inspect aileron surfaces for damage, deformities and contamination which can cause loss of aileron effectiveness. Additionally, inspect the aileron hinges and edges for signs of control binding.

6. Under Wing **CONDITION**

- Inspect lower wing surface for dents and deformities. Inspect for ice and other contaminants adhering to the wing. These containments must be removed prior to flight as they can significantly reduce aircraft performance.

7. Fuel Drains (3) CHECK

- Inspect fuel drains for obstructions and fuel leaks.

8. Fuel Vents (2) CHECK

- Inspect fuel vents for obstructions.

9. Wing Tip CONDITION

a. Static Wick
b. Fuel Filler Cap
c. Position and Recognition / Anti-Collision Lights

- Inspect wing tip condition with emphasis on the light fixtures, fuel filler cap and seal, as well as the condition of the static wick. Note that fuel may not be visible if tank is less than full.

10. Wing De-Ice Boot CONDITION

- Inspect boot for cracks, holes, chips, and wear. A damaged boot may not inflate/deflate properly which could result in the inability to shed ice. In addition, a damaged boot may not be held tight against the wing which could result in a significant loss in aircraft performance.

11. Main Landing Gear (Front) CHECK

a. No External Damage
b. Actuator Condition
c. Tire Condition
d. Wheel Condition
e. Brake Condition
f. Sensors (WOW and downlock)
g. Side Brace Condition
h. Strut Extension / Hard Landing Indicator
i. Gear Door

- All landing gear components should be free of damage and should be inspected thoroughly prior to flight. The gear wells should be inspected for anything that would restrict free landing gear operation. The tire should have sufficient tread depth and if necessary be filled to the proper pressure. Brake wear indicator pins should be inspected and should not be flush with their mounting surface. Brake lines should be firmly attached in a manner that will not cause any pinching during gear cycles. Brake line fittings should show no evidence of leakage. A leak will be indicated by yellowish brake fluid dripping from brake line fittings. Both WOW and Downlock sensors should be firmly mounted to their mounting surface. The hard landing indicator should be properly seated in its grove. The landing gear over-center brace should be fully extended and the landing gear door should be inspected for signs of damage.

NOTE

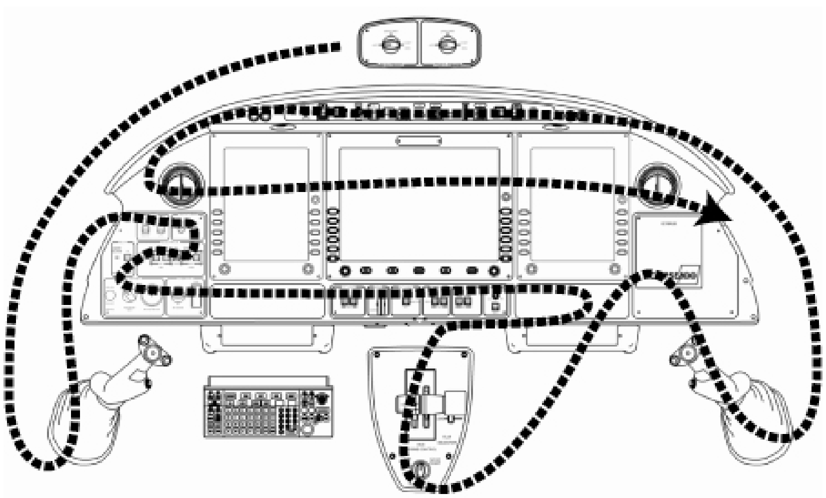
A displaced landing gear ring (red groove visible) indicates a hard landing and the aircraft's landing gear requires inspection prior to flight.

12. Landing Light CONDITION
- Inspect landing Light lens for scratches, cracks, and interior moisture.

13. Ice Inspection Light CONDITION
- Check the ice inspection light lens for scratches, cracks, and interior moisture.

BEFORE STARTING CHECK

Before Start Flow Pattern



Before Starting Check (Expanded)

1. Passenger Briefing.. COMPLETE
- As a minimum, the passengers should be briefed on the following:
  - o Use of the cabin door and emergency exit for emergency egress
  - o Use of the passenger O_2 system
  - o Location of the first aid kit and portable fire bottle
  - o Use of the seat belt / shoulder harness
  - o Sterile cockpit after takeoff and before landing

- Additional items that may be of interest to the passengers are:
  - o Flight time
  - o Weather (en route and destination)
  - o Rout of flight

2. GPU (If Required)...............................CONNECT
- Ensure both engine selector switches are OFF

- Both battery switches must be ON in order for the Electrical Power contactor to close, allowing external power to the aircraft.

3. Door …………………………………………CLOSED, VERIFY FLAGS GREEN

4. Seat Belts, Shoulder Harnesses, Headrests………FASTEN / ADJUST

- Adjust headrest so that the oxygen mask holder is situated higher than the pilot's shoulder. This will allow expeditious donning of the mask (less than 5 seconds) in an emergency.

5. Seat Rail Stop Assembly DOWN / LOCKED

6. Oxygen Control…………………………………….. PULL ON

- When pulling the oxygen control knob out, there should be an audible rush of air.

7. Crew Mask…………………………………………CHECK, SELECT 100%

- The crew oxygen mask should be checked for proper operation (harness inflation, breathing capability, and microphone operation). To check, remove mask from the stowage cup, inspect the face cone for rips/tears, inflate the harness, feel and listen for leaks, don the mask. Move the MASK HEADSET switch to MASK and activate the right side speaker via the AUDIO synoptic page or keyboard. You should hear your voice from the right speaker. Note that aircraft power must be on to accomplish this check. To check the right pilot's mask (if installed) repeat this procedure except select the left speaker to check for proper audio. Remove the mask and fold properly ensuring 100% setting selection before stowing. NOTE: If battery power only, the right pilot's mask cannot be tested at this point; test prior to "Before Taxi" checklist. A through-flight check of the mask does not require removal of the mask from the cup. Ensure a proper connection of the microphone cable and oxygen hose under the armrest, check for a green in-line indicator, and test the mask by momentarily selecting the "Emergency" setting on the mask regulator ensuring oxygen flow to the mask and returning the switch back to the 100% setting.

8. Flight Controls……………………………………………..CHECK

- Move sidestick full forward, full left, full aft, full right, then full forward again, verifying complete freedom of movement of flight controls.

9. MASK HEADSET Switch(es)……………………………...HEADSET

- Ensure MASK HEADSET switches are selected to the HEADSET position.

10. COM System Select…………………………………………L PFD

- Verify left com select switch set to the left PFD position and right com select switch (if installed) set to the right PFD position.

NOTE

During normal operations (both PFDs functioning) the com select switched(s) should be set to their respective PFD. Improper selection during normal operations can cause confusion regarding active frequency assignment.

11. L PFD Circuit Breaker SET

- Verify circuit breaker pressed in

12. L ACS Circuit Breaker SET

- Verify circuit breaker pressed in

13. R GEN Switch AUTO

14. BUS TIE Switch AUTO

15. SYSTEM BATT Switch .... ON

16. L GEN Switch……………..……………………………………….AUTO

17. ELT Switch……………………………………………………..ARM

18. Passenger Mask…………………………………………………AUTO

19. AIR SOURCE Switch……………………………………………OFF

20. External Lights…………………………………………..AS REQUIRED

- Turn Beacon light on.

21. Gear Indication…………………………………………THREE GREEN

22. Parking Brake……………..SET

- Pulling the parking brake handle without simultaneously depressing the brake pedals will not engage the parking brake, even though the PARKING BRAKE status message is illuminated.

23. COMM / NAV……………………………………………………………SET

- Set tower and departure frequencies in comm. #1. Use comm. #2 for all ground frequencies (ATIS, clearance delivery, ground control, etc). This will allow a simple change to comm. #1 when ready to talk to tower.
- Set the two navaids likely to be initially used in both nav #1 and nav #2.

24. Altimeter……………………………………………………………SET

- Use ATIS/ASOS/AWOS altimeter setting. If no weather source available, set airport elevation.

25. Ops Page…………………………………………………………..CHECK

a. Weights…….ENTER

- Enter each pilot/passenger weight and any baggage.

b OAT…………ENTER

- Use ATIS temperature, if available. If the OAT is not immediately accepted, re-enter the OAT after taxi and prior to takeoff. Takeoff performance data is NOT assured unless the OAT is properly entered.

c. Vr Speed………ENTER

- Enter Vr speed computed from performance data.

26. Trims (3)……………………………………………………………SET

- Ensure all trims are in the green area. Failure to do so will result in "TO CONFIG OK" not being presented on CAS display. For most conditions, 10% nose down is recommended for pitch trim.

27. Landing Altitude……………………………………………….....CHECK, SET

- Set destination airfield elevation as printed in A/FD or approach plate.

28. AIR COND/FANS……………………………………………….....AS REQUIRED

- Set air conditioner AUTO or OFF. Set desired temperature or "MAX COOL/HEAT" and fan speed (AUTO, HIGH, MED, or OFF).

29. DC Voltage……………………………………………CHECK, 23 VDC MINIMUM

30. Chocks…………………………………………………………REMOVED

ENGINE START

1. **Throttles ....IDLE**

2. **START BATT Switch ....ON**

- Ensure both engine selector switches are OFF
- R AFT BUS Voltage: CHECK 23 VDC MINIMUM FOR BATTERY START; 25 VDC MINIMUM FOR GPU START

3. **R ENGINE Selector……………………………………………...ON/START**

- The switch must be pushed in to move between OFF and ON/START.
- The start cycle is complete when the red ITT limit line resets for normal operation.

CAUTION

Whenever the engine fails to light, a dry motoring cycle is required to clear out trapped fuel or vapors. The high speed rotor (N_2) should be allowed to decelerate to zero RPM before attempting another start. Repeat complete starting sequence, observing starter limits. (Refer to 2-8)

ECLIPSE AVIATION

4. L ENGINE Selector…………………………………………………….ON/START

5. Ground Power Unit (If connected)…DISCONNECT

- If icing conditions present, ground or airborne, turn on engine anti-ice system by selecting ENG on the ANTI-ICE/DE-ICE SELECTOR SWITCH.

BEFORE TAXI

1. Warning and Caution Annunciators ……….ACKNOWLEDGED
Investigate any CAS message by referring to section 3 of the AFM.

2. OPS Page

a. LAMP TEST

- Select SYSTEM TEST
- Select COCKPIT LAMPS; then START TEST
- Observe all lamps on ACP and keyboard(s) illuminate
- Select STOP TEST when test completed
- Select RETURN TO OPS to continue with other functions

b. AUTOPILOT TEST

- Center control sticks and rudder pedals
- Select "AUTOFLIGHT" and "START TEST".
- Verify "IN PROGRESS" indicated on OPS Systems Test page
- Press AP on/off button; verify (1) YD and AP button lights are on; (2) FMA tile on PFD displays "PITCH ← ALT" and "ROLL"; (3) "AP" and "YD" appear at top of ADI; (4) Stick and rudder pedals cannot be moved with small forces
- Verify stick can be overpowered left-right / forward-aft with no AP disconnect

NOTE

During the overpowering of the stick in the forward-afterward direction, the following will occur:

Pitch trim tab will be commanded to move;

"Trim-In-Motion" Aural alert will appear after trim servo moving for 2 seconds;

"PITCH MISTRIM" CAS will appear after about 4 seconds of pitch slip clutch started to slip

- Verify pitch trim position, "Trim-In-Motion" aural alert and "PITCH MISTRIM" CAS behave as stated in the above note
- Verify rudder pedals can be overpowered, without causing YD to disconnect

- Assume AP and YD still engaged as indicated by symbols “AP” and “YD” at top of the ADI. Dialing the vertical wheel on ACP up and then down causes stick to move aft and forward.
- Press HDG-SEL knob to sync heading bug to current heading; press HDG mode button on ACP; verify FMA tile on PFD displays “PITCH ← ALT” and “HDG”
- Dialing HDG-SEL knob left and right causes stick to move left and right.
- Press AP DISC on stick; verify (1) YD button light remains on and AP button light off; (2) FMA tile on PFD displays “PITCH ← ALT” and “HDG”; (3) AP DISC appears at top of ADI and blinks for at least 3 seconds, and AP disconnect aural alert is on and can be silenced by pressing “AP DISC” button on either stick grip; (4) stick can be moved freely.
- Press YD on/off button; verify (1) YD button light off; (2) Symbol “YD” disappears from the top of ADI; (3) rudder pedals can be moved in either direction with normal resistance.
- Press MFD knob to un-select “AUTOFLIGHT” test on OPS Systems Test page.
- Verify “IN PROGRESS” indication on OPS page extinguishes.
- Check for any AFS CAS messages and follow AFM instructions

NOTE

Selecting AUTOFLIGHT test will initiate self-test for the Autopilot System (A/P), and Yaw Damper System (YD). The AUTOFLIGHT test takes approximately 1 to 2 minutes to complete, depending on pilot’s pace. If a pilot takes more than 2 minutes before completing steps 1 through 14, the AUTOFLIGHT preflight tests are terminated by AP servos automatically. The pilot MUST re-select “AUTOFLIGHT” test on OPS Systems Test page to re-activate the preflight test mode and continue with the remaining steps.

