


Einflug in IMC

Wie meistere ich die
Situation ?



Andreas
Konietzko

Inhalt

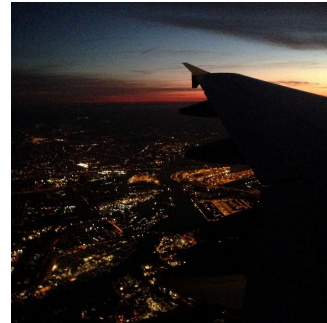
- Mögliche Situationen VFR  IMC
- Meine Helfer
- Radartechnologien
- Phraseologie
- Tipps
- Fliegen ohne Außenreferenz

Mögliche Situationen VFR



IMC

Nachtflug



Seenebel



„Über den Wolken gefangen“



aufliegende Wolken



Meine Helfer, meine Recourcen



ATC - FIS

Kommunikation und Ortung

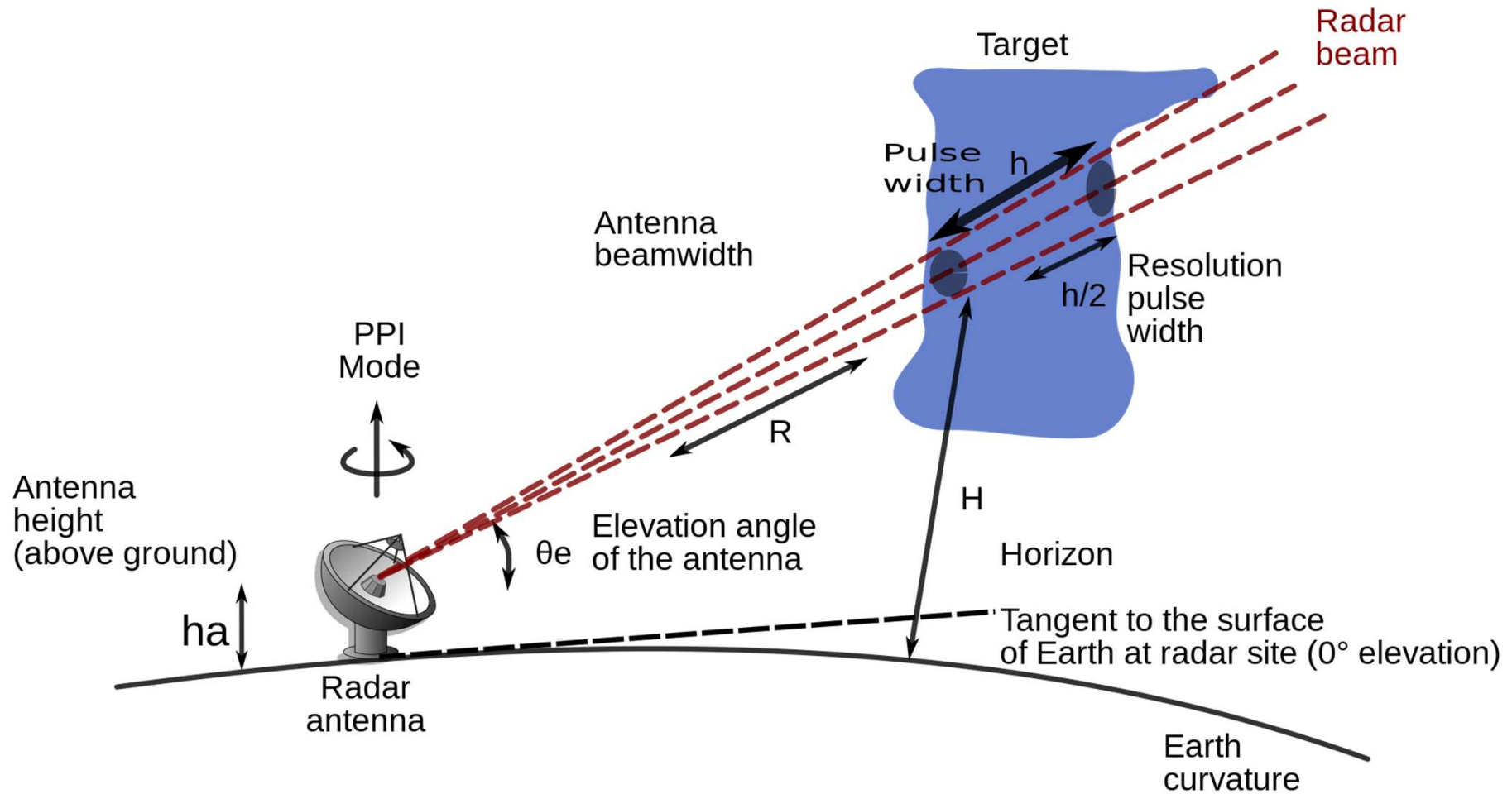
Primärradar



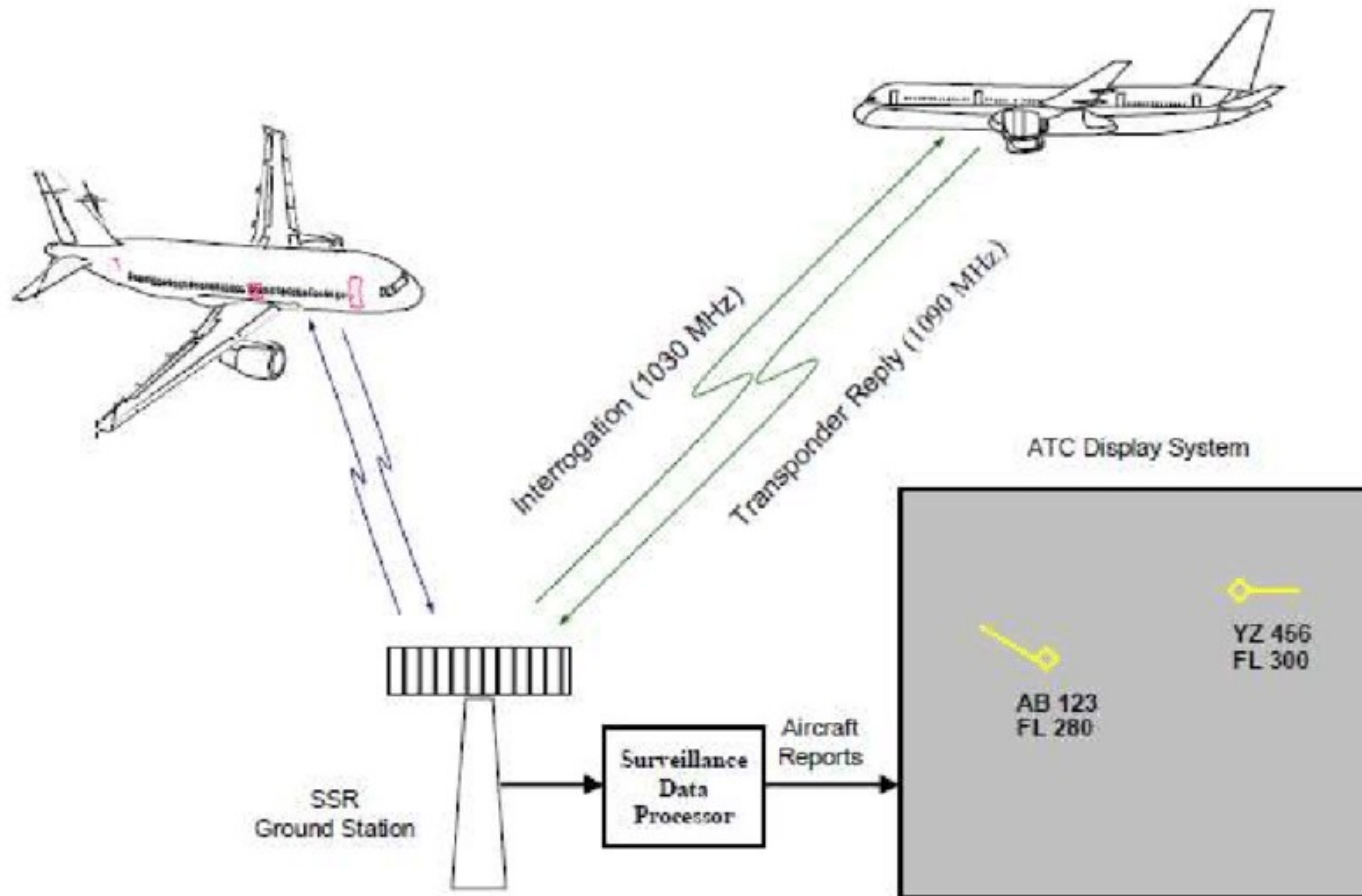
Sekundärradar



Primärradar



SSR - Secondary surveillance radar

