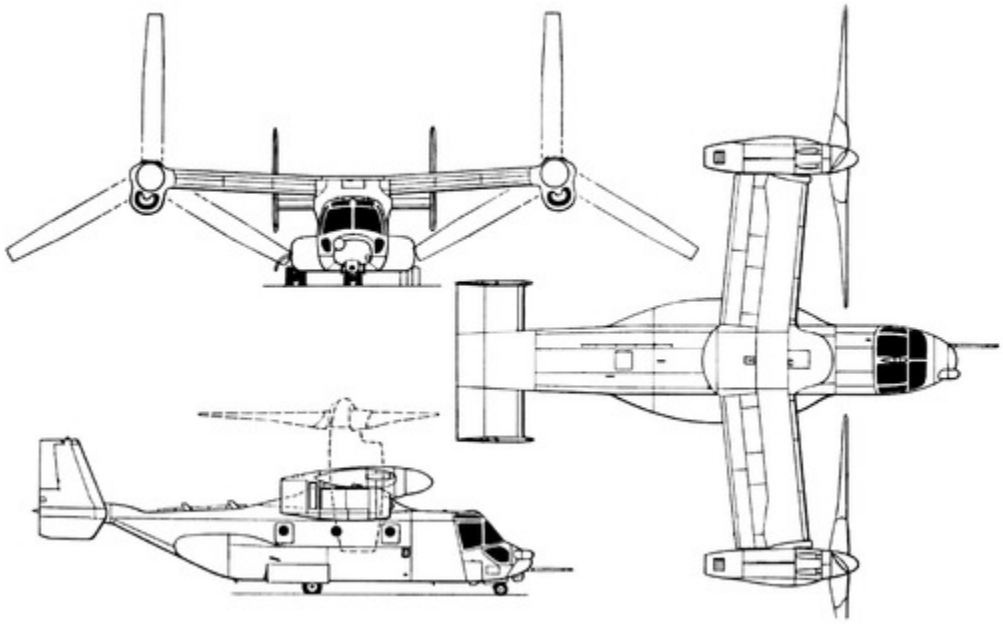
VIRTUAL UNITED STATES AIR FORCE MISSION QUALIFICATION HANDBOOK FOR THE V22 OSPREY



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COMMANDER, AIR COMBAT COMMAND

COMMANDER, AIR EDUCATION AND TRAINING COMMAND

RELEASE RECORD

Release Date	Description	Author
01/05/2024	Initial Release of V22 Hurlburt MQT Handbook	vCapt. Kevin Boyd

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COURSE INTRODUCTION

Mission Qualification Training (MQT) is a training program that upgrades newly assigned crewmembers to Combat Mission Ready (CMR) or Basic Mission Capable (BMC) to accomplish the unit mission. Mission Qualification Training for the V22 will be conducted with the 8th Special Ops Squadron at Hurlburt Air Force Base, Florida.

Module 100, Local Area Orientation and Aircraft Familiarization prepares the pilot for the advanced training modules. The Local Area Orientation / Instrument element is mandatory for all pilots and will be accomplished in conjunction with the pilot's first MQT sortie. These training flights will be conducted in the V22 and are designed to acclimate the pilot to the surrounding training area and allow the pilot to adjust to the local operating area in which advanced training will be conducted, while increasing proficiency in the aircraft. Completion of Module 100 will earn the pilot the qualification of Basic Mission Capable (BMC), which will allow the pilot to operate the aircraft in operational and training environments, under the instruction of qualified instructor pilots.

Module 200, Strategic Insertion, introduces the pilot to the art of insertion / exfiltration from high or low levels, and evading surface-to-air counterattacks.

Module 300, Air to Air Refueling introduces the pilot to Air to Air Refueling operations. During these sorties, the pilot will study and then demonstrate an understanding of approaching a tanker, flying formation with other aircraft and a tanker, and the areas (observation, astern and reform).

