FLIGHT CREW TRAINING MANUAL

PA44 – Seminole

Version 1.0
30.01.2012
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Inhalt

Vorwort

Das Training Manual Piper Seminole dient als verbindliche Arbeits-grundlage zur Harmonisierung der praktischen IFR-, CPL- bzw. ATPL-Ausbildung und des Zwei-Mot.-Ratings. Die beschriebenen Verfahren basieren auf den Richtlinien des BMV für die Ausbildung und Prüfung des Luftpersonals.

Fluglehrer und Flugschüler sollten sich daran orientieren, um das Ausbildungsziel in optimaler Weise zu erreichen.

Ändern sich Gesetze, Verordnungen oder Richtlinien, so gelten diese Änderungen mit ihrem Inkrafttreten. Diese Unterlage wird dann entsprechend berichtigt.

1. Geschwindigkeiten

Die folgenden Geschwindigkeiten (IAS) sind wichtig für den sicheren Betrieb des Flugzeugs.
Die Angaben beziehen sich auf Standardbedingungen in MSL bei maximalem Fluggewicht.

v_R (Rotation Speed)	75 kts
v_X (Best Angle of Climb Speed)	82 kts
v_Y (Best Rate of Climb Speed)	88 kts
Cruise Climb Speed (best economic)	110 kts
v_{MCA} (Minimum Control Speed Air) = red line	56 kts

v_{YSE} (Best Rate of Climb Speed Single Engine) = blue line	88 kts
Stall speed gear + flaps down	55 kts
Stall speed gear + flaps up	57 kts
v_A (Design Maneuvering Speed) 1999 kg	135 kts
v_{FE} (Max. Speed Flaps Extended) 40°	111 kts
Max. Gear Operating + Max. Gear Extended Speed	140 kts

v_{REF}	flaps up	=	85 kts
	flaps 10°/25°	=	80 kts
	flaps 40°	=	75 kts

v_{TGT}	= v_{REF}	+	$^1/_2$ Windspeed + Gusts
	= v_{REF}	+	max. 15 kts
	= v_{REF}	+	min. 5 kts

2. Power Settings

CONDITIONS	Power	KIAS	Pitch °
Initial Climb	**28'' / 2500**	**90**	**+8**
Cruise Climb	**25'' / 2500**	**110**	**+5**
Cruise (21/2300)	**21'' / 2300**	**140**	**0**
Approach clean	**17'' / 2300**	**110**	**0**
High Speed Final clean	**16'' / 2300**	**140**	**-2**
Approach Flaps 10°	**18'' / 2400**	**110**	**0**
Final Flaps 10° + Gear down	**15'' / 2300**	**110**	**-2**
Final Flaps 25° + Gear down	**13'' / 2400**	**90**	**-2**
Airwork	**18'' / 2400**	**120**	**0**
Slow flight clean	**16'' / 2400**	**100**	**0**
Slow flight Flaps 10°	**16'' / 2400**	**90**	**+1**
Slow flight Flaps 10° + Gear down	**17'' / 2400**	**90**	**+1**
Slow flight Flaps 25° + Gear down	**17'' / 2400**	**80**	**+3**
Slow flight Flaps 40° + Gear down	**17'' / 2400**	**70**	**+5**

3. Piper Seminole

4. Zulässige Windbedingungen

Maximale Querwindkomponente:	nach Handbuch 17 kts bei der Schulung 15 kts

5. Wettermindestbedingungen

Platzrundenflüge VFR:	Hauptwolkenuntergrenze min. 1500 ft Sicht min. 1,5 km
Überlandflüge VFR:	Hauptwolkenuntergrenze min. 2000 ft Sicht mit Lehrer min. 3 km
Take Off:	Hauptwolkenuntergrenze min. OCA (CAT1) + 200 ft Landebahnsicht (RVR) 1000 m keine bekannten Vereisungsbedingungen
Approach IFR:	Entscheidungshöhe OCA (CAT1) + 200 ft Landebahnsicht (RVR) 1000 m keine bekannten Vereisungsbedingungen
Enroute IFR:	keine bekannten Vereisungsbedingungen

6. Betriebsgrenzen für den Schulbetrieb

Start- und Landebahnlänge gem. Flughandbuch.
Schul- und Einweisungsflüge dürfen nur mit Fluglehrer durchgeführt werden.

Ansonsten sind die Betriebsgrenzen laut Flughandbuch einzuhalten.

7. Engine Failure Training

Die Erfahrung hat gezeigt, dass es nicht sinnvoll ist, Engine Failure durch Ziehen des Mixtures oder Abstellen der Benzinzufuhr zu simulieren. Das damit verbundene Risiko ist zu groß. Deshalb simuliert der Lehrer den Engine Failure durch langsames Zurücknehmen des Throttles.

Der Schüler führt die **"memory items"** durch (siehe emergency briefing) und fordert die **Emergency Checklist** an. Die Emergency Checklist wird dann als **"do-it list"** durchgeführt.

- Detecting a dead engine:

  - loss of thrust
  - a/c nose will point to dead engine
  - dead foot = dead engine

- 5° bank into running engine erleichtern das Geradeausfliegen.

- das Flugzeug immer austrimmen.

- **BLUE LINE SPEED = 88 kts**

- Das kritische Triebwerk ist dasjenige, das bei **Ausfall** die Flugeigenschaften am negativsten beeinflusst. Da die Seminole gegenläufig drehende Propeller hat, gibt es kein kritisches Triebwerk.

- Im Endanflug dürfen Landeklappen und Fahrwerk erst ausgefahren werden, wenn die Landung sichergestellt ist. Maximale Landeklappenstellung 10°.

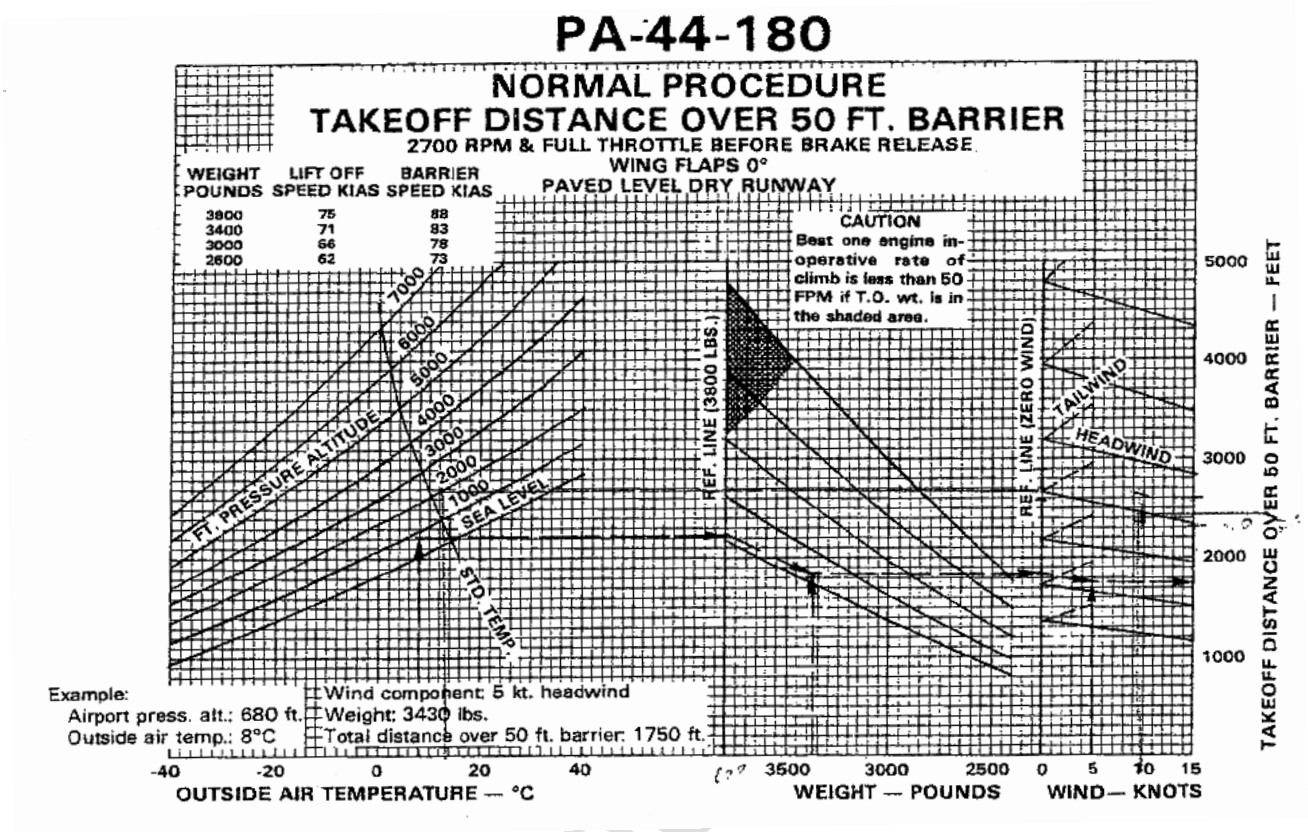
8. Single Engine Power Settings

CONDITIONS	Power	KIAS	Pitch °
Climb	**28'' / 2500**	**88**	**+8**
Cruise	**22'' / 2400**	**110**	**0**
Approach clean	**22'' / 2400**	**110**	**0**
Final Flaps 10° + Gear down	**14'' / 2400**	**90**	**-2**

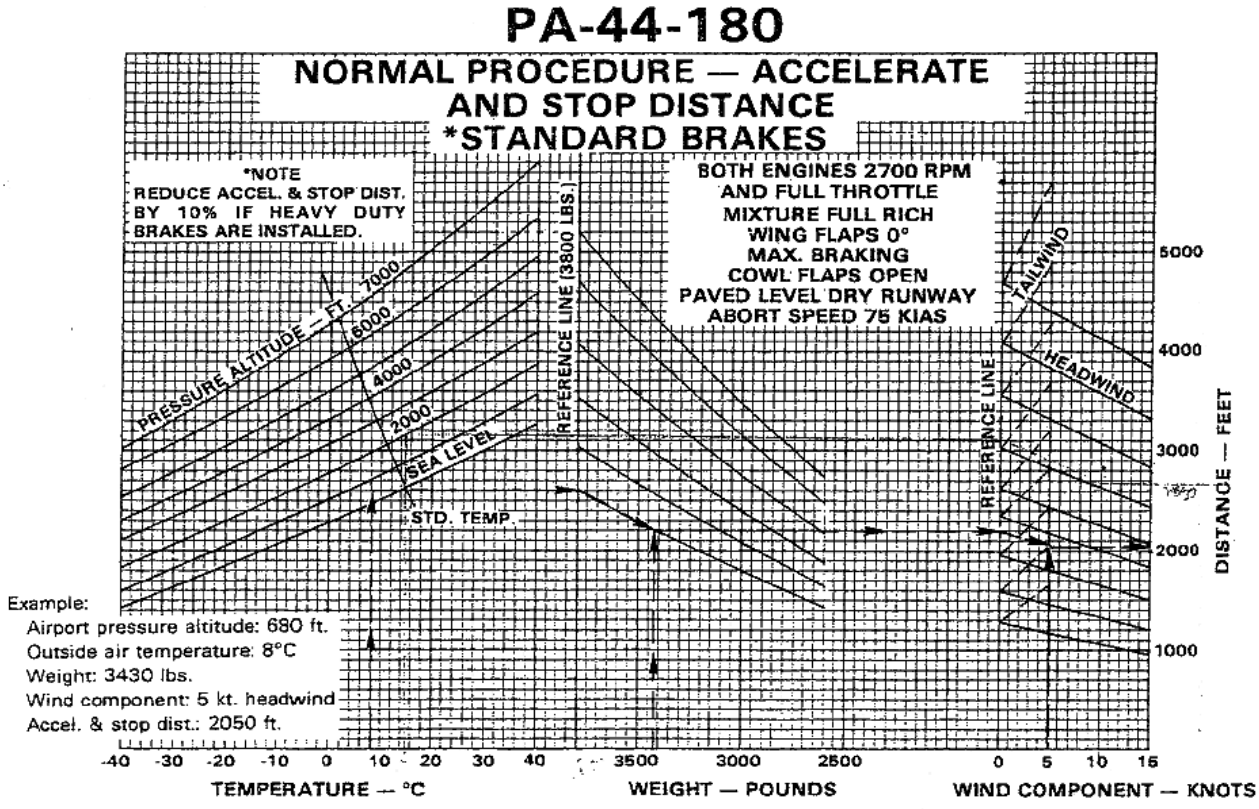
Maintain 5° bank into running engine.