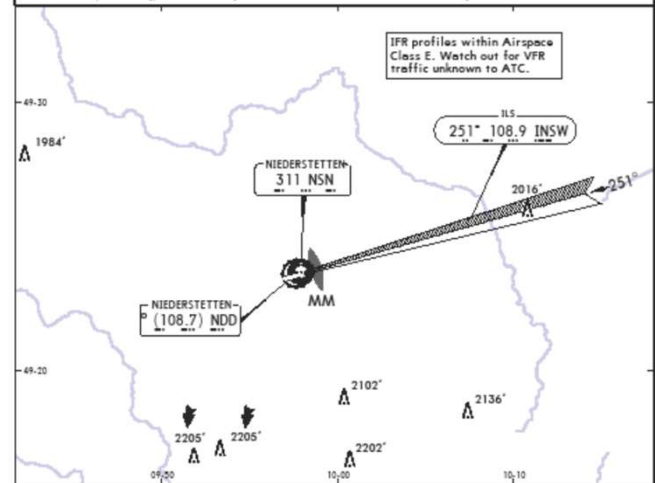


GCA – Ground Controlled Approach

- *PAR Precision Approach Radar*
- *SRA/ASR Non-Precision Radar Approach*
Surveillance Radar Approach / Airport Surveillance Radar
- Non-Gyro-Approach – bei Ausfall des Kurskreisels

ETHN **JEPPESEN** **NIEDERSTETTEN, GERMANY**
NIEDERSTETTEN 29 JAN 21 (18-1) [CAT A, B & C] *PAR Rwy 25 or *SRA Rwy 07

LANGEN Radar 135.725		NIEDERSTETTEN Radar 123.3 127.190		NIEDERSTETTEN Tower 122.1		No MSA published
Four UNIP see MIL-101 listing						
RADAR	Final Apch Crs By ATC	PAR GS Not published Minimum Alt No FAF	DA(H)/MDA(H) Refer to Minimums	Apt Elev 1536' TDZE RWY 25 1535'		
