

# Balloon Crew Training



# What is a balloon crew?

- ▶ Not just balloon chasers
- ▶ Integral part of flight safety
- ▶ You are the pilot's eyes, ears, nose and voice
- ▶ You are part of a team

**“Chase crews” often follow the balloon into trouble, proactive flight crews minimize risks**



# Balloon Crew Hierarchy

## ▶ Pilot

- Legally is responsible for all aspects of the flight and balloon operations

## ▶ Crew Chief

- Experienced crew person who helps direct crew and helps with performing critical tasks

## ▶ Crew

- The ones who make everything come together for a successful flight
- 

# Crewing Commandments

## ▶ **Protect yourself**

- Ballooning can be dangerous. Be safe to protect yourself from injury. Balloons and items are replaceable, you are not.

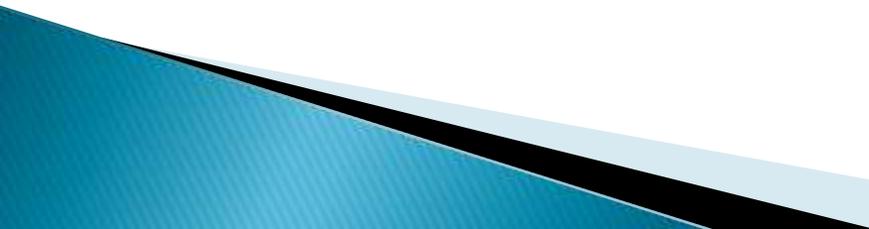
## ▶ **Follow directions**

- Do what the pilot or crew chief asks of you and do it NOW. If you are told to do something it is for a good reason. Delaying can make small problems into large ones.

## ▶ **Know when and how to stop**

- Know how to stop the fan, pull the vent line and signal to halt inflation.
  - Don't be afraid to halt an inflation for any reason related to safety.
- 

# Crewing Commandments

- ▶ **Make every decision count**
    - Every incident begins as a small decision or indecision.
    - Your input is vital to the safe operation of the balloon. If you see something of concern, say something
  - ▶ **Don't React to events, direct them**
    - Take control of yourself, your situation and your tasks.
    - Don't Wait for events to happen, decide how you want them to happen and make them happen
  - ▶ **Plan for the unexpected, then expect it**
    - Prepare yourself for emergencies. Develop proactive strategies, rehearse them and be ready to implement them at any moment
- 

# Crewing Commandments

- ▶ **Establish flight routines at home**
  - Run through practice scenarios in your free time before you need them while under the stress of the situation. Learn equipment in a low pressure setting
- ▶ **Review your performance**
  - Make it a ritual, no exceptions
  - Review what you did well and what you can improve on for the next flight
- ▶ **You are in command**
  - Your decisions and skills largely determine flight safety.
  - Take charge and play an active role in every aspect of the flight

# IMPORTANT!

If you are told to do something, there is a good reason.

**DO IT AND DO IT NOW!**

Waiting or second guessing can cause people to get hurt and things to get damaged

- ▶ **Waterford, WI July 2015**
  
  - ▶ **Clear skies and calm winds during tether**
  - ▶ **Storm 60 miles west near Madison**
    - Gust front proceeded storm
    - Pilot started deflation and unloading passengers
    - Pilot and 1 passenger remained aboard
    - Never got a drop of rain, sky clear 20min after this video
  
  - ▶ **Pilot told crew to shut down ride line and move people out of way. They did so immediately and without question, likely saving many lives as a truck was dragged through the area where the people were in line for a balloon ride**
  
  - ▶ **Nothing more than minor injuries**
- 



# FAQ'S – Flying

- ▶ **When do we fly?**
  - Early mornings and evenings when winds are calmest and there is little or no thermal activity
- ▶ **How windy is too windy?**
  - We prefer to fly with wind speeds under 8mph. Ideal winds are around 3–6mph. Too little winds can cause issues as well
- ▶ **How high do we fly?**
  - Ballooning is normally a low altitude sport, like tree top level low. We will fly upwards of a couple thousand feet above ground though as well

# FAQ'S – Flying

- ▶ **How fast do we fly?**
  - We fly as fast as the wind is blowing. Normally around 5–8mph
- ▶ **How far do we fly?**
  - It is dependent on wind speed. Faster winds means more distance travelled. Typical flights are between 5 and 8 miles
- ▶ **How do you steer?**
  - You can not steer like a airplane or car. The pilot uses different winds at different altitudes to go a direction he or she wants.

# FAQ'S – Flying

## ▶ Is it cold up there?

- We don't fly high enough to feel the effect of altitude temperature loss. It will be about the same temp as on the ground.

## ▶ How long is a flight?

- Flights normally last between 30min and an hour and a half. We plan for 45–60min of flight time. The entire ordeal takes around 2 ½ to 3 hours

## ▶ How hot is “Hot Air” ?

- To make a balloon buoyant air typically needs to be heated to around 100–120° warmer than the ambient air temp
- Our burner outputs around 9 million BTUs to heat the air

# FAQ'S – Equipment

- ▶ **What are balloons made out of?**
  - Our basket is made of Rattan wicker and wood. The envelope is made of polyester fabric
- ▶ **What do we use for fuel?**
  - Propane, same as is used for your grill or camper. We carry three 10 gallon fuel tanks.
- ▶ **How big is it?**
  - Our current balloon stands 65ft tall and is 57ft in diameter
  - Volume of 77,000 cubic feet
  - Can carry 2 or 3 people in addition to the pilot
- ▶ **How much does it weigh?**
  - The basket, burner, fuel tanks and envelope weighs 550lbs
    - Basket=350lbs (full fuel), Envelope=200lbs
    - Inflated mass is around 8000 pounds

# FAQ'S – Safety

## ▶ **Is ballooning safe?**

- It is statistically very safe. However, it is considered an adventure activity and there is always some risk. Crew can help minimize risks to help with incident free flying

## ▶ **Do they ever crash?**

- While there are balloon crashes they are rare and good crewing can help minimize the risk of crashes. Hard landings can and do happen usually without injury or damage.
- People are not used to seeing balloons land and will frequently call 911 saying a balloon crashed, when it actually just set down normally. Be prepared to explain the situation to law enforcement, fire personnel and media

# FAQ'S – Safety

- ▶ **Can they fly with a hole in them?**
  - Small holes will not cause the need for alarm. The balloon can fly with small holes (<3in) and even with a burned panel or two. Holes are less critical at the bottom of the envelope and more critical at the top half of the envelope
- ▶ **Can it catch fire?**
  - The fabric of the balloon may melt from the burner flame hitting it, however the fabric will not continue to burn. The biggest fire risk is a propane leak. This risk can be minimized with your help smelling and reporting possible propane leaks to the pilot. If you smell propane, say something!



# FAQ'S – Crewing

- ▶ **How many people crew at a time?**
  - We like to have 3 or 4 crew members for a flight
- ▶ **Is crewing difficult?**
  - It can be strenuous and physical at times but working as a team minimizes the difficulty on each person
- ▶ **What do I get out of crewing?**
  - Crewing is fun and exciting. You get to be a part of a small community of balloonists (roughly 5000 balloon pilots).
  - You also have the chance to get free rides at events, passenger cancellations and other opportunities!
  - People look at you like you are a superstar
- ▶ **How do we schedule crew**
  - We plan on using the Doodle app

# Appropriate Dress for Crew

- ▶ **Crew shirts**
- ▶ **Sensible footwear**
  - Many crew injuries are foot injuries
  - No open toe, high heels, flip flops, etc
  - Minimum of tennis shoes, hiking boots recommended for ankle support and mud!
- ▶ **Gloves**
  - Rope handling causes a lot of ballooning injuries
  - **MUST WEAR** when handling ropes, drop lines, or refueling
- ▶ **Clothing**
  - Natural fibers are better than synthetic
    - Natural fibers don't cause static discharge like synthetic
    - Synthetic materials melt to skin, natural fibers act as a barrier

# Appropriate Dress for Crew

- ▶ **Dress in layers**
  - Cold at morning launch, warm by landing
- ▶ **Pants and long sleeves recommended**
  - You may be recovering in brush
  - Helps prevent burns from burner and sun
- ▶ **Don't wear items or clothing with stuff that can get sucked into fan, tangled in ropes or can tear fabric**
- ▶ **You don't have to dress like you are going to a red carpet event, but also don't dress like a hobo. Jeans and a t-shirt/sweatshirt suffice.**

# Vehicle Operations

- ▶ **Follow the law.**
  - Unless it is a true emergency.
  - Getting pulled over can cause you to not be there to assist with a tough landing or obstacle avoidance
- ▶ **Drive Defensively**
  - Be aware of other drivers watching the balloon instead of the road.
- ▶ **Stick to assigned duties**
  - Driver drives, navigator watches balloon and navigates
  - No cell phone use, texting or radio use by driver. Leave that to navigator.
  - If driver needs to see the map, pull over in safe location

