

Sky Arrow

Standard Operating Procedures and Maneuvers Supplement



January 3, 2012

Normal Takeoff

Fuel pump on

Flaps 0°

Trim set - slightly above the midline

Check for traffic

Line up on white stripe

Full power

Stick should be located in the middle of the travel space

Steer with feet only

Gradually apply back pressure to lift the nose off ground
but leave the mains on the ground

Rotate 50kts

Climb out 65kts

Set trim to hold 65kts

Fan off

Fuel pump off - over dry land

Follow noise abatement procedures

Level Off From Climb

Lower nose to achieve level flight

Reduce power to 5100RPM

Reset trim to remain in level flight - start with the orange
indicator line about 1/3 from the bottom

Verify: flaps up, fans off, fuel pump off, engine
instruments green

*Note: Start level off approximately 100ft before
desired altitude to avoid overshooting.*

Straight and Level Flight

Use outside references to establish and maintain the
desired pitch attitude and wings level position.

*Note: use instrument panel glareshield position
with respect to the horizon*

Check the ball of the slip/skid indicator.

*Note: Ball to the left of center requires left rudder
for balanced flight, ball to right of center requires
right rudder for balanced flight. Keep the ball in
the middle by "stepping on the ball."*

Trim as required.

*Note: Use trim to minimize the stick force required
to hold the desired pitch attitude not to change the
attitude.*

Check the altimeter.

Make small pitch corrections necessary to maintain
desired altitude.

Do not fixate on any one instrument.

Turns (Level Flight)

Look in the direction of turn before banking!
Use rudder and aileron together to establish the desired bank angle.
Simultaneous apply back pressure to elevator.
Once the desired bank angle is established, neutralize the rudder and aileron inputs. Keep in elevator.

Note: Level altitude turns require some elevator force (back stick) to maintain a constant altitude (more bank, more elevator back stick.)

Use rudder and aileron together to roll out of the bank to wings level.
Release any back stick elevator pressure.
Neutralize the rudder and aileron.
Check that the ball is centered.

Note: To roll out on a specific heading, lead the heading by one third the bank angle (example: 30 degrees bank angle, lead rollout by 10 degrees.)

Climbs

Apply full power
Raise the nose to the desired climb pitch attitude
Refine pitch attitude to maintain desired airspeed
*Note: $V_x = 60\text{kts}$ (best angle)
 V_y (best rate) = 65kts
cruise climb = 70-80kts*
Set trim to hold desired attitude and airspeed

Descents

Reduce power to desired RPM and lower nose to the pitch attitude for desired airspeed.
Note: For a cruise descent, reduce power to maintain a descent rate of approximately 500 ft/min. and maintain cruise speed.
Trim as required to minimize elevator force.

Keep the ball centered.

Level Off From Descent

Simultaneously add desired power and raise the nose.
Trim to eliminate stick pressure.

Note: To level off from a descent, lead the level off by approximately 100 feet

Note: To level off in cruise flight bring power to 5100RPMs. To level off for the traffic pattern bring power to approximately 3800 rpms.

Normal Landing

10nm from airport, listen to AWOS and/or request Airport advisory

5nm from airport begin self announcing position

Enter traffic pattern following noise abatement procedures

As you enter the pattern power back to 3,800 rpms to get the aircraft slowed down

Fuel pump on

Downwind leg approximately 3,800 RPM, 65kts level flight, retrim

Abeam of numbers, reduce power to approximately 2,800 rpms, add first notch of flaps, retrim for 60kt decent

Base, add second notch of flaps, adjust power/ power if need be for appropriate decent altitude and to maintain 60kt decent

Final, add third notch of flaps, adjust power if need be for appropriate decent altitude and to maintain 55-60kt decent

Airspeed should be 55 kts over the runway, 50 kts at the beginning of the flare, 45 kts at touch down

Once the runway is made, reduce power to idle 20 feet above runway, begin transition from maintaining airspeed to maintaining attitude. Focus eyes at far end of the runway. Gradually increase back pressure on stick to try and hold aircraft 2 feet off the runway as long as possible. Use your feet to point airplane down the runway and hands to maintain altitude and keep it over the centerline.

Once main wheels touch the ground, steer with feet.

Gradually lower the nose wheel and begin applying brakes as needed

Clear runway

Make radio call

Reset trim, turn off fuel pump, and adjust fans and baffles as needed to maintain water temperature.

Note: If fast, raise nose; if slow, lower nose.

Summary: PITCH CONTROLS AIRSPEED, POWER CONTROLS ALTITUDE.

