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ORANGE COUNTY SHERIFF'S DEPARTMENT

AVIATION SUPPORT BUREAU

PILOT TRAINING MANUAL

ASB Pilot Training Manual

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Purpose:

This manual was prepared to provide a standardized program for the training of Aviation Support Bureau (ASB) pilots.

Applicability:

This training program is intended for an ASB designated pilot holding a valid Commercial Pilot's certificate with a rotorcraft-helicopter rating and current Class 2 Medical Certificate.

In situations where the department elects to train a person who does not hold a Commercial pilot with a rotorcraft-helicopter rating, the Aviation Support Bureau will send the person to an OCSD contracted FAA certificated flight school.

Pilot training is divided into four categories:

- **Initial Training** assures pilot standardization in Aviation Support Bureau patrol procedures and techniques, and provides information and skills essential to the safe and efficient conduct of assigned duties. Successful completion of Stage Checks 1 and 2 are required to complete Initial Training.
- **Special Operations Training** provides initial qualification in the Bureau's missions that require advanced flight operations skills. Successful completion of Stage Check 3 is required in order to perform Special Operations Training. Typically, the Stage Check 3 is given after the pilot obtains 1,500 Pilot in Command helicopter hours.
- **Refresher Training** periodically refreshes pilots in initial training and special operations duties, skills and subjects. Every 6 months an ASB Pilot will conduct 1.5 hours of full contact emergency procedures at an FAA certified flight school.
- **Standardization Flight Checkrides** are designed to evaluate pilots in emergency procedures, limitations, aircraft systems and other subjects from the FAA Practical Test Standards for the Commercial Helicopter Pilot. If a pilot is found to be deficient in knowledge or skills during a Standardization Flight Checkride, immediate training is provided to bring the pilot back to the desired level of proficiency. This checkride will usually be conducted in conjunction with the Night Vision Goggle Checkride.

ASB Pilot Qualification Requirements:

- Possess a valid FAA Commercial Pilot's Certificate with a Rotorcraft-Helicopter Rating.
- Possess a valid FAA First or Second Class medical certificate.
- Successful completion of the Aviation Support Bureau Initial Pilot Training Program and successful completion of Standardization Flight Checkrides.

ASB Training Records:

Pilot flight training, to include written, oral and flights, will be documented on the ASB Pilot Evaluation Form (Appendix A). Refresher training may be documented on the abbreviated Pilot Evaluation Form (Appendix B). However, the abbreviated Pilot Evaluation Form cannot be used for any training involving initial qualification.

For every training event, there should be an entry in the OCSD Pilot/TFO Training Record Form located in the front of each pilot's training binders. The Pilot Evaluation Form should be placed into the appropriate section of each training binders.

ASB Training Binders:

At a minimum, each training binder should have the following tabs:

1. OCSD ASB Pilot/TFO Training Record (Located at the front of the binder)
2. Licenses
3. Certificates
4. Currency Check
5. Special Operations
6. Initial Pilot
7. Initial TFO

Initial Training (Category 1):

The OCSD Aviation Support Bureau (ASB) pilot trainee will be sent for training to a contracted helicopter flight training facility prior to beginning Initial Pilot Training In-House. The ASB Pilot Trainee will begin in-house initial training with a FAA Commercial Pilot's Certificate with a Rotorcraft-Helicopter Rating and a FAA Second Class Medical Certificate.

The first part of initial training will focus on transitioning to the Eurocopter AS 350B2 or B3e Helicopter. The pilot trainee will focus on the pre-flight inspection, aircraft systems, emergency procedures, limitations and starting the helicopter.

The first 50 hours should focus on basic flight maneuvers (Appendix H) in the traffic pattern at Los Alamitos Army Airfield or John Wayne Airport to help the pilot trainee transition to the AS350B2/B3e. This focus of training will be performed in conjunction with routine patrol flights. If a significant patrol call (Search and Rescue, Overwater Operations) is encountered during the first 50 hours of training, the ASB Certified Flight Instructor (CFI) may use his discretion and move the pilot trainee to the TFO seat.

At approximately 200-250 total helicopter flight hours, the pilot trainee should be sent to an approved initial qualification school for the AS350 B2/B3e. The pilot trainee will receive ground school and flight time. This will give the pilot trainee a better understanding of the emergency procedures of the helicopter to enhance the remainder of the flight training.

At approximately 300-450 total helicopter flight hours, the training should be focused on Night Vision Goggle Operations, Off-Site Landings, Search and Rescue Operations and Patrol

Specific Flight Operations. During these hour levels, the pilot trainee should have a solid understanding of aircraft systems, emergency procedures and aircraft limitations. The pilot trainee will be given a Stage 1 Checkride at approximately 275-300 flight hours. Appendix C has specific information regarding the Stage Checks.

At approximately the 450 hour level, the pilot trainee should be sent back to the FAA certificated flight school for 1.5 hours of emergency procedure training. At approximately 485 flight hours, the pilot trainee will be given a Stage 2 Checkride.

During the initial flight training phase, the pilot trainee is responsible for understanding all the material previously taught in the Rotorcraft Flying Handbook. In addition the pilot trainee is responsible for the Commercial Pilot Practical Test Standards (PTS) previously taught while obtaining the Commercial Pilot License.

The standards for the flight maneuvers are located in Appendix H. However, the majority of the emergency procedure training will be conducted at an FAA certificated flight school. The reason ASB does not train many of the contact maneuvers in-house is the limited aircraft in the fleet. If one aircraft is damaged in flight training, 33% of ASB's fleet is grounded. Another reason for using a flight school is the proficiency of the CFI's. ASB CFI's do not have the opportunity to conduct emergency procedures on a regular basis which makes teaching the maneuvers difficult with a greater probability of damaging the aircraft.

Emergency procedure training performed by ASB in-house is limited to the maneuvers listed in Appendix D.

Special Operations Training (Category 2)

Special Operations Training provides initial qualifications for Aviation Support Bureau pilots in areas other than basic law enforcement patrol. The program consists of training in each of the following areas: Bambi Bucket, Long Line, Tyler Bench, SWAT Live Fire, and Diver and K-9 Insertions.

A Special Operations Pilot must have at least 1,500 hours helicopter Pilot-in-Command flight hours.

An ASB pilot trainee (Category 1) will not perform any Special Operations Training.

However, an ASB Pilot with less than 1,500 helicopter Pilot-in-Command flight hours may conduct Special Operations Training given by a CFI qualified and current in the type of Special Operations Training given. All Special Operations training will be documented using the Pilot Evaluation Form (Appendix A). However, once an ASB Pilot is qualified for a Special Operation Task (ex. Bambi Bucket), the refresher training will only need to be documented on the Abbreviated Pilot Evaluation Form (Appendix B).

All Tactical Flight Officer (TFO) Training regarding Special Operations will also be documented on the Abbreviated Pilot Evaluation Form (Appendix B).

Refresher Training (Category 3)

Refresher training is intended to refresh and update Aviation Support Bureau Pilots with Initial and Special Operations flight training subjects.

Refresher Training may cover any specific area from Initial and Special Operations Training. Each year the Aviation Support Bureau will published a training calendar to ensure all ASB Pilots receive adequate refresher training in order to perform ASB Missions. The refresher training should also help prepare ASB Pilots for their Standardization Flight Checkrides.

Every 6 months an ASB Pilot will conduct 1.5 hours of full contact emergency procedures at an FAA certified flight school. A pilot can be granted a 30 day extension for completion of the full contact emergency procedures if there are extenuating circumstances which prevents completion at the 6 month interval. If an ASB Pilot is also a UH-1 PIC, the pilot will rotate the full contact emergency procedures every 6 months (AS350 at the first 6 month interval, UH-1 at the next 6 month interval). If the ASB Pilot is not a UH-1 PIC, the pilot will conduct full contact emergency procedures in the AS350 at each 6 month interval.

Standardization Flight Checkrides (Category 4)

Standardization Flight Checkrides are designed to evaluate pilots in emergency procedures, limitations, aircraft systems and other subjects from the FAA Practical Test Standards for the Commercial Helicopter Pilot. If a pilot is found to be deficient in knowledge or skills during a Standardization Checkride, immediate training is provided to bring the pilot back to the desired level of proficiency. This checkride will usually be conducted in conjunction with the Night Vision Goggle Checkride.