# Vehicle Operations

## ▶ Stopping

- Pull off only when safe to do so. Avoid pulling over on side of road on a curve, hill or other blind area
- Disrupt traffic as little as possible
- Use emergency flashers when pulled over on side of road

## ▶ Private Property

- DO NOT drive onto private property without the landowners permission

## ▶ Verify parking brake is off when leaving launch field

## ▶ Drive Safe

## ▶ You are in a marked vehicle, so drive safe and courteous

# Professionalism

- ▶ **You are an ambassador to ballooning**
  - Act professional during entire process
    - No swearing or derogatory comments/speech/gestures
    - Act like a pro
  - You are highly visible
    - Be polite and courteous
    - Answer questions to best of ability
    - Share your happiness/excitement
  - Hand out business cards and trading cards
    - Rule of thumb, business cards to adult spectators, trading cards to kids, landowners, sponsors and passengers

# Landowner Relations

- ▶ **Assess situation as you approach**
  - Landowner demeanor
  - Dogs
- ▶ **Act and speak professional**
- ▶ **Only one or two people to door**
- ▶ **Ask if it is their land**
  - Yes – ask permission to retrieve balloon
  - No– ask if they know who's it is
  - Yes but they lease it to farmer – get farmers info (leasee has the rights)
- ▶ **Sincere thank you if it's a yes or no**
- ▶ **Value their time – In and out**

# Landowner Relations

- ▶ **Protect their property – Especially animals**
  - ▶ **Ask for guidance – Paths, gates, etc**
  - ▶ **Follow their direction exactly – write them down if need be**
  - ▶ **Tread lightly – minimal people and vehicles needed for recovery**
  - ▶ **No cutting fences, taking apart gates, etc**
  - ▶ **Close all gates after passing through – livestock**
  - ▶ **Work quick – We value their time**
  - ▶ **Invite them to see balloon up close and talk to pilot**
- 

# Landowner Relations

- ▶ Ask if they would like to join in the post flight celebration as thanks for letting us land there
- ▶ Give them trading cards, balloon pics, etc
- ▶ Ask about future use
- ▶ Leave a great impression of us and ballooning overall



# Hostile Landowners

- ▶ We don't know their story. They may be having a bad day/week/month etc.
- ▶ They may have had issues with other trespassers in the past, maybe not even balloon related, but they still are not keen on people on their land.
- ▶ They may just hate the world
- ▶ No matter what the situation, we are trespassing on their land



# Hostile Landowners

- ▶ **Match their headcount**
- ▶ **Discreetly advise pilot of situation**
- ▶ **Offer sincere apology and thank you**
- ▶ **Let them talk/yell**
  - Listen without interrupting
  - Stay calm, don't feed their anger
  - Don't take abuse
- ▶ **Make no promises or admit liability**
  - Pilot will resolve issues
- ▶ **Personal threats/guns – Leave immediately, call 911 and notify pilot**

# Hostile Landowners

- ▶ **Get them saying yes quickly and often**
  - ▶ **If they threaten police, welcome the police presence**
  - ▶ **Don't show you are afraid of them**
  - ▶ **Advise them we will mark their property on the map as a red zone and notify local balloonists**
  - ▶ **If they threaten to damage or seize equipment advise them that the FAA and DHS do not look kindly upon that since 9/11 and it is a federal felony and is not worth mandatory prison and 10's of thousands in fines.**
- 

# Landowner Relations

We experienced some unfavorable winds that were different than forecast and due to **lack of acceptable landing sites further ahead** (and/or) **amount of fuel and or daylight remaining** the pilot determined that this was the safest and best place to land to minimize any injuries or damages. The FAA grants pilots the authority to make such decisions to prevent accidents and injuries to the people aboard the balloon as well as on the ground.

Thank you and sorry for any inconvenience



# Media Relations

## ▶ **FAKE NEWS!**

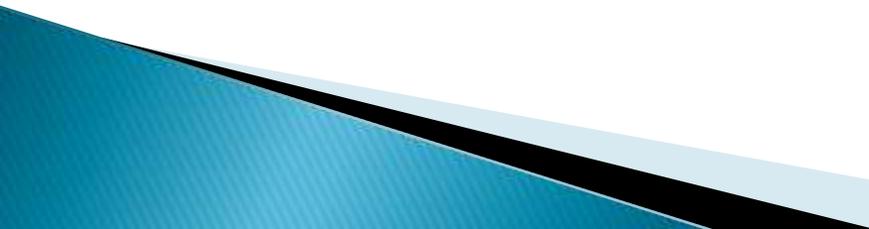
- When it comes to balloons the media often gets it all wrong. Often they will exaggerate the facts of the events.
  - Balloons are big, bright and make for good news stories, good or bad!
  - We must be ambassadors to ballooning when dealing with the media as they are in the business of selling a story and we need to portray ballooning as safe, fun and positive.
- 

# Media Relations

- ▶ What do you think of this reporting?



# Media Relations – Incidents

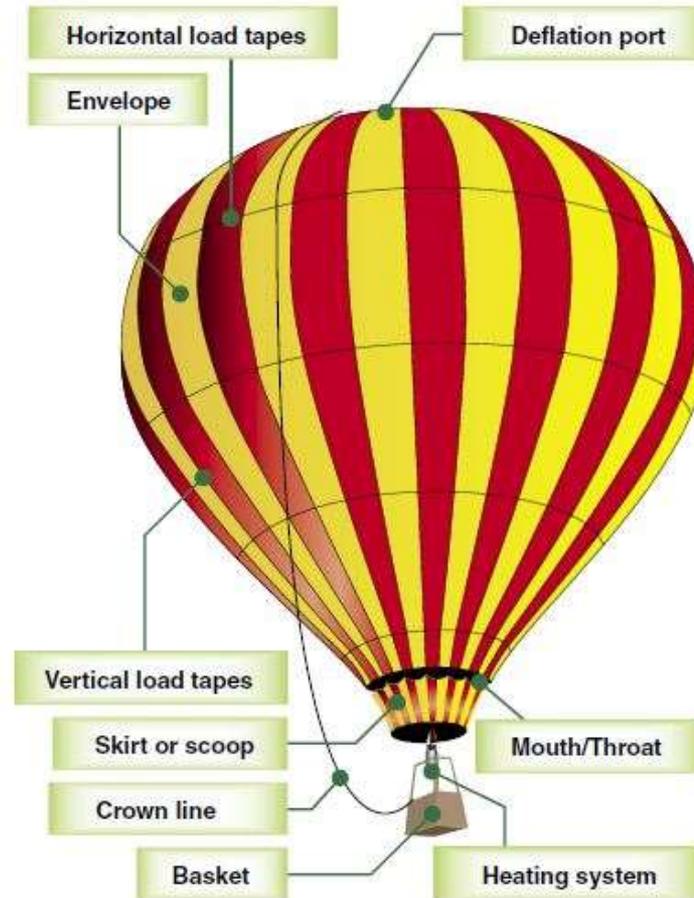
- ▶ Safety take precedence over media
  - ▶ You can't take back what you said
  - ▶ They look for sound bites – make every word count
  - ▶ Don't speculate on causes of incidents– only facts
  - ▶ Gather thoughts, take a deep breath and remain calm
  - ▶ Consider liability – never admit fault/wrong doing
  - ▶ Stick to facts and release as little info as possible
  - ▶ Never release names of passengers, pilot or crew
  - ▶ Minimize the incident and redirect the focus to how safe ballooning is
  - ▶ Don't let reporter sway you to keep talking – keep it short and sweet
- 

# Media Relations – Incidents

- ▶ **Do not dramatize the event – Just the facts**
- ▶ **Don't say no comment** – they will seek others without any knowledge of ballooning and will over dramatize incident
- ▶ (Identify self) Today around \_ (time), there was an incident involving a hot air balloon. The balloon was on a routine flight in the \_ area carrying the pilot and \_ passengers. During the flight, for unknown reasons, the balloon \_ (hit power lines, landed hard, etc). There were/were no injuries to those on board (or on the ground). Local emergency personnel responded and cared for the injured parties (if injuries) While rare, sometimes ballooning incidents do occur. With pilot training focused on handling these rare emergencies, hot air ballooning has an incredible safety record and is a safe, fun and enjoyable activity. That is all of the information we have available to release at this time. Thank you

Break?

