Piper Warrior Flight Maneuvers

North Star Aviation
Minnesota State University, Mankato

Slow Flight (Landing Configuration)

Altitude.....2000' AGL Minimum
Pre-Maneuver Check.....Complete
Throttle.....1700RPM
Pitch to Maintain Altitude
Below 103 KIAS.....Flaps 40º
(One Notch at a Time)
Throttle.....Increase to Maintain Altitude
(1800-2000 RPM)
Pitch.....Maintain Stall Speed +10/-0
(Target 49 KIAS)
Trim.....Adjust As Necessary
Recovery:
Smoothly Reduce Pitch
Throttle.....Max Power
Flaps.....25º
Pitch for minimal loss of altitude
Positive Rate.....Flaps 10º
.....Flaps 0º
Accelerate.....V_Y (79 KIAS)
Return to Cruise Flight 90 KIAS

Slow Flight (Takeoff Configuration)

Altitude.....2000' AGL Minimum
Pre-Maneuver Check.....Complete
Throttle.....1500 RPM
Pitch to Maintain Altitude
Throttle.....Increase to Maintain Altitude
(1800-2000RPM)
Pitch.....Stall Speed +10/0
(Target 55 KIAS)
Trim.....Adjust as Necessary
Recovery:
Smoothly Reduce Pitch
Throttle.....Max Power
Pitch for minimal loss of altitude
Positive Rate.....Verify Flaps 0º
Accelerate.....V_Y (79 KIAS)
Return to Cruise Flight 90 KIAS

Ground Reference

Altitude.....600-1000'AGL
Pre-Maneuver Check.....Complete
Area.....Identify Pos. Landing Area
Airspeed.....90 KIAS
Enter Maneuver on Downwind Heading
Perform to Applicable Test Standards

Power Off Stalls (Landing Configuration)

Altitude.....2000' AGL Minimum
Pre-Maneuver Check.....Complete
Throttle.....1700RPM
Pitch to Maintain Altitude
Below 103 KIAS.....Flaps 40º
(One Notch at a Time)
Enter Normal Descent to Land
…….....Throttle to Idle
Maintain Altitude to Induce a Stall
Recovery:
Smoothly Reduce Pitch
Throttle.....Max Power
Flaps.....25º
Pitch for minimal loss of altitude
Positive Rate.....Flaps 10º
.....Flaps 0º
Accelerate.....V_Y (79 KIAS)
Return Original Altitude & Airspeed 90 KIAS

Power On Stall (Takeoff Configuration)

Altitude.....2000' AGL Minimum
Pre-Maneuver Check.....Complete
Throttle.....1500 RPM
Pitch to Maintain Altitude
63 KIAS.....Max Power
Smoothly Increase Pitch to Induce a Stall
Recovery:
Smoothly Reduce Pitch
Throttle.....Max Power
Pitch for minimal loss of altitude
Positive Rate.....Verify Flaps 0º
Accelerate.....V_Y (79 KIAS)
Return to Cruise Flight 90 KIAS

Steep Turns

Altitude.....2000' AGL Minimum
Pre-Maneuver Check.....Complete
Throttle.....2300-2400RPM
Airspeed.....90 KIAS
Bank.....Commercial (50º)
Private (45º)
Trim.....Roll Aft to Relieve Back Pressure
Power.....Increase to Maintain Airspeed
Roll Out.....Initial Heading+/- 10°
Repeat Procedure in the opposite direction as necessary
Return to Cruise Flight 90 KIAS

Eights on Pylons

Airspeed.....90 KIAS
Pre-Maneuver Check.....Complete
Area.....Clear of Obstructions
Pivotal Altitude.....$GS^2/11.3$
Enter 45º to Downwind
Pitch.....Maintain Pivotal Altitude
Perform 2 revolutions, one around each point

Lazy Eights

Altitude.....2000' AGL Minimum
Pre-Maneuver Check.....Complete
Airspeed.....90 KIAS
(Increasing Pitch, Increasing Bank)
45º Point.....Max Pitch Up, 15º Bank
(Decreasing Pitch, Increasing Bank)
90º Point.....Level Pitch, 30º Bank
(Decreasing Pitch, Decreasing Bank)
135º Point.....Max Pitch Down, 15º Bank
(Increasing Pitch, Decreasing Bank)
180º Point
Straight and Level
Initial Heading +/- 10º
Initial Altitude +/- 100'
Initial Airspeed +/- 10 KIAS
Repeat in Opposite Direction

Chandelles

Altitude.....2000' AGL Minimum
Pre-Maneuver Check.....Complete
Airspeed.....90 KIAS
Bank.....30º
Throttle.....Max Power
Pitch.....Gradually Increase
90º Point.....Max Pitch Up
Maintain Pitch, Gradually Decrease Bank
180º Point
Roll Out.....+/- 10º Heading
Pitch.....Maintain Without Stalling
Airspeed.....Maintain Just Above Stall
Slowly decrease pitch to accelerate while holding altitude
Return to Cruise Flight 90 KIAS

Steep Spirals

Altitude.....4000' AGL Minimum
(Altitude enough to complete three turns. Consider DA)
Pre-Maneuver Check.....Complete
Airspeed.....90 KIAS
Begin Maneuver on Downwind Heading
Prior to being abeam the reference point
Throttle.....Idle
Pitch.....V_G (73 KIAS)
Bank.....Up to 60º
(Maintain Equal Radius)
Each Upwind Heading - Clear the engine by adding power slowly up to 1700 RPM
After 3rd Turn:
Wings Level
Heading +/- 10º
Recovery
Return to Cruise Flight
Or
Climb As Assigned
Or
Proceed With Simulate Power-Off Landing
(No Lower than 500' AGL)

Warrior V-Speeds

V_Y = 79 KIAS --- Best Rate of Climb
V_X = 63 KIAS --- Best Angle of Climb
V_{SO} = 44 KIAS --- Stall Speed (Landing Configuration)
V_S = 50 KIAS --- Stall Speed (Clean Configuration)
V_{FE} = 103 KIAS --- Maximum Flaps Extended Speed
V_{NO} = 126 KIAS --- Maximum Structural Cruising Speed
V_{NE} = 160 KIAS --- Never Exceed Speed
V_A = 88 – 111 KIAS --- Maneuvering Speed
V_G = 73 KIAS --- Best Glide Speed

Archer V-Speeds

V_Y = 76 KIAS --- Best Rate of Climb
V_X = 64 KIAS --- Best Angle of Climb
V_{SO} = 45 KIAS --- Stall Speed (Landing Configuration)
V_S = 50 KIAS --- Stall Speed (Clean Configuration)
V_{FE} = 102 KIAS --- Maximum Flaps Extended Speed
V_{NO} = 125 KIAS --- Maximum Structural Cruising Speed
V_{NE} = 154 KIAS --- Never Exceed Speed
V_A = 89 – 113 KIAS --- Maneuvering Speed
V_G = 76 KIAS --- Best Glide Speed