Skycoaster®

Owner's Manual

Copyright 1996

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If your site has been granted any variance from the standards listed in this manual, please keep a copy of Skycoaster's written approval of the variance with the most current revision of your Skycoaster® Owner's Manual.

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TABLE OF CONTENTS

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1.0 INTRODUCTION

The Skycoaster® is a sport and amusement attraction designed by Skycoaster of Stevensville, MD. The attraction offers the thrills of skydiving and hang gliding to virtually anyone.

The Skycoaster® operates by putting the participant in a full body flight suit that supports the flyer in a prone or seated position. The flight suit is then connected (from one to three flyers at a time) to flight cables. The cables are tethered to a support structure, which is held aloft by a permanent tower.

From a static position near the ground, the flyers are pulled aloft by a launch cable that is attached to a tower located an appropriate distance from the first support structure. The cable pulls the flyers up to an altitude of 80 feet (24.38 meters) or more to a point near the top of the launch tower. At this time, the launch cable is taut and the flight is ready to begin. The flyers pull a ripcord attached to a release mechanism and begin a swing that carries them near the ground, along an arc-shaped trajectory similar to a back yard swing set. The scale of the flight is so dramatic the flyers accelerate to 60 to 80 miles (96 to 128 kilometers) per hour and receive the sensation of "body flight." The overall feeling is similar to swooping along the ground in a hang-glider or skydiving. Flyers who have experienced Skycoaster® comment that the thrill is similar to a bungee jump, without the terrifying jump from a high platform. The flyers experience the rush of wind and a very exciting "ground rush" as they swiftly pass over the ground at 60 to 80 miles (96 to 128 kilometers) per hour during the lowest part of the flight trajectory.

After the flyers swing back and forth in a pendulum motion (approximately 6 to 8 times) the motion subsides to the point where the flyers can be stopped. The flyers are then disconnected from the flight cables and the flight suits are removed.

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1.0 INTRODUCTION

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WARNING!

Your Skycoaster® has been carefully engineered to provide the safest, most thrilling amusement ride experience possible. All components are designed to work in concert with all other components originally supplied with the ride. It is important to maintain the integrity of the ride by using Skycoaster supplied/approved parts, hardware and other materials in maintenance and service of the ride.

SUBSTITUTION, MODIFICATION AND OR ADDITION OF ANY PARTS, HARDWARE OR OTHER MATERIALS NOT ORIGINALLY SUPPLIED/INSTALLED BY SKYCOASTER MAY CAUSE SERIOUS INJURY OR DEATH AND/OR DAMAGE TO THE RIDE, AS WELL AS ENDANGER YOUR PURCHASE AND LICENSE AGREEMENT. ANY MODIFICATION OR ALTERATION TO YOUR SKYCOASTER® ATTRACTION WITHOUT THE PRIOR WRITTEN APPROVAL OF SKYCOASTER IS STRICTLY PROHIBITED.

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The Skycoaster® consists of flight and launch cables, a flight cable support structure, a launch tower, a loading platform, flight suits and associated flight areas. There are numerous configurations including the A-Frame, Arch, Dual and Crane. All configurations share common elements such as flight, counterweight and launch cables; intake, flight and safety areas; and flight suits. Principal differences rest in tower geometry, size and winch motor capacity.

The various Skycoaster® areas are illustrated in Figure 1 and Figure 2 and are explained in *Section 1.3 - Definitions.*

I. A-Frame Flight Tower

A. The A-Frame flight tower, Figure 1, consists of two steel towers, canted slightly towards one another, joined at the top by a steel bridge assembly. Attached at the bridge are the flight brackets, which in turn tether the two flight cables and single counterweight cable. Standard flight cables are 5/16 inch (7.9 millimeters), made of galvanized or stainless steel, each capable of supporting 9800 lbs. (4082 kilograms)/9000 lbs., (4445 kilograms)respectively. Connected to the counterweight cable are the counterweight and the flyer-attachment end of the launch cable.

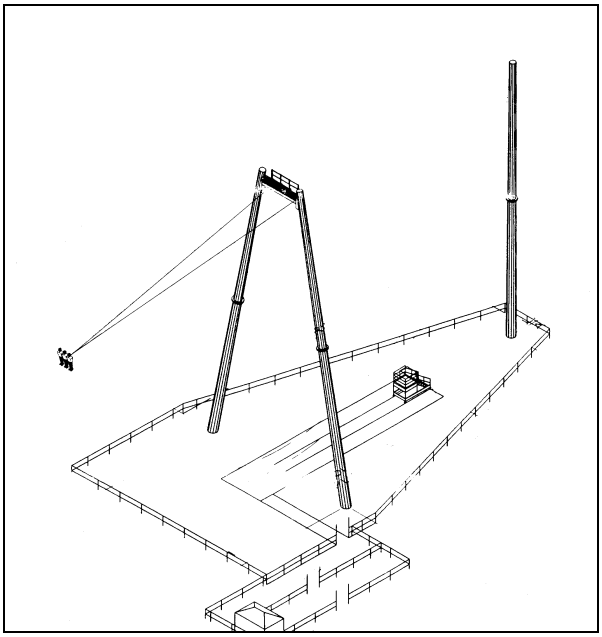

Figure 1 Single Skycoaster® (Monopole towers)

B. The launch cable is attached to the launch tower-mounted winch drum, located an appropriate distance from the flight towers. The launch cable runs over a sheave wheel mounted at the top of the launch tower, then parallels the tower to the winch drum mounted near the bottom of the tower. The winch drum is driven by an approximate 2,750 psi hydraulic power unit that receives its power from an integral 5.0 hp or 7.5 hp 230 volt, 3 phase electric motor. Electrical control is by means of a wireless pendant or winch pendant attached to approximately 100 feet (30.48 meters) of electrical cord.

C. Located between the flight towers and launch tower is either a wheeled, track-guided boarding platform or a stationary scissors lift elevating platform, depending upon installation. The loading platform allows for the elevated attachment of the flight suit-equipped flyer to the flight and launch cables. The flight suits are specially designed harnesses, which secure the flyer to the flight cables and allow

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for a ripcord-initiated release from the launch cable. Flight suits are color-coded according to flyer size.

II. Dual Skycoaster®

A. The dual Skycoaster®, Figure 2, uses two launch towers, allowing double capacity as two separate flight systems are installed.

III. Portable Skycoaster®

A. Portable or temporary Skycoaster® operations are possible with the use of a crane and portable launch tower. The crane must be at least 50 tons (112,000 pounds or 50802 kilograms) in weight and must be of the conventional, lattice-boom type. The crane holds the flight bracket. All other aspects of the Skycoaster® remain identical to the permanent installations.

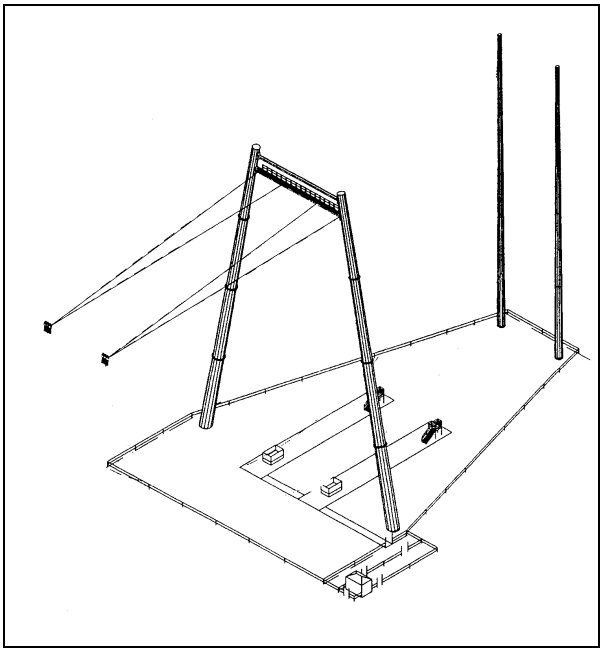

Figure 2 Dual Skycoaster® (Monopole towers)

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1.3 DEFINITIONS

The following definitions are used throughout this manual. It is important to understand the terminology used in the operation of the Skycoaster®.

Aluminum Carabiner: Used only for securing flight cables and launch bridle during non-operation time, and to secure Rolling Platform in safety area. **THIS COMPONENT IS NOT TO BE USED FOR FLIGHT**.

Anemometer: A **required** wind speed measuring device mounted no lower than 3/4 of the way up the flight or launch tower, with the readout installed at the E-Stop switch station/Operator's Workstation.

Assistant Controller: The person who assists the Controller on the flight line.

Attachment Area: The area where flight-suited flyers are connected and disconnected to/from flight and launch cables. The area is occupied by the flight-boarding platform, flyers, Controller and Assistant Controller.

B-12 Clips: The parachute industry style snaps used on the Launch Release System and all new Flight Suits for interconnecting the flyers together.

BBL: Refers to the flight crew checking backstraps, buckles, and legs on the flight suits.

Bird Caging: Buckling of the wires within a cable, usually caused by extreme axial compression, which results in radial deformation

Connector Ring: The ring located on the back of the Sky Sled, used to allow the harness to fold back for easy mobility during the flyer's walk to and from the Flight Line.

Controller: The flight crew leader trained in all aspects of the operation. A Controller must be trained by a Site Controller.

Cotter Pin: Short stainless steel split pin used to secure the end of a shackle pin after the locking nut is installed.

Counterweight: The weight attached to the counterweight cable end that facilitates the launch cable return to the flight-boarding platform at the end of each flight.

Counterweight Cable: The cable connecting the counterweight and launch cable to the flight bracket. Counterweight cable and Launch cable may be the same size, and may be 1/4" or 5/16", depending on equipment used.

Crane: A portable flight cable support structure that meets the criteria established by Skycoaster

Customer Representative: The person who assists flyers in all preflight operations including, but not limited to, sign-in, briefing, sales and cashier.

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Cycle Start Switches (Enable Switches): Located at both the Low Point and E-Stop Switch stations, these enable the winch-up and winch-down operations.

Down Safety Alarm: A flashing light/horn combination that is activated whenever the winch is given an electrical command to winch down.

Dynamic Loading: The load placed on the rigging and attachments by the swinging motion of the flight.

E-Stop Switch: Emergency stop which removes power to the winch, located at the Operator's Workstation.

E-Stop Switch Station/Operator's Workstation: The E-Stop panel box that is located in the safety area at some distance from the low point of the flight. This panel box contains the cycle start switches, which enable the winch-up and winch-down functions. The hydraulic landing unit, winch video monitor (if installation is required) and operator's workstation are all contained in this area.

Expediter: The crewmember that assists the flight crew and ensures each group of flyers has been properly prepared. The Expediter also escorts flyers to and from the flight-boarding platform at the appropriate times.

Fairing (Carabiner Cover): Fabric and foam cover that is wrapped around the flight carabiners and secured with Velcro straps. The purpose is to prevent the flight carabiners from contacting flyers' head.

Fences: A permanent (or temporary, ONLY in the case of a portable Skycoaster®) structure, a minimum of 42 inches (1066.8 millimeters) high, designed to restrict people, animals and objects from entering the operations area.

Flight Area: The area in which the flight takes place between the flight towers and extending out in both directions from the attachment area.

Flight Bracket: The mechanical device placed at the top of the crane or tower that serves as the attachment point for the flight cables.

Flight Cables: The cables that attach the flyers to the flight bracket. The Skycoaster® has two independent flight cables for suspension, stability and safety. Each flight cable is made of Stainless Steel or Galvanized Steel, with a minimum tensile strength of 9,000 pounds (4082 kilograms) for Stainless and 9,800 pounds (4445.2 kilograms) for Galvanized. Standard flight cables are 5/16 inch (7.9 millimeters).

Flight Carabiners: Steel carabiners stamped 'SMC' or 'SMC USA' used to attach the flyers to the flight cables. Omega carabiners may also be used as flight carabiners as long as the flight cables are manufactured with 3/8" heavy duty thimbles. Omega carabiners can be stamped 'OMEGA 4100kg' or 'OMEGA 98 OP 12S3 KN 63'.

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Flight Clearance Zone: A 6-foot safety clearance area extending from the underside of the Flyer to the edge of the flight area.

Flight Crew: The Controller and Assistant Controller who are directly responsible for connecting, winching, flying and disconnecting Skycoaster® flyers.

Flight Handles: The yellow handles on the Sky Sled, which are grasped by the flyer(s) during their initial descent.

Flight Line: The operations area inside the fence under the direct control of the Controller and Assistant Controller. This area includes the attachment area, flight-boarding platform, E-Stop switch station and hydraulic landing unit.

Flight Shackle Bushings: Oil impregnated bronze bushings inserted in flight brackets to allow free movement of flight shackle pin.

Flight Suit: The harness assembly worn by the flyers while participating in the Skycoaster® attraction. The flight suit is shown in Figure 3.

Flight Suit Release Rings: The steel ring on the Flight Suit suspension straps that serve as attachment points for the B-12 clips on the Launch Release System.

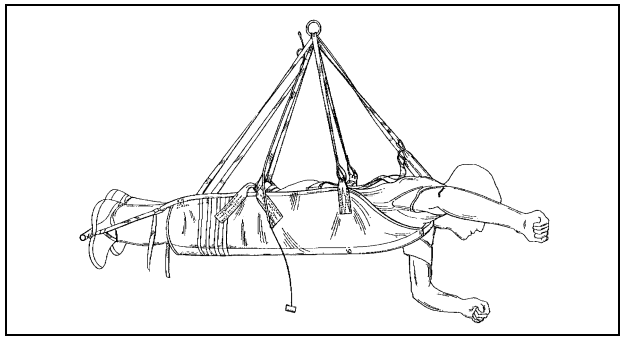

Figure 3 Skycoaster® Flight Suit

Flight Tower: The tower assemblies that support the flight and counterweight cables.

Flyer(s): The person or persons participating in flying the Skycoaster® attraction.

Footbar: The solid rod attached with adjustable length straps to the lower portion of the flight suit. The footbar gives support to the flyer's legs during Skycoaster® flight. Flyers hand carry their footbars whenever they are walking to avoid tripping on them.

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Hydraulic Landing Pole: A **SCHEDULE 80** PVC or carbon fiber pole attached to the Hydraulic Landing Unit, which has a vinyl covered rope loop at one end the flyers grab onto in order to slow them down after their flight. The rope deployment from the landing unit is slowed, which in turn stops the flyers over the low point at the completion of their flight. It is similar in construction to the Manual Landing Pole.

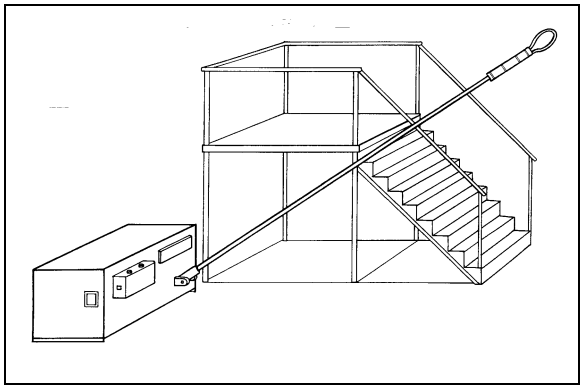

Figure 4 Hydraulic Landing Unit / Workstand

Hydraulic Landing Unit: A machine having a loop of rope through a long pole used to slow flyers by having all flyers grab onto it with both hands while the Assistant Controller holds it aloft. The hydraulic landing unit, landing machine pole and operator's workstand are illustrated in Figure 4. **NOTE: NOT TO BE USED WITH SKY SLED.**

Hydraulic Scissors Lift (Loading Platform): A 5 foot (1.5 meters) or 10 foot (3.048 meters) tall hydraulically operated lift used to raise the flyers to the flight cables for attachment and detachment. The maximum load is 2,000 pounds (907.18 kilograms) or 10 people.