# Balloon Components

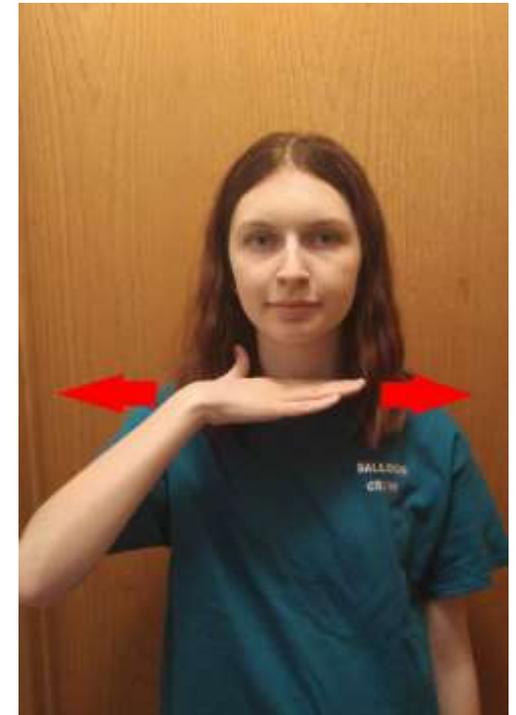


# Hand Signals

- ▶ **Due to the high noise levels produced by the fan and burner hand signals are used to relay messages.**
- ▶ **During inflation the following signals are used**
  - ALL STOP (All)
  - Ready Hot/Going Hot (All)
  - Full Throttle, Half Throttle and Stop Engine (Fan)

# Hand Signals – ALL STOP

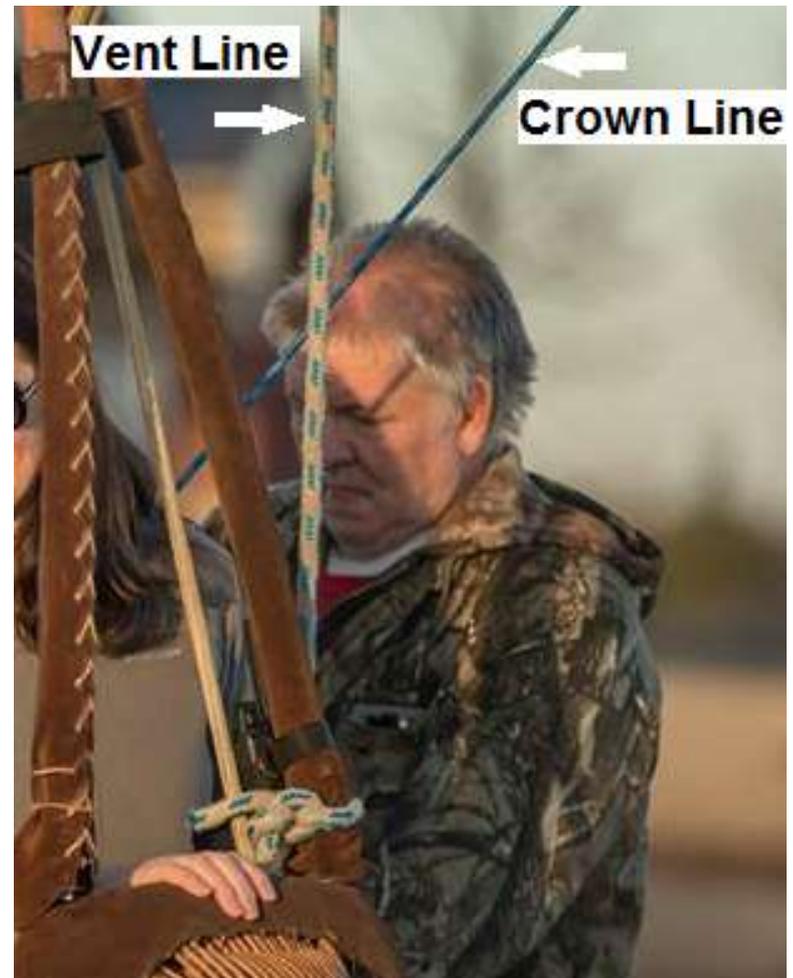
- ▶ Same as EMERGENCY STOP!
- ▶ Everything/one stops, balloon vent line is pulled to deflate envelope



If only one hand available

# Vent Line – Ripping Out

- ▶ You all need to be ready to rip out in case of an urgent situation
  - Vent line may also be referred to as the “red line” however ours is white and blue, so we call it the vent line
  - If there is a situation where you need to deflate you pull the vent line. Pull, pull, pull, keep pulling hard and hold it
  - The vent line is white with blue tracers, crown line is blue with silver tracers. The vent line is also a lot thicker than the crown line. Grab the correct one!



# Hand Signals – Ready/Going Hot

- ▶ Given by pilot to crew positions to verify they are ready for hot inflation
- ▶ All crew must return the signal before going hot



# Hand Signals – Fan

- ▶ **Throttle up**
  - Signals to run the fan at full throttle
- ▶ **Throttle down**
  - Signal means to reduce throttle
    - Around half throttle
- ▶ **Stop fan**
  - Turn off inflator fan



# Crew Positions – Fan

- ▶ Fan operator assists with fan control during inflation
  - ▶ Operates throttle and kill switches
  - ▶ Reduces throttle and kills motor when signaled
  - ▶ Responsible to keep others away from the fan area
  - ▶ Holds fan in position while running to prevent fan from walking or tipping
  - ▶ Watch for stop signals from crowline (and other) crew
  - ▶ Shuts down and moves fan out of way
- 

# Crew Positions – Mouth

- ▶ Mouth crew holds open the mouth or throat of the balloon to allow air flow in and prevent mouth from closing while burner is operating
  - ▶ May be asked to assist with floofing
  - ▶ When balloon is upright mouth crew will go weight-on on the basket sides
  - ▶ Watch for stop signal from crowline (and other) crew
  - ▶ Watch/look for twisted load and valve lines
- 



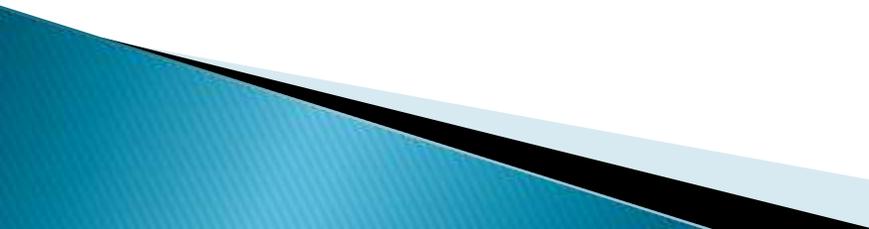
ART EICHMANN PHOTOGRAPHY

# Crew Positions – Crown line

- ▶ One of, if not the most critical crew position for a successful inflation
  - ▶ May assist with attaching vent to Velcro tabs
  - ▶ Stabilizes the envelope during inflation and stand up
  - ▶ Has best visibility of damage on bottom of envelope
  - ▶ Watches for twisted load ropes
  - ▶ Has best visibility of any overhead traffic
- 



# During All Flight Stages

- ▶ **Be observant**
    - See Something, Say Something
  - ▶ **Be safety conscious**
  - ▶ **Think ahead**
  - ▶ **Crowd control**
    - Keep others safe
  - ▶ **Professionalism**
    - Represent ballooning in a great way
  - ▶ **Customer service**
    - Be polite, courteous and helpful
  - ▶ **Ballooning ambassador**
    - We are high visibility, give ballooning good name
- 

# Pre-Flight (Prior to arriving at launch site)

- ▶ **Meeting time and place established** – May be launch site or other location. Don't be late
- ▶ **Proper dress** – Dress for forecasted weather
- ▶ **Gloves** – For balloon handling and warmth if needed
- ▶ **Weather** – Watch for wind indications on way to meeting site. Smoke, flags, tall grass, etc. Take notice of any changes that are unforecasted
- ▶ **Drive safe** – Get there in one piece
- ▶ **Be in the right mindset**
  - Focus on ballooning and safety, not your day at work, etc
- ▶ **Be physically ready**
  - Not sick, drunk, hung over, etc. Be ready to perform and do so safely

# Pre-Flight – Passengers

## ▶ Customer service/Professionalism

- First meeting with customers, their first experience with a balloon

## ▶ Passenger Briefing

### ◦ Inflation

- Stay back for your safety. Watch for lines and other hazards
- Will call/wave you over for boarding
- Pics of inflation are ok but don't get too close without pilot or crew chief permission and escort

### ◦ Boarding

- Take your time and be careful when boarding

### ◦ Flight

- Follow the pilots instructions, don't pull ropes, turn valves, squeeze handles, etc. without the pilots permission

### ◦ Landing

- Feet together, knees bent, hold on in two places, no phones, cameras or items in hands
- **STAY IN BASKET UNTIL TOLD BY PILOT TO EXIT**

# Pre-Flight (At launch site)

- ▶ **Crew Briefing**
  - Flight profile
  - Crew chief assigned
  - Duty assignments
  - Special instructions
  - Q&A
- ▶ **Site inspection**
  - 360° visual inspection for hazards/obstacles
  - Walk inflation area looking for sharps, hazards, biological matter, etc.
  - Inform pilot findings/all clear