Upon successful completion of these modules, the pilot will be certified as Combat Mission Ready (CMR).

TRAINING TERMS

MARSA: Military Authority assumes Responsibility (for) Separation of Aircraft:
MARSA procedures are used when military aircraft must operate in proximity and with close coordination. Under such conditions, it may be impractical for standard civilian air traffic controllers to ensure safe separation of the aircraft. MARSA procedures delegate the separation responsibility temporarily to the military authority operating the flights, thereby relieving ATC of the separation workload

SUA: Special use airspace:
An area designated for operations of a nature such that limitations may be imposed on aircraft not participating in those operations, often of a military nature. The designation of SUAs identifies for other users the areas where such activity occurs, provides for segregation of that activity from other users, and allows charting to keep airspace users informed of potential hazards. Types important to this course include restricted airspace, military operations area, warning areas and alert areas.

MOA: Military Operating Area:
Airspace established outside Class A airspace to separate or segregate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. Often positioned over isolated, rural areas to provide ground separation for any noise nuisance or potential accident debris, whenever a MOA is active, nonparticipating IFR traffic may be cleared through the area provided ATC can ensure IFR separation; otherwise, ATC will reroute or restrict nonparticipating IFR traffic. Although MOA's do not restrict VFR operations, pilots operating under VFR should exercise extreme caution while flying within, near, or below an active MOA.

Restricted Airspace:
An area of airspace, typically used by the military in which the local controlling authorities have determined that air traffic must be restricted or prohibited for safety or security concerns. It is depicted on aeronautical charts with the letter "R" followed by a serial number. Restricted areas almost always start at the surface and can extend up to FL180.

Warning Area:
Airspace of defined dimensions, extending from three nautical miles outward from the coast of the U.S., that contains activity that may be hazardous to nonparticipating aircraft. The purpose of such warning areas is to warn nonparticipating pilots of the potential danger. It is depicted on aeronautical charts with the letter "W" followed by a serial number.

OPERATIONAL REQUIREMENTS / SETTINGS

REQUIRED SIMULATOR SETTINGS

Parameter	Setting	Notes
Unlimited fuel:	**Off**	Self-explanatory
"G" Forces:	**On**	To ensure student doesn't overstress aircraft
Damage and Collisions:	**On**	To ensure damage, overclocking, etc. is monitored
Realism Sliders:	**Max**	Self-explanatory
Air Traffic Tags:	**Off**	Self-explanatory

GENERAL INSTRUCTIONS

1. Remember to include your sortie number in the MISREP comments.

2. Include your vUSAF.us Axxxx and sortie number in your VATSIM flight plans.

3. If VATSIM ATC is available, follow all departure/arrival instructions. Always notify ATC when you enter Restricted Airspace / MOA and FIVE MINUTES before EXITING restricted airspace, MOA, etc. Upon entering restricted airspace, MOA, etc., you will be under visual rules only, as radar service will always terminate when in an active MOA.

4. You are ultimately responsible for the safety and proper operation of your aircraft and proper separation from other aircraft.

MODULE 100: LOCAL AREA ORIENTATION AND FAMILIARIZATION

SORTIE 101: LOCAL AREA FAMILIARIZATION

OBJECTIVE: Introduce and familiarize pilot with aircraft and local operating areas

LOCATION: HURLBURT, FL (KHRT), EGLIN E & PENSACOLA SOUTH MOAS

TIME: DAYTIME

WEATHER: REAL WORLD

FLIGHT RULES: INSTRUMENT FLIGHT RULES

ROUTE: RUBBN EGLIN E, PENSACOLA SOUTH /D01+00[2]

PLANNED ALTITUDE: 7500

SUMMARY

This sortie will take you to the EGLIN E MOA, which is part of the Hurlburt/ Eglin AFB training environment. This mission is simply to introduce you to the training environment in which you will be training.

