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Atlanta, Georgia 30341
U.S.A.

Balloon Flight Manual
For
Adams Balloon
Model A-B

Reg. No. _____

Serial No. _____

This flight manual is required by
Federal Aviation Regulations, to be
carried on board the balloon during all
free flight operations.

F.A.A. Approved:

John R. James

Manager

Atlanta Aircraft Certification Office
Central Region, F.A.A.

Date AUG. 8, 1983

ADAMS BALLOON FLIGHT MANUAL
Model A-B

Log of Revisions

Revision No. Pages Affected Description F.A.A. Approved

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I. OPERATING LIMITATIONS:

This balloon must be operated in accordance with the following limitations:

- A. Daytime VFR conditions only.
- B. Maximum gross weight shall not exceed 2000 pounds, including the weight of the envelope. Volume 125,000 cu. ft.
- C. Maximum envelope temperature - 250 F. degrees - (see figure #1 for estimating temperature limited gross weight).
- D. Maximum allowable rate of climb -800 feet per minute.
- E. Venting of hot air shall not be initiated while in descents of more than 600 feet per minute.
- F. POP-TOP Models (if installed) Crown Safety Line must be around balloon envelope opposite the maneuvering vents and secured to the basket (no slack) while in flight.
- G. POP-TOP Models (if installed) The deflation mechanism (red control line) shall not be activated when the gondola is more than five feet above the landing surface.
- H. PARA-VENT TOP (if installed) Except for landing, the Para-vent top shall not be opened in excess of 3 seconds. The envelope must be allowed to fully reinflate between actuations of the Para-vent.
- I. Fuel - Propane - 4, 5 or 6 FAA Approved 10 gallon fuel cylinders.
- J. Fuel cylinder connections will not be changed while in flight.
- K. Two or more flint strikers, in good operating condition, must be on board during each flight.
- L. Logbook must contain all inflated time - free flight and tether.

II. NORMAL PROCEDURES

A. Pre-inflation

1. Basket Assembly

- a. Fit the strut tubes over the short legs on the burner ring.
- b. Strut tubes are simultaneously inserted into the sockets at the gondola corners.
- c. Fuel lines must come straight down the strut tubes and not wrap around.
- d. Upper load cables must come straight down the strut tubes and not wrap around.

CAUTION:

FUEL LINES MUST BE SITUATED SUCH THAT THEY WILL NOT BE SUBJECT TO PINCHING OR CHAFING BY THE LOAD CABLES.

- e. Joining of upper and lower load cables must be done with the upper load cable between the two lower load cables. Insert bolt (AN 4-12) through the cable end fittings with 1/4" x 3/4" washers under the bolt head and under the nut. Install fiber lock nut.
- f. The nut should be tightened so that the cables are snug, not jammed (4 to 6 threads showing past the nut).

CAUTION:

IF THE FIBER LOCK NUT BECOMES LOOSE ENOUGH TO BE TURNED WITH FINGERS, IT SHOULD BE REPLACED.

- g. When fully assembled, the length of the load cables should be such that the total vertical movement of the strut tubes is less than one inch. If there is more than one inch of movement, maintenance is required.
- h. Check all burner gimbal bolts. Each nut must have safety wire securing the nut. Gimbal action of the burner must be free, with only slight drag created by the gimbal bolts. Allow enough slack in the fuel lines to allow full gimbal action.

2. Fuel System

- a. All fuel fittings must be free of all foreign matter prior to attachment.
- b. Check installation of fuel cylinders. Fuel tanks must be installed in such a manner that there is no tension on the fuel lines and tank couplings will not provide an obstacle to the occupants. Check that the two leather tank straps securing each tank are tight.
- c. Check each fitting for possible fuel leakage by sound and smell. If there is any doubt, use a solution of soapy water and watch for bubbles.
- d. Check quantity of fuel in each tank. Fuel quantity may be determined by three methods:
 - (1) 10 percent bleeder valve - if the tank is full it will blow a white mist.
 - (2) Guage - will read the percent of fuel remaining when the level is 32 percent or below.
 - (3) Weight - quantities between 32 percent and full can only be determined by weighing the fuel tank. When full a fuel tank will weigh approximately 71 pounds and contain approximately 10 gallons of usable liquid. Propane weighs approximately 4.2 pounds per gallon.
- e. Verify flow from each fuel tank and blast valve operation by opening the blast valve and then opening each tank valve, one at a time, for two seconds.

