

D. TASK**PERFORMANCE AND LIMITATIONS****OBJECTIVE****KEY ELEMENTS**

To determine that the applicant exhibits commercial pilot knowledge of the elements of performance and limitations, appropriate to the balloon used for the practical test, by explaining:

- Use of performance charts, tables, and other data in determining performance in various phases of flight.
- Computation of operating weight, maximum load, fuel quantity and endurance.
- Determination of normal and maximum rates of ascent and descent, and the altitude required to arrest a high rate of descent.
- Determination of envelope temperatures, including never-exceed temperature and maximum continuous temperature.
- Effects of atmospheric conditions on performance.
- Factors to be considered in determining that the required performance is within the balloon's capabilities and limitations.

SCHEDULE

- Discuss objectives
- Review material
- Conclusion

EQUIPMENT

- FAR/AIM
- Balloon Flight Manual
- Sources
- References
 - AC 61-84

INSTRUCTOR ACTIONS

- Discuss lesson objectives
- Present lecture
- Questions
- Homework

STUDENT ACTIONS

- Participate in discussion
- Take notes

COMPLETION STANDARDS

- Participate in discussion
- Take notes

D. TASK

PERFORMANCE AND LIMITATIONS

**PERFORMANCE
CHARTS**

**REFER TO HOMEWORK ASSIGNMENT
AND BALLOON FLIGHT MANUAL**

**WEIGHT AND
BALANCE**

MAX LOAD

FUEL QUANTITY

**ENVELOPE
TEMPERATURES**

**ASCENT &
DESCENT RATES**

D. TASK

PERFORMANCE AND LIMITATIONS

**EFFECTS OF
ATMOSPHERIC
CONDITIONS ON
PERFORMANCE**

AIR DENSITY REVIEW

HOT AIR TEMPS

- Decreased performance
- Take more heat to create lift

Envelope

- More heat required to create lift
- Monitor max envelope temp.
- .
- .

Fuel pressure

- Higher fuel pressure will give better burn
- Possible over pressure can occur
- .
- .

Burner

- Will have more powerful burn
- Will use more fuel than normal
- .
- .

COLD AIR TEMPS

- Increased performance
- Won't need a ton of heat to create lift

Envelope

- Less heat required
- Extended flight times without temping out
- .
- .

Fuel pressure

- Colder temps will create lower pressure
- Consider warming fuel tanks for better performance
- .
- .

Burner

- Smaller flame produced unless bottles are heated
- .
- .

Whats the temperature going to be during flight?
 What's your weight and balance look like?
 What's your planned time en-route?
 How much fuel will it take to complete the mission with these two factors?

**FACTORS TO
CONSIDER PRIOR
TO FLIGHT**

D. TASK**PERFORMANCE AND LIMITATIONS****HOMEWORK
ASSIGNMENT****Balloon Flight Manual Homework Assignment**

Instructions: Use your balloon flight manual (and flight manual supplement to answer each question). If you can't find the answer in the manual, answer it as best you can.

Feel free to type or handwrite the answer.

- 1) Maximum Gross Weight of your balloon
- 2) What is the total volume (in Thousands of Cubic Feet of Your Balloons)
- 3) Maximum Continuous Envelope Temperature
- 4) Never Exceed Envelope Temperature
- 5) Except for Landing, How long can the Parachute Valve be Held Open
- 6) Can your balloon for flown at Night
- 7) Maximum Rate of Climb
- 8) Maximum Rate of Descent
- 9) How many Supplemental Sources of Ignition are required to be on board
- 10) Minimum Required Fuel Pressure to fly
- 11) What altitude do you set your Altimeter to before flight
- 12) What corner should be facing up when inflating
- 13) At what percentage does liquid propane come out the bleeder valve
- 14) How many tanks can you legally have in your basket
- 15) What size tanks can you have in your basket
- 16) How much does propane weigh
- 17) What is the approximate weight of an empty propane tank
- 18) What is the approximate weight of a full propane tank
- 19) What is the fueled weight of your balloon system (you may not be able to answer this one because I am afraid your weight and balance data has not been updated for current configuration)
- 20) Per the Flight manual supplement, what tank do you hot inflate on
- 21) Are your fuel tanks manifolded together ? if so, describe to me what that means

WEIGHT & BALANCE

N _____ S/N: _____

PART	S/N	WEIGHT
Carriage		
Burner		
Envelope		
Skirt		
	TOTAL	

FUEL TANKS	S/N	EMPTY WEIGHT	FULL FUEL 10 GAL TANKS X 4.24 PPG
Tank 1			
Tank 2			
Tank 3			
Tank 4			
	TOTAL		

TOTAL EMPTY WEIGHT	
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TOTAL WEIGHT + FUEL	
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EQUIPMENT	WEIGHT
Accessories Radios/strikers/ manuals/drop line/	9.5
4 Fuel Lines	18
Uprights	25
TOTAL EQUIPMENT	52.5

MAX GROSS:
USEFUL LOAD:

SOULS	WEIGHT
Pilot	
Pax 1	
Pax 2	
TOTAL SOULS	

(_____ +SOULS)

TOTAL WEIGHT FOR FLIGHT	
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