MISSED APCH: As directed by RADAR CONTROLLER.						
Alt Set: hPa (IN on req)		Apt Elev: 55 hPa		Trans level: By ATC		Trans alt: 5000'

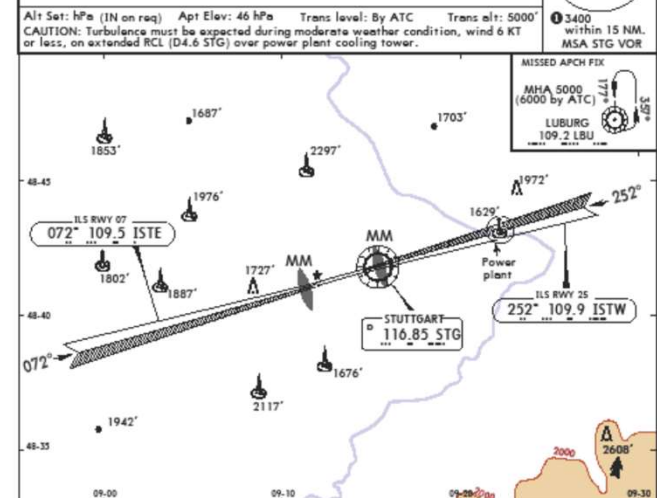


PAR TCH 49'	
Gnd speed-Kts	70 90 100 120 140 160
PAR GS	3.40 4.21 5.41 6.02 7.22 8.42 9.63
Lighting - Refer to Airport Chart	Refer to Missed Apch above

Standard		STRAIGHT-IN LANDING		CEILING REQUIRED
PAR 25		SRA 07 non-CDFA		
DA(H) 1735' (200')		MDA(H) 1940' (404')		
ALS out		ALS out		
A	200' - 800m	200' - 1200m		500' - 2100m
B				
C	200' - 1200m			500' - 2300m
D	NOT APPLICABLE			NOT APPLICABLE