CAUTION:

THE FIRST SIGN OF "O" RING DETERIORATION IN THE BLAST VALVE WILL BE STIFF OPENING AND CLOSING (WILL NOT SNAP TO THE OFF POSITION) DUE TO LACK OF LUBRICANT. LUBRICATION SHOULD BE DONE IN ACCORDANCE WITH AIRWORTHINESS DIRECTIVE NO. 75-12-08.

- f. The balloon is equipped to operate with FAA approved 10 gallon fuel cylinders. Normal operation of the main burner consumes the fuel in it's liquid state by means of a withdrawal tube which feeds off the bottom of the tank. When the fuel supply is reduced to approximately 7 percent as indicated on the guage, a loss of fuel pressure may be noted and the balloon will become less responsive. This is because the withdrawal tube does not extend all the way to the bottom of the fuel tank. The remaining fuel is unusable as a liquid, but can be consumed in the vapor form.

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Section II
Normal Procedures
(Cont.)

CAUTION:

BURNER OUTPUT AND PERFORMANCE ARE GREATLY AFFECTED BY FUEL TEMPERATURE/PRESSURE AND SHOULD BE DETERMINED PRIOR TO FLIGHT. MANUFACTURER RECOMMENDS A MINIMUM OF 70 psi FOR SAFE OPERATION.

3. Check attachment of instrument package. Set altimeter to field elevation and rate of climb to "0". Install envelope thermometer in crown - six inches down.
4. Check flint igniters. There must be at least two on board. Test each.
5. POP-TOP Models (if installed) Check deflation mechanism rigging and safety thread.
 - a. Yellow deflation mechanism should be set with small loop inserted through the large loop so that the small loop points toward center.
 - b. The pin should be inserted in the small loop so that the line of pull is down toward the gondola along the vertical axis of the envelope.
 - c. Safety tie with 4 lb. thread through the two small holes in the deflation pin and around the yellow deflation mechanism so that the pin cannot move more than one inch with out breaking the thread.
6. Brief passengers and crew.

B. Inflation:

1. Lay gondola on side.
2. Lay out envelope down wind.
3. Connect suspension cables.
4. Check the general integrity of the envelope, suspension cables and attachments.
5. Check that the control lines are through guide grommets. Use velcro straps on strut leathers to secure control lines such that they can pull free.
6. Inflate balloon.

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Section II
Normal Procedures
(Cont.)

C. Pre-Lift Off:

1. Check for any fouled control lines or suspension cables.
2. Check that the envelope temperature is reasonable for the load carried.
3. PARA-VENT TOP (if installed)
Check to be sure that the Para-vent Control Line is in the gondola and not fouled. Allow enough slack for 10 percent elongation (8 ft. minimum). TEST PULL IT!
4. POP-TOP Models (if installed) place the crown safety line along gore seam around balloon envelope oppsite the maneuvering vents and secure to the basket - no slack. (Manufacturer reccommends securing the crown safety line by first passing the end of the line from the inside of the basket out through the upper window of the weaving. The line is then tied to itself at the padded rail level with a half hitch and a half bow knot.)
5. POP-TOP Models (if installed) Check that the ends of the red deflation line and white maneuvering vent line are within the basket and within reach of the pilot. Allow enough slack in the lines for 10 % elongation (8 ft. mimimum).

D. Flight

1. In the event of a pilot light flameout, the pilot light should be relighted immediately.
2. Recommended fuel usage. Use fuel from one tank at a time and alternate throttles, so as to maintain a balanced fuel supply for each side of the system. Manufacturer recommends that the pilot light tank not be consumed to less than 20%.

E. Landing

1. Main burner should be off at touchdown to avoid possible envelope damage.
2. Landings at low ground speeds may be achieved by venting to stabilize the balloon on the ground without deflating.
3. Manufacturer recommends touch and go landings not be made when the operational tank has less than 25% fuel.
4. PARA-VENT TOP (if installed) The Para-vent top may be fully opened, at the pilots discretion, during the landing maneuver. For deflation, open and maintain tension on the control line until the envelope is deflated.
5. POP-TOP Models (if installed) activation of the deflation system is best accomplished by releasing the crown safety line, taking up all the slack in the red deflation line, pulling it taut and giving it a brisk yank.