Incident Report Form: A form located in *Section 3.5, Appendix B* that must be completed immediately following any accident, near accident or potential for accident. A copy of this form must be faxed or emailed to Skycoaster without delay.

Inspection Log: The document used prior to each day's activities to record inspections of all equipment and systems. A copy of each Monthly Inspection Log must be received by Skycoaster by the 5th day of the following month.

Lattice Skycoaster Inspection Component Terminology:

Bend: A permanent deformation from a straight line of the primary axis of a component.

Kink: A misalignment of a portion of a “U” shaped Toe or angle Leg which is only a few inches long with proper alignment on adjacent portions.

Lacing: Diagonal piece of steel angle which spans between the Legs of the tower. Lacings are manufactured of a thinner (lighter) material than the Legs.

Lattice A-Frame Skycoaster Leg: Steel angle vertical component found on the outside corners of each tower.

Lattice Arch Skycoaster Leg: A somewhat flattened “U” shaped component found on the outside three corners of the flight and launch towers. In cross-section, the Leg has three major components – one Heel and two Toes. The Heel is the flat area in the

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middle of the component and the Toes are the two angled edges on the outside of the component.

Primary Axis: The centerline along the component. For example, in a steel angle, the primary axis is the line along the length of the component at the "V" joint.

Strut: Horizontal piece of steel angle which spans between and is essentially perpendicular to the Legs of the tower. Struts are manufactured of a thinner (lighter) material than the Legs.

Launch Bridle: The triangular shaped cable/tube device that connects the counterweight, the launch cable and the launch release system.

Launch Cable: The cable leading from the winch to the flyer that pulls the flyer up to the launch position in a pendulum movement. Launch cable and Counterweight cable may be the same size, and will be 7/32 inch (5.55 millimeters), 1/4 inch (6.35 millimeters), or 5/16 inch (7.93 millimeters), depending on equipment used.

Launch Release Cable (Pigtail): A plastic-coated cable approximately 14 inch (355.6 millimeters) long that is connected to the ripcord of the right-side flyer. A pull of the ripcord withdraws the release cable and opens the release to begin the flight.

Launch Release System: The detachable mechanism used to release the flyer when the flight launch position is reached. The flyer pulls the ripcord to activate the launch release system. The launch release system is illustrated in Figure 5.

Launch Tower: The tower that supports the launch cable and winch assemblies.

Liberty Carabiner: A large locking carabiner, used as a secondary safety attachment when climbing towers, in addition to the required OSHA Fall Protection equipment.

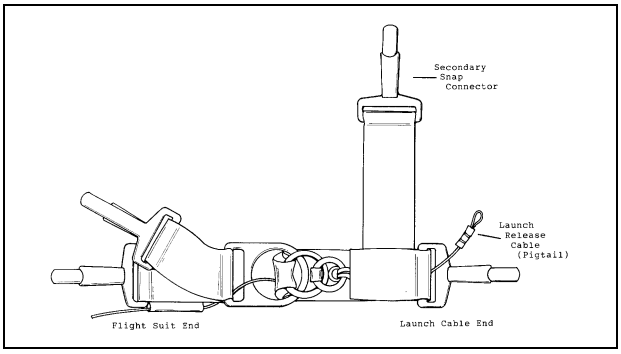

Figure 5 Launch Release System

Low-point Switch Station: An electrical panel box located near the low point containing UP and DOWN cycle start switches which enable the winch-up and winch-down functions and the RAISE enable switch for the hydraulic scissors lift flight-boarding platform.

Manual Landing Pole: A **SCHEDULE 80** PVC or carbon fiber pole used as a backup measure to the hydraulic landing unit. Flyers grab onto a vinyl covered rope loop that extends from one end of the manual landing pole in order to slow them down at the end of their flight.

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Omega Carabiner: The steel locking device used to connect the launch cable to the launch bridle. **This is the only carabiner authorized for this application**. This carabiner can also be used as a flight carabiner as long as the flight cables are manufactured with 3/8" heavy duty thimbles. Can be stamped OMEGA 4100kg or OMEGA 98 OP 12S3 KN 63.

On-Deck Area: The area where the flyers are prepared for flight. It is an area away from the intake area, the landing area and the viewing area.

Owner's Manual: The document containing the procedures and forms for operating the Skycoaster®.

Over-speed Clutch Assembly: Located at the end of the winch drum shaft, this mechanism prevents high speed, uncontrolled lowering of the flyers in the event of a hydraulic failure of the winch.

Perlon Rope: Dynamic, braided rope used on both the hydraulic landing unit pole and the manual landing pole.

Proximity Limit Switches: Two individual electromagnetic switches located on the winch drum. They sense the presence or absence of the launch cable on the winch drum and, while in the remote mode only, stop the winch at the up or down setting.

Quick-link: 1/2" stainless steel connector link used to connect the launch bridle assembly to the counterweight cable. Note that only Mallion Rapide or Suncor Stainless brand links may be used for this purpose.

Raise Enable Switch: Located on the Low Point Switch Station, this switch enables the hydraulic scissors lift up operation.

Ripcord: The handle and cable on each flight suit used by the flyers to activate the launch release system and begin the flight.

Rolling Boarding Platform: A 5-foot (1.5 meters) tall rolling metal cart with stairs used to raise the flyers to the flight cables for attachment and detachment. This cart is mounted on 6 inch (15.24 centimeter) metal wheels and a track surface to allow movement to and from the low point of the flight path.

Safety Area: The area in which the rolling flight-boarding platform is placed prior to commencing the flight.

Safety Tether: The red nylon strap that secures the rolling flight-boarding platform to an anchor point during flight.

Self-Latching Gate: A gate that will swing shut and latch closed after it has been opened and released. Required on all gates to and from the flight line area, per Safety Bulletin #12. ASTM requirements call for gates to open away from the flight line area.

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Shackle: A "U" shaped fastening device utilizing a bolt-type pin secured by a nut and stainless steel cotter pin. Used to attach the flight cables to the flight brackets, the counterweight cable to the counterweight bracket and the safety climbing cables to the towers.

Sheave Wheel Assembly: Bearing mounted wheel at top of launch tower. The launch cable passes over this between the winch and launch bridle.

Side Clips: B12 clips located on the right side of the flight suit at the armpit and near the bottom of the suit. These clips are used to attach the flight suits together during flight.

Site Controller: Skycoaster certified personnel. A Site Controller must be present during all Skycoaster® operations.

Skyhook: A hooked pole used to pull the launch cable to the flight-boarding platform.

Sky Sled: The seated harness assembly worn by flyers while participating in the Skycoaster® attraction. The Sky Sled harness is illustrated in Figure 6.

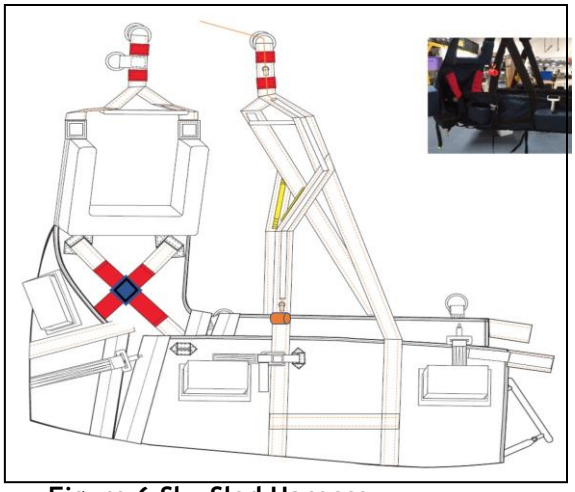

Figure 6 Sky Sled Harness

Spreader Bar: The solid rod attached to the suspension straps, which allow for an unobstructed flight.

Tandem Fairing: Used to connect the Sky Sled spreader bars together during a double flight.

Video Person: The person who operates the photographic equipment in the flight area.

Winch: The hydraulically powered device that pulls the launch cable and flyers into the launch position. The winch power unit and drum are shown in *Section 2.1, Appendix I*.

Winch Pendant: The remote control that allows operation of the winch-up and winch-down functions.

Winch Video Camera & Monitor: A video camera aimed at and focused on the winch drum, with the monitor located in the E-Stop switch station/operators station. This unit is used to monitor the winch drum for possible mis-spools during winch-up. This unit is normally required on Skycoaster® attractions taller than 100 feet (30.48 meters) and is always required if the view of the winch drum from the Operator's Workstation is obstructed.

Wire rope clips: "U" shaped clamps with threaded ends secured by nuts, used to secure cable ends.

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Workstand: A 5 foot (1.5 meters) platform with guardrails and staircase that the Assistant Controller stands on to manipulate the hydraulic landing unit pole into the grasp of the flyers.

Zoom Zone: The portion of the flight area beyond the attachment area and furthest from the launch structure. Natural or artificial structures may be within this area to enhance the visual perception of the climbing portion of the flight. Skycoaster must first approve, **IN WRITING**, any structure placed in the Zoom Zone.

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Although some of the duties assigned to specific positions described below may be combined when business is slow, Skycoaster policy **requires** that **at least two** employees perform the duties of Flight Crew for **ALL** operations with neither employee participating as the flyer. This ensures that all flight suit fittings and flyer connections are cross-checked by at least two trained flight crewmembers. The first flight of the day requires at least three employees with a Site Controller or Controller participating as the flyer.

I. Site Controller

The Site Controller is responsible for overseeing all operations of the site and shall be versed in all operations, procedures (including flying the Skycoaster®), staffing and training. Ultimately, this person is responsible for all actions and processes of the Skycoaster®. The Site Controller must be at least 18 years old, and have completed a minimum of 24 hours of on-site training (32 hours for sites that use an expediter). Sites utilizing Sky Sleds will have a minimum of 30 & 38 hours respectfully. **The Site Controller must have completed a factory authorized certification program. A Site Controller must be physically present (within the perimeter of the Skycoaster® flight operations area) during all Skycoaster® operations of any nature**. A Site Controller will possess, on their person, a current and valid factory issued certification card. Certification cards are valid for one year and will be renewed upon completion of certification requirements - generally met by completing a written test. Being certified as a Site Controller is a qualification, not a position on the Flight Crew.

Site Controller certification cards are issued to specific individuals at specific sites. If that individual's employment is terminated, their card **CANNOT** be altered, re-issued to or used by any other individual. If this occurs, all Site Controller certifications at that site may be revoked.

The Site Controller can fill any position during the operation of the Skycoaster®, but remains responsible for the supervision of the site at all times.

Site Controller duties include, but are not limited to, the performance or supervision of the following items:

A. Ultimately responsible for ensuring that all pre-operational checks are completed per the Skycoaster® Owner's Manual.

B. Ensuring that all equipment is maintained in serviceable condition.

C. Performing the first flight of the day as part of the inspection procedure. This task may also be performed by a Controller.

D. Ensuring that all staff follow the Skycoaster® Owner's Manual procedures and guidelines.

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E. Training and advancing of all staff. The first two hours of training in any position must be under the direct supervision of a Supervising Site Controller who has been appointed by the Senior Site Controller.

F. Staffing and rotating work positions every day.

G. Reviewing and signing all Incident Reports and Inspection Logs.

II. Controller

The Controller will be versed in all operations and procedures. The Controller must be at least 17 years old and have completed 8 hours of on-site training in this position (10 hours for sites utilizing a Sky Sled). No one will perform any duties of a Controller unless certified as a Controller or in training to be a Controller with a certified Controller or Site Controller directly supervising that person.

Controller duties include, but are not limited to, assisting the Site Controller and performing the following items:

A. Ensuring that all pre-operational checks are completed per the Skycoaster® Owner's Manual.

B. Ensuring that all equipment is maintained in serviceable condition.

C. Performing the first flight of the day as part of the inspection process. This task may also be performed by a Site Controller.

D. Giving a final briefing and check on flyers before ascent.

E. Maintaining security of the flight area against unauthorized persons and objects.

F. Operating the winch.

G. Ensuring the rolling flight-boarding platform is securely tethered in the safety area before the launch countdown is started.

H. Ordering the countdown to the launch after receiving the all clear from the Assistant Controller.

I. Lowering the launch cable after a successful catch has been made and moving the rolling flight-boarding platform into the attachment area after the flyers have been stabilized by the Assistant Controller.

J. Maintaining a position with a clear view of the flight area and flyers.

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III. Assistant Controller

The Assistant Controller will be versed in all operations and procedures, except operating the winch. This person must be at least 17 years old and have completed 8 hours of on-site training in this position (10 hours for sites utilizing a Sky Sled). No one will perform any duties of an Assistant Controller unless certified as an Assistant Controller or in training to be an Assistant Controller with a certified Assistant Controller or Site Controller directly supervising that person.

Assistant Controller duties include, but are not limited to, the following items:

A. Ensuring that all pre-operational checks are completed per the Skycoaster® Owner's Manual.

B. Ensuring that equipment is maintained in serviceable condition.

C. Directing flyers to the flight-boarding platform.

D. Connecting flyers to the flight cables.

E. Connecting the launch release system to the flyers.

F. Giving the final physical check on flyers and giving the signal to begin winch-up to the Controller.

G. Stabilizing flyers as they begin their ascent from the 5-foot single scissors lift.

H. Moving the rolling flight-boarding platform into the safety area and securing it with the safety tether.

I. Maintaining security of the flight area against unauthorized persons and objects.

J. Signaling the Controller that the flight line is clear to begin the launch countdown.

K. Re-assembling the launch release system for the next flight.

L. Stabilizing the flyers over the low-point.

M. Disconnecting flyers and supervising their descent from the rolling flight-boarding platform.

N. Maintaining a position with a clear view of the flight area and flyers.

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IV. Flight Suit Person

The Flight Suit Person is responsible for flyer sequence, briefing, fitting and removing the Skycoaster® flight suits & Sky Sleds. The Flight Suit Person must have completed 8 hours of on-site training in this position (10 hours for sites utilizing a Sky Sled). The minimum age of the Flight Suit Person will be in accordance with the local employment regulations. No one will perform any duties of a Flight Suit Person unless certified as a Flight Suit Person or in training to be a Flight Suit Person with a certified Flight Suit Person or Site Controller directly supervising that person. The Flight Suit Person will be positioned in the flight suit area when separately assigned.

Flight Suit Person duties include, but are not limited to, the following items:

A. Completing daily flight suit checks as outlined in the Skycoaster® Owner's Manual.

B. Controlling crowds.

C. Sequencing flyers.

D. Fitting flight suits based on size and height.

E. Briefing flyers on all aspects of the attraction including the landing procedure.

F. Expediting flyers to the rolling flight-boarding platform when cleared by the Controller or Assistant Controller, if applicable.

G. Removing flight suits from flyers.

H. Answering customer questions about the Skycoaster®.

V. Expediter

Locations using the scissors lift flight-boarding platform require an additional crewmember to assist the Flight Crew and Flight Suit Person. The Expediter must have completed 8 hours of on-site training in this position. The minimum age of the Expediter will be in accordance with the local employment regulations. No one will perform any duties of an Expediter unless certified as an Expediter or in training to be an Expediter with a certified Expediter or Site Controller directly supervising that person.

Expediter duties include, but are not limited to, the following items:

A. Ensuring each group of flyers has been properly suited, briefed and prepared for flight.

B. Answering customer questions about the Skycoaster®.

C. Escorting flyers to and from the flight-boarding platform at the appropriate times.

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D. Assisting the Controller in completing the winch-down while the flight crew raises the scissors lift flight-boarding platform.

E. Retrieving the launch bridle and giving it to the Assistant Controller for connection to the launch release system.

VI. Customer Representative

The Customer Representative is responsible for customer service, crowd control and cashier responsibilities. The minimum age of the Customer Representative will be in accordance with the local employment regulations.