MISSION INSTRUCTIONS

1. Conduct the required preflight checks and prepare aircraft for takeoff.

2. **IF ATC IS AVAILABLE**: Request standard IFR departure based on above route. Taxi to the active runway as assigned by ATC and depart the airfield via the assigned route.

   IF NO ATC IS AVAILABLE: Depart using Visual Flight Rules but adhering to the assigned route.

3. Explore the restricted areas to the North and East of Hurlburt. Conduct a flight pattern from around the entire airspace noted in the Location section, taking note of landmarks, mountain ranges, etc., to help you identify your location during future operations. Plan for approximately 60 minutes in the SUA.

4. After completing the airspace familiarization, navigate back to Hurlburt.

5. Make a non-precision approach to the field, resulting in a low approach, and then on the climb out, enter the traffic pattern, and perform at least five (5) landings. 3 VERTICAL (NACELLES AT 80+) 2 STOL (NACELLES AT 60-80)

SPECIAL INSTRUCTIONS

In the remarks of your flight plan, include the following:

vUSAF.us Axxxx[3] / vUSAF MQT Training Flight 101 / Activate EGLIN E, PENSACOLA SOUTH MOA

NOTES

1. Note N/A for this environment.

2. This indicates an enroute delay. Format is /DHH+MM. (Note that the plus (+) character may not be accepted, so a format of /DHHMM is acceptable)

   Examples:
   0 hour 30 min delay = /D00+30
   1 hour 30 min delay = /D01+30

   Note: Some clients do not allow the "+" character; if this is true for you, simply use "/DHHMM" format.

3. Use your vUSAF number, e.g. A4999.

SORTIE 102: NIGHT OPERATIONS

OBJECTIVE: Introduce and familiarize pilot with aircraft and local operating areas

LOCATION: HURLBURT, FL (KHRT), EGLIN E & PENSACOLA SOUTH MOAS

TIME: PLAN TO TAKE OFF AT SUNSET (+/- 15 MINUTES)

WEATHER: REAL WORLD

FLIGHT RULES: INSTRUMENT FLIGHT RULES

ROUTE: RUBBN EGLIN E, PENSACOLA SOUTH /D01+00[2]

PLANNED ALTITUDE: 7500

SUMMARY

This sortie is largely the same as sortie 101, but is conducted at night and includes a precision approach and a low approach.

MISSION INSTRUCTIONS

1. Conduct the required preflight checks and prepare aircraft for takeoff.

2. **IF ATC IS AVAILABLE**: Request standard IFR departure based on above route. Taxi to the active runway as assigned by ATC and depart the airfield via the assigned route.

   IF NO ATC IS AVAILABLE: Depart using Visual Flight Rules but adhering to the assigned route.

3. Enter the restricted areas to the East of Hurlburt. Conduct a flight pattern from around the entire airspace noted in the Location section, taking note of landmarks, mountain ranges, etc., to help you identify your location during future operations. Plan for approximately 60 minutes in the SUA.

4. After completing the airspace familiarization, navigate back to Hurlburt.

5. Make a precision approach to the field, resulting in a low approach, and then on the climb out, enter the traffic pattern, and perform at least five (5) landings. 3 VERTICAL (NACELLES AT 80+) 2 STOL (NACELLES AT 60-80)

SPECIAL INSTRUCTIONS

In the remarks of your flight plan, include the following:
vUSAF.us Axxxx[3] / vUSAF MQT Training Flight 102 / Activate EGLIN E MOA

NOTES

1. Note N/A for this environment.

2. This indicates an enroute delay. Format is /DHH+MM. (Note that the plus (+) character may not be accepted, so a format of /DHHMM is acceptable)

   Examples:
   0 hour 30 min delay = /D00+30
   1 hour 30 min delay = /D01+30

   Note: Some clients do not allow the "+" character; if this is true for you, simply use "/DHHMM" format.