NOTE

The AUTOFLIGHT test can be terminated at any time by any of the following action or conditions:

- *Pressing the MFD knob to un-select the AUTOFLIGHT test on OPS Systems Test page.*
- *Either WOW indicates in-air*
- *Either Equivalent airspeed is greater than 45 knots*
- *120 seconds have elapsed since the AP initiated the AP preflight test mode.*
- *During the AP preflight test, the following buttons behave as if aircraft were in-air:*
- *ALL INTERRUPT button on either Control Stick*
- *AP DISC button on either Control Stick*

- *YD OFF/ON button on the Autopilot Control Panel*
- *AP OFF/ON button on the Autopilot Control Panel*
- *AP mode buttons on the Autopilot Control Panel*

c. STALL PROTECTION SYSTEM TEST

- Select STALL PROTECTION and START TEST
- Verify "STALL" appears on ADI and aural "STALL" warning is heard
- Verify stick pusher function activates and control stick moves forward
- Pull back on control stick to overpower stick pusher, then release pressure
- Verify stick continues to push forward after overpower is relaxed
- Select STOP TEST

3. Electronic Circuit Breakers ....CHECKED

- Select ECB synoptic page and check for tripped/pulled/collared ECBs

4. FLAPS .... SET FOR TAKEOFF

- TO or UP, based on preflight performance planning

5. PARKING BRAKE .... RELEASED

6. External Lights ....AS REQUIRED

- Turn taxi light on when beginning to taxi. Flash the taxi light to signal the ground crew of intent to commence taxi.

7. Air Source Switch…………….....NORMAL (see note)

NOTE

If OAT is greater than 75°F / 24° C, the Air Source Switch may be set to OFF before and during taxi to reduce air conditioning workload.

8. Seats Inertia Reel LOCKED

Conduct departure self-briefing

TAXI

1. Brakes ....CHECK

2. Engine Instruments................................CHECK

3. Flight Instruments................................ CHECK

NOTE

Taxi light should be on when during taxi. Turn taxi light off when stopped (or in consideration of others) and back on when moving again.

When crossing a runway, turn all exterior lights on. Exercise caution in using forward facing lights when crossing at night in the event that they may be blinding to other flight crews or ground traffic in motion.

BEFORE TAKEOFF

Accomplish this checklist before entering active runway.

If icing conditions exist and there is precipitation, make a visual inspection before takeoff to confirm no ice or snow is present on wing surfaces. Do not begin takeoff if ice or snow is present; de-icing is required.

1. Takeoff Briefing .... COMPLETE

- Include flap position, Vr, and initial heading / altitude

2. Batteries (Charge Rates)…….CHECK, LESS THAN 7 AMPS

- Verify excessive charging is not occurring, ensuring health of battery

3. Warning Lights and CAS Annunciations………. ACKNOWLEDGED

4. T/O CONFIG OK Status Message…………ANNUNCIATED

5. External Lights .... AS REQUIRED

- Turn on strobe lights when cleared into position and hold on the runway. When cleared for takeoff, turn on landing lights.

6. Air Source Switch…………….NORMAL

AFTER TAKEOFF

1. GEAR Handle.. UP

- After confirming positive rate of climb

2. FLAP POSITION Handle................................ UP

- At 400' AGL or obstacle clearance

3. YAW DAMP Switch .... ON

- At 400’ AGL or obstacle clearance

CLIMB

When passing 10,000 feet MSL

1. Pressurization ....CHECK

- dP – positive value
- Cabin rate of climb ≤500 fpm in AUTO; as selected in MAN
- Cabin altitude lower than aircraft altitude
- CAS messages – check
- Crew masks – secure in quick-don mask cup

2. Landing Lights... OFF

When passing 18,000 feet MSL or Transition Altitude

3. Altimeter..................................SET STANDARD

DESCENT / APPROACH

Accomplish prior to top-of-descent (TOD)

1. Seat Belts/Shoulder Harnesses ......FASTENED

2. Windshield Defog.......................AS REQUIRED

3. Altimeter..SET

4. LAND Light Switch.....................AS REQUIRED

5. COM/NAV ....SET

6. Landing Performance Data................CONFIRM

- Confirm FMS has been programmed for the expected arrival/approach
- Conduct approach self-briefing

BEFORE LANDING

Accomplish by 1,000’ AGL on an instrument approach; 500’ AGL on a visual approach

1. GEAR ....DOWN
- Confirm 3 green

2. FLAPS .... LDG

3. Yaw Damper ....OFF

4. Seats Inertia Reel ....LOCKED

MISSED APPROACH/GO-AROUND

1. Throttles MAX

2. Climb Airspeed Vref
- Establish 10° pitch attitude

3. FLAPS T/O

4. GEAR UP
- When positive rate of climb is established

5. FLAPS UP
- At 400' AGL or obstacle clearance
- When clear of obstacles, accelerate to Vyse

AFTER LANDING
- Accomplish after clearing all runways

1. FLAPS ....UP

2. TRIM ....RE-SET

3. External Lights .... AS REQUIRED
- When clear of runway, turn landing lights off, strobe lights off, and taxi light on when airplane is moving.

4. Air Source Switch………..……..……...NORM (see note)

NOTE

If OAT is greater than 75°F / 24° C the Air Source Switch may be set to OFF, before and during taxi to reduce air conditioning workload.

SHUTDOWN

1. Throttles ....IDLE

NOTE

Allow engine to stabilize for a minimum of one minute at Ground Idle.

2. **PARKING BRAKE ....AS REQUIRED**

- Pulling the parking brake handle without simultaneously depressing the brake pedals will not engage the parking brake, even though the PARKING BRAKE status message is illuminated.
- After chocks are in place, brake off

3. **AIR SOURCE Switch ....R, L, OFF**

NOTE

Pause briefly after each position and check for CAS message.

4. **ENGINE Selectors .... OFF**

5. **SYS BATT Switch .... OFF**

6. **START BATT Switch.................................... OFF**

7. **L GEN Switch.. OFF**

8. **R GEN Switch .... OFF**

9. **BUS TIE Switch .... OPEN**

10. **OXYGEN Control .... PUSH OFF**

11. **Control Gust Lock SECURED**

12. **Cabin Door.. OPEN**

- If leaving aircraft for extended period, ensure at least two chocks are in place.
- If the aircraft battery will be stored or exposed to temperatures below -15°C, both aircraft batteries should be removed and stored above -15°C**,** re-installed just prior to flight. Using warm batteries ensures that at least 30 minutes of reserve power is available in case of a battery-only load-shed event while in-flight.

c. SELF BRIEFINGS

Operating as a single pilot, the Eclipse pilot should always contemplate and plan, in a logical manner, each phase of operation—essentially "briefing" himself/herself on what will come next. As a solo jet pilot, you must develop a philosophy/mindset of “staying ahead of the jet”. As an old aviation adage says: “Never let your aircraft arrive anywhere that your brain hasn’t arrived ten minutes earlier”.

The following are the minimum items that should be self-briefed.

Departure (before taxi, after receiving ATIS and clearance)

Expected runway

Taxi route

Takeoff flap position

Departure procedure (SID and/or Obstacle Departure; engine failure)

Weather considerations

Radar / anti-ice considerations

MEL considerations

Noise abatement considerations

Rejected takeoff procedure

Engine failure after takeoff plan

Immediate return to airport plan

Takeoff (prior to entering active runway)

Flap position

Speeds

Initial heading / altitude

Approach (prior to terminal area)

Weather (ATIS, ASOS, AWOS)

NOTAMS

Expected runway

Visual or Instrument approach

Type of instrument approach (ILS, VOR, GPS, etc); use briefing strip on approach plate

Pattern entry/altitude

Collision avoidance

Runway exit (desired intersection and direction)

Taxi route to parking

d. PROFILES

The following discussions of phases of flight, although not all-inclusive, describe the areas and items that must be considered and performed properly for a safe and efficient flight.

Taxi

Listen closely and read back all taxi instructions from ATC—especially any "hold short" instructions. At busy/complicated airports, it is helpful to write the taxi route down. During taxi, the pilot's attention should be solely on aircraft control and position awareness—checklist usage should be suspended until the aircraft is fully stopped. The airport diagram should be readily available for reference to progressively follow position on the airport. Don't hesitate to request "progressive taxi" from ATC if there are any doubts as to your clearance or route.

Always be aware of turning room available versus turning room required. With optimum technique (asymmetric power and brakes), the Eclipse 500 requires approximately 27 feet to make a 180 degree turn. It would be prudent to have significantly more room than this before making such a maneuver.

A jet aircraft produces a higher velocity of exhaust from its engines than a propeller aircraft. Therefore, consideration for 'jet blast' is very important. Minimize thrust when maneuvering close to objects, especially if single engine, and make all turns considering what might be behind you.

Taxi speed must be monitored. A groundspeed, referenced via the PFD, between 10 and 20 knots is about right for most situations. However, it should be significantly lower if the taxiway is slippery and/or contaminated, visibility is limited, or there are numerous aircraft in the area.

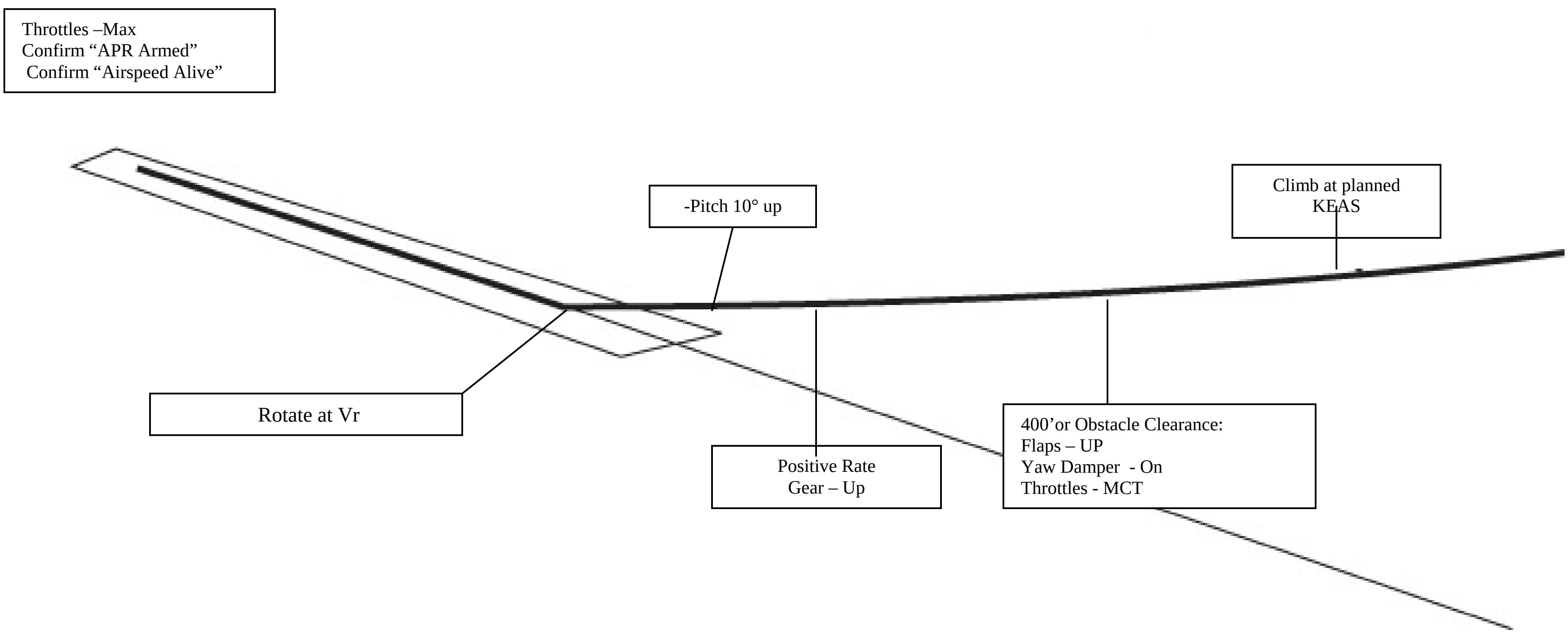
The beacon should be illuminated anytime engines are running. The taxi light can be used if needed, but should be turned off when stationary. All lights should be on when crossing a runway.

