



Combined Checklist

[PLT & CPG]



Revision 0.0.3a

AH-64D Apache

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!!! IMPORTANT !!!

**As long the CPG didn't close the door, don't press any Button and/or Controls.
Also rearming or refueling shouldn't be requested.**

ENTERING COCKPIT (PLT)	ENTERING COCKPIT (CPG)
WAIT FOR CPG COCKPIT DOOR CLOSING.....Verify	IF ALL RUNNING SMOOTH.....close door
CLOSE OWN DOOR.....closed	WAIT FOR PILOT DOOR CLOSING.....Verify
INTERIOR CHECKS PLT	INTERIOR CHECKS CPG
CANOPY DOOR.....Verify Closed	CANOPY DOOR.....Verify Closed
LIGHTNING PANEL.....As desired	LIGHTNING PANEL.....As desired
JETTISON PANEL.....Verify All Off	JETTISON PANEL.....Verify All Off
ENGINE CRANK 1+2.....Verify Off	BRAKE Check.....Single Step
APU & APU Cover.....Verify Off/Closed	POWER LEVERS & COLLECTIVE.....Verify Off/Idle
BATTERY KNOB.....Verify Off	CYCLIC.....Stowed
POWER LEVERS & COLLECTIVE.....Verify Off/Idle	SENSORS & DISPLAY.....Off
PARK BRAKE.....Verify Set/On	AUDIO PANEL.....As desired
SENSORS & DISPLAY.....Off	
AUDIO PANEL.....As desired	
INTERIOR CHECKS COMPLETE	



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BEFORE APU START PLT	BEFORE APU START CPG
ICS MODE SWITCH.....Set PTT	
SQUELCH.....All Up	
BATTERY.....On	EUFD Presets.....Checked
INTERCOM.....Checked	
EUFD.....WCA Checked	
TAIL WHEEL.....Locked	
EMER HYD.....Off	
FIRE DET/EXTG PANEL TEST AS FOLLOW	
FIRE DET/EXTG TEST POS.1.....Start	FIRE DET/EXTG TEST POS.1.....Monitor
FIRE DET/EXTG TEST POS.2.....Monitor	FIRE DET/EXTG TEST POS.2.....Start
BEFORE APU START COMPLETE	

APU START PLT	APU START CPG
NAV LIGHTS (Day).....BRT	
NAV LIGHTS (Night).....DIM	
APU START.....Press and release	
EUFD.....Observe for "APU START", "APU POWER ON" and "ACCUM OIL PRESS LO" advisories.	
REARM AND REFUEL.....as briefed	
APU START COMPLETE	



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AFTER APU START PLT

Performing DMS [Data Management System] Sweep as follow:

- Load DTU [Data Transfer Unit] [Right MPD Main Page]
 - Master Load
- A/C [Aircraft] Setup
 - Anti Ice[A/C Util], FLT Page [low/high Alt, QNH]
- ASE [Aircraft Survivability Equipment] Setup
 - CHAFF Program [Program or Manual], RLWR On [ASE Util Page]
- TSD [Tactical Situation Display] Setup
 - Map, Show/THRT Show/COORD Show [Nav & Attack Phase]
- WPN [Weapon] Setup
 - IHADSS Boresight, MAN RNG, Gun, MSL, RKT
- FCR [Fire Control Radar] Setup
 - TBD
- CMWS Panel
- DMS Page
 - Master Warning, Master Caution

AFTER APU START CPG

Performing DMS [Data Management System] Sweep as follow:

- TEDAC [TADS[Target Acquisition and Designation Sights] Electronic Display and Control]
 - Power, FLIR, Movements, functions
- A/C [Aircraft] Setup
 - Set Fuel Page [C/Ex Tank/s], Set PERF Page
- ASE [Aircraft Survivability Equipment] Setup
 - Check RLWR On[ASE Util Page]
- TSD [Tactical Situation Display] Setup
 - Doppler [TSD Util],Map, Show/THRT Show/COORD Show [Nav & Attack Phase]
- WPN [Weapon] Setup
 - IHADSS Boresight, MAN RNG, Gun, MSL, RKT, LST & LRFD Codes, Laser [WPN Util]
- FCR [Fire Control Radar] Setup
 - TBD
- COM [Communications] Setup
 - Radio Frequencies, Transponder Code