Customer Representative Duties include, but are not limited to, the following items:

A. Allowing flyers to enter the flight suiting area.

B. Collecting money.

C. Selling concessions.

D. Answering customer questions about the Skycoaster®.

VII. Video Person

The Video Person is responsible for sales and related operations of video recording for flyers. He/she will be positioned at the Skycoaster® site as necessary while observing the minimum 25-foot clearance zone. The minimum age of the Video Person will be in accordance with the local employment regulations.

VIII. Senior Site Controller

A. **Profile** - The Senior Site Controller should be someone who works at the Skycoaster® Site in a supervisory position (i.e. Manager, Supervisor for Skycoaster® only). It should not be someone who only visits the site once a week, month, or season. The Senior Site Controller should be more knowledgeable about the design, operations, and maintenance of the Skycoaster® than any other person involved. They should be looked upon to complete (supervise) MOST of the training of new personnel. They should be available and able to answer any questions which may arise about this attraction. The senior site controller should not be the head of operations, who has numerous other rides and attractions to oversee. **The Senior Site Controller is appointed by their site, NOT by Skycoaster.**

B. **Attendance at Skycoaster® Site** - The Senior Site Controller should be the person who is directly responsible for the operation of the site. This person should spend a great deal of their time at the Skycoaster® working, training and observing safe and efficient operations.

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C. **Familiarity with the "Ride System"** - The Senior Site Controller **WILL HAVE** a complete understanding of the Skycoaster® including all operations and maintenance. He/she is responsible for ensuring that all inspections and maintenance repairs are being completed to specifications provided by Skycoaster (i.e. proper equipment, etc.)

D. **Attendance, Distribution and Review** - The Senior Site Controller will attend all Skycoaster Safety Meetings and required Training Sessions (not to exceed 2 - 2 day sessions). After attending these meetings, it is his/her responsibility to review new information with all current Site Controllers and other employees. Additionally, he/she must distribute and review all new written documentation pertaining to the Skycoaster® attraction (i.e. Owner's Manual, Safety Bulletins, etc.).

E. **New Skycoaster® Personnel Training** - Training is to be completed per the Skycoaster® Owner's Manual. It is the responsibility of the Senior Site Controller to make sure that all employees know what is expected of them i.e.: 8 hours in each position prior to advancing to another position. The Senior Site Controller is responsible for ensuring ALL new employees complete the training requirements.

F. **New Site Controller Certification** - It is the responsibility of the Senior Site Controller to ensure that all employees to be tested by Skycoaster, for certification as Site Controllers, are thoroughly trained and ready for observation. Hence, each Site Controller Candidate will have completed the minimum 8 hours of supervised training necessary in each of the positions and have a completed Skycoaster® Training and Certification Worksheet. Skycoaster should not be called to the site until such training has been completed.

G. **Owner's Manual** - The Senior Site Controller is responsible for distributing and reviewing the Skycoaster® Owner's Manual with all new Skycoaster® personnel. If necessary, the Senior Site Controller may designate another Site Controller to conduct this review. The Manual should be distributed to each employee when they are introduced to the Skycoaster® attraction and the Flight Suiting position. All employees should be informed of the pertinent information relating to their type of Skycoaster® and notified of the importance of reading, understanding and knowing the information provided in the Manual.

H. **Alterations** - Under no circumstances is the Senior Site Controller or any Owner/Operator authorized to change or alter any equipment, operation procedure, inspection procedures or safety and emergency guidelines without the expressed, WRITTEN consent of Skycoaster. If your site has been granted any variance from the standards listed in this manual, please keep a copy of Skycoaster written approval of the variance with the most current revision of your Skycoaster® Owner's Manual.

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2.0 MAINTENANCE

This section of the Skycoaster Owner's Manual deals with the Maintenance and Pre-Operating Procedures of the Skycoaster® attraction.

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2.1 PRE-OPERATION INSPECTION PROCEDURES

Each day, prior to opening, a thorough inspection must be completed using the Skycoaster approved Inspection Log located in *Section 2.2, Appendix A*. A Site Controller is ultimately responsible for signing off on all areas of the checklist as satisfactorily inspected. Complete this inspection carefully to eliminate potentially dangerous situations. If any component of the ride is deemed to be not satisfactory or inoperable, the ride cannot be operated until a maintenance person has inspected and repaired any deficiencies found. After the maintenance has been performed, the Site Controller must perform a follow-up inspection to ensure the deficiency has been properly repaired. All maintenance performed on the Skycoaster® must be recorded in the Maintenance Journal located in *Section 2.2, Appendix B*. The work performed shall be described in detail.

NOTE: Before performing maintenance or inspection of the Skycoaster®, all personnel must have read and be familiar with all operating procedures and aspects of the ride.

I. Helpful Tips on Inspections

There is a difference between mental checking and physical checking. In redundant activities such as inspections, it is easy to internalize the activities and miss items. Break this cycle by concentrating on the inspection. Talk with your co-inspector as you go through the checkpoints and verbally confirm all check procedures one at a time. Do not rush through these procedures. Ensure that you and any co-inspector(s) are not preoccupied. Finally, sign the checklist only when you are confident that all safety inspections and procedures are satisfactorily completed. If there is any doubt to the integrity of any component, replace that component before operation.

II. Flight Tower

A. Inspect the base:

1. Inspect earth stability against the concrete foundation and concrete stability with the steel.

2. Check that all anchor bolts and nuts are in place and tight.

3. Confirm that lightning grounding rods and grounding mechanisms are properly grounded and that connections are tight.

4. Inspect the attachment of lights and their safety cables, the lower attachment of the safety climbing cable and climbing steps (if applicable).

WARNING!

Never inspect or operate the Skycoaster® when the possibility of lightning is present.

B. At least once a week, maintenance personnel using safety fall protection equipment, must complete a top-side inspection:

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2.1 PRE-OPERATION INSPECTION PROCEDURES

WARNING!

Always use safety fall protection equipment when climbing towers.

NOTE: Follow all Federal, State, Local and OSHA requirements and use proper equipment.

1. Inspect the climbing safety cable for attachment security/wear and proper tension.

2. Each month, inspect the full length of each safety climbing cable by climbing the tower while allowing the cable to pass through your hand. The cable must be replaced if two (2) or more broken wires, bird caging or damage is discovered.

3. Visually inspect all bolts for tightness.

4. Inspect Lattice A-Frame Skycoaster® attractions as follows:

   (a) Legs – Inspect the full length of each Leg and document any kinks or bends found. If any single Leg has; a) adjacent kinks in both faces, b) a twist in both faces or, c) if the primary axis is bent, notify Skycoaster with details and digital photographs.

   (b) Lacings and Struts – Inspect each Lacing and Strut for kinks or bends. If any single Lacing or Strut has; a) adjacent kinks in both faces, b) a twist in both faces or, c) if the primary axis is bent, notify Skycoaster with details and digital photographs.

5. Inspect Lattice Arch Skycoaster® attractions as follows:

   (a) Legs – Inspect the full length of each Leg and document any kinks or bends found. If on any single Leg; a) kinks or bends are found in adjacent toes or an adjacent tow and heel or, b) if any primary axis is bent, notify Skycoaster with details and digital photographs.

   (b) Lacings and Struts – Inspect each Lacing and Strut for kinks or bends. If any single Lacing or Strut has; a) adjacent kinks in both faces, b) a twist in both faces or, c) if the primary axis is bent, notify Skycoaster with details and digital photographs.

   (c) Triangulated Flight Bracket Catwalk and Support – Inspect as per Service Bulletin 31 issued on May 28, 2004. If your site has installed the revised Triangulated Flight Bracket Catwalk and Support mounting bracket and no longer utilizes the “U-Bolt” mounts, the monthly inspection as outlined in Service Bulletin 31 becomes an annual

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inspection and the monthly inspection becomes a visual inspection that no longer requires the removal of the mounting bracket.

6. Inspect Valmont manufactured Monopole Skycoaster® attractions as follows:

   (a) Ensure that the secondary safety cables between the towers and the bridge are securely attached.

C. Inspect the flight and counterweight brackets:

1. Inspect welds, bolts, shackles, cotter pins, bushings and washers, secondary cable loops and wire rope clips.

2. If applicable, inspect adjusting turnbuckles, support cables and wire rope clips.

D. Inspect the flight cables:

CAUTION: Flight cables that are removed from service must not be used again in any ride-related capacity and must be destroyed.

1. Inspect the shackles, thimbles, swages and cables at attachment points.

2. Inspect secondary cable loops and wire rope clips. Secondary cable loops must be replaced if two (2) or more broken wires, bird caging or damage is discovered.

3. Each month, inspect the full length of the flight cables by slowly climbing down the tower while inspecting the cables as they pass through your hand.

4. The cable must be replaced if one (1) or more broken wires, bird caging or damage is discovered.

WARNING!

Do not pull the flight cables to the top of the structure for inspection. A cable dropped from the top will be irreparably damaged, but more importantly, a cable dropped from the top is a serious safety hazard to the inspector or anyone else on or near the structure or boarding platform.

E. Inspect the counterweight cable:

1. Inspect the thimble, swages and cable at the attachment point.

2. Inspect the secondary cable loop and wire rope clips.

3. Each month, inspect the full length of the counterweight cable using the following procedure:

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(a) Disconnect the launch cable from the launch bridle at the Omega Carabiner.

(b) Tie a length of rope to the launch bridle and use it to pull the counterweight cable towards the base of the flight structure.

(c) Wearing and using safety fall protection equipment, climb the flight structure approximately 20 to 30 feet (6.09 to 9.144 meters) while carrying one end of the rope that was just tied to the launch bridle.

(d) Using the rope, pull the launch bridle and counterweight to the flight structure and tie the counterweight to the flight structure to relieve its weight from the counterweight cable.

WARNING!

Do not pull the counterweight cable to the top of the structure for inspection. A cable dropped from the top will be irreparably damaged, but more importantly, a cable dropped from the top is a serious safety hazard to the inspector or anyone else on or near the structure or boarding platform.

(e) Ascend the flight structure to the counterweight bracket and while slowly climbing down the flight structure, inspect the entire length of the counterweight cable as it passes through your hand.

(f) Inspect for any broken wires, bird caging, or damage. The cable must be replaced if two (2) or more broken wires, bird caging or damage is discovered.

(g) Replace the counterweight cable if there is any doubt about cable integrity.

(h) Inspect the quick-links on the launch bridle and counterweight for tightness and excessive wear. Only Mallion Rapide or Suncor Stainless brand links are suitable for use in this area.

(i) Use medium grade Loc-tite to close any quick-link.

(j) Inspect the launch bridle thimbles, swages and cable. Look for broken wires, bird caging, or damage. The launch bridle must be replaced if two (2) or more broken wires, bird caging or damage is found on any single leg.

(k) Replace any components of doubtful integrity.

(l) Untie the counterweight from the structure and lower the launch bridle to the attachment area.

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(m) Connect the launch cable to the launch bridle with the Omega Carabiner.

CAUTION: Look upwards along the counterweight cable and ensure it is not twisted around a flight cable. The flight cables and counterweight cable must hang independently with no wraps around another.

III. Launch Tower

A. Inspect the base:

1. Inspect earth stability against the concrete foundation and concrete stability with the steel.

2. Check that all anchor bolts and nuts are in place and tight.

3. Confirm that lightning grounding rods and grounding mechanisms are properly grounded and that connections are tight.

4. Inspect the attachment of lights and their safety cables, the lower attachment of the safety climbing cable and climbing steps (if applicable).

WARNING!

Never inspect or operate the Skycoaster® when the possibility of lightning is present.

B. At least once a week, maintenance personnel using safety fall protection equipment, must complete a top-side inspection:

NOTE: Follow all Federal, State, Local and OSHA requirements and use proper equipment.

1. Inspect the climbing safety cable for attachment security/wear and proper tension.

2. Each month, inspect the full length of each safety climbing cable by climbing the tower while allowing the cable to pass through your hand. The cable must be replaced if two (2) or more broken wires, bird caging or damage is discovered.

3. Visually inspect all bolts for tightness.

4. Inspect Lattice A-Frame Skycoaster® attractions as follows:

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(a) Legs – Inspect the full length of each Leg and document any kinks or bends found. If any single Leg has; a) adjacent kinks in both faces, b) a twist in both faces or, c) if the primary axis is bent, notify Skycoaster with details and digital photographs.

(b) Lacings and Struts – Inspect each Lacing and Strut for kinks or bends. If any single Lacing or Strut has; a) adjacent kinks in both faces, b) a twist in both faces or, c) if the primary axis is bent, notify Skycoaster with details and digital photographs.

5. Inspect Lattice Arch Skycoaster® attractions as follows:

(a) Legs – Inspect the full length of each Leg and document any kinks or bends found. If on any single Leg; a) kinks or bends are found in adjacent toes or an adjacent tow and heel or, b) if any primary axis is bent, notify Skycoaster with details and digital photographs.

(b) Lacings and Struts – Inspect each Lacing and Strut for kinks or bends. If any single Lacing or Strut has; a) adjacent kinks in both faces, b) a twist in both faces or, c) if the primary axis is bent, notify Skycoaster with details and digital photographs.

6. Inspect all cable guides for excessive wear, security and alignment. Excessive wear is any grooving or condition that could interfere with the smooth passage of the launch cable.

7. Adjust or replace cable guides as necessary.

8. Visually inspect all sheave bolts for tightness and security including the axle bolt.

9. Inspect the sheave for signs of irregular groove wear or looseness on the axle.

10. Relieve the weight of the launch cable, turn the sheave by hand and observe the condition of the axle bearings. The bearings are sealed and require no lubrication.

C. Inspect the winch system:

1. Visually inspect the winch drum assembly and all welds and mounting bolts for security on a daily basis. Also, inspect all bolts on the winch drum mechanism for tightness.

2. Inspect cable guide loops and proximity limit switches for placement and security.

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3. Check all fluid lines for damage or leaks.

4. Check the hydraulic fluid level and fill with the appropriate fluid if necessary.

5. Wipe down all surfaces with a clean cloth.

6. Inspect the area between the pinch roller and drum for foreign objects or debris and remove any objects that are found.

7. Be sure warning signs are visible.

8. Lubricate bearings as directed in the winch manual.

9. Visually check all bolts on the over-speed clutch assembly for tightness.

10. When checking winch operation, keep all personnel clear of the winch drum and moving cable.

11. Ensure the launch cable is not attached to the flight-boarding platform or other structures.

12. Turn on the winch and begin raising the launch cable while observing the operation.

13. Check the remote camera and television monitor if installed.

14. Check that the winch drum light is operational.

D. Every day, before any operations, inspect the full length of the launch cable using the following procedure:

1. Clear all personnel away from the winch drum and launch cable.

2. Inspect the area between the pinch roller and the drum for foreign objects or debris and remove any objects that are found.

3. Turn on the winch.

4. Shift to manual control.

5. Ensure the launch cable is not attached to the flight-boarding platform or to other structures.

6. Winch-up the launch cable bumper until it gently contacts the sheave at the top of the tower or the launch cable is taut.

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7. Check the condition and position of the red UP marker tape flag on the launch cable. Replace the flag as necessary.

8. Fold a rag around the launch cable below the red UP marker tape flag and hold the two ends of the rag in one hand.

9. Slowly lower the launch cable to the black DOWN marker tape flag. Replace the flag as necessary.

10. Visually inspect the launch cable and use the rag to check for any broken wires, bird caging or damage along the launch cable. If two (2) or more broken wires or other items mentioned above are discovered, they must be cut off (if sufficient cable length remains) or the cable must be replaced.

11. Check for the correct positioning of the black DOWN marker tape flag by standing on the flight-boarding platform and pulling the launch release as if to connect to flyers. It should require approximately 25 pounds (11.33 kilograms) of force to pull in the launch cable.

12. If necessary, adjust the amount of launch cable out by moving the winch drum up or down and adjust the black DOWN marker tape flag accordingly.