EDDS/STR **JEPPESEN** **STUTTGART, GERMANY**
STUTTGART 6 OCT 23 (18-1) SRA All Rwy's

D-ATIS 126.130		LANGEN Radar (APP) 125.050 119.2		*STUTTGART Director (APP) 119.850		STUTTGART Tower 118.805 119.055		Ground 118.605	
RADAR		Final Apch Crs By ATC	Minimum Alt See table below	DA/MDA(H) Refer to Minimums	Apt Elev 1276' Rwy 07 1267' Rwy 25 1181'				
MISSED APCH: Climb STRAIGHT AHEAD to 5000'.									
Alt Set: hPa (IN on req)		Apt Elev: 46 hPa		Trans level: By ATC		Trans alt: 5000'		3400' within 15 NM. MSA STG VOR	



RWY 07	RADAR FIX	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0
	ALTITUDE	4300'	4000'	3700'	3400'	3100'	2800'	2500'	2200'
RWY 25	RADAR FIX	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0
	ALTITUDE	4300'	4000'	3700'	3400'	3100'	2800'	2500'	2200'
Minimum Alt/NM		10.0 FAF							
SRA 07		4300'							
SRA 25		4300'							

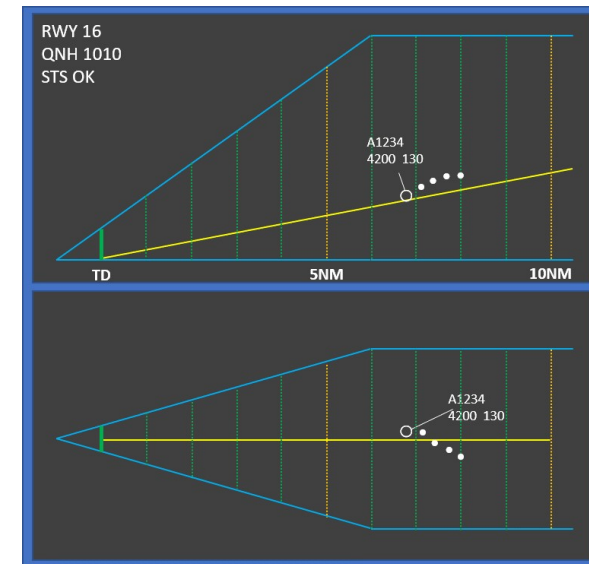
Gnd speed-Kts	70 90 100 120 140 160	Lighting - Refer to Airport Chart	5000'
Descent Angle	2.83° 350 451 501 701 801	Lighting - Refer to Airport Chart	
RWY 07: MAP 2.0 NM from THR			
RWY 25: MAP at THR			
Standard		STRAIGHT-IN LANDING	
SRA 07 CDFA		SRA 25 CDFA	
DA/MDA(H) 2140' (873')		DA/MDA(H) 2220' (1039')	
ALS out		ALS out	
A	RVR 1500m	RVR 1500m	
B			
C	NOT APPLICABLE	RVR 2400m	
D			

PAR - Systemtechnik

Antennenanlage



Controller - Bildschirm



Phraseologie - Ground Controlled Approach

ATC: FASTAIR 345 THIS WILL BE A PRECISION RADAR APPROACH RUNWAY 27, OBSTACLE CLEARANCE ALTITUDE 400 FEET POSITION 6 MILES EAST OF GEORGETOWN TURN RIGHT HEADING 260 DESCEND TO 2 500 FEET QNH 1014