AFTER APU START COMPLETED



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Revision 0.0.3a

AH-64D Apache

☰ AH-64D Checkliste Black

BEFORE ENGINE START PLT	BEFORE ENGINE START CPG
STANDBY ATTITUDE INDICATOR.....Uncage	OUTSIDE CHECK.....Clear
ANTI COL. LIGHT.....On	REQUEST / REPORT ENGINE START-UP
ENGINE START PLT	ENGINE START CPG
ROTOR BREAK.....Off, or LOCK if performing a rotor lock start	
ENG. CRANK 1.....Start (3 Sec. hold)	
Observe ENG 1 START advisory on the EUFD and START box displayed on the ENG page. Prior to advancing the power lever to IDLE, verify TGT is less than 80° C.	
ENG 1 Ng%..... > 15%	
POWER LEVER 1.....Idle	
Monitor.....ENG Oil PSI, TGT, Ng%, MSTR WARN, MSTR CAUT, and EUFD	
F ROTOR LOCK START.....Rotor Brake Off	
ENG 1 NG%.....stable at approx 67%	
REPEAT FOR ENG 2	
Prior to advancing the power levers to FLY, confirm that both ENG 1 and 2 OIL PSI readouts are less than 70 PSI and the NGB TEMP readouts are above 20° C.	
POWER LEVERS 1 & 2.....Idle	
Prior to advancing the power levers to FLY, confirm that both ENG 1 and 2 OIL PSI readouts are less than 70 PSI and the NGB TEMP readouts are above 20° C.	
NP and NR.....Verify 101%	
POWER LEVERS 1 & 2.....Flight	
APU.....Off	



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Revision 0.0.3a

AH-64D Apache

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PREFLIGHT CHECKS PLT	PREFLIGHT CHECKS CPG
APU.....Verify Off	ALIGNMENT STATUS.....Verify
POSITION CONFIDENCE.....Green/Checked	
INSERT POINTS.....as briefed (MDC loader)	SEARCH LIGHT.....On & Forward
ARMAMENT A/S GND ORIDE.....verified Off	
ARMAMENT A/S BUTTON.....verified Safe	
VERIFY LOADOUT.....as briefed	
COMM VOLUME PANEL RLWR.....as desired	
SET WPNS PROFILE.....checked	LASER CODES.....set
	LASER.....On (A/C UTIL)
PREFLIGHT CHECKS COMPLETED	



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Revision 0.0.3a

AH-64D Apache

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HOVER CHECK PLT	HOVER CHECK CPG
PARKING BRAKE.....Off	REQUEST / REPORT HOVER CHECK
TAIL WHEEL.....Locked	
STABLE HOVER [IGE].....5-10 ft AGL STABLE HOVER [OGE].....> 80ft AGL	
INDICATED TRQ%.....Check	
<p>Check if the indicated IGE TRQ value matches with the required Value at the HOVER Q window [A/C, PERF] and not over GO-NO/GO OGE Value.</p> <p>If the Indicated TRQ higher then the GO-NO/GO the Aircraft is not able to perform certain maneuvers i.e. OGE Hover Approach, Masking/Unmasking, NOE Flight</p>	
HOVER CHECK COMPLETED	

GROUND TAXI PLT	GROUND TAXI CPG
	REQUEST / REPORT TAXI
<p>During ground taxi, perform the following:</p> <p>Check in both crew stations by applying a slight amount of pressure against the toe brakes.</p>	
TAIL WHEEL LOCK.....as required	
GROUND TAXI SPEED GS.....~ 20 kts	
GROUND TAXI TRQ%.....< 30%	
HOVER TAXI SPEED TAS.....~ 30 kts	
HOVER TAXI ALT.....~ 10 - 20 ft	
END OF GROUND TAXI	



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AH-64D Apache

Revision 0.0.3a

☰ AH-64D Checkliste Black

TAKEOFF TYPES OVERVIEW

There are four types of Visual Meteorological Conditions (VMC) takeoffs performed
The preferred takeoff for the AH-64D is the VMC Level Acceleration Takeoff.

- **VMC Takeoff**
From a hover, cyclic is pushed forward and collective is increased more than 10 above hover power or as necessary to establish the desired climb The climb is performed at 90 kts
- **VMC Level Acceleration Takeoff**
is performed when surface conditions and obstacles permit and involves accelerating the aircraft through velocity safe single engine (VSSE) airspeed prior to initiating a climb. This type of takeoff is meant to reduce the risks of operating inside the avoid region should an engine fail.
- **VMC Minimum Power Takeoff from the ground/hover**
is performed when surface conditions are not suitable for a rolling takeoff. During training, the pilot is limited to only IGE hover power when performing this type of takeoff.
- **Rolling Takeoff**
is performed when the aircraft is IGE power limited, and surface conditions are suitable for a rolling takeoff. During training, the pilot is limited to 10% below hover power when performing this type of takeoff.