Always strive to be on the taxiway centerline. As in most small aircraft, simply imagine straddling the yellow centerline with your feet.

Lastly, don't be in a hurry. Runway incursions are a very high emphasis item. Don't be a statistic.

Eclipse 500
Normal Takeoff

Prior to takeoff:
- Heading Bug – Initial Turn
- Altitude Bug – Initial Cleared Altitude
- Speed Bug – Planned KEAS
- Complete Before T/O Checks



Takeoff

Before every takeoff, consider the possibility of a rejected takeoff. The distance required to accelerate to Vr and then reject the takeoff should be known. This 'rejected takeoff distance' can be estimated by adding 50% to the takeoff distance (100% if flaps UP takeoff) and then compare to the available runway. If rejected takeoff distance is greater than runway length, the pilot must use risk management skills and assess and mitigate the situation.

For all takeoffs, keep one hand on the throttles until the decision to continue.

Monitor engine instruments and CAS during takeoff roll to be alert to any abnormalities.

NOTE

Takeoff distance data contained in section 5 of the AFM assume that brakes are held until both engines are at maximum available thrust.

Normal takeoff

With the airplane aligned on the runway centerline, release brakes, advance the throttles to max and call out when the APR ARMED status message appears and the airspeed comes alive. Accelerate to Vr and smoothly rotate to 10^{o}.

When a positive climb is confirmed by observing an increasing altimeter indication, raise the landing gear. Maintain 10° pitch attitude to 400' AGL or obstacle clearance, whichever is higher.

At 400': Flaps - UP, Yaw Damper - ON, Throttles - MCT, Airspeed – as planned.

For a rolling takeoff, maintain normal taxi speed until aligned with the runway. Then advance power to maximum thrust.

Short field/obstacle takeoff

If runway length is limited and/or there is a close-in obstacle, refer to the AFM Performance chapter to determine takeoff performance margins. In position at the very beginning of the usable runway, hold the brakes while advancing power to maximum. Once the throttles are full forward and APR ARMED is observed, release brakes. Rotate at the normal Vr. With a close-in obstacle, raise the gear normally and climb at V_{50}. When clear of the obstacle, accelerate normally.

Crosswind takeoff

The crosswind technique in the Eclipse is essentially like that of any tricycle gear aircraft. Conventional crosswind correction is effective. Apply full aileron into the wind as the airplane begins the takeoff roll. Gradually reduce aileron input as the airplane accelerates. Lift off in a slip, immediately relaxing the slip into coordinated flight and track the runway centerline (unless assigned a specific heading by ATC).

The maximum demonstrated crosswind limit is 14 knots.

Flaps UP takeoff

A takeoff with flaps UP may be desired if single engine climb performance with flaps TO is determined to be marginal or negative and single engine climb performance for flaps UP is acceptable. In this case, consider the longer runway required versus runway available. The flaps UP takeoff is performed much like the normal takeoff procedure above.

Traffic Pattern Ops (closed patterns)

On upwind leg, after gear and flaps are up and reaching 500' AGL begin the crosswind turn using approximately 15° pitch. At 200'–300' prior to pattern altitude (1,500' AGL), lower pitch and reduce power to 65% to be level at pattern altitude and 150 knots.

At mid-field downwind, reduce power to idle, lower gear, select flaps to TO and maintain at least 115 KEAS.

At the approach end of the runway, begin a descent at 800-1,200 fpm. In the middle of the base turn, select flaps to LDG and maintain at least 100 KEAS.

After turning final and wings level, adjust power to establish Vref. Power should be reduced to idle at just prior to the runway threshold. Normal touchdown will occur at approximately 1,000' past the threshold at 75-80 knots.

Keep in mind that the above 'flow' is simply a 'standard'. Traffic patterns, at controlled or uncontrolled airports can be very dynamic and you must be ready to use your airmanship and decision-making skills. Weather, traffic, terrain, ATC, and many other variables may dictate deviating from the norm. Be methodical, not mechanical.

Departure and Climb

The planned departure procedure, IFR or VFR, should be thoroughly self-briefed. A plan for an immediate return to the field should also be considered.

The PFD, MFD and flight control panel should be pre-set as completely as possible (speed bug, heading bug, course select, comm/nav frequencies, etc.) for the planned departure procedure. Minimize any requirement to take hands off stick and throttle or eyes away from PFD (if IFR) or from outside the cockpit (if VFR) below 1000' AGL.

Unless otherwise required, no turns should be initiated below 400' AGL.

There are several methods to accomplish an enroute climb. The pilot should select the method combining airspeed and climb rate that is most appropriate for the planned flight. The following are three common methods used in the Eclipse 500.

1. 200 KEAS Climb: Departing from class B or similar high-density environments, a 200 KEAS climb will get the aircraft out of busy airspace in

a timely manner. It will provide greater than 1,000 fpm climb rate to approximately 18,000' MSL and greater than 500 fpm to approximately FL 250. Above FL 250, speed should be adjusted to maintain a minimum of 500 fpm, unless coordinated with ATC.

2. Vy Climb: Another method is a maximum rate profile. This profile can be used if high-density airspace is not an issue and/or minimum time to altitude is desired. Best rate of climb, Vy, should be extracted from "Enroute Rate of Climb" data in section 5 of the AFM. As a rule of thumb for Vy, establish 160 KEAS at sea level, then reduce 1 knot per 1,000' of climb.
3. KEAS / Mach Climb: This method involves flying a constant KEAS to a constant Mach. The specific KEAS and Mach values will vary with ISA and are found in the Time, Fuel & Distance to Climb charts in the performance section of the AFM.

For any of the above methods, it must be remembered that ATC must be advised if you are unable to maintain at least 500 fpm rate of climb.

Autopilot use is highly recommended to monitor systems and maintain situational awareness. Engage autopilot only above 1,000 AGL.

During flight in icing conditions (visible moisture and less than 10° C), be sure all de-ice/anti-ice systems are on and operating.

Minimize any non-aircraft related conversations with passengers while below 10,000' AGL.

Cruise

Generally, a jet aircraft is most efficient at its highest altitude. The Eclipse 500 is capable of a maximum of FL 410. However, there are many considerations regarding selecting a cruise altitude.

The selected altitude should be based on TAS, wind, fuel flow/range, turbulence and enroute weather. Reference the cruise performance tables in section 5 of the AFM.

Once cruise level is selected, determine true airspeed and fuel flow. This information will be used for your flight planning.

Leveling at cruise altitude, maintain MCT until established at planned TAS. Then set N1 to desired setting based on performance data used in preflight planning.

During cruise, ALWAYS monitor fuel status. One of the most important aspects of managing the Eclipse 500 is monitoring fuel. Fuel flow rates can vary significantly with altitude, power and airspeed. Additionally, total fuel burn will be affected by wind-affected groundspeed that may be different than forecast/planned. The pilot should constantly be aware of how current performance compares to the plan.

Continually verify that the projected arrival fuel matches minimum requirements. If not, use actual cruise performance to fly to a suitable alternate.

Monitor all available sources for enroute and arrival weather. Be proactive with ATC if re-routing or divert is a possibility. Have an answer, other than "standby", if ATC asks for your intentions.

Minimum fuel advisory

If the fuel supply becomes such that no unusual delay can be accepted at the destination, the pilot should advise the ATC controller, "Minimum fuel". Doing so is not declaring an emergency and does not guarantee special handling but it alerts the controller to avoid delays, if possible. It is always possible that another aircraft may have an emergency and requires ATC priority handling and delay is unavoidable. For the Eclipse 500, declare minimum fuel if it is determined any time during the flight that you will land with less than 350 pounds.

The prudent pilot, having planned properly and monitored fuel burn performance en route should not find him or herself in this situation, even if that means landing short of the intended destination.

Emergency Fuel

If the fuel supply becomes such that absolutely no delay can be accepted, do not hesitate to declare "emergency fuel". Doing so is declaring an emergency and you will receive immediate priority for landing. For the Eclipse 500, declare emergency fuel if it is determined at anytime during the flight that you will land with less than 250 pounds.

Descent

The key to an efficient descent is "plan ahead". The FMS can assist, but you must have a solid grasp on the basic techniques for high altitude, high speed arrivals—particularly into high density airports.

An accepted standard descent profile—what ATC will reasonably assume or expect and what your passengers will appreciate—is a 3° flight path. To accomplish this, the pilot must know where to begin the descent and how fast (in feet per minute) to descend. The top of descent (TOD), or distance required to descend, is computed by dividing the altitude to lose by 300 (or divide flight levels by 3). For example: FL 350 to 8,000'—a descent of 27,000'—would require 90 nautical miles.

Once the distance to descend is known, the rate of descent must then be computed and updated to stay on the descent profile. The descent rate can be computed by multiplying miles per minute (groundspeed) by the flight path, times 100. If you are at 300 knots groundspeed (5 miles per minute) and you fly a 3° flight path, the descent rate would be 1500 feet per minute. The rule of thumb for most situations in the Eclipse 500 is 1500 to 1800 fpm for the standard 3° descent profile.

To fly the standard Eclipse 500 descent profile: maintain cruise N1 setting and adjust pitch to maintain your computed rate of descent. As indicated airspeed increases, adjust N1 to maintain 250 KEAS. Update your descent profile every 5,000 feet and adjust your rate of descent as necessary.

Another profile is the idle descent. This descent will vary based on the airspeed in which it is flown, but if flown at the same speeds as the previously described 3° profile, it will result in approximately a 6° profile taking half the distance to descend at twice the rate of descent (~3,000 to 3,600 fpm).

There will be situations when ATC will keep you high, for whatever reason, until much later (steeper) than either the 3° or the idle profiles. In this case extra drag—gear and/or flaps—might be appropriate. Keep in mind the limitations in terms of altitude and airspeed and always remember to say “unable” to ATC if they ask something beyond your performance capabilities.

Approach

The approach phase can be one of the most critical, challenging and stressful phases of any flight. Again, planning and preparation are the keys to success. You should always plan and self brief the arrival, approach, and missed approach during a low workload time such as at cruise—just prior to beginning your initial descent. Proficiency is also critical. Instrument flying is a perishable skill. It must be practiced on a regular basis in order to keep our skills equal to the task. Whenever possible and appropriate, plan on flying an instrument approach even if in VFR conditions.

<u>Cockpit organization</u>

In the spirit of staying ahead of the jet, have any/all materials you may need during the approach arranged and readily accessible before actually beginning to fly the approach. Set up the PFD and MFD, and avionics to the maximum extent possible as early as possible.

<u>Briefing</u>

There are many techniques of briefing an instrument approach. The purpose of the briefing is to become completely familiar with how to safely fly the approach and missed approach while minimizing workload. Any technique will suffice as long as all critical areas are covered. The “briefing strip” on many approach plates covers the required data.

<u>Autopilot</u>

Although hand-flying an instrument approach can be done from time to time for proficiency purposes, the autopilot should normally be used to the maximum extent possible. The minimum altitudes for the autopilot on approach are 400’ AGL for a precision approach and 400’ AGL for a non-precision approach.