Pilot: PRECISION APPROACH RUNWAY 27, HEADING 260 DESCENDING TO 2 500 FEET QNH 1014 FASTAIR 345

ATC: FASTAIR 345 CLOSING FROM THE RIGHT TURN RIGHT HEADING 270

Pilot: RIGHT HEADING 270 FASTAIR 345

ATC: FASTAIR 345 ON TRACK APPROACHING GLIDE PATH HEADING IS GOOD

Pilot: FASTAIR 345

ATC: FASTAIR 345 REPORT RUNWAY IN SIGHT

Pilot: FASTAIR 345

ATC: In case of lost communication follow

Phraseologie - Ground Controlled Approach

ATC: FASTAIR 345 DO NOT ACKNOWLEDGE FURTHER TRANSMISSIONS, ON TRACK APPROACHING GLIDE PATH . . . CHECK YOUR MINIMA . . . COMMENCE DESCENT NOW AT 500 FEET PER MINUTE . . . I SAY AGAIN 500 FEET PER MINUTE . . . CHECK GEAR DOWN AND LOCKED . . . ON GLIDE PATH 5 MILES FROM TOUCHDOWN . . . SLIGHTLY LEFT OF TRACK, TURN RIGHT 5 DEGREES NEW HEADING 275 I SAY AGAIN 275 . . . 4 MILES FROM TOUCHDOWN SLIGHTLY BELOW GLIDE PATH . . . 100 FEET TOO LOW ADJUST RATE OF DESCENT . . . STILL 50 FEET TOO LOW, TURN LEFT 3 DEGREES HEADING 272 ON TRACK 3 MILES FROM TOUCHDOWN . . .

Pilot: FASTAIR 345 RUNWAY IN SIGHT

ATC: COMING BACK TO THE GLIDE PATH . . . ON GLIDE PATH 2½ MILES FROM TOUCHDOWN RESUME NORMAL RATE OF DESCENT . . . FASTAIR 345 CLEARED TO LAND . . . ON GLIDE PATH . . . HEADING 272 IS GOOD SLIGHTLY ABOVE GLIDE PATH . . . 2 MILES FROM TOUCHDOWN . . . COMING BACK TO THE GLIDE PATH . . . ON GLIDE PATH 1¾ MILES FROM TOUCHDOWN . . . TURN LEFT 2 DEGREES NEW HEADING 270 . . . 1½ MILES FROM TOUCHDOWN . . . ON GLIDE PATH 1¼ MILES FROM TOUCHDOWN RATE OF DESCENT IS GOOD ON GLIDE PATH 1 MILE FROM TOUCHDOWN . . . ¾ OF A MILE FROM TOUCHDOWN ON GLIDE PATH . . . ½ MILE FROM TOUCHDOWN ON GLIDE PATH . . . ¼ MILE FROM TOUCHDOWN APPROACH COMPLETED AFTER LANDING CONTACT TOWER ON 118.7

Phraseologie - SRA/ASR Surveillance Radar Approach / Airport Surveillance Radar

G = Lotse; A = Pilot

Englisch

Der Lotse hat für die Einleitung des Anfluges einen Standardspruch in seinem Repertoire:

G: DLH123, this will be a surveillance radar approach runway 25 terminating at missed approach point, obstacle clearance altitude (oder height) <Wert>, check your minima.

A: DLH123, roger, OCA/H <Wert>.

Es folgen Vektoren, die den Flieger auf die Extended Centerline bringen sollen.

G: DLH123, for final, turn left heading 250.

A: Turning left heading 250, DLH123.

Außerdem wird, in Übereinstimmung mit der MVA, eine passende Höhe gewählt, aus der der Anflug beginnt. Dies können z.B. die in Deutschland verbreiteten 3000/4000/5000 Fuß sein.

Kurz vor Intercept ist eine Information an den Piloten erforderlich:

G: DLH123, 12NM from touchdown, 3NM prior descent.

A: Roger, DLH123.

G: DLH123, 9NM from touchdown, commence descent now.

A: Descending, DLH123.

G: DLH123, turn right heading 256.

A: Heading 256, DLH123.

G: DLH123, 4NM from touchdown, altitude should be 1200ft, remember OCA/H <Wert>, check gear down and locked.

A: DLH123, roger, gear is down.

Nach Koordination mit dem Tower wird die Landefreigabe eingeholt und weitergereicht:

G: DLH123, wind 260 degrees, 10 knots, runway 25, cleared to land.

A: Cleared to land runway 25, DLH123.

G: DLH123, 3NM from touchdown, altitude should be 900ft.

A: DLH123.

G: DLH123, approaching OCA/H, report runway in sight.

A: Wilco, DLH123.

G: DLH123, passing missed approach point, continue visually or go around.

A: Runway in sight, continue visually, DLH123.

G: DLH123, roger, after landing contact Tower 122.8.