3. Use your vUSAF number, e.g. A4999.

SORTIE 103: LOW ALTITUDE FLIGHT OPERATIONS

OBJECTIVE: Conduct a military training route

LOCATION: HURLBURT AFB, FL (KHRT)

TIME: DAYTIME

WEATHER: REAL WORLD

FLIGHT RULES: VISUAL FLIGHT RULES

ROUTE: RUBBN VR1084

PLANNED ALTITUDE: 1500 AGL WHILE ON VR1084

SUMMARY

In preparation for Modules 200 and 300, this training evolution will prepare you for low-level high-speed flight. This training will be exceptionally useful during periods of hostilities in which terrain following is needed to avoid anti-aircraft fire and/or enemy aircraft. You will fly VR1084 at a speed of 225kts or above and at an altitude of 1500' AGL.

MISSION INSTRUCTIONS

1. Conduct the required preflight checks and prepare aircraft for takeoff.

2. **IF ATC IS AVAILABLE**: Request standard IFR departure based on above route. Taxi to the active runway as assigned by ATC and depart the airfield via the assigned route.

   IF NO ATC IS AVAILABLE: Depart using Visual Flight Rules but adhering to the assigned route.

3. Proceed to RUBBN,. Maneuver to approach VR1084 point A from the South to cross VR1525 point A at 1500' AGL.

4. Complete VR1084 at a speed of 225kts and at an altitude of 1500' AGL.

5. After completing VR1084, climb as necessary to maintain a safe (at least 1500 AGL) clearance from terrain, and navigate back to Hurlburt.

6. Make a low approach to the field, and then on the climb out, enter the traffic pattern, and perform at least three (3) landings.

SPECIAL INSTRUCTIONS

In the remarks of your flight plan, include the following:
vUSAF.us Axxxx / vUSAF MQT Training Flight 103

VR-1084

ORIGINATING ACTIVITY: USAFAWC-79 Test and Evaluation Group/CD, Eglin AFB, FL 32542 DSN 872-2024, C904-882-2024.

SCHEDULING ACTIVITY: 85 Test and Evaluation Squadron/DOOS, Eglin AFB, FL 32542 DSN 872-2622, C904-882-2622. Alternate DSN 872-2413, 55 TES OPS desk. Route must be scheduled. between the hours 1330-2200Z weekdays.

HOURS OF OPERATION: Normally 1200-2300Z++ Mon-Fri, route usage is allowable OT

ROUTE DESCRIPTION:

Altitude Data	Pt	Fac/Rad/Dist	Lat/Long
As assigned to	A	CEW 013/12	N31°01.00' W86°37.00'
01 AGL B 15 AGL to	B	MVC 131/21	N31°13.00' W87°04.00'
01 AGL B 15 AGL to	C	CEW 357/34	N31°24.00' W86°41.00'
15 AGL to	D	CEW 019/18	N31°06.00' W86°33.00'
15 AGL to	E	CEW 059/18	N30°58.00' W86°22.00'
15 AGL to	F	DWG 058/18	N30°38.00' W86°14.00'

TERRAIN FOLLOWING OPERATIONS: Authorized from A to C.

ROUTE WIDTH - 2 NM left and 5 NM right of centerline from A to B; 5 NM either side of centerline from B to F.

Special Operating Procedures:

(1) Maintain 1500' AGL from Point C to R-2914 to avoid Fort Rucker helicopter training areas.
(2) Contact Elgin Mission Control on 262.3 prior to Point E for clearance into R-2914.
(3) CAUTION: Heavy Navy air training from Point A to C.