Simulated Engine Failure Power: 11,5'' / 2000 RPM

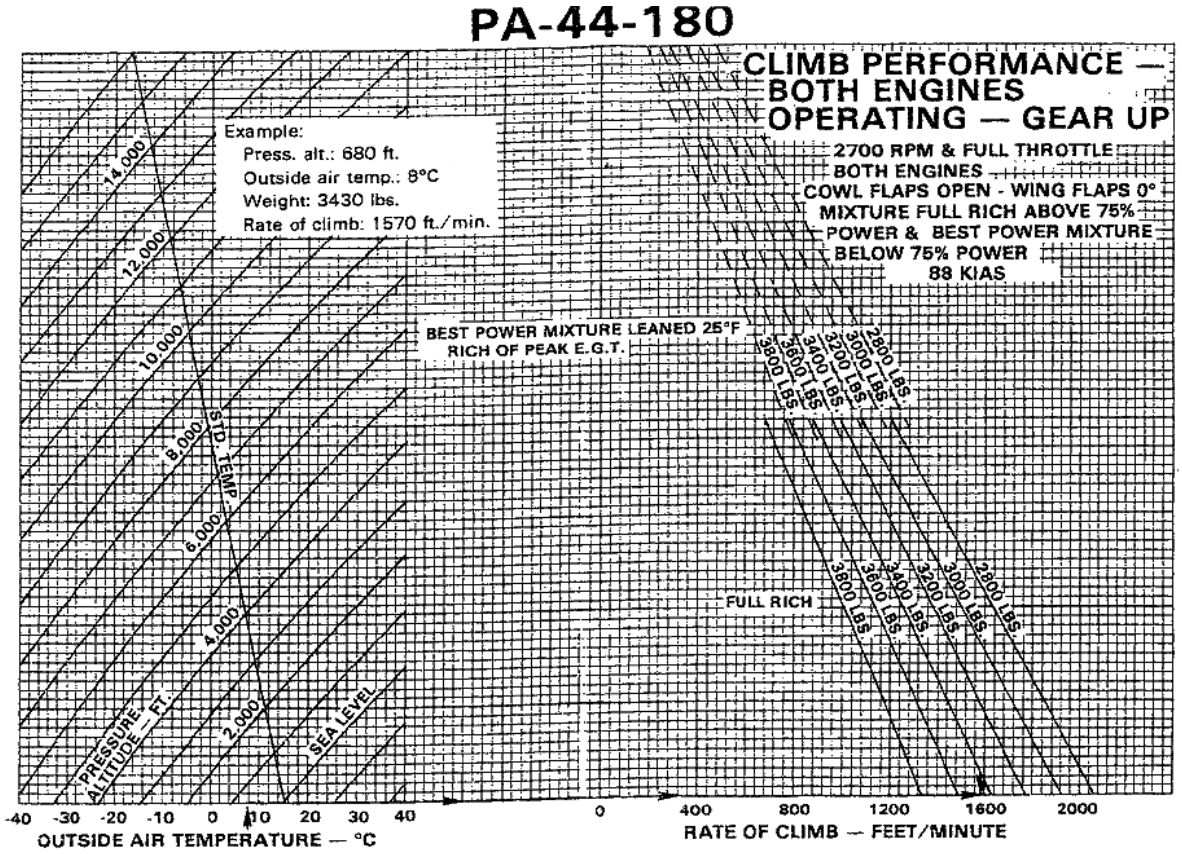
9. Take-off Distance over 50 ft



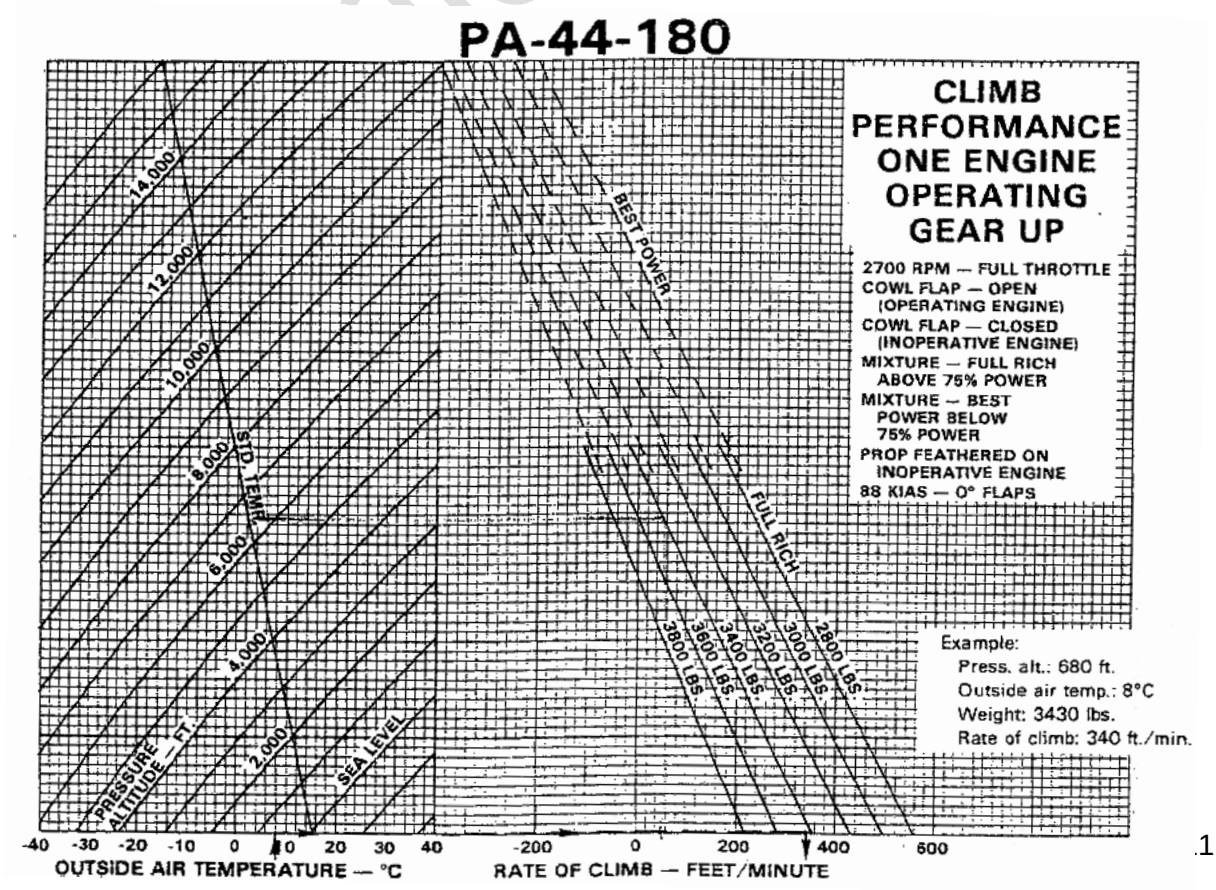
10. Accelerate and stop distance



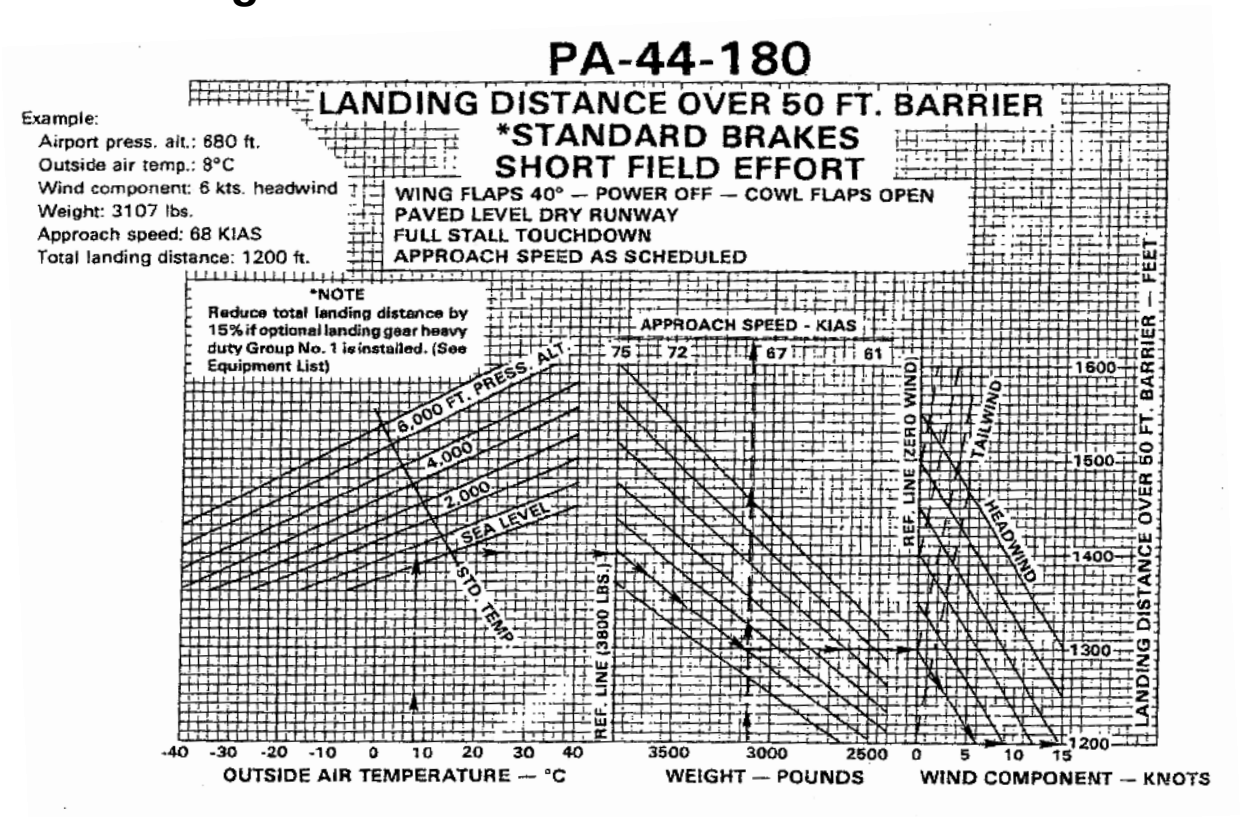
11. Climb Performance – Both engines



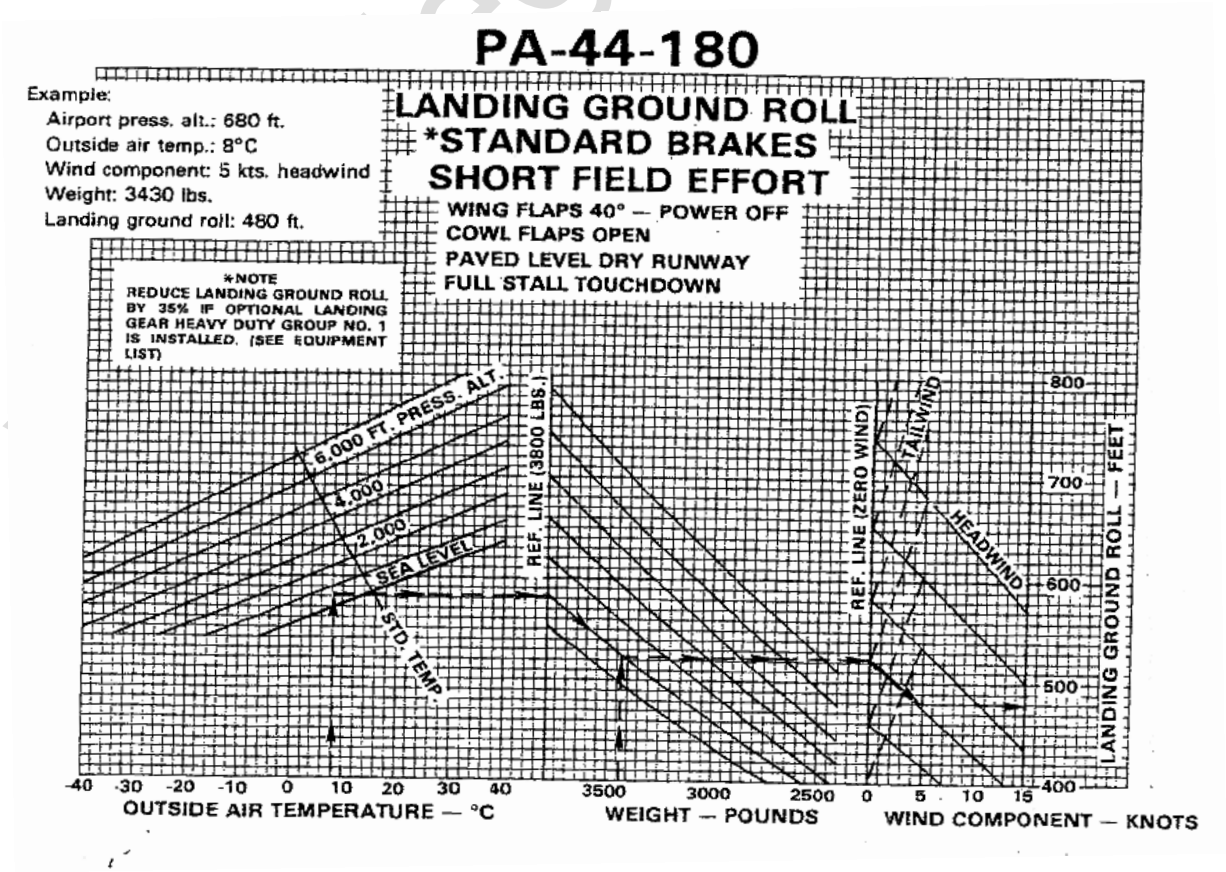
12. Climb Performance – One engine inoperating



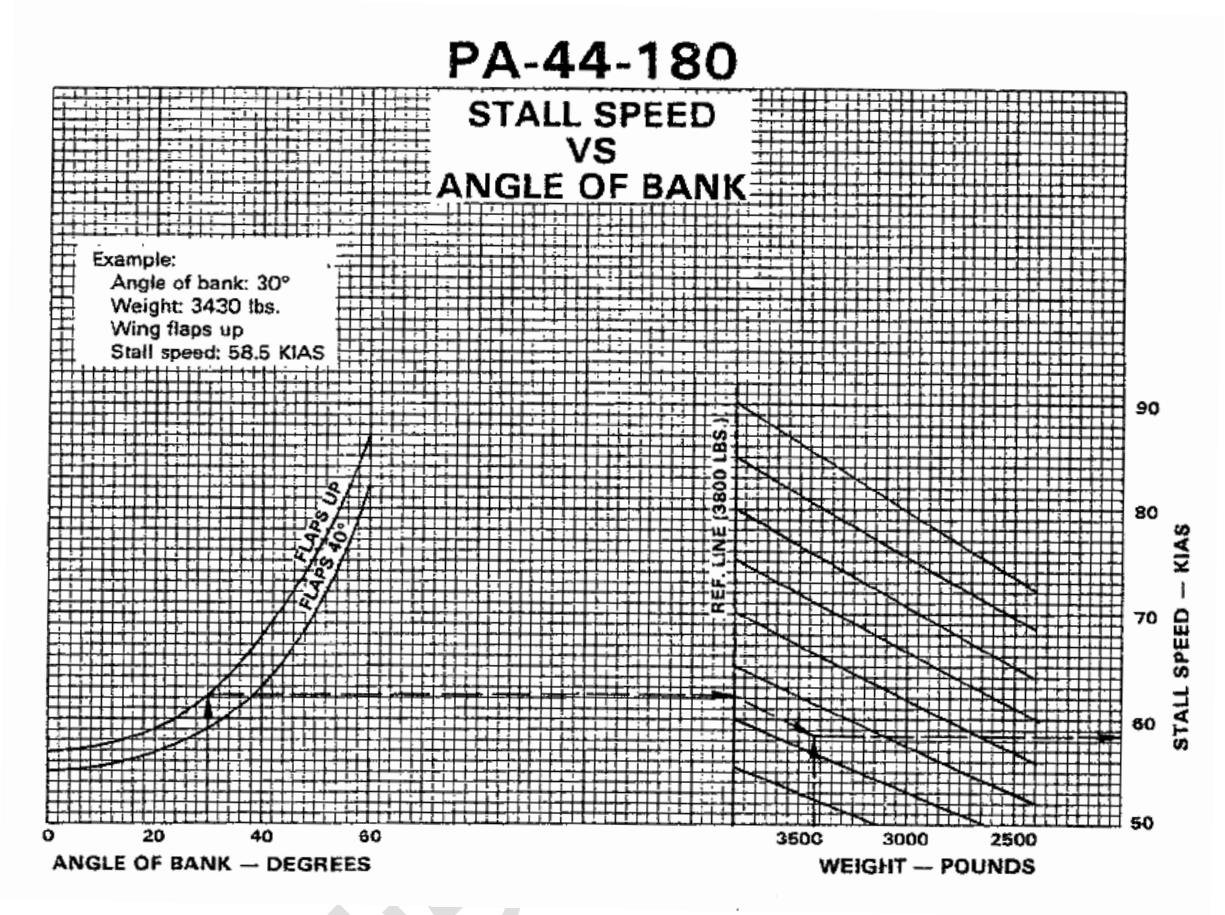