# Pre-Flight (At launch site)

## ▶ **Equipment**

- Off load equipment
  - Basket
  - Envelope
  - Fan
  - Tie-off system, radios, water and any other needed items

## ▶ **PiBal – Pilot balloon**

- Fill from helium tank in trailer
- Loudly announce “Pibal”
- Release Pibal, watching wind direction
- If pilot/crew chief wants a Pibal series:
  - Fill first with pure helium
  - Second is helium plus one breath
  - Third is helium plus two breaths

## ▶ **Radio check**

# Basket setup

- ▶ **Drag/carry basket into place**
  - Set basket upright
  - Corner 1 facing upwind (away from envelope)
  - Corner #1 is the corner with tank #1 and the plaque



# Basket setup

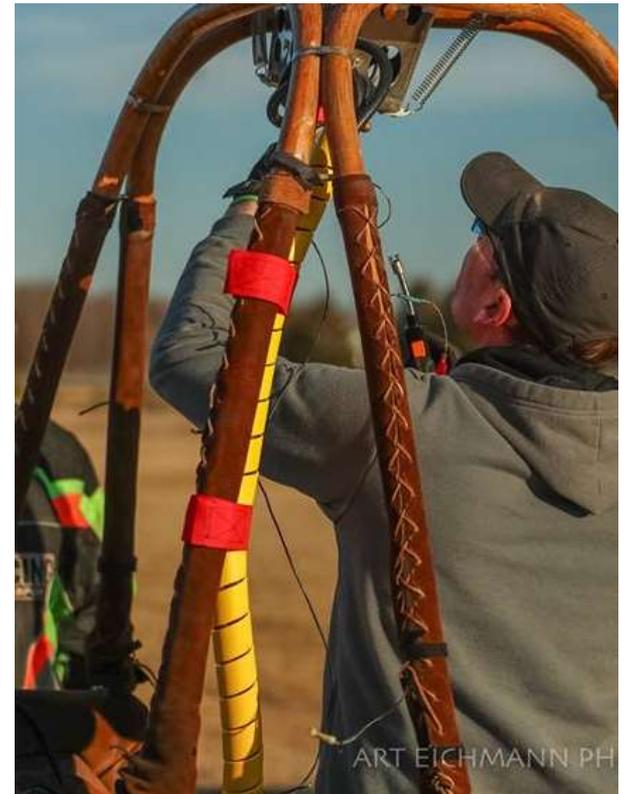
- ▶ **Attach uprights**

- Hose tie-offs on corner #1 (Hose tie-offs are the red straps)



# Basket setup

- ▶ Attach burner and secure fuel lines



# Basket setup

- ▶ After pilot completes pre-flight inspection tip basket onto side
  - Tip basket downwind, corner #1 facing up
  - Stay clear/watch toes and fingers



# Fan Placement

- ▶ **Place fan on left side of basket**
  - Angled toward where throat of envelope will be
  - Place roughly a foot or two from side of basket, even with top rail of basket

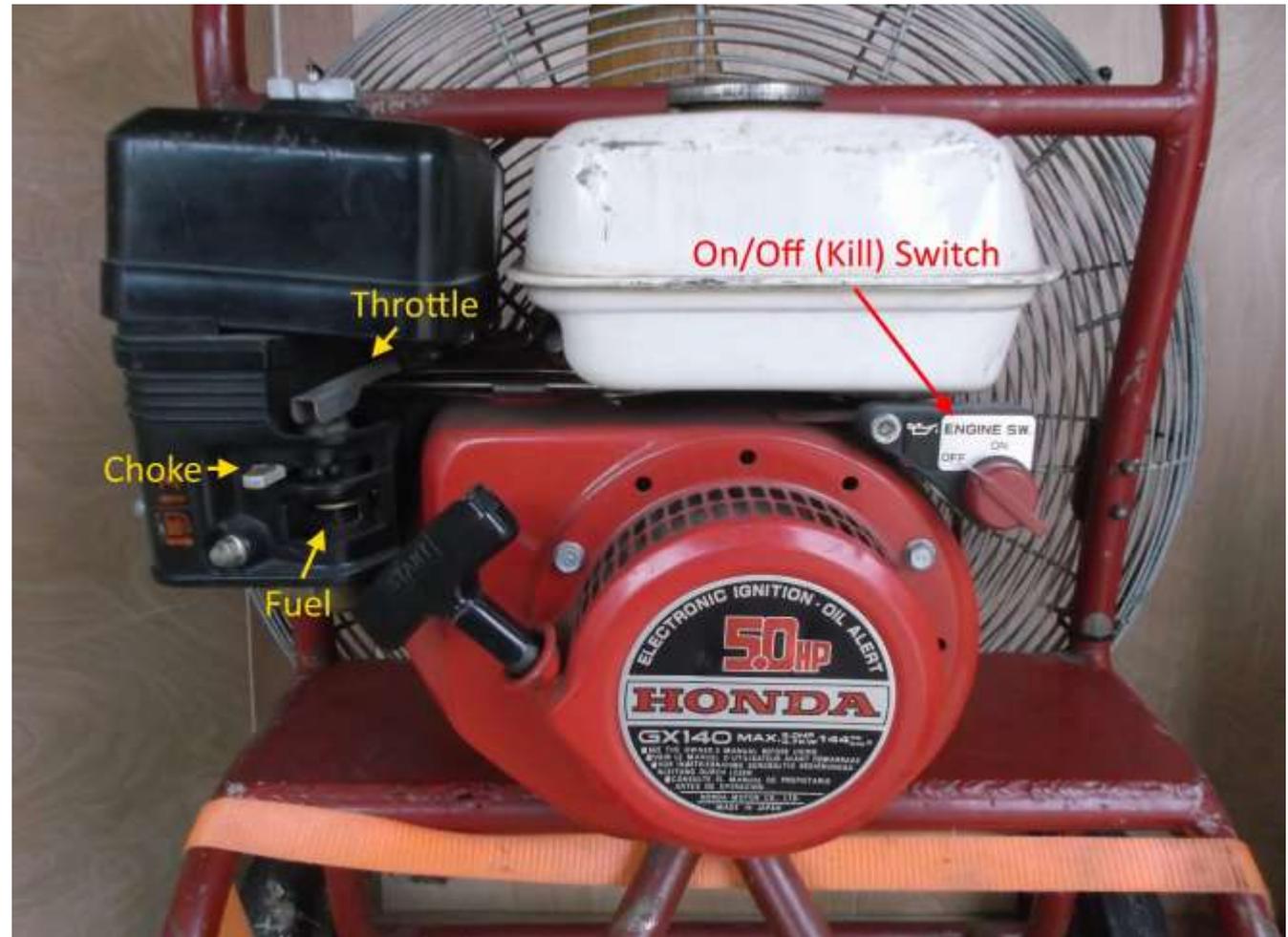


# Inflation Fan Care & Feeding

- ▶ THE MOST DANGEROUS PIECE OF EQUIPMENT
  - ▶ NO LONG HAIR, LOOSE CLOTHING, LOOSE STRINGS, ETC AROUND FAN WHEN ON
  - ▶ DO NOT MOVE FAN WHILE IT IS RUNNING
  - ▶ STAY OUT OF ROTATION PLANE OF PROP. IF BLADE BREAKS YOU DO NOT WANT TO BE IN ITS PATH!!!
- 

# Inflation Fan Care & Feeding

- ▶ Controls



# Inflation Fan Care & Feeding

- ▶ Fan Starting and Shutdown

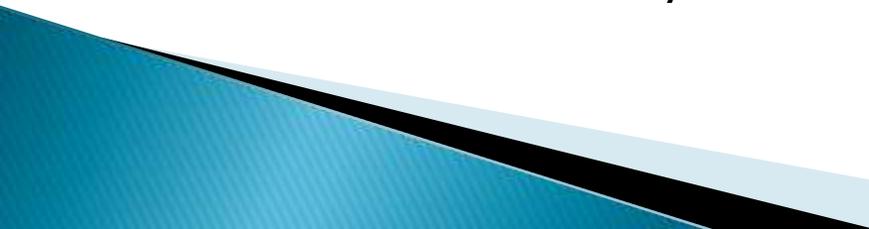


# Envelope Layout

- ▶ **Place envelope bag about 10–12 feet downwind from basket**
  - Ensure bag flap faces away from basket
- ▶ **Pull scoop/skirt and throat out of bag to basket**
- ▶ **Pilot will attach envelope lines to basket**
- ▶ **After envelope is attached to basket, unpack envelope downwind**
- ▶ **After envelope is pulled from bag, remove all storage straps and stow bag and straps**
- ▶ **Attach vent line to upright (Use simple overhand knot)**
- ▶ **Lay out crown line downwind. Make sure it is free of tangles and knots**



