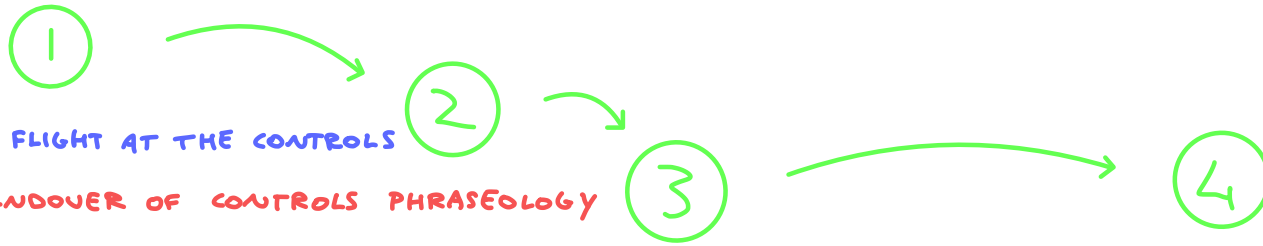


EXERCISE 3 : TRIAL FLIGHT

AIM : EXPERIENCE HELICOPTER FLIGHT AT THE CONTROLS

AIRMANSHIP : LOOKOUT, HANDOVER OF CONTROLS PHRASEOLOGY



ENABLING
OBJECTIVE 1

 **PILOTS WHO ASK WHY**

ENABLING
OBJECTIVE 2


ENABLING
OBJECTIVE 3

EXERCISE 3 : TRIAL FLIGHT

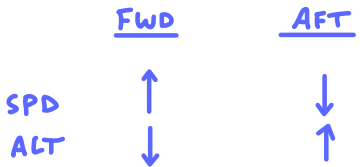
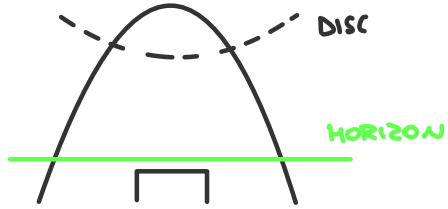
AIM : EXPERIENCE HELICOPTER FLIGHT AT THE CONTROLS

AIRMANSHIP : LOOKOUT, HANDOVER OF CONTROLS PHRASEOLOGY

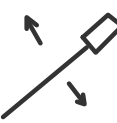
CYCLIC

- RIGHT HAND
 - LIGHT GRIP
 - SMALL MOVEMENTS
- 

CONTROLS DISC ATTITUDE



COLLECTIVE

- LEFT HAND
 - LIGHT GRIP
- 

CONTROLS BLADE PITCH

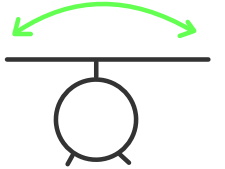


PILOTS WHO ASK WHY

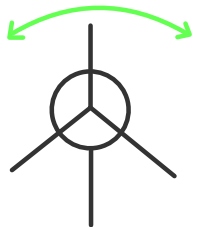
PITCH



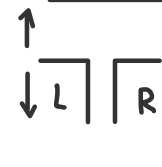
ROLL



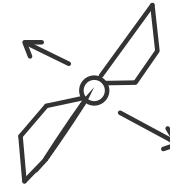
YAW



PEDALS

- BALANCE
 - DIRECTIONAL CONTROL
 - LIGHT PUSH
- 

CONTROLS TAIL ROTOR BLADE PITCH



EXERCISE 4: EFFECTS OF CONTROLS

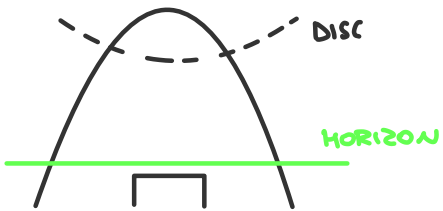
AIM: TO LEARN THE EFFECT OF CONTROLS IN FORWARD FLIGHT

AIRMANSHIP: LOOKOUT (CLOCK CODE), HANDOVER OF CONTROL

CYCLIC

- RIGHT HAND
- LIGHT GRIP
- SMALL MOVEMENTS

CONTROLS DISC ATTITUDE



	FWD	AFT	RIGHT	LEFT
DISC	↓	↑	→	←
NOSE	↓	↑	→	←
SPD	↑	↓	→	←
ALT	↓	↑	→	←
YAW	→	←	→	←

AUTOROTATION

COLLECTIVE CONTROLS RRPM

	RAISE	LOWER
BLADE PITCH	↑	↓
DRAG	↑	↓
RRPM	↓	↑

COLLECTIVE

- LEFT HAND
- LIGHT GRIP

CONTROLS BLADE PITCH



	RAISE	LOWER
BLADE PITCH	↑	↓
LIFT	↑	↓
ALT	↑	↓
DRAG	↑	↓
PWR	↑	↓
NOSE	↑	↓
YAW	←	→

THROTTLE

- SMALL MOVEMENTS
- CONTROLS RRPM

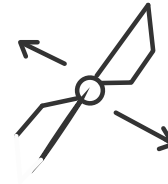
	OPEN	CLOSE
RPM	↑	↓
PWR	↑	↓
YAW	→	←

PILOTS WHO ASK WHY

PEDALS

- BALANCE
- DIRECTIONAL CONTROL
- LIGHT PUSH

CONTROLS TAIL ROTOR BLADE PITCH

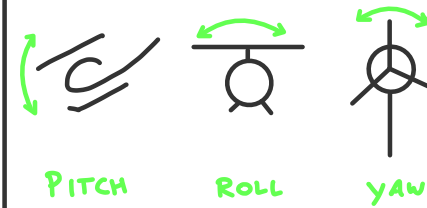


	LEFT	RIGHT
TR THRUST	↑	↓
YAW	←	→
ROLL	→	←
NOSE	↓	↓
IAS	↓	↓

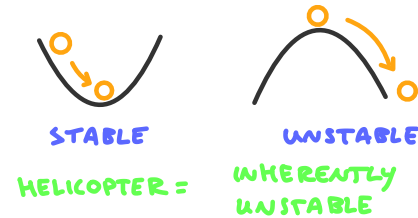
AIRSPEED

	INCREASE	REDUCE
GOV OFF	↑	↓
GOV ON	↓	↑
RRPM	↑	↓
PWR	↓	↑
DISC LOADING	INCREASE	REDUCE
GOV OFF	↑	↓
GOV ON	↓	↑
RRPM	↑	↓
PWR	↓	↑

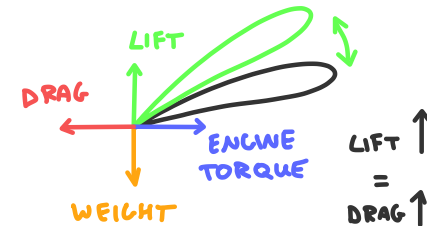
PITCH/ROLL/YAW



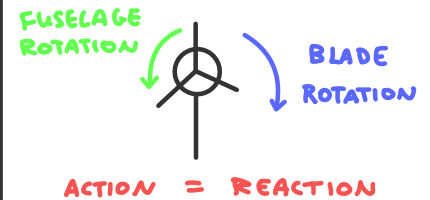
STABILITY



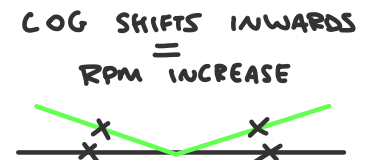
BLADE PITCH



NEWTON'S 3RD LAW



DISC LOADING

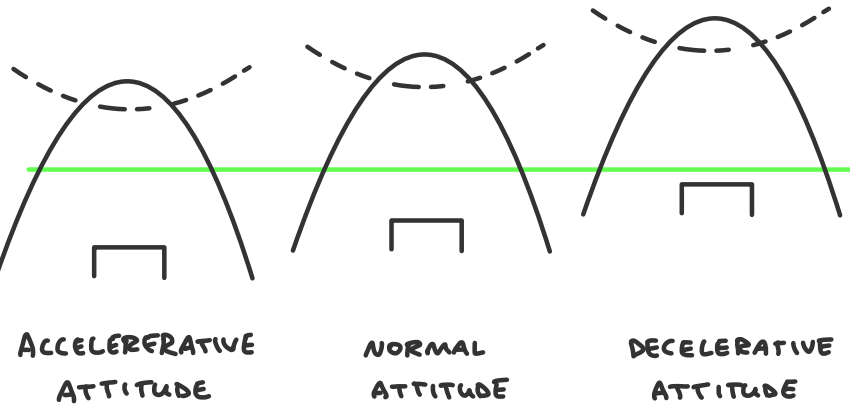


EXERCISE 5: ATTITUDE AND POWER CHANGES

AIM: TO LEARN THE RELATIONSHIP BETWEEN ATTITUDE VS POWER AND HOW TO CHANGE POWER

AIRMANSHIP: LOOKOUT, T'S + P'S, FUEL, SPEED + POWER LIMITS

ATTITUDE AND AIRSPEED

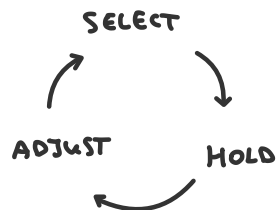


PICK HEADING MARKER

- FORWARD CYCLIC
- SELECT ACCEL ATTITUDE
- NOSE ↓
- HOLD ATTITUDE (FLAPBACK)
- YAW →
- PEDAL ←

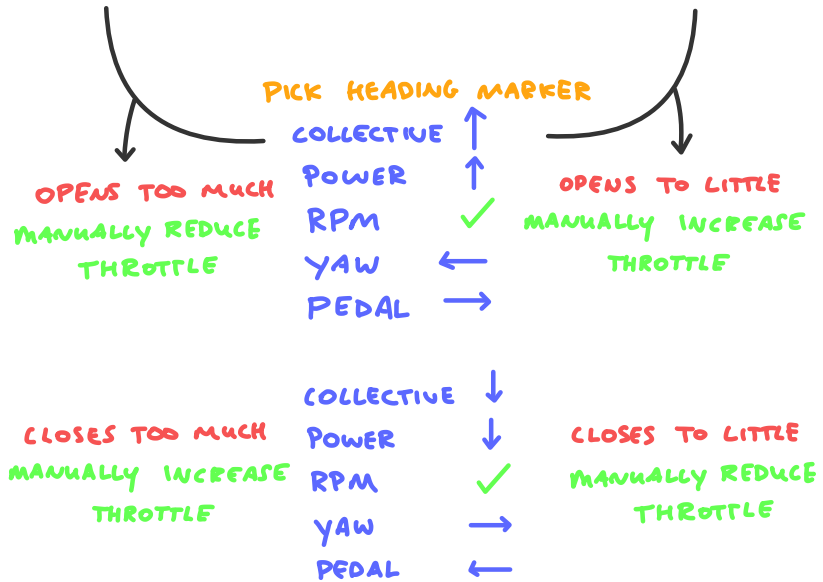
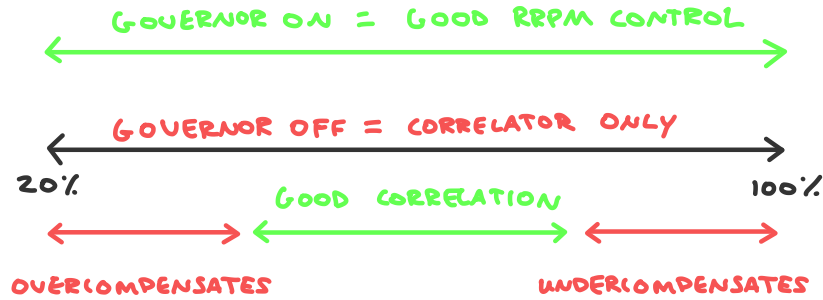
PICK HDG MARKER

- AFT CYCLIC
- SELECT DECEL ATTITUDE
- NOSE ↑
- HOLD ATT (FLAP FORWARD)
- YAW ←
- PEDAL →



SCAN INSTRUMENTS
LOOKOUT 80% LOOK IN 20%
MONITOR INDICATED AIRSPEED

POWER CHANGES



FLAPBACK

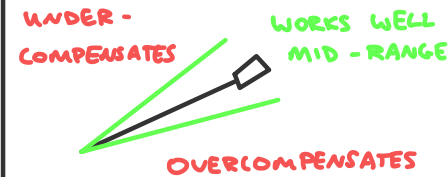


HOLD THE ATTITUDE

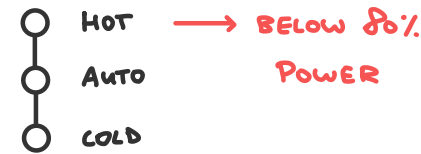
INSTRUMENTS



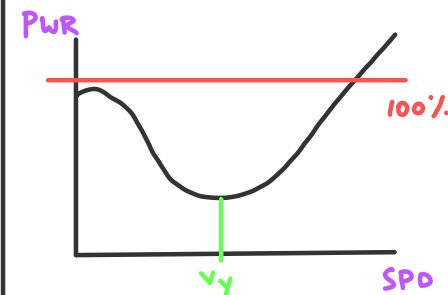
CORRELATOR



CARB HEAT



POWER CURVE



EXERCISE 6: LEVEL FLIGHT, CLIMBING, DESCENDING AND TURNING (PART 1)

PILOTS WHO ASK WHY

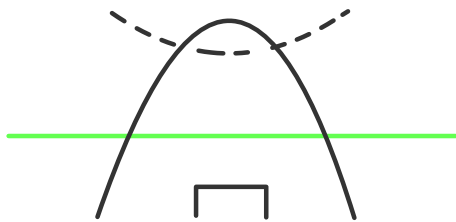
ENGINE HEALTH CHECK

- WARNING LIGHTS (OUT)
- T'S + P'S (GREEN)
- CAPTIONS / CARB HEAT
- FUEL (QUANTITY)
- RPM (GREEN)
- PWR (%)

AIM: TO LEARN HOW TO FLY STRAIGHT AND LEVEL AT A VARIETY OF SPEEDS, TO CLIMB / DESCEND AND TO TURN ONTO SPECIFIC HEADINGS

AIRMANSHIP: LOOKOUT, SCAN (READING + TREND), ENGINE HEALTH, LIMITS

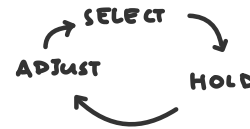
STRAIGHT AND LEVEL FLIGHT



NORMAL ATTITUDE

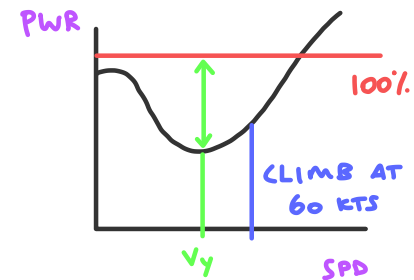
- FLY AIRCRAFT VISUALLY
- SPEED - CYCLIC
- ALTITUDE - COLLECTIVE
- BALANCE - PEDALS
- OVERCOME DISTURBANCES

LOOKOUT
HDG MARKER



FLY AT 40-50-60-70 KTS
FIND POWER TO MAINTAIN IAS

POWER CURVE



$$\textcircled{1} + \textcircled{2} = \textcircled{3}$$

ATTITUDE	+	POWER	=	PERFORMANCE
70 KTS	+	70%	=	70 KTS S/L
60 KTS	+	70%	=	60 KTS CLIMBING

SPEED CHANGES

40 KTS
S/L



ACCEL →

80 KTS
S/L



DECEL →



DECEL →



HDG MARKER

- FORWARD CYCLIC
- SELECT ACCEL ATT
- HOLD ATT (FLAPBACK)
- COLLECTIVE ↑
- MAINTAIN BALANCE

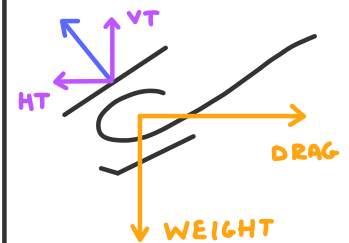
- AT 80 KTS
- SELECT 80 KTS ATT
- COLLECTIVE ↓
- MAINTAIN BALANCE
- TRIM 80 KTS S/L

- AFT CYCLIC
- SELECT DECEL ATT
- HOLD ATT
- COLLECTIVE ↓ 30% PWR
- MAINTAIN BALANCE

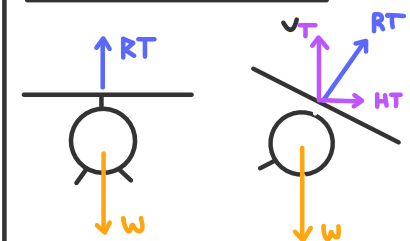
- AT 45 KTS
- SELECT 40 KTS ATT
- COLLECTIVE ↑ 50% PWR
- MAINTAIN BALANCE
- TRIM 40 KTS S/L

FORCES IN FWD FLIGHT

ROTOR THRUST



FORCES IN A TURN



MORE PWR REQUIRED IN TURN

EXERCISE 6: LEVEL FLIGHT, CLIMBING, DESCENDING AND TURNING (PART 2)

PILOTS WHO ASK WHY

AIM: TO LEARN HOW TO FLY STRAIGHT AND LEVEL AT A VARIETY OF SPEEDS, TO CLIMB / DESCEND AND TO TURN ONTO SPECIFIC HEADINGS