13. Landing Distance over 50 ft



14. Landing Ground Roll



15. Stall Speed – Angle of bank



16. Ladeplan mit Beispiel

Station	Arm (inches)	Mass (lbs)	Moment (in.lbs.)	Example Weight	Moment
Basic D-GEDM	87,4	2612	228.289	2612	228.289
Pilot + Copilot	80,5			340	27.370
Seat 3+4	118,1			170	20.077
Baggage (max. 200)	142,8				
Fuel (max. 108 Gal useable)	95,0			648	61.560
TOTAL				3770	337.296

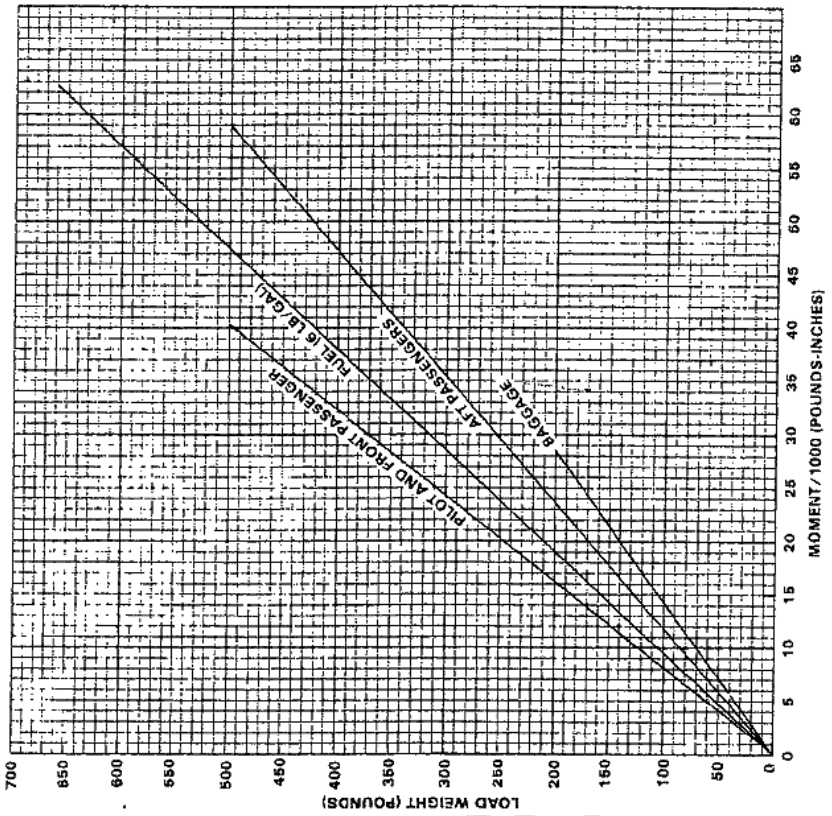
EXAMPLE:

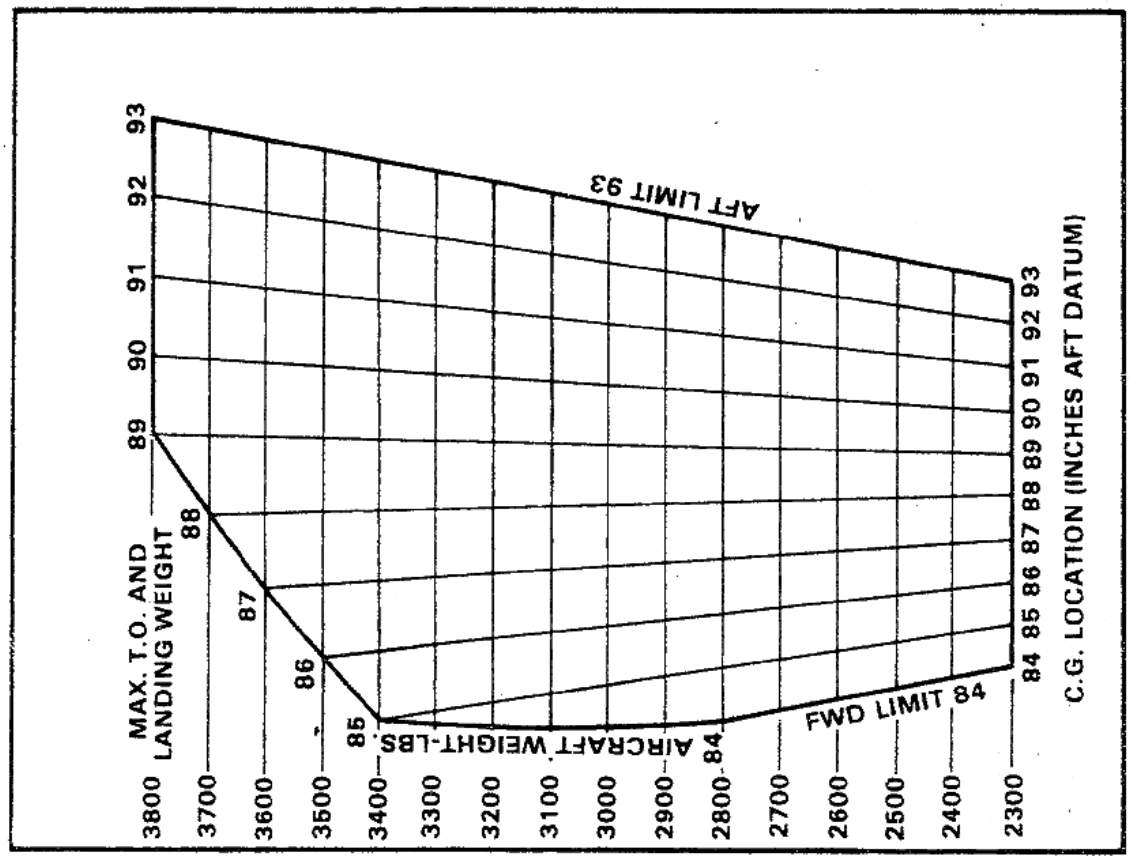
$$\text{C.G. FOR T/O} = \frac{\text{TOTAL MOMENT}}{\text{TOTAL MASS}} = \frac{337.296}{3770} = \underline{89{,}47}$$

CHECK MASS AND C.G. ON FOLLOWING SIDE!

Fuel Tanks			
Gal.	**ltr.**	**Weight**	**Moment**
108	399	648	61560
100	378	600	57000
80	303	480	45600
60	227	360	34200
40	151	240	22800
20	76	120	11400

Max. Ramp Mass: 3816 lbs
Max. T/O Mass: 3800 lbs
Max. Landing Mass: 3800 lbs


LOAD WEIGHT (POUNDS)
MOMENT/1000 (POUNDS-INCHES)
PILOT AND FRONT PASSENGER
FUEL 16 LB/GAL
AFT PASSENGERS
BAGGAGE


MAX. T.O. AND LANDING WEIGHT
AIRCRAFT WEIGHT-LBS.
C.G. LOCATION (INCHES AFT DATUM)
AFT LIMIT 93
FWD LIMIT 84

17. Fuel Calculation mit Beispiel

Für alle Trainingsflüge ist eine Fuel-Calculation anhand der im Flight-Log errechneten Zeiten durchzuführen.

Prinzipiell wird das Schulflugzeug bei Standardtrainingsflügen auf allen 2 Tanks voll betankt. Daraus ergibt sich ein Kraftstoffvorrat von:

108 Gal = 409 ltr.

Davon sind

10 ltr. für Start und Taxi abzuziehen = 399 ltr.

Hieraus errechnet sich eine sichere Flugzeit von ca. 5 Stunden, wenn man einen Verbrauch von 80 ltr./h zu Grunde legt.

Bei einem angenommen Verbrauch von 80 ltr./h sind bereits Zuschläge für eventuelle Steigflüge eingerechnet.

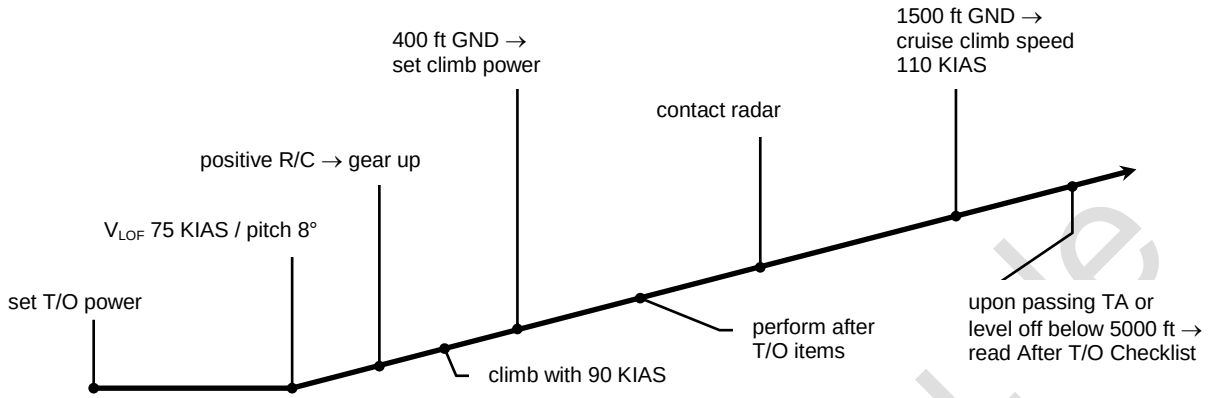
Musterberechnung

	Time	**Fuel**	**Time**	**Fuel**
Trip Fuel	2:30	200		
Contingency 10 %	0:15	20		
Alternate	0:30	40		
FINRES	0:45	60		
Min. T/O Fuel	4:00	320		
Extra Fuel	0:59	79		
T/O Fuel	4:59	399		
Startup + Taxi		10		
Block Fuel		409		

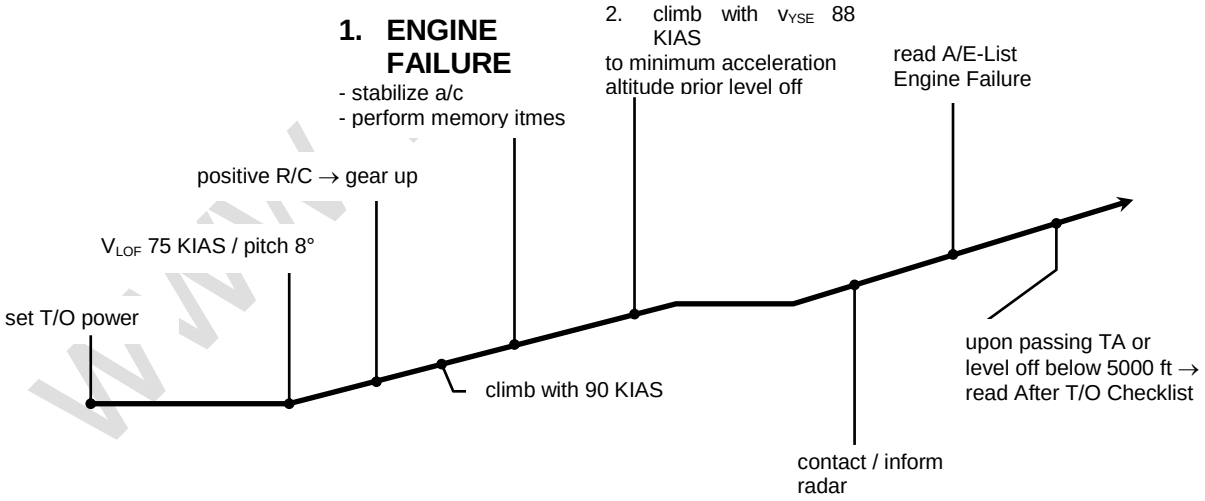
Tankinhalt ausfliegbar: Beide Tanks 108 Gal. = 409 ltr.

Start + Taxi: pauschal 10 ltr.
Holding: pauschal 60 ltr.