13. Disconnect the launch cable from the launch bridle at the Omega Carabiner.

14. At this point, allow the counterweight cable, counterweight and launch bridle to hang freely so that any accumulated twists in the counterweight cable may rotate out.

15. Have a crewmember pull tension on the launch cable at the bumper while winching out enough launch cable to allow the red UP marker tape flag to be inspected at ground level.

16. While pulling out the launch cable, grasp the bumper, not the carabiner, so that any accumulated rotations or twists in the launch cable can relax out.

17. Using a rag around the launch cable, walk the launch cable from the red UP marker tape flag to the bumper and inspect for broken wires, bird caging or damage. Allow any accumulated rotations or twists in the launch cable to rotate out.

18. If two (2) or more broken wires or other items mentioned above are discovered, they must be cut off (if sufficient cable length remains) or the cable must be replaced.

19. Have a crewmember pull tension on the launch cable at the bumper.

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20. Use a wooden stick to guide the launch cable on to the grooved drum and slowly wind the cable on to the drum using manual control.

21. Visually inspect the condition of the lower portion of the counterweight cable.

22. Visually confirm that the quick-link connectors on the counterweight and launch bridle are closed. Only Mallion Rapide or Suncor Stainless brand links are to be used in this area.

23. Use Loc-tite medium thread-locking compound on any quick-link connector whenever closing.

24. Inspect the launch bridle thimbles, swages and cable. Look for broken wires, bird caging, or damage. The launch bridle must be replaced if two (2) or more broken wires, bird caging or damage is found on any single leg.

25. Connect the launch cable to the launch bridle with the Omega Carabiner.

26. Securely lock the Omega Carabiner.

27. Launch cables at some locations show a tendency to counter twist or birdcage, particularly within the first 5 to 15 feet (1.5 to 4.57 meters) from the rubber bumper. If you see this tendency in your launch cable, follow these steps:

    (a) Each day during the pullout inspection of the launch cable, allow any accumulated twists or rotations to come out; the cable must be allowed to relax.

    (b) Lay the launch cable straight on the ground, remove the Omega Carabiner from the thimble and inspect the cable from the red UP marker tape flag at the launch end.

    (c) Use a rag around the cable and push toward the rubber bumper end. This will remove any accumulated twists.

E. Make these operational checks:

1. If necessary, adjust the UP and DOWN proximity limit switches for proper operation. Final adjustment of the proximity limit switches must only be done only after the winch hydraulic fluid has reached a stabilized operating temperature.

2. Test the E-Stop switch for proper operation. Pushing the button in should remove electrical power from the winch.

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3. Test the DOWN cycle start circuit for proper operation:

   (a) With the launch cable bumper at or near the top of the launch tower, press and hold down the winch pendant DOWN button for 15 seconds. The winch must not begin turning down.

   (b) If the winch begins turning down without pressing the DOWN cycle start button, **DO NOT** operate the Skycoaster® until the cycle start circuit has been repaired.

   (c) Press and hold the winch pendant DOWN button and then momentarily press the DOWN cycle start button. The winch should begin turning down. The normal start delay time is 3 to 6 seconds with the winch hydraulic fluid at a stabilized operating temperature. Verify that the down safety alarm is working properly during winch-down.

4. If equipped, test the UP cycle start circuit for proper operation:

   (a) With the launch bridle near the low point, press and hold the winch pendant UP button for 15 seconds. The winch must **NOT** begin turning.

   (b) If the winch begins turning without pressing the UP cycle start button, **DO NOT** operate the Skycoaster® until the cycle start circuit has been repaired.

   (c) Press and hold the winch pendant UP button and then momentarily press the UP cycle start button. The winch should begin turning. The normal start delay time is 3 to 6 seconds with the winch hydraulic fluid at a stabilized operating temperature.

5. Monthly and after any repair or maintenance of the over-speed clutch, test the operation of the over-speed clutch as follows:

WARNING!

The Site Controller, Controller or maintenance person (mechanic) must be briefed by the Inspector and be thoroughly familiar with the purpose and procedure of this test.

When there are flyers aloft on the launch cable, a flight may occur at any time for any reason. Therefore, the flight line must be kept clear of all persons and objects anytime flyers are aloft on the launch cable.

   (a) Using the winch pendant, winch a Site Controller, Controller or mechanic in a Skycoaster® flight suit to the launch position at the top of the launch tower.

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(b) The Site Controller, Controller or mechanic will grip the ripcord on the flight suit with his or her right hand.

(c) The Site Controller, Controller or mechanic will indicate "ready to test" by giving a thumbs-up with the left hand to the Inspector at the winch drum.

(d) The Inspector will return the thumbs-up to the Site Controller, Controller or mechanic to signal, "Begin test."

(e) With a small adjustable wrench, the Inspector will slowly open the hydraulic bypass valve located near the hydraulic motor on the winch drum. This will allow the winch drum to begin turning freely at a speed controlled initially by the position of the hydraulic bypass valve and finally by the operation of the over-speed clutch. Normal operation of the over-speed clutch will control the rate of descent at a faster than normal rate, but less than a freewheeling descent.

(f) The Site Controller, Controller or mechanic will be alert to total failure of the over-speed clutch. In the unlikely event of a total failure of the over-speed clutch system, he/she will pull the ripcord to release from the launch cable. Total failure of the over-speed clutch would be apparent by the speed of descent. The response of the Site Controller, Controller or mechanic will be very simple:

(i) If the descent feels like a normal *winch-down*, **DO NOT** pull the ripcord, as the test is normal. When the Site Controller, Controller or mechanic has come to a stop over the low point, the Inspector will close the hydraulic bypass valve to restore normal winch operation.

(ii) If the descent feels like a normal *flight*, **PULL THE RIPCORD**, as the over-speed system has failed. Also, the bypass valve must be closed immediately to prevent collision with the launch bridle.

(g) In the event the over-speed clutch has failed, the over-speed system must be repaired or replaced prior to any further Skycoaster® operations.

F. Inspect these miscellaneous points:

1. Inspect any lights, flag poles, audio speakers or other attachments for security of attachment. Any object secured to the tower must have redundant connections to preclude any danger from falling objects. Wire rope chokers with a quick-link or shackle will be used to provide back-up attachments to the towers.

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IV. Rolling Flight-Boarding Platform

A. Check welds, wheels, railing, safety bar and operating abilities.

B. Visually check all bolts and nuts for placement and tightness.

C. The platform hand strap must be very tight to prevent the flyer's knuckles from contacting the deck surface while pushing on the strap as an aid to standing up after the flight.

D. Lubricate bearings as necessary.

E. Verify proper position at the low point.

F. Check the security of the safety tether, carabiner and tether post used to lock the rolling flight-boarding platform in the safety area during every flight.

G. Inspect winch interlock system for proper operation if applicable.

V. Scissors Lift Flight-Boarding Platform

A. Inspect the hydraulic power unit for oil level and oil leaks.

B. Wipe down all surfaces with a clean cloth.

C. Inspect electric motor cooling ducts and clear them of debris.

D. Check all lines for damage or leaks.

E. Clear lowered scissors lift of trash or debris.

F. Test the electrical RAISE enable circuit by boarding the lift, standing on the operator footplate and depressing the UP toe-switch. The scissors lift should **NOT** rise.

G. If the scissors lift should raise without activating the RAISE enable timer switch, **DO NOT** operate the Skycoaster® until the RAISE enable timer switch circuit has been repaired.

H. Depress the RAISE enable button. This enables 60 seconds of electrical power to the hydraulic power unit for the scissors lift.

I. Board the lift, stand on the operator's footplate and depress the UP toe-switch. The scissors lift should rise.

J. With the scissors lift in the raised position, insert maintenance blocks in the frame before proceeding with further inspection.

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WARNING!

At no time should any personnel enter the area beneath the lift table unless maintenance blocks are in position to prevent the lowering of the lift table.

K. With maintenance blocks in position, inspect these points:

1. All welds for cracks
2. All bolts for looseness
3. All actuators for leaks and mechanical security
4. All limit switches for adjustment and mechanical security

L. Lubricate all hinge points and rollers following the manufacturer's schedule.

M. Move all personnel and objects from under the lift table and remove the maintenance blocks. While lowering the lift, test the E-Stop by pushing in the red E-Stop button. The lift should stop and remain stopped until the button is manually returned to its operational (out) position.

N. Test that the winch interlock system will disable the winch-up function with the lift wings in any position other than fully down (less than 6 inches (152.4 millimeters from ground).

NOTE: The 10-foot (3.04 meters) double scissors lift does not have retracting wings. The winch-up function will be disabled if the table is in any position other than fully down (less than 6 inches (152.4 millimeters) from ground).

O. Raise the wings of the scissors lift 6 inches (152.4 millimeters) off the ground or raise the table of the double scissors lift 6 inches (152.4 millimeters) off the ground. With the lift raised 6 inches off the ground the winch-up function must be disabled. If winch-up is possible then **DO NOT** operate the Skycoaster® until the winch interlock circuit has been repaired.

P. Test the wing manual valve and the lift manual valve:

WARNING!

The wing manual valve and the lift manual valve provide an essential safety function. If either valve does not function properly, do not operate the Skycoaster®.

1. Fully lower the lift and wings.
2. Activate the UP toe-switch, without depressing the aluminum footplate, taking care to run the motor not more than five seconds to avoid overheating the oil.

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3. The wings should not rise. If they do, **DO NOT** operate the Skycoaster®, as the wing manual valve is defective. Replace the valve before operating the Skycoaster®.

4. Partially raise the lift and wings.

5. Activate the UP toe-switch, without depressing the aluminum footplate, taking care to run the motor not more than five seconds to avoid overheating the oil.

6. The lift should not rise any farther. If it does, **DO NOT** operate the Skycoaster®, as the lift manual valve is defective. Replace the valve before operating the Skycoaster®.

Q. For complete scissors lift inspection and maintenance procedures, please refer to the Vestil Manufacturing Scissors Lift Owner's Manual.

VI. Hydraulic Landing Unit

A. Inspect the hydraulic power unit for oil level and oil leaks.

B. Wipe down all surfaces with a clean cloth.

C. Inspect all landing poles for proper construction, cracks and/or breaks.

D. Inspect the Perlon rope for frayed or worn sheathing. Remove any portion of the rope that is frayed.

E. Ensure the vinyl loop is in good condition and extends far enough out of the end of the pole to allow the flyers to grab it easily.

F. Ensure that there are no edges on the Perlon rope that can catch on the coupler causing a jerking action as the rope is un-spooled.

G. Test all weight settings by pulling on the loop to ensure proper pressure settings. To properly set the pressure settings, use the following procedure.

1. The recommended pressure settings are as follows:

   (a) Light – 200 psi

   (b) Medium – 400 psi

   (c) Heavy – 550 psi

2. To test the pressure settings for each weight settings, set the selector switch to the desired setting.

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3. Open the door on the side of the landing unit to reveal the pressure valves and gauge. Three valves will be located on the right side of the unit with the valve on the left being the “Light” valve, the middle valve is the “Medium” valve and the valve on the right is the “Heavy” valve.

4. Have a crew member pull on the landing loop simulating a catch while another crew member observes the reading on the pressure gauge.

5. If the pressure setting is different from those recommended by the manufacturer, adjust the valve setting as follows;

   (a) Place an Allen head wrench into the set screw at the top of the appropriate valve and, using an open end wrench, loosen the lock nut at the base of the set screw.

   (b) Turn the set screw clockwise to increase the pressure setting or counterclockwise to decrease pressure.

   (c) Have a crew member pull on the landing loop again to verify the proper pressure setting. If the pressure setting is not correct, continue to adjust set screw until the proper pressure setting is made. After adjusting the valve to the correct setting, tighten the lock nut at the base of the set screw while maintaining the position of the set screw with the Allen wrench.

H. Ensure there is sufficient rope on the drum by pulling the loop a minimum of 30 feet (9.14 meters) beyond the low point.

VII. Overall Area Inspection

A. Inspect the intake area:

1. Make sure all appropriate supplies (pens, pencils, paper, Daily Intake Sheet, etc.) are available for the Customer Representative.

2. Make the area clean and neat.

B. Inspect the flight suit area:

1. Check that all flight suits are in position and all related equipment is available to the Flight Suit Person. The area should be clean and neat.

2. Completely inspect the flight suits:

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NOTE: Every flight suit must be returned to the Skycoaster® authorized inspection facility for inspection/repair every twelve months and taken out of service after five years from the in-service date. Any flight suit that has not received an annual inspection within the last twelve months is to be immediately removed from service and returned to the inspection facility.

(a) Check the flight suit data card to verify that the flight suit has not been in service for more than 12 months without an annual inspection or that the in-service date is not more than 5 years ago.

(b) Check all flight suits for cleanliness, wear and stress.

(c) Inspect the suspension rings, confluence wraps, suspension straps, upper and lower side clips, release rings and connections to the flight suit body. For Sky Sled: Inspect the front and rear suspension rings, front and rear suspension rings, front and rear suspension straps, front and rear spreader bar anchor stitching, front and rear confluence wraps, both yellow flight handles, upper and lower side clips, release rings and connections to the flight suit body.

(d) Inspect the footbars and check the security of the quick-link connectors on the footbars. Check the footbar adjusters for operation and lubricate or replace them if necessary. If the footbar straps are not folded and stitched, ensure that knots are tied in the end of each foot strap to preclude the passage of the strap through a worn or sticking adjuster. Verify that each footbar is connected to the eyebolts with zinc plated nylon insert locknuts.

(e) Check ripcords and snaphooks.

(f) Check leg straps for security and twists through the adjuster hardware.

(g) If there is any doubt that a flight suit is not suitable for use, take it out of service and send it to the factory for inspection/repair.

(h) Store all flight suits in a shaded area to prevent sunlight deterioration.

C. Inspect the flight area:

1. Clear the area of all obstacles and trash.

D. Inspect the attachment area:

1. Clear the area of all obstacles and trash.

2. Inspect the flight carabiners:

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(a) Check the carabiners for proper spring action, locked position, and pin placement.

(b) Replace any carabiner if it is cracked, has more than 10% deformation, missing or loose pins, excessively sharp edges or if the gate will not self-close under spring action.

3. Inspect the launch release system:

(a) Check the launch release system for wear and verify that all components are working properly.

(b) Inspect the yellow pigtail release for cracks or abrasions that could cause damage to the loop on the launch release system.

(c) Have the standby launch release systems available at all times. All launch release systems will have in place an operational secondary snap connection to ensure the launch release system is connected to the launch bridle with two separate connections. It is recommended that all sites have a minimum of 2 working launch release systems during all operations.

4. Inspect the flight cables:

(a) Inspect the bottom attachment end of the flight cables, flemish eyes, thimbles, and swages.

E. Inspect the fencing:

1. Check that all fences and gates are in place and will deter spectators and animals from entering the operations area.

2. All fence openings must be closed with self-latching gates (per SB #12) during flight time.

F. Complete the first flight:

1. At the completion of all inspections, a Site Controller or Controller will make the first flight before opening to the public. **The first flight must be a solo flight, with two other qualified crew members performing the duties of flight crew.**

2. During the winch-up for the first flight, the flyer will be alert to any unusual condition such as noise from the winch, a cable guide or the sheave wheel.

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3. Using the winch pendant, winch the flyer to the top for the first flight and perform the first flight as a normal flight. During winch up, verify that the anemometer is working correctly.

4. After completing the flight, the flyer must be landed using the hydraulic landing pole. Special attention must be paid to the landing unit during the landing to verify proper operation. If unusual noises or a jerking motion is detected, the hydraulic landing unit and hydraulic landing pole must be further inspected for proper operation.