The purpose of the Standardization Flight Checkride is to ensure ASB pilots are maintaining proficiency with emergency procedures, limitations, aircraft systems and other subjects from the FAA Practical Test Standards for the Commercial Helicopter Pilot Practical Test Standards. This checkride also ensures all ASB Pilots are performing flight maneuvers to the standards located in Appendix H.

The Standardization Flight Checkride will be given annually. The checkride can be given one calendar month prior to the month which the checkride is due. Although the checkride may have been given a month early, it will be considered to have been completed in the month it was due.

ASB Flight Currency

If an ASB Pilot has not flown as a Pilot in Command within 75 days, the pilot will require a currency flight with an ASB CFI. There is no minimum flight time requirement for the currency flight.

ASB Pilots will maintain Night Currency and Night Vision Goggle Currency per FAR 61.57.

If an ASB Pilot has not flown as a Pilot in Command within 180 days, the pilot will require at least 3 hours of refresher training by an ASB CFI. The length of the refresher training will be based on proficiency as determined by the ASB CFI. The 1.5 hours of full contact emergency procedures at an FAA certified flight school may be applied to towards the 3 hour minimum flight requirement.

THRU-FLIGHT Procedures

The THRU-FLIGHT Checklist may be utilized when the circumstances dictate for a more than standard response (Pursuit, 999, Officer needs assistance, etc.).

The THRU-FLIGHT Checklist may be used in situations when a quicker response to critical incidents is needed in the interest of public safety. Aircrews will make every attempt to obtain the current ATIS. However, for critical incidents, it is permissible to state, "Negative ATIS," to expedite the response due to the lengthy ATIS used at John Wayne Airport.

The Standard Checklist shall be used for the first start of the day regardless of the circumstances.

Appendix A

Form: Pilot Evaluation Form

Location: Digital Copy on ASB Share Drive in Folder labeled “ASB Policy Manuals”

Purpose: Pilot training will be documented on this form. The documentation of training will assist with maintaining a standardized training program and help each CFI determine where a pilot may need additional training. This documented training will also assist the Aviation Support Bureau with routine audits of the Bureau.

Example of Form: Located on the next 2 pages. The second page is the narrative portion of the Pilot Evaluation Form.

PILOT TRAINING EVALUATION

PRIVATE

COMMERCIAL

Pilot Name: PETER PILOT	A/C Type: AS350B2/B3e	#: 184 SD	Date: 8-18-13
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Flight Instructor: John Doe		Previous Flight Hrs.	Flight Hrs. This Eval	Total Flight Hours
	Day	500.5	4.0	504.5
	Night	110.0	1.2	111.2
	NVG	22.4	0.0	22.4
	Total	632.9	5.2	638.1

PREFLIGHT PREPARATION	S	MANEUVERS	S	EMERGENCY OPERATIONS	S
Certificates and Documents	S	Power Checks		Power Failure at a Hover	
Obtaining WX/NO TAMS	S	Straight and Level	S	Eng Failure at Altitude: Entries	S
Performance Planning	S	Climbs, Descents	S	Inadvertent IMC Procedures	
Cross-Country Flight Planning		Turns (10 - 30 degrees)	S	System/Equip. Malfunctions	
Operation of Helicopter Systems	S	Steep Turns (30 - 60 degrees)	S	Anti-torque Failure	
Risk Management (ASB Forms)		Slow Flight	S	Settling-With-Power Orally	
Emergency Procedures (Oral)	S	Accelerations / Decelerations	S	Low Rotor Recovery	S
Airworthiness Directives/SB's		Quick Stops		FCL/Governor Failure Orally	
		MCP Operations		Unusual Attitude Recovery	S
GROUND OPERATIONS		Maximum Gross Weight Operations		AS350B2 Limitations	
Visual Inspection, Preflight	S	Run-on Landings		Dynamic Rollover Orally	
Servicing of Helicopter		Slope Operations		Ground Resonance Orally	
Cockpit Management	S			HYD OFF Training	
Starting Engine	S	OFF-AIRPORT SITE LANDING			
Pre-takeoff Check	S	Santiago Peak (w/o Star Safire HD)			
Post flight Procedures	S	Mountainous MAL Sites		AVIATION KNOWLEDGE	
		Hutton Tower Helipad		Accident Reporting Requirements	
AIRPORT/HELIPORT OPNS		Other: ECB		Applicable FAR's	S
Airport Marking/Lighting	S	Confined Area Operations	S	AIM & Advisory Circular Use	
Radio /ATC communications	S	High Altitude Takeoff (Max. Perf)		Visual Flight Rules Navigation	
Normal and Crosswind Departures	S	High DA Operations	S	AS35082 Weight Calculations	
Traffic Pattern Operations	S		S	Recognition of Critical Weather	
Normal and Crosswind Approaches	S	CROSS-COUNTRY FLIGHT OPS		Safe Operation of Aircraft	
Steep Approaches	S	Pilotage and Dead Reckoning		Basic Aerodynamics	S
Go-Around	S	Radio Navigation		Privileges/Limits of Comm. Pilot	S
Collision Avoidance Procedures	S	Diversion	S	Use of Charts/Mag Compass	
Night Flight Operations		Lost Procedures		CG Calculations	S
		Radio Communication			S
MANEUVER BY GROUND REF.		X-Country Flight	S		
Vertical Takeoff and Landing	S				
Hover (IGE and OGE)	S				
Hover Taxi	S				
Air Taxi (Taxi above ETL)	S				
P - Proficient	S - Satisfactory	NI - Needs Improvement	U - Unsatisfactory		
D - Demonstrated	N - Night	PR - Power Recovery	H - Hooded Flight		
Signature of Pilot: _____		Signature of Flight Instructor: _____			

DATE: 8-18-13

Prior to the first flight Peter Pilot conducted the pre-flight. The first flight was a 1.0 day flight...

Appendix B

Form: Abbreviated Pilot Evaluation Form

Location: Digital Copy on ASB Share Drive in Folder labeled “ASB Policy Manuals”

Purpose: Refresher training may be documented on the abbreviated Pilot Evaluation Form. However, the abbreviated Pilot Evaluation Form cannot be used for any training involving initial qualification.

Example of Form: Located on the next page.



Orange County Sheriff's Department

Bambi Bucket Training Checklist/ Evaluation



DATE	TIME	AIRCRAFT	PILOT	INSTRUCTOR

Empty Weight	Lbs	3305
Crew	Lbs	225
Fuel	Lbs	600
Bucket	Lbs	1370
Gross Weight	Lbs	5500

Water Drops (Type)	# of Drops
Line Drops	
Spot Drops	
Total Drops	

| **Hobbs Time** **Hrs** |

Aircraft Configuration	X
Rigging the Bucket	X
Bucket/Aircraft Preflight Check	X
Aircraft Performance	X
Communications	X
Water Pick Up	X
Water Drops	X
Malfunctions	X
Emergency Procedures	X
Landing with the Bucket	X
Flying Within Your Limitations	X

COMMENTS:

Deputy X completed recurrent training for Bambi Bucket operations as outlined in the OCSD Pilot Training Manual. He performed all tasks and maneuvers to commercial pilot standards. Deputy X is authorized to conduct bucket operations.

Pilot's Signature _____

Instructor's Signature _____

Appendix C

Topic: Stage Checks

Location: N/A

Purpose: Stage Checks are an essential part of pilot training. Stage Checks evaluate the pilot in training to ensure all standards are met prior to moving to the next phase of pilot training. Stage Checks also ensure standardization of Bureau CFI's since Stage Checks will normally be performed by a CFI other than the trainee's primary instructor.

Example of Form: Located on the next 2 pages.



Appendix C- ASB Pilot Training Stage Checks



All stage checks will be initiated by the pilot trainee's instructor. If ASB scheduling permits, the stage checks should be performed by a CFI other than the trainee's instructor.

STAGE ONE CHECK:

Ground

Written test on: Regulations, aircraft systems, aircraft operator's flight manual, aircraft limitations, emergency procedures and aerodynamics as selected by the instructor.