Stabilized approach Criteria

Part of every safe arrival and approach plan is to position and configure the aircraft in order to fly a “stabilized approach”. The following criteria should be used every time a VFR or IFR approach is flown:

IMC

By 1,000’ AGL:

- Final landing configuration
- Maximum of 1,000fpm descent
- Airspeed stabilized within 20 knots of Vref
- On course
- On glidepath (if precision approach)

By 500’ AGL:

- Landing checklist complete

VMC

By 500’ AGL:

- Final landing configuration
- Maximum of 1,000fpm descent
- Airspeed stabilized at Vref
- Aligned with runway
- Landing checklist complete

Visual Descent Point (VDP)

A VDP should be established and used for non-precision approaches. Some VDPs are published, but others must be computed by the pilot. Compute the VDP by subtracting the threshold crossing height from the height above touchdown (HAT) and divide by 300. This will give you the distance, in nautical miles, from the threshold.

Personal minimums

Because every pilot possesses a varying amount of experience, skill, and recency, each pilot must establish personal limits for beginning and continuing an approach. These minimums will be based on proficiency, aircraft status, physical status, and myriad other factors. Your personal minimums will likely be more restrictive than the legal minimums. They may change from day to day—or even in the same day.

Speed ranges for approach category type aircraft

The Eclipse 500 is an Aircraft Category B airplane due to its approach speeds being between 91 and 120 knots. If flying an approach at a higher airspeed than 120 knots for any reason (circling, no flap), use Category C minima.

Minimum Flap Maneuvering Speeds

Flaps are used in the approach phase to increase the safety and stall margin while allowing the aircraft to fly at a lower airspeed.

For maneuvering (up to 30° bank) with adequate stall margin safety, adhere to the following minimum flap speeds:

UP min speed 130 knots

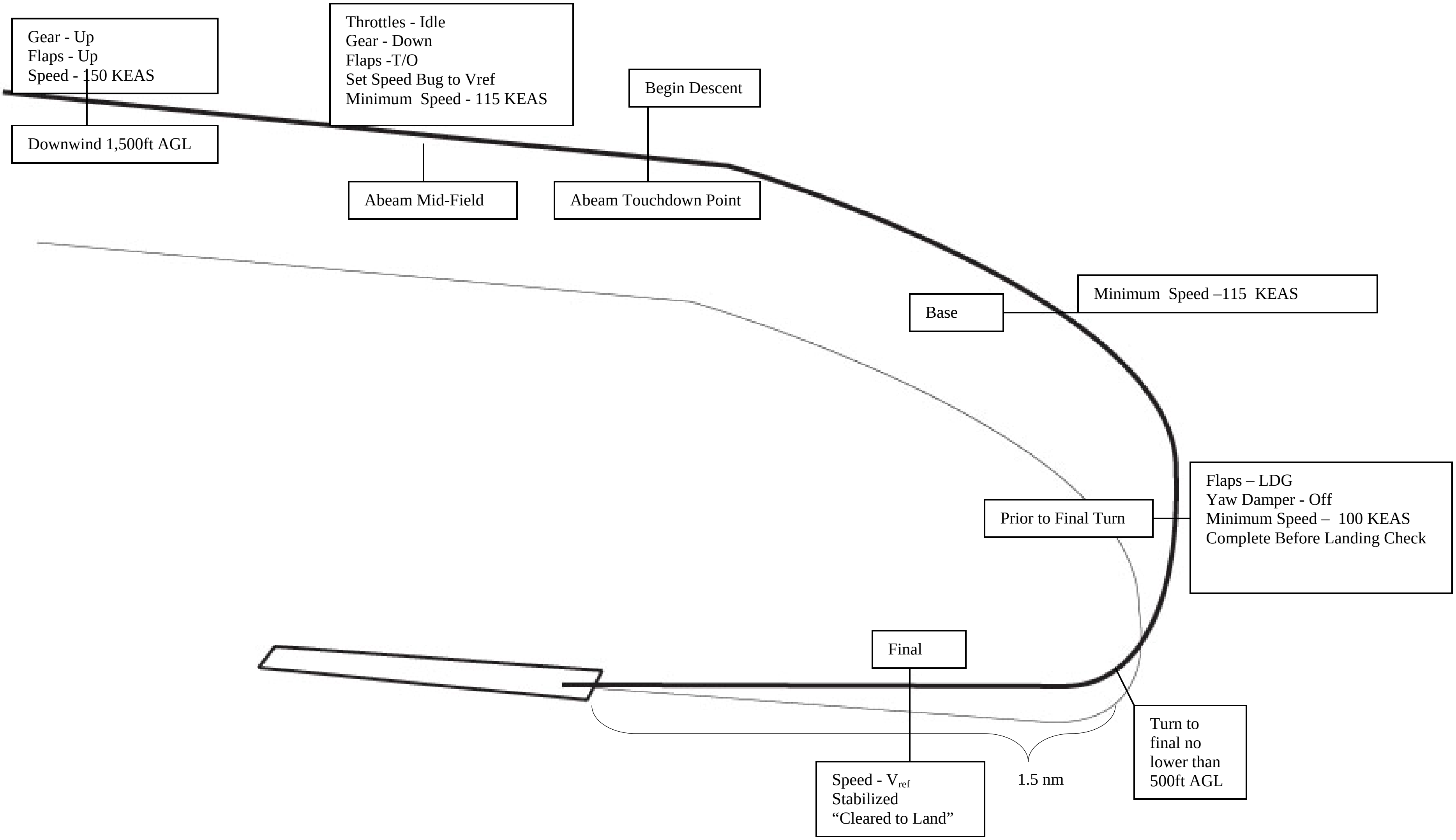
TO min speed 115 knots (max speed 200)

LDG min speed 100 (max speed 120)

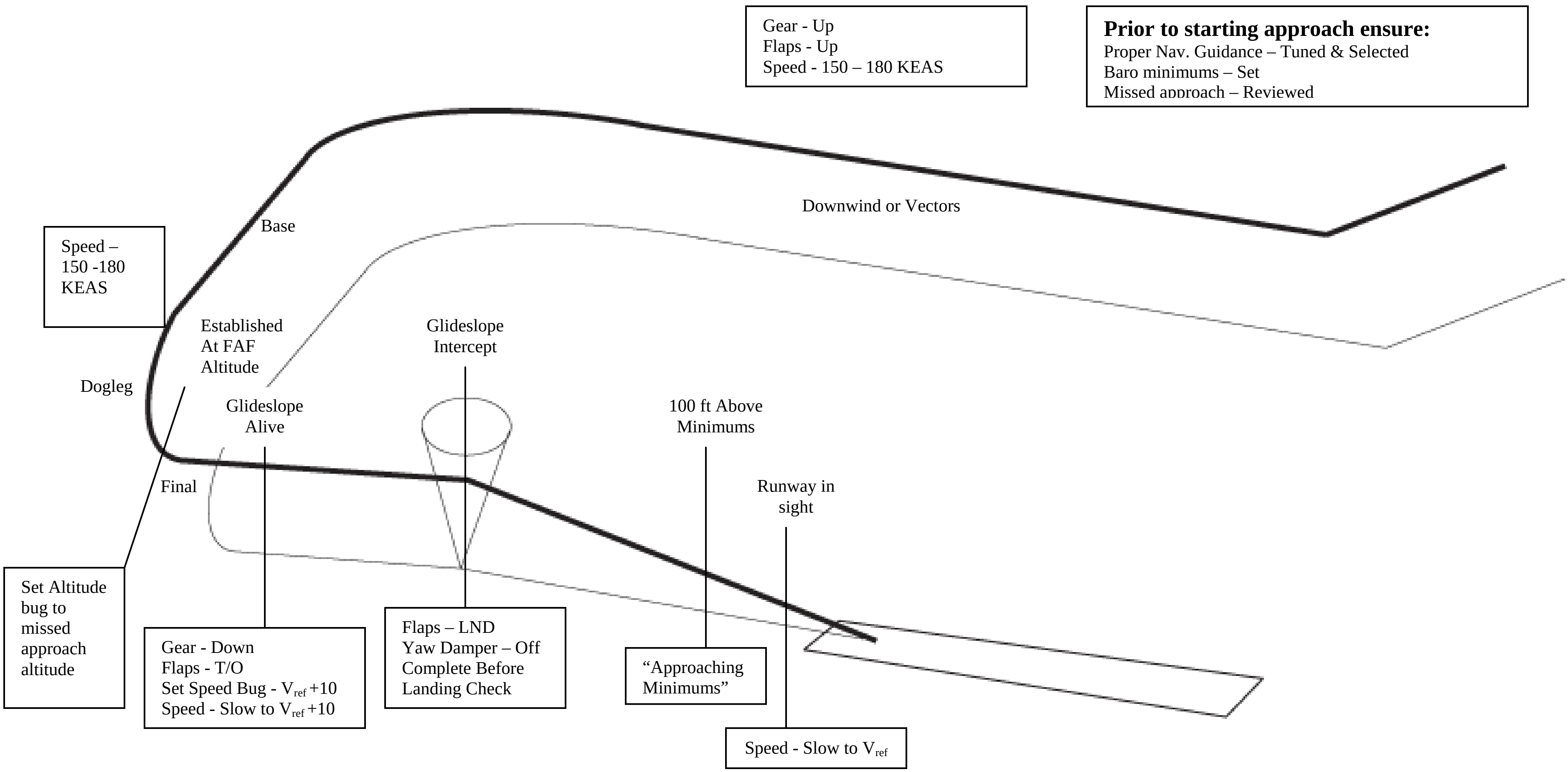
If conditions require maneuvering below these speeds, limit bank angle to 15°.

When de-configuring aircraft (example: takeoff and go around), flap lever can be moved to the next detent 10 knots prior to the above minimum maneuvering speeds as long as the aircraft is accelerating.

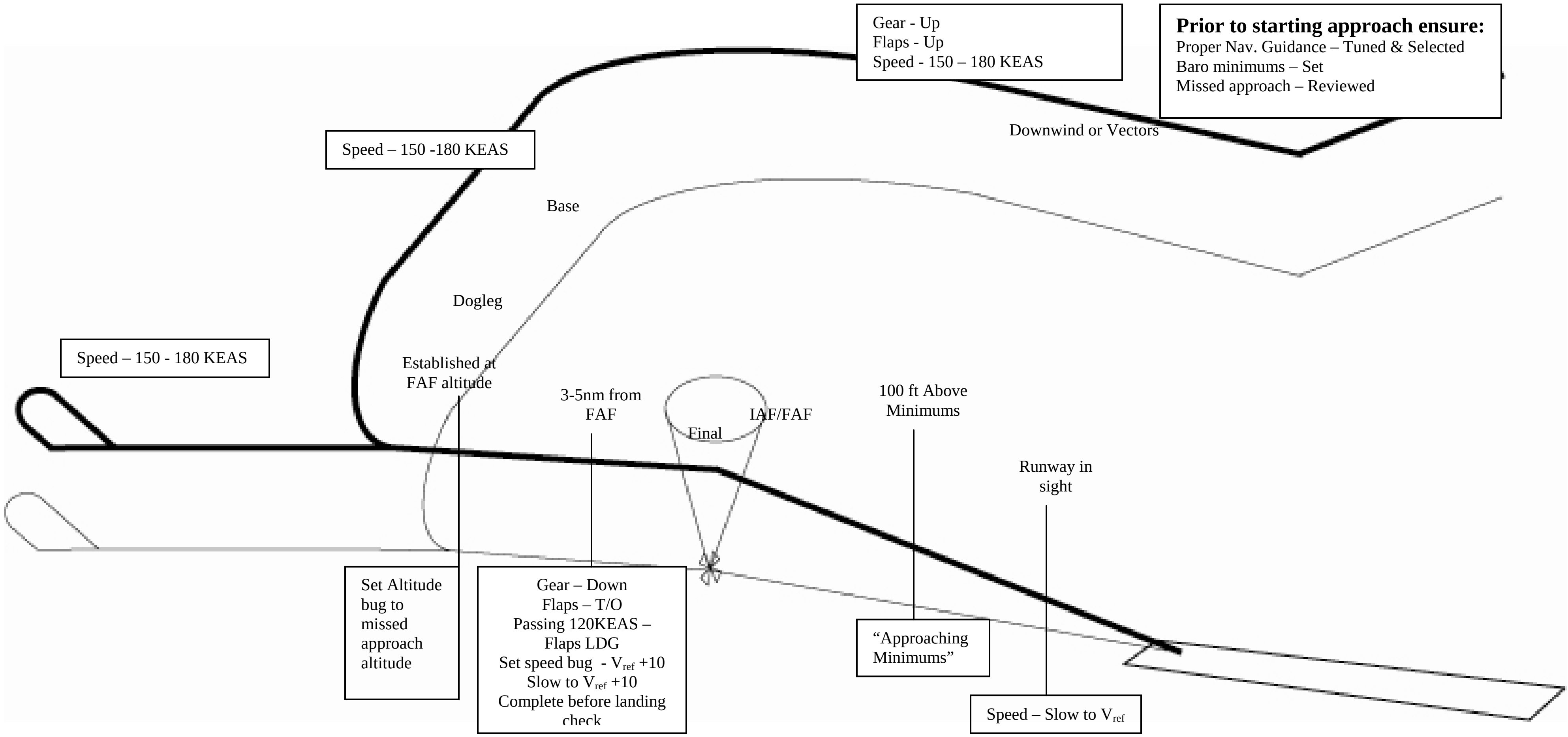
Eclipse 500
Visual Traffic Pattern – Normal