Slow Flight

2 clearing turns
Reduce power to 3,500
Increase pitch attitude and trim to maintain altitude
Once within the white arc, bleed in flaps
Adjust pitch and power to maintain altitude at 46kts

Recovery

Full power
Pitch for level attitude
Bleed out flaps while in the white arc
Retrim

Power Off Stall

2 clearing turns
Reduce power to 3500 rpm
Increase pitch attitude and trim to maintain altitude
Once within the white arc, add all flaps
Reduce power to idle
Adjust pitch to establish 60kt glide
Descend approximately 300 feet and then gradually pitch back to maintain altitude and induce a stall.
Watch coordination and maintain heading unless performing "turning stall."

Note: For turning stall maintain shallow bank angle and keep plane coordinated.

Recovery

Simultaneously apply full power, pitch for level attitude, and remove first notch of flap.
Once airspeed has increased to 60kts, establish 60kt climb
Bleed out flaps and climb to desired altitude.
Return to cruise flight

Power On Stall

2 clearing turns
Reduce power to 3000 rpm
Increase pitch attitude and trim to maintain altitude
Once within the white arc, add 1 notch of flaps
Adjust pitch and power to maintain altitude until 45kts
At 45kts, apply full power, and immediately pitch back to further reduce airspeed until stall
Watch coordination and maintain heading unless performing "turning stall."

Note: For turning stall maintain shallow bank angle and keep plane coordinated.

Recovery

Pitch for level attitude
Once airspeed has increased to 60kts, establish 60kt climb
Remove flaps and climb to desired altitude.
Return to cruise flight.

Steep Turns

Establish cruise flight at or below 93kts approx 4500 rpm

2 clearing turns

Choose landmark for entry heading

Begin roll to 45° bank

At 30°, add 100rpm and continue roll to 45° adjusting back pressure as needed

Maintain altitude

10° prior to roll-out heading, begin roll out and reduce power 100rpm.

Roll out at entry altitude and heading.

Turns Around a Point

Determine wind direction

Select a suitable site. Should have emergency landing areas, no towers, and not disturb the neighbors.

Establish cruise flight at or below 93kts 4500 rpm

Select four points around the point that are equidistance from the center. These four points are your targets.

Enter maneuver at 1000 feet

Steepest turn should be downwind. Shallowest upwind.

Keep object same distance from aircraft by adjusting bank angle. Steeper brings it closer. Shallower takes it further away.

S-Turns Across a Road

Determine wind direction

Select either Rt 50, Rt 404, or Rt 301. Winds should be perpendicular to road. (Talk to ESN tower for 50)

Establish cruise flight at or below 90kts 4500 rpm

Select target distance from road

Enter maneuver at 1000 feet, perpendicular to road

When over the road begin turn

Steepest turn should be downwind. Shallowest upwind.

Airplane should be wings level only when crossing the road. Adjust bank angle accordingly.

Loss of Engine

Establish and trim for best glide speed 60kts
Select emergency landing site and head that way

IF there is time, try to restart engine

Work left to right

Emergency Shutoff - verify it is closed

Carburetor Heat - On

Throttle - Open half way

Ignitions - Check

Fuel Pump - On

Attempt re-start

IF there is time, call for help giving position

Radio 121.5 MHz

Transponder 7700

Secure Engine

If engine will not restart - Fuel Shutoff Up

Flaps - as necessary

Master off after final flaps

Unlock canopy immediately upon touchdown

Go-Arounds

Apply full power

Reduce flaps to 20°

Pitch for level attitude until 60kts and then begin climb

Fuel pump off

Bleed out flaps

Short Field Takeoff

Fuel pump on

10° flaps

Stop aircraft at the very end of the runway

Hold brakes and apply full power

Release brakes

Climb out at 60kts

Above obstacle height, pitch for 65kts

Flaps up

Fuel pump off

Short Field Landing

Set up final approach at 55kts

Establish aim point prior to actual touch down point

After touch down, retract flaps, apply brakes but do not
skid!

Soft Field Takeoff

Inspect field condition checking for grass height, holes, debris, and wetness

Flaps 10°

Fuel pump on

Fans on

Full aft pressure during taxi continuing through takeoff

Apply full power

As soon as main wheels leave the ground, lower nose to level attitude and fly aircraft 5 feet off the ground until 60kts

Climb out at 60-70kts

Fuel pump off - above dry land

Fans off

Soft Field Landings

Perform low pass to inspect field condition for grass height, holes, debris, and wetness

Set up normal approach to landing

Keep nose wheel off the ground as long as possible holding aft pressure as long as possible

Use minimal braking and keep aircraft moving until parked

Open baffles and use fans for extended taxi

Note: Be sure to check NOTAMS that runway is open! Kentmorr closes when it is muddy.