Oral exam as determined by flight instructor giving the check ride. Topics may include: ASB policy manuals, the Eurocopter AS350 B2/B3e flight manual, F.A.R.'s, weather, weight and balance, aircraft performance charts or any subject referred to in the pilot training manual or training syllabus.

Oral exam identifying aircraft components with the trainee describing their functions.

Flight

Flight test portion shall be determined by the instructor giving the stage check. The instructor should use the ASB Flight Maneuver Standards (Appendix H). Flight shall involve traffic pattern work, simulated emergency procedures, cross country flight planning, in and out of county navigation/communication, offsite landings and flight in mountainous areas.

STAGE TWO CHECK:

To be given by the Chief Pilot or his designee. This check should be given at approximately 485 hours of helicopter flight time. This flight hour requirement can be waived by the Chief Pilot if the trainee can demonstrate prior experience and the required skill level. The stage two check shall be a complete review of the entire air support program held to the commercial helicopter

practical test standards encompassing everything covered in the stage one check. Passing of the stage two check qualifies the trainee for consideration for assignment as a patrol pilot in the ASU. New pilots assigned to the ASU shall have the following restrictions applied to them: No special operations, external loads, fires or any other limitation as designated by the Chief Pilot. This requirement can be waived by the if the trainee can demonstrate prior experience and the required skill level, such as prior military aviation experience.

The stage one and stage two check rides are given to help both the trainee and the instructor evaluate the trainee's comprehension, progress and suitability as an ASU pilot in command. Failure to successfully complete a stage check is grounds for removal from the ASU pilot training program.

STAGE THREE CHECK:

Shall be required for approval for special operations. This check requires 1500 hours of helicopter Pilot in Command flight time. This requirement can be waived by the Chief Pilot if the trainee can demonstrate prior experience and the required skill level. The Stage Three check ride will individually include SWAT operations with Tyler Benches, Dive Team operations, K9 operations, Bambi bucket operations and external loads.

Appendix D

Topic: ASB In-House Emergency Procedure Training

Location: N/A

Purpose: The following training procedures will be adhered to by ASB CFI's regarding emergency procedure training in the Sheriff's Department Aircraft. This Appendix discusses what flight maneuvers will be trained in-house by ASB, but does not discuss the standards or procedures for each maneuver. For the standards and procedures for each maneuver, please see Appendix G.

Example of Form: Located on the next 2 pages.



Appendix D- ASB Emergency Procedures Training

The following training procedures will be adhered to by ASB CFI's regarding emergency procedure training in the Sheriff's Department Aircraft. This Appendix discusses what flight maneuvers will be trained in house by ASB, but does not discuss the standards or procedures for each maneuver. For the standards and procedures for each maneuver, please see Appendix H.

The pilot trainee will never manipulate the Fuel Control Lever in flight during ASB Pilot Training. The Star Safire HD Camera is authorized during ASB Emergency Procedure Training.

Simulated Engine Failures (SEF's)

Should not be performed without reducing the throttle to idle. The pilot trainee will not gain an appreciation of Rotor RPM decay without the engine RPM at idle.

The SEF will only be initiated by the CFI. The pilot trainee will never manipulate the Fuel Control Lever in ASB Pilot Training. The CFI will ensure there is a suitable landing area in case the engine actually fails. The following are the restrictions for the SEF's:

1200 feet AGL- minimum altitude to initiate the SEF

400 feet AGL- Fuel control lever must be returned to the detent position "Fly Position."

Night:

1200 feet AGL- minimum altitude to initiate the SEF

400 feet AGL- Fuel control lever must be returned to the detent position "Fly Position."

Note: Night SEF's may only be conducted at an Airport

Hovering Autorotation

May only be conducted on grass at an Airport.

Run On Landings

After the aircraft touchdowns on the runway and the helicopter is stable, the pilot trainee will immediately bring the aircraft off the ground to avoid wear to the OCSD Helicopter Skid Tubes/Plates.

Hydraulic Off Run-On Landings

This maneuver should be performed minimally during ASB Pilot Training in order to avoid wear to the OCSD Helicopter Skid Tubes/ Plates.

When this maneuver is performed with ASB's helicopter, the CFI will be light on the controls with the pilot trainee to ensure the maneuver is performed correctly. This maneuver will be considered a modified demonstration maneuver.

This maneuver will be practiced and performed to standard using a FAA certified flight school's aircraft.

There are no restrictions in flight for hydraulics off training.

Tail Rotor Malfunctions/ Fixed Tail Rotor Pitch Landings

This maneuver will not be practiced during ASB Pilot Training.

Settling with Power

This maneuver will not be practiced or demonstrated during ASB Pilot Training.

Loss of Tail Rotor Effectiveness (LTE)

LTE may be simulated with a minimum altitude of 400 feet AGL.

Autorotations (Strait-in, 180)

Fuel Control Lever should be reduced to flight idle during the practice autorotations. At 400 feet AGL, the fuel control lever must be returned to the detent position "Fly Position." This power recovery maneuver should be terminated to a hover.

Note: This maneuver should only be conducted at an Airport.

Appendix E

Form: ASB AS350B2 Limitations

Location: Digital Copy on ASB Share Drive in Folder labeled “ASB Training”

Purpose: The ASB Limitations sheet ensures standardization since all ASB Pilots are responsible for understanding and adhering to the limits on this document.

Example of Form: Located on the next page.

AS 350B2- Limitations

Max gross weight	4961 lbs - 5512 lbs external loads	
Max Persons carried (including pilot)	6	
VNE (OCSD) Power On	155 knots - 3 knots per thousand feet	
Power off	125 knots -3 knots per thousand feet	
Doors removed	110 knots	
Max substantiated pressure altitude	20,000 feet	
Main Rotor Speed (NR) Power on	On ground @ low pitch	380 (+5 -5)
	In stabilized flight	390 (+4 -5)
Main Rotor Speed (NR) Power off	Max <u>430</u> Min <u>320</u> Low horn <u>360</u> High horn <u>410</u>	
Max NR for rotor brake application (flight manual)	<u>170</u>	
Recommended NR for rotor brake application (OCSD)	<u>100</u>	
Minimum time between two consecutive brakings	<u>5 min</u>	
Torque limits (TQ)	Take-Off (A/S less than 40 knots)	<u>100%</u>
	Transient	<u>107 % for 10 seconds</u>
	Max Continuous 40 knots and greater	<u>94%</u>
Gas Generator (NG)	Take off -	<u>100% of whatever value is on gauge (delta) when button pushed (5 min)</u>
	Transient -	<u>Delta plus 6 (Less than 5 seconds)</u>
	Max Continuous-	<u>Delta – 3.5 use 98% as a general guideline</u>
	Min Stabilized (idle)-	<u>67-70%</u>
Temp (T4)	Max for engine start	<u>795</u>
	Max Transient for starting	<u>865 (5 sec)</u>
	Take Off	<u>845</u>
	Max Continuous	<u>795</u>
Engine oil	Max Temp	<u>115 degrees</u>
	Min Oil Pressure	<u>1.3 bar below 85% NG 1.8 bar above (a bar equals 14.7 PSI)</u>
Minimum fuel pressure	<u>.4 bar</u>	
Electrical system	Max voltage	<u>31.5 (26-29 normal operating range; Below 15 watch for hot start)</u>
	Max current	<u>200</u>
Slopes Limits (In degrees)	Nose up <u>10</u>	Nose down <u>6</u> Lateral <u>8</u>
CG Limits (Longitudinal)	<u>Forward 124.8"// Aft 137.8"</u>	
Datum	133.8" forward of rotor hub	

Appendix F

Form: ASB AS350B2 Emergency Procedures

Location: Digital Copy on ASB Share Drive in Folder labeled “ASB Training”

Purpose: The ASB Emergency Procedures sheet ensures standardization since all ASB Pilots are responsible for understanding and adhering to the emergency procedures on this document.

Example of Form: Located on the next page.