Eclipse 500
Normal Precision Approach

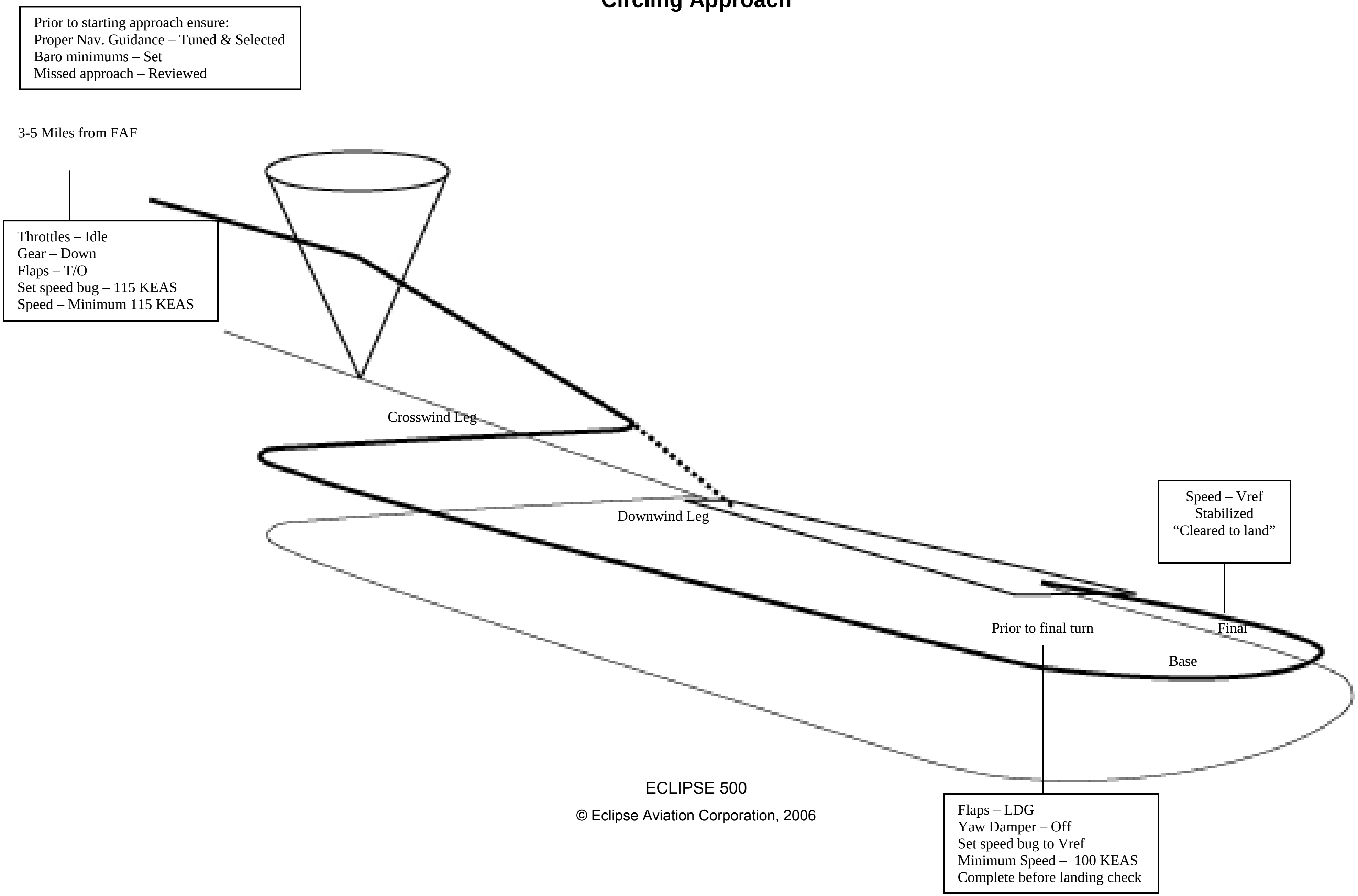


Eclipse 500
Normal Non Precision Approach



ECLIPSE AVIATION

Eclipse 500
Circling Approach



ECLIPSE 500

Missed approach / rejected landing

A rejected landing or missed approach is required if any one of the conditions defining a stabilized approach is not met. Additionally, a missed approach must be executed if the required conditions of 91.175 are not met and maintained. Lastly, a missed approach or rejected landing should be made if a safe landing is in doubt, for any reason. The most critical aspect of performing this maneuver is making the decision to do so.

Once the decision to execute a missed approach or rejected landing is made;

Simultaneously:

- Select throttles max
- Pitch to 10° nose high

Then:

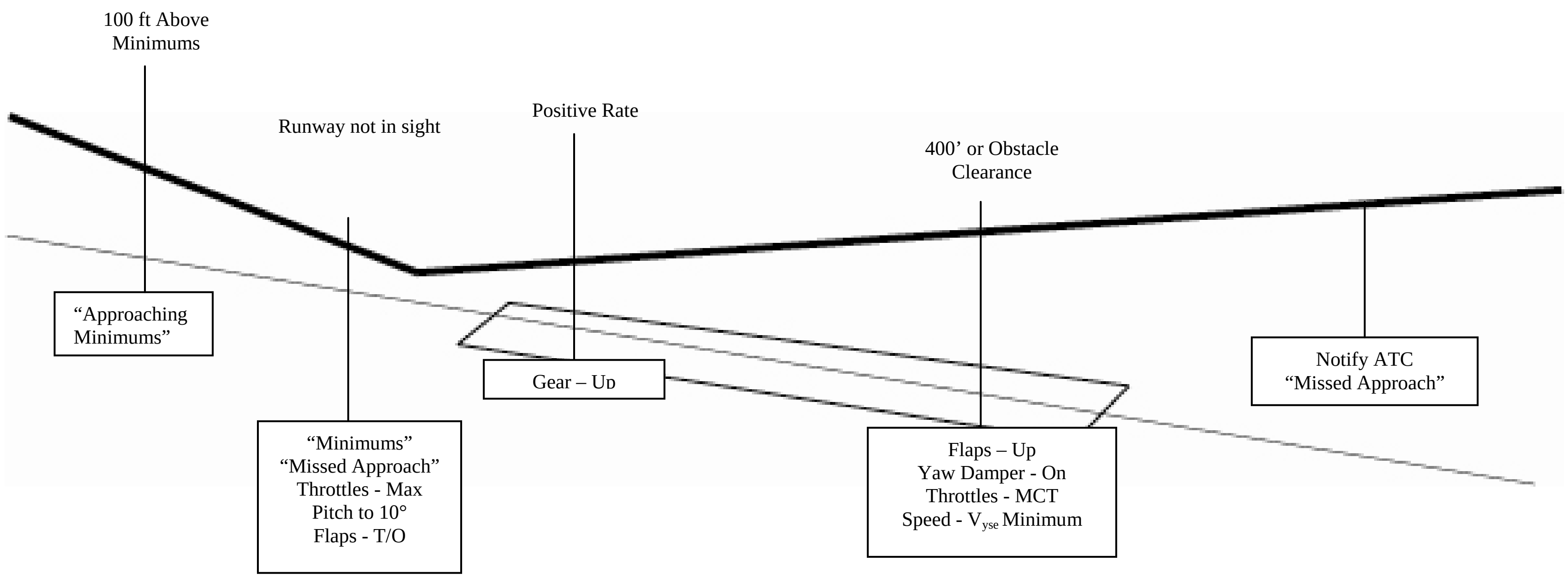
- Select flaps TO

Confirm positive rate of climb and select landing gear UP. Maintain pitch attitude at 10°. At 400' AGL, or obstacle clearance, flaps UP and accelerate to at least Vyse. Advise ATC and fly the missed approach procedure.

NOTE

During flight training, the rejected landing will be called out by the instructor at 50 feet AGL. The missed approach should be initiated by the pilot at anytime he or she feels it is necessary or when called out by the instructor.

Eclipse 500
Normal Missed Approach



Holding

Holding is usually an unplanned event, although it may be an expected possibility based on weather, traffic and other factors. Fuel conservation during holding may be critical.

The most fuel efficient holding airspeed for the Eclipse 500 is approximately Vref + 30 knots. Holding will be with flaps UP.

Holding in icing conditions, turbulence or pilot discretion may dictate a higher airspeed.

Landing

Configuration

The normal configuration for landing is gear down and flaps LDG. The aircraft can be landed safely with flaps in TO or UP with penalties in landing distance (see AFM section 5 performance section).

Adverse weather

Make an assessment of how weather may affect your landing. Wind, precipitation, and contaminated runway will affect your decision to land and braking technique.

Normal

The end result of a proper landing is "on-speed, on target". The aircraft should land at the desired point and desired airspeed—approximately 1,000' AGL past the threshold and just a few knots above stall.

A quality landing begins with a stabilized final, regardless if flying an IFR or VFR approach.

Maintain the appropriate approach airspeed and flight path until 200' AGL. Below 200' AGL, begin transition from the approach mindset to the landing mindset. The goal is to arrive over the threshold at Vref. Power reduction is a matter of pacing. In most conditions, if the approach is stable, power should be at idle when crossing over the threshold (approximately 50'). If a strong headwind is present, a late reduction will be in order. If no wind or tailwind, an earlier reduction will be necessary. Reference a visual aimpoint somewhere around the numbers and imagine simply driving the aircraft to that spot. Be very 'measured' in your power changes.

After power is at idle, simply hold the aircraft off until it's ready to land. Don't 'force' it down—unless there is an overriding reason to do so. The touchdown should occur with a 3°- 5° pitch attitude and 5-10 knots above stall and approximately 500' to 1,000' past the threshold.

After touchdown, smoothly lower the nose, maintain centerline, and begin smooth, assertive application of brakes.

Short Field/Obstacle

If landing runway length is limited and / or there is a close-in obstacle, refer to the AFM / POH, Performance chapter to determine landing performance margins.

A short field approach/landing is essentially the same as a normal approach/land. At the normal approach speed, establish a normal descent to the touchdown aiming point. Simultaneously, reduce thrust to idle and touch down at the desired point and airspeed. Do not let the aircraft float. Begin maximum braking immediately after the nose wheel is down. Maximum braking is slightly more aggressive than normal braking, but definitely avoid locking up a brake, potentially resulting in a blown tire.

Crosswind

While crosswind landing techniques differ, one acceptable method is to approach the runway while tracking the centerline in a crab. Approaching the threshold, establish a bank angle into the wind to prevent drifting downwind across the runway while applying opposite rudder to keep the airplane longitudinal axis aligned with the runway centerline. Touch down in this cross control configuration and immediately lower the nose to assist in directional control. Increase aileron into the wind as the airplane decelerates.

Bounced

If a bounce occurs, this generally means you had too much airspeed and/or too high descent rate. After a bounce, immediately establish the landing pitch attitude—slightly nose high. At this point, assess runway remaining and decide whether to attempt to continue the landing or do a go-around.

Touch and Go

For training or proficiency, a touch and go may be desired. This procedure is designed to return the aircraft to a normal takeoff configuration as soon as possible after landing so as to not diminish the runway available. The maneuver should only be done with sufficient runway available with primary focus on aircraft control. Consideration must also be made for the touchdown point; a long landing may dictate a full stop instead of the touch and go.