AIRMANSHIP: LOOKOUT, SCAN (READING + TREND), ENGINE HEALTH, LIMITS

CLIMBING

ENTRY

- ENGINE HEALTH
- LOOKOUT (UP)
- HDG MARKER

**A
P
T** { SELECT 60 KTS ATTITUDE
COLLECTIVE ↑ 90% PWR
BALANCE
TRIM 60 KT CLIMBING

500 FPM

161 70 KTS S/L
70% PWR

LEVEL OUT

ANTICIPATE 50' BEFORE
**A
P
T** { SELECT 70 KTS ATTITUDE
COLLECTIVE ↓ 70% PWR
BALANCE
TRIM 70 KTS S/L

161
70 KTS S/L 70% PWR

DESCENDING

161
70 KTS S/L
70% PWR

ENTRY

- ENGINE HEALTH
- CARB HEAT AUTO
- LOOKOUT (DOWN)
- HDG MARKER

**P
A
T** { COLLECTIVE ↓ 30% POWER
SELECT 60 KTS ATTITUDE
BALANCE + TRIM 60 KTS CLIMBING

500 FPM

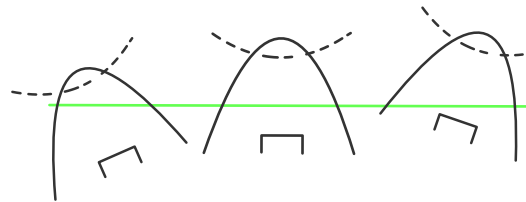
LEVEL OUT

**P
A
T** { COLLECTIVE ↑ 70% PWR
SELECT 70 KTS ATTITUDE
BALANCE
TRIM 70 KTS S/L

161 70 KTS S/L
70% PWR

TURNING

OFFSET SEAT EFFECT
(PERCEPTION IN PICTURE)



ENTRY

- ENGINE HEALTH
- LOOKOUT
- HDG MARKER

ROLL ON BANK
COLLECTIVE A/R TO MAINTAIN BALANCE
TRIM 70 KTS LEVEL TURN 20°

DURING TURN

REGULAR CHECKS
TRIM 70 KTS LEVEL TURN 20°

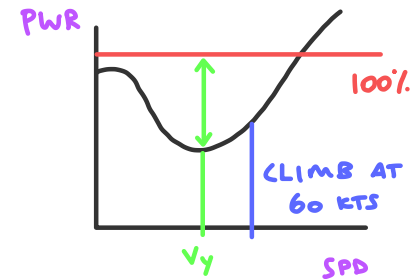
ROLLOUT

ANTICIPATE 10' BEFORE
ROLL AIRCRAFT LEVEL
MAINTAIN ALTITUDE
MAINTAIN BALANCE
TRIM 70 KTS S/L

ENGINE HEALTH CHECK

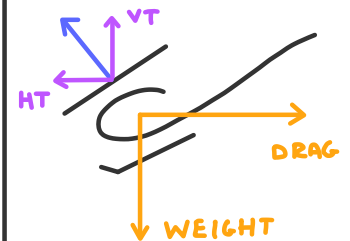
- WARNING LIGHTS (OUT)
- T'S + P'S (GREEN)
- CAPTIONS / CARB HEAT
- FUEL (QUANTITY)
- RPM (GREEN)
- PWR (%)

POWER CURVE

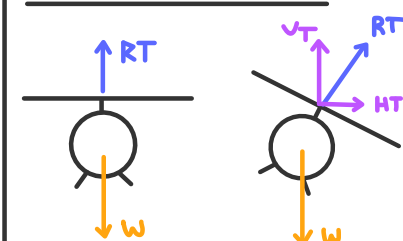


FORCES IN FWD FLIGHT

ROTOR THRUST



FORCES IN A TURN



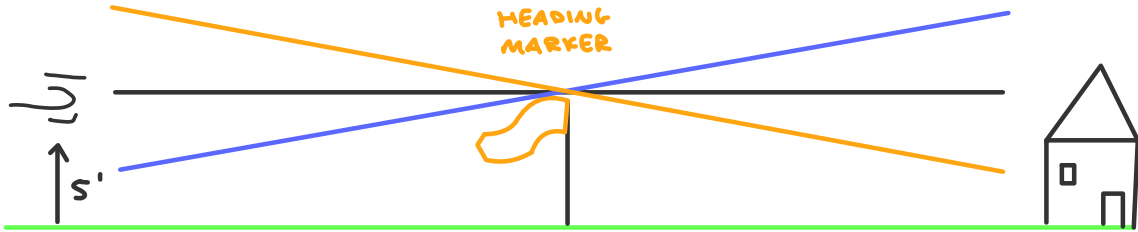
MORE PWR REQUIRED IN TURN

EXERCISE 8: HOVERING (PART 1)

AIM: TO LEARN HOW TO HOLD A FIXED POSITION OVER THE GROUND
 MAINTAINING A CONSTANT HEADING / HEIGHT / RPM

AIRMANSHIP: LOOKOUT, AREA, TAIL CLEARANCE, ENGINE HEALTH, PWR LIMIT, W/V, DOWNWASH

CONTROLLING THE HELICOPTER



PEDALS HEADING
 TR BLADE PITCH
 1 REFERENCE

COLLECTIVE HEIGHT
 BLADE PITCH
 2 REFERENCES

CYCLIC POSITION
 DISC ATTITUDE
 2 REFERENCES

HOVER ATTITUDE

AFFECTED BY WIND
 TAIL ROTOR ROLL
 L OF G

SURFACE

AFFECTS POWER REQUIRED
 GROUND CUSHION STRENGTH

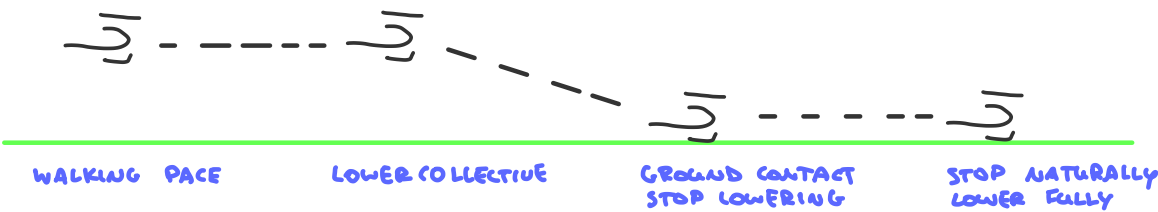
WIND

WEATHERLOCK STABILITY
 POWER REQUIRED
 CYCLIC POSITION
 MORE CORRECTIONS

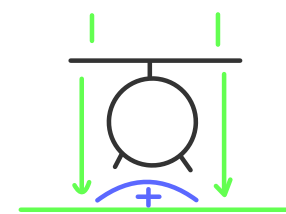
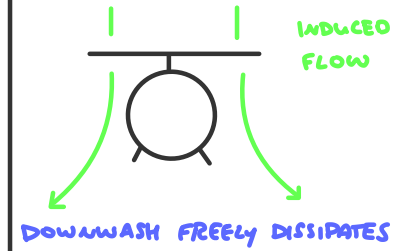
HAZARDS

FOREIGN OBJECT DEBRIS (FOD)
 SNOW / DUST / SAND
 OBSTACLES

GENTLE FORWARD RUNNING TOUCHDOWN



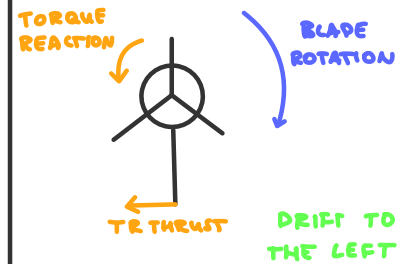
GROUND EFFECT



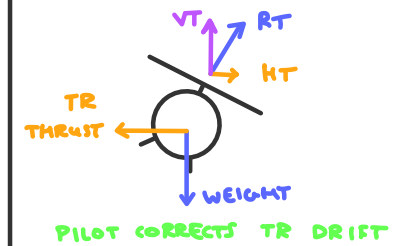
DOWNWASH RESTRICTED
 LESS INDUCED FLOW
 GROUND CUSHION WITH
 POSITIVE PRESSURE

LESS POWER REQUIRED

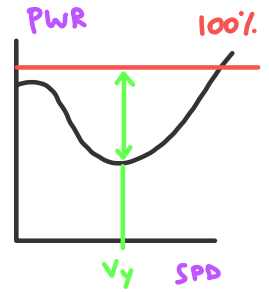
TAIL ROTOR DRIFT



TAIL ROTOR ROLL

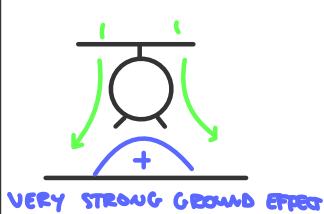


POWER CURVE

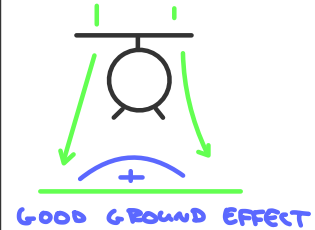


SURFACE EFFECTS

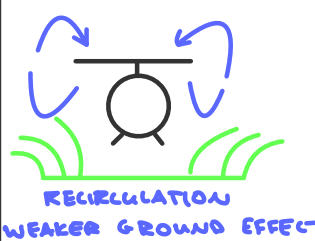
TARMAC



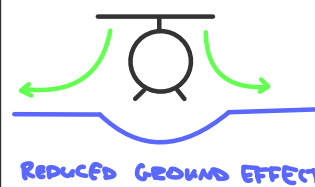
SHORT GRASS



LONG GRASS



WATER



EXERCISE 8: HOVERING (PART 1)

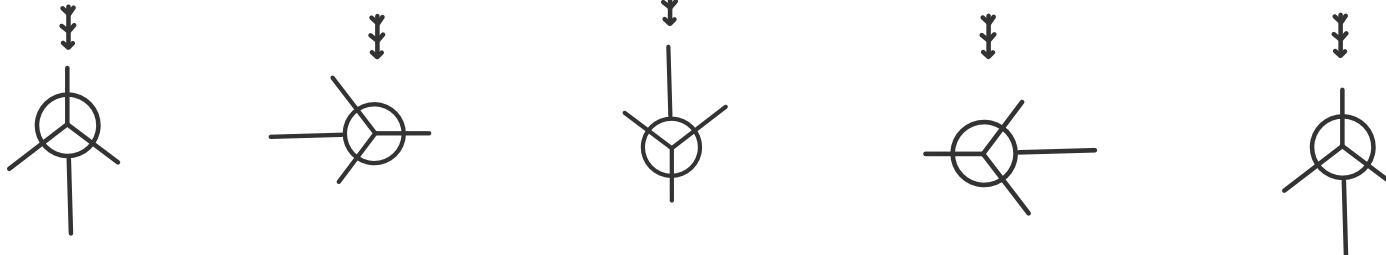
AIM: TO LEARN HOW TO HOLD A FIXED POSITION OVER THE GROUND MAINTAINING A CONSTANT HEADING / HEIGHT / RPM

AIRMANSHIP: LOOKOUT, AREA, TAIL CLEARANCE, ENGINE HEALTH, PWR LIMIT, W/V, DOWNWASH

HOVER TAXI

FORWARD MOVEMENT IN THE HOVER AT A SLOW PACE

90° TURNS IN THE HOVER



FWD CYCLIC RIGHT PEDAL PWR A/R	RIGHT PEDAL TO TURN LEFT + AFT CYCLIC LEFT PEDAL TO STOP	RIGHT PEDAL TO TURN LEFT + AFT CYCLIC LEFT PEDAL TO STOP	RIGHT PEDAL TO TURN RIGHT / FWD CYCLIC LEFT PEDAL TO STOP	RIGHT PEDAL LEFT / FWD CYCLIC LEFT PEDAL TO STOP
MOST STABLE	LEFT CYCLIC MOST RIGHT PEDAL MOST POWER HOLD AGAINST WIND MORE DIFFICULT	AFT CYCLIC SENSITIVE PEDALS LESS POWER LESS WEATHERCOCK STABILITY	RIGHT CYCLIC SOME LEFT PEDAL LEAST POWER VARIABLE PEDAL AND PWR REQUIRED	FWD CYCLIC RIGHT PEDAL PWR A/R MOST STABLE

ENGINE FAILURE

YAWS RIGHT
APPLY LEFT PEDAL
DRIFTS RIGHT
LEFT CYCLIC
DESCENDS
WAIT!

PRIOR TO TOUCHDOWN
COLLECTIVE ↑
HOLD ATTITUDE
NO DRIFT EXCEPT FWD



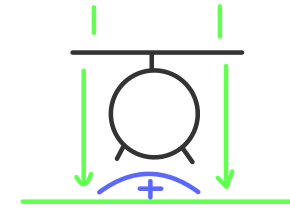
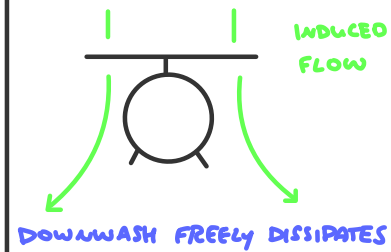
TAIL ROTOR FAILURE

UNCONTROLLABLE YAW LEFT
CLOSE THROTTLE AS PER ENGINE FAILURE

OVER PITCHING

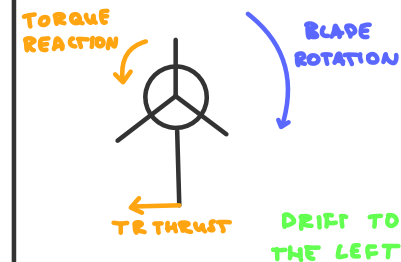
RPM ↓
INCREASE THROTTLE, COLLECTIVE ↓

GROUND EFFECT

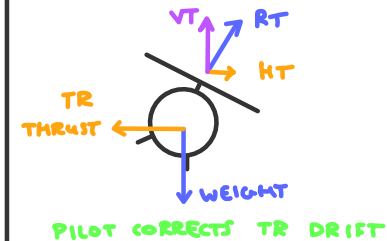


LESS POWER REQUIRED

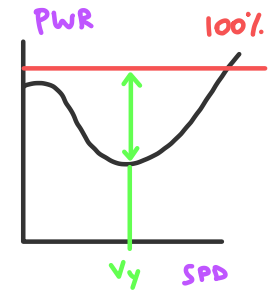
TAIL ROTOR DRIFT



TAIL ROTOR ROLL

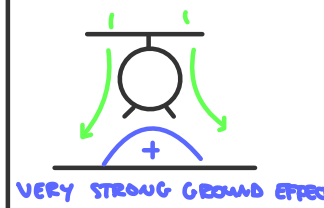


POWER CURVE

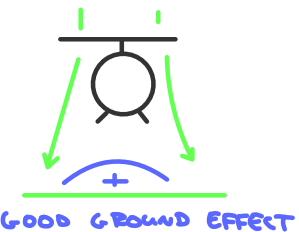


SURFACE EFFECTS

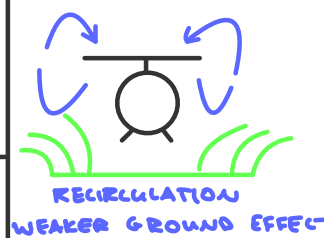
TARMAC



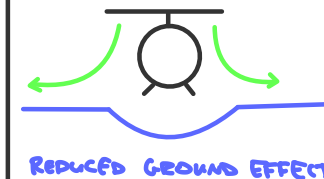
SHORT GRASS



LONG GRASS



WATER

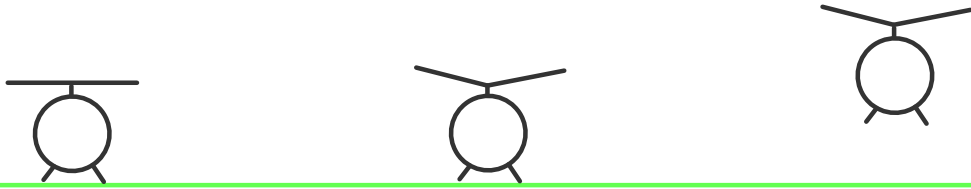


EXERCISE 9 : TAKE - OFF AND LANDING

AIM: TO LEARN HOW TO TAKE OFF INTO THE HOVER AND LAND FROM THE HOVER

AIRMANSHIP: LOOKOUT, CHECKS (PRE / AFTER T/O, SHUTDOWN), AREA, SURFACE, W/V, PWR LIMITS

TAKE - OFF



HDG MARKER

PRE T/O CHECKS

ANTICIPATE CYCLIC
 COLLECTIVE ↑ SMOOTHLY
 COORDINATE → PEDAL

LIGHT ON SKIDS

NO ADVERSE ROLL / PITCH
 COLLECTIVE ↑
 COORDINATE → PEDAL
 LEAVE GROUND VERTICALLY

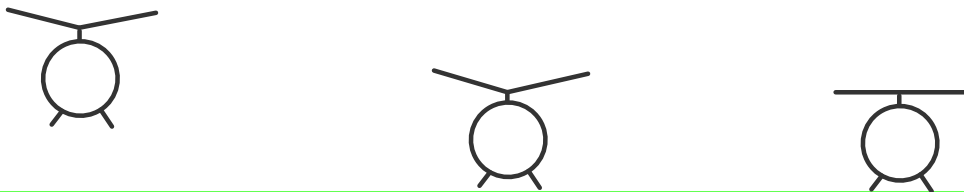
SELECT HOVER ATT
 CONTINUE TO 5' HOVER
 AFTER T/O CHECKS

ABORTED TAKE - OFF



IF EXCESSIVE PITCH/ROLL DEVELOPS
 SAY 'GOING AROUND'
 COLLECTIVE ↓ SMOOTHLY
 CONTROLS NEUTRAL, START OVER

LANDING



HDG MARKER

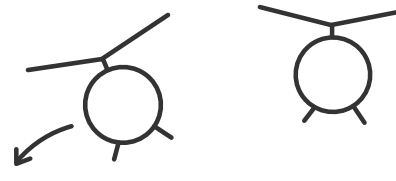
STABLE HOVER
 COLLECTIVE ↓ SMOOTHLY
 COORDINATE ← PEDAL
 ESTABLISH CONSTANT ROD
 PREVENT DRIFT WITH CYCLIC

GROUND CONTACT

BOTH SKIDS DOWN
 COLLECTIVE ↓ SMOOTHLY
 COORDINATE WITH PEDALS

COLLECTIVE ↓ FULLY
 AFTER LOG CHECKS

MISSED LANDING



MAKE DECISION PRIOR TO CONTACT
 NO DRIFT
 SAY 'GOING AROUND'
 COLLECTIVE ↑
 RESELECT HOVER ATTITUDE 5'