CAUTION:

IF THE CROWN SAFETY LINE IS NOT RELEASED, THE POP-TOP WILL ONLY OPEN SLIGHTLY WHEN THE DEFLATION SYSTEM IS ACTIVATED.

6. Immediately upon landing extinguish the pilot light at the burner, shut off all fuel tank valves and bleed all fuel from all lines.
7. Always store balloon with all fuel valves in the closed position.

III. EMERGENCY PROCEDURES

A. EXCESS ENVELOPE TEMPERATURE - Maximum operating temperature is 250 degrees F. Operation in accordance with the Sample Loading Chart Fig. #1 should preclude operation above this level. If 250 degrees F. is exceeded, descend to a minimum practicable altitude and continue flight with a minimum of vertical maneuvering. If the temperature is not reduced by this action, land as soon as practicable.

CAUTION:

IF THE ENVELOPE TEMPERATURE SHOULD EXCEED 300 DEGREES F. OR 250 DEGREES F. FOR MORE THAN 10 MINUTES TOTAL TIME, THE ENVELOPE SHOULD BE INSPECTED IN ACCORDANCE WITH THE PROCEDURES FOR A 100 HR/ANNUAL INSPECTION.

B. RELIGHTING THE PILOT LIGHT - first be sure that the fuel is turned on at the tank and at the burner manifold, then using a flint striker or matches reach up and into the side opening of the burner make a spark about 3 inches above one of the blast orifices immediately after actuating the blast valve trigger to allow a very small amount of fuel to escape. As soon as ignition is achieved, actuate the main blast valve and it will light the four pilot lights. This relighting technique should be practiced on the ground, prior to take off.

C. PILOT LIGHT FAILURE - if for any reason the pilot light system becomes inoperative during a flight, the main burner system can be ignited without the pilot light and kept burning by slightly opening the main blast valve and using a flint striker or matches for relighting as described in III-B. After relighting, the main burner can be:

1. Throttled in short bursts to keep the fire going.
2. Throttled from the main tank valve while holding the blast valve open.
3. Throttled by holding the blast valve open slightly.

CAUTION:

IF THE PILOT LIGHT FAILS - LAND AS SOON AS PRACTICABLE!

D. MAIN BURNER FAILURE - if for any reason, either side of a burner becomes inoperative or malfunctions normal flight may be continued by shutting down the failed portion of the system. A landing should be made, and the flight terminated as soon as practicable.

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Section III
Emergency Procedures
(Cont.)

E. FUEL LEAKS - if for any reason a fuel leak occurs in flight, the failed portion of the system should be shut down and a landing should be made as soon as practicable.

F. LOSS OF CROWN SAFETY LINE on POP-TOP Models (if installed) - if for any reason during a flight the crown safety line is cast off out of reach, a landing should be made as soon as practicable.