A: After landing Tower 122.8, DLH123

Phraseologie – No – Gyro – Approach bei Ausfall des Kurskreisels

- kann als PAR/ASR erfolgen
- „turn right/turn left“ , „stop turn“
- 30 degrees AOB oder Standard turns (3°/sec)
- 20 degrees AOB on Base to Final
- 10 degrees AOB on Final oder ½ Standard Rate Turns

Tipps

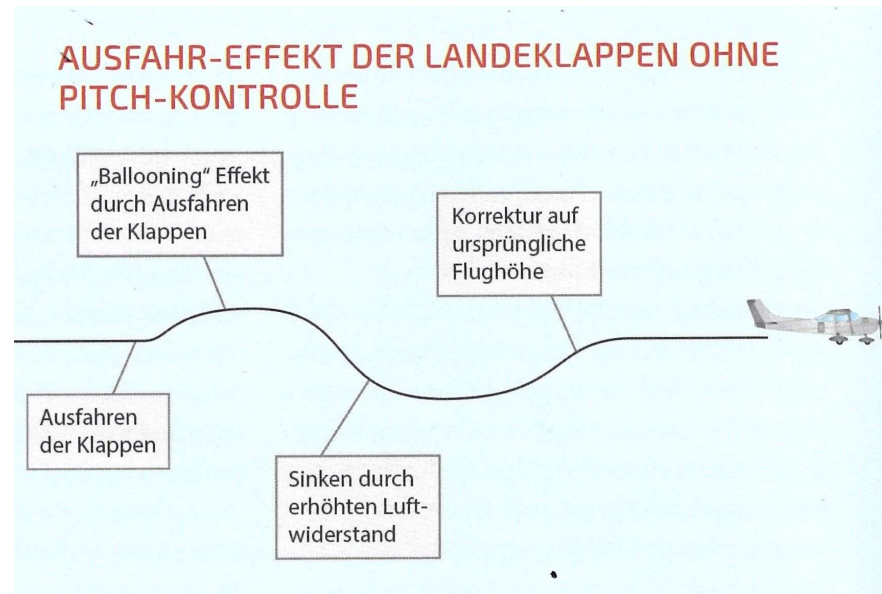
- Selbständiges Handeln abschalten ! Controller = Chef
- lokales QNH beachten
- Frequenzen setzen
- auf Baseleg Kurskreisel synchronisieren, 1. Klappenstufe setzen
- beim Übergang ins Final 2. Klappenstufe, Konfiguration Endanflug
- den Gleitpfad mit Höhenruder und Leistung halten
- kleine Korrekturen
- volle Konzentration auf die Instrumente
- auf die Speed achten

Fliegen ohne Außenreferenz



Basic T – Instrumente priorisiert, Dicke der Pfeile stellen den Grad der Aufmerksamkeit dar

Pitch - Control



Auftrieb

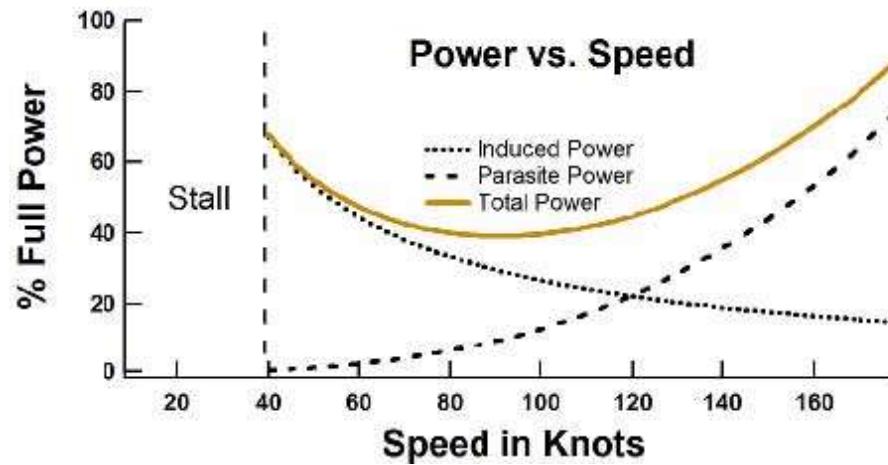
$$A = c_a \times F \times \frac{\rho}{2} v^2$$

Widerstand

$$W = c_w \times F \times \frac{\rho}{2} v^2$$

„Vor dem Flugzeug sein“ = Reaktionen des Flugzeugs antizipieren = proaktiv Gegensteuern

Power vs. Speed and lift



„Vor dem Flugzeug sein“ = Reaktionen des Flugzeugs antizipieren = proaktiv Gegensteuern

