

UMKC CME	Flight Test Card	FLT No. 01	DATE 2020-04-02	PAGE No. 1
PROJECT No. Test 4: Aircraft Performance	MAKE AND MODEL Piper Warrior II PA-28	SER No. 001	REGISTRATION N6394C	

Crew	TEST DIRECTOR	CREW CHIEF	RANGE SAFETY OFFICER
	PILOT	FTE - INSTRUMENTATION ADVISOR	FTE - PERFORMANCE ADVISOR

Purpose

Identify the aircraft performance characteristics in level flight, climb, descent, takeoff, and landing. Identify characteristic airspeeds, including:

- Best endurance
- Best range
- Best climb rate
- Best climb angle
- Minimum sink rate
- Best glide angle

Maximum performance:

- Takeoff distance
- 50 ft obstacle clearance
- Landing distance
- Landing a 50 ft obstacle

Maneuvers:

- **Short-Field Takeoff** for maximum performance takeoff and obstacle clearance performance
- **Level Acceleration** for level flight power required assessment
- **Steady Climbs** for climb performance assessment
- **Steady Descents** for descent assessment
- **Short-Field Landing** for maximum performance obstacle clearance and landing performance

Changes

- Added Pixhawk 2.1, Here2 GPS, and telemetry radio inside cabin
- Added PixRacer, mRo GPS, pitot tube, and pressure sensor to underwing mount

Weather

TEMPERATURE:	DENSITY ALTITUDE:	PRECIPITATION:
WIND SPEED:	VISIBILITY:	LOCATION:
WIND DIRECTION:	CLOUDS:	GROUND SURFACE:

Time

TEST TIME (UTC/EST)	FLIGHT TIME (UTC/EST)
START:	START:
STOP:	STOP:
TOTAL:	TOTAL:

Risk Assessment

- Risk of passenger discomfort or nausea during maneuvers
- Risk of turbulence or high winds affecting flight performance
- Risk of low visibility or poor weather affecting flight schedule

☒ Low

☐ Medium

☐ High

Director, UMKC Flight Operations

Date

Test Director, Flight Test

Date

UMKC CME	Flight Test Card	FLT No. 01	DATE 2020-04-02	PAGE No. 2
PROJECT No. Test 4: Aircraft Performance	MAKE AND MODEL Piper Warrior II PA-28	SER No. 001	REGISTRATION N6394C	

Flight Maneuver Assessment Criteria

Assessment Criteria	
Maneuver	Assessment Criteria
Short-Field Takeoff Line up aircraft with known point on runway, then extend flaps to 25 degrees (second notch). Apply maximum brake pressure, then full throttle. Release brakes and allow aircraft to accelerate to 52 KIAS, then rotate and maintain 52 KIAS until 50 feet AGL. Accelerate to 79 KIAS, then slowly retract flaps and maintain climb until 1000 ft AGL.	Throttle reaches maximum before brakes released Airspeed at rotation within +5/-2 KIAS of 52 KIAS Initial climb speed remains within +5/-2 KIAS of 52 KIAS Final climb speed remains within +/- 5 KIAS of 79 KIAS Steady climb maintained until above 1000 ft AGL
Level Acceleration Climb to 3000 ft MSL and set flaps to 0 deg. Reduce throttle steadily until aircraft is maintaining altitude at stall speed. Increase throttle to full and allow aircraft to stabilize at maximum speed. Reduce manifold pressure in 2 in. Hg or power in 10% increments. Allow airspeed to stabilize at each condition, record data, then continue reducing throttle until aircraft reaches stall speed.	Airspeed stabilizes at each test point Altitude remains within 100 feet throughout maneuver Bank angle remains within 5 deg of level
Steady Climbs Climb to 2500 ft MSL and set flaps to 0 deg. Trim to desired airspeed, then set throttle to full. Climb through 4000 ft MSL or for 3 minutes. If conducting steady climb in sequence with descent maneuver, set throttle to full after descending through 2500 ft.	Airspeed remains within 5 knots of desired airspeed Climb speed remains within +/- 100 ft/min Bank angle remains within 5 deg of level Aircraft remains clear of clouds Aircraft does not encounter moderate or higher turbulence
Steady Descents Climb to 4000 ft MSL and set flaps to 0 deg. Trim to desired airspeed, then set throttle to idle. Descend through 2500 ft MSL or for 3 minutes. If conducting steady descents in sequence with climb maneuver, set throttle to idle after climbing through 4000 ft.	Airspeed remains within 5 knots of desired airspeed Descent speed remains within +/- 100 ft/min Bank angle remains within 5 deg of level Aircraft remains clear of clouds Aircraft does not encounter moderate or higher turbulence
Short-Field Landing Establish 3 deg glide path on final approach. Trim airspeed to 63 KIAS and set flaps to 40 degree. Land on runway numbers and apply full brakes after nosewheel touches ground. Slow to complete stop on runway.	Aircraft established on 3 deg glide path on final approach Steady descent rate on final approach Airspeed remains within +/- 5 KIAS of 63 KIAS Aircraft touches down within 100 feet of runway numbers Aircraft comes to complete stop for 5 seconds on runway