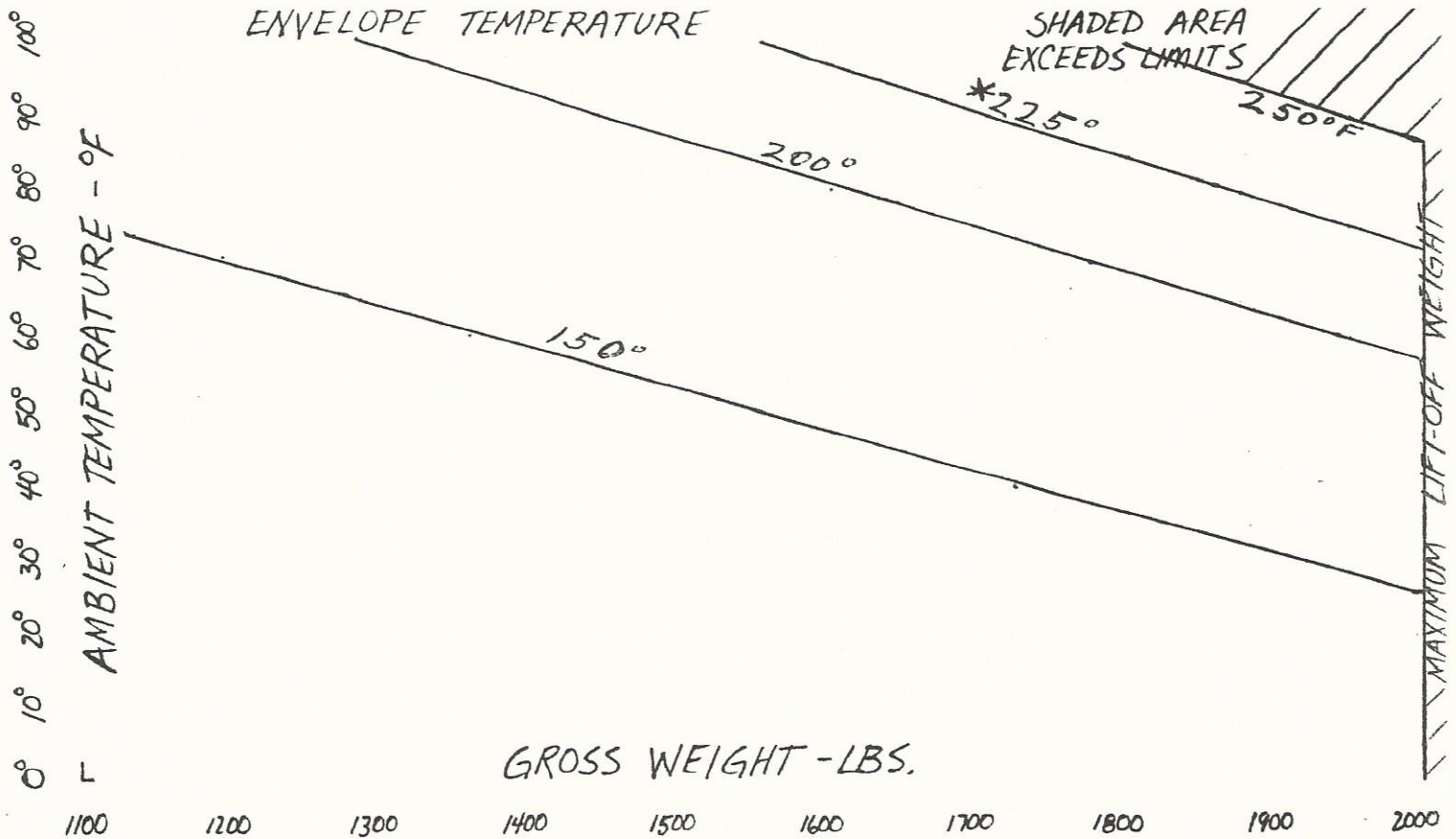
G. Premature ACTIVATION OF THE DEFLATION SYSTEM on POP-TOP Models (if installed) - if for any reason the deflation mechanism is prematurely activated the crown safety line will hold the deflation port closed enough to permit a controlled landing. The balloon should be landed as soon as practicable.

IV. PERFORMANCE

- A. Operating weights - see figure #1 to estimate the envelope temperature necessary for ambient conditions at the take off gross weight.
- B. Burner off descent rate - see figure #2 for maximum rate of descent vs. gross weight with the burner off or inoperative. Maximum rate of descent will develop after an altitude loss of approximately 700 feet.
- C. Altitude loss during recovery - recovery to level flight from a descent at maximum descent velocity using one burner continuously at 65 psi of fuel pressure may incur as much as 2000 feet of altitude loss. The time to recover to level flight may exceed two minutes.
- D. Surface winds - the maximum demonstrated surface winds during certification tests were 7 knots.

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SAMPLE LOADING GUIDE
standard day-sea level



Slightly less lift will be generated at higher field elevations—approximately 40 lbs. per one thousand feet above sea level.

*Manufacturers recommended maximum natural buoyancy temperature.