SORTIE 104: BASIC FORMATION TRAINING

OBJECTIVE: Learn proper procedures and techniques for formation flying

LOCATION: HURLBURT AFB, FL (KHRT), EGLIN E MOA

TIME: DAYTIME

WEATHER: REAL WORLD

FLIGHT RULES: INSTRUMENT FLIGHT RULES

ROUTE: RUBBN EGLIN E /D01+00

PLANNED ALTITUDE: 7500

SUMMARY

This sortie will take you to the SUA to the East of Hurlburt for formation flight orientation and practice. On this sortie, you will be joined by your instructor pilot (IP), who you are to follow as the number 2 aircraft in the formation. Your sim and/or settings will undoubtedly be slightly different, so you will literally have to "wing it" using a good sense of the situation (situational awareness – SA), your knowledge and experience of how the V22 flies.

The purpose of this mission is to offer you an opportunity to experience firsthand formation flight and certify you as ready to begin the advanced levels of military flight training. Do not be discouraged if you do not fly a perfect formation on the first time or two out - you may repeat the exercise as many times as needed till you are able to comfortably get into and stay in position with the lead aircraft.

MISSION INSTRUCTIONS

1. Conduct the required preflight checks and prepare aircraft for takeoff.

2. **IF ATC IS AVAILABLE**: Request standard IFR departure based on above route. Taxi to the active runway as assigned by ATC and depart the airfield using the route.

   IF NO ATC IS AVAILABLE: Depart using Visual Flight Rules but adhering to the route.

3. Follow the route to enter the Special Use Airspace (SUA).

4. Follow the directions of your IP. You should practice joins, breaking off, breakaway maneuver, lost visual procedures, etc.

5. At some point, your IP is likely to swap lead pilots for a period of time during the sortie. For this sortie, unless the IP specifies otherwise, the first designated lead pilot for this sortie will squawk Mode C.

6. When the formation training objective is complete, your IP will give you instructions to recover at Hurlburt.

SPECIAL INSTRUCTIONS

Regardless of the standard instructions, follow the direction of your instructor pilot (IP). Your IP may deviate from these standard procedures to accomplish various training objectives, accommodate weather, sim differences, etc.

In the remarks of your flight plan, include the following:
vUSAF.us Axxxx / vUSAF MQT Training Flight 104 / Activate EGLIN E MOA

NOTES

1. If you are unable to schedule a time to conduct your formation flight live online, this flight may also be conducted with a non-IP pilot or by using a pre-recorded flight. You will be responsible for recording your flight to submit to your IP for grading purposes.

2. Remember, when flying in formation, the lead (number 1) pilot is responsible for navigating and communicating with ATC. The lead pilot uses his transponder, squawking Mode C. All other formation pilots squawk standby. That said, recall the mission instructions, above, for this sortie.

MODULE 200: STRATEGIC CARGO INSERTION

SORTIE 201: HIGH ALTITUDE OPERATIONS

OBJECTIVE: Deliver cargo/personnel from high altitude (HALO, PARA, AIRDROP)

LOCATION: HURLBURT AFB, FL (KHRT), EGLIN E MOA

TIME: DAYTIME

WEATHER: REAL WORLD

FLIGHT RULES: INSTRUMENT FLIGHT RULES

ROUTE: RUBBN EGLIN E /D01+00

PLANNED ALTITUDE: 16500

SUMMARY

In this sortie, you will deliver cargo/personnel over an instructor-assigned target inside the Eglin E MOA from 16500'.

MISSION INSTRUCTIONS

1. Conduct the required preflight checks and prepare aircraft for takeoff.

2. **IF ATC IS AVAILABLE**: Request standard IFR departure based on above route. Taxi to the active runway as assigned by ATC and depart the airfield using the route.

   IF NO ATC IS AVAILABLE: Depart using Visual Flight Rules but adhering to the route.

3. When the training objective is complete, your IP will give you instructions to recover at Hurlburt.

SPECIAL INSTRUCTIONS

Regardless of the standard instructions, follow the direction of your instructor pilot (IP). Your IP may deviate from these standard procedures to accomplish various training objectives, accommodate weather, sim differences, etc.