PRE - TAKE-OFF CHECKS

ENGINE HEALTH

LOOKOUT

W/V

AFTER TAKE-OFF CHECKS

ENGINE HEALTH

CONTROL RESPONSE NORMAL

AFTER LANDING CHECKS

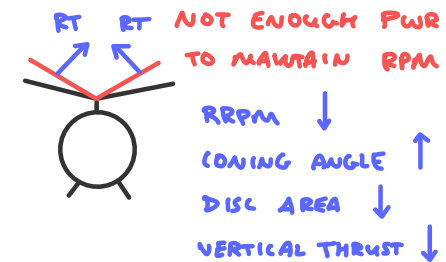
CONTROLS NEUTRAL

ENGINE TO IDLE

FRICTION ON

CHECKLIST OUT

OVERPITCHING



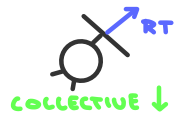
DYNAMIC ROLLOVER

STATIC

RRPM = 0



DYNAMIC



GROUND RESONANCE



RRPM W LIMITS

LIFT INTO HOVER

RRPM INSUFFICIENT

CLOSE DOWN

EXERCISE 10 : TRANSITIONS FROM THE HOVER TO THE CLIMB AND APPROACH TO HOVER PILOTS WHO ASK WHY

AIM: TO LEARN HOW TO DEPART FROM THE HOVER TO THE CLIMB, AND APPROACH THE HOVER FROM FORWARD FLIGHT

AIRMANSHIP: LOOKOUT, W/V, SURFACE, ENGINE HEALTH, AVOID CURVE, LIMITS

TRANSITION FROM HOVER TO CLIMB

LOOKOUT TURN

Hdg MARKER

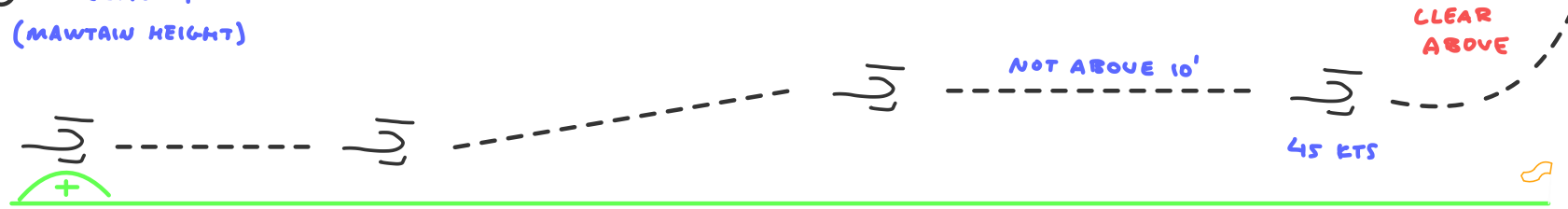
FWD CYCLIC

① COLLECTIVE ↑
(MAINTAIN HEIGHT)

② ③ HOLD ATT

④ SELECT ACCELERATIVE ATTITUDE

AT 45 KTS
SELECT 60 KTS ATTITUDE
PWR A/R 500' / m

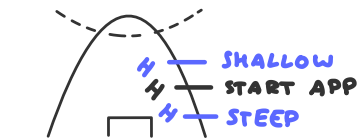


TRANSITION FROM APPROACH TO HOVER

1000' AGL CHECKS / LOOKOUT
50 KTS + HEADWIND COMPONENT

MAX 60 KTS

NOTE APPARENT GROUND SPEED



GO AROUND
IAS < 30 KTS
ROD > 300' / m
PWR APPLIED
LANDING SITE OBSTRUCTED
HIGH / SLOW OR LOW / FAST
IAS > 30 KTS
PWR ↑
CLIMB AWAY

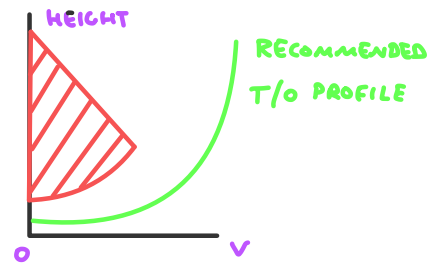
} VORTEX RING

COLLECTIVE ↓ 30-40% PWR
MAINTAIN BALANCE
PWR A/R TO MAINTAIN
SIGHT PICTURE

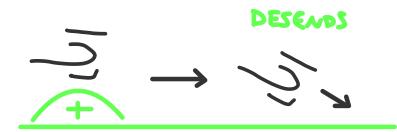
MANAGE PWR + IAS

Hdg MARKER
SKIDS IN DIRECTION OF TRAVEL
ANTICIPATE LOSS OF
COLLECTIVE ↑
HOLD ATT

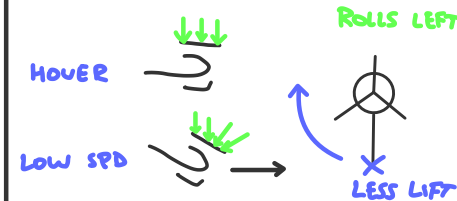
AVOID CURVE



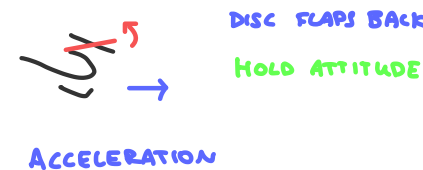
① GROUND CUSHION



② INFLOW ROLL



③ FLAPBACK



④ TRANSLATIONAL LIFT



EXERCISE 11: CIRCUIT, APPROACH AND LANDING

AIM: TO LEARN THE CORRECT CIRCUIT AND EMERGENCY PROCEDURES

AIRMANSHIP: LOOKOUT, W/V, RT, FREDAT CHECK, TRAFFIC SEPARATION, NOISE ABATEMENT

RADIOCALLS

- 1 DEPARTURE
- 2 DOWNWIND
- 3 FINAL APPROACH

FREDAT

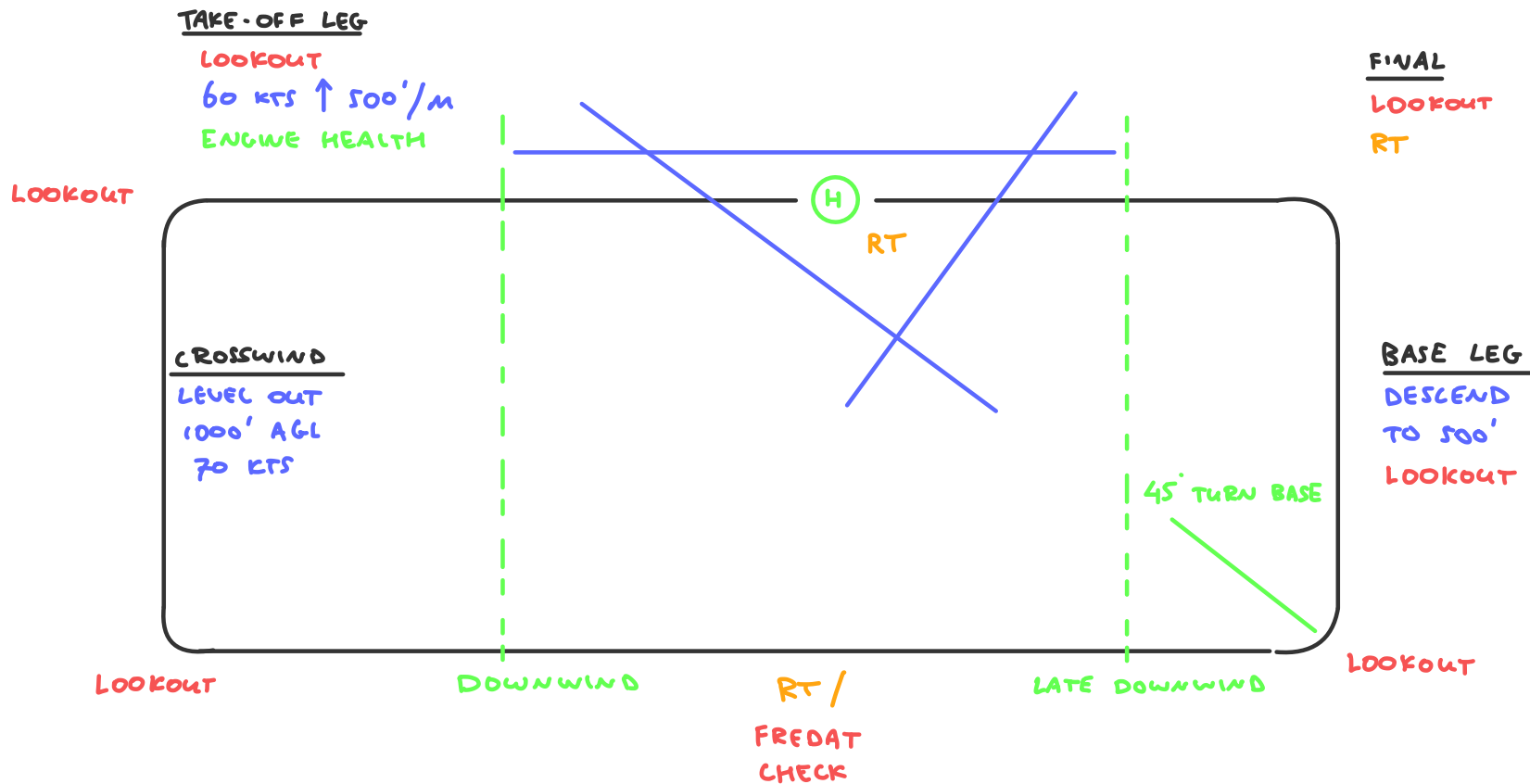
- FUEL
- RADIO
- ENGINE HEALTH
- DIRECTION
- ALTITUDE
- TRANSPONDER

CIRCUIT SPEEDS

- CLIMB 60 KTS
- LEVEL 70 KTS
- FINAL 50 KTS + HWC

BRIEF
AIRFIELD PLATES
AND
PROCEDURES

CIRCUIT PATTERN



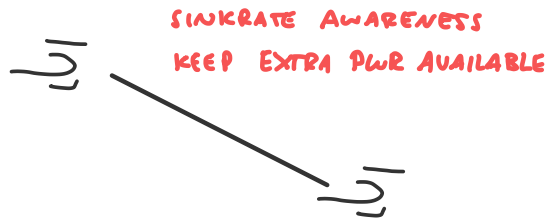
EXERCISE II : CIRCUIT, APPROACH AND LANDING (PART 2)

PILOTS WHO ASK WHY

AIM : TO LEARN THE CORRECT CIRCUIT AND EMERGENCY PROCEDURES

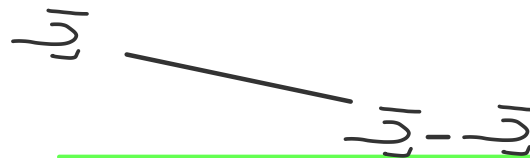
AIRMANSHIP : LOOKOUT, W/U, FREDAT, TRAFFIC SEPARATION, NOISE ABATEMENT

STEEP APPROACH



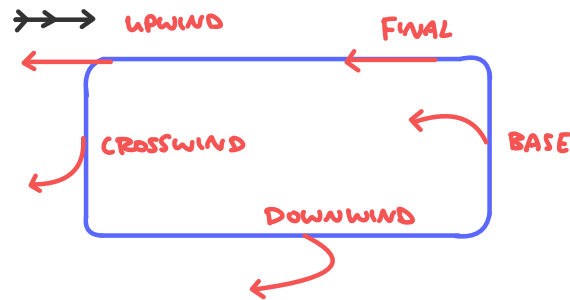
DESCEND SLOWLY ALONG STEEP ANGLE
BY USING LOWER IAS IF ROD > 300' / M
MAINTAIN IAS 30+ KTS COLLECTIVE ↑
TO REDUCE ROD

LIMITED POWER APPROACH



NORMAL CONSTANT ANGLE APPROACH
ANTICIPATE LOSS OF TRANSLATIONAL LIFT
COLLECTIVE ↑
AT PWR LIMIT DO NOT REDUCE IAS
RUN ON SMOOTHLY

FORCED LANDING



UPWIND : INTO WIND, HIGH PWR
LOW IAS, LOW HEIGHT

CROSSWIND : TURN 90°, LOW IAS,
LOW HEIGHT, HIGH PWR

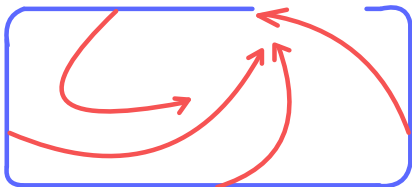
DOWNWIND : TURN 180°
LESS PITCH, HIGH IAS

BASE : TURN 90°, LOW IAS,
LOW HEIGHT, LOW PWR

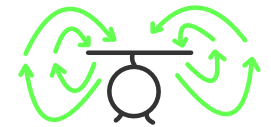
FINAL : LOW IAS, LOW HEIGHT,
INTO WIND, VERY LOW PITCH

EMERGENCY PROCEDURES

LAND AS SOON AS PRACTICAL
AVIATE — FLY AIRCRAFT
NAVIGATE — WHERE TO?
COMMUNICATE — TELL CREW / RT



VORTEX RING



HAZARDOUS
FLIGHT
CONDITION

CONDITIONS
IAS < 30 KTS
ROD > 300' / M
PWR APPLIED

SYMPTOMS
INCREASING ROD
VIBRATION
RANDOM PITCH / ROLL / YAW

RECOVERY
INCREASE IAS
BEFORE INCREASING PWR

EMERGENCY ACTIONS

LAND AS SOON AS PRACTICAL
LANDING SITE IS AT PILOT'S DISCRETION BASED ON NATURE OF PROBLEM. FLIGHT BEYOND NEAREST AIRPORT IS NOT RECOMMENDED.
CONTINUE CIRCUIT — PAN CALL

LAND IMMEDIATELY

POWERED

LAND ON NEAREST CLEAR AREA
CUT CIRCUIT SHORT
PAN / MAYDAY CALL

AUTO ROTATION

ENTER AUTO
SELECT FIELD INTO WIND
MAYDAY CALL

EXERCISE 12: FIRST SOLO

AIM: TO PREPARE THE STUDENT AND ASSESS THEIR ABILITY TO FLY A SOLO CIRCUIT

AIRMANSHIP: STUDENT TO DISPLAY GOOD AIRMANSHIP AND DECISION MAKING

ADMIN CHECKS

PRE-REQUISITES

- MEDICAL
- AIR LAW PASSED
- AGE 16+

WEIGHT / BALANCE

- UNDERSTANDING
- BALLAST?
- C OF G EFFECTS

COMPLETED EXERCISES

- EX 1-11, 16
- TRAINING RECORDS

EMERGENCIES

- BRIEFED

RADIO

- PHRASEOLOGY
- EQUIPMENT

COMPANY POLICIES

PERFORMANCE CHECKS

CONSISTENCY

- THREE ACCURATELY FLOWN CIRCUITS
- MINIMAL INSTRUCTOR INPUT
- T/O/LANDING

AIRMANSHIP

- POSITIVE DECISION MAKING
- SITUATIONAL AWARENESS

MENTAL STATE

- FATIGUE
- IMSAFE
- CAPACITY

WEATHER

- RAIN
- CLOUDBASE
- VIS
- W/V

PRE-SOLO BRIEF

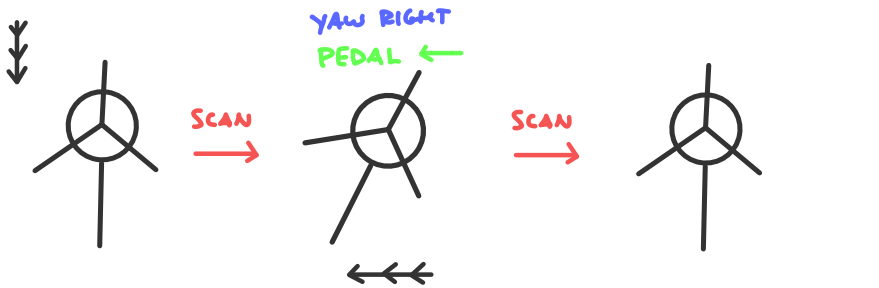
- BE SPECIFIC
- WHAT, WHEN?
- C OF G
- PWR DIFFERENCES
- DON'T RUSH
- IN DOUBT? GO AROUND