ENGINE FAILURE • CRUISE

- 1. AUTOROTATE A RSPEED 65 KNOTS
- Attempt restart if time and altitude permit:**
- 2. FUEL FLOW CONTROL OFF
- 3. FUEL PUMP 1 & 2..... ON
- 4. GENERATOR ON
- 5. START BUTTON (when Ng is below 30%) PRESS
- If restart not successful:**
- 6. FUEL FLOW CONTROL OFF
- 7. FUEL SHUT-OFF CLOSE
- 8. FUEL PUMP 1 & 2..... OFF
- 9. GENERATOR OFF
- 10. MASTER CUTOFF (f there is a burning smell) OFF

GOVERNOR FAILURE • LOW SIDE

- 1. AUTOROTATE A RSPEED 65 KNOTS
- 2. FUEL FLOW CONTROL..... ADVANCE
(Into Emergency Sector. Ng 70%)
- 3. COLLECT VE ADJUST set 350 Nr
- 4. FUEL FLOW CONTROL " INCREASE to 380 Nr
- 5. REESTABL SH CRU SE FL GHT (f Possible)
- 6. Land as soon as practicable Shallow App/Run-On Ldg

GOVERNOR FAILURE- HIGH SIDE (Ng, T4, Nr, & Tq increase)

- 1. COLLECT VE (To maintain Nr limits) DO NOT REDUCE
- 2. FUEL FLOW CONTROL (Nr within limits) REDUCE
- 3. Land as soon as practicable Shallow App/Run-On Ldg

ENGINE SURGING

- 1. COLLECTIVE ADJUST/
- 2. FUEL FLOW CONTROL (io le ave governed rnmge) REDUCE
- 3. f Surging Continues LAND AS SOON AS POSS BLE
- 4. f Oscillations ncrease.....AUTOROTATE/ENG SHUTDOWN

ENGINE FIRE/DURING START

- 1. FUEL SHUT-OFF CLOSE
- 2. FUEL PUMP 1 & 2 OFF
- 3. CRANK \$W (for 10 seconds) ... ENGAGE
- 4. BAT-EXT POWER..... OFF

- 5. Fire Extinguisher AS REQU RED

ENGINE FIRE / FLIGHT "FIRE" LIGHT ON

- 1. AUTOROTATE.....A RSPEED 65 KNOTS
- 2. FUEL SHUT-OFF CLOSE
- 3. FUEL PUMP 1 & 2 OFF
- 4. GENERATOR OFF
- 5. MASTER CUTOFF (f there is a burning smell) OFF

TAIL ROTOR DRIVE FAILURE - HOVER IGE

- 1. COLLECT VE REDUCE (As Required)
- 2. LAND MA NTA N LEVEL ATT TUDE

TAIL ROTOR DRIVE FAILURE - HOVER OGE

- 1. COLLECT VE REDUCE (As Required)
- 2. A RSPEED..... NCREASE
- 3. See TAIL ROTOR DRIVE FAILURE - IN FLIGHT

TAIL ROTOR DRIVE FAILURE - IN FLIGHT

- COLLECHVE REDUCE (As Required)
- 2. A RSPEED ADJUST (Minimize left yaw)
- 3. LAND AS SOON AS POSS BLE
- CAUTION Do not shutdown engine until aircraft and profile permit a safe autorotation
- 4. AUTOROTATE/ENG SHUTDOWN Minimize touchdown speed

TAIL ROTOR CONTROL FAILURE (FIXED PEDAL)

- 1. A RSPEED (70 Knots level) ADJUST
- 2. HYD TEST (5 secs & reset)..... ENGAGE
- 3. Land as Soon as Practicable Shallow App/Run-On Ldg

HYDRAULIC FAILURE IN FLIGHT

- 1. A RSPEED (40-60 Knots) ADJUST
- 2. HYDRAUL C PRESSURE OFF
- 3. LANO AS SOON AS POSS BLE Shallow Appr/Run-On Ldg

MAIN SERVO-CONTROL SLIDE-VALVE SEIZURE

- 1. HYDRAUL C PRESSURE OFF
- 2. A RSPEED (40-60 knots) ADJUST
- 3. LAND AS SOON AS POSS BLE Shallow App/Run-On Ldg

LOW ENGINE Oil PRESSURE (GAUGE)

- WARN/F RE TEST CHECK ENG PL GHT
- If ENG P ght off when tested:
- AND TO is Very Low AU TOROTATE/ENG SHUTDOWN
- AND TQ is Normal LAND AS SOON AS POSS BLE
- f ENG P light on when tested
- AND TO is Very Low LAND AS SOON AS POSS BLE
- AND TQ is Normal Land As Soon As Practicable

HIGH ENGINE Oil TEMPERATURE

- 1. LAND AS SOON AS POSS BLE
- 2. f landing is not possible A RSPEED 80 KNOTS
- MGB L ght

- 1. POWER REDUCE
- 2. LAND AS SOON AS POSS BLE

M.G.B.T LIGHT

- 1. POWER REDUCE
- 2. LAND AS SOON AS POSS BLE

ENG CHIP LIGHT

- LAND AS SOON AS POSS BLE

ENG P LIGHT

- POWERREDUCE

f Oil Press Low

- AND TQ is Very Low AUTOROTATE/ENG SHUTDOWN
- AND TQ is Normal LAND MMED ATELY
- f Oil Press Normal
- AND TQ is Normal LAND AS SOON AS POSS BLE

F FILT. LIGHT (EITHER)

- LAND AS SOON AS POSS BLE

CHIP TGB LIGHT

- LAND AS SOON AS POSS BLE

CHIP MGB LIGHT

- LAND AS SOON AS POSS BLE

Nr ROTOR RPM INDICATOR FAILURE

- 1. Torque MAINTAIN ABOVE 10%
- 2. Nf..... MON TOR
- 3. LAND AS SOON AS POSS BLE

F.FILT.



Appendix G

Form: ASB Law Enforcement Pilot Training

Location: Appendix G

Purpose: To tailor ASB pilot training to the specific nature and demands of Law Enforcement Flying. The last page of this appendix has a sign off checklist that will be placed in the pilot trainee's training binder.

Example of Form: N/A

Appendix G- Law Enforcement Pilot Training Table of Contents

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100 INITIAL PILOT TRAINING

- .1 The OCSD Aviation Support Bureau (ASB) pilot trainee will be sent for training to a contracted helicopter flight training facility prior to beginning Initial Pilot Training In-House.
- .2 Flight Instructors of the training facility and the ASB Sergeants will evaluate the pilot trainee's progress during this stage.
- .3 The ASB Administrative, Operations Sergeant, or Chief Pilot may interrupt, extend or terminate flight training at any time if there are facts, conditions or circumstances to indicate that it is not in the best interest of ASB, or the pilot trainee to continue training.
- .4 Completion of initial pilot training at the contracted flight training facility will be determined by the pilot trainee's receipt of a Rotorcraft/Helicopter Rating with Commercial Pilot privileges.

110 TURBINE TRANSITION TRAINING

- .1 Pilot trainees will receive transition training into the AS350B2/B3e model helicopter. ASB Flight Instructors will give this transition training in accordance with each helicopter manufacturer's specified transition training guidelines.
- .2 Four hours of ground instruction to include:
 - a. Preflight operations
 - b. Starting procedures
 - c. FAA approved flight manual
- .3 Ten hours of flight instruction to include:
 - a. Normal flight operations
 - b. Pattern operations and off-site landings
 - c. ASB In-House Emergency Procedures (Appendix D)
- .4 All procedures and maneuvers will be performed to commercial pilot test standards. Additional time may be allocated if more transition training time is needed.

200 HELICOPTER PATROL OPERATIONS

The following sections of the manual will outline operations encountered by a law enforcement helicopter pilot in day-to-day operations. The Pilot Trainee will receive training and instruction in each area outlined in this section. Once training has been received the CFI and Pilot Trainee will initial that portion of the Pilot Trainee Checklist (last page of this appendix), and each will sign off each section on the checklist as it is completed.

205 ATC PROCEDURES

- .1 In the immediate vicinity of John Wayne Airport, clarify intentions and working altitude.
- .2 Review Letter of Agreement with John Wayne Tower.

210 PATROL PATTERNS

- .1 Maintain a random patrol pattern at a constant speed and altitude. Try to avoid patterns, where noise over certain areas becomes constant.