In the remarks of your flight plan, include the following:
vUSAF.us Axxxx / vUSAF MQT Training Flight 201

SORTIE 202: LOW ALTITUDE OPERATIONS

OBJECTIVE: Deliver cargo/personnel from low altitude (SPIE, FASTROPE, PRECISION DROP, ASSAULT LANDING)

LOCATION: HURLBURT AFB, FL (KHRT), EGLIN E MOA

TIME: DAYTIME

WEATHER: REAL WORLD

FLIGHT RULES: INSTRUMENT FLIGHT RULES

ROUTE: RUBBN EGLIN E /D01+00

PLANNED ALTITUDE: 1500 AGL

SUMMARY

In this sortie, you will deliver live Cargo/ personnel over an instructor-assigned target inside the EGLIN E MOA from 1500 feet AGL, while also demonstrating the skills required to successfully evade surface to air missiles.

MISSION INSTRUCTIONS

1. Conduct the required preflight checks and prepare aircraft for takeoff.

2. **IF ATC IS AVAILABLE**: Request standard IFR departure based on above route. Taxi to the active runway as assigned by ATC and depart the airfield using the route.

   IF NO ATC IS AVAILABLE: Depart using Visual Flight Rules but adhering to the route.

3. When the training objective is complete, your IP will give you instructions to recover at Hurlburt.

SPECIAL INSTRUCTIONS

Regardless of the standard instructions, follow the direction of your instructor pilot (IP). Your IP may deviate from these standard procedures to accomplish various training objectives, accommodate weather, sim differences, etc.

In the remarks of your flight plan, include the following:
vUSAF.us Axxxx / vUSAF MQT Training Flight 202 / Activate EGLIN E MOA

MODULE 300: AIR-TO-AIR REFUELING (AAR) (DROGUE)

SORTIE 301: AIR-TO-AIR REFUELING (AAR)

OBJECTIVE: Practice conventional air-to-air refueling (AAR) maneuvers

LOCATION: KEESLER AFB, MS (KBIX)

TIME: DAYTIME

WEATHER: REAL WORLD

FLIGHT RULES: INSTRUMENT FLIGHT RULES

ROUTE: HOBVI AR302W&E /D01+00[2]

PLANNED ALTITUDE: IP DISCRETION (NORMALLY BLOCK FL100-FL200)

SUMMARY

In this sortie, you will learn how to perform the basic Air-to-Air refueling procedures for receiver and tanker.

MISSION INSTRUCTIONS

1. Conduct the required preflight checks and prepare aircraft for takeoff.

2. **IF ATC IS AVAILABLE**: Request standard IFR departure based on above route. Taxi to the active runway as assigned by ATC and depart the airfield using the route.

   IF NO ATC IS AVAILABLE: Depart using Visual Flight Rules but adhering to the route.

3. When the training objective is complete, your IP will give you instructions to recover at Hurlburt.

SPECIAL INSTRUCTIONS

Regardless of the standard instructions, follow the direction of your instructor pilot (IP). Your IP may deviate from these standard procedures to accomplish various training objectives, accommodate weather, sim differences, etc.

In the remarks of your flight plan, include the following:
vUSAF.us Axxxx / vUSAF MQT Training Flight 301

QUALIFICATION

Upon successful completion of each of the sorties and modules, your instructor will certify to both AETC and ACC that you have successfully completed the qualification training (MQT), and should be certified as Combat Mission Ready (CMR). Your commander will, upon concurring with your instructor, notify AFPC to annotate your official record.

Congratulations!

APPENDIX ONE:

AAR SCRIPT

PLANE	PILOT	POUNDS
1		
2		
3		
4		
5		

At 15 miles from the tanker the first contact is made between the receiver and tanker.