EXERCISE 13 : SIDEWAYS AND BACKWARDS HOVER MANOEUVRING

AIM: TO LEARN HOW TO MANOEUVRE THE AIRCRAFT SIDEWAYS AND BACKWARDS, INTO AND OUT OF WIND

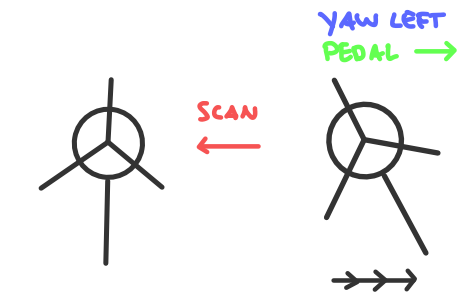
AIRMANSHIP: LOOKOUT, AREA, SURFACE, TAIL CLEARANCE, ENGINE HEALTH, PWR LIMITS

SIDEWAYS INTO WIND

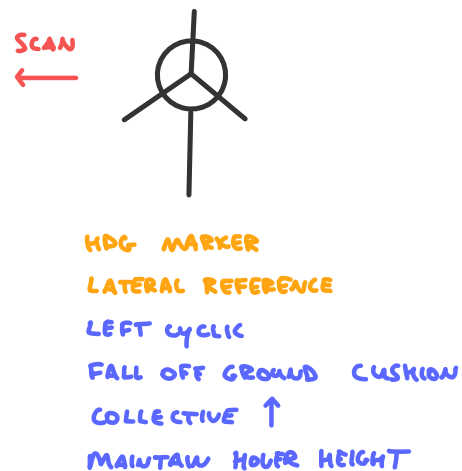


HDG MARKER
LATERAL REFERENCE
RIGHT CYCLIC
FALL OFF GROUND CUSHION
COLLECTIVE ↑
MAINTAIN HOVER HEIGHT

LEFT CYCLIC TO STOP
MAINTAIN HEADING
MAINTAIN HEIGHT
SELECT HOVER ATT

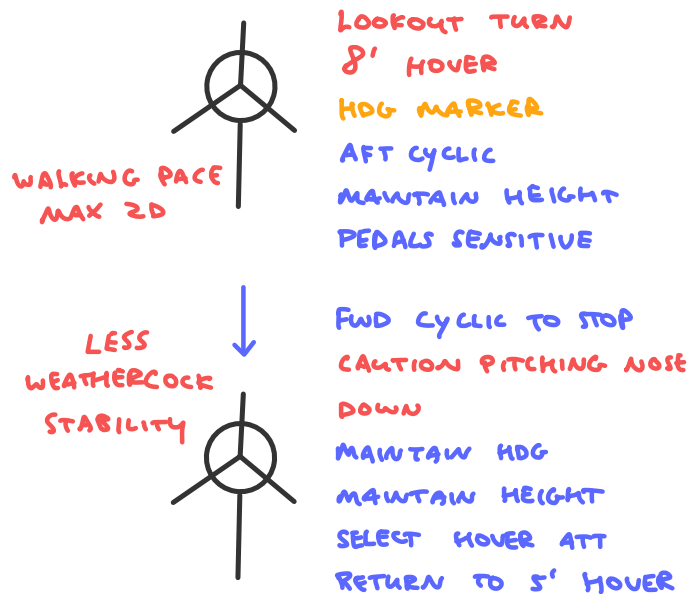


RIGHT CYCLIC TO STOP
MAINTAIN HDG
MAINTAIN HEIGHT
SELECT HOVER ATT

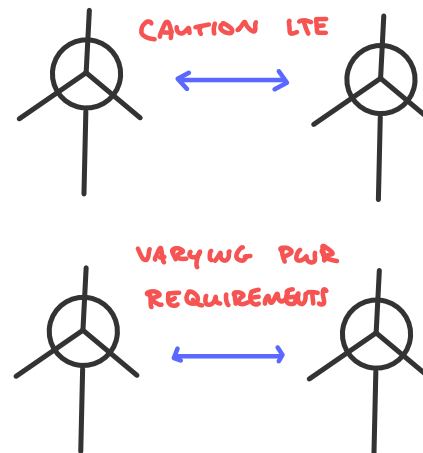


HDG MARKER
LATERAL REFERENCE
LEFT CYCLIC
FALL OFF GROUND CUSHION
COLLECTIVE ↑
MAINTAIN HOVER HEIGHT

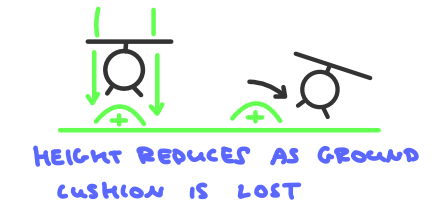
BACKWARDS INTO WIND



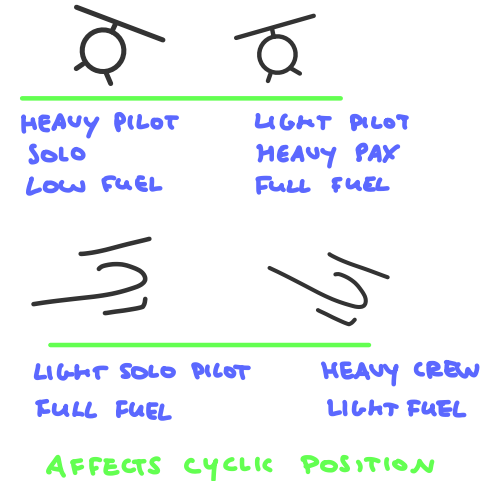
OUT OF WIND CONSIDERATIONS



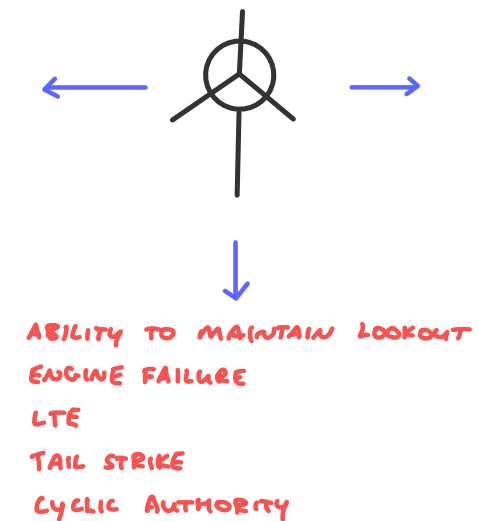
GROUND EFFECT



C OF G



SPEED CONSIDERATIONS



EXERCISE 14 : SPOT TURNS

AIM: TO LEARN HOW TO TURN THE AIRCRAFT IN THE HOVER THROUGH 360° ABOUT A GIVEN POINT

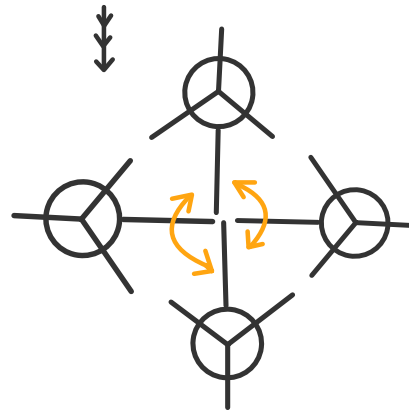
AIRMANSHIP: LOOKOUT, AREA, LIMITS, ENGINE HEALTH, W/V

SPOT TURN



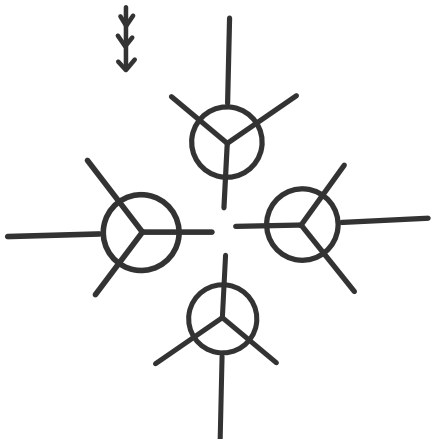
- LOOKOUT
- HOG MARKER
- RIGHT PEDAL
- CYCLIC INTO WIND
- MAINTAIN POSITION
- MAINTAIN HEIGHT
- 30° MARKERS
- CONTROL RATE OF TURN

TURN AROUND TAIL



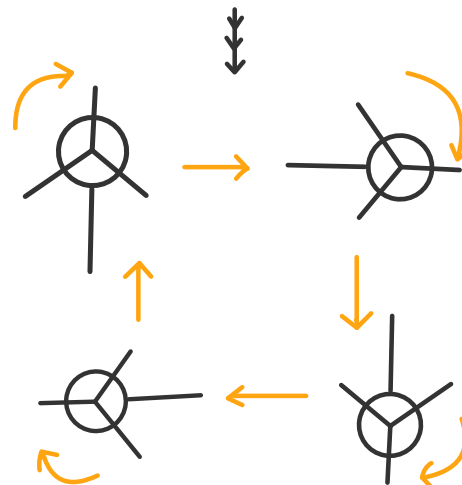
- LOOKOUT
- HOG MARKER
- LATERAL MARKER
- LATERAL CYCLIC
- PEDAL INPUT
- PREVENT DRIFT
- MAINTAIN HEIGHT
- 30° MARKERS
- CONTROL RATE OF TURN

TURN AROUND NOSE



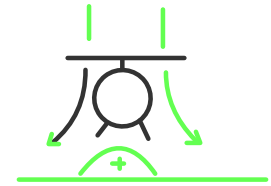
- COMBINATION OF SPOT TURN AND SIDEWAYS HOVER
- LOOKOUT
- HOG MARKER
- LATERAL REFERENCES
- LATERAL CYCLIC
- OPPOSITE PEDAL
- PREVENT DRIFT
- MAINTAIN HEIGHT
- 30° / LATERAL MARKERS
- CONTROL RATE OF TURN

SAFE AND SQUARE CLEARING TURN



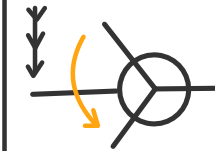
- CLEAR RIGHT
- HOG MARKER
- SIDEWAYS HOVER
- STOP - TURN 90°
- TAIL IN SAFE AREA
- CONTINUE UNTIL INTO WIND AGAIN

GROUND EFFECT



ICE HOVER DURING SPOT TURNS

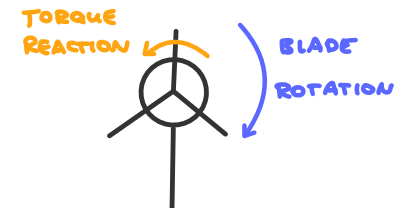
WIND AND WEATHERCOCKING



- AFFECTS CYCLIC POSITION
- RATE OF TURN INCREASE

STRONG WIND - CHALLENGING

TORQUE REACTION



CAUTION USING LEFT PEDAL
CONTROL RATE OF TURN

CYCLIC LIMITS

- MORE WIND - MORE CYCLIC DEFLECTION
- FLAPBACK
- TRANSLATIONAL LIFT
- TR DRIFT

EXERCISE 15 : HOVER OUT OF GROUND EFFECT AND VORTEX RING

AIM: TO LEARN HOW TO HOVER OGE, RECOGNISE THE SYMPTOMS OF VORTEX RING, AND LEARN THE RECOVERY ACTIONS

AIRMANSHIP: LOOKOUT (360°), CONSPICUITY, W/V, AREA, ENGINE HEALTH, PWR LIMITS, PERFORMANCE CHARTS

OGE HOVER

3000' 70 KTS

DECEL ATT



LOOKOUT
HDG MARKER

SELECT 20 KTS ATT
GROUND REFERENCES
MAINTAIN ALTITUDE
MAINTAIN HDG

SCAN INSTRUMENTS
MONITOR ROD, IAS, PWR

POTENTIAL HAZARDS
OVERPITCH
LOWER RPM
CONTROLLABILITY ISSUES

20 KTS

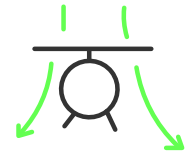


IAS 20 KTS
GS 0 KTS



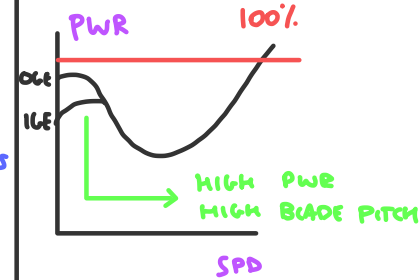
IAS -20 KTS
GS 0 KTS

OGE HOVER



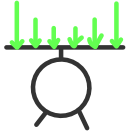
DOWNWASH FREE TO DISSIPATE
MORE PWR REQUIRED

PWR REQUIRED

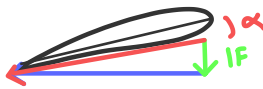


VORTEX RWG

OGE



TIP



ROOT



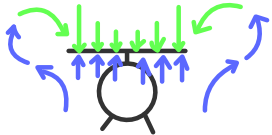
CONDITIONS

< 30 KTS IAS
> 300' / M
PWR APPLIED

RECOVERY

FWD CYCLIC
> 30 KTS IAS
BEFORE INCREASING PWR

ROD OCCURS



HIGH IF, NO LIFT

STALL

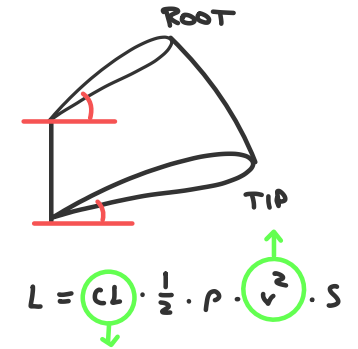
SYMPTOMS

VIBRATIONS
RANDOM PITCH/ROLL/YAW
INCREASING ROD

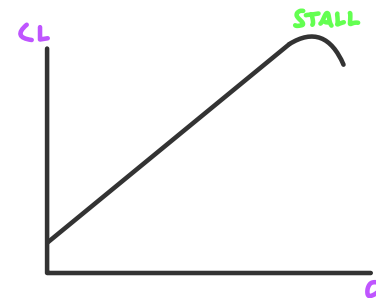
SCENARIOS

OGE HOVER
APPROACH
DOWNWIND QUICKSTOPS
BEST PRACTICE AVOID

WASHOUT



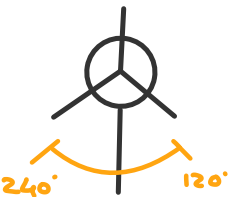
alpha VS CL



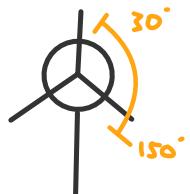
LOSS OF TAIL ROTOR EFFECTIVENESS

UNIDIRECTIONAL YAW
IN DIRECTION OF
TORQUE REACTION
DUE TO SUDDEN
REDUCTION IN TR
EFFECT

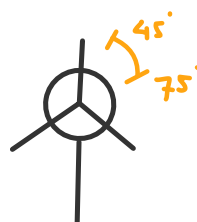
LESS WEATHERCOCK
STABILITY



TR
VORTEX RING



MAIN ROTOR
VORTEX



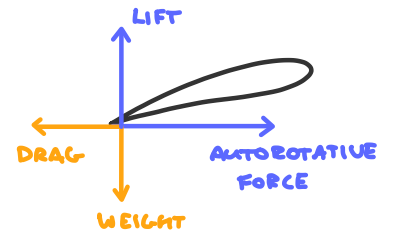
RECOVERY ACTIONS

FULL RIGHT PEDAL
INCREASE IAS
REDUCE PWR
AVOID BY CORRECTING-
YAW ASAP

EXERCISE 16: SIMULATED ENGINE OFF LANDINGS

PILOTS WHO ASK WHY

FORCES IN AUTOROTATION



AIM: TO LEARN HOW TO LAND SAFELY WITHOUT USE OF THE ENGINE

AIRMANSHIP: HASEL, W/V (GUSTS), WEIGHT, USE OF THROTTLE, VERBAL WARNING, 300' CHECK

VARIABLE FLARE EOL

1000' AGL
70 KTS
HASEL
WIND
WEIGHT

ENTRY
HOG MARKER
VERBAL WARNING
COLLECTIVE ↓ FULLY
HOLD ATT
LEFT PEDAL
SELECT 60 KTS ATT
THROTTLE CLOSED
NEEDLES SPLIT
RPM CHECK

DESCENT

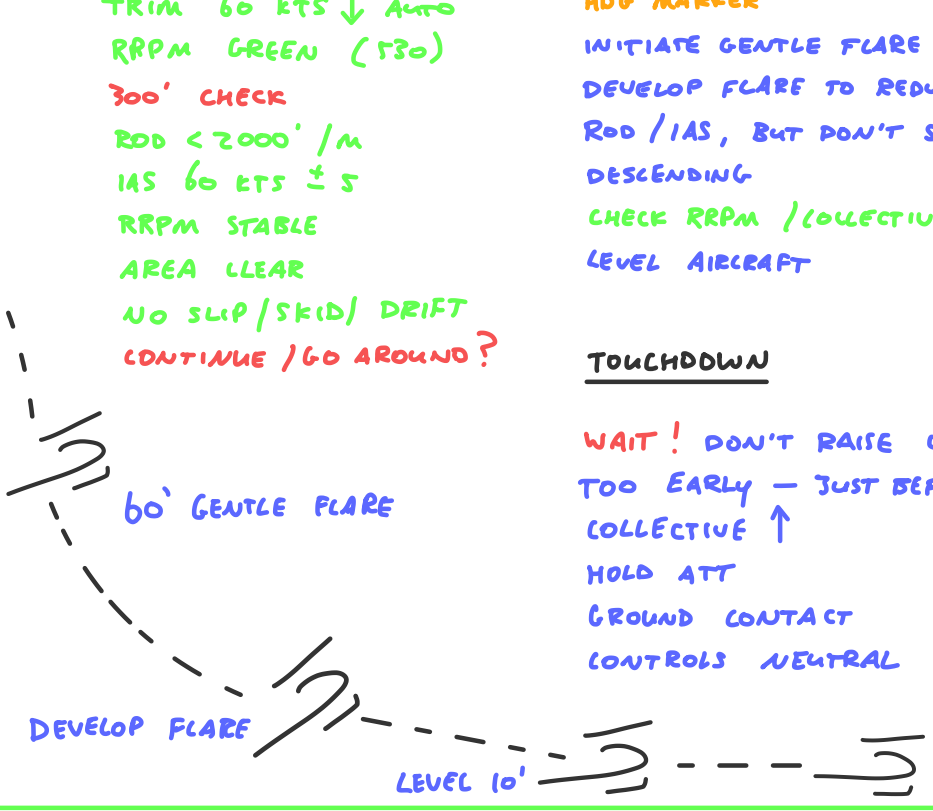
TRIM 60 KTS ↓ AUTO
RRPM GREEN (F30)
300' CHECK
ROD < 2000' / M
IAS 60 KTS ± 5
RRPM STABLE
AREA CLEAR
NO SLIP / SKID / DRIFT
CONTINUE / GO AROUND?