18. NORMAL TAKE OFF

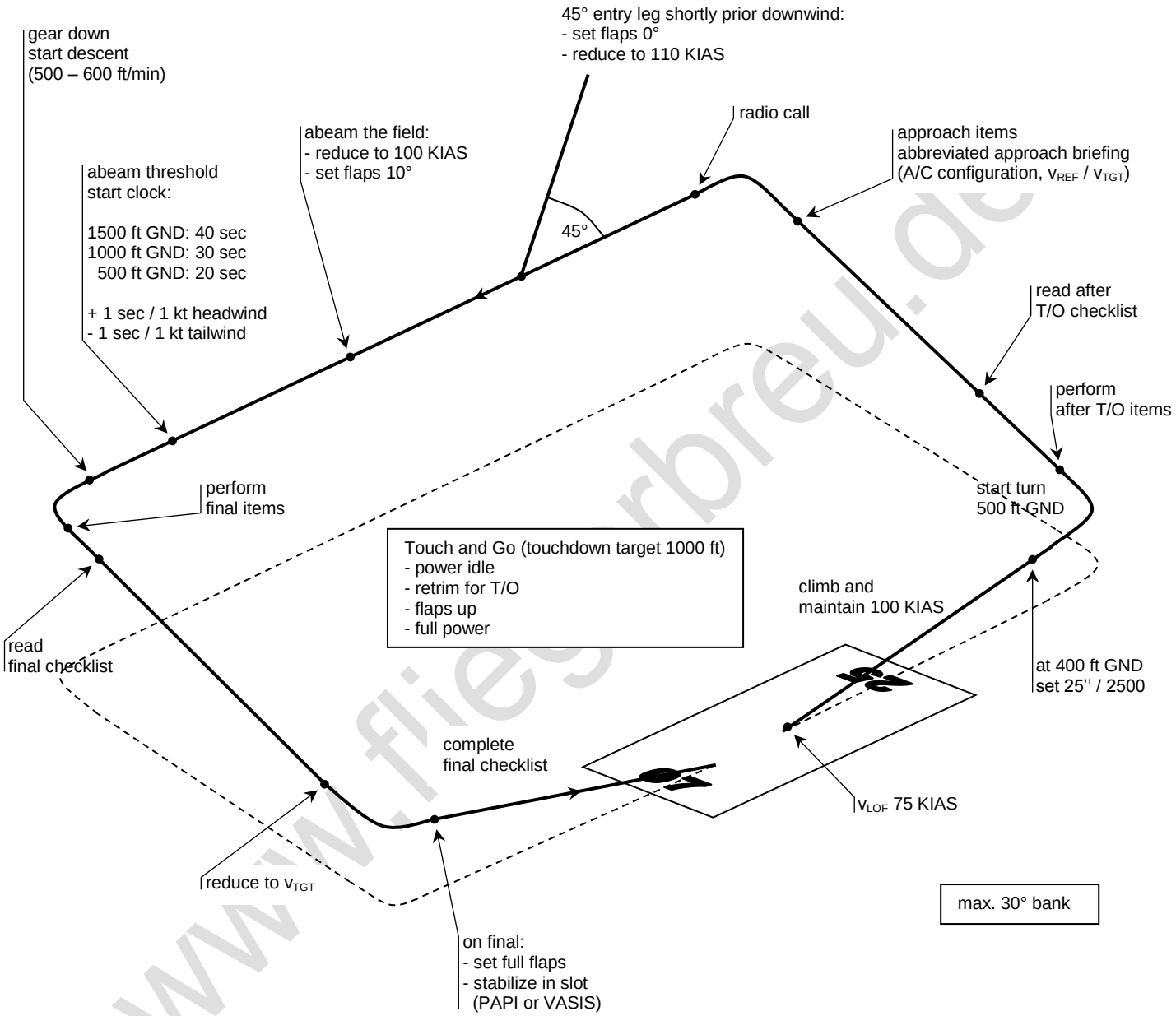


19. ENGINE FAILURE after T/O



20. TOUCH AND GO LANDING

PATTERN FOR TRAINING PURPOSES



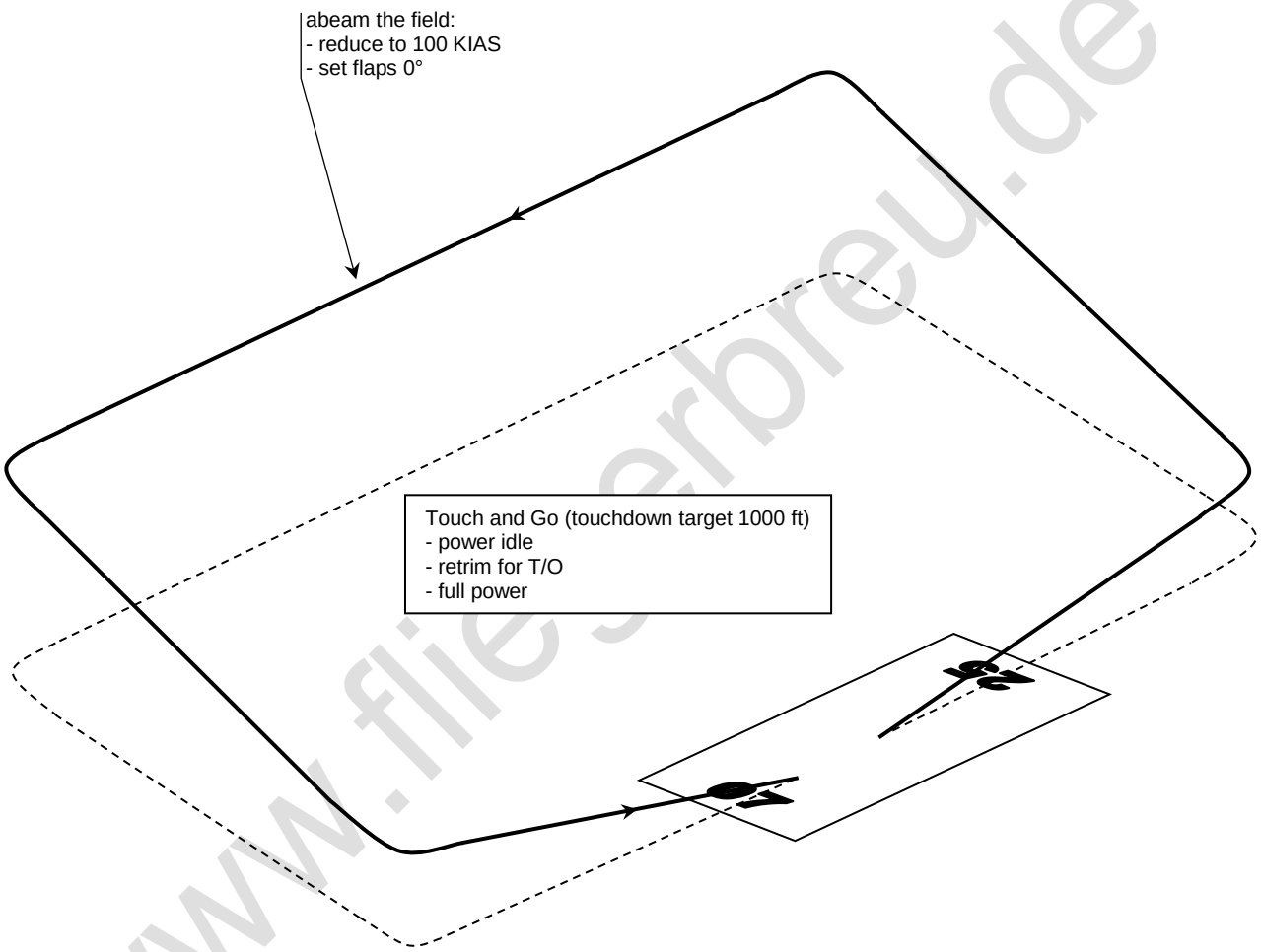
v_{REF}	=	1,3 x v_S	
v_{REF}	=	Flaps 0° :	85 KIAS
		Flaps 10° / 25° :	80 KIAS
		Flaps 40° :	75 KIAS

v_{TGT} = $^1/_2$ Wind Speed + Gustfaktor

min. v_{TGT} = v_{TGT} + 5 kts
max. v_{TGT} = v_{TGT} + 15 kts

21. ZERO-FLAP LANDING

PATTERN FOR TRAINING PURPOSES

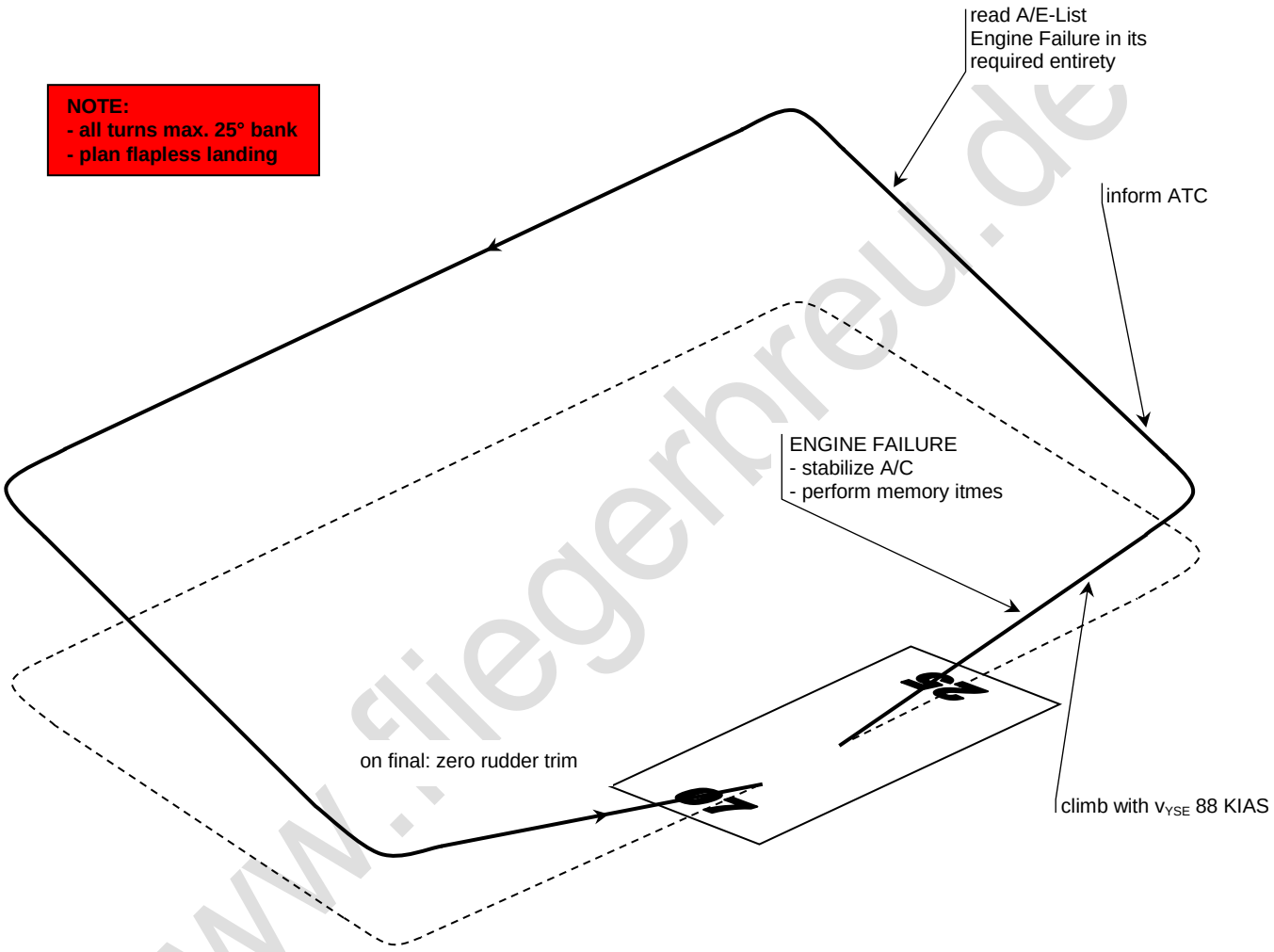


NOTE :
Only deviations from NORMAL PATTERN are shown

22. SINGLE ENGINE PATTERN

PATTERN FOR TRAINING PURPOSES

One engine inoperative **AFTER** take off



NOTE :
Only deviations from NORMAL PATTERN are shown

23. STEEP TURN (45° Bank)

Caution:

If the a/c has more than 45° bank with a low attitude resulting in a high rate of sink, start …