VIII. Staffing Check Points

A. It is important that all staff be in positive working order just like the equipment. They must be physically and mentally capable of performing all duties that they are assigned. The Site Controller is responsible for ensuring that the staff is ready for the day's activities. These are some tips for ensuring a healthy and prepared staff:

1. Comfort Level: How comfortable does your staff feel in expressing their limitations to the Site Controller?

2. Responsibility: Are your team members willing to take on the responsibilities that are placed on them?

3. Awareness: Are your team members aware of all of their duties?

4. Review: A good Site Controller will always be reviewing with the team members.

5. Praise: Let your team members know when they are performing to the standards that you have placed on them. Also, let them know when they are not.

6. Respect: Respect everyone you meet. Out of respect comes growth, knowledge and loyalty. Respect your staff's limitations concerning assigned duties, hours of employment and pay scale.

IX. Crane (when applicable)

A. Inspect the outriggers:

1. Check the earth stability under the pads.

2. Check for hydraulic leaks or settling.

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Do not inspect or operate the Skycoaster® when the possibility of lightning is present.

3. Confirm that lightning grounding rods and grounding mechanisms are properly grounded and that connections are tight.

B. Inspect the house swing lock:

1. Check external house lock cables for security and proper tension.

C. Inspect the boom:

1. When applicable, check the guy wire anchoring system, turnbuckles, shackles, thimbles, wire rope clips and cable.

2. Check cables for proper tension. The cables should be loose enough to allow some visible motion of each cable as a flight swings from side to side.

NOTE: A minimum of once each week, maintenance personnel using safety fall protection equipment, must complete a top-side inspection.

3. Inspect the climbing safety cable for proper tension, wire strand breaks and kinks and inspect the cable attachment at the top of the tower. The cable must be replaced if two (2) or more broken wires or bird caging are discovered.

4. Ensure structural integrity by checking for broken welds, bends or abrasions.

5. Inspect all pins and cotter pins for placement and cracks and visually inspect all bolts for tightness.

6. Check shackles for placement, cracks, cotter pin placement and position.

7. Inspect cables and pennant lines for broken wires, kinks, compression or abrasion.

8. Inspect sheave wheels for breaks, cracks and placement.

D. Inspect the flight and counterweight brackets:

1. Inspect welds, bolts, shackles, cotter pins, bushings and washers, secondary cable loops and wire rope clips.

2. If applicable, inspect adjusting turnbuckles, support cables and wire rope clips.

3. Triangulated Flight Bracket Catwalk and Support – Inspect as per Service Bulletin 31 issued on May 28, 2004.

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E. Inspect the flight cables:

CAUTION: Flight cables that are removed from service must not be used again in any ride related capacity and must be destroyed.

1. Inspect the shackles, thimbles, swages and cable at attachment points.

2. Inspect secondary cable loops and wire rope clips.

3. Each month, inspect the full length of the flight cables by slowly climbing down the boom while inspecting the cables as they pass through your hand.

4. The cable must be replaced if one (1) or more broken wires or bird caging are discovered.

WARNING!

Do not pull the flight cables to the top of the structure for inspection. A cable dropped from the top will be irreparably damaged, but more importantly, a cable dropped from the top is a serious safety hazard to the inspector or anyone else on or near the structure or boarding platform.

F. Inspect the counterweight cable:

1. Inspect the shackle, thimble, swages and cable at the attachment point.

2. Inspect the secondary cable loop and wire rope clips.

3. Every month, inspect the full length of the counterweight cable using the following procedure:

   (a) Disconnect the launch cable from the launch bridle at the Omega Carabiner.

   (b) Tie a length of rope to the launch bridle and use the rope to pull the counterweight cable towards the base of the flight structure.

   (c) Wearing and using safety fall protection equipment, climb the flight structure approximately 20 to 30 feet (6.09 to 9.144 meters) while carrying one end of the rope that was just tied to the launch bridle.

   (d) Using the rope, pull the launch bridle and counterweight to the flight structure and tie the counterweight to the flight structure to relieve its weight from the counterweight cable.

   (e) Ascend the flight structure to the counterweight bracket.

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WARNING!

Do not pull the counterweight cable to the top of the structure for inspection. A cable dropped from the top will be irreparably damaged, but more importantly, a cable dropped from the top is a serious safety hazard to the inspector or anyone else on or near the structure or boarding platform.

(f) While slowly climbing down the flight structure, inspect the entire length of the counterweight cable as it passes through your hand.

(g) Inspect for any broken wires, kinks, compressions or abrasions.

(h) Replace the counterweight cable if there is any doubt about cable integrity. The cable must be replaced if two (2) or more broken wires or bird caging are discovered.

(i) Inspect the quick-links on the launch bridle and counterweight for tightness and excessive wear. Only Mallion Rapide or Suncor Stainless brand links are to be used in this area.

(j) Use medium grade Loc-tite to close any quick-links.

(k) Inspect the launch bridle thimbles, swages and cable. Look for broken wires, kinks, serious bird caging, compressions or abrasions. The launch bridle must be replaced if two (2) or more broken wires or bird caging is found on any single leg.

(l) Untie the counterweight from the structure and lower the launch bridle to the attachment area.

(m) Connect the launch cable to the launch bridle with the Omega Carabiner.

CAUTION: Look upwards along the counterweight cable and ensure it is not twisted around a flight cable. The flight cables and counterweight cable must hang independently with no wraps around another.

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2.1 PRE-OPERATION INSPECTION PROCEDURES

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Use the following Skycoaster® inspection log for your 'Daily', 'Weekly' and 'Monthly' inspections. If an inspection item does not apply to your site, write “n/a” in the initials column for that item. All dual Skycoaster® sites must complete a separate inspection log for each flight line. **Inspections must be completed and dated for the month in which they are to apply.** Keep all inspection logs in chronological order in a three ring binder. **Skycoaster must receive a copy of each month’s inspection log by the 5th day of the following month.**

Any Skycoaster site that uses an inspection log other than the one provided in this manual must submit a written document to Skycoaster stating that the inspection log they are using meets and/or exceeds the inspection guidelines as outlined in this Owner’s Manual.

Skycoaster requires that all sites have a third party inspection completed on an annual basis. A professional engineer, a state licensed ride inspector, or a licensed ride inspector with an insurance company, NAARSO (level II or better) or AIMS (CRI or PRI) designation may perform the inspection. The inspection must cover the entire ride, including its structure and components, done in accordance with the inspection procedures outlined in the Skycoaster® Owner’s Manual and any applicable service bulletins. Each year’s inspection must be completed no more than 15 days after the one year anniversary of the previous year’s inspection. A completed Skycoaster® Inspection Log must accompany all third party inspection documentation.

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Location	**2018 SKYCOASTER® INSPECTION LOG** **Page 1 of 2**	Today's date

Items 1-26, 38 are to be performed daily,1-29, 38 weekly, 1-35, 38 monthly, and 1-38 Semi Annually

Item No.	Day of inspection (circle one): SUN MON TUE WED THUR FRI SAT Description of inspection criteria.	Initials
	FLIGHT TOWER – DAILY	
1	**BASE:** Inspect the foundation base bolts and grounding rods. (p. 29)	
2	**MISCELLANEOUS:** Check the attachment of the lights and their safety cables, steps and lower attachments of the safety climbing cables. (p. 29)	
	LAUNCH TOWER – DAILY	
3	**BASE:** Inspect the foundation, base bolts and grounding rods. (p. 33)	
4	**MISCELLANEOUS:** Check the attachment of the lights and their safety cables, steps and lower attachments of the safety climbing cables. (p. 33)	
5	**WINCH:** Inspect mounting bolts, welds and winch drum assembly.(p. 34)	
6	**WINCH:** Inspect hydraulic hoses, oil level, electrical and hydraulic operations. (p. 35,65)	
7	**OPERATION:** Check the winch light, video and PA systems. (p. 35)	
8	**OPERATION - LAUNCH CABLE:** Perform a daily full length cable inspection (including the marker tape flags). (p. 35-37)	
9	**OPERATION:** Inspect the winch pendant, check function of cycle start up and down, and proximity limit switches. (p.37-38)	
10	**OPERATION:** Check the E-Stop function. (p. 37)	
11	**OPERATION:** Test operation of the Down Safety Alarm. (p. 38)	
	AREA INSPECTIONS – DAILY	
12	**LAUNCH BRIDLE:** Inspect connector links, swages, thimbles and all legs for broken wires. (p. 37)	
13	**HYDRAULIC LANDING UNIT:** Inspect oil level, hoses, electrical and hydraulic operation. (p. 42-43, 65)	
14	**HYDRAULIC LANDING UNIT:** Inspect the both manual landing pole and hydraulic landing pole. (p. 42)	
15	**HYDRAULIC LANDING UNIT:** Inspect the perlon rope for wear and proper length (minimum 30-feet past low point). (p. 42-43)	
16	**HYDRAULIC SCISSORS LIFT:** Inspect power unit, hoses and fluid level. (p. 40)	
17	**HYDRAULIC SCISSORS LIFT:** Check the welds, anchoring, hoses and tracks. (p. 41)	
18	**HYDRAULIC SCISSORS LIFT:** Test the raise enable function, manual foot valve, and winch interlock function. (p. 41-42)	
19	**HYDRAULIC SCISSORS LIFT:** As required, lubricate all pivot areas. (p. 41)	
20	**ROLLING CART:** Inspect the structure, fasteners, track and wheels. Lubricate weekly. (p. 40)	
21	**ROLLING CART:** Inspect the safety tether and safety bar. (p. 40)	
22	**FLIGHT AREA:** Ensure flight area is clear of all obstacles. (p. 44)	
23	**FENCES & GATES:** Inspect all signs, markings, fencing and gates. (p. 45, 205-206)	
24	**INTAKE AREA:** Check the condition of the intake area. (p. 43)	
25	**FLIGHT SUIT AREA:** Check the flight suit & Sky Sleds cleanliness, straps, hardware, ripcord, in-service and last inspection dates. (p. 43-44, 81)	
26	**MISCELLANEOUS:** Inspect the flemish eyes, thimbles, swages, carabiners, and launch release systems. Verify that anemometer is working correctly. (p. 44-46)	

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Location	**2018 SKYCOASTER® INSPECTION LOG Page 2 of 2**	Today's date

Items 1-26, 38 are to be performed daily,1-29, 38 weekly, 1-35, 38 monthly, and 1-38 Semi Annually

Item No.	Day of inspection (circle one): SUN MON TUE WED THUR FRI SAT Description of inspection criteria.	Initials
	FLIGHT TOWER – WEEKLY	
27	**TOP-SIDE:** Check the structure, fasteners, climbing safety cables, and lights. (p. 29-31)	
28	**FLIGHT AND COUNTERWEIGHT BRACKETS:** Inspect flight shackles, bushings, washers, welds, thimbles, swages, secondary loops and wire rope clips. (p. 31)	
	LAUNCH TOWER— WEEKLY	
29	**TOP-SIDE:** Check the structure, fasteners, climbing safety cables, lights, speakers, cable guides, and sheave. (p. 33-34)	
	FLIGHT TOWER – MONTHLY	
30	**LATTICE ARCH/PORTABLE FLIGHT BRACKET:** Inspect per SB#31. (p. 30-31, 243-244)	
31	**FLIGHT CABLE:** Perform full length inspection. (p. 31)	
32	**COUNTERWEIGHT CABLE:** Perform full length inspection. (p. 31-33)	
33	**SAFETY CLIMBING CABLE:** Perform full length inspection. (p. 30)	
	LAUNCH TOWER – MONTHLY	
34	**SAFETY CLIMBING CABLE:** Perform full length inspection. (p. 33)	
35	**WINCH SYSTEM:** Perform an overspeed clutch test and the pressure relief valve test, inspect electrical enclosure, and lubricate bearings. (p. 38-39, 65-66, 268)	
	SEMI ANNUAL INSPECTION (Annual Inspection for Seasonal Parks)	
36	**HYDRAULIC LIFT:** Perform NDT of all weld joints per SB #28 and #30. (p. 237, 241)	
37	**WINCH:** Inspect motor and load adapter shaft and keys. (p. 66)	

ANYONE WHO HAS PERFORMED AN INSPECTION AND INITIALED THIS LOG MUST SIGN BELOW

Inspectors signature:

Inspectors signature:

Inspectors signature:

Inspectors signature:

BEFORE ANYONE MAY FLY THIS ATTRACTION, THIS SHEET MUST BE SIGNED BY A SITE CONTROLLER IDENTIFYING IT AS READY TO OPERATE.

Site Controller Name (print):

Site Controller signature: **Date:**

	FIRST FLIGHT OF THE DAY	
38	**FIRST FLIGHT:** Site Controller or Controller must perform first flight. (p. 45-46)	

Pass Down Information (use additional sheet if necessary)

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Any maintenance completed or repairs made to the Skycoaster® attraction must be recorded in the Maintenance Log Journal.

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Skycoaster® Maintenance Log Journal

Location _____ Skycoaster Serial # _____

Date	Work Performed	Print Name

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APPENDIX C TESTING REQUIREMENTS

These are Florida and Nevada non-destructive testing requirements for annual Skycoaster® flight simulator inspection:

1. Inspect carabiners, including the gates, pins, lock mechanism and frame for any signs of wear or corrosion. Replace if necessary. Do not attempt to repair any carabiners.

2. Inspect the winch and winch mounting structure thoroughly and check the tightness of all bolts, nuts and pins.

3. Check all welds for cracks.

4. The drum mounting assembly is extremely critical; check all bearing and attachment points.

5. Take any corrective action necessitated by inspection.

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APPENDIX D REFERENCE TO ISSUED STANDARDS

The following is a partial list of issued standards that affect the amusement industry worldwide. Some of the standards are voluntary and some are legally binding. However, the existence of standards, whether they are voluntary or required by law, has legal significance in terms of the standard of care to which park management may be held in the event of a lawsuit.

U.S.A. Standards

ASTM American Society for Testing and Materials:

- F698.88 - Standard specification for Physical Information to be Provided for Amusement Rides and Devices
- F747.89 - Standard Definitions of Terms Relating to Amusement rides and Devices
- F770.88 - Standard Practice for Operation procedures for Amusement Rides and Devices
- F846.92 - Standard Guide for Testing performance of Amusement Rides and Devices
- F893.87 - Standard Guide for Inspection of Amusement Rides and Devices
- F1159.92 - Standard practice for the Design and Manufacture of Amusement Rides and Devices
- F1193.88 - Standard Practice for Amusement Ride and Device Manufacturer Quality Assurance Program
- F1305.90 - Standard Guide for the Classification of Amusement Ride and Device Related Injuries and Illnesses

NFPA, National Fire Protection Life Safety Code (NFPA 101)

Occupational Safety and Health Administration Standards (CFR-1910)

BOCA, National Building Code

ADA, Americans with Disabilities Act, Title 111, Public Accommodations and Commercial Facilities

ANSI B-77, Aerial Passenger Tramways

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APPENDIX D REFERENCE TO ISSUED STANDARDS

British Standards	British Code of Safe Practice
Canadian Standards	Standard Z-267
German Standards	Standard D-4112
European Standards	Under Development, European Standard CEN-152

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APPENDIX E HYDRAULIC COMPONENT MAINTENANCE/SERVICE

I. Daily Inspections

A. Visually inspect all equipment for hydraulic leaks and loosened hose connections, fittings, nuts, bolts, etc. and tighten as necessary.

B. Visually inspect the filter clog indicator gauge while the unit is operating and at a stabilized operating temperature. Cold oil is thick and may falsely cause the indicator to show a clogged condition. If the filter is not dirty, this false indication will slowly decrease as the oil temperature rises. If the clog indicator continues to show a clogged condition at stabilized operating temperature, the filter must be replaced.