FLARE

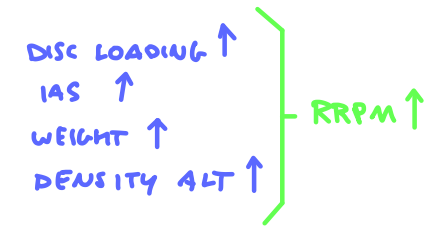
HOG MARKER
INITIATE GENTLE FLARE
DEVELOP FLARE TO REDUCE
ROD / IAS, BUT DON'T STOP
DESCENDING
CHECK RRPM / COLLECTIVE ↑
LEVEL AIRCRAFT

TOUCHDOWN

WAIT! DON'T RAISE COLLECTIVE
TOO EARLY - JUST BEFORE CONTACT
COLLECTIVE ↑
HOLD ATT
GROUND CONTACT
CONTROLS NEUTRAL



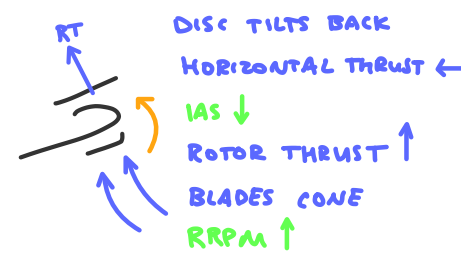
RRPM FACTORS



ENERGY MANAGEMENT

KINETIC ENERGY - SPEED
POTENTIAL ENERGY - HEIGHT
ROTATIONAL ENERGY - RRPM
MUST BE MANAGED

FLARE EFFECT



CONSTANT ATTITUDE AUTO

30 KTS DURING DESCENT
NO FLARE
COLLECTIVE ↑
CUSHION LANDING
CAUTION VORTEX RING
IF PWR RECOVERY

HOVER TAXI EOL

PEDAL ←
PREVENT DRIFT
COLLECTIVE ↑
CUSHION LANDING

EOL IN TRANSITION

COLLECTIVE ↓
FLARE
DEVELOP FLARE
LEVEL
TOUCHDOWN

POWER RECOVERY

NEEDLES JOIN
5' : COLLECTIVE ↑
PEDAL →
HOLD ATT

TORQUE EFFECT

NEWTON'S 3RD LAW
PWR RECOVERY = TORQUE REACTION
FULL EOL = NO TORQUE REACTION

EXERCISE 17 : ADVANCED AUTOROTATIONS

LIMITS IN AUTOROTATION

450 - 515 HORN 466
 515 - 540
 540 - 610 HORN 594
 POWER OFF VNE 110 KTS
 - 2 KTS / 1000'

HIGHER BANK = HIGHER ROD

AIM: TO LEARN HOW TO VARY THE DISTANCE COVERED IN AUTOROTATION USING IAS, RRPM, AND TURNS

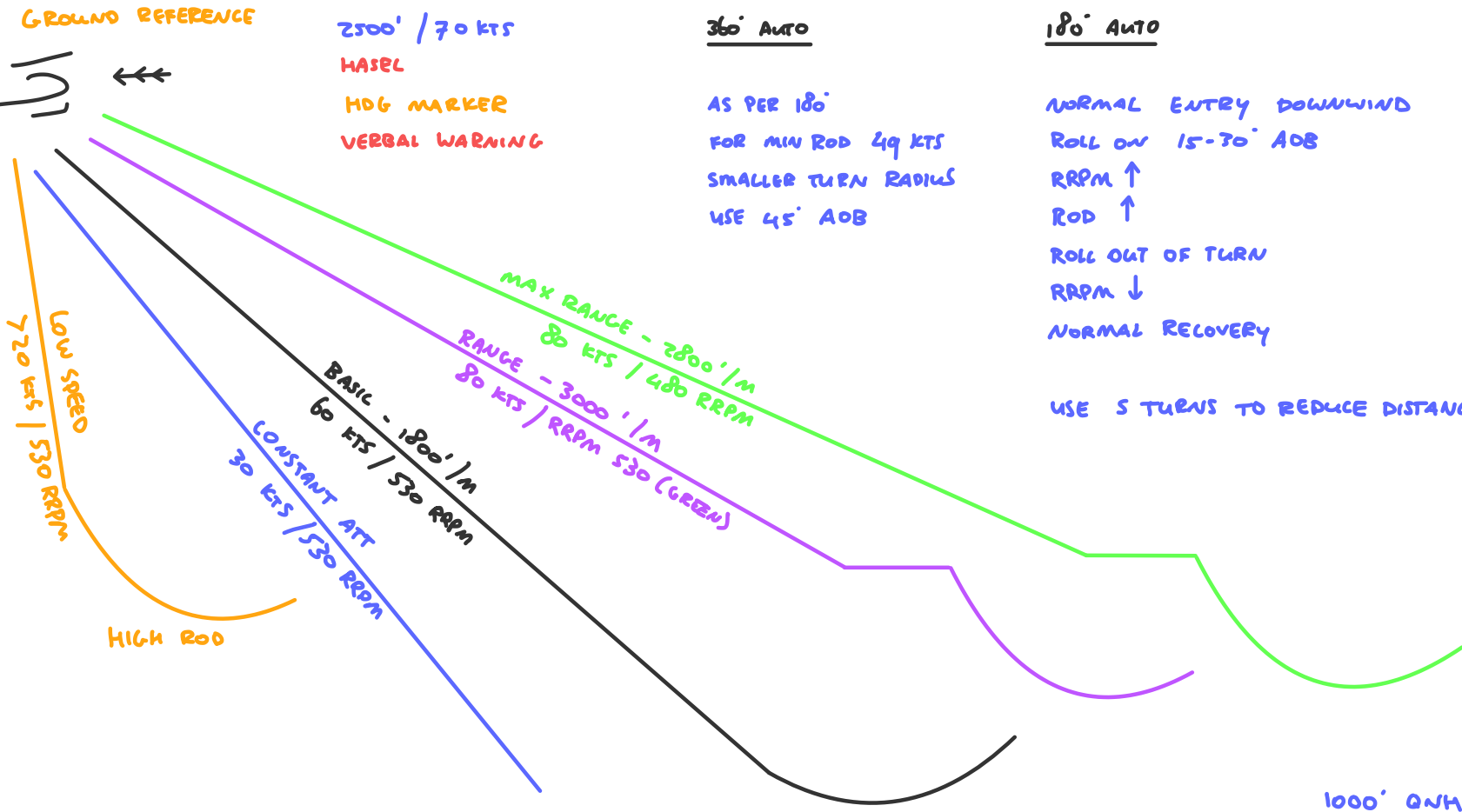
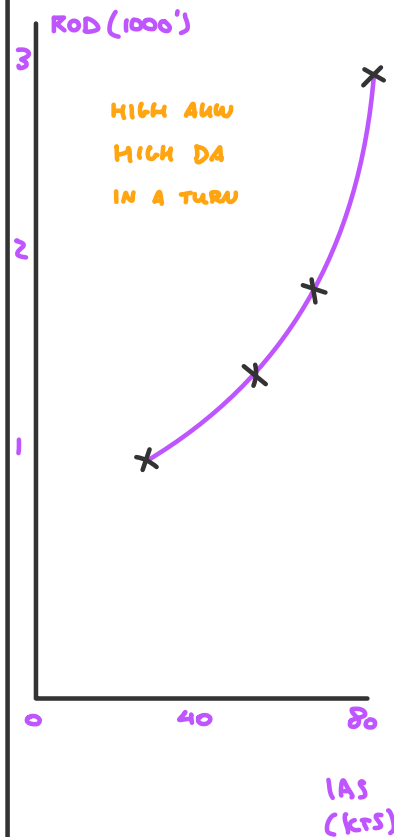
AIRMANSHIP: HASEL, VERBAL WARNING, USE OF THROTTLE, W/V, LOW FLYING RULES

RRPM FACTORS

DISC LOADING ↑
 IAS ↑
 WEIGHT ↑
 DENSITY ALT ↑

RRPM ↑

ROD IN AUTOROTATION



AS PER 180'
 FOR MIN ROD 49 KTS
 SMALLER TURN RADIUS
 USE 45' AOB

NORMAL ENTRY DOWNWIND
 ROLL ON 15-30' AOB
 RRPM ↑
 ROD ↑
 ROLL OUT OF TURN
 RRPM ↓
 NORMAL RECOVERY

USE 5 TURNS TO REDUCE DISTANCE

LOW SPEED

NORMAL ENTRY
 SELECT 20 KTS ATT
 RRPM ↑ THEN ↓
 MAINTAIN RRPM
 SELECT 60 KTS ATT
 RRPM ↓ THEN ↑
 NORMAL RECOVERY

CONSTANT ATT

NORMAL ENTRY
 SELECT 30 KTS ATT
 RRPM ↑ THEN ↓
 MAINTAIN RRPM
 RECOVER TO CLIMB
 GRADUALLY IAS ↑
 CAUTION VORTEX RING

BASIC

NORMAL ENTRY
 NORMAL RECOVERY
 AS PER EXERCISE 7

RANGE

NORMAL ENTRY
 SELECT 80 KTS ATT
 RRPM ↓ THEN ↑
 MAINTAIN 530 RRPM
 SELECT 60 KTS ATT
 RRPM ↑ THEN ↓
 MAINTAIN RRPM
 NORMAL RECOVERY

MAX RANGE

NORMAL ENTRY
 SELECT 80 KTS ATT
 COLLECTIVE ↑ 480 RRPM
 SELECT 60 KTS ATT
 COLLECTIVE ↓ 530 RRPM

EXERCISE 18: PRACTICE FORCED LANDINGS

PILOTS WHO ASK WHY

AIM: TO LEARN HOW TO CARRY OUT AN AUTOROTATIONAL APPROACH TO A SPECIFIC LANDING AREA

AIRMANSHIP: HASEL, W/V, USE OF THROTTLE, VERBAL WARNING, DRILLS / ACTIONS

1 ESTABLISH AUTOROTATION

UNCOMMANDED YAW / FIRE CAPTION
MAY HEAR LOW RPM HORN
ENTER WITHOUT DELAY

2 WHERE IS THE WIND?

PLANNING — FORECAST WIND
W/V ON DEPARTURE
ATC - OTHER TRAFFIC CALLS
VISUAL CUES :
• WATER
• SMOKE
• WIND TURBINES
• TREES / FLAGS

BE WIND AWARE

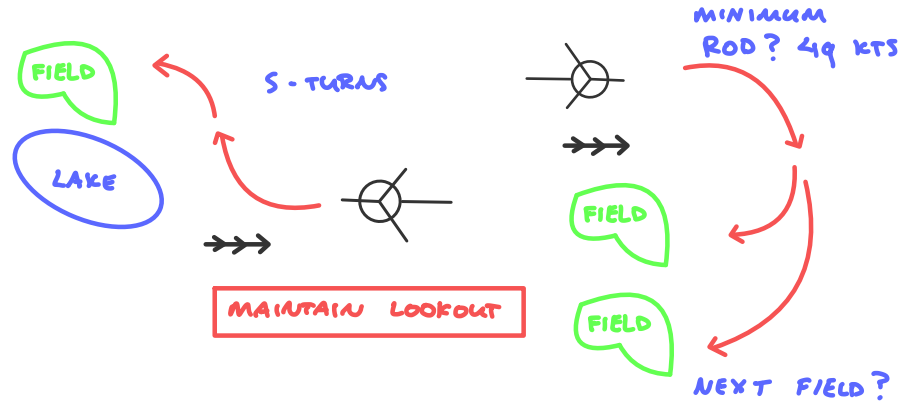
3 PICK A FIELD

SUITABLE?
IN RANGE?
CONSIDER WIND + HEIGHT LOSS
BE DECISIVE

FLY DEFENSIVELY

4 PLAN THE APPROACH

- ANY BASIC OR ADVANCED AUTO TECHNIQUE
- THINK:
 - WHERE DO WE WANT TO BE AT 500'?
 - LEVEL, BASIC AUTO IAS, 530 RRPM
 - WITHIN 30' OF WIND



5 MAYDAY CALL

CALL + LOCATION

6 VITAL ACTIONS

DRILLS, BRACE

7 PREPARE TO LAND

EOL TECHNIQUE
GO AROUND (PRACTICE)

TYPES OF EMERGENCIES

ENGINE / TRANSMISSION	YAW →
TAIL ROTOR	YAW ←
FIRE	CAPTION

TIME CONSIDERATIONS

2000' AGL	TIME ≈ 60S
5 SEC	ENTER AUTO
10 SEC	SELECT FIELD
3 SEC	PLAN APPROACH
15 SEC	MAYDAY CALL
10 SEC	VITAL ACTIONS
17 SEC	TIME REMAINING

FIELD SELECTION

SIZE	BIG ENOUGH?
SHAPE	SUITABLE FOR W/V
SURROUNDINGS	UNOBSTRUCTED?
SURFACE	FIRM / MUD / PLOUGHED?
SLOPE	FLAT - NO DOWNSLOPE

VITAL ACTIONS

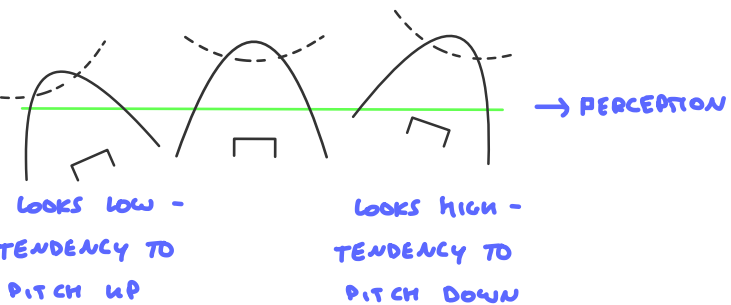
ENGINE FAIL / TRANSMISSION
TAIL ROTOR FAIL
FIRE

EXERCISE 19: STEEP TURNS

AIM: TO LEARN HOW TO TURN AT A HIGH RATE USING A CONSTANT BANK ANGLE, SPEED, AND RRPM

AIRMANSHIP: LOOKOUT, SCAN, SPACIAL AWARENESS, LIMITS, EH, W/U, VERBAL WING, THROTTLE USE

OFFSET SEAT EFFECT



LEVEL TURNS

30° = STEEP TURN
45° = MAX RATE

EH
LOOKOUT
HDG MARKER

ENTRY

ROLL ON BANK
COLLECTIVE ↑
MAINTAIN ALT
MAINTAIN BALANCE

DURING TURN

REGULAR LOOKOUTS
SCAN/TRIM 70 KTS

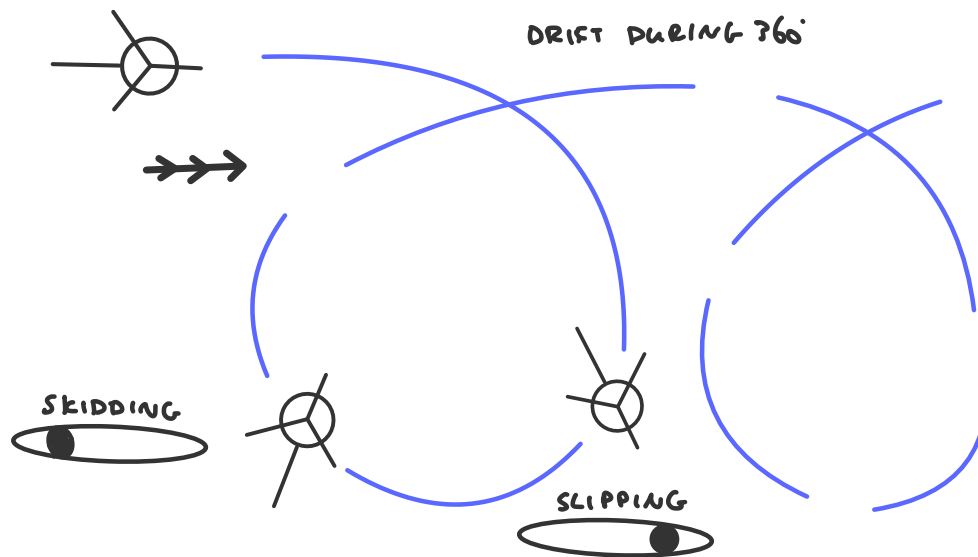
ROLL OUT

ANTICIPATE 20°-30°
MAINTAIN BALANCE/ALT

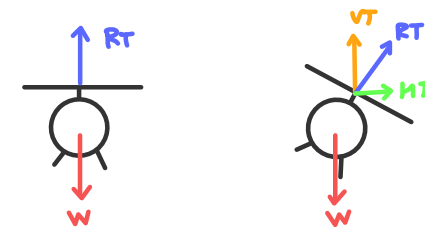
STEEP TURNS IN AUTO ROTATION

ENTER AUTO ROTATION
ROLL ON 30°/45° AOB
RRPM ↑ COLLECTIVE ↑
LOOKOUT
ROLL OUT
RRPM ↓ COLLECTIVE ↓
IAS 60 KTS RRPM 530
NORMAL RECOVERY

BALANCE AND DRIFT

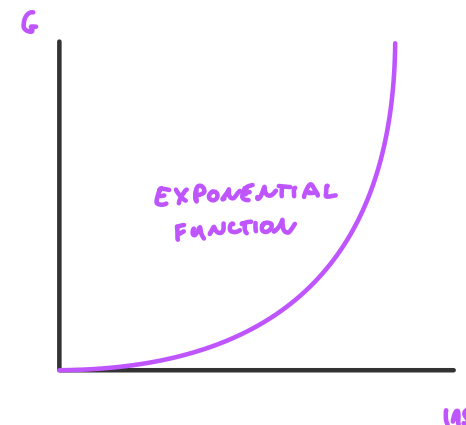
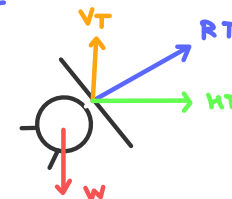