AFTER TAKEOFF PLT	AFTER TAKEOFF CPG
Take-off / rejoin TAS..... 80 kts	FUEL PAGE CHECK.....set as required
Cruise [empty / loaded] TAS.....115 / 100 kts	SEARCH LIGHT.....Off & Retract

AFTER TAKEOFF COMPLETED



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Revision 0.0.3a

AH-64D Apache

☰ AH-64D Checkliste Black

BEFORE LANDING CHECK PLT

BEFORE LANDING CHECK CPG

Weapons Subsystem – Check the following:

- A/S button – SAFE.
- GND ORIDE button – Off
- Weapons not actioned – Verify in the High Action Display [HAD]

TAIL WHEEL BUTTON.....Locked

ASE.....as required

PARK BRAKE.....Off

BEFORE LANDING CHECK COMPLETED

TYPES OF APPROACHES OVERVIEW

There are two main approach types: The Visual Meteorological Conditions [VMC] Approach to a Hover/Ground and the Rolling Landing. When performing a VMC Approach, key considerations are:

- Size of the landing area. Is the area large enough for the aircraft to land and depart from? If there are multiple aircraft landing to the area, is it large enough for all the aircraft to land and depart from?
- Suitability of the landing surface. Is it an improved landing area? Soft dirt/mud? Snow or Dust which may result in white/brownout conditions?
- Barriers or obstacles in/around the landing area. Are there trees, rocks, fences, wires, holes?
- Approach and takeoff direction. Are they the same? Or is the approach made in one direction and the takeoff made in another?
- Termination point. Perform the approach to the last one-third of the usable landing area, especially if multiple aircraft are landing.
- Winds. A landing into the wind is preferred, but if it is not possible, increase the power required during the approach.
- Power available. Evaluate both IGE and OGE power required against maximum torque available.

If the aircraft is power limited, and the surface area is suitable, then a rolling landing should be considered, and the aircraft should be kept above ETL or Velocity Safe Dual Engine [VSDE], or if single engine, above Velocity Safe Single Engine [VSSE].

VMC APPROACH TO A HOVER

Landing using a VMC [Visual Meteorological Conditions] Approach to a Hover is a technique used when the landing area is small and little space is available to slow down The approach is performed to stop the helicopter into a hover, then land on a helipad or a FARP Forward Arming Refueling Point landing zone This landing technique can be...



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AH-64D Apache

Revision 0.0.3a

☰ AH-64D Checkliste Black

difficult [or even impossible] to achieve if you are power limited [power to maintain a hover is very high due to a heavy configuration, hot day or high altitude] or in case of a single engine failure.

ROLLING LANDING

Landing using a Rolling Landing technique is used whenever you have enough space to decelerate using a prepared landing surface like a runway and aerobraking A Rolling Landing is very useful when you are power limited [power to maintain a hover is very high due to a heavy configuration, hot day or high altitude] or in case of a single engine failure

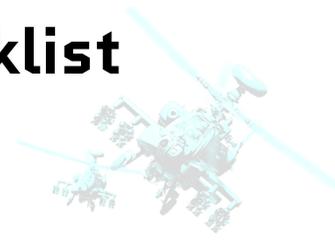
LANDING CHECKLIST PLT	LANDING CHECKLIST CPG
EXTERIOR LIGHTS.....as required	SEARCH LIGHT.....On & Forward
CRUISE [EMPTY / LOADED] TAS.....115 / 100 kts	ARMAMENT A/S BTN & GND ORIDE.....Off & Safe
APPROACH / RECOVER TAS..... 80 kts	
TRAFFIC PATTERN ALT.....500 ft AGL	
BASE / FINAL LEGS TAS..... 60 / 40 kts	
FINAL ALT.....300 ft AGL	