After accomplishing a normal landing with all three wheels on the ground and throttles in idle:

1. Retract the flaps to T/O; confirm movement
2. Confirm adequate runway available
3. Advance the throttles to max
4. Rotate at Vr

NOTE

During actual aircraft flight training, the instructor will brief whether the landing will be a touch and go or a full stop. If there is doubt, the pilot should accomplish a full stop landing. The minimum runway length used for touch & goes will be 6,000' (7,000' if temperature is above 30° C).

4. ABNORMAL OPERATIONS

Emergency management

It is critical to have a coherent philosophy in how to deal with an abnormal situation or emergency. There are 3 principal steps you must follow in any and all abnormal situations:

1. Maintain aircraft control
2. Analyze the situation
3. Take the proper action

The above steps are also priorities. The number 1 step, maintain aircraft control, is absolutely the number one priority. If you do not continue to fly the airplane, all else is moot. The autopilot should be considered one of the primary resources to assist in maintaining aircraft control.

Step number 2 involves a thorough knowledge of your aircraft and its systems. To analyze a situation, you must first assimilate the information given to you by the aircraft via CAS messages, warning and caution lights, flight and engine instruments, aircraft handling, etc. Acknowledge all CAS messages by depressing the master warning/caution light so that any new messages will illuminate it again.

Step 3 will be determined by step 2. The proper action in some cases may be memory item execution, while in others, execution of an emergency checklist. It is critical that the analysis in step 2 be careful and deliberate, so that the action taken in step 3 does not make the abnormal situation worse (e.g., shutting down the wrong engine).

In most abnormal situations, there will be two possible conclusions—land as soon as possible or land as soon as practical.

> Land As Soon As Possible: Land without delay at the nearest airport where a safe approach and landing can be accomplished.
>
> Land As Soon As Practical: Landing airport and duration of flight are at the discretion of the pilot. Extended flight beyond the nearest suitable airport is not recommended.

Go No-Go Decision

More often than not, the decision to fly or not fly will be determined by the pilot in command prior to engine start. This decision process is described earlier in this manual under Risk Assessment/Risk Management.

Occasionally, the “go or no-go” decision will be determined by the pilot in command in an instant during takeoff roll. This decision should be thoroughly self-briefed for any potential circumstances prior to setting takeoff power.

For the Eclipse 500, any abnormal prior to Vr should be reason to reject the takeoff. For any abnormal after Vr, the pilot must consider the severity of the abnormal and the runway remaining. Abnormals such as engine failure, fire, wind shear, and questionable aircraft control should be considered reasons to reject the takeoff as long as there is runway available.

Rejected takeoff

If the decision to reject the takeoff is made, immediately bring both throttles to idle and apply braking (up to maximum) commensurate with remaining runway. When able, notify ATC with callsign, runway number and any assistance required. Once the aircraft is stopped, execute any abnormal checklist as appropriate. If the abort was at a high speed and maximum braking was used, consider potential for hot brakes and taxiing to a clear area for brake cooling. Consideration must also be given to whether to clear the runway, calling for fire department or other emergency vehicles, emergency evacuation, etc.

NOTE

During actual aircraft flight training, the rejected takeoff maneuver will be thoroughly briefed between the instructor and the pilot. The objective is to train the actions required to make a successful rejected takeoff and to demonstrate those actions that may be required following the event. In accordance with the practical test standards, the rejected takeoff maneuver will be begin no later than ½ Vmc (~30 KEAS).

A rejected takeoff will be introduced by reducing thrust on one engine with a throttle. Doing so requires several precautions:

- *Runway not less than 50’ wide*
- *Airspeed not greater than ~30 kts*
- *Guard the rudder against application of the wrong rudder.*

Once the pilot performs the proper initial steps of the rejected takeoff, at the instructor’s discretion, the takeoff may be continued.

Single engine operations

Flying the Eclipse 500 on a single engine involves close adherence to proper airspeeds. The most important of which is Vyse. Anytime the aircraft is operated single engine, the aircraft should not be allowed to go below this airspeed until landing is assured.

Takeoff

Before every takeoff, the pilot should plan for an engine failure in the context of existing takeoff conditions.

The most critical point for an engine failure is the takeoff and departure. Preflight planning must consider this possibility. If an engine fails on takeoff, the choices are to abort or continue. AFM takeoff performance data tells the pilot what performance margins are available considering gross weight, density altitude, runway length, wind and obstructions. Other factors to consider are weather and terrain. If the single engine climb performance for a T/O flaps takeoff is unacceptable, consider flaps UP takeoff for better single engine climb performance as long as there is sufficient runway available for the longer takeoff roll.

If an engine failure occurs before liftoff, with sufficient runway remaining, the takeoff should be aborted and the airplane brought to a stop.

Following an engine failure during takeoff with a decision made to continue, confirm the throttles to max and APR ON, apply appropriate rudder for coordinated flight while lowering the nose slightly to continue acceleration. Landing gear should be retracted normally at positive rate of climb. Maintain a minimum airspeed of V_{50}. Climb straight ahead (conditions permitting) to 400' AGL or obstacle clearance, whichever is higher. At that point, if a T/O flaps takeoff was conducted, retract flaps to UP and accelerate to the flaps UP Vyse. When above 1,000' AGL consider engaging the autopilot and executing the appropriate checklist.

Your first consideration should be to return to the departure airport unless returning is a poor option (e.g., poor weather at the departure airport, high terrain etc.).

See diagram for engine failure after takeoff profile.

Planning for an engine failure should include a planned flight path after takeoff. This may be dictated by the presence of terrain and obstructions. Density altitude, terrain and obstacle factors could be such that commitment to an off-airport landing may be required.

If performance conditions are marginal or unacceptable, the pilot may have several options to mitigate this risk:

- Consider a flaps UP takeoff for better single engine climb performance
- Plan departure under more favorable conditions.
- Reduce the fuel and / or cabin load.
- Cancel the flight.

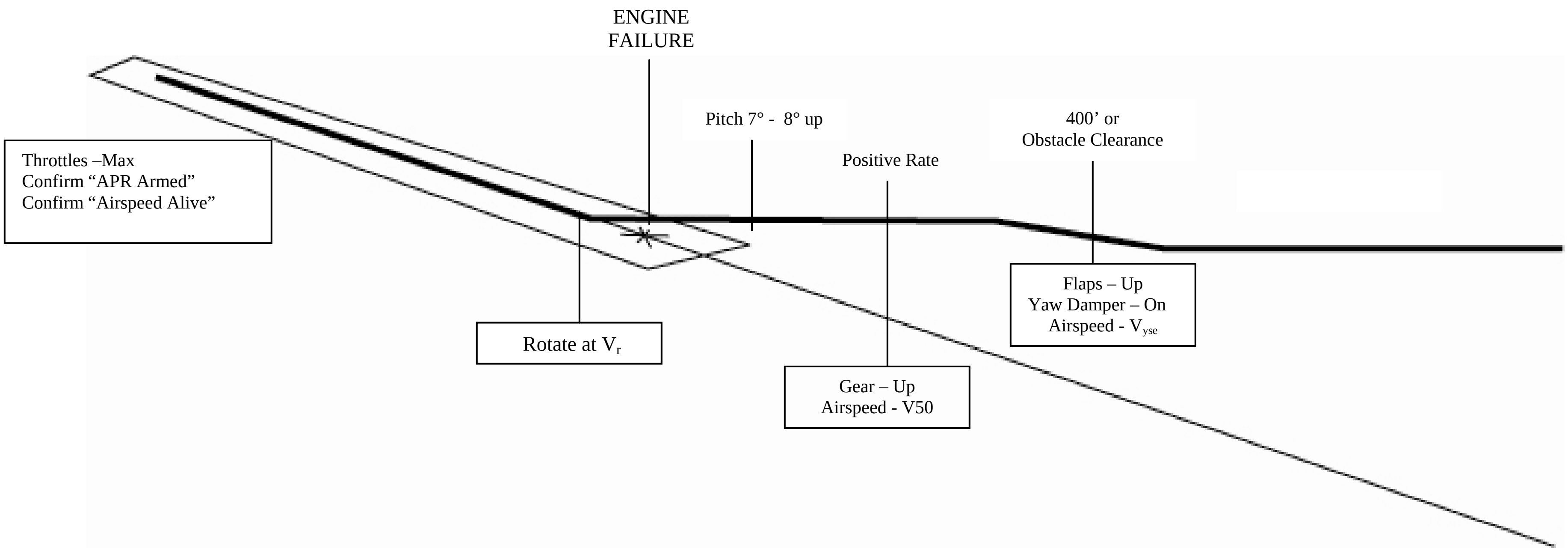
NOTE

During actual aircraft flight training, the engine failure after takeoff will be induced by the instructor slowly bringing one throttle to idle. This will occur at an altitude not lower than 500' AGL and airspeed not less than Vyse.

Airspeed discipline is the primary focus and objective. Always be mindful of V_{YSE} and not permit an unintentional sped variation significantly below or above that speed. V_{YSE} provides the best rate of climb (or minimum rate of descent) in the event of an actual engine failure. If climb performance is not possible at V_{YSE} (which will be briefed prior to the maneuver), demonstrate the performance then discontinue the simulation.

Before simulating an engine failure after takeoff, give careful thought to all factors that may affect a safe outcome (e.g., terrain, density altitude, landing options, traffic etc.).

Eclipse 500
Engine Failure – Takeoff Continued



Departure

An engine failure on climbout with airspeed above Vyse gives the pilot a few more options. Knowledge of single engine performance is still critical to determine the extent of those options. If an engine failure occurs on departure, immediately set APR, apply appropriate rudder for coordinated flight and pitch to maintain level flight. After declaring an emergency, returning to the departure airport is the most desired option. Keep in mind that the highest priority at the time is "maintain aircraft control". Fly the airplane!

NOTE

During actual aircraft flight training, the engine failure will be induced by the instructor slowly bringing one of the throttles to idle. This will occur at an altitude at least 500' AGL and airspeed not less than Vyse.

Cruise

An engine failure while en route probably will occur well above the maximum altitude that can be maintained on one engine (single engine absolute ceiling). As a result, a gradual descent (driftdown) will occur.

For optimum performance immediately set Automatic Power Reserve (APR) thrust on the operating engine and maintain level flight at or above V_{YSE}. If it is not already on, consider engaging the autopilot. Allow the airspeed to decay in level flight until reaching Vyse. If airspeed continues to decrease, begin a gradual descent controlling pitch to maintain Vyse.

Anytime you have an engine abnormal, identifying the affected engine is absolutely critical. When identifying the affected engine, use all indicators at your disposal (engine indicators, rudder pedal displacement, yaw indicator, and CAS messages).

After identifying the proper engine, execute any memory items that may apply and execute the appropriate abnormal checklist.

Advise ATC of your situation, declare an emergency and request assistance as circumstances require. Select the nearest suitable airport and turn toward it.

NOTE

During actual aircraft flight training, the engine failure will be induced by the instructor slowly bringing one of the throttles to idle. This will occur at an altitude at least 500' AGL and airspeed not less than Vyse.

Approach

During the approach phase, do not slow the aircraft below Vyse until landing is assured. This will likely dictate a flaps TO approach due to flap airspeed limitation. Once landing is assured you can select flaps LDG and decelerate below Vyse to Vref. You can also choose to maintain the current configuration and continue with flaps TO, but your speed will be Vref+10 and landing distance will increase.

See diagrams for single engine precision and non-precision approach profiles.

The pilot should always consider coordinating with ATC alternate missed approach instructions of a runway heading climb if the published missed approach procedure cannot be safely flown single engine.

NOTE

During actual aircraft flight training, the engine failure will be induced by the instructor slowly bringing one of the throttles to idle. This will occur at an altitude at least 500' AGL and airspeed not less than Vyse.

Visual Pattern

A single engine traffic pattern should be flown as much like a normal pattern as possible. As with any single engine operation, airspeed discipline is critical—do not fly slower than Vyse. As described earlier, do not attempt any turns until at least 400' AGL or minimum safe altitude. After reaching pattern altitude, fly the downwind leg at the normal 150 knots, if possible. Delay gear extension and flaps TO until abeam the touchdown point of the desired runway and/or ready to begin descent ("gear down to go down"). Maintain normal pattern airspeeds. When wings level on final and landing is assured, select flaps LDG. At this point, slow to Vref (or Vref + 15 if landing with flaps TO), and execute a normal landing.