UMKC CME	Flight Test Card	FLT No. 01	DATE 2020-04-02	PAGE No. 3
PROJECT No. Test 4: Aircraft Performance	MAKE AND MODEL Piper Warrior II PA-28	SER No. 001	REGISTRATION N6394C	

Checklist and Procedures	
Task	Procedures
Pre-Flight Check	<input type="checkbox"/> Verify doors and windows closed and latched <input type="checkbox"/> Verify all passengers are wearing seat belts <input type="checkbox"/> Verify intercom communication <input type="checkbox"/> Verify instrumentation recording <input type="checkbox"/> Brief location of air-sickness bags and return-to-base criteria <input type="checkbox"/> TD: Conduct Go/No-Go Poll:
TC1: Short Field Takeoff	<input type="checkbox"/> TD: Announce start of test card / Conduct Go/No-Go Poll / Announce test conditions <input type="checkbox"/> PLT: Taxi aircraft into position on runway and set flaps to 25 deg <input type="checkbox"/> PLT: Apply full brake, then full throttle. Release brake for maximum acceleration <input type="checkbox"/> FTE: Call out airspeed every 2 seconds <input type="checkbox"/> PLT: Rotate aircraft at 52 KIAS and maintain airspeed until above 50 ft AGL <input type="checkbox"/> PLT: Increase airspeed to 79 KIAS and slowly retract flaps. Climb to 1000 ft AGL <input type="checkbox"/> FTE: Call out airspeed and climb rate every 5 seconds <input type="checkbox"/> TD: Report test card complete when reaching 1000 ft AGL
TC2: Level Acceleration	<input type="checkbox"/> TD: Announce start of test card / Conduct Go/No-Go Poll / Announce test conditions <input type="checkbox"/> PLT: Report on conditions / ready to maneuver <input type="checkbox"/> PLT: Reduce throttle and maintain stall speed <input type="checkbox"/> FTE: Record flight data <input type="checkbox"/> PLT: Increase throttle to maximum, allow airspeed to stabilize <input type="checkbox"/> FTE: Record and report flight data <input type="checkbox"/> TD: Continue with subsequent test points by requesting throttle decrease in 10% increments
TC3: Steady Climbs	<input type="checkbox"/> TD: Announce start of test card / Conduct Go/No-Go Poll / Announce airspeed test point <input type="checkbox"/> PLT: Report on conditions / ready to maneuver <input type="checkbox"/> PLT: Apply full throttle and maintain steady climb at desired airspeed <input type="checkbox"/> PLT: Report maneuver complete after climbing through target altitude <input type="checkbox"/> FTE: Report airspeed tracking and climb rate <input type="checkbox"/> TD: Repeat maneuver at next airspeed test point
TC4: Steady Descents	<input type="checkbox"/> TD: Announce start of test card / Conduct Go/No-Go Poll / Announce airspeed test point <input type="checkbox"/> PLT: Report on conditions / ready to maneuver <input type="checkbox"/> PLT: Reduce throttle to idle and maintain steady descent at desired airspeed <input type="checkbox"/> PLT: Report maneuver complete after descending through target altitude <input type="checkbox"/> FTE: Report airspeed tracking and climb rate <input type="checkbox"/> TD: Repeat maneuver at next airspeed test point
TC5: Short Field Landing	<input type="checkbox"/> TD: Announce start of test card / Conduct Go/No-Go Poll / Announce test conditions <input type="checkbox"/> PLT: Establish aircraft on final approach and report on conditions <input type="checkbox"/> FTE: Report airspeed every 3 seconds <input type="checkbox"/> PLT: Touch down on runway numbers, then apply full brake and come to complete stop <input type="checkbox"/> TD: Repeat maneuver complete

UMKC CME		Flight Test Card		FLT No.	DATE	PAGE No.
PROJECT No.		MAKE AND MODEL		01	2020-04-02	4
Test 4: Aircraft Performance		Piper Warrior II PA-28		SER No.	REGISTRATION	
				001	N6394C	