RECEIVER:	SHELL 01, _____ FL ____ NOSE COLD, SWITCHES SAFE
TANKER:	_____, YOU ARE CLEARED TO THE OBSERVATION AREA LEFT LOW. ALTIMETER 29.92, FL_____, HDG_____
RECEIVER:	SHELL 01, _____ VISUAL, REQUESTING _____ POUNDS.
TANKER:	_____, SHELL 01, COPY

(AT 10NM SEPARATION)

TANKER:	(ATC) SHELL 01 ACCEPTING MARSA AT THIS TIME WITH _____ AT ANGELS ____
	NOTE: MARSA CAN BE ACCEPTED ONCE COMMS ARE ESTABLISHED

(AT 3NM SEPARATION YOU ARE IN THE OBSERVATION AREA)

RECEIVER:	_____, STABLE AND READY
TANKER:	_____, CLEARED TO CONTACT
RECEIVER:	CLEARED TO CONTACT, _____
RECEIVER:	_____, STABLE AND READY
TANKER:	_____, CLEARED TO CONTACT

(AT 1NM SEPARATION)

TANKER:	SHELL 01 CONTACT, POSITIVE FLOW
TANKER:	_____, SHOWING NO FLOW ((WHEN REQUESTED AMOUNT HAS BEEN OFFLOADED)
RECEIVER:	COPY, REQUEST DISCONNECT
TANKER:	_____ DISCONNECT. YOU TOOK _____ LBS.

(AT 3NM SEPARATION YOU ARE IN THE REFORM AREA)

TANKER:	_____, CLEARED TO THE HOLDING AREA RIGHT LOW (IF MORE THAN ONE AIRCRAFT)
RECEIVER:	SHELL 01, I WILL BE CLEARING LOW AND RIGHT, HAVE A GOOD DAY (IF ONLY ONE AIRCRAFT)
TANKER:	_____, COPY YOU ARE CLEARED, HAVE A GOOD DAY
TANKER:	(ATC) ____ SHELL 01 IS CLEAR OF _____, TERMINATING MARSA