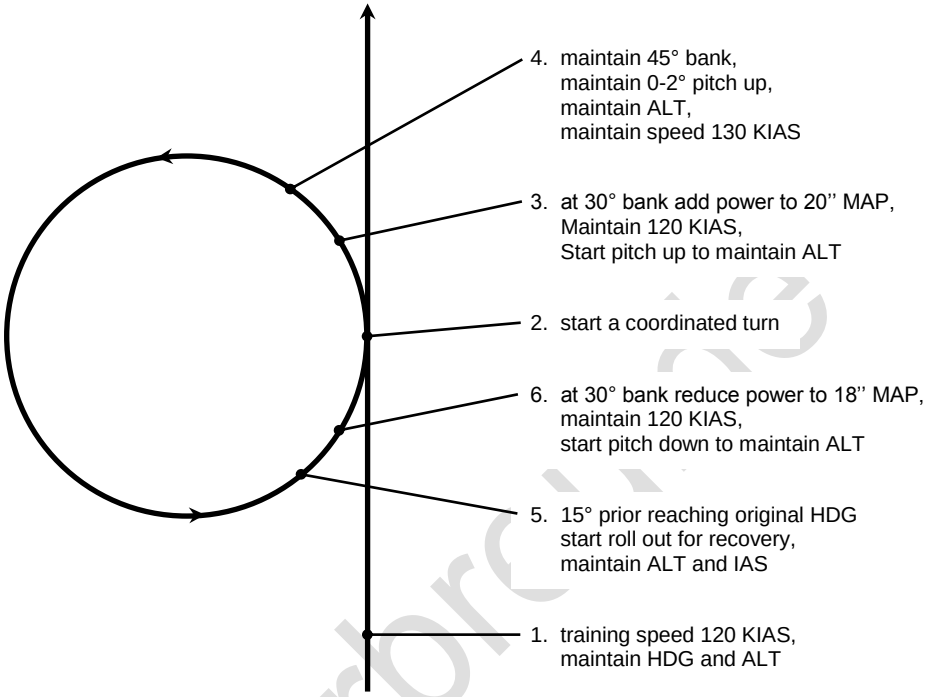
Recovery:

power → reduce

bank → wings level

pitch → nose up for level flight

(applying back pressure only may result in a spiral dive)

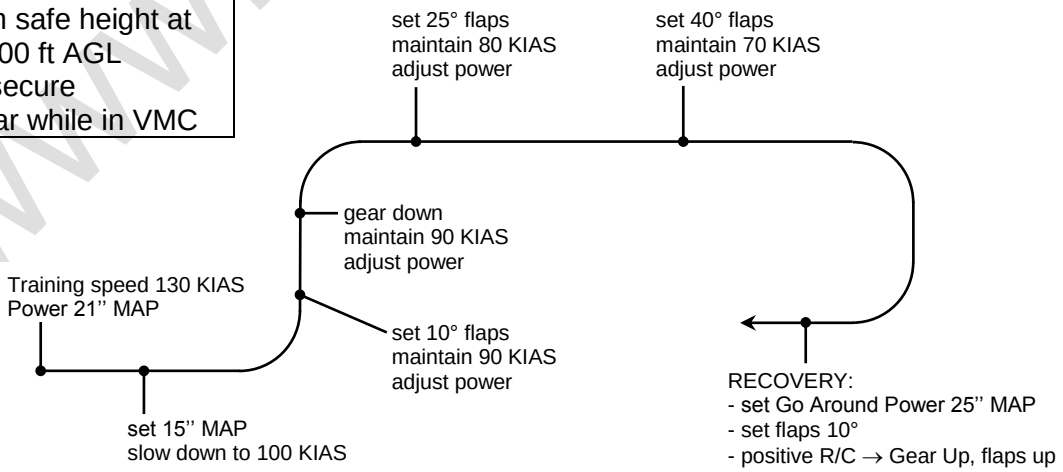


NOTE: Entry and recovery should be made in a smooth and coordinated manner.

24. SLOW FLIGHT

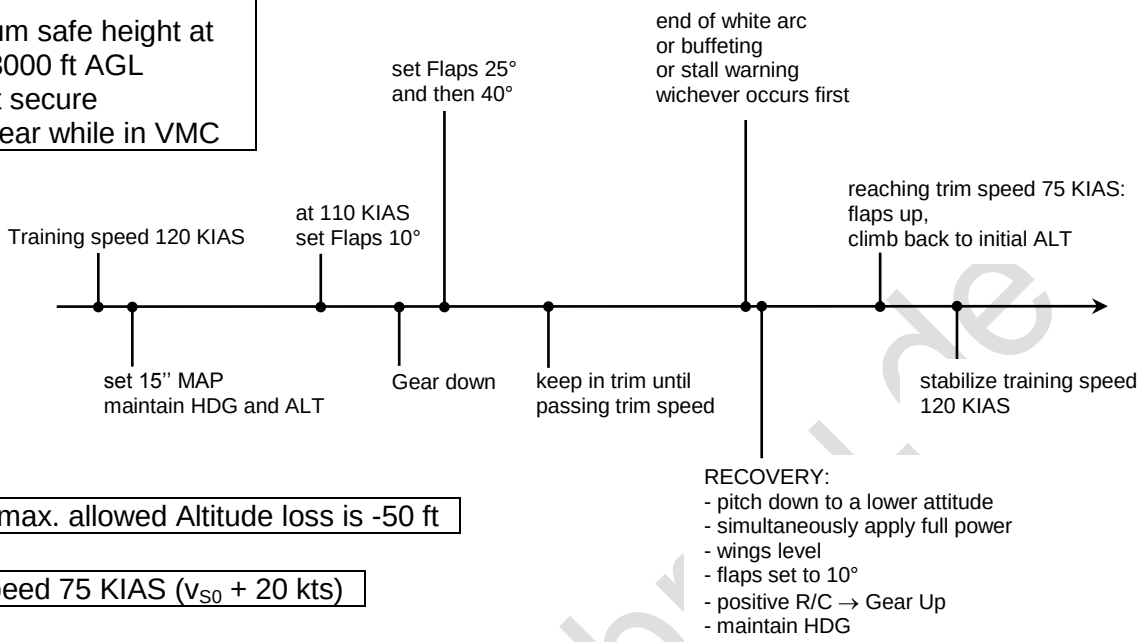
ATTITUDE FLYING

Check:
- Minimum safe height at least 3000 ft AGL
- cockpit secure
- area clear while in VMC



25. LANDING CONFIGURATION STALL

Check:
- Minimum safe height at least 3000 ft AGL
- cockpit secure
- area clear while in VMC

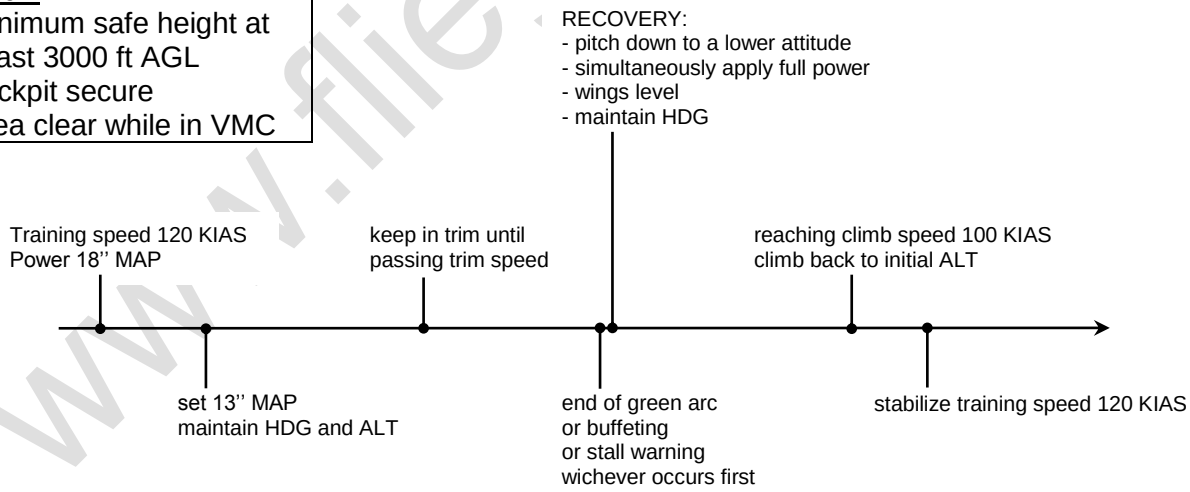


NOTE: max. allowed Altitude loss is -50 ft

Trim Speed 75 KIAS (v_{S0} + 20 kts)

26. CLEAN STALL

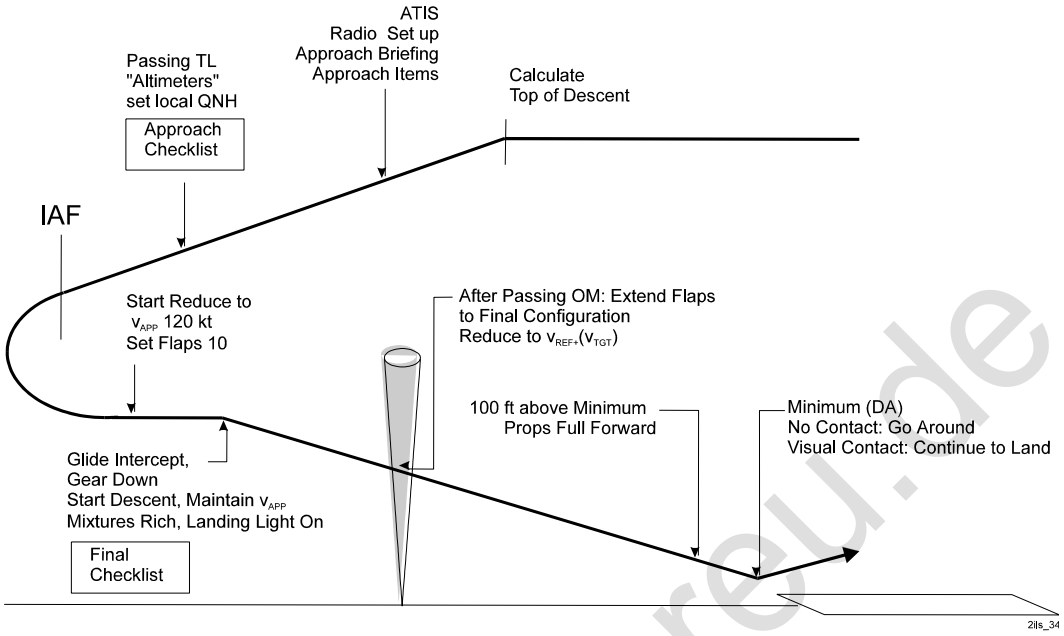
Check:
- Minimum safe height at least 3000 ft AGL
- cockpit secure
- area clear while in VMC