215 OBSTACLES AND LOCAL HAZARDS

- .1 Several obstacles and hazards to navigation exist near or within the patrol area. Pilots should familiarize themselves with the prominent obstacles listed below, and others that may not be listed.
 - a. High tension wires along the Santa Ana River
 - b. Radio tower, 17th/ I-5, 700 feet MSA
 - c. Radio tower, W. 16th, Newport beach, 500 feet MSA
 - d. Blackstar Canyon, 2 sets of high tension wires 2,200 feet MSA and 2,700 MSA
 - e. Signal Peak, 1,500 feet MSA
 - f. Oakley Wires, 1,500 feet MSA
 - g. KFI tower- west of Fullerton Airport, 1,000 feet MSA

- h. Radio Towers- 57 Fwy at the Brea / Diamond Bar Pass, 1,600 feet MSA
- i. Silverado Canyon/ Main Divide wires- 4,000 feet MSA
- j. Aliso Viejo Wires – 1,300 feet MSA
- k. Green River Wires- 1,000 feet MSA
- l. Santiago Canyon Road/ Modjeska Canyon Wires- 2,200 feet MSA
- m. Ladera Ranch Wires- 1,300 feet MSA
- n. Oso/ 5 FWY Wires- 700 feet MSA
- o. Aliso Canyon Wires- 600 feet MSA

220 RADIO MANAGEMENT

- .1 VHF radio set-up. Primary responsibility is monitoring the appropriate ATC frequencies. Tactical frequencies are secondary.
- .2 Monitoring primary ATC frequency and appropriate back-up ATC Frequency.
 - a. 126.80 / 119.90 and 122.85/ 123.025 (1 mile north of 91 FWY)
 - b. 126.80 or 119.90. The back-up frequency allows the pilot to hear traffic on the appropriate tower frequency that may not have been pointed-out on the advisory frequency
- .3 122.85/ 123.025/ 123.50 advisory procedures
 - a. Air to air coordination.
 - b. Position reports – ID, location, direction, altitude, and intentions (as needed)
 - c. Familiarization with LA and OC landmarks / reporting points

225 ETS / LOJACK.

- .1 A quick response followed by a slow methodical search is typical for LoJack and ETS searches. As the PIC, special flying considerations may include:
 - a. Obtaining a higher altitude for a greater line-of-sight
 - b. Notifying ATC of intentions as needed
 - c. Avoiding fixation on the ETS / LoJack receiver
 - d. Incorporating the ETS / LoJack into your inside / outside scan
 - e. Working as a team, employing good CRM
 - f. Using slow, flat grid patterns or circular orbits as needed

230 PURSUITS

- .1 New pilots shall be familiar with the ASB pursuit policy Section V of the ASB Policy and Procedures Manual.
- .2 In addition, the pilot trainee should consider other factors:
 - a. Use of any additional frequencies that may be available to coordinate between pilots, such as tower frequencies after hours.
 - b. ATC may free up a frequency for coordination
 - c. News helicopter coordination – Establish parameters as soon as possible.
 - d. Concise verbal / non-verbal communications (hand signals) between pilot and flight officer.

235 SURVEILLANCE

[REDACTED]

240 PHOTO FLIGHTS

- .1 ASB handles photo flights from a variety of agencies. Photo flights can place unique demands on the pilot.
- .2 As with any other non-crewmember ride along, a thorough briefing on safety procedures and precautions should be given. All rear headsets and headrests should be removed.
- .3 Secure any loose items. Photographers or videographers carry several loose items, and usually have to change lenses and/or film during the flight. Ensure that all precautions are taken when loose items are handled in flight.
- .4 The photo flight often requires a door be opened from to eliminate distortion, reduce glare and add sharpness and quality and to the photos or video.
- .5 Increased wind noise from the open door can make communicating with the photographer difficult. Ensure that the photographer wears the headset properly and adjust volumes before the flight begins.

- .6 Conduct an adequate pre-flight with the photographer to cover all aspects of the flight. Considerations include:
 - a. What type of photos is the photographer trying to get? Does he/she have specific needs?
 - b. How many photos? How many locations?
 - c. Altitudes and angles needed.
 - d. Airport and airspace considerations.
 - e. It is best to schedule photo flights during first or second flights of the day, because late afternoon shadows reduce detail. Overcast may also affect photos or video.
 - f. If photographer is in front seat, mute all his radios and turn TX selector to a non-transmitting slot.

245

FIRES (Special Operations Task- Category 2)

- .1 Structure or wild land fires can vary in complexity for the pilot and TFO. Depending on the severity of the incident, multiple frequencies might be required and additional coordination in the air and on the ground may be needed. The pilot needs to prepare for the possibility of the incident becoming more complex and have a plan to safely coordinate activities.
- .2 On severe fires, firefighting personnel may need to take a flight for aerial assessment and coordination. The TFO may or may not be aboard during these flights. In instances where the TFO stays behind, the mission should be well-defined, radio frequencies preset and a thorough safety briefing completed.

Other considerations include:

- a. Wind. Direction and size of the smoke plume might affect coordination and visibility, and reduce choices of attack methods.
- b. Is the smoke toxic? Consider wind speed and direction.
 - a. Will it affect air traffic? Can you provide heads-up info for ATC?
 - b. Does a Temporary Flight Rules area need to be established?
- c. News helicopter coordination. While you are coordinating the incident, News pilots may want information from you.
- d. Fire helicopter coordination. May involve several helicopters.

- e. Follow established Cal Fire Procedures on a fire under Cal Fire control.
- f. Is an off-site landing zone (LZ) established and will you need to coordinate a landing there?

See ASB External Load Manual for further details.

250 EMERGENCY LZ'S / TEMPORARY LZ'S

- .1 Landing at a location other than an FAA approved helipad may occur with some pre-planning, or may occur on a moment's notice (usually termed "scheduled" or "non-scheduled" landings). The pilot is the ultimate authority as to the decision to land off-site, and should not be influenced by the severity or nature of an incident. Extreme caution should be exercised. Listed below are some considerations when making a decision to land:
 - a. Radio coordination
 - b. Ground coordination
 - c. Obstacles – GOOD RECON
 - d. Ground debris – dirt, trash, weeds, rocks
 - e. Brown-out conditions
 - f. Ensure safe zone for approach, landing and departure
 - g. Ensure safe zone around tail
 - h. TFO should be the first one out and last one in to enhance area safety

255 SCHOOL LANDINGS

- .1 Landing at or within 1,000 feet of a school (grades K through 12) requires CALTRANS approval. Select ASB personnel have been trained as designees to survey landing sites to facilitate these permits.
 - a. Study the landing approval paperwork carefully. Items of safety include:
 - b. Diagram of school LZ
 - c. Approach and departure routes

- d. Hazards – wires, trees, poles and playground obstacles
- e. Location of student assembly area
- f. NO over flights of school buildings or children
- g. Assurance of school officials, law enforcement officials, or both
- h. Ground communication / coordination
- i. Obstacles marked with high-visibility material
- j. Loose material removed
- k. Caution – small debris from rotor downwash

260

MOUNTAIN FLYING

- .1 Mountain flying challenges the pilot as terrain, weather, and lighting tend to change from one extreme to another in relatively short periods. Listed below are some other safety related concerns for a pilot trainee, as well as the TFO:
 - a. Illusions day and night. Bright sunny days correspondingly create dark shadows in canyons. Detailed views of the ground and potential hazards can be limited. At night, a lack of visual cues is evident and depth perception can be compromised.
 - b. Lack of horizon. A lack of lights on the ground and a dark night can cause the horizon to blend-in with the mountain and sky. During the day, clouds or smog and haze can eliminate the horizon. Be alert for any subtle changes in visual cues.
 - c. Caution for changes in wind patterns and severity. Wind reports from ATC usually will not apply to mountain flying. Expect shifting leeward and windward winds.
 - d. Fly the ridges. Winds are usually more favorable and any potential emergency landing zones are more visible.
 - e. Dim panel lights at night. This helps to adjust your eyes to the terrain.
 - f. Caution for obstacles. Neutral colored towers are hard to see.