ANGLE OF BANK LIMITS



60° LEVEL TURN

≈ 2 G



RRPM LIMITS

DISC LOADING ↑ RRPM ↑

POWER ON 515 - 540

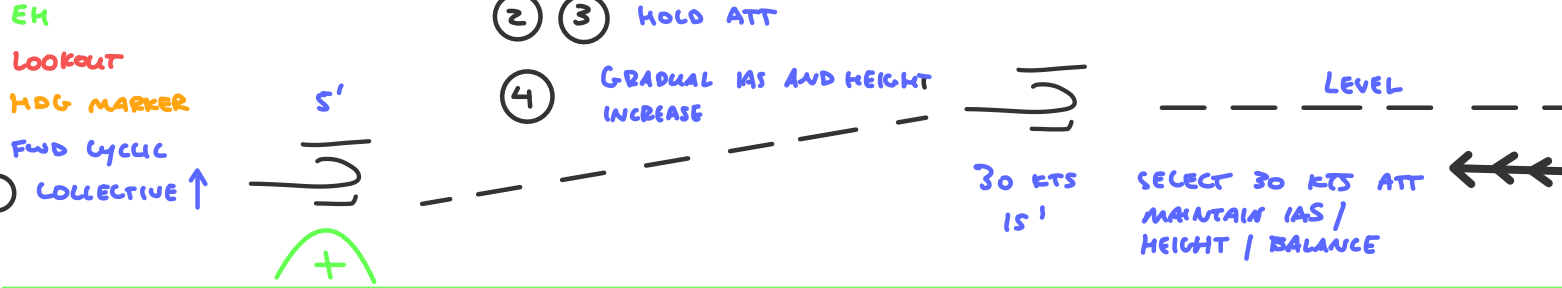
POWER OFF 450 - 515
515 - 540
540 - 610

EXERCISE 20 · TRANSITIONS

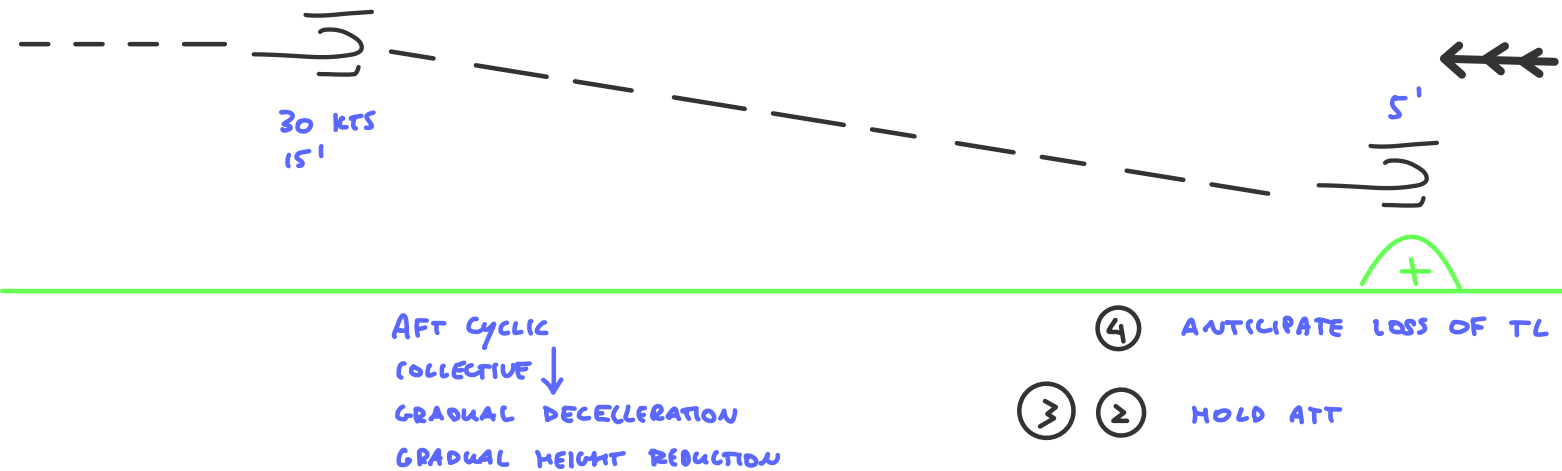
AIM: TO LEARN HOW TO TRANSITION FROM THE HOVER TO A GIVEN IAS AND BACK AGAIN

AIRMANSHIP: LOOKOUT, W/V, SURFACE, AREA, EH, LIMITS, AVOID CURVE, RT

ENTRY



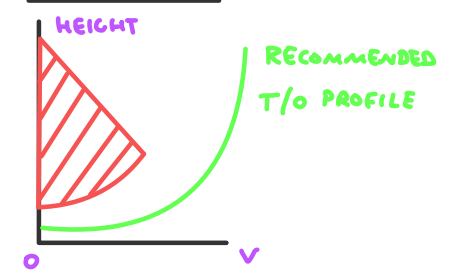
EXIT



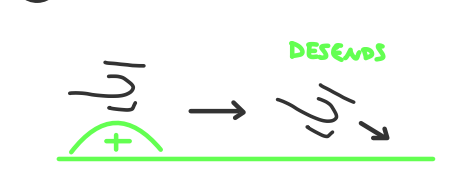
EFFECT OF WIND

STRONGER HEADWIND — LESS DISTANCE / TIME TO 30 KTS
CROSSWIND — CORRECT FOR DRIFT

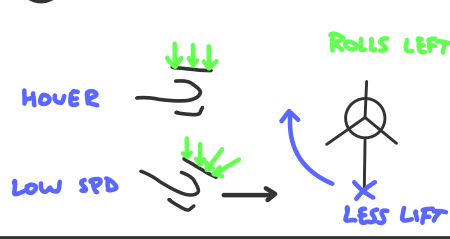
AVOID CURVE



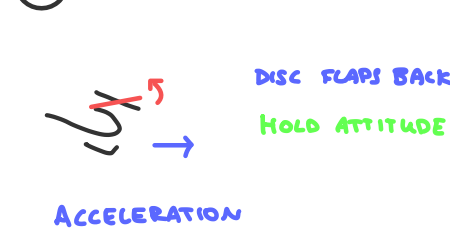
① GROUND CUSHION



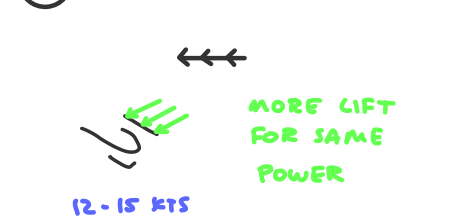
② INFLOW ROLL



③ FLAPBACK



④ TRANSLATIONAL LIFT

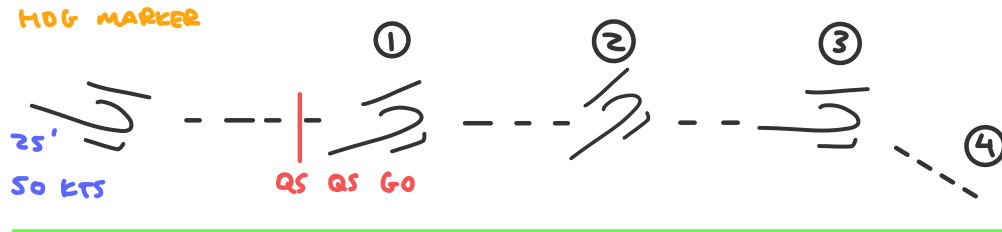


EXERCISE 21 : QUICKSTOPS

AIM: TO LEARN HOW TO BRING THE AIRCRAFT TO A STOP QUICKLY AT LOW LEVEL INTO WIND

AIRMANSHIP: LOOKOUT, AREA, W/V, SURFACE, EH, LIMITS, AVOID CURVE, VERBAL WARNING

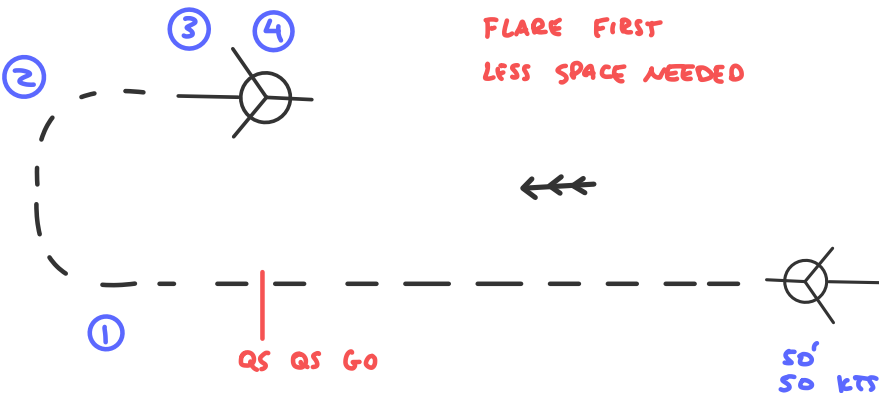
INTO WIND



- ① GENTLE AFT CYCLIC COLLECTIVE ↓
MAINTAIN HEIGHT/Hdg
- ② DEVELOP FLARE COLLECTIVE ↓
MAINTAIN HEIGHT/Hdg
- ③ LEVEL (Fwd cyclic) COLLECTIVE ↑
MAINTAIN HEIGHT/Hdg
- ④ Fwd / DOWN MIN ROD VISUAL WITH AREA

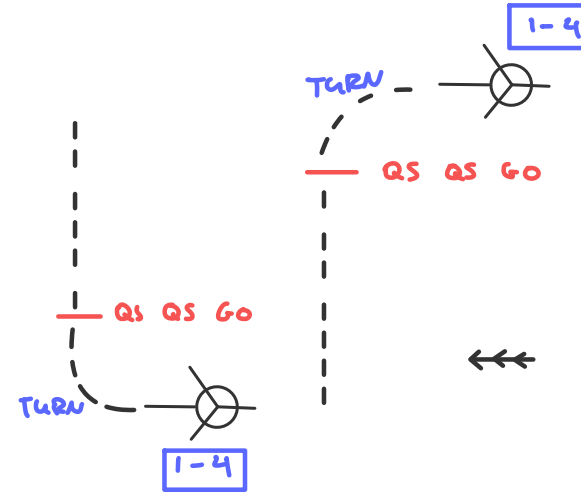
DOWNWIND - FLARE AND TURN

TAKES MORE DISTANCE

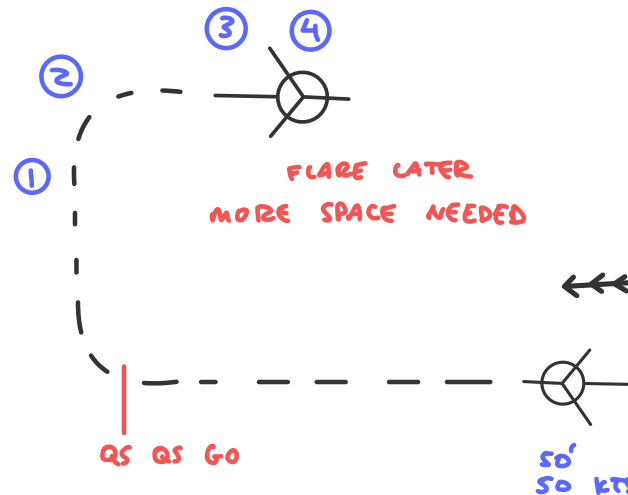


FLARE FIRST
LESS SPACE NEEDED

CROSSWIND



DOWNWIND - TURN AND FLARE



FLARE LATER
MORE SPACE NEEDED

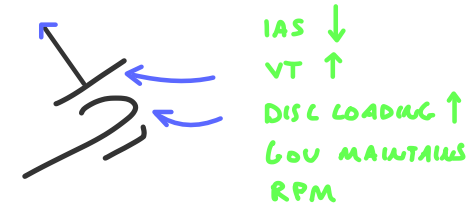
ANGLE OF BANK LIMITATIONS

- PWR AVAILABLE
- OVERPITCHING
- AEROBATICS PROHIBITED (>60°)
- LOAD FACTOR
- STRUCTURAL DAMAGE
- HIGH DISC LOADING
- RPM LIMITS
- GOVERNOR ISSUES

AIRSPEED LIMITATIONS

- HIGH IAS → LARGE TURN RADIUS
- LIMITED BY SPACE
- ABILITY TO LOOKOUT
- HIGH GS
- EMERGENCY CONSIDERATIONS

FLARE EFFECT



VORTEX RWG

- IAS < 30 KTS
- Rod > 300' / M
- PWR APPLIED

EXERCISE 22 : NAVIGATION (PART 1)

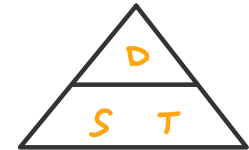
PILOTS WHO ASK WHY

DISTANCE, SPEED, TIME

AIM: TO LEARN HOW TO NAVIGATE FROM POINT TO POINT AND UNDERSTAND THE PROCEDURES THAT ARE TO BE FOLLOWED

AIRMANSHIP: FUEL PLANNING, LOOKOUT, RT, SITUATIONAL AWARENESS, FREDAT, W/V

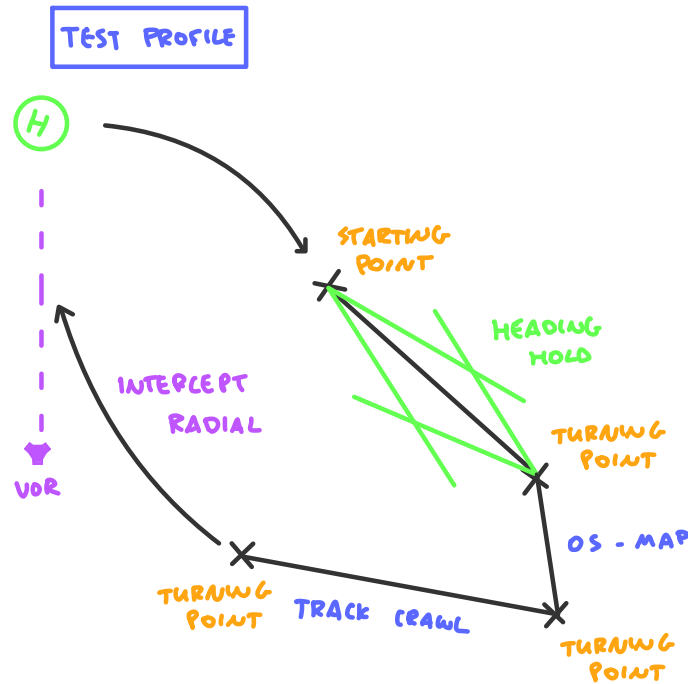
$$SPEED = \frac{DISTANCE}{TIME}$$



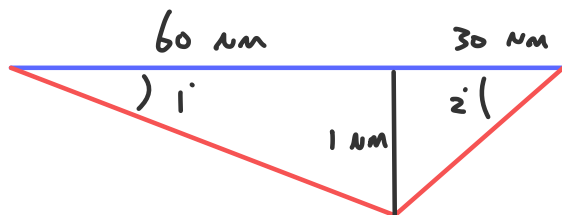
CHARTS

- ROADS
- LAKES / RIVERS
- CITIES / VILLAGES
- RAILWAYS
- POWERLINES
- AIRSPACE
- DISUSED AIRFIELDS
- DANGER / RESTRICTED / PROHIBITED AREAS
- NAV AIDS
- OBSTACLES
- ELEVATION
- CHART ORIENTATION

BASIC TECHNIQUES

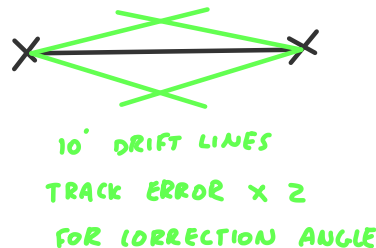


1 IN 60 RULE

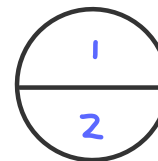


1 NM OF TRACK AFTER 60 NM
TRACK ERROR = 1°

HEADING HOLD

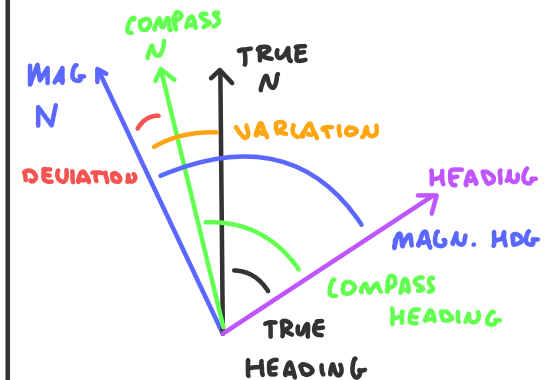


FUEL CIRCLES



1 = PLANNED REMAINING FUEL
2 = FUEL REQUIRED TO COMPLETE ROUTE

VARIATION / DEVIATION



VARIATION WEST, MAGNETIC BEST
DEVIATION WEST, COMPASS BEST

FUEL PLANNING

BURN RATE 40 L / H

FUEL MINIMA
LAW 30 M ENDURANCE
COMPANY COULD BE STRICTER
FUEL CIRCLES TO PLAN

EXERCISE 22 : NAVIGATION (PART 2)

HELICOPTER DOCUMENTATION

- CERTIFICATE OF AIRWORTHINESS
- AIRWORTHINESS REVIEW
- INSURANCE
- RT LICENCE
- NOISE CERTIFICATE
- RELEASE TO SERVICE

AIM : TO LEARN HOW TO NAVIGATE FROM POINT TO POINT AND UNDERSTAND THE PROCEDURES THAT ARE TO BE FOLLOWED

AIRMANSHIP : TRAFFIC AWARENESS, DOCUMENT RESPONSIBILITIES, WEATHER AWARENESS, MATED

MATED CHECKLIST

METEOROLOGY	AIRCRAFT	TRAFFIC	EXERCISE	DUTIES
SYNOPTICS TAF / METARS SIGNIFICANT WX / SPOT W/V	DOCUMENTS CHECK A W & B TECH LOG COMPANY	NOTAMS AIS INFO BOOKINGS	FLIGHT PLAN ROUTE PLATES RADIO CALLS	PAX BRIEF MP US SP DANGEROUS GOODS