FIGURE #1

ADAMS BALLOON FLIGHT MANUAL
Model A-B

MAXIMUM DESCENT RATES
standard day-sea level

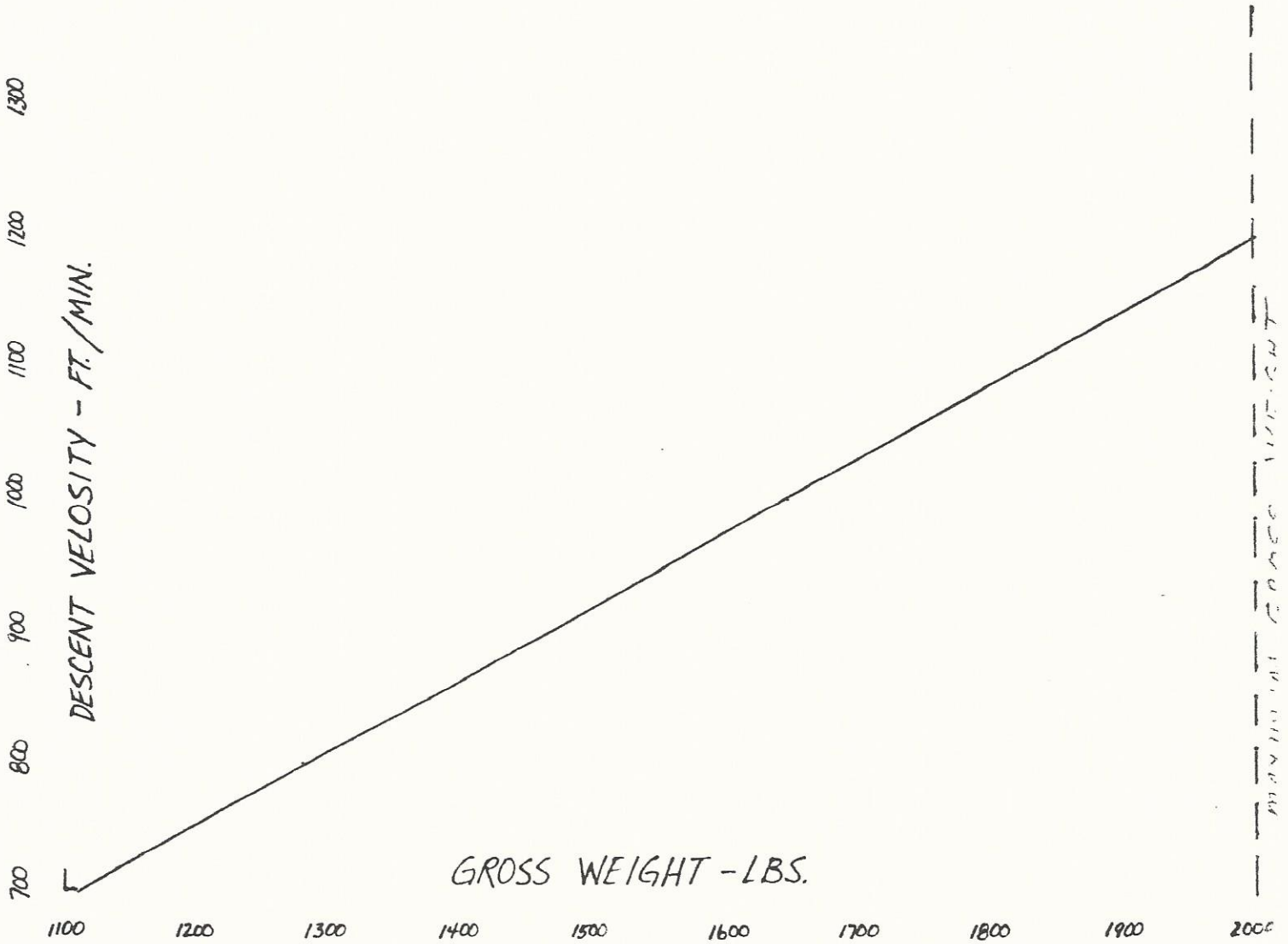
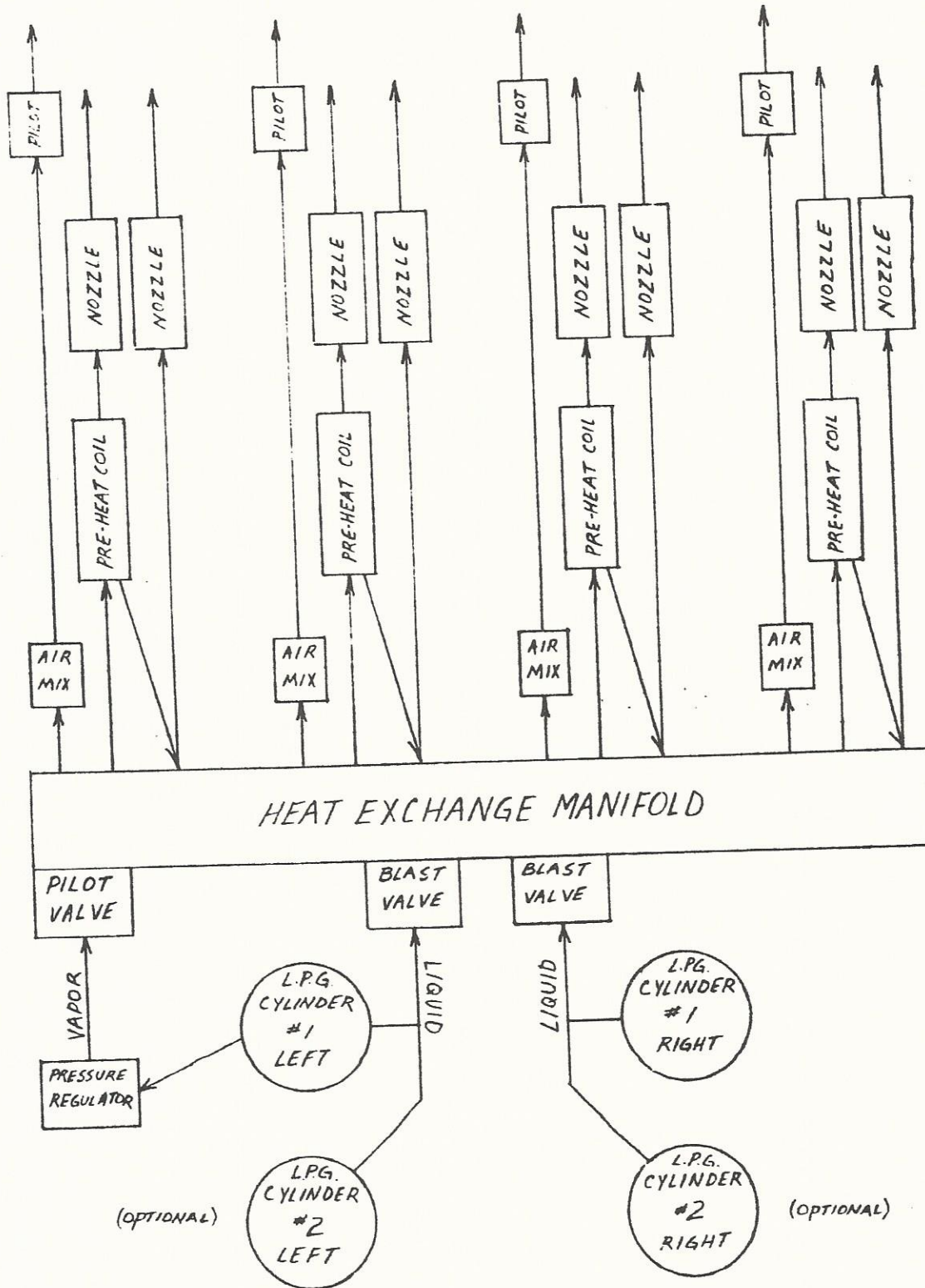