Missed Approach

In the event that a single engine missed approach is necessary, proper aircraft control is essential. Simultaneously advance throttle to APR thrust, apply appropriate rudder for coordinated flight and set an initial pitch attitude following the flight director. At positive rate of climb or if ground contact is not imminent, raise the gear. Fly at Vyse. When above 400' AGL or when terrain is not a factor, select flaps UP and accelerate to the new flaps UP Vyse.

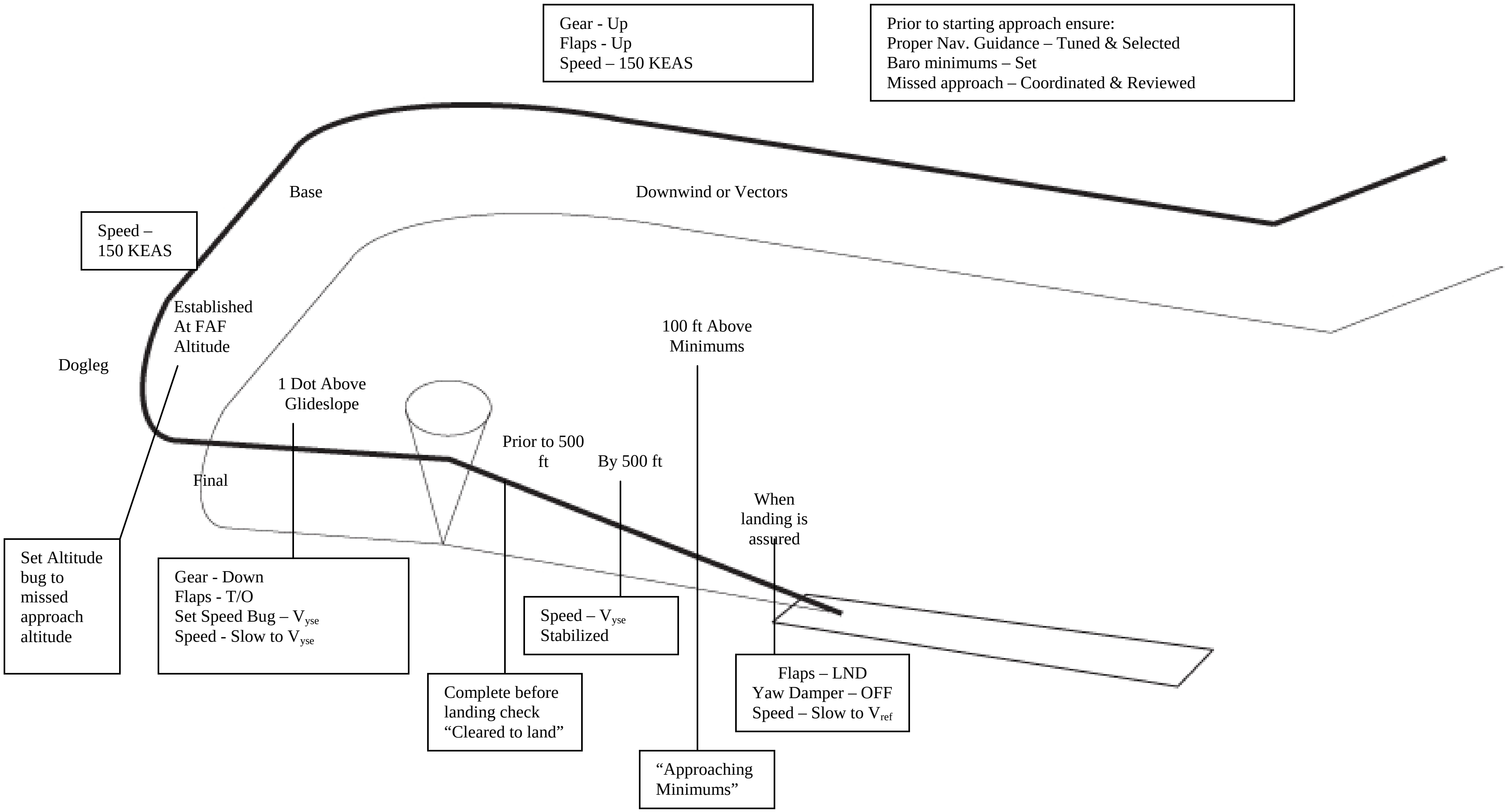
See diagram for single engine missed approach profile.

NOTE

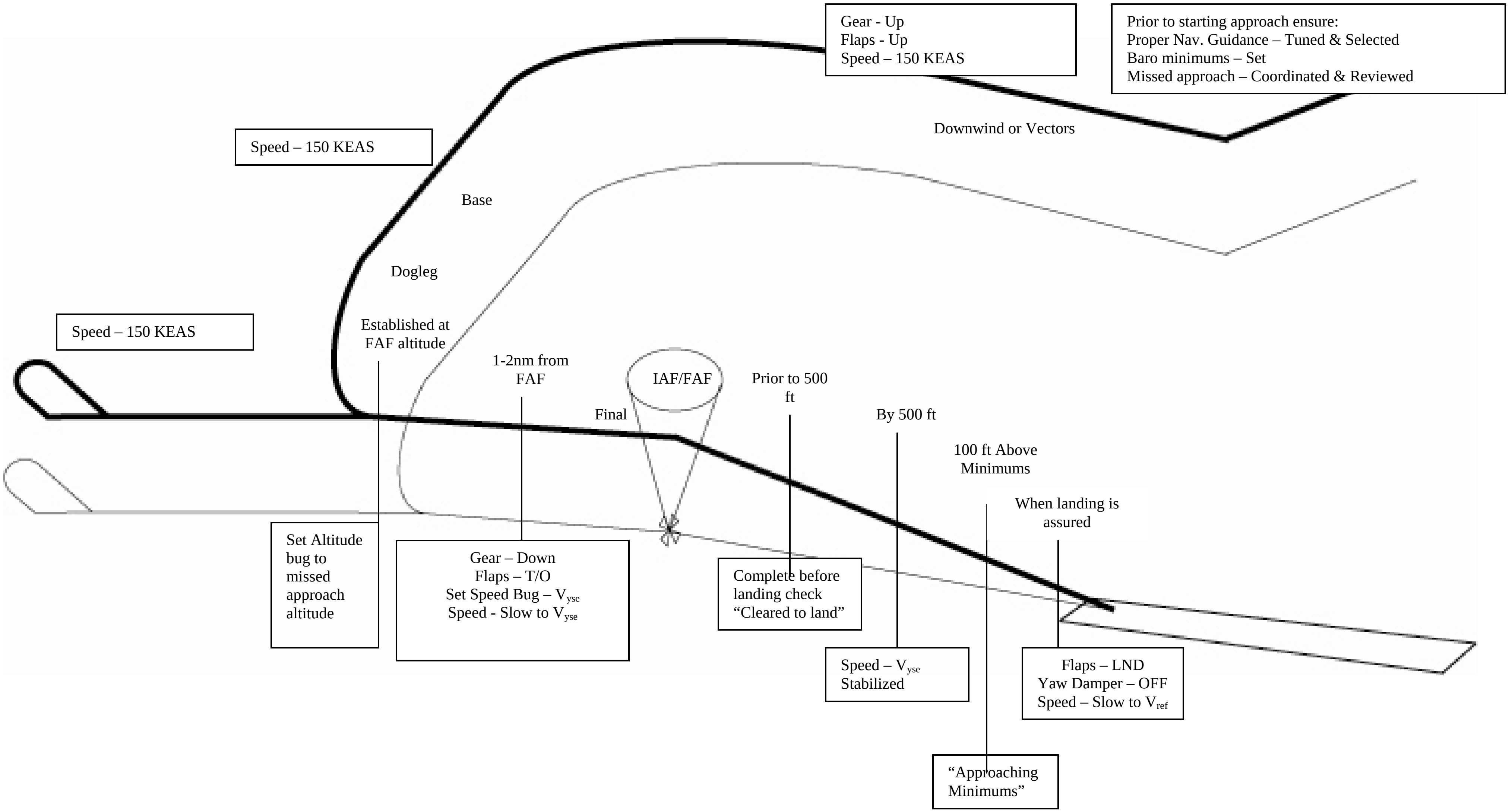
During actual aircraft flight training, if single engine climb performance is marginal, the instructor will discontinue the maneuver by directing the pilot to resume use of both throttles.

Eclipse 500

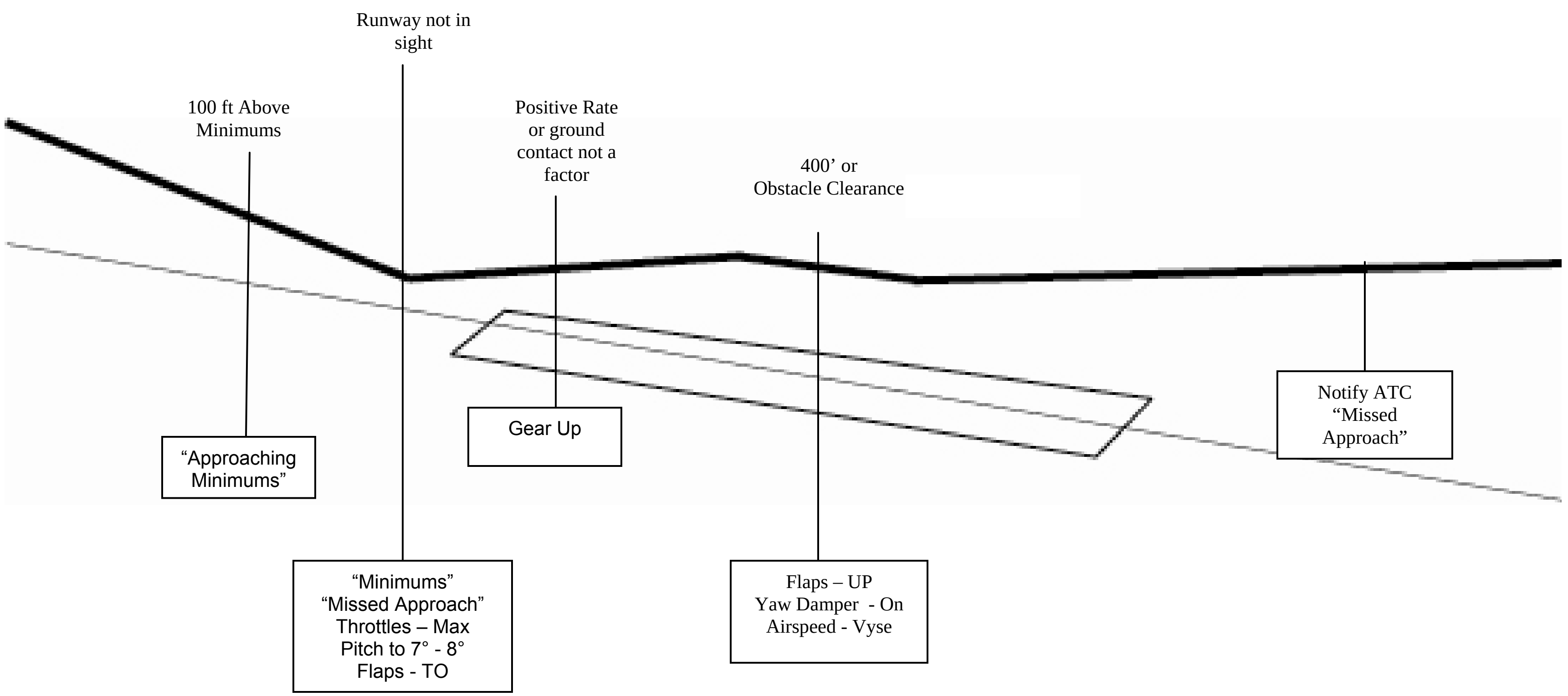
Single Engine Precision Approach



Eclipse 500
Single Engine Non Precision Approach



Eclipse 500
Single Engine Missed Approach



Landing

Landing with a single engine does not require any special technique. The only difference might be a higher airspeed over the threshold due to higher approach speed. Consider this and allow for a longer landing distance.