# Envelope Layout Methods

- ▶ **Pilot and Crew Chief decide which layout method to use**
    - Three layout methods
      - Spread
      - Strip
      - Progressive (bag) fill
  - ▶ **Crew will be advised which method will be used prior to layout.**
  - ▶ **Be alert for line/rope tangles and knot security**
    - Alert pilot if issues found
    - Bowline knots only
- 

# Spread layout

- ▶ Envelope is pulled out of bag in a strip
- ▶ Envelope is then pulled outwards from center
- ▶ **ONLY PULL ON LOAD TAPES NOT FABRIC (Black)**



# Strip Layout

- ▶ Pull envelope from bag
- ▶ Leave envelope in a strip for inflation



# Progressive Fill

- ▶ Only throat is pulled from bag and attached to basket
  - ▶ Fan is started for cold inflation
  - ▶ As envelope is cold packed crew slowly walks bag away from basket
  - ▶ Let the envelope “push” you to ensure good cold packing
- 

# Tie-off

- ▶ **Attach tie-off strap to chase vehicle**
  - Attach only to frame or hitch frame – Never to trailer
- ▶ **Place end with rescue 8/quick release next to basket.**
- ▶ **Pilot will tie off the basket to the rescue 8 with rope**



Rescue 8



# Cold Inflation

- ▶ **360° Scan for hazards and bystanders**
  - Keep spectators clear of inflation area
- ▶ **Crew in assigned positions**
- ▶ **Be aware of weather changes**
  - Wind speed/direction, temp drops, etc
- ▶ **Be ready to notify pilot/crew chief of any problems**
- ▶ **Crownline crew positioned near valve to assist with Velcro tabs before grabbing crownline**
- ▶ **Mouth crew in position on side(s) of mouth staying clear of lines, fabric and burner**
- ▶ **Fan operator in position behind fan**

# Cold Inflation

- ▶ With everyone in position pilot will signal for fan start
  - ▶ Fan operator will run fan on full throttle while mouth crew hold open mouth
  - ▶ Pilot and crownline crew attach vent to tabs
  - ▶ Crownline crew walks out to crownline handle and takes up position and crownline duties
  - ▶ Pilot will walk around to check envelope and lines
  - ▶ Pilot may ask mouth crew to assist floofing
- 

# Cold inflation – Floofing

- ▶ Floofing is the act of walking under the fabric and “floofing” it out with your arms over your head.
  - ▶ Floofing helps spread the fabric on the bottom of the balloon that is still bunched up
- 

# “Going Hot”

Now that the balloon is packed with cold air from the fan we are ready to add fire, which is an exciting and loud time.

The burner flame is HOT so be alert and sure of where you are standing when we are ready to go hot.

Don't be startled by the loudness of the burner.

Be sure of your footing and if you lose balance or the envelope pulls you in towards the burner LET GO!  
It is better to burn fabric than yourself.



# Hot Inflation

- ▶ Watch for signal from pilot, return ready signal
  - ▶ Double check area is clear of hazards/spectators
  - ▶ Stay clear of burner
  - ▶ Watch your step
  - ▶ **DO NOT WRAP ANY LINES AROUND BODY PARTS!!!**
- 

# Hot Inflation – Mouth

- ▶ Hold the mouth open to allow the flame to heat the air in the envelope without burning fabric. Looking away from the flame is normally more comfortable
  - ▶ Do not wrap any lines around any part of your body
  - ▶ When envelope starts to lift off the ground, take 2–3 steps backwards and then walk to back of basket
  - ▶ As Basket becomes upright assist with going weight–on
  - ▶ Be sure to watch your feet so that the basket doesn't land on your toes as it tips upright
- 

# Hot Inflation – Fan

**During hot inflation the pilot will have you turn the throttle down or completely off so watch for hand signals of what the pilot wants.**

**If pilot forgets to give a signal or you don't see it, turn off fan as envelope starts to lift off ground**

**After fan is shut down, move it out of the way, away from the basket**

# Hot Inflation – Crown Line

- ▶ Different types of crown line ops
  - Single line down wind
  - Single line at 45°
  - Dual lines

A single crown line may have one or two people on it as needed for wind conditions



# Hot Inflation – Crown Line

- ▶ **Crown line persons primary duty is to stabilize the envelope during inflation.**
  - Prevent rolling
  - Prevent envelope from rising too fast and going over back of basket
- ▶ **Don't start pulling until directed**
  - Usually once valve is velcroed in place
- ▶ **Maintain a constant PRESSURE on line**
  - Do not allow the line to go slack at anytime
  - If balloon rolls towards you walk backwards to keep pressure on line
  - Pull with your body weight. Knees bent, leaning back
  - Can use rope as a “saddle” but do not wrap it around you

# Hot Inflation – Crown Line

- ▶ Do not wrap line around body parts you want to keep
- ▶ **MUST WEAR LEATHER GLOVES**
- ▶ Don't run crown line under power lines
- ▶ Don't run crown line over fences or roads
- ▶ Try to keep crown line free of knots and tangles
- ▶ Keep steady pressure on line as balloon rises
- ▶ **When signaled by pilot walk line to basket**
  - Double check airspace above balloon prior to walking in

# Pre-Launch

- ▶ Balloon is upright, fan has been moved out of the way, mouth and fan crew are weight-on on the basket sides
- ▶ Passengers are loaded in basket – at pilots direction
  - Assist them as needed with stool, helping them in, etc.
- ▶ Crown line person remains in position until pilot waves them in. Crownline person keeps eye above balloon and advises pilot of other balloon traffic
- ▶ Crown line person walks to basket with crownline and puts crown line handle inside basket and secures rope to upright with Velcro tab

# Launch

- ▶ **Everyone performs a 360° safety check**
  - Always check overhead for other traffic
- ▶ **Pilot will call for weight-off and release tie off**
  - Stand clear of tie off rope in case of recoil, especially in higher winds
- ▶ **If obstacles are in the way of launch, pilot will get the balloon buoyant enough to just break ground and crew will be able to walk basket away from obstacles**
- ▶ **Wave and tell passengers to have a good flight**
- ▶ **Take pictures for passengers and website**
- ▶ **Feet must remain on ground at all times**

# Launch

- ▶ **Watch for signs of balloon experiencing false lift**
  - False lift is when air moving over the top half of the balloon creates low pressure above the balloon causing it to lift off before it is actually ready to fly
  - False lift subsides as the balloon speed matches the wind speed
  - As false lift subsides the balloon will settle back to the ground. This can cause an unintended landing or hitting obstacles downwind
  - Watch for the balloon to descend shortly after lift off as well as for the sound of the pilot burning hard
- ▶ **Try to get to the balloon to help keep it clear of hitting obstacles downwind by guiding the basket or going weight-on**



# Launch – Keys



# Post Launch

- ▶ **This is another good time to snap a couple of pictures**
- ▶ **Immediately following launch pack up all equipment and secure in trailer**
- ▶ **Sweep launch field for any items laying/left**
- ▶ **Work quick, but work smart and efficiently**
- ▶ **Secure trailer doors before driving**
  - We secure rear trailer gate with carabiners instead of padlocks while in flight phase
- ▶ **Watch balloons flight path and compare to expected path**
- ▶ **Slowly and carefully pull out from launch field**

# Post Launch - Trailer Loading



# Flight

- ▶ **Always maintain situational awareness**
  - Watch and pay attention to what is happening around you
  - Stay a couple steps ahead of the balloon
- ▶ **Watch flight profile**
  - Contour flying
    - Stay put or head towards balloon
    - May be mistaken for landings
    - May lose sight of balloon
    - Notify pilot of powerlines, antennas or other hazards when the balloon is below 100ft above ground level
  - Higher flights
    - Higher means more speed and better balloon visibility so you can get further ahead and use main roads
  - Pull over prior to intersections to avoid need to turn around with wind shifts or changes in landing plans

# Flight

## ▶ Leap frog balloon

- Try to plan balloons path and stay ahead. Not always possible but try to
- Don't get too far ahead of balloon
- Try not to park directly in balloons path

## ▶ Radio/Communications

- Keep radio on you. If you leave vehicle take radio with you
- Remember pilot may be busy and unable to answer radio right away
  - May have to use hand signals or flashing lights to get pilot attention
- Use code words/phrases to relay messages relating to issues to avoid passenger panic
- Act professional on radio – No swearing etc.