FIGURE #2

ADAMS BALLOON FLIGHT MANUAL
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FUEL SCHEMATIC



Model A-B Gondola (if installed) uses two complete heater systems with a maximum of three fuel cylinders per system.

FIGURE #3

ADAMS BALLOON FLIGHT MANUAL

SAMPLE LOADING GUIDE

Adams Balloon

Model A-E

Reg. No. _____

Serial No. _____

CAUTION:

IT IS THE RESPONSIBILITY OF THE PILOT TO INSURE THAT THE BALLOON IS LOADED PROPERLY. THE EMPTY WEIGHT FOR THIS BALLOON AS DELIVERED FROM THE FACTORY IS NOTED BELOW:

LOADING INFORMATION

Actual weights

weight

Basket (including instruments)
Serial No. _____

Envelope
Serial No. _____

Fuel Tanks- FAA approved 10 gallon

Empty fuel tank 28 lbs.
Full fuel tank 71 lbs.

SAMPLE LOADING

EXAMPLE ONLY - APPROXIMATE WEIGHTS

Basket	215 lbs.
Envelope	260 lbs.
Optional Equipment (Empty weight not including fuel tanks)	<u>475</u>
Assume 4 full fuel tanks	284 lbs.
Pilot	170 lbs.
Passengers	<u>1000 lbs.</u>
Lift off gross weight	1454

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(MAXIMUM ALLOWABLE GROSS WEIGHT 2000 POUNDS.).