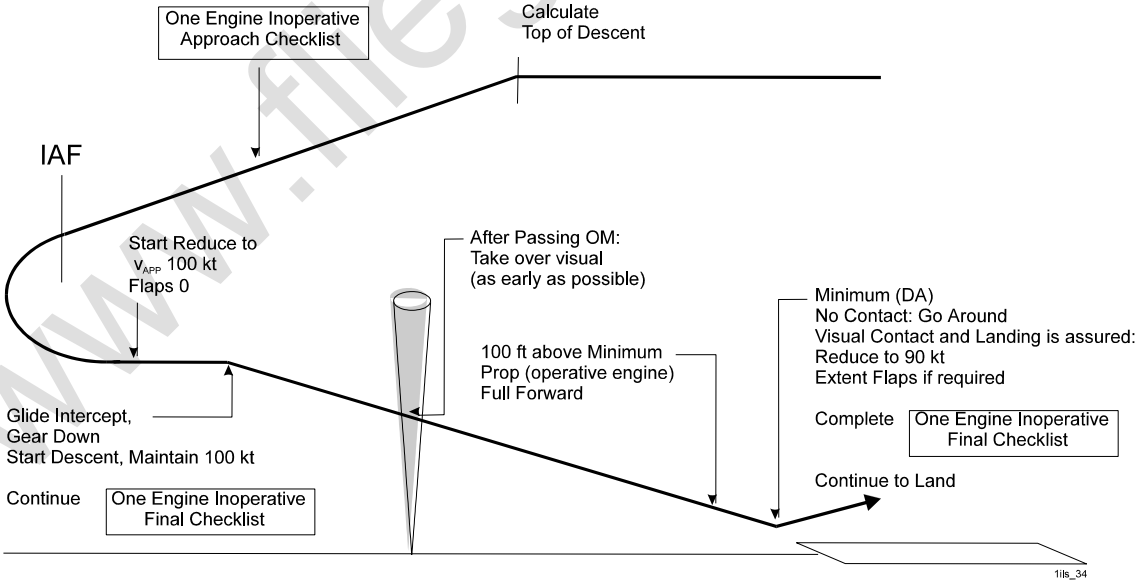
NOTE: max. allowed Altitude loss is -200 ft

Trim Speed 77 KIAS (v_S + 20 kts)

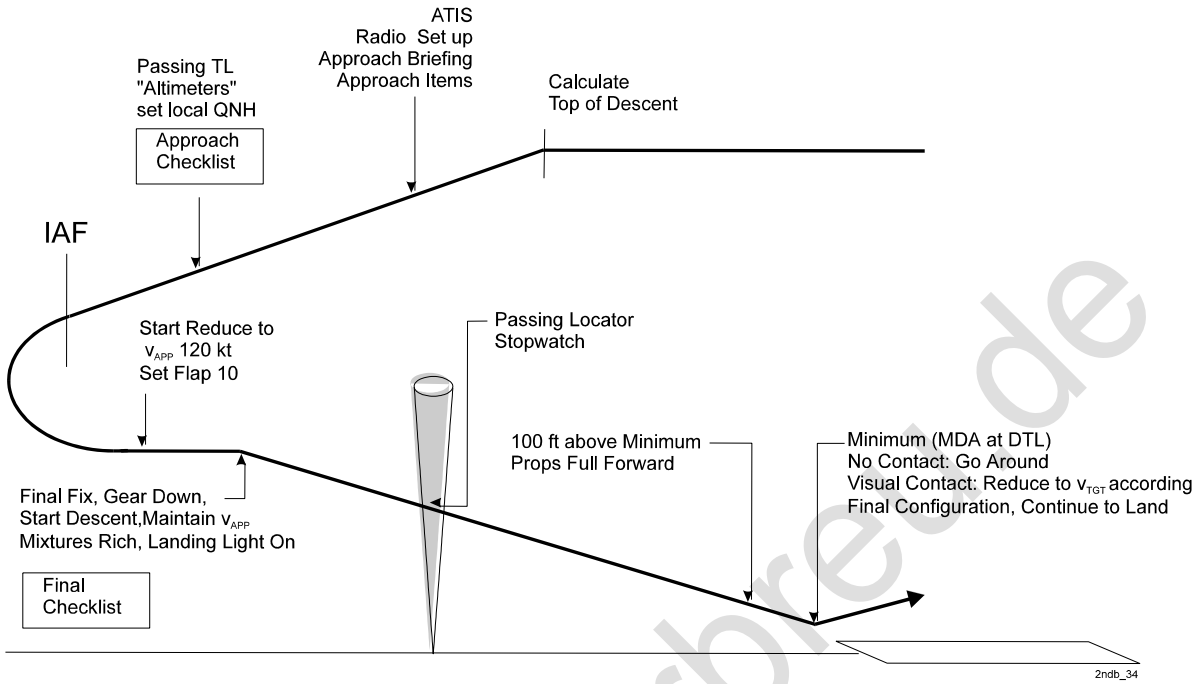
27. 2 - ENGINES ILS – APPROACH



28. 1 – ENGINE ILS – APPROACH



29. NON – PRECISION APPROACH



30. Briefings

T/O + Dep. Briefing

Rwy, Rwy length
Type of T/O, Flap setting
v_{LOF} 75 kts, v_{CLIMB} 90 kts
Initial Altitude, First heading change
NAV-Setting

Holding Briefing

MHA ……
Type of Entry ……..
Outbound heading ……
Outbound time ……..

Emergency Briefing

1. In case of any malfunction before v_{LOF}, 75 kts, close throttle, apply brakes, maintain centerline.

2. In case of engine failure after v_{LOF} and sufficient runway, lower the nose to maintain blue line speed 88 kts, close throttle, check gear down and locked and land straight ahead.

3. In case of engine failure after v_{LOF} and no sufficient runway, lower the nose to maintain blue line speed 88 kts, maintain heading.
   Power, Prop and Mixture forward.
   Detect dead engine. Dead engine
   Power off, Prop. feather and Mixture cut-off.
   Request emergency checklist.
   Inform ATC.

Approach Briefings

Approach Briefing ILS
1) _____ Appr. RWY _____
2) NAV Aids set
3) MSA
4) Initial-, Interm.-Appr.-Altitude
5) Final Track
6) Descent Point
7) OM Check Altitude
8) DA
9) Missed Approach Procedure

Approach Briefing NDB
1) _____ Appr. RWY _____
2) NAV Aids set
3) MSA
4) Initial-, Interm.-Appr.-Altitude
5) Final Track
6) Descent Point
7) Beacon Check Altitude
8) MDA/MAP
9) Missed Approach Procedure

Take-Off Call-Outs

Required power	o.K.
Engine Instruments	normal
Air Speed	rising

31. Aircraft Briefing

Speeds and Configuration on Final

	Prec. And Non Prec. Normal Approach	**Prec. And Non Prec. High Speed / Low Noise**
Descent Point → OM, 4 DME, NDB, …	Flaps 10° Gear down 110 kts	Clean 140 kts
Stabilized Final last 1000 ft GPD	Flaps 25° Gear down V_{TGT}	Flaps 25° Gear down V_{TGT}

Overhead OM/Beacon

OM/Beacon Check Altitude ……

100 ft before DA / MDA

Approaching Minimum!

Faustformeln:

$$WCA = \frac{WS \times (Faktor\ 1\text{-}6)}{TAS/10}$$

ROD [ft/min] = GS [kts] x 5

Faustformeln für Holding:

Bodenwind: Richtung / Geschwindigkeit
Höhenwind: +30° / x 2

Inbound-Leg = 1 x WCA vorhalten
Diagonal-Leg = 2 x WCA vorhalten
Outbound-Leg = 3 x WCA vorhalten

0° - 30° = v in kts → t in sec.

30° - 60° = v/2 in kts → t in sec.

60° - 90° = nach Bedarf

ENGINE FAILURE OR FIRE

Throttle No._____	CLOSE
Prop Lever No._____	FEATHER
Mixture No._____	IDLE CUT OFF

Caution: Determine the reason for engine failure before attempting a restart

- Do not attempt to restart in case of fire
- Maintain 3-5° bank to operative engine (ball ½ to ¾ out for min drag)

ENGINE

RESTART — Apply Abnormal Procedure: INFLIGHT ENGINE START (END)

NO RESTART

MAGNETOS.....OFF
FUEL PUMP.....OFF
ALTERNATOR.....OFF
ELECTRICAL LOAD.....MONITOR

- Max load of 60 AMPS on remaining alternator

Cowl Flap (inop engine).....CLOSE

- Adjust cowl flap of operative engine

Fuel Selector (inop engine).....OFF

- Consider fuel managment (crossfeed)
- Land at nearest suitable airport

Apply Abnormal Procedure: ONE ENGINE INOPERATIVE LANDING

ENGINE SHUTDOWN IN FLIGHT

THROTTLE NO.____.....CLOSE

PROP LEVER NO.____.....FEATHER

Feathering is impossible with windmilling < 950 RPM

MIXTURE NO.____.....IDLE CUT OFF

Maintain 3-5° bank to operative engine
(ball 1/2 to 3/4 out for min drag)

FUEL PUMP NO.____.....OFF

MAGNETO SWITCHES NO.____.....OFF

COWL FLAP (INOP ENGINE) NO.____.....CLOSE

Adjust cowl flap of operative engine
to maintain safe temperatures

ALTERNATOR NO.____.....OFF

ELECTRICAL LOAD.....MONITOR

Note: max load of 60 AMPS on remaining alternator

FUEL SELECTOR NO.____.....OFF

- Land at the nearest suitable airport

Apply Abnormal Procedure: ONE ENGINE INOPERATIVE LANDING

INFLIGHT ENGINE START

FUEL SELECTOR NO.____.....ON

FUEL QUANTITY.....CHECK

FUEL PUMP NO.____.....ON

MAGNETO SWITCHES.....ON

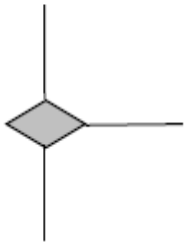
MIXTURE NO.____.....RICH

PROP LEVER NO.____.....FORWARD

THROTTLE NO.____.....INCH OPEN

STARTER.....ENGAGE

ENGINE



DOES NOT START

Land at the nearest suitable airport
Apply Abnormal Procedure:
ENGINE SHUTDOWN IN FLIGHT

STARTS

PROP.....AS RQD

COWL FLAP.....AS RQD

ALTERNATOR.....ON

- Observe other engine parameters and consider a precautionary engine shutdown

(END)

ONE ENGINE INOPERATIVE LANDING

Note: Normal Checklist included

- Maintain 100 KIAS minimum on final approach
  Landing gear down within gliding distance of landing airport
  Use flaps only when landing is assured

APPROACH

ATIS.....RECEIVED

ALTIMETERS.....___/___

COWL FLAP / CARBURATOR HEAT.....AS RQD

FUEL PUMP.....AS RQD

FUEL SELECTOR.....AS RQD

GO AROUND PROCEDURE.....REVIEW

- Go Around Power
  Rotate to Go Around Attitude
  Positive Climb – Gear up
  Maintain 88 KIAS

FINAL

GEAR.....DOWN / 3 GREEN

PROP.....AS RQD

MIXTURE.....RICH

LANDING LIGHT.....ON

FLAPS.....___SET

Note: Consider Rudder Trim Zero before Landing
Avoid Go Arround with more than 10° Flaps

32. Normal Checklist

COCKPIT CHECKLIST		
Preflight Inspection	COMPLETED	B
Seat Belts	FASTEND	ALL
Avionics	OFF	1
Alternate Static Source	NORMAL	1
Parking Brake	SET	1
Flight Controls	CKD	1
Trim	SET FOR T/O	1
Cowl Flaps	OPEN	1
Flaps	CKD	B
Gear Lever	DOWN	B
Cockpit Checklist Completed		