Landing with flap malfunctions

A flap malfunction may result in landing with flaps other than LDG. This will dictate a higher approach and landing speed, resulting in a longer landing distance up to 50% longer. When in the flare, do not hold aircraft off the runway; make a deliberate touchdown and begin braking.

Windshear

A windshear encounter at low altitude can place the aircraft in a situation requiring maximum performance in minimum time. Improper or ineffective response to windshear can result in loss of control and/or flight into terrain.

Severe windshear is that which produces changes (observed or reported) greater than:

- 15 knots airspeed
- 500 fpm vertical speed
- 5° pitch attitude,
- 1 dot displacement from the glideslope
- unusual thrust lever position for a significant period of time

WINDSHEAR AVOIDANCE: The first priority in any windshear condition is to avoid it. Delaying the takeoff or approach and waiting for better conditions is usually the best defense against windshear. Also, making the takeoff or approach in a direction as to avoid exposure to localized windshear is an option. If a takeoff or approach is necessary and no actual windshear has been reported, the pilot should take precautions when executing a takeoff or approach/landing.

WINDSHEAR PRECAUTIONS

Takeoff: If windshear is suspected or there is a potential for windshear (“Windshear advisory in effect” on ATIS), add 10 knots to the computed Vr and maintain the recommended 10° pitch attitude until at a safe altitude. If using Vr + 10 knots, ensure runway length is at least 1,000’ longer than minimum required.

Approach/Landing: If windshear is suspected or there is a potential for windshear (“Windshear advisory in effect” on ATIS), add ½ the wind gust factor, if any, to your approach and landing speeds. Plan on making a deliberate touchdown to minimize flare and exposure to the potential windshear. Consider increased runway length requirement due to higher landing speed.

WINDSHEAR RECOVERY: If windshear is encountered, altitude loss is of primary concern. Apply full power and set 10 degrees of nose up pitch to maintain or gain altitude. Do not change the configuration of the airplane until confident the aircraft is clear of the windshear and normal aircraft climb performance is determined. If altitude cannot be maintained and ground contact is possible, increase pitch to maintain an airspeed just above the audible and visual stall warnings ("Stall, Stall") until a climb is achieved. Once the Aircraft is clear of the windshear, reconfigure the aircraft for normal flight.

In-flight cabin smoke

In-flight smoke can be an extremely dangerous situation. Immediate donning of your oxygen mask and subsequent completion of the "Cabin Smoke or Fumes" memory items is time-critical.

In any smoke in cabin or fire emergency, these 3 priorities should be used:

1. "Cabin Smoke or Fumes" memory items

   Protect yourself and passengers while ventilating the cabin

2. Plan to land

   Do not delay descent or diversion to find the smoke source. Coordinate with ATC and land at the nearest suitable airport. Consider an evacuation.

3. Identify

   Execute "Cabin Smoke or Fumes" checklist

Emergency descent/rapid decompression

This is another situation in which time can be critical. An emergency descent, due to decompression, smoke in the cabin, or any other reason, must be done in a timely manner, but also deliberately and safely.

To execute an emergency descent, establish the recommended target pitch attitude of -20° (this can be expedited by banking the aircraft and allowing the nose to fall), and monitor airspeed and mach number. Reduce pitch as necessary when airspeed passes 250 KEAS/.60 M so as not to exceed Vmo/Mmo.

For collision avoidance considerations, immediately declare an emergency and use ATC to help with traffic. After memory items are complete, controlling the descent so aircraft limitations are not exceeded becomes the priority. If it becomes necessary to increase descent rate, consider lowering the landing gear if below 200 KEAS while making shallow turns.

If structural damage is suspected or significant turbulence is encountered, consider a reducing airspeed to Vo (180 KEAS).

Single and dual generator failure

Electrical problems require adequate knowledge of the overall system in order to understand the problem and its consequences. The Eclipse 500's electrical synoptic will assist the pilot in analyzing any electrical anomaly. Although the various checklists are straightforward, some aircraft functions may be lost in the process. In the event of a dual generator failure, the batteries will provide 30 minutes of usable power and it is essential to land within this time frame.

Emergency evacuation

If an evacuation of the aircraft is required, it is very important that all on board are "on the same sheet of music". The preflight briefing, in at least general terms, should include how this is to be accomplished and locations of the primary and emergency exits. Given enough time, a more detailed brief should be re-accomplished before landing.

In all evacuation situations, the pilot in command must make it clear to all on board that only he/she may initiate the evacuation.

NOTE

During actual aircraft flight training, the emergency evacuation procedure will be simulated by a discussion between the pilot and instructor. During training, the pilot will be given the opportunity to become familiar with the opening of the emergency exit door.

Unusual Attitude/Upset Recovery

An upset can generally be defined as unintentionally exceeding the following conditions:

- Pitch attitude greater than 25° nose up, or
- Pitch attitude greater than 10° nose down, or
- Bank angle greater than 45°, or
- Within above parameters, but flying at airspeeds inappropriate for the conditions

The following techniques represent a logical progression for recovering the aircraft. The sequence of actions is for guidance only and represents a series of options to be considered and used, depending on the situation.

Nose high recovery

- Recognize and confirm the situation
- Disconnect autopilot and autothrottle and adjust power as required
- Adjust bank angle to obtain a nose-down pitch rate
- Complete the recovery
  - o When approaching the horizon, roll to wings level
  - o Check airspeed and adjust thrust

Nose low recovery

- Recognize and confirm the situation
- Disconnect autopilot and autothrottle and adjust power as required
- Roll in shortest directions to wings level
- Recover to level flight

NOTE

During aircraft flight training, this maneuver will be accomplished above 3,000' AGL.

5. FLIGHT TRAINING OPERATIONS

Introduction

The following section is a quick reference guide to descriptions and explanations of Eclipse 500 flight training maneuvers. The pilot will be expected to perform these maneuvers during the course of initial and recurrent flight training.

These training maneuvers are designed to give the pilot the skills required in all operations of the aircraft and to become familiar with its basic handling qualities.

NOTE

During aircraft training, the flight instructor is the pilot in command. The question of who is flying the airplane must never be in doubt. If it becomes necessary for the instructor to assume control of the airplane for any reason, he or she will say, "I have the Flight Controls" and shake the control stick. Once the pilot feels the instructor on the controls and hears the instructor's command, the pilot must release the controls immediately and without question by stating "You have the Flight Controls". When it comes time the instructor will give control of the aircraft back to the pilot, he or she will say, "You have the Flight Controls" but will not relinquish control until the instructor feels the pilot shake the control stick and say "I have the flight controls".

Maneuvers

<u>Pitch and Power Familiarization</u>

Early during Eclipse 500 flight training, the pilot should be introduced to the concept and benefits of flying with target pitch attitudes and thrust settings (pitch & power) for common configurations.

The table below provides the pilot with initial parameters that should only be used as a baseline to maintain airspeed and flight path in a given configuration. These pitch and power targets are not meant to be memorized, and they do not replace basic attitude instrument flying. They simply serve as a guide for a new pilot in the Eclipse 500.

ECLIPSE 500
TARGET PERFORMANCE

MANEUVER	GEAR	FLAPS	AIRSPEED	THRUST (Target)	ATTITUDE (Target)
LEVEL	UP	UP	180	74-78% N_1	1-2° NU
LEVEL	UP	UP	150	60-65%	1-2° NU
DESC 600 fpm	DOWN	LDG	Vref + 10	60-65%	2-3° ND
DESC 1000 fpm	DOWN	LDG	Vref + 10	55%	3-5° ND

<u>Steep Turns</u>

The steep turn is used to familiarize the pilot with the Eclipse 500 handling characteristics and improve the instrument cross check. The attitude indicator is reliable for accurate pitch and bank information throughout the turn. In addition the altimeter, VSI, and airspeed all must be involved in the instrument cross check.

Entry:

- Establish a constant altitude and heading
- Airspeed 150 - 180 knots
- Smoothly roll into 45° bank
- Simultaneously add power as required (2 - 3% N1) to maintain 180 knots and increase pitch (add 2° nose up) to maintain altitude
- Start the rollout of the turn at 10° prior to the assigned heading (usually 180° from entry heading and smoothly reduce pitch and power to maintain altitude and airspeed

NOTE

In actual aircraft training, this maneuver must be accomplished above 3,000' AGL.

<u>Slow Flight</u>

Slow flight maneuvers may be used as an introduction to approaches to stalls. It is also an excellent training maneuver to become proficient and comfortable with the flight characteristics of the Eclipse 500 at slow airspeed and high angle of attack. Slow flight should be conducted in various configurations; full and partial flaps, gear UP and DOWN.

To enter slow flight, reduce power and allow the aircraft to slow to Vref minus 5 (flaps LDG) or Vref plus 5 (flaps TO). Maintain altitude by adjusting pitch and power. Make gentle turns left and right (no more than 15° bank), being careful to maintain coordinated flight.

NOTE

In actual aircraft training, this maneuver must be accomplished above 3,000' AGL.

Missed Approach Exercise

The missed approach exercise is used to familiarize the Eclipse 500 pilot with the proper missed approach procedure in the transition from an approach to rejected landing/go around. The procedure is outlined in the Normal Operations section of this manual.

Approach To Stall

The approach to stall maneuver is used to familiarize the Eclipse 500 pilot with the handling characteristics of the Eclipse 500 at near stall airspeeds, its stall warnings and protections, and the correct stall recovery techniques. The intent of the maneuver is not to stall the aircraft, but to recognize the indications (aural warnings and/or stick pusher) and apply the proper recovery procedures to avoid a stall.

Immediately after recognition of stall warning, stall recovery should be initiated so as to minimize any altitude loss. Recovery is complete when the aircraft is maintaining level flight or climbing.

The Eclipse 500 instructor will brief the condition/configuration of the approach to stall and will also direct whether the approach to stall is turning or wings level.

During approaches to stalls in a turn, be alert to uncoordinated flight.

The following are the entry set-up and recovery procedures for each approach to stall.

- Landing Configuration

Entry:

Throttles idle
Airspeed below 200, Gear down, flaps TO
Airspeed below 120, Flaps LDG
Smoothly adjust pitch and trim to establish and maintain a 600 fpm descent until first indication of stall.

Upon first indication of stall, *simultaneously*:

Apply maximum thrust
Roll to wings level (if turning)

Reduce AOA to avoid stall
Select flaps TO
Once thrust is restored (wait for engine spoolup), establish pitch up attitude to reestablish altitude
Retrim as airspeed increases
Positive rate, gear up
Above 100 knots, flaps UP
Recover with minimum altitude loss

- Takeoff Configuration

Entry:

Airspeed below 200, Flaps TO
Slow to between 120 and 150 knots
Set power to mid-range while smoothly increasing pitch to 15°; use bank if instructed
Recover at first indication of stall

Upon first indication of stall, *simultaneously*

Apply maximum thrust

Roll to wings level (if turning)

Reduce AOA to avoid stall
Once thrust is restored (wait for engine spoolup), establish pitch up attitude to reestablish altitude
Above 100 knots, flaps UP
Recover with minimum altitude loss

- Clean Configuration

Entry:

Throttles idle
Smoothly increase pitch and trim to maintain altitude until first indication of stall
Recover at first indication of stall

Upon first indication of stall, *simultaneously*:

Apply maximum thrust
Roll to wings level (if turning)
Reduce AOA to avoid stall
Once thrust is restored (wait for engine spoolup), establish pitch up attitude to reestablish altitude
Recover with minimum altitude loss

NOTE

In actual aircraft flight training, prior to each approach to stall, a 90° clearing turn should be made and accomplish all approach to stalls so as to remain above 3,000' AGL.

In-Flight Engine Shutdown/Restart

An actual engine shutdown and engine re-light will be performed by reference to AFM, Section 3, Emergency Procedures ("Engine Air Start" checklist).

When executing the "Engine Air Start" checklist, ensure throttle of operating engine is set to MCT and maintain coordinated aircraft control throughout the procedure.

NOTE

In aircraft flight training, the engine shutdown should be performed no lower than 3,000' AGL and in a position where a safe landing can be made on an established airport in the event difficulty is encountered in restarting the engine.