- g. Communication dead spots. Consider a flight profile that maintains a line-of-sight for VHF or tactical communications.
- h. Survival gear. Consider assembling a personal survival kit and carrying it with you at all times.

265

WEATHER

- .1 ASB pilots will adhere to Section V in the ASB Policy and Procedures Manual regarding weather.
- .2 Pilots should be familiar with local weather patterns. Rapidly changing weather conditions, particularly at night, can cause the weather to change from VMC to IMC in a matter of minutes.
- .3 During the hours of darkness and during certain daytime conditions, fog or low clouds blend-in with the ocean to reduce or eliminate any visual reference to the horizon. Pilots should maintain visual reference with land at all times to avoid spatial disorientation.
- .4 Patrol during windy conditions shall be conducted in accordance with the ASB Policy and Procedures Manual. During windy conditions less than the prescribed ASB minimums, aircrews should evaluate:
 - a. Effectiveness of routine patrols
 - b. Aircrew fatigue
 - c. Helicopter performance
 - d. Call-out considerations – weather vs. call priority.
 - e. Is wind increasing or diminishing?
 - f. Turbulent vs. smooth wind conditions
- .5 Use rotor blade tie-downs as necessary. Consider using tie-downs while helicopter is parked outside overnight during windy or forecasted windy conditions.
- .6 Rain considerations include:
 - a. Blade erosion
 - b. Ceiling and visibility limitations

- c. Calls for service
- d. Severity of calls during call-outs vs. inclement conditions
- e. Degraded performance of FLIR and Nightsun

270 INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS (IIMC)

- .1 Pilots usually encounter Spatial Disorientation almost immediately after entering IIMC. Pilots should have a plan that includes not only a disciplined instrument scan, but also Crew Resource Management. The TFO is critical in helping the pilot maintain situational awareness and sharing the workload.

See ASB Policy and Procedure Manual section VII for the ASB’s IIMC Procedure.

275 OVER WATER OPERATIONS

- .1 Over-water operations include normal patrol along the coastline or bay, or assisting an agency over the water beyond safe autorotation glide distance.
- .2 Wear a personal flotation device when planning to work a call over water, and the call is beyond autorotation glide distance.
- .3 Normal or routine flight operations should not be conducted beyond normal autorotation glide distance to dry land. Altitude, airspeed as well as wind speed and direction should be considered.
- .4 Review power-on and power-off ditching procedures.
- .5 Other considerations when handling calls over water:
 - a. Life threatening incident?
 - b. What effect will we have on the outcome?
 - c. How can we be most effective, yet limit our exposure of danger to the aircrew.
 - d. Helicopter capability
 - e. Crew capability
 - f. What is our latitude / longitude?
 - g. What personal safety equipment do we keep on our flight suit (glow sticks, mirror, etc.)?

- h. Review dunking procedures with TFO.
- i. Current weather conditions and forecasts. Is it deteriorating?
- j. CRM during flight. Crosscheck each other's decision-making and thoughts.

280 CREW RESOURCE MANAGEMENT

- .1 Crew Resource Management (CRM) is essential in our demanding cockpit environment. As the complexity of the mission increases, the need for open two-way communications between pilot and TFO increases. As we increasingly add hi-tech equipment to our mission, the levels of efficiency and complexity also increase. Above all, the key is maintaining an open line of verbal communication and conveying our thoughts to safely complete the mission.
- .2 Ensuring the safety of the flight crew is at the center of good CRM. At times, the crew focuses on the efficient handling of an incident. The success comes not only from the tactical decisions made, but just as importantly the flight safety employed during a tactical incident or routine patrol.
- .3 CRM starts on the ground. Regardless of which crewmember is designated as pilot or TFO for a particular day, flight safety, maintenance and tactical issues need to be openly shared.

285 FORMATION FLIGHT

- .1 Pilot trainees will be given at least 30 minutes flight time of actual formation flight during initial pilot training. The pilot trainee should be comfortable flying at 5 rotor disk separation.
- .2 Prior to an ASB Pilot being involved in a formation flight mission, the pilot must have formation flight training documented in his or her training binder.

290 LOS ANGELES BASIN FAMILIARIZATION

- .1 Familiarization with Greater Los Angeles Basin
 - a. All airports
 - b. Airspace
 - c. Reporting points
- .2 Law Enforcement Heliport and Facilities Familiarization

- a. Control One
- b. L.A.S.O.
- c. Long Beach P.D.
- d. Pasadena P.D.
- e. Riverside P.D.
- f. San Bernardino S.O.
- g. Riverside S.O.
- h. Anaheim P.D.
- i. Huntington Beach P.D.
- j. L.A.P.D. Hooper
- k. L.A.S.O. Industry Station

415 K-9 DEPLOYMENT FROM HELICOPTER (Special Operations Task- Category 2)

- .1 K-9 Officers and their K-9s will utilize the helicopter when the situation requires moving K-9 members a great distance, when conventional means are unavailable, or it is otherwise tactically advantageous to deploy K-9 members with a helicopter.
- .2 K-9 Officers utilizing Sheriff aircraft during a tactical assignment or training exercise shall adhere to the procedures set forth in this manual.
- .3 K-9 Officers and their K-9s will participate in annual training and orientation flights in the helicopter.
- .4 All K-9s *shall* be muzzled before any flight operations commence and secured to the rear seat D-Ring.

420 HOT REFUEL OPERATIONS

- .1 An ASB Pilot may not conduct Hot Refuel Operations until receiving training on ASB's Hot Refuel Policy and have the training documented in the pilot's training binder. ASB's Hot Refuel Policy is located in Section IV in the ASB Policy Manual.



ASB Pilot Trainee Checklist



SECTION	TOPIC	INSTRUCTOR	TRAINEE	REVIEW DATE
110	Turbine Transition			
200	Helicopter Patrol Operations			
205	ATC Procedures			
210	Patrol Patterns			
215	Obstacles & Local Hazards			
220	Radio Management			
225	ETS / LoJack			
230	Pursuits			
235	Surveillances			
240	Photo Flights			
245	Fire Operations			
250	Emergency LZ's / Temporary LZ's			
255	School Landings			
260	Mountain Flying			
265	Weather			
270	IIMC			
275	Over Water Operations			
280	Crew Resource Management			
285	Formation Flight			
290	LA Basin Familiarization			
420	Hot Refuel Operations			

Appendix H

Form: ASB AS350B2 Flight Maneuver Standards

Location: Digital Copy on ASB Share Drive in Folder labeled “ASB Training”

Purpose: To assist the Aviation Support Bureau with standardization. The published standards for flight maneuvers in Appendix G helps ensure all ASB Pilots are performing the flight maneuvers within Commercial Standards. The flight maneuver standards also allows for the CFI to give an evaluation using a specified criteria.

Example of Form: Located on the next 24 pages.

Maneuvers:

Straight and level flight

Purpose:

To maintain a constant altitude, airspeed, and course.

Execution:

1. Establish 50% TQ with the collective.
2. Adjust pitch attitude with the cyclic as necessary to achieve level flight attitude.
3. Maintain trim with pedals.
4. Maintain course by selecting a prominent reference point in the distance towards which to fly.

Completion Standards:

Commercial

Altitude +/- 25'

Airspeed +/- 5 KIAS

Heading +/- 5 degrees

Reference:

Rotorcraft Flying Handbook, Page 9-12.

Maneuver:

Turns

Purpose:

To change the course using a constant angle of bank while maintaining a constant airspeed and altitude.

Execution:

1. Clear the aircraft in the desired direction of turn, verbally announce "Clear Left" or "Clear Right".
2. Initiate turn using lateral cyclic application until reaching desired angle of bank.
3. Maintain constant airspeed by cross checking cockpit reference and horizon (pitch attitude).
4. Maintain altitude with collective, trim with pedals.
5. Prior to reaching desired heading or new reference, begin roll out to stop turn using opposite cyclic application.
6. If necessary, adjust cyclic for attitude, collective for cruise power, pedals for trim.

Completion Standards:

Commercial

Attitude +/- 25'

Airspeed +/- 5 KIAS

Roll-out Heading +/- 5 degrees

Reference:

Rotorcraft Flying Handbook, Page 9-12.