Crosswind Takeoff

Modify appropriate takeoff procedures as such:

Begin ground roll with full aileron into the wind

Gradually take out most of the aileron as aircraft accelerates

Upon lift-off, establish coordinated crab into the wind

Crosswind Landing

Modify appropriate landing procedures as such

Add 5kts approach speed if runway length allows, especially in gusts

Apply rudder to point nose down the runway

Apply aileron to hold aircraft over the centerline

Do not use more than 20° flap

Note: Net effect should be the aircraft slightly cross controlled with the wing down into the wind

Note: Control input should be increased as aircraft decelerates and maintained until landing

Forward Slips

Apply almost full rudder

Apply enough opposite aileron to hold the aircraft over the centerline

Pitch to maintain airspeed

This is most effective with no power, full flaps and downward wing into the crosswind wind

Emergency Descent

Reduce power to idle.

Flaps up.

Lower the pitch attitude to increase airspeed until desired rate of descent is obtained. If air is smooth ≤ 132 kts if turbulent ≤ 104 kts

Banking bank to 45 degrees.

Trim.

Approaching desired altitude, level the wings and gradually raise the nose.

Add power and trim to level off, if available.

Flat Tire Upon Landing

Stop aircraft

Radio call - Notify UNICOM and landing traffic of runway situation

If able, push aircraft off of runway while keeping as much weight off of that wheel as possible

If unable to reach UNICOM - Call CSP emergency numbers for assistance

Aborted Takeoff

Retard throttle

Apply full braking

Steer as appropriate

Note: Grass can be used to slow the airplane down

Loss of Engine Immediately After Takeoff

Pitch DOWN for 60kts

Make shallow turns right or left

Do NOT attempt to return to runway below 1000 feet

Off runway 29 - prepare for ditching

Ditching

Pitch or 60 KIAS

Head towards a boat or shoreline

Radio - Transmit MAYDAY on 121.5 Mhz and 7700

Wing flaps - DOWN

Approach - Into the wind

Seatbelt - Secure

Eyeglasses - Remove

Face - Cushion is possible

Touchdown - Minimum airspeed, right wing down

Canopy and windows - Open

Airplane -Evacuate

Engine Fire - Emergency Decent

Emergency fuel shut off - OFF

Full throttle

Pitch for highest possible to try and snuff out flames. If air is smooth ≤ 132 kts if turbulent ≤ 104 kts

Select emergency field

Mayday 121.5 and 7700

Ignition switch off after fuel is consumed (30 seconds)

Prepare for forced landing (use loss of engine checklist)

Spin Recovery

From the FAA Airplane Flying Handbook

Reduce the power to idle

Position the ailerons to neutral

Apply full opposite rudder against the rotation

After spin rotation stop, neutralize the rudder

Begin applying back-elevator pressure to raise the nose to level flight (Maintain airspeed \leq 93kts)

Overheating Cylinders/Water (In-Flight)

Reduce RPMs to lowest possible to maintain safe flight

Check baffle open

Land as soon as practicable

Overheating Oil Without Loss of Oil

Pressure

Reduce RPMs

Lower angle of attack

Check baffles open

If oil temperature continues to climb, land

Overheating Oil With Loss of Oil

Pressure

Select and head towards emergency landing spot

Declare an emergency 121.5 and 7700

Prepare for loss of engine and use of appropriate checklist

Loss of Radio

If in a pattern at a towered field, look for light gun signals. If under flight following or in towered airspace with radar, squawk 7600

Otherwise return home or to nearest appropriate airport

Overfly and observe airport traffic pattern

Carefully merge with traffic

Execute normal landing

Loss of Flap Control

If flaps are down, maintain airspeed below 68 kts when returning to airport

If flaps are up, return home and execute normal flaps-up landing

Loss of Trim Control

Fly the aircraft paying special attention to airspeed in the pattern

Loss of Brakes

If you are fast and have half or more of the runway remaining, go-around and re-approach using short field landing technique or go to longer runway

Land with minimum airspeed

Roll into the grass on the side of the runway if needed to stop the plane

Electrical Fire

Master switch - OFF

Vent fumes from cabin

Land as soon as practical

Remember, you will have no flaps, radio, or trim control

Loss of Generator

Turn off all unneeded electrical equipment

Land as soon as practical

Use no-flap landing

Canopy Opening in Flight

Fly the plane!

Slow the plane down or maintain a low airspeed and carefully pull the canopy shut