BEFORE START CHECKLIST		
Battery + Alternators	ON	1
Gear Indication	3 GREEN	B
Fuel Quantity	CKD	1
Fuel Selectors	ON	1
Anti Collision Light	ON	1
Props	FULL FWD	1
Before Start Checklist Completed		

STARTING ENGINE LIST 1+2			
Magnetos	R/L	ON	1
Mixture	R/L	RICH	1
Throttle	R/L	$^1/_4$ INCH OPEN	1
Fuel Pump	R/L	ON	1
Primer	R/L	AS REQ	1
Prop Area	R/L	CLEAR	B
Starter	R/L	ENGAGE	1
Throttle	R/L	1000 RPM	1
Oil Pressure	R/L	CKD	1
Repeat for opposite engine			
Alternators		CKD	1
Suctions		IN LIMITS	1
Fuel Pumps		OFF	1
Starting Engine List Completed			

AFTER START CHECKLIST		
Avionics	ON + SET	1
Circuit Breakers	CKD	2
Altimeters	SET … + X-CKD	1
Gyro	PRE-SELECTED	1
After Start Checklist Completed		

TAXI CHECKLIST		
Brakes	CKD	B
Flight Instruments	CKD	1
X-Feed	CKD	1
Taxi Checklist Completed		

ENGINE RUN UP LIST		
Brakes	SET	1
Engine Instruments	IN LIMITS	1
Throttles	1500 RPM	1
Feather	CKD	1
Throttles	2000 RPM	1
Prop Governors	CKD	1
Magnetos	IN LIMITS	1
Carb. Heat	CKD	1
Throttles	IDLE	1
RPM & Oil Pressure	IN LIMITS	1
Throttles	1000 RPM	1
Engine Run Up List Completed		

T/O Briefing:	Runway, RWY-Length
	Type of T/O
	Flap Setting
	v_{LOF}, v_{CLIMB}
	1. ALT, 1. HDG change

BEFORE T/O CHECKLIST		
T/O & Emer. Briefing	COMPLETED	B
Magnetos	BOTH	1
Trims	SET FOR T/O	1
Mixtures	RICH	1
Fuel Pumps & Press.	ON / CKD	1
Clock	SET	1
Doors / Windows	CLOSED / LATCHED	1
Before T/O Checklist Completed		

CLEARED FOR T/O CHECKLIST		
Transponder	ON & ALT	1
Landing Light	ON	1
Pitot Heat	AS REQ	1
Gyro	SET	1
Cleared For T/O Checklist Completed		

AFTER T/O CHECKLIST		
* Gear	UP	PF
* Flaps	UP	PF
Landing Light	OFF	PF
Fuel Pumps	OFF	PF
Cowl Flaps	AS REQ	PF
Altimeters	____ / ____	B
After T/O Checklist Completed		

* during pattern only

AFTER LANDING CHECKLIST		
Transponder	STAND BY	1
Pitot Heat	OFF	1
Landing Light	AS REQ	1
Fuel Pumps	OFF	1
Cowl Flaps	OPEN	1
Flaps	UP	1
Heater	2 MIN FAN / OFF	1
After Landing Checklist Completed		

APPROACH CHECKLIST		
ATIS	RECEIVED	B
Approach Briefing	COMPLETED	B
Gyro	CKD	PF
Landing Light	ON	PF
Fuel Pumps	ON	PF
Fuel Selectors	ON	PF
Mixtures	AS REQ	PF
Altimeters	____ / ____	B
Approach Checklist Completed		

PARKING LIST		
Throttle	1000 RPM	1
Avionics	OFF	1
Mixture	CUT OFF	1
Brakes	AS REQ	1
All Light Switches	OFF	1
Battery + Alternator	OFF	1
Magnetos	OFF	1
Parking List Completed		

FINAL CHECKLIST		
* Gear	DOWN, 3 GREEN	B
* Props	AS REQ	PF
* Mixtures	AS REQ	PF
* Flaps	SET AS BRIEFED	PF
Final Checklist Completed		

* during pattern only

Speeds:

v_Y		88 KIAS
v_X		82 KIAS
v_{YSE} (Blue Line Speed)		88 KIAS
v_{REF}	Flaps 0°	85 KIAS
	Flaps 10°/25°	80 KIAS
	Flaps 40°	75 KIAS

Abbreviations:

1	=	CM1
2	=	CM2
B	=	BOTH
PF	=	PILOT FLYING

33. Call outs

CREW COORDINATION AND STANDARD CALL OUTS DURING TAKE OFF		
Condition	**PF**	**PNF**
Line Up Position	announces: **"Take Off"** and advances Throttles to Take Off power	
		checks engine instruments and calls: **"Take off Power Set"**
60 KIAS		calls: **"60"**
	acknowledges: **"Checked"**	
at v_R (75 KIAS)		calls: **"v_R"**
	rotates to proper Attitude (pitch ca. 8°) with both hands on Controls	
at positive rate of climb (on altimeter **and** VSI)	commands: **"Gear Up"**	
		acknowledges: **"Gear Up"** positions gear lever up and reports: **"Gear Up No Lights"**
400 ft AGL	sets climb power	
		Contacts ATC
passing transition altitude or first level off, whatever is earlier	announces: **"Altimeters Standard"** sets 1013 and requests: **"After Take Off Checklist"**	
		sets 1013 and reads After Take Off Checklist

CREW COORDINATION DURING PRECISION APPROACHES		
Condition	**PF**	**PNF**
Localizer motion		calls: **"Localizer alive"**
	acknowledges: **"Checked"**	
Glide slope motion		calls: **"Glide slope alive"**
	acknowledges: **"Checked"**	
Localizer capture		calls: **"Localizer capture"**
	acknowledges: **"Final RWY-HDG set"**	
Glide slope capture		calls: **"Gide slope capture"**
	acknowledges: **"Checked"**	
passing OM (or any Check-Altitude on final)		calls: **"OM Alt. checked"**
passing OM (or any Check-Altitude on final) with deviations more than 100 ft		calls: **"passing OM, … ft high/low"**
	acknowledges: **"Checked"** Corrects rate of descent	
at 500 ft AGL (Elev. + 500 ft)		calls: **"Five Hundred"**
	acknowledges: **"Checked"**	
at 100 ft BARO above Minimum		calls: **"Approaching Minimum"**
	acknowledges: **"Checked"** positions Prop Full forward	
at Minimum		calls: **"Minimum, RWY …"** (i.e. straight ahead)
	calls: **"Continue"** continues visually according VASIS / PAPI	
		or **"Minimum No Contact"**
	calls: **"Go Around"** and starts Go Around Procedure	

CREW COORDINATION DURING NON-PRECISION APPROACHES		
Condition	**PF**	**PNF**
All recommended Altitudes at DME-readings		announces: **“Approaching … DME, Altitude should be … ft”**
	acknowledges: **“ … ft at … DME”**	
any deviation more than 100 ft		announces: **“ … DME now, … ft high/low”**
	acknowledges: **“Checked”** corrects rate of descent	
all Check Altitudes at DME-readings		announces: **“Check altitude, at … DME … ft”**
	acknowledges: **“ … ft at … DME”**	
passing Locator (or any Check-Altitude on final)		calls: **“Passing Locator, altitude checked”**
passing Locator (or any Check-Altitude on final) with deviations more than 100 ft		calls: **“Passing Locator, … ft high/low”**
	acknowledges: **“Checked”** corrects rate of descent	
at 100 ft BARO above Minimum		calls: **“Approaching Minimum”**
	acknowledges: **“Checked”** positions Prop Full forward	
at Minimum (MDA at DTL)		calls: **“Minimum, RWY …”** (i.e. straight ahead)
	calls: **“Continue”** continues visually according VASIS / PAPI	
		or **“Minimum No Contact”**
	calls: **“Go Around”** and starts Go Around Procedure	

CREW COORDINATION DURING TOUCH AND GO

Condition	PF	PNF
on ground	commands: **"Flaps up, Retrim, Carburator Heat Off"**	
		positions Flaps to Up-Position, retrim, switches Carburator Heat to Off-Position and reports: **"Flaps are Up, Trim set, Carburator Heat Off"**
	announces: **"Take Off"** and advances throttles to Take Off power	
		checks engine instruments and calls: **"Take off Power Set"**
at v_R (75 KIAS)		calls: **"v_R"**
	rotates to proper attitude (pitch ca. 8°) with both hands on controls	
at positive rate of climb (on altimeter **and** VSI)	commands: **"Gear Up"**	
		acknowledges: **"Gear Up"** positions gear lever up and reports: **"Gear Up No Lights"**
400 ft AGL	sets climb power	
		contacts ATC

CREW COORDINATION DURING GO AROUND		
Condition	**PF**	**PNF**
Go Around	announces: **"Go Around, Max. Power"** simultaneously advances Throttles, switches Carburator Heat Off and rotates to Go Around Attitude (pitch ca. 8°)	
		checks engine instruments (Man. Press., RPM)
	commands: **"Flaps 10"**	
		positions Flaps into position 10° and reports: **"Flaps 10 Set"**
at positive rate of climb (on altimeter **and** VSI)	commands: **"Gear Up"**	
		acknowledges: **"Gear Up"** positions gear lever up and reports: **"Gear Up No Lights"**
IAS > 88 KIAS	commands: **"Flaps Up"**	
		positions Flaps into Up-Position and reports: **"Flaps are Up"**
400 ft AGL	sets climb power	
		contacts ATC

CREW COORDINATION DURING ENGINE FAILURE		
Condition	**PF**	**PNF**
Engine Failure		calls: **"Engine Failure No. 1"**
	checks the failure and commands: **"Engine Failure – start procedure"**	
		touches Throttle No. 1 and announces: **"Throttle No. 1"**
	acknowledges: **"Confirmed"**	
		closes Throttle and reports: **"Closed"**
		touches Prop Lever No. 1 and announces: **"Prop Lever No. 1"**
	acknowledges: **"Confirmed"**	
		feathers Prop No. 1 and reports: **"Feather"**
		touches Mixture No. 1 and announces: **"Mixture No. 1"**
	acknowledges: **"Confirmed"**	
		closes Mixture No. 1 and reports: **"Idle Cut Off"**
		reports after completion: **"Memory items completed"**

Engine Failure bei Multi Crew Concept

Der PNF führt die Memory Items aus dem Gedächtnis aus. Jeder einzelne Item muss vom PF visuell überprüft und verbal genehmigt ("confirmed") werden.
Der PNF muss hierzu eindeutig auf den entsprechenden Hebel oder Schalter zeigen.
Nachdem der PF die Handlung "confirmed" hat, führt sie der PNF durch.
Danach fordert der PF die Emergency Checklist "Engine Failure Checklist". Memory Items werden überprüft und Non-Memory Items nach dem Read-and-do Verfahren durchgeführt.

Engine Failure bei Single Pilot Concept

Der SP stellt den Engine Failure fest und führt die Memory Items durch. Der FI überprüft und “confirmed” hier jeden einzelnen Item.
Auch die Non-Memory Items des Multi Crew Concepts werden beim Single Pilot Concept aus dem Gedächtnis abgearbeitet. Danach liest der SP die Engine Failure Checklist laut vor.