Maneuver:

Climbs

Purpose:

To accomplish desired change in altitude while maintaining a constant airspeed and course.

Execution:

1. Increase TQ to 60% using the collective.
2. Maintain a constant attitude/airspeed with cyclic, trim with pedals.
3. When 50' prior to desired altitude, decrease collective pitch to cruise power (level off).
4. Maintain attitude with cyclic, trim with pedals.

Completion Standards:

Commercial

Level Off Altitude +/- 25"

Airspeed +/- 5 KIAS

Reference:

Rotorcraft Flying Handbook, Page 9-13.

Maneuver:

Descents

Purpose:

To accomplish a desired change in altitude while maintaining a constant airspeed and course.

Execution:

1. Decrease TQ to 40% using the collective.
2. Maintain a constant attitude/airspeed with cyclic, trim with pedals.
3. When 50' prior to desired altitude, increase collective pitch to cruise power setting (initiate level off).
4. Maintain attitude with cyclic, trim with pedals.

Completion Standards:

Commercial

Level Off Altitude +/- 25'

Airspeed +/- 5 KIAS

Reference:

Rotorcraft Flying Handbook, Page 9-14.

Maneuver:

Acceleration/Deceleration

Purpose:

To accomplish an airspeed change while maintaining a constant altitude and course.
As training, to increase pilot control coordination.

Execution:

A. Deceleration

1. Adjust attitude slightly nose high with aft cyclic to decelerate to target airspeed 40 KIAS for training.
2. Simultaneously adjust collective to maintain altitude, pedals to maintain trim.
3. Approaching target airspeed, adjust to 40 KIAS attitude using cyclic. Maintain a constant altitude with collective.
4. Note required attitude and power setting to maintain 40 KIAS and constant altitude.
5. Maintain trim with pedals.

B. Acceleration

1. Adjust attitude slightly nose low using forward cyclic to accelerate to target airspeed 80 KIAS for training.
2. Simultaneously adjust collective as necessary to maintain altitude, pedals to maintain trim.
3. Approaching target airspeed, adjust to 80 KIAS attitude with cyclic. Maintain a constant altitude using collective.
4. Note required attitude and power setting to maintain 80 KIAS and a constant altitude.
5. Maintain trim with pedals.

(continued)

Maneuver:

Acceleration/Deceleration (continued)

Completion Standards:

Commercial

Altitude +/- 25'

Target Airspeed +/- 5 KIAS

Heading +/- 5 degrees

Reference:

Commercial PTS

Maneuver:

Normal and Crosswind Takeoffs From a Hover

Purpose:

To transition from flight at a hover to a climb to altitude.

Execution:

1. Perform a clearing turn.
2. Realign with takeoff heading.
3. Perform a before takeoff check: announce, "takeoff check complete".
4. Obtain takeoff clearance as necessary.
5. Select an initial distant reference point towards which to fly.
6. Begin moving the helicopter forward slowly, using the cyclic (approximately 1 degree nose low). Maintain hover altitude with the collective and heading with the pedals.
7. At effective translational lift, accelerate the aircraft. Place the compass 4 to 6 inches below the horizon with cyclic.
8. At 45 KIAS, establish a 65 knot attitude with slight aft cyclic. Continue to climb at 65 KIAS.
9. Once above 50' AGL, center the trim string with pedals, maintain ground track with cyclic, hover power with collective.

(continued)

Maneuver:

Normal and Crosswind Takeoffs From a Hover (continued)

Completion Standards:

Commercial

Drift Below 10' AGL +/- 6'

Drift Above 10' AGL +/- 12 ½'

Reference:

Rotorcraft Flying Handbook, Page 9-10.

WARNING

In order to complete a successful autorotation following engine failure at low altitude, low speed, and high power, takeoffs should be conducted in accordance with the recommended takeoff profile whenever possible.

Maneuver:

Normal and Crosswind Approaches To a Hover

Purpose:

To transition from flight at altitude to flight at a hover.

Execution:

1. On down wind, confirm “cleared to land”, perform landing check – instruments normal operating range.
2. When abeam approach angle intercept point, begin a normal decent to 300’ AGL. With descent established, turn base.
3. Arrive on final at 300’ AGL, straight and level watching desired light picture develop.
4. Just prior to a normal approach angle, begin by adjusting rate of closure with cyclic. Decelerate to an apparent rate of a brisk walk.
5. Maintain altitude with collective as aircraft decelerates. As approach angle is intercepted, allow aircraft to descend.
6. Maintain trim with pedals.
7. Continue to control angle (sight picture) with collective, rate of closure with cyclic (appearance of a brisk walk).
8. Descending below 50’ AGL, align heading with ground track using pedals.
9. As effective translational lift is lost, maintain angle with collective, rate of closure with cyclic, heading with pedals.
10. Arrive at the point of intended landing at a 5’ hover and zero forward speed.

(continued)

Maneuver:

Normal and Crosswind Approaches To a Hover (continued)

Completion Standards:

Commercial

Drift Below 10' AGL +/- 12 ½' +/- 6'

Drift Above 10' AGL +/- 25' +/- 12 1.2'

Reference:

Rotorcraft Flying Handbook, Page 9-19.

Maneuver:

Vertical Takeoff To a Hover

Purpose:

To lift the helicopter vertically to a stabilized hover.

Execution:

1. Clear the aircraft left and right.
2. Before lifting off check all instruments are normal.
3. Begin lifting the collective and establish the aircraft light on the skids (~93% Ng).
4. As the aircraft becomes light on the skids, pause. Apply slight downward pressure on the collective to remain firmly on the ground.
5. Perform before takeoff check. Select a ground reference point 100' in front of the aircraft.
6. Lift the aircraft slowly to a stabilized hover using the collective. Maintain position over the ground using the cyclic and heading with pedals.
7. Maintain hover altitude with collective.

Completion Standards:

Commercial

Hover Altitude +/- 6"

Heading +/- 2 ½ degrees

(continued)

Maneuver:

Vertical Takeoff To a Hover (continued)

Reference:

Rotorcraft Flying Handbook, Page 9-5.

WARNING

Incorrect cyclic stick position and/or raid collective inputs may cause an uncontrollable condition of dynamic rollover.

Maneuver:

Vertical Landing From a Hover

Purpose:

To land the helicopter vertically from a hover.

Execution:

1. Begin lowering the helicopter slowly by applying gentle downward pressure on the collective.
2. Maintain position over the ground with the cyclic and heading with pedals. Prevent lateral and rearward movement with the cyclic.
3. As skids contact surface, stop all lateral and rearward movement with cyclic. Maintain heading with pedals.
4. Continue to lower collective until full down.

Completion Standards:

Commercial

Heading +/- 5 degrees

Reference:

Commercial PTS

Maneuver:

Steep Approach

Purpose:

To transition from flight at altitude to a hover using a steeper than normal approach angle.

Execution:

1. Maintain 300 ft. AGL/ 60 KIAS until normal approach sight picture is intercepted.
2. As normal approach sight picture is intercepted begin deceleration with aft cyclic and lowering collective.
3. Maintain altitude with collective and allow steep approach sight picture to develop.
4. Apply forward cyclic to maintain rate of closure at a slow walk, maintain sight picture with collective.
5. Keep helicopter moving slowly toward landing spot, maintaining a vertical rate of descent of less than 300 FPM.
6. As effective translational lift is lost, apply forward cyclic and increase collective pitch to maintain rate of closure and sight picture.
7. Terminate at a 5 ft. hover over landing spot.

Completion Standards:

Commercial

Drift Below 10' AGL +/- 6"

Drift Above 10' AGL +/- 12 1/2'

Reference:

Rotorcraft Flying Handbook, Page 10-4.

WARNING

To prevent settling with power during steep approach with little or no wind, do not allow vertical rates of descent to exceed 300 FPM below ETL.

Maneuver:

Maximum performance takeoff and climb

Purpose:

To simulate obstacle clearance.