LANDING CHECKLIST COMPLETED



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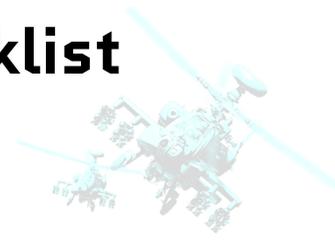
FENCE-IN PLT	FENCE-IN CPG
CMWS MODE SWITCH.....CMWS	ARMAMENT A/S BUTTON.....Arm
CMWS OPERATION SWITCH.....as desired	LASER ON.....checked
CMWS FLARE SWITCH.....ARM	GUN SALVO.....as required
EXT LT PANEL NAV.....Off	RKT SALVO.....as required
EXT LT PANEL ANTI-COL.....Off	LASER CODE PRESET.....verify set
TSD PHASE.....ATK	TSD PHASE.....ATK
CHAFF MODE [WPN].....as desired	PLT FENCE CHECKS PERFORMED.....verify
CHAFF [WPN].....Arm	
FUEL ON EUFD.....cross checked & reported	
MASTER ARM.....cross check & reported	
FENCED IN	

FENCE-OUT PLT	FENCE-OUT CPG
CMWS FLARE SWITCH.....Safe	ARMAMENT A/S BUTTON.....Safe
EXT LT [NAV & ANTI COL].....On	TSD PHASE.....Nav
TSD PHASE.....Nav	FUEL ON EUFD.....verify
FUEL ON EUFD.....cross checked & reported	
MASTER ARM OFF.....cross check & reported	
FENCED OUT	



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Fuel Planning / Useful Formulas	FARM REPORT & TARGET CALLS	
Bingo Fuel (lbs) = [Time of Flight ÷ 60] × Fuel Flow	FARM REPORT	TARGET CALL
Objective Time (mins) = [(Total Fuel Bingo Fuel) ÷ Fuel Flow] × 60	Fuel (Rounded down thousand and hundreds)	Type (e.g. AAA) and Number
Specific Fuel Range (SFR) Factor = Ground Speed ÷ Fuel Flow	Ammunition (Rounded down hundreds and tenth Rounds)	Cardinal (3 O'Clock) or Heading (e.g. 250°)
Flight Range (nm) = SFR × Total Fuel	Rockets (Total amount)	Distance (e.g. 2 clicks)
Bingo Fuel Calculation Example: 100 minutes for time of flight with a fuel flow of 1000 lbs /hour gives a Bingo Fuel of 1666 lbs which is the minimum fuel quantity required to get back to base.	Missiles (Total amount)	Description (e.g. middle of the Town on the Junktion left side)



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AIRSPPEED & MANOEUVERING LIMITS

- VNE [Never Exceed Speed] Determined as a function of weight altitude and temperature see PERF page]
- Maximum Airspeed for Autorotation 145 kts
- Maximum Rearward Sideward Flight Speed 45 kts [for all gross weights]
- Maximum Airspeed for Searchlight Extension 90 kts
- Maximum Airspeed with Symmetrically Loaded External Fuel Tanks 2 or 4 installed 130 kts
- Maximum Airspeed for Stores Jettison 130 kts
- Maximum Airspeed for External Tanks Jettison 100 kts
- Intentional manoeuvres beyond attitude 30 deg in pitch or 60 deg in roll are prohibited
- Avoid large pedal step inputs in arresting right hovering/low speed yawing turns greater than 60 deg/sec
- Do not complete a landing on terrain which produces a pitch attitude change from a hover greater than 7 deg nose up or 12 deg nose down or a roll attitude greater than 10 deg
- Do not exceed 2 Gs when flying with external fuel tanks

Engine Operation Limits

Torque

- 2.5 Minute Single Engine Contingency Range if NR 90 111 to 122 % [yellow]
- 6 Second Dual engine Transient Operating Range if NR 90 101 to 115 % [yellow]
- 6 Second Single engine Transient Operating Range if NR 90 123 to 125 % [yellow]
- Red maximum limit is dynamic [red]
 - If NR is < 50% TQ redline is 30%
 - If NR is < 90% TQ redline is 70%
 - If NR is > 90% in AEO [All Engines Operating] conditions, TQ redline is 115%
 - If NR is > 90% in OEI [One Engine Operating] conditions, TQ redline is 125%

NP [Power Turbine Speed]

- 30 Minute Intermediate Operating Range [yellow]: 107% to 121%
- Overspeed [red]: At or above 121%

NG [Gas Generator Speed]•

- 30 Minute Intermediate Operating Range [yellow] 102,3% to 105,1%
- Underspeed [red]: At or below 63,1%
- Overspeed [red]: At or above 105,1%

NR [Main Rotor Speed]

- 30 Minute Intermediate Operating Range [yellow] 106% to 111%
- Underspeed [red]: At or below 95% displays LOW ROTOR RPM Warning
- Overspeed [red]: At or above 110% displays HIGH ROTOR RPM Warning