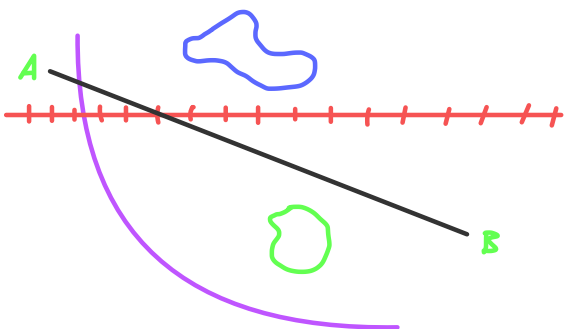
WEATHER WFO

METOFFICE

- Z14
- Z15
- METAR / TAF

CODE FAMILIARISATION

TRACK CRAWL



VARIABLE HEADING, UNLIKE HDG HOLD USE FEATURES

USE OF PLOG

- CRP - S
- FUEL CALCULATIONS
- MSA / MOCA / MORA

ALTIMETER SETTINGS

- QFE
- QNH
- 1013 / TRANSITION ALT
- ALT SETTING REGIONS

TRAFFIC INFORMATION

NATS UK

- AERODROME BRIEF
- ROUTE BRIEF
- POINT BRIEF

AIS CALL

TECH LOG

LEGAL DOC

TO BE COMPLETED BEFORE AND AFTER EACH FLIGHT

EXERCISE 22 : NAVIGATION (PART 3)

TYPES OF ATSU

- AIR GROUND
- INFORMATION
- ATC

AIM : TO LEARN HOW TO NAVIGATE FROM POINT TO POINT AND UNDERSTAND THE PROCEDURES THAT ARE TO BE FOLLOWED

AIRMANSHIP : FUEL PLANNING, LOOKOUT, RT, SITUATIONAL AWARENESS, FREDAT CHECKS, W/V

IN FLIGHT DECISION MAKING

- WEATHER
- DAYLIGHT PERIOD
- TRANSPONDER CODES
 - 7700 EMERGENCY
 - 7600 RT FAILURE
 - 7500 HIJACK

- WHERE IS BAD WX COMING FROM?
- CONSPICUITY
- MSA
- W/V
- TURBULENCE

RADIO CALLS

REVISE AIRFIELD RT

LOST PROCEDURE

- DISTRESS & DIVERSION 121.5
- DIRECTION FINDING ODR
QDM
QTE
- VHF DIRECTION FINDING ± 3 NM

COMMUNICATION

- PREP
- RT EXAM
- CONSPICUITY
- BLIND CALLS
- LISTENING SQUAWK
- REQUESTING A SERVICE

WEATHER MINIMA

REVISE NATIONAL VFR MINIMA

AND COMPANY MINIMA

EXERCISE 22 : NAVIGATION (PART 4)

TITS CHECK

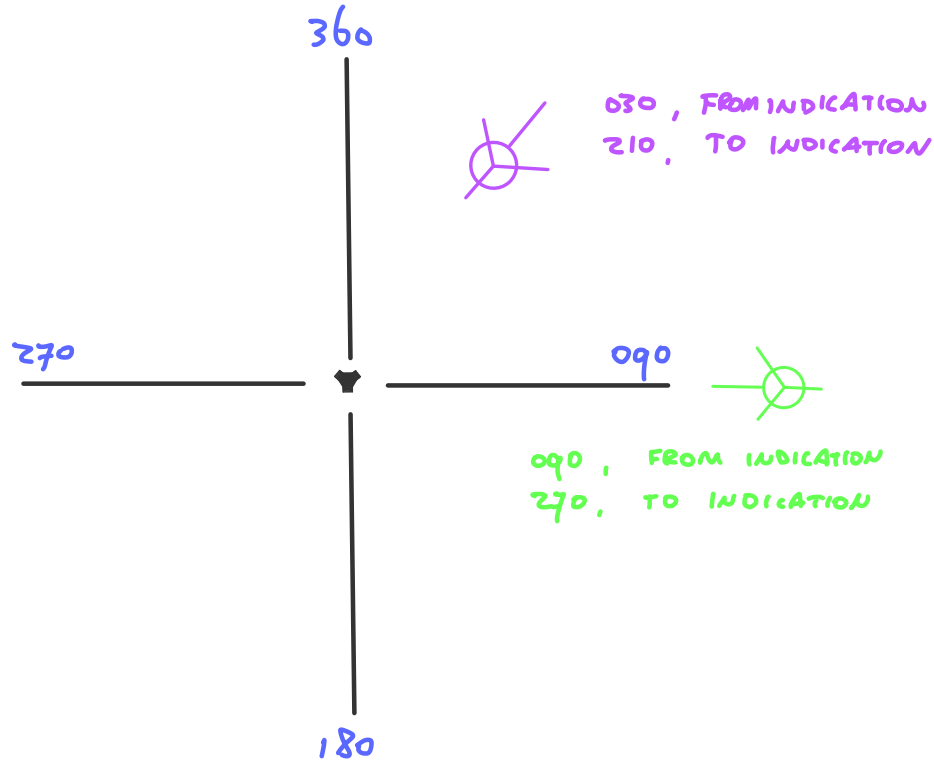
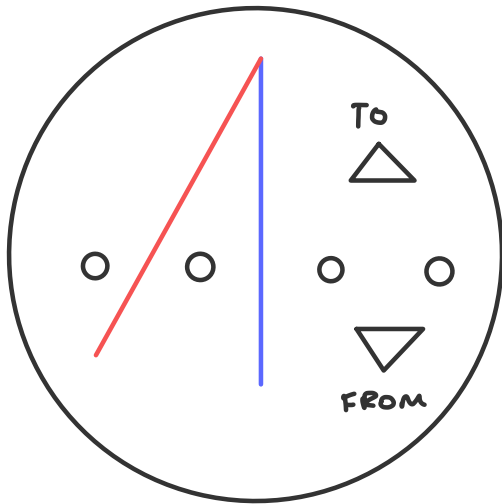
- TUNE
- I IDENTIFY
- T EST
- S ELET

AIM : TO LEARN HOW TO NAVIGATE FROM POINT TO POINT AND UNDERSTAND THE PROCEDURES THAT ARE TO BE FOLLOWED

AIRMANSHIP : TRAFFIC AWARENESS, DOCUMENT RESPONSIBILITIES, WX AWARENESS, CHECKS

VOR

OMNI BEARING SELECTOR

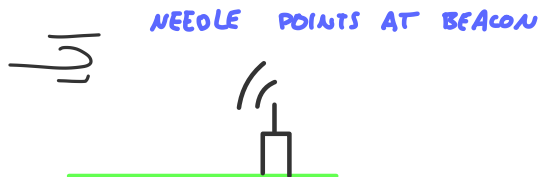


TRANSPONDER

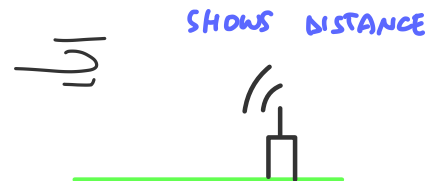
- MODE A : 4 DIGIT CODE
- MODE C : + PA
- MODE S : + REG

EMERGENCY CODES

NDB



DME



RADAR

- SECONDARY : TRANSPONDERS
- PRIMARY : PULSE BOUNCES OFF AIRCRAFT

EXERCISE 23: ADVANCED TAKE-OFFS AND LANDINGS (PART 1)

AIM: TO LEARN ADVANCED TECHNIQUES FOR TAKEOFF AND LANDING

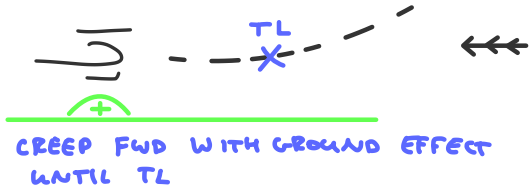
AIRMANSHIP:

- LOOKOUT
- W/V
- LIMITS
- ENGINE HEALTH
- PWR CHECKS
- RT, AVOID CURVE, VORTEX

- SIZE
- SHAPE
- SURROUNDINGS
- SURFACE
- SLOPE

CUSHION CREEP

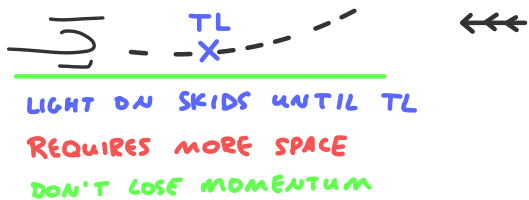
- LOOKOUT
- RELCE
- HOG MARKER



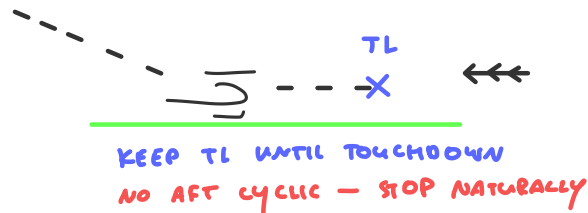
ZERO SPEED LANDING



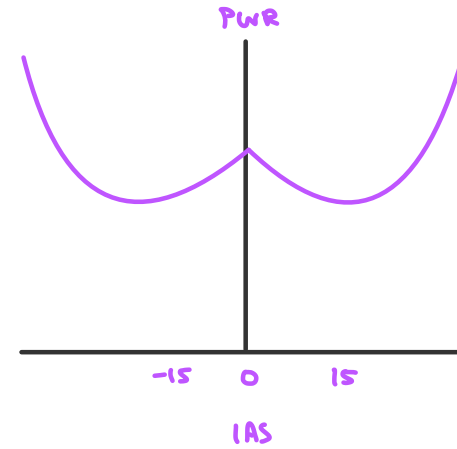
RUNNING T/O



RUNNING LANDING



PWR REQUIRED



MORE PWR ON DOWNWIND APPROACH

PWR CHECK

HOVER
 2' - NOTE PWR%
 THEN PULL 100% (NOTE RRPM)
 PWR AVAIL = MAX - ACTUAL

FLIGHT
 S/L V_y (50 KTS) - NOTE PWR
 THEN PULL 100% (NOTE RRPM)
 PWR AVAIL = MAX - ACTUAL

PERFORMANCE

ALT ↑ PERFORMANCE ↓

HIGH PRESSURE ALT MEANS
 ACTUAL PRESSURE < ISA PRESSURE

DENSITY ALT ADDS TEMPERATURE
 VARIABLE

$DA = PA + (120 \times (OAT - ISA))$
 PERFORMANCE CHARTS USE PA

EXERCISE 23 : ADVANCED TAKE-OFFS AND LANDINGS (PART 2)

AIM: TO LEARN ADVANCED TECHNIQUES FOR TAKING OFF AND LANDING

<u>AIRMANSHIP:</u>	LOOKOUT	SIZE
	W/V	SHAPE
	LIMITS	SURROUNDINGS
	ENGINE HEALTH	SURFACE
	PWR CHECKS	SLOPE
	RT, AUDIO CURVE, VORTEX	

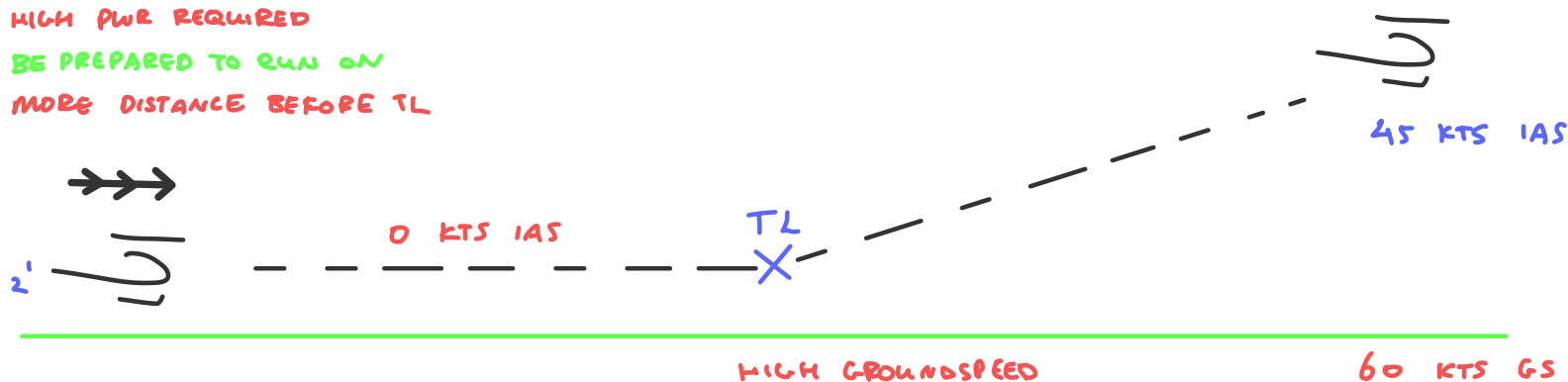
DOWNWIND TRANSITION

CUSHION CREEP TECHNIQUE

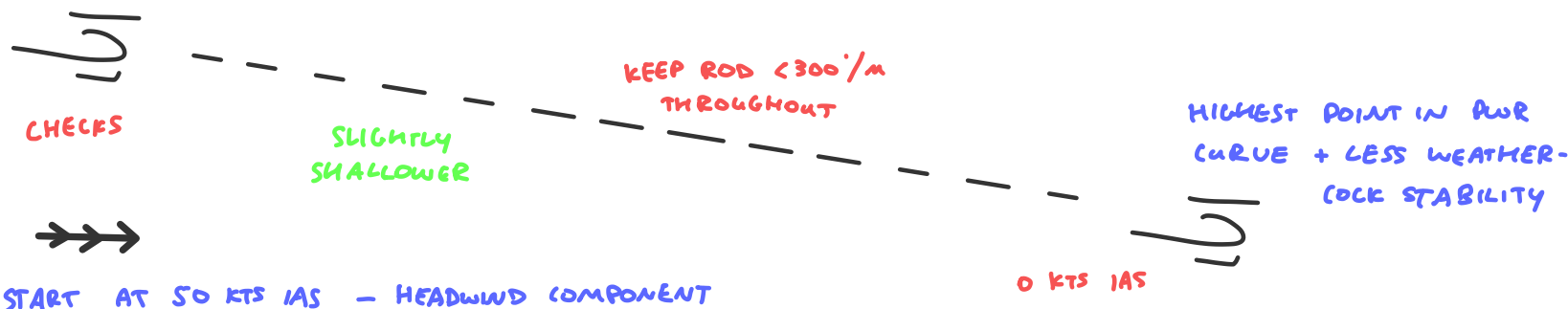
HIGH PWR REQUIRED

BE PREPARED TO RUN ON

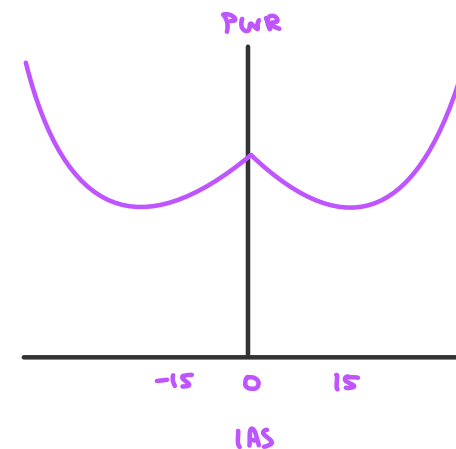
MORE DISTANCE BEFORE TL



DOWNWIND APPROACH TO HOVER



PWR REQUIRED



MORE PWR ON DOWNWIND APPROACH

PWR CHECK

HOVER

2' - NOTE PWR%

THEN PULL 100% (NOTE RRPM)

PWR AVAIL = MAX - ACTUAL

FLIGHT

S/L V_y (50 KTS) - NOTE PWR

THEN PULL 100% (NOTE RRPM)

PWR AVAIL = MAX - ACTUAL

PERFORMANCE

ALT ↑ PERFORMANCE ↓

HIGH PRESSURE ALT MEANS ACTUAL PRESSURE < ISA PRESSURE

DENSITY ALT ADDS TEMPERATURE VARIABLE

$$DA = PA + (120 \times (OAT - ISA))$$

PERFORMANCE CHARTS USE PA

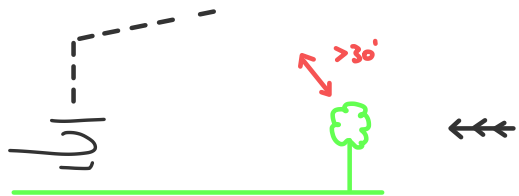
EXERCISE 23 : ADVANCED TAKE-OFFS AND LANDINGS (PART 3)

AIM: TO LEARN ADVANCED TECHNIQUES FOR TAKING OFF AND LANDING

<u>AIRMANSHIP</u> :	LOOKOUT	SIZE
	W/V	SHAPE
	LIMITS	SURROUNDINGS
	ENGINE HEALTH	SURFACE
	PWR CHECKS	SLOPE
	RT, AUDIO CLUE, VORTEX	