1 – Short Field Takeoff						
Conditions: Flaps: 25 deg (second notch) Start: Full brake, full throttle Rotation and initial climb airspeed: 52 KIAS Obstacle clearance altitude: 50 ft Climb airspeed: 79 KIAS Target altitude: 1000 ft		Monitor: Airspeed Climb rate Altitude		Recovery: Pitch down Increase throttle Increase airspeed Reduce flap angle Recover to level flight		
Condition	Takeoff			Observations / Comments		
1.1 Ground Roll: Flaps: 25 deg (notch 2) Alt: Ground level Airspeed: 0 to 52 KIAS	Time: _____ AVX: _____ V _{initial} : _____ V _{rotation} : _____ Notes: _____	Runway Position: _____ Winds: _____ Anomalies: _____ Pilot Comments: _____			53 knots	
1.2 Obstacle Clearance: Flaps: 25 deg Alt: 0 to 50 ft AGL Airspeed: 52 KIAS	Time: _____ AVX: _____ V _{climb} : _____ Climb rate: _____ Notes: _____	Airspeed: _____ Climb Rate: _____ Anomalies: _____ Pilot Comments: _____				
1.3 Climb: Flaps 25 to 0 deg Alt: 50 to 1000 ft AGL Airspeed: 79 KIAS	Time: _____ AVX: _____ V _{initial} : _____ V _{climb} : _____ Climb rate: _____ Notes: _____	Airspeed: _____ Climb Rate: _____ Anomalies: _____ Pilot Comments: _____				

UMKC CME	Flight Test Card		FLT No.	DATE	PAGE No.
	PROJECT No.		01	2020-04-02	5
Test 4: Aircraft Performance	MAKE AND MODEL		SER No.	REGISTRATION	
	Piper Warrior II PA-28		001	N6394C	

2 – Level Acceleration							
Conditions: Flaps: 0 deg Start at cruise airspeed Throttle: 0%, then slow to stall speed Throttle: 100%, then accelerate to max speed Throttle: Decrease in 10% increments Airspeed: Stabilize at each test point			Monitor: Airspeed Altitude RPM Manifold pressure Fuel quantity and flow rate			Recovery: Pitch down Increase throttle Increase airspeed Recover to level flight	
Time	Airspeed	Altitude	RPM	Manifold Pressure / Throttle	Fuel Quantity	Fuel Flow	Observations / Comments
2.1 10:43	86.49	3000	1700	0%	FJI		112
2.2 10:47	112	3000	2600	100%			
2.3 10:48	111	3000	2600	40%			
2.4 10:49	111	3000	2600	80%			
2.5 10:50	110	3000	2550	70%			
2.6 10:51	99	3000	2450	60%			
2.7 10:51	100	3000	2450	50%			
2.8 10:52	95	3000	2350	40%			
2.9 10:52	91	3000	2250	30%			
2.10 10:53	89	3000	2100	20%			
2.11 10:53	60	3000	1800	10%			
2.12 10:54	60	2800	2050	—			
2.13 10:56	55	3000	1950				
2.14							

Acceleration

UMKC CME		Flight Test Card		FLT No.	DATE	PAGE No.
PROJECT No.		MAKE AND MODEL		01	2020-04-02	7
Test 4: Aircraft Performance		Piper Warrior II PA-28		SER No.	REGISTRATION	
				001	N6394C	

4 – Glide Performance						
Conditions: Flaps: 0 deg Trim at desired airspeed Altitude: 4000 ft Throttle: idle, then descend through 2500 ft			Monitor: Airspeed Altitude Climb rate RPM Manifold pressure Fuel quantity and flow rate			Recovery: Pitch down Increase throttle Increase airspeed Recover to level flight
Time	Airspeed	Descent Rate @ 4000 ft	RPM	Manifold Pressure / Throttle	Descent Rate @ 2500 ft	Fuel Quantity
4.1 11:02.04	55		1250			
4.2 11:03	75		1200			
4.3 11:04.10	95		1150			
4.4						
4.5						
4.6						
4.7						
4.8						
4.9						
4.10						
4.11						
4.12						
4.13						
4.14						

UMKC CME		Flight Test Card		FLY No 01	DATE 2020-04-02	PAGE No 8
PROJECT No. Test 4: Aircraft Performance		MAKE AND MODEL Piper Warrior II PA-28		SER No 001	REGISTRATION N6394C	

5 - Short Field Landing

Conditions: Flaps: 40 deg Established on final approach 3-deg glide slope to runway Airspeed: 63 KIAS		Monitor: Airspeed Climb rate Altitude	Recovery: Pitch down Increase throttle Increase airspeed Reduce flap angle Recover to level flight
Condition	Takeoff		
5.1 Final Approach: Flaps: 40 deg Alt: 500 ft AGL Airspeed: 63 KIAS	Time: 11:39 AVX: _____ V _{approach} : _____ Descent rate: _____ Notes: _____	Observations / Comments Airspeed: _____ Winds: _____ Anomalies: _____ Pilot Comments: _____	
5.2 Touchdown: Flaps: 40 deg Alt: 0 ft AGL Airspeed: 63 KIAS Full brake	Time: 11:40 AVX: _____ V _{touchdown} : _____ Climb rate: _____ Notes: _____	Airspeed: _____ Touchdown point: _____ Anomalies: _____ Pilot Comments: _____	
5.3 Roll Out: Flaps 40 deg Alt: ground level Airspeed: 0 KIAS	Time: 11:40 AVX: _____ V _{initial} : _____ V _{rotation} : _____ Climb rate: _____ Notes: _____	Landing Distance: _____ Runway Condition: _____ Anomalies: _____ Pilot Comments: _____	