NORMAL TANKER REFUELING SPEEDS

V22	200	**C5**	275	**F16/15/22**	315
HH60	150	**C17**	265	**KC-10**	295
B52	275	**C130**	200	**KC135**	295

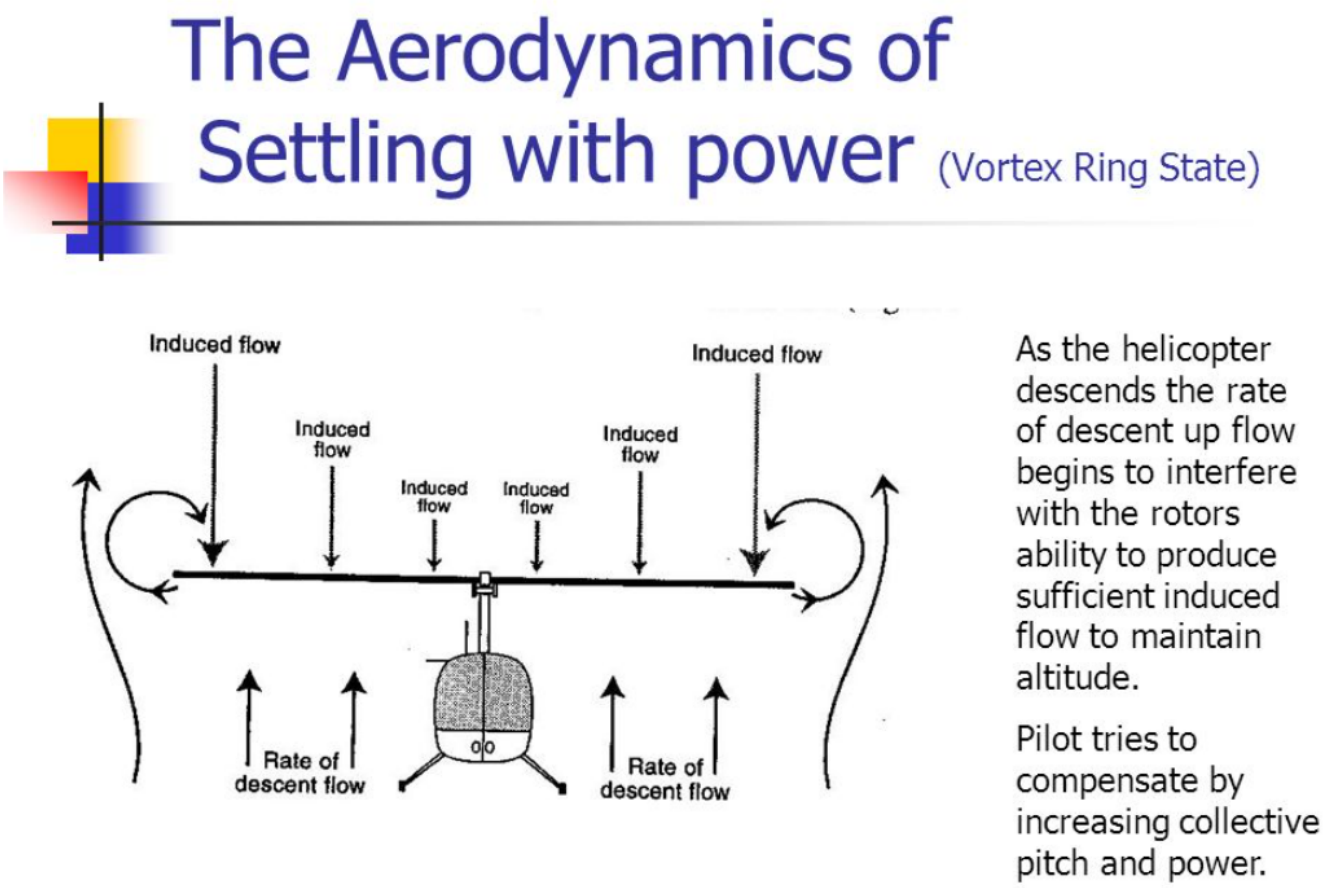
APPENDIX TWO: SUPPLEMENTAL TRAINING MATERIAL

WHY LOW ALTITUDE

Fighter and bomber aircraft fly at low altitudes to avoid ground radar. At low altitudes, these aircraft are able to take advantage of terrain and other natural features to conceal their presence from radar systems. Additionally, flying at low altitudes allows aircraft to avoid the higher altitudes where surface-to-air missiles and anti-aircraft artillery are typically most effective. It's also worth noting that flying at low altitudes allows aircraft to engage ground targets more effectively, as they are able to deliver ordnance with greater accuracy and precision.

VORTEX RING STATE

V22s are particularly susceptible to vortex ring state when a high descent rate and a low forward speed meet. For users of the Miltech Simulations V22, Easy mode (ACFT INIT, Menu 3) is permitted. Easy mode will not remove vortex ring stalls, but will make them recoverable.



A WORD ON OPERATIONAL FLEXIBILITY / AFSOC

The primary mission of the 8th SOS is to provide rapid global response supporting long-range infiltration, exfiltration and resupply of Special Operations Forces in hostile or denied territories, during day, night, and adverse weather, under one period of darkness. As such the V22 is one of the most versatile multi role combat aircraft and in its role at the 8th works side by side with JSOC including Rangers, Delta, Recon, Pararescue, SEALS and more.

Capabilities include:

FAST ROPE

WINCH/RESCUE SWIMMER OPS

SPIE INSERT/EXFIL

HALO JUMP

PARA-JUMP

HEAVY LIFT

TRADITIONAL AIRDROP

PRECISION AIRDROP (in conversion mode)

MEDEVAC (6 CRIT, 12 STABLE)

Tools developed for the Osprey include:

MRZR (military variant of Polaris RZR UTV)

REMOTE GUARDIAN BELLY TURRET

VARS DROGUE REFUELING SYSTEM