C. Visually verify the hydraulic fluid level in the reservoir using the sight level gauge on the side of the reservoir. The fluid level must never be allowed to drop below sight range in the glass. The normal operating level is when the fluid level is at or slightly below the "maximum oil level" mark. Replenish hydraulic fluids as necessary. **Note**: Clean hydraulic fluids range from clear to a golden honey color depending on the manufacturer. No clean oil is brown or black in color. If the fluid is milky in color, this is a sign of water emulsified in the fluid and the reservoir should be drained and filled to the proper level with new fluid.

D. Check to be sure the reservoir filler cap is securely tightened to prevent the introduction of foreign particle contamination.

E. Visually inspect the hand-held winch pendant and its cable the full length to the control enclosure on the power unit. Check for loose wire connections at both ends and cut or worn areas along the cable. Repair or replace as necessary.

F. Visually inspect the winch cable drum for obvious signs of wear or distress. With the drum turning, verify that the pinch roller assembly is rotating freely. If the pinch roller appears bound or shows excessive wear, apply several shots of WD-40 or equivalent to each end where the roller shaft rotates in bronze sleeve bushings. Operating the winch cable drum with a seized pinch roller will quickly damage the roller beyond repair.

II. Monthly Inspections

A. Monthly or at least once during the operating season, the hydraulic filter should be changed regardless of the condition shown on the clogging indicator. Remember that filters are cheap - hydraulic pumps and valves are not. Refer to the filter element replacement section of this manual and follow the installation instructions printed on the replacement filter.

B. After switching the main power off, open the electrical enclosure on the power unit and visually inspect the contactor and transformer for obvious signs of electrical

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distress such as arcing or excessive heat. Notify your electrician if anything looks questionable.

C. Grease the 4-bolt flange bearing on the cable drum unit (item 15 on drawing B10036) with two shots of bearing grease. Skycoaster recommends "LUBRIPLATE" but any premium grade, high quality bearing grease is acceptable. **Note**: If a replacement load adapter bearing (Item 16 on drawing B10036) is purchased from Skycoaster, it will require proper lubrication prior to use.

D. Perform the monthly test of the Hydraforce Pressure Relief Valve as instructed in Notification N-003. A copy of this Notification can be found in the Service Bulletin Section of this manual.

III. Annual Inspections

A. All hydraulic fluid should be drained and replaced with new fluid. While the reservoir is drained it is recommended (and convenient) to unbolt and raise the top reservoir cover and remove the pump suction strainer (item 4 on drawing B10035) for cleaning. This strainer is cleanable in any petroleum-based solvent and can be blown clean with a compressed air blowgun. Re-install the cleaned strainer and tighten sufficiently before adding new oil.

B. Inspect the shafts and square keys on the winch cable drum motor and load adaptor bearing. Begin by removing the hydraulic motor and load adaptor bearing from the cable drum shaft. Inspect the motor and load adaptor shafts and keys. If either shaft shows obvious signs of excessive wear (i.e.; broken metal pieces or keyways being sheared off), that component should be replaced immediately. If either key is broken or shows obvious signs of excessive wear, replace it with the appropriate key stock as follows: Load Adaptor Key – 3/8” square C1018 steel key stock cut 2” long, Hydraulic Motor Key – 5/16” square C1018 steel key stock cut 1.25” long. These keys may be obtained from your local industrial supply store. While the unit is disassembled, check the fit of the shaft into the end plates of the winch drum for proper fit. If the holes in the end plates are elongated to the point where the shaft does not fit properly and the drum is allowed to move on the shaft, the load adaptor bearing may experience excessive wear and premature failure.

IV. Hydraulic Fluid Cleanliness

A. The single worst enemy of any hydraulic system is hydraulic oil contamination. Proper filter elements plus systematic filter changes can eliminate most of the potential causes of hydraulic systems failure.

B. The hydraulic system continually circulates the same fluid and although the system is "closed", it is not dirt proof. Harmful dirt and other foreign particles may be introduced or produced by wear. Introduced contaminants can enter the

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system through seals, the filler-breather cap on the reservoir, or when hose connections are broken for repair and/or equipment relocation. Wear contaminants include small particles of metal and sealing materials which result from wear of moving parts within the system. Fluid breakdown can form sludge and acids. These result from chemical reactions within the fluid caused by water, excessive heat and pressure, and incompatible fluids. Sludge is not generally abrasive; however, it is recognized as the source of resinous and gummy coatings on moving parts that can clog passages and pit and corrode critical moving parts. Each dirt particle in the system is an "abrasive seed" that produces additional particles as it passes through pumps, valves, and actuators. Clearances in hydraulic components are extremely close, as small as .0005 inches (12 microns) and when abrasive particles of dirt enter the space between moving parts they score or hone the surfaces to greater clearances and coincidentally produce additional particles. Thus, the process continues at ever increasing speed as the system continues to run. The ensuing results are:

1. Internal leakage (or slippage) which lowers the efficiency of the hydraulic pump and hydraulic motor and decreases the ability of the valves to control flow and pressure accurately. This also wastes horsepower and generates heat.

2. Sticking of parts due to sludge or silting (collection of fine particles).

V. Filter Element Replacement

A. The factory-installed hydraulic fluid filter is a spin-on, throwaway type (non-cleanable) with a filtration degree of 10-micron nominal and can be purchased through Skycoaster.

B. In maintenance circles, it is generally understood that "the easier it is to do, the more apt it is to get done." For this reason, we have provided below a list of alternative filter manufacturers with part numbers that are a direct interchange with the factory installed filter.

C. The following elements are available from various fluid power parts houses:

1. Parker #921999

2. Fairey Arlon #FA35-CC10

3. Zinga #AE10

4. Gresen #K22001

5. MP Products #CSG-50-P10A

D. The following elements are available from most automotive parts houses:

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1. AC #PF16
2. Mopar #L318
3. WIX #CW1551-MP
4. Hastings #P731
5. Purolator #PER-10
6. Baldwin #BT839-10
7. NAPA #l551
8. Fleetguard #HF6056
9. Motorcraft #FH10

VI. Filter Maintenance

A. Set up a filter maintenance schedule and follow it diligently.

B. Inspect filter elements that have been removed from the system for signs of failure, which may indicate the need for shortening the service interval and the possibility of other system problems.

C. Do not return any fluid to the system that has leaked out.

D. Always keep the supply of fresh fluid covered tightly.

E. Use clean containers, hoses and funnels when filling the reservoir.

F. Use common sense precautions to prevent entry of dirt into temporarily removed components.

G. Properly fasten all clean-out holes, filler caps and breather cap filters on the reservoir.

H. Do not run the system unless all normally provided filtration devices are in place.

I. Make certain that the hydraulic fluid used in the system is a type recommended by the manufacturer of the system components.

VII. Hydraulic Fluid Specifications

When it becomes necessary to replenish or replace the hydraulic fluid in the reservoir, be sure to use only a premium grade hydraulic fluid. Do not operate this system using

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motor oil. Approved premium grade hydraulic fluids contain anti-wear and anti-foaming additives, which prolong system component life.

Before leaving our factory, the unit is filled with Citgo 46 AW, which is generally recommended for climates with average operating season ambient temperatures of 50 degrees Fahrenheit or higher. In areas where average operating season ambient temperatures are below that, a 32 weight fluid is recommended.

On the following pages are lists of approved hydraulic fluids. Several of the fluids from major manufacturers are available nationwide at your local industrial oils and lubricants dealer.

VIII. Factory Approved Hydraulic Oils

Amoco Oil Co.	AW46
Arco Oil Co.	Duro AW46
Chevron	AW46
Citgo	AW46
Conoco	ISO-VG46
Exxon Company	NUTO-H46
Gulf Oil Company	Harmony 46AW
Mobil Oil Corp.	DTE25
Pacer Lubricants, Inc.	V46
Pennzoil Products Co.	AWX46
Shell Co.	Tellus 46
Sun Oil Co.	Sunvis 821 WR
Texaco, Inc.	Rando HD46

IX. Hydraulic Fluid - HF-O Qualified Products List

Amalie Refining Co.	800 Manual Transmission Lube

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Amalie Refining Co.	AMA-OIL R&O AW 100, 200, 300, 500
American Lubricants Co.	160, 200, 300, 450, 600 AW Hydraulic Fluid
Amoco Oil Co.	Rynkon Oil Number 32, 46, 68
Autoline Oil Co.	Super Blue Hydraulic Oil ISO 32, 46, 68, 100, 150
Autoline Oil Co.	Terrapin Industrial Oil ISO 32, 46, 68, 100, 150
Chevron (USA)	Chevron AW Hydraulic Oils ISO 32, 46, 68
Citgo	Citgo AW Hydraulic Oil 32, 46, 68, 100, 150
D-A Lubricant Co. Inc. - USA	D-A Hydra Shield 32, 46, 68, 100
Elf/Antar	Elf Olna DS 32, 46, 68
Exxon Company - USA	NUTO-H 32, 46, 68, 100
Georgia-Carolina Oil Co.	G-C Safety Press AW Hydraulic Oil, Light Special #15 Medium, Heavy and X-Heavy #40
Gulf (USA)	Gulf Harmony 46 AN-HVI
Gulf (USA)	Gulf Harmony AW 32, 46, 68, 100, 150
Gulf (USA)	Gulf SL H32AW, SL H46AW, SL H68AW
Gulf Canada LTD.	Harmony HVI 36
Illinois Oil Products - USA	Supreme R&O Antiwear Hydraulic Oil
Kendall Refining Co.	Kenoil R & O AW 32, 46, 68, 100
Kendall Refining Co.	Kentran 080
Luscon Ind.	Hydralube 32AW, 46AW, 68AW, 100AW
Luscon Ind.	Luscon HD 32, 46, 68, 100
Neruol	Neruol Fluid SH2 ISO 32, 46, 68, 100, 150
Northland Products Co. - USA	H D Hydraulic Oil
Nyco Lubricants Corp.	Nyco Hydraulic Oil 32, 46, 68, 100
Orly International	Orly Agena ISO 32, 46, 68
Orly International	Orly Gala ISO 32, 46, 68

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Orly International	Orly Hydro ISO 32, 46, 68
Pacer Lubricants, Inc. - USA	Pacer Power V Hydraulic Oil V32, V46, V68, V100, V150
Petroleum Packers, Inc. - USA	452-03 A.W. Hydraulic HF-O 46 200 452-03 A.W. Hydraulic HF-O 68 30
Primrose Oil Co.	No. 210 Hydraulic Oil
Shell Canada LTD.	Shell Tullus Oil 32, 46, 68, 100, 150
Shell Co. - CANADA	Tellus T37 (Multigrade)
Shell Co. – USA	Tellus 23, 32, 46, 68, 100
Showa Oil Co. LTD. (Japan)	Shoseki W-R 22, 32, 46, 56
Sun Oil Company - USA	Sunvis: 816 WR (32)* 821 WR (46); 321 WR (68); 851 WR (100); 865 WR (150) *manufactured after July 1, 1978
Suncor (Canada)	Sunvis 816WR, 821WR, 831WR, 841WR, 851WR, 865WR
Texaco	Rando Hydraulic AZ
Texaco Inc. – USA	Rando Oil HD 32, 46, 68, 150
The Pentagon Corp.	Pen Premium EP Hydraulic Oil 32, 68, 100
Viscosity Oil Co.	Viscor L-4333, L-4327, L-4328A, L-4

X. Hydraulic Fluid – Petroleum Base With Anti-Wear Additive For Severe Duty

Amoco Oil Company – USA	Amoco AW OIL 32, 46, 68
Arco	DURO AW 32, 46, 68, 100
Chevron Canada	Chevron AW Hydraulic Oil 32, 46, 68
Conoco	Super Hydraulic Oil ISO-VG 32, 46, 68, 100
Dryden Oil Company - USA	Blue Hydraulic Oil 10, 20, 30
Dryden Oil Company - USA	Paradene anti-wear 32AW, 46AW, 68AW, 100AW, 150AW
Getty Refining & Mktg. Co. - USA	Skeluis MP SAE 10, 20, 30
Golden Bear – USA	Golden Bear 8090 CO ISO, 32, 46, 68, 100, 150
Hydrotex USA	Systems I Hydraulic Fluid ISO, 32,

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	46, 68, 100, 150
Imperial Oil Limited - Canada	NUTO H32, H46, H68, H80, H100
Klasing Oil Co. - USA	Powerlene Hydraulic Oil A, B, C
Mobil Oil Corporation	DTE 24, DTE 25, DTE 26
Pennzoil Products Company - USA	Pennzoil AWX Hydraulic Fluids 32, 46, 68, 100
Selco	Selco SF 330-32, -46, -68, -100, -150
Steelco Industrial Lubricants - USA	#7410 Hydraulic Oil, #7420, #7430
Total Technique - France	Total Hydraulique 05171
Union Oil – USA	Union Unax AW ISO-VG 32, 46, 68, 100, 150

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Occasionally when performing maintenance, it is necessary to turn the power OFF to some machinery. For safety when turning the power OFF, properly lockout and tagout the equipment. The owner/operator has the ultimate responsibility for training and instructing in proper lockout and tagout procedures.

The procedure for the daily launch cable inspection is found in *Section 2.1 – III – D*.

I. Replacing the Launch Cable

A. Refer to Figure 8 as shown below for the following procedure.

1. Set the spool of new cable in front of the winch, acclimated so that the rotation is in the same direction as the rotation as the winch drum.

2. Disconnect the Omega Carabiner from the launch bridle.

3. Pull tension on the launch cable. Use manual control to winch down so that only one turn of cable remains on the drum.

4. Remove the last turn from the cable drum and cut the copper stopper off the end with a cable cutter tool.

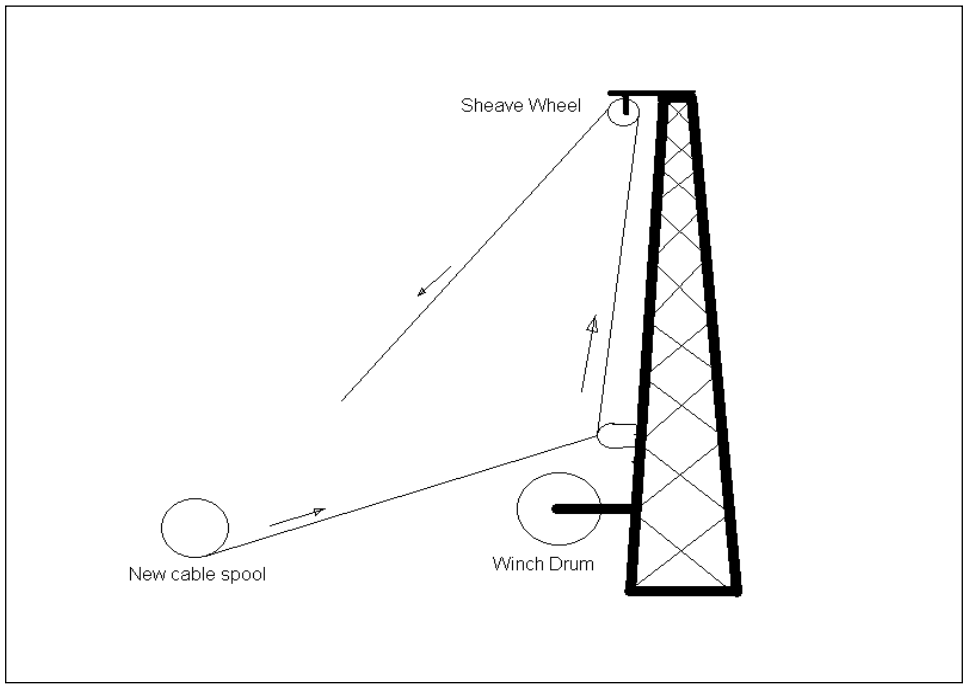

Figure 8 New launch cable installation

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CAUTION: Do not let the end of the cable loose, as it may unwind up the tower and go over the sheave, falling to the ground, possibly causing injury to persons or property.