VERTICAL T/O

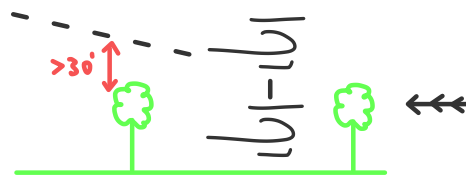
PWR CHECK
HDG MARKER



VERTICAL UNTIL CLEAR OF OBSTACLES

VERTICAL LOG

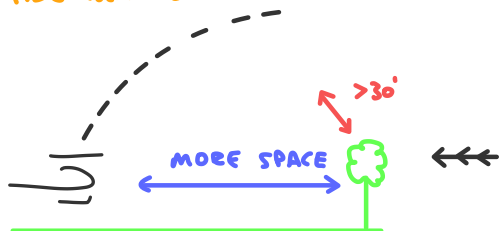
RECCE /EH
PWR CHECK
HDG MARKER



ONE HOVER, THEN SMALL ROLL

TOWERING T/O

PWR CHECK
HDG MARKER



POSITIVE ROC, GENTLE FWD CYCLIC

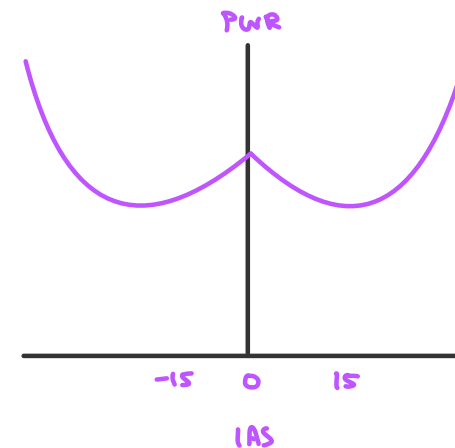
STEEP / DOUBLE ANGLE

RECCE /EH
PWR CHECK
HDG MARKER



STEEP TO CLEAR OBSTACLE
OR DOUBLE ANGLE

PWR REQUIRED



MORE PWR ON DOWNWIND
APPROACH

PWR CHECK

HOVER

Z' - NOTE PWR%
THEN PULL 100% (NOTE RRPM)
PWR AVAIL = MAX - ACTUAL

FLIGHT

S/L V_y (50 KTS) - NOTE PWR
THEN PULL 100% (NOTE RRPM)
PWR AVAIL = MAX - ACTUAL

PERFORMANCE

ALT ↑ PERFORMANCE ↓

HIGH PRESSURE ALT MEANS
ACTUAL PRESSURE < ISA PRESSURE

DENSITY ALT ADDS TEMPERATURE
VARIABLE

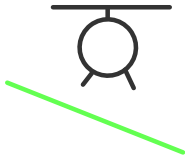
DA = PA + (120 x (OAT - ISA))
PERFORMANCE CHARTS USE PA

EXERCISE 24 : SLOPING GROUND

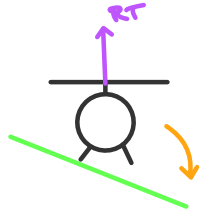
AIM: TO LEARN HOW TO T/O AND LAND USING AN UNEVEN GROUND TECHNIQUE

AIRMANSHIP: LOOKOUT, RECCE, W/V, TAIL CLEARANCE, C OF G, ENGINE HEALTH, LIMITS

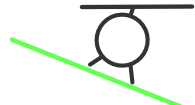
LEFT / RIGHT SKID UP LANDING



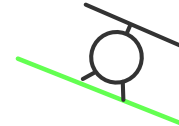
Hdg MARKER
STABLE HOVER
NO DRIFT
ESTABLISH ROD



L SKID CONTACT
FIRMLY DOWN
COLLECTIVE ↓ SLOWLY
KEEP DISC LEVEL

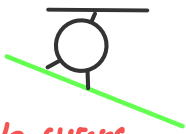


BOTH SKIDS DOWN
DISC STILL LEVEL
COLLECTIVE ↓ FULLY

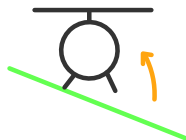


CYCLIC NEUTRAL
PEDALS NEUTRAL

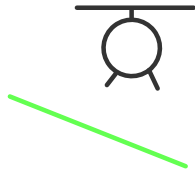
LEFT / RIGHT SKID UP TAKE-OFF



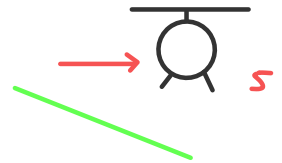
PRE T/O CHECKS
HDG MARKER
DISC LEVEL
SLOWLY COLLECTIVE ↑
LIGHT ON 1 SKID



RIGHT SKIDS
MAINTAIN DISC LEVEL

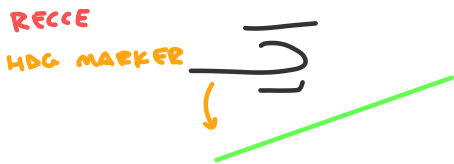


BOTH SKIDS OFF GROUND
LEAVE GROUND VERTICALLY



LOOKOUT
MOVE AWAY FROM
SLOPE
AFTER T/O CHECKS

NOSE UP LANDING



FRONT SKIDS TOUCH DOWN
COLLECTIVE ↓ SLOWLY
DISC LEVEL
MAINTAIN HDG
CYCLIC NEUTRAL AFTER COLLECTIVE ↓



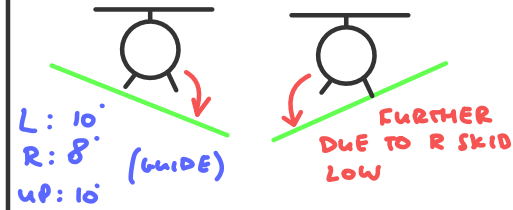
PRE T/O CHECKS
DISC LEVEL
COLLECTIVE ↑ SLOWLY
BACK OF SKIDS LEAVE GROUND
MAINTAIN DISC LEVEL
LIFT VERTICALLY INTO HOVER



NEVER DOWNSLOPE
TAIL CLEARANCE

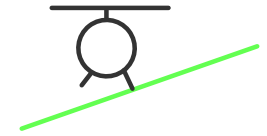
SLOPE LIMITS

NOT PUBLISHED FOR CASRI



WIND

INTO WIND MORE STABLE

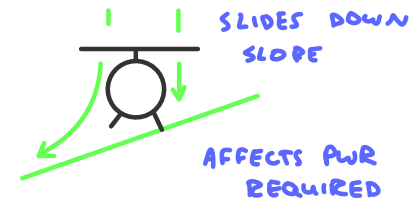


REDUCES CYCLIC AUTHORITY

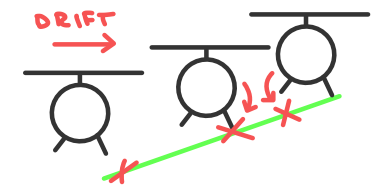
C OF G

AFFECTS CYCLIC POSITION
COMBINED WITH WIND
EVEN LESS CYCLIC AUTHORITY
MAY RUN OUT

GROUND EFFECT



DYNAMIC ROLLOVER

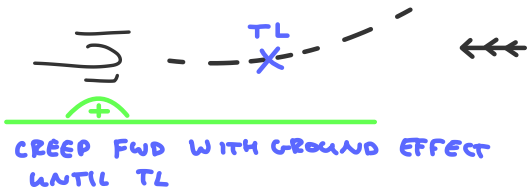


EXERCISE 25 : LIMITED POWER

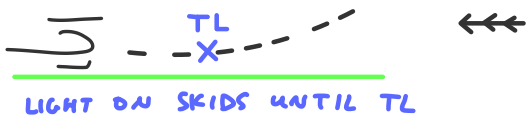
AIM: TO LEARN HOW TO APPLY THE CORRECT TECHNIQUES FOR T/O AND LG DEPENDING ON PWR AVAILABLE

AIRMANSHIP: RECCE, LIMITS, PERFORMANCE, W/V, EH, PWR CHECK, AVOID CURVE

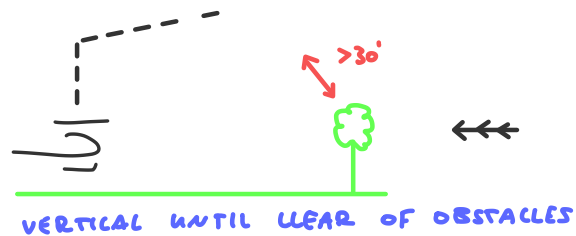
CUSHION CREEP



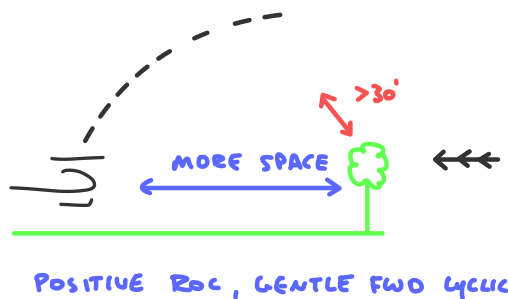
RUNNING TAKE-OFF



VERTICAL T/O



TOWERING T/O



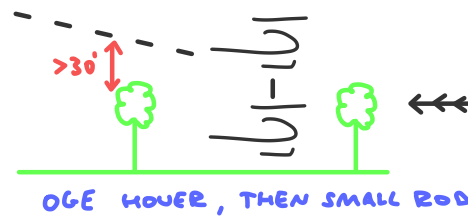
ZERO SPEED LANDING



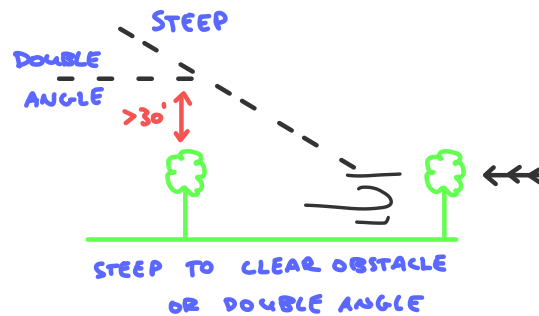
RUNNING LANDING



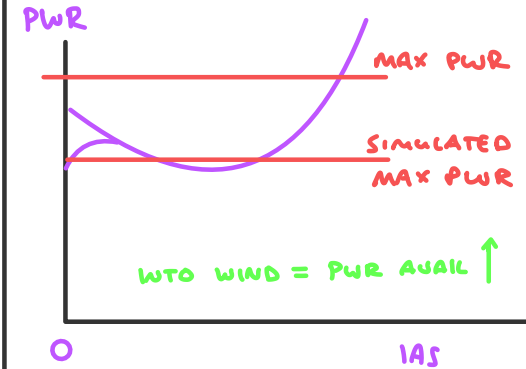
VERTICAL LG



STEEP / DOUBLE ANGLE



PWR REQUIRED



PWR CHECK

HOVER

2' - NOTE PWR%

THEN PULL 100% (NOTE RRPM)

PWR AVAIL = MAX - ACTUAL

FLIGHT

S/L V_y (50 KTS) - NOTE PWR

THEN PULL 100% (NOTE RRPM)

PWR AVAIL = MAX - ACTUAL

PWR AVAIL	TECHN.	PWR AVAIL	TECHN.
<4%	RUNNING	<20%	RUNNING
4%	CUSHION CRP	20%	0 SPD
6%	NORMAL	25%	NORMAL
8%	TOWERING	30%	STEEP/D.A
>10%	VERTICAL	>35%	VERTICAL

PERFORMANCE

ALT ↑ PERFORMANCE ↓
 HIGH PRESSURE ALT MEANS
 ACTUAL PRESSURE < ISA PRESSURE
 DENSITY ALT ADDS TEMPERATURE
 VARIABLE
 $DA = PA + (120 \times (OAT - ISA))$
 PERFORMANCE CHARTS USE PA

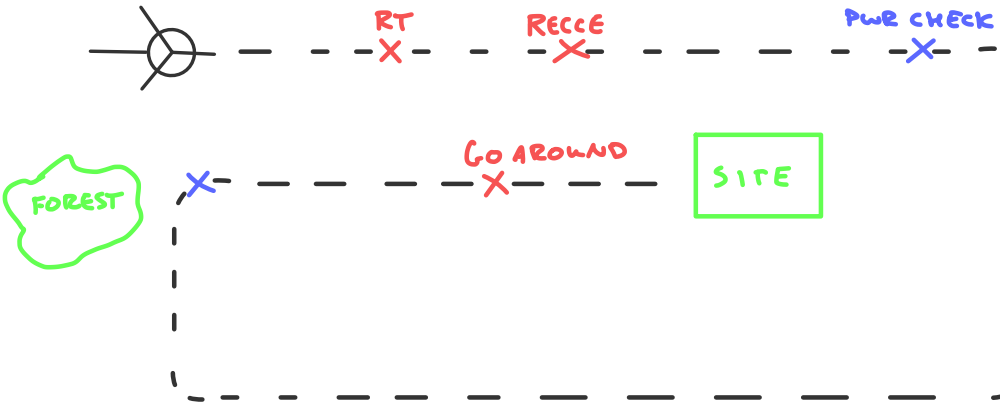
EXERCISE 26 : CONFINED AREA

AIM : TO LEARN HOW TO PERFORM OFF AIRFIELD T/O AND LANDINGS

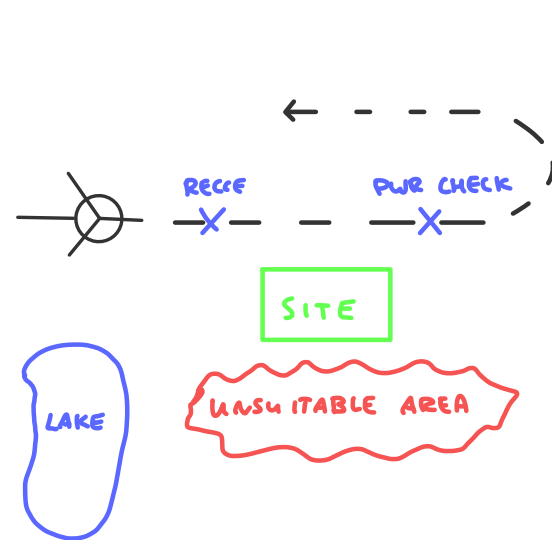
AIRMANSHIP : RECCE , S S'S , W/V , RT , EH , PWR LIMITS , SLOPED SURFACE TECHNIQUE

GETTING IN

ASSESS W/V AND LEAD IN / LEAD OUT MARKERS

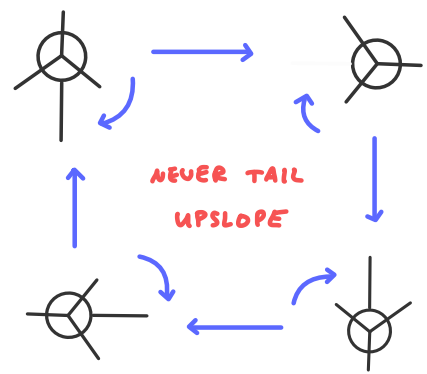


FLYBY RECCE



GETTING OUT

PWR CHECK
SAFE / SQUARE CLEARING TURN



PWR CHECK
SELECT AMING POINT $\frac{1}{3}$ OF FIELD
GO AROUND?
SLOPED LOG TECHNIQUE

DOWNWIND

HIGH APPARENT GROUND SPEED
AFT CYCLIC POSITION
VORTEX RING

PWR CHECK

HOVER

Z' - NOTE PWR%
THEN PULL 100% (NOTE RRPM)
PWR AVAIL = MAX - ACTUAL

FLIGHT

S/L V_y (50 KTS) - NOTE PWR
THEN PULL 100% (NOTE RRPM)
PWR AVAIL = MAX - ACTUAL

PWR AVAIL	TECHN.	PWR AVAIL	TECHN.
<4%	RUNNING	<20%	RUNNING
4%	LUSHION CRP	20%	0 SPD
6%	NORMAL	25%	NORMAL
8%	TOWERING	30%	STEEP/D.
>10%	VERTICAL	>35%	VERTICAL

PERFORMANCE

ALT ↑ PERFORMANCE ↓

HIGH PRESSURE ALT MEANS
ACTUAL PRESSURE < ISA PRESSURE

DENSITY ALT ADDS TEMPERATURE
VARIABLE

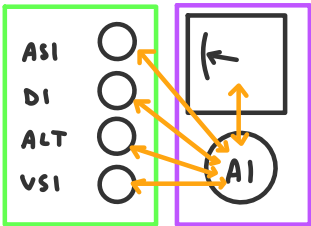
$DA = PA + (120 \times (OAT - ISA))$
PERFORMANCE CHARTS USE PA

EXERCISE 27 : BASIC INSTRUMENT FLYING

AIM : TO LEARN HOW TO PERFORM BASIC MANOEUVRES WHILE ONLY REFERENCING THE INSTRUMENTS

AIRMANSHIP : INSTRUCTOR LOOKOUT, SCAN, HANDOVER OF CONTROLS, FH, LIMITS, NEVER ENTER CLOUD WITHOUT REQUIREMENTS

RADIAL SCAN



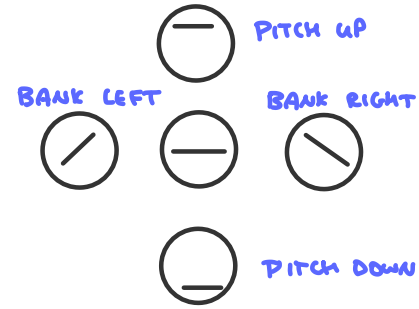
S/L FLIGHT AT VARIOUS SPEEDS

AI	NORMAL ATT
VSI	'0'
ASI	CONSTANT
DI	CONSTANT
MLI	AS REQUIRED

CLIMBING AND DESCENDING

AI	NORMAL ATT
VSI	500' / M
ASI	70 KTS
DI	CONSTANT
MLI	AS REQUIRED

ATTITUDE INDICATOR



IF : WHY AND HOW?

CABRI 62 : IMC PROHIBITED AND ILLEGAL

TECHNIQUES USED TO GET OUT OF WADUERTENT IMC

FOGGLES TO SIMULATE

PHYSIOLOGICAL FACTORS

MOTIONSICK : CONTRADICTING INFORMATION

LEANS : ROLLING OFF BANK AFTER LONG TURN

TRUST THE INSTRUMENTS

WASP PROCEDURE

- WINGS
- ATTITUDE
- SPEED
- POWER

PERFORMANCE CONTROL INSTRUMENTS INSTRUMENTS

KEEP SCAN GOING

CLIMBING + DESCENDING TURNS

CLIMB / DESCEND FIRST (TRIM) THEN TURN

UNUSUAL ATT RECOVERY

USE WASP PROCEDURE

- WINGS LEVEL
- ATTITUDE NORMAL
- SPEED > 30 KTS
- POWER
 - LEVEL FOR CLIMBING
 - CLIMB FOR DESCENDING

TURNS

RATE 1 TURN : 360° / 2 MIN
3° / SEC

$$BANK = \frac{TAS}{10} + 7 (\approx 15^\circ)$$