Execution:

1. Clear the aircraft left, right and overhead and complete a pre-takeoff check.
2. Begin the take off by getting the helicopter light on the skids, neutralize all aircraft movement.
3. Slowly increase the collective until the maximum power available is reached.
4. At an altitude above the highest obstacle, lower the nose to a 65 KT climb attitude as airspeed passes 55 KT, reduce the collective to normal climb power, trim with pedals.

Completion Standards:

Commercial

Altitude +/- 25'

Airspeed +/- 5 KIAS

Reference:

Rotorcraft Flying Handbook, Page 10-2.

Maneuver:

Shallow Approaches and Running Landings

Purpose:

To simulate an approach and landing when sufficient power for hovering is not available.

Execution:

1. At 300' AGL and no less than 65 knots, establish a shallow approach cycle (approximately 3°).
2. When shallow approach angle is intercepted, begin the approach by lowering collective.
3. Maintain approach angle with the collective and begin a slow deceleration with aft cyclic, trim with pedals.
4. As helicopter begins to pass through effective transitional lift, apply forward cyclic to keep aircraft moving and begin increasing collective to maintain desired approach angle.
5. Continue increasing collective to slightly below hover power, trim with pedals.
6. Prior to ground contact, adjust cyclic to insure that the helicopter is in a level attitude.
7. After ground contact, maintain heading with pedals and slowly lower the collective for braking action.

Completion Standards:

Commercial

Heading +/- 5%

Touchdown Point +/- 25'

Note: Power used should be less than hover

Reference:

Rotorcraft Flying Handbook, Page 10-5

Maneuver:

Quick Stop (Rapid Deceleration)

Purpose:

To simulate a condition when a rapid decrease in forward airspeed is required, as in an aborted take off.

Execution:

1. At a 5' hover into the wind, check all instruments for normal indications.
2. Take off and climb to 25 feet above ground level.
3. Accelerate with cyclic to maintain 25 foot altitude.
4. Before entering maneuver, adjust power to 30% TQ. Look outside.
5. Initiate maneuver by lowering collective and applying left pedal.
6. As helicopter begins to settle, apply aft cyclic to maintain altitude.
7. Rotate to specific attitude with reference to cockpit.
8. As the helicopter begins to settle, apply collective to maintain altitude, apply forward cyclic to level helicopter.
9. Pick spot on ground and perform last part of a normal approach to a hover.
10. Terminate at 5' hover.

(continued)

Maneuver:

Quick stop (Rapid Deceleration) (continued)

Completion Standards:

Commercial

Heading Tolerance +/- 5 degrees

Assigned Altitude Tolerance +/- 5'

Terminated at Predetermined Point +/- 12 ½'

Reference:

Rotorcraft Flying Handbook, Page 10-3.

Maneuver:

Straight-In Autorotation (with power recovery)

Purpose:

To practice autorotative approach and landing.

Execution:

1. Arrive on final at 700' AGL, straight and level with ~50% Torque. Airspeed should be 70 to 80 KIAS.
2. Enter autorotation at desired sight picture. Look at the horizon and place the collective full down. Simultaneously adjust the cyclic to maintain a constant attitude and pedals to maintain trim.
3. Cross-check attitude, trim, RPM.
4. Approaching 65', look 300-500' beyond landing area.
5. At 65' AGL, begin cyclic flare. Continue to decelerate so as to arrive at 25' with little forward speed and descent rate.
6. At approximately 25', begin lifting collective and leveling pitch attitude with cyclic.
7. Arrive skids level at 8' and maintain heading with the pedals.

(continued)

Maneuver:

Straight-In Autorotation (with power recovery) (continued)

Completion Standards:

Commercial

Termination at Target +/- 25'

Airspeed +5, - 0 KIAS

References:

Rotorcraft Flying Handbook, Page 11-2.

AS350 Operating Handbook, Sect. 3

WARNING

Approximately 4/5 of the total available energy for autorotation is stored in airspeed; therefore, it is imperative that airspeed is not allowed to decrease below 65 knots. Failure to maintain sufficient airspeed will cause excessive and uncontrollable rates of descents.

Maneuver:

180 degree autorotation

Purpose:

To Practice autorotative approach with turn and landing (power recovery)

Execution:

1. Arrive on downwind 1000' straight and level, 70-80 KIAS.
2. Abeam the intended point of landing, enter autorotation.
3. Look at the horizon and place the collective full down. Simultaneously adjust the cyclic to maintain a constant attitude and pedals to maintain trim.
4. Initiate the turn using lateral cyclic application until reaching desired angle of bank. Cross check attitude, trim, rpm.
5. Adjust the rotor rpm into the green using the collective. Control pitch attitude and bank angle with cyclic.
6. Prior to reaching desired heading, roll out wings level using opposite lateral cyclic application. Continue cross checking attitude, trim, rpm.
7. Approaching 65', look 300-500' beyond landing area.
8. At 65' AGL, begin cyclic flare. Continue to decelerate so as to arrive at 25' with little forward speed and descent rate.
9. At approximately 25', begin lifting collective and leveling pitch attitude with cyclic.
10. As the helicopter begins to settle, increase collective as necessary, level the helicopter with the cyclic, maintain heading with pedals.
11. Arrive skids level at 5' and maintain heading with pedals.

(continued)

Maneuver:

180 degree autorotation (continued)

Complete Standards:

Commercial

Termination at target +/- 25'

Airspeed + 5, -0 KIAS

Reference:

Rotorcraft Flying Handbook, Page 11-3.

WARNING

Approximately 4/5 of the total available energy for autorotation is stored in airspeed; therefore, it is imperative that airspeed is not allowed to decrease below 60 knots. Failure to maintain sufficient airspeed will cause excessive and uncontrollable rates of descent.

Maneuver:

Hovering Autorotation

Purpose:

To practice landing the helicopter from a hover following an engine failure.

Execution:

1. Establish a 3' hover headed into the wind.
2. Maintain hover altitude with the collective.
3. Look at a reference point 100' in front of the helicopter.

The Instructor will now reduce FFCL to ground idle.

4. Maintain position over the ground with the cyclic and heading with the pedals (anticipate slightly left cyclic and left pedal).
5. As the aircraft begins to descend, fly the helicopter to the surface using collective to control descent and land. Do not allow lateral or rearward drift.
6. Once firmly on the ground, lower the collective and neutralize the controls.

Competition Standards:

Commercial

Hover Altitude +/- 6"

Heading +/- 5 degrees

Drift +/- 6"

Reference:

Rotorcraft Flying Handbook, Page 11-4.

CAUTION

Over or under application of collective pitch may result in a hard landing. Dynamic rollover

Maneuver:

Slope Landings

Purpose:

To land from a hover to a sloped surface.

Execution:

1. Approach slope from a hover so that landing will be cross-slope and generally into the wind.
2. Slowly descent vertically until uphill skid makes light ground contact.
3. Apply lateral cyclic control into the uphill skid and stabilize all movement of helicopter.
4. Maintain positive heading on a forward reference point and begin slowly and cautiously lowering downhill skid.
5. When the downhill skid makes contact with the ground begin lowering collective smoothly.
6. As collective is being lowered check the stability of landing area by gently moving pedals and by moving cyclic fore and aft.
7. Before lowering collective to full down position begin moving cyclic toward neutral position. Once collective is in full down position, neutralize cyclic and pedals.

Completion Standards:

Commercial

Heading +/- 5 degrees

Reference:

Rotorcraft Flying Handbook, Page 10-6.

WARNING

To prevent rollover, do not decrease M/R RPM until stable condition is confirmed.

Maneuver:

Slope Takeoffs

Purpose:

To take off to a hover from a sloped surface.

Execution:

1. Apply lateral cyclic into slope and begin slowly and cautiously increasing collective.
2. Maintain positive heading on a forward reference point with pedals.
3. Continue raising the down slope skid to a level attitude and simultaneously work the cyclic control to neutral.
4. When there is no longer any side pressure on the uphill skid, lift helicopter to a 3 foot hover.
5. Slide sideways away from slope and assure tail rotor clearance before takeoff.

Completion Standards:

Commercial

Heading Tolerance +/- 5 degrees

Reference:

Rotorcraft Flying Handbook, Page 10-6.

WARNING

Excessive and abrupt cyclic or collective movements may cause uncontrollable rollover.