5. Overlap the end of the new launch cable 24 inches (609.6 millimeters) with the end of the old launch cable and tape the two securely together by wrapping one layer of tape tightly around the 24 inches (609.6 millimeters) of overlapped cables.

6. Grasping the rubber bumper on the old cable, pull the old cable, which in turn will install the new cable up the tower and over the sheave.

CAUTION: Inspect the new cable carefully as it is drawn up the tower. While wearing gloves, hold a rag around the cable to feel for any broken wires as the cable is being slowly fed onto the tower. Inspect for any kinks, broken wires or irregularities in the cable. Do not install any cable of questionable integrity.

7. Using the proper tools and techniques as outlined in Notification N-003, swedge the launch bridle end of the launch cable using the appropriate heavy-duty thimbles and zinc plated copper sleeves, copper stopper, two 3 or 4 inch (76.2 or 101.6 millimeter) steel discs and the rubber bumper.

8. If not already installed, swedge a copper stopper on the launch cable 2 inches (50.8 millimeters) from the winch drum end of the cable.

9. Route the launch cable through the cable guide on the winch drum and insert the copper stopper into the keyway in the winch drum.

10. Using manual control, slowly rotate the winch drum up one turn while holding tension on the launch cable at a point approximately 2 feet (.609 meters) from the winch drum.

WARNING!

Keep hands, hair, and clothing well away from a moving winch drum to avoid serious injury and/or being pulled into the moving winch.

11. Ensure the copper stopper is approximately 1 to 2 inches (25.4 to 50.8 millimeters) inside the keyway of the winch drum and that the cable exits the drum as flat as possible in the machined groove. Avoiding a sharp bend in the cable where it exits the keyway will help prevent broken wires in this area.

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12. Have an assistant maintain as much tension in the launch cable as possible by pulling on the rubber bumper.

13. Use a wooden stick or handle to guide the launch cable into the grooves and slowly winch up while tension is being held on the launch cable. Winch up until the rubber bumper is at the flight-boarding platform at the low point of the flight.

14. Visually inspect the lower portion of the counterweight cable for condition. Confirm that the quick-link connectors on the counterweight and launch bridle are closed. Use Loc-tite medium thread-locking compound on any quick-link connector whenever closing.

15. Set the marker flags, as described in the next section.

II. Setting Marker Flags on the Launch Cable

A. Ensure that the flight cables are not connected to the launch bridle.

B. Using manual control at the winch unit, winch up to the absolute top or until the counterweight cable is taut between the launch tower and the flight structure.

C. Use red cloth tape to make the UP marker flag on the launch cable just above the winch drum. Refer to Figure 9.

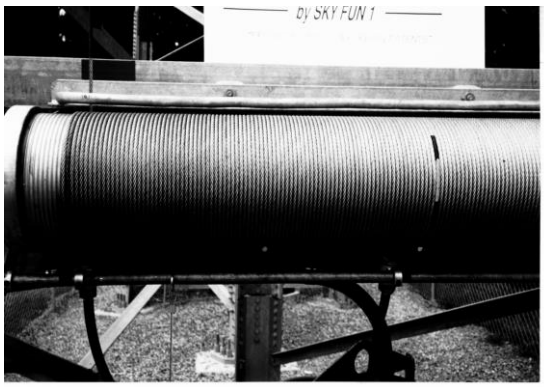

Figure 9 "UP" marker flag

CAUTION: If moving/replacing the tape marker flag on the cable, scrape off the old tape with a dull knife. To avoid roller damage, do not allow a build-up of tape on the cable.

D. Using manual control, slowly lower the launch cable approximately 24 inches (609.4 millimeters).

E. Use yellow cloth tape to make the FLIGHT marker flag, 18 inches (457.2 millimeters) below the red UP marker flag. The UP proximity limit switch will be set so that flyers are raised to the yellow FLIGHT marker flag. Refer to Figure 10.

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F. To determine the location of the DOWN marker tape:

1. Lower the launch cable enough so that it can be attached to the launch bridle, and the launch bridle attached to the flyers.

2. It should require approximately 25 pounds (11.33 kilograms) of force to pull in the launch bridle.

3. Adjust the amount of cable out, to achieve the 25 pound (11.33 kilogram) force.

4. Use black cloth tape to make the DOWN marker flag on the launch cable, just above the winch drum.

5. The DOWN proximity limit switch will be set to lower the launch cable to the black DOWN marker tape.

Figure10 'FLIGHT' mark position flag

III. Setting the Proximity Limit Switches Up and Down

Before beginning, you must understand that the final adjustment of the proximity limit switches must be accomplished only after the winch unit and hydraulic oil have reached a stabilized operating temperature.

A. Using the pendant, run the launch cable up and down and observe any change that may be needed in proximity limit switch settings to stop the launch cable at the yellow FLIGHT and black DOWN marker flags. Turn the power to the winch unit OFF.

> **CAUTION:** Turn OFF power to the winch before working on any winch drum component or adjusting proximity limit switches. For safety, properly lockout and tagout the winch after turning the power OFF.

B. Use a small piece of tape to mark a reference starting point on the proximity limit switch mounting bar and loosen the set screw on the proximity limit switch mounting bracket.

C. Insert the switch shim tool between the proximity limit switch and the launch cable, not the winch drum. Move the proximity limit switch a small distance in the appropriate direction, and tighten the set screw.

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D. Remove the shim tool from between the proximity limit switch and the cable before turning the winch power ON and rotating the winch.

E. Observe the operation of the winch and the location of the marker tape flags during a flight cycle. Adjustments to the proximity limit switches may be made during the flight time when the winch drum is full of launch cable. Remember to turn off power to the winch while you are making any adjustments, so the flight crew cannot inadvertently start the winch.

F. Because of "cold oil" affecting the delay time of the solenoid valve, it is normal for the first few flights of the day to be taken to the absolute top and for the launch cable to lower further DOWN. As the unit reaches a stabilized operating temperature, the soft shift valve will react at its adjusted speed and the launch cable will stop where it was previously set at normal operating temperature.

IV. Adjusting the Soft Shift Valve

Adjusting the soft shift valve will rarely, if ever, be necessary. The normal delay range, from energizing the UP or DOWN circuit until the winch begins turning, is 3 to 6 seconds with the unit at normal, stabilized operating temperature. A cold unit will have an increased delay time, both in starting and stopping. Turning the adjustment screw IN (clockwise) will increase delay time. If the winch has no delay time, i.e. the winch drum "jumps" immediately to full speed, it is likely the valve has air in the delay mechanism and must be bled. If the valve is removed from the unit and replaced, it is likely that air will need to be bled from the valve.

V. Bleeding the Soft Shift Valve

A. Disconnect the two hydraulic lines to the winch drum hydraulic motor at the quick-disconnect fittings.

B. Loosen the locknut on the delay adjustment screw on the valve.

C. Unscrew and remove the adjustment screw from the valve body. If necessary, fill the threaded opening with hydraulic oil.

D. Using the winch pendant, switch from UP to DOWN at 5 to 10 seconds intervals. Stop every 2 to 3 cycles to fill the threaded opening with hydraulic oil.

E. Continue this process for 20 to 40 cycles.

F. Replace the adjustment screw in the valve body and snug down the locknut.

G. Connect the hydraulic lines to the winch drum hydraulic motor.

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H. Winch the launch cable/counterweight system 3/4 of the way to the top to give the launch cable some tension on the drum.

I. Cycle the winch up and down at 5-10 second intervals for 5 cycles to help purge air from the valve.

J. Repeat the process if necessary. Having the unit at a normal, stabilized operating temperature will aid in purging air from the valve.

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APPENDIX G SPARE PARTS LIST

The Skycoaster® system has proven to be very rugged. Nevertheless, it is an electrical/mechanical system subject to wear and break down for any number of reasons.

It is strongly suggested that you be well acquainted with a highly qualified and motivated electrical shop and hydraulic shop in your immediate area before you have need of their assistance. It is also suggested that you maintain spare parts at your site.

I. These are the recommended minimum spare parts to have on site.

A. All Skycoaster® attractions:

1. One complete set of cables (flight, launch and counterweight)
2. One launch bridle
3. Ten zinc plated copper sleeves - 1/4 and 5/16 inch (ten of each)
4. Five heavy-duty cable thimbles - 3/8 inch
5. Five copper stoppers - 1/4 or 5/16 inch
6. One complete winch pendant assembly (yellow Up/Down handle with cord and plug)
7. One cycle start latching relay
8. One set of proximity limit switches
9. One complete set of carabiners (2 flight, 1 omega)
10. Two three ring release assemblies
11. Three flight shackles, with bushings and washers
12. One carabiner fairing
13. Three 3/8 inch wire rope clips

B. Sites utilizing Hydraulic Lift

1. One E-Stop switch
2. Four wing return springs (sites with 5 foot (1.5 meter) lift)

C. Sites utilizing Rolling Cart

1. Two cart wheels

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2. Two cart bumpers
3. Two ball sockets and studs
4. Two gas shocks

D. Sites utilizing Hydraulic Lander

1. One time delay relay
2. One roll of Perlon rope
3. One relief valve

II. These are the recommended additional spare parts to have on site.

A. One hydraulic pump

B. One hydraulic motor

C. One soft shift hydraulic valve

D. One counterbalance valve

E. One manual valve

F. One relief valve

G. One roller cable guide rebuild kit for each size

H. Six Cam Lock buckles

I. Four footbar straps

J. Six #3 connector links

K. Six ripcord snaphooks

III. High volume/high income sites should carefully consider their anticipated revenue losses should a major malfunction occur on a busy Friday night or weekend. It is highly recommended you have in your storage area a complete second winch system and, at the very least, the minimum spare parts shown in the list above. Inspect all parts upon receipt. Damaged or incorrect parts must be returned within 60-days of receipt to receive full credit.

Please contact Skycoaster for all your spare parts needs.

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I. Prolonging the Life of Your Skycoaster® Flight Suit & Sky Sled

A. Always keep your flight suits in the shade out of direct sunlight as UV sunlight destroys nylon.

WARNING!

Never allow flight suits & Sky Sleds to be in the presence of acids or acidic vapors such as in the area of batteries or batteries undergoing charging. Acids cause immediate and severe damage or weakening of nylon. Suits should also be kept away from paints and other chemical solvents. Keep flight suits & Sky Sleds away from sources of heat, sparks or flame. Elevated temperatures degrade or destroy nylon.

B. Visually inspect flight suits & Sky Sled daily for damage. If any item looks questionable, send it in for repairs. Never try to second-guess safety.

C. Never store flight suits or Sky Sled wet. If the flight suit becomes wet, rinse it with potable water and hang it in the shade to dry.

D. Rotate suspension and side-clip rings in webbing regularly to prevent rings from taking a "set" to the webbing.

E. If the footbar strap is not folded and stitched, verify a knot is tied in the end of the footbar strap, after it passes through the adjustable Cam Lock hardware.

F. Always use Loc-tite on all threaded connections.

G. If a Cam Lock slips slightly, try a small drop of light oil on the pivot points and spring. Make sure that oil is kept off the webbing.

H. Verify that your flight suits or Sky Sled have been inspected within the last 12 months. Do not use any flight suits or Sky Sled unless the inspection is current. Any flight suit that has been in service for 5 years from the date on the data card must be retired.

I. Protect the data card. Any flight suit returned for service without a data card will be considered ‘Out of Service’ and will be destroyed.

II. Approved Operator Cleaning of Skycoaster® Flight Suits & Sky Sled

A. The following is the only approved method for operators to field clean their flight suits:

1. Approved detergents:

(a) (Preferred) Proctor & Gamble Ultra ERA Liquid

(b) (Alternative) Proctor & Gamble Cheer Liquid with color guard

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2. Spot cleaning of grease and heavy stains:

   (c) Use only Sunshine Makers Simple Green Liquid

   (d) If needed, use only a soft bristle nylon brush

B. It is not advisable to put flight suits into a mechanical washing machine, as the flight suit or the machine or both could be damaged.

1. Use detergent quantities following the detergent manufacturer directions.

2. Use only cold, potable water.

3. Soak flight suits for 24 hours (longer if needed).

4. Scrub lightly as required. Do not scrub the webbings or structural sewn areas.

5. Rinse thoroughly in cold water to remove all traces of detergent. Three rinses are usually required to extract soap from the foam padded parts. Snuggle or Downey fabric softener may be used during the first rinse.

6. Hang flight suits & Sky Sleds in shade to dry. Never put flight suits into a laundry dryer - extreme heat from clothes dryers will destroy nylon.

7. Never use a flight suit or Sky Sled unless it is completely dry.

8. Never second guess safety. If a flight suit looks questionable, do not use it. Any flight suit or Sky Sled that has questionable characteristics must be sent to the authorized repair center for inspection and repair.

III. Returning Flight Suits & Sky Sleds for Inspection/Repair

All flight suits & Sky Sleds requiring inspection and repair are to be sent to High Energy Sports, Inc., our authorized repair center. Do not send your flight suits or Sky Sled to Skycoaster in Stevensville, MD; this will only delay the return of your flight suits and add additional shipping cost to your invoice. DO NOT USE SECONDARY BOXES (boxes which were used previously for some other purpose) and DO NOT SEND WET OR DAMP FLIGHT SUITS. **A copy of your Skycoaster Flight Suit Service Request form must be faxed to Skycoaster prior to shipping your flight suits to High Energy Sports.** Also, please include a copy of the Flight Suit Service Request in each box/bag of flight suits returned to High Energy Sports, Inc. Skycoaster strongly recommends that all International sites use a freight forwarder with “door to door” service. If needed, contact Skycoaster for the shipping address of High Energy Sports, Inc.

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SKYCOASTER® FLIGHT SUIT & SKY SLED SERVICE REQUEST

Park/Site Information		**Return Shipping Instructions**
Park/Site Name: _____	Total Suits Returned: _____	(Please circle appropriate service)
Contact Person: _____	No. of Boxes/Bags: _____	UPS FEDEX Other _____
Ship to Address: _____	Is Park Closed? _____	Ground 3-Day 2-Day Next Day
_____	Re-Opening Date: _____	Account Number _____
_____	Date Suits Needed: _____	(If not specified, suits will be returned UPS Ground)
	Rush? (Additional charge) _____	

- Please complete this form in its entirety.
- Include a copy of this form in EACH box/bag.
- Fax a copy of this form to Skycoaster prior to shipping flight suits to High Energy Sports.
- When sending multiple boxes, label each accordingly: "1 of 5", 2 of 5" etc. This will alert us to any box separated during shipping.
- DO NOT USE SECONDARY BOXES and DO NOT SEND WET OR DAMP SUITS. Additional handling charges will apply if wet or damp suits are received.
- High Energy Sports reserves the right to wash and repair any flight suit as it deems necessary.
- Normal service time is 6-8 weeks.
- For International sites, if you want your suits returned via a shipper other than UPS or FEDEX, please make arrangements with your shipper and provide us with contact info.
- For repair pricing or replacement parts, contact Skycoaster at (888) 801-0303.
- Use additional sheets if necessary.