# Flight

- ▶ **Radio/Communications**

- If radios fail to work, use cell phones in urgent situations

- ▶ **Be on constant watch for abnormalities with the balloon**

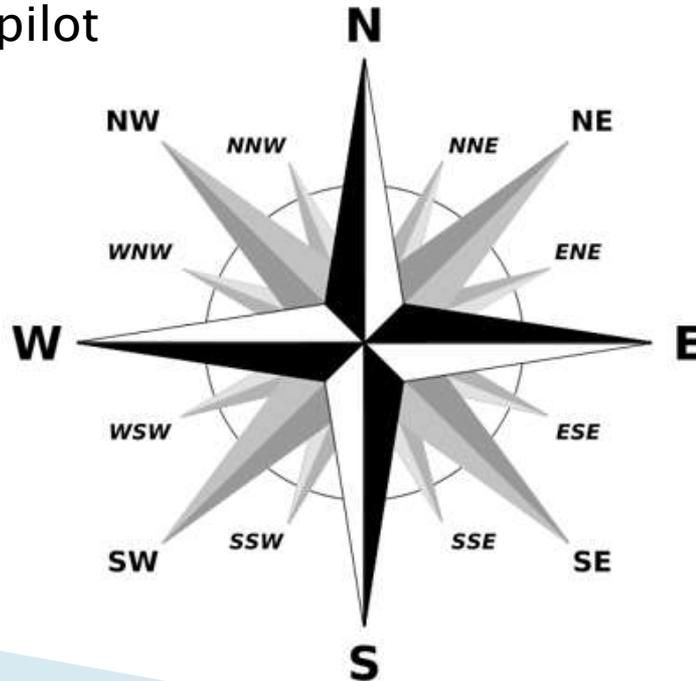
- Alert pilot of abnormalities but be aware they may be dealing with the issue and unable to respond to radio calls

- ▶ **Constantly monitor weather**

- Take wind speed and direction readings at stops
  - Note any other weather changes
- 

# Flight – Wind Readings

- ▶ In aviation wind direction is the direction the wind is coming from, not direction it is blowing
  - Face into the wind (use grass, breath, etc if needed)
  - Take compass reading in degrees or cardinal direction
    - N, NNE, NE, ENE, E, etc
    - Take wind speed measurement or estimate (calm, 5, 10)
    - Relay wind info to pilot



# Flight

- ▶ **Constantly be picking out landing sites**
  - As you are driving always be looking for sites in the balloons projected path that can be used for landing
  - Be watchful for:
    - Powerlines
    - Antennas
    - Livestock or crops – always choose crops over livestock
    - Fences and gates
    - Trees and buildings
    - Mud/water
    - Ease of access
    - Owner permission
  - Stage vehicle in front of site but don't park in approach path

# Lost Balloon

- ▶ **Attempt to contact balloon via radio or cell phone**
- ▶ **Return to area you last saw balloon**
- ▶ **Take note of wind to predict balloon flight path and head in direction of predicted flight path**
  - Use widening sweep pattern as you drive
- ▶ **If unable to find balloon or get in touch with pilot via radio or cell phone, attempt to call passengers phone if number is known**
  - Only as a last effort
  - Tell passengers the radios aren't working, may I please talk to the pilot
- ▶ **At 30 minutes past planned landing time start planning to get authorities involved with search**

# Pre-Landing

- ▶ **Try to obtain landowner permission**
  - Don't spend a lot of time tracking down the owner however
- ▶ **Communications**
  - Powerlines, obstacles other landing site concerns
  - Permission or lack of
- ▶ **Position self to assist with landing**
  - Keep vehicle out of approach path
- ▶ **Crowd control**
  - Keep spectators out of balloon path
    - May need to have people to move their car or bodies out of the way
  - Keep spectators off private property
- ▶ **Take wind speed and direction measurements**
  - Relay them to pilot

# Landing

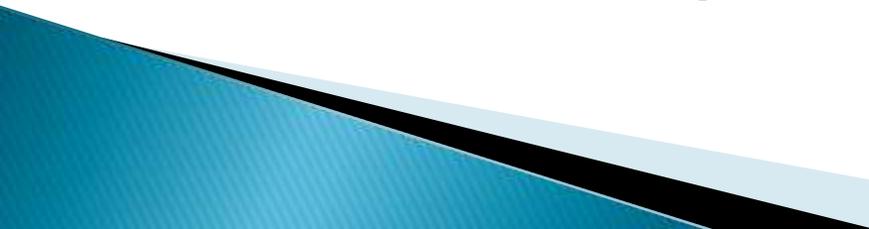
I would rather have my crew at the landing site and not need them, rather than need them and not have them!



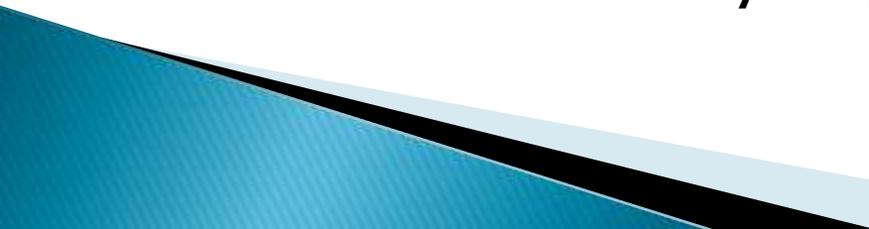
# Landing

- ▶ **Be prepared to go weight-on**
  - Watch for recoil bounce – FEET MUST STAY ON GROUND
- ▶ **Use body to block basket exits to prevent passengers from getting out of basket before envelope is heavy (Not producing lift)**
  - Passengers didn't listen or due to excitement forgot instructions to stay in basket
  - Balloon will rocket back into air at loss of passenger weight before cooling

**Remember the inflated balloon has around 8,000lbs of mass. Don't hurt yourself trying to stop it or "catch" it!**



# Landing – Drop Line

- ▶ Drop lines are only used in calm conditions
  - ▶ Used to help maneuver balloon to acceptable landing area
  - ▶ **MUST WEAR GLOVES** when handling drop line
  - ▶ Do not try to catch drop line as it is thrown, let it hit the ground then pick it up
  - ▶ Be aware of anything the line may snag on. Especially **POWERLINES!**
  - ▶ Drop line is used to assist horizontal movement, not to pull balloon down. Make your pulling as horizontal as possible
- 

# Landing – Drop Line

- ▶ **Remember lag time of 5–7 seconds**
  - Don't over pull and drag balloon into obstacles
- ▶ **Keep spectators from “helping” unless absolutely needed**
  - Make sure they have gloves on if they do help
  - Give them quick, basic instructions on how to pull

**MOST IMPORTANT!!!**

**If pilot throws drop line overboard without attaching it to the basket, point and laugh at them!**



# Landing – High Wind

- ▶ Pick large, open landing sites clear of obstacles
- ▶ High wind landings can cause multiple bounces, a long drag and is most likely time for passenger injuries
- ▶ Bystanders often think a normal high wind landing is a “crash” and may even call 911
- ▶ Do not get in path of basket
- ▶ Pilot may use trees to slow forward movement prior to landing, don't be alarmed by this unless the balloon becomes entangled or otherwise stuck in the trees
- ▶ Pilot may use ditches or berms to stop or slow

# Landing – High Wind

- ▶ **Make sure to watch for obstacles on far/downwind side of landing field. Many powerline strikes are from dragging into them.**
- ▶ **If you can do so safely, run along to grab basket to help slow it**
  - Do not get in front of its path
  - Do not allow basket to drag you
  - Do not hurt yourself
  - If balloon rebounds do not hang on to basket, feet stay on ground!
  - Stay clear of burner as basket is likely to tip
- ▶ **As soon as it is safe go weight-on on the basket**
- ▶ **Assist passengers as needed (getting out, first aid, etc)**

# Landing

- ▶ **DO NOT STAND UPWIND OF BASKET!**



# Post Landing

- ▶ **Crew remains weight-on**
  - ▶ **Assist with passengers containment**
    - Continue to use body to block exits until ready to offload
  - ▶ **When pilot gives ok for passengers to get out of basket assist with passenger offloading**
    - Assist with stool, helping out of basket, holding arms for balance, etc
  - ▶ **If final flight of the day prepare for deflation duties**
- 

# Post Landing–Walk the Balloon

- ▶ Sometimes it is necessary to walk the balloon to a different location for deflation
- ▶ Crew remains weight-on
- ▶ Follow directions of pilot if unloading passengers or keeping them aboard
- ▶ Plan for delay of 5–7sec after your input
  - Don't run balloon into obstacles
- ▶ Stay out of path of basket
- ▶ If pilot overburns don't hang on or try to catch basket
  - Feet stay on ground, watch feet to prevent basket landing on toes
- ▶ Always looking for overhead obstacles – especially powerlines

# Post Landing – Hops

- ▶ **Landing with passenger change (hop)**
  - Weight-on
  - Assist loading and unloading passengers
    - Load new passenger first, then unload previous passenger
  - Assist with launch duties
  - Perform same duties as on initial launch and flight

# Post Landing – Deflation

- ▶ **If the landing is a normal landing and the envelope is still standing crew will assist with deflation duties**
- ▶ **Crown line**
  - The pilot will have one or two crew members grab the crown line and walk it out from the envelope
  - Crown line person will have to pull hard to bring the envelope down clear of obstacles.
  - In higher winds the pilot may tell you to run, it means just that, run with the crown line in order to get the envelope down as soon as possible.
  - Maintain pressure on the crown line to keep the deflation port open to assist with deflation

# Post Landing – Deflation

## ▶ Other crew

- Assist offloading passengers if not done previously
- Assist with tipping basket
- Assist with deflating envelope by grabbing mouth fabric and bunching together to prevent air from going in through mouth
  - Secure mouth with green envelope strap
- Walk out away from basket squeezing air out of envelope
  - On good ground you can use knees and slide along fabric bunching it as you scoot forward
  - On sketchy ground, one person squeezes, another follows lifting fabric. This takes strain off the squeezer trying to lift and squeeze
  - Squeezer facing basket often is less physically demanding
- Place envelope straps around deflated envelope to prevent back filling with air.
  - Green strap always goes closest to the basket

## ▶ We want a nice streamer on the ground when done





# Packing Up – Envelope

- ▶ Loosely coil crown line
  - ▶ Neatly lay load ring and coiled crown line on envelope fabric
  - ▶ Roll up about 6–8ft of the crown end of envelope (sleeping bag style)
  - ▶ Place envelope bag (flap away from basket) at end of rolled fabric
  - ▶ Roll fabric into bag
  - ▶ Always know where your feet are to prevent tripping and stepping on fabric
- 

# Packing Up – Envelope

- ▶ **One person drags bag towards basket**
  - Flap now towards basket
  - Go about half way down the length of the envelope
- ▶ **Stuff streamered envelope into bag**
  - Slide fabric over itself, each crew member grabs an armful a couple feet behind the person in front of them and walks it to the bag
  - Stuff it into the bag while one person holds bag sides up, shakes and stuffs bag
  - Sit on bag to squeeze air out of fabric in the bag
  - Move bag to mouth and continue stuffing
  - Close bag flap and secure straps
- ▶ **Make sure not to drag fabric over snags or sharps**

# Packing Up – Basket

- ▶ **Verify with pilot that tank valves are shut off, pilot light is off and fuel lines are bled**
  - ▶ **Tip basket upright**
  - ▶ **Remove burner and unfasten fuel lines from uprights, stow burner in basket**
  - ▶ **Remove uprights and stow upside down in basket**
- 

# Packing Up

- ▶ **Visual sweep of field for any equipment dropped during pack up or fell from basket during landing (high winds landings especially) or tipping**
  - Cell phones, radios, water bottles, etc
- ▶ **Carry envelope and basket to trailer**
  - Envelope goes in first, basket last
- ▶ **Secure balloon components and trailer doors**

# Post-Flight Celebration

- ▶ **We will celebrate the flight with a toast and the balloonists prayer**
  - Be considerate of landowner and passenger wishes
  - No open intoxication in public streets or in vehicles
  - No booze for minors, use N.A. drinks



- ▶ Break?

# Refueling – Propane Safety

- ▶ **NO SMOKING DURING REFUELING**
- ▶ **NEVER** refuel inside trailer, drag basket out on ramp and open side door for air flow
- ▶ Turn off vehicles
- ▶ **YOU MUST WEAR GLOVES**
  - You don't want propane touching our skin unless you want severe frostbite!
- ▶ Verify all instruments and pilot lights are off prior to beginning fueling
- ▶ Avoid wearing synthetic fiber clothing to prevent static electricity

# Refueling – Propane Safety

- ▶ No pets or animals allowed near fueling area (fur creates a lot of static electricity)
- ▶ Keep electronics / phones away from fueling area
- ▶ Stay out of basket when fueling
- ▶ Only fill one tank at a time
- ▶ Know location of nearby fire extinguishers
- ▶ Pay attention, no horseplay or distractions

**Propane is very cold, and very flammable. Both aspects can severely hurt you! Be safe, pay attention!**



# Refueling



# Refueling – Procedures

- ▶ Open up trailer doors (both) and slide basket down to bottom of ramp
- ▶ Retrieve fuel adapter from trailer tool box
- ▶ Connect quick connect end to tank #2 quick connect
- ▶ Open yellow flow valve on tank #2
- ▶ Open bleeder valve on tank #3 (you will hear gas escaping, this is normal)
- ▶ When pump starts open tank #3 valve
- ▶ Watch for bleeder valve to start spraying white liquid

# Refueling – Procedures

- ▶ **Once bleeder starts spraying white droplets QUICKLY close bleeder with GLOVED hand**
- ▶ **Quickly close tank valve**
- ▶ **Do the same for tank #1, then tank #2**
- ▶ **When finished close yellow fueling valve on tank 2 and have pump person bleed his line**
- ▶ **Verify all tank valves are closed and safely point burner up and downwind to bleed system lines**
  - You can bleed through pump bleeder but it takes a long time because the lines hold a lot of propane

# Refueling – Procedures

- ▶ Let basket sit out for a few minutes (while paying) to help disperse any pooling propane vapors in basket
  - ▶ Disconnect quick connect from tank #2 and put caps on ends
  - ▶ Slide basket back into trailer and secure with tie-down straps
  - ▶ Place fueling adapter back into toolbox
  - ▶ Secure trailer – Padlock trailer gate
- 

# Special Events

- ▶ **Act and perform our best!**
    - Lots of spectators
    - Sponsors
    - Media
    - FAA
  - ▶ **Be professional**
    - Dress and act like a pro crew
  - ▶ **Be an ambassador**
    - Photo ops
    - Trading cards
  - ▶ **Safety conscious!**
    - Make safety top priority
- 

# Special Events – Balloon Rallies



# Special Events – Balloon Rallies

- ▶ **Tight launch quarters**
  - Watch for lines crossing, other balloons rolling into ours
- ▶ **Tight/demanding schedules**
- ▶ **Be vigilant for overhead traffic**
  - Pilot can't see above, so be his eyes
- ▶ **Lots of people means more vigilant crowd control**
- ▶ **Rally officials**
  - Listen to their directions
  - Any conflicts advise pilot so they can take it up with them
- ▶ **FAA On-site**
  - Checking for proper documents and equipment
  - Watching for safe operations
- ▶ **Volunteer crew members**

# Special Events – Static Displays

- ▶ Statics may be done at rallies, at local events, for business advertising, school presentations, etc
- ▶ We are not inflating the envelope up but not flying
- ▶ We may do it in less than ideal conditions at events when flying is not an option
  - More workload
    - Dual or even triple crown lines
    - Weight-on at all time
- ▶ Pictures of people in or outside of basket
  - Weight-on
  - Assist loading and unloading
- ▶ Always use a tie-off or even two

# Special Events – Glows



# Special Events – Glows

- ▶ A balloon glow is many times the main attraction at a balloon event.
- ▶ It is simply a static display at dawn or dusk so when the pilot actuates the burner the balloon “glows”
- ▶ It is the same as a static display, just in darker conditions. The challenge with glows is the fact that set-up or deflation takes place in little light
  - Extra caution and awareness of your surroundings is needed to ensure safety. Lines are not as easy to see and easily become trip hazards