► PLEASE SEND ALL FLIGHT SUITS TO: HIGH ENERGY SPORTS, INC. 1081 SHEPARD STREET UNIT A ANAHEIM, CA 92806 (714) 632-3323 ◄

Write the serial number & color of each flight suit and check the appropriate box for service to be completed. If sending additional sheets, note that this is Page 1 of _____

SERIAL #	COLOR	WASH	REPAIR	ANNUAL INSPECT	RETIRE	SERIAL #	COLOR	WASH	REPAIR	ANNUAL INSPECT	RETIRE	SERIAL #	COLOR	WASH	REPAIR	ANNUAL INSPECT	RETIRE

Internal Use Only

Flight Suits Received by High Energy Date_____ Flight Suits returned to Customer Date _____

Invoice received from High Energy Yes _____ No _____ Invoice No. _____ Date _____

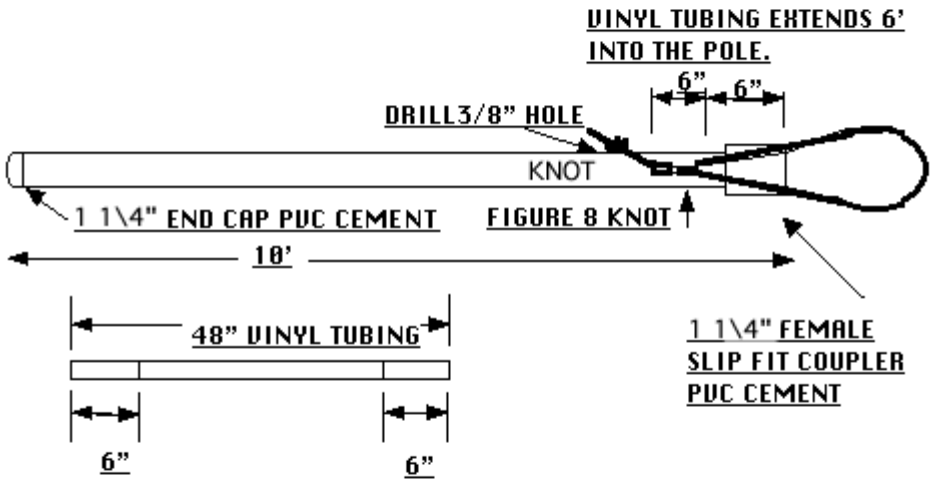
-- Information on this page supersedes previous information --

-- Information on this page supersedes previous information --

I. Manual Landing Pole

PARTS NEEDED

10' FEET 1 1/4" SCHEDULE 80 PVC PIPE
ONE 1 1/4" PVC END CAP
ONE 1 1/4" PVC FEMALE SLIP FIT COUPLER
48" 5/8" CLEAR VINYL TUBING
80" 7 MM PERLON ROPE



1) CUT PVC TO 10'
2) CUT VINYL TUBING TO 48"
3) MARK VINYL TUBING AT 6" TO INDICATE PROPER INSERTION INTO THE PVC POLE.
4) DRILL 3/8" HOLE IN THE PVC PIPE 12" FROM THE COUPLER END.
5) RUN THE ROPE THROUGH THE VINYL TUBING AND KNOT.
6) INSERT THE VINYL TUBING 6" INTO THE POLE, PULL THE ROPE TIGHT AND KNOT THE END OF THE ROPE.

REVISED 12/11/98 CS

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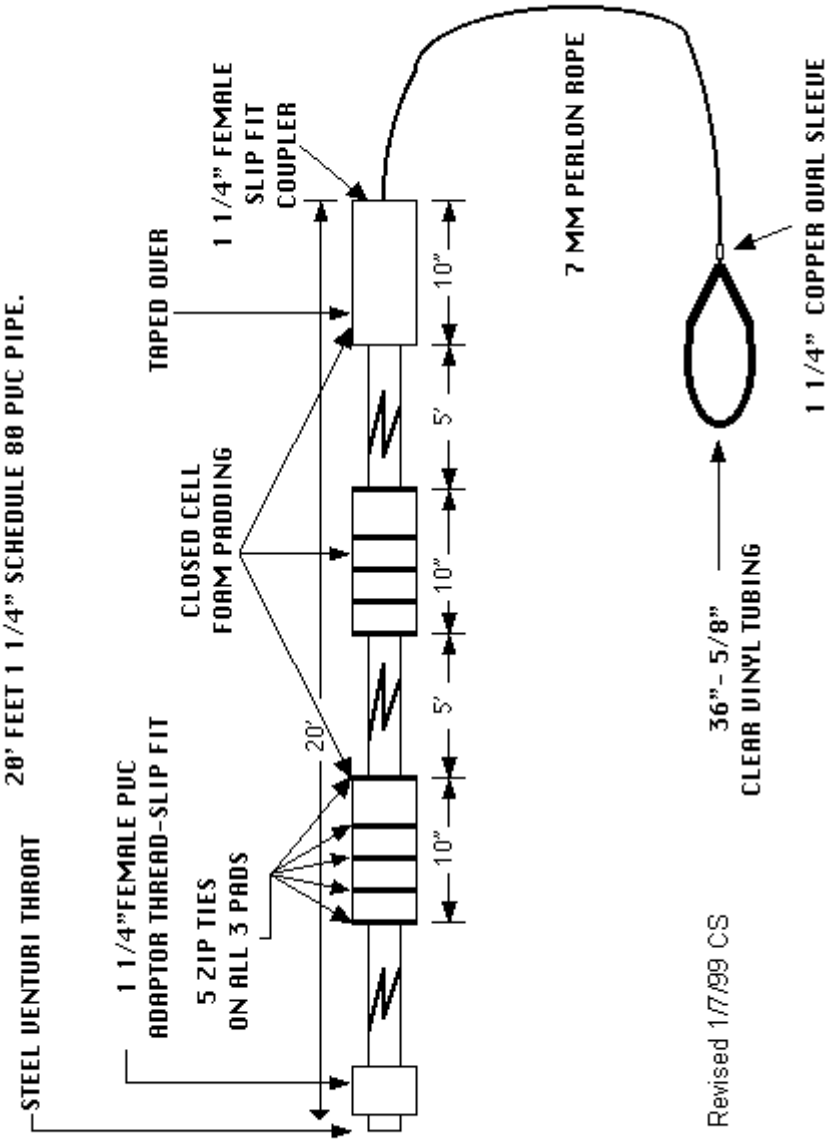
II. Hydraulic Landing Pole



NOTE: Normal hydraulic landing pole length is 20 feet. The length of the hydraulic landing pole at your site may vary based upon conditions at the site. The end of the pole must not come closer than 18 inches from the flyer's underside anytime during the landing process. If you are unable to determine this by suspending a flyer over the workstand, please contact Skycoaster for assistance.

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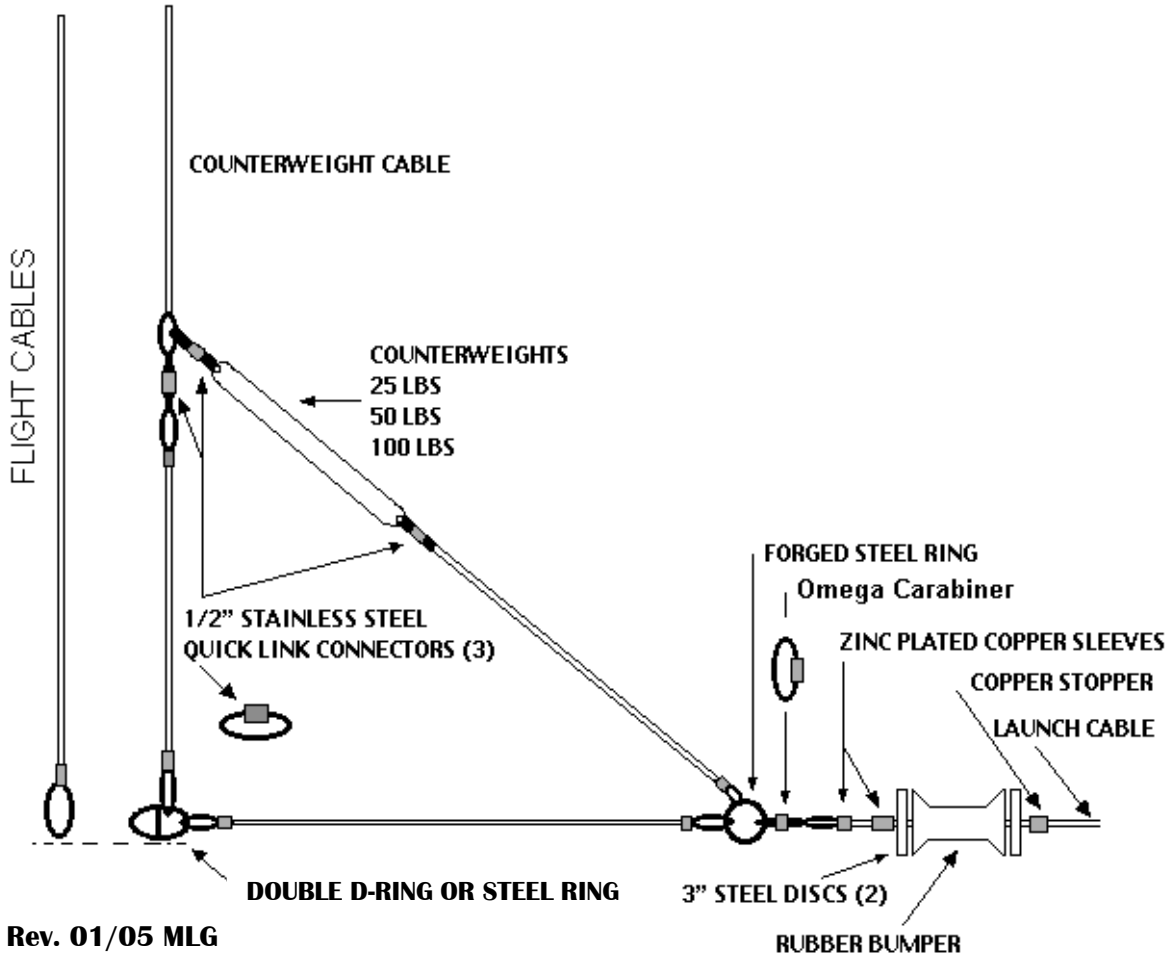
III. Launch Bridle Details



Rev. 01/05 MLG

This drawing is not to scale. For ease of installation, please refer to the table below for each leg's measurement based upon equipment used.

Counterweight Size	Horizontal Leg	Vertical Leg	Diagonal Leg
25 lb. counterweight	36.5"	66.75"	60.0"
50 lb. counterweight	36.5"	66.75"	47.0"
100 lb. counterweight	36.5"	66.50"	21.0"

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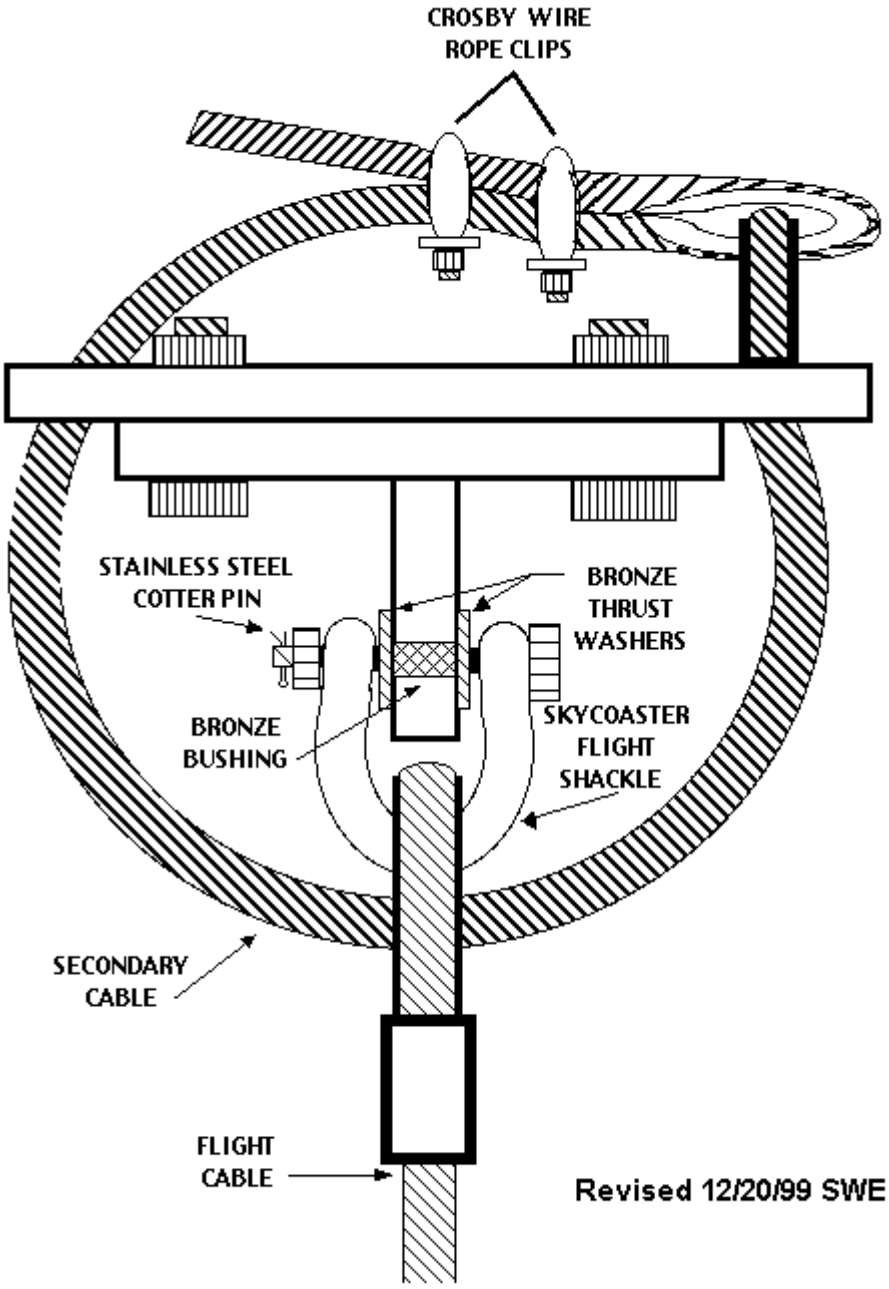
IV. Flight Shackle Details



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V. Skycoaster® Launch Release System

Shown below is the three ring release mechanism that is used to release the flyers from the launch cable and start the ride. The system consists of three forged steel metal rings that are attached to nylon webbing. The rings are inserted through each other, from bottom to top, and folded back over the ring below. The top ring then has a loop made of nylon sheathing inserted through it and through a grommet installed in the webbing. A plastic coated steel cable (the pigtail) is inserted through the loop on the back side. When the flyer pulls the ripcord, which is connect to the pigtail, the loop is released and each ring drops through the ring below until they are completely separated and the flyer is released. Figure 1 shows the system in its assembled condition. Figure 2 is a side view of the same assembly. Figure 3 shows how the loop and rings separate when the ripcord is pulled. The rings provide 10:1 levers; when interlocked, the mechanical advantage multiplies to 100:1. With the 2:1 advantage of the nylon loop, the total mechanical advantage is 200:1. Therefore, if the whole system were loaded to 2,000 pounds (907.18 kilograms), the force in the cable locking system would be just 3 pounds (1.36 kilograms). The maximum weight on the Skycoaster® is 3 people or 850 pounds (385.56 kilograms).

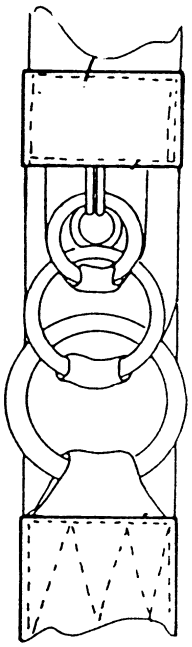

Figure 1

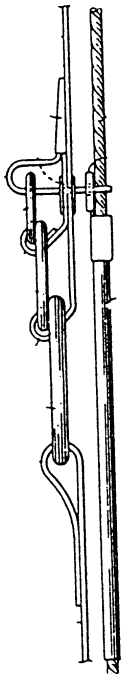

Figure 2

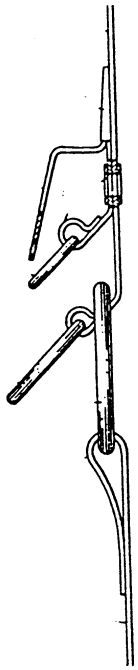

Figure 3

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