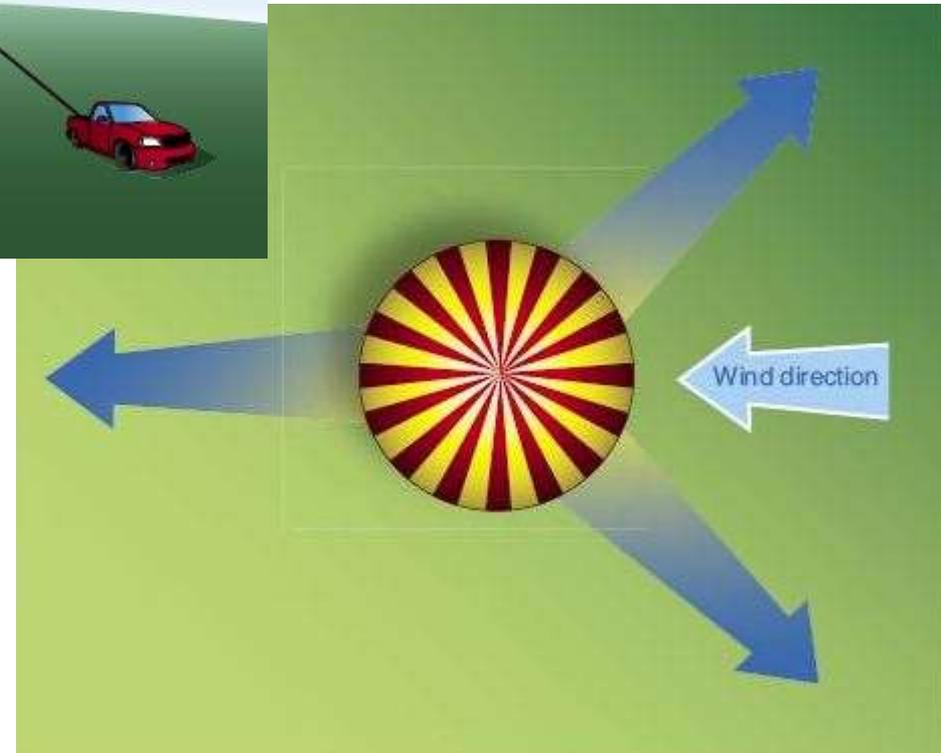
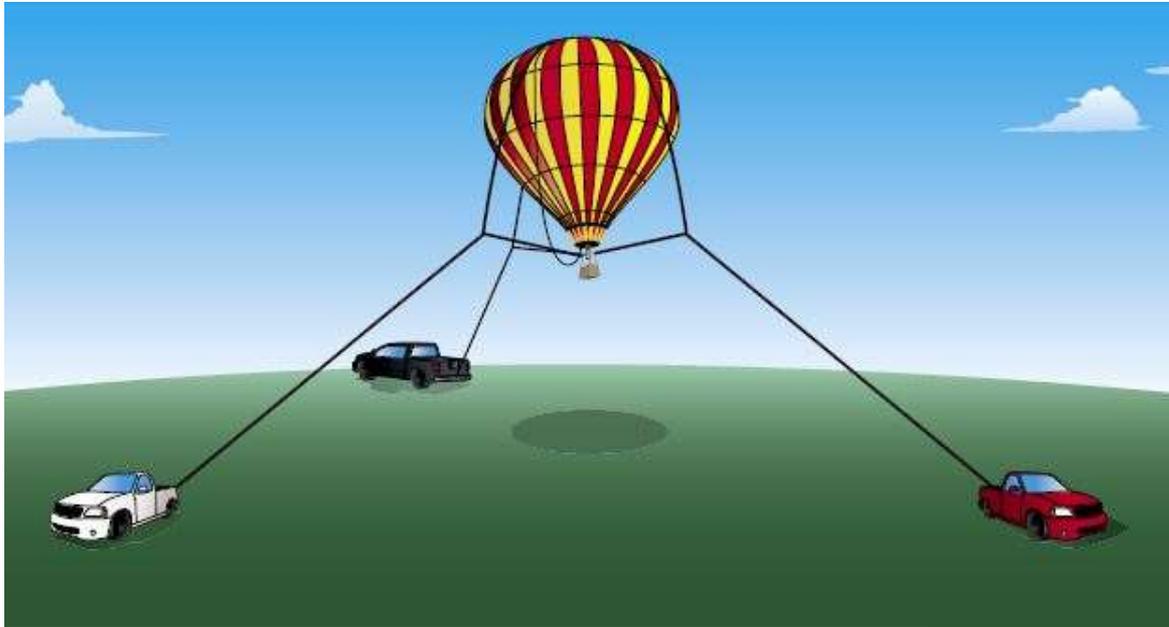
# Special Events – Tethers

- ▶ **Brief overview – will give in depth training/briefing prior to tether ops**
- ▶ **Tethers are intensive**
  - Hard on crew and equipment
  - 1 hour of tether operations is equal to 2–3 hours of free flight wear and tear on equipment and crew.
- ▶ **Need a lot of hands**
  - Set-up and takedown
  - Balloon handling
    - Downwind line control to help guide balloon path
  - Ticketing
  - Passenger loading/unloading

# Special Events – Tethers

- ▶ **Tethered flights are where the balloon is restrained by a series of ropes**
  - 3 or 6 point setup
  - We normally use 6 point for control and safety
    - 3 ropes attach to load cable at basket and at load ring
    - 3 ropes then attach to those ropes and to 3 anchors
    - Anchors can be vehicles, large trees, structures, etc
  - Two anchor ropes upwind, one downwind
  - Need large space to perform (min 150x150ft prefer 200+)
- ▶ **Ride lasts around 5–7min, about 50–70ft in air**
- ▶ **Lots of passengers in a short amount of time**
- ▶ **May require fuel tank swap**

# Special Events – Tethers



# Special Events – Tethers

- ▶ **Dope on a rope**
  - ▶ **Basically tethering the balloon for a short up and down while tethered to chase vehicle with drop line**
    - May be used in really calm conditions
    - Requires utmost attention to wind changes
    - May require crew to help guide balloon back to landing area due to ability for balloon to move more than on a three anchor system
  - ▶ **Many times used to appease a landowner with a quick up and down flight**
  - ▶ **Be discrete with saying dope on a rope in front of landowners, etc**
- 

# Special Events – Engagements

## ▶ Engagement packages

- They are paying for an unforgettable experience
- Help them relax and stay calm, they will be nervous
- You may be tasked with deploying a “will you marry me” banner under our flight path and may have to shuttle additional family and friends of the passengers
- You may have to help with setting out flowers and champagne at landing site
- Be prepared for the ones who say no. It has or will happen to every balloon ride operator at some point.
- We will use a discreet radio code phrase to communicate a negative outcome to the proposal.
  - “I will not need assistance with the load ring on this landing” or similar.

# Emergency Response

- ▶ **Stay Calm**
    - Remove yourself from scene if need be
  - ▶ **Don't become a victim yourself**
    - Be smart, be safe
  - ▶ **Secure scene to prevent further injuries**
  - ▶ **Provide First Aid**
    - Keep current on first aid techniques
  - ▶ **Call for emergency services**
- 

# Emergency Response

## ▶ Fires

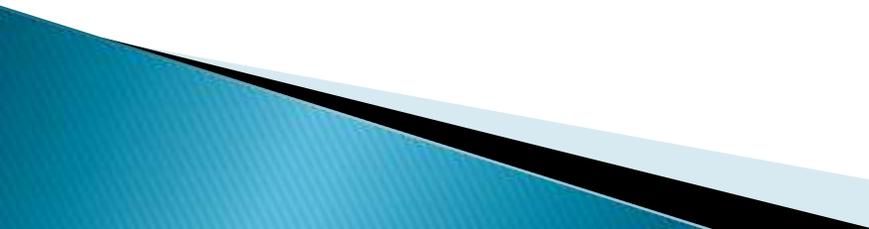
- Your safety comes first
- Rescue others if able
- If you can turn off fuel valve do so
- Fire extinguisher
  - Pull – pull the pin
  - Aim – aim at base of the fire, not the top
  - Squeeze – squeeze the handle to activate
  - Sweep – Use a back and forth sweeping motion
    - No extinguisher will put out a pressurized propane fire
- If unable to gain control in 20 seconds, evacuate area
  - Tanks will rupture after roughly 20–30 seconds of a pressurized propane fire

# Powerline Safety

 newsflare



# Powerline Safety – Prevention

- ▶ **Note any lines around launch or landing sites**
    - Look for poles – Easier to see than the lines themselves
    - Look for poles hidden in trees
    - Assume every road has lines along it going to every building
    - Watch for lines downwind of site as well as immediate area
  - ▶ **Never run crown lines or drop lines under powerlines**
  - ▶ **Use extra caution in high winds**
  - ▶ **During launch, keep weight-on until enough lift is obtained to clear downwind powerlines**
- 

# Powerline Incidents – DO

- ▶ **Stay Calm and protect yourself first**
- ▶ **Assume every line is alive until the power company tells you it is dead**
- ▶ **Stay back at least 100'**
  - Block road if needed/able
  - Keep bystanders back
- ▶ **Call 911**
  - Advise them of situation and that there is a pressurized propane system on board
- ▶ **Know your location and relay it to authorities**
  - If able to safely do so give them the pole number
- ▶ **Follow pilots directions if they are not incapacitated**

# Powerline Incidents – DON'T

- ▶ Touch anything that is in contact with lines
- ▶ Assume the line is dead
- ▶ Let anyone exit the basket until power company gives ok unless it is an emergency
  - Basket is on fire, etc.
- ▶ Pull lines off the balloon or the balloon off lines
- ▶ Drive over downed lines
- ▶ Touch feet and hands to ground at same time
- ▶ Become a casualty

# Putting it all together

- ▶ **Use common sense**
  - ▶ **Think ahead**
  - ▶ **Act quickly and correctly**
  - ▶ **Be prepared for anything**
  - ▶ **Be safety minded**
  - ▶ **Drive safe**
  - ▶ **Have the correct mindset**
    - More than just a chase crew, you are part of a flight team
  - ▶ **Be professional**
  - ▶ **Be a ballooning ambassador**
  - ▶ **HAVE FUN!**
- 

# Recommended Further Study

- ▶ **Crew Portal**
  - Calmskyadventures.com/crewportal
- ▶ **Balloon Federation of America (BFA)**
  - Safety seminars and videos
- ▶ **FAA Balloon Flying Handbook**
  - Free pdf from FAA website
- ▶ **Crewing Essentials by Gordon Schwontkowski**
  - I own a copy will loan it out to those interested
- ▶ **Cazooee Balloon Team crew training website**
  - Link on crew portal
- ▶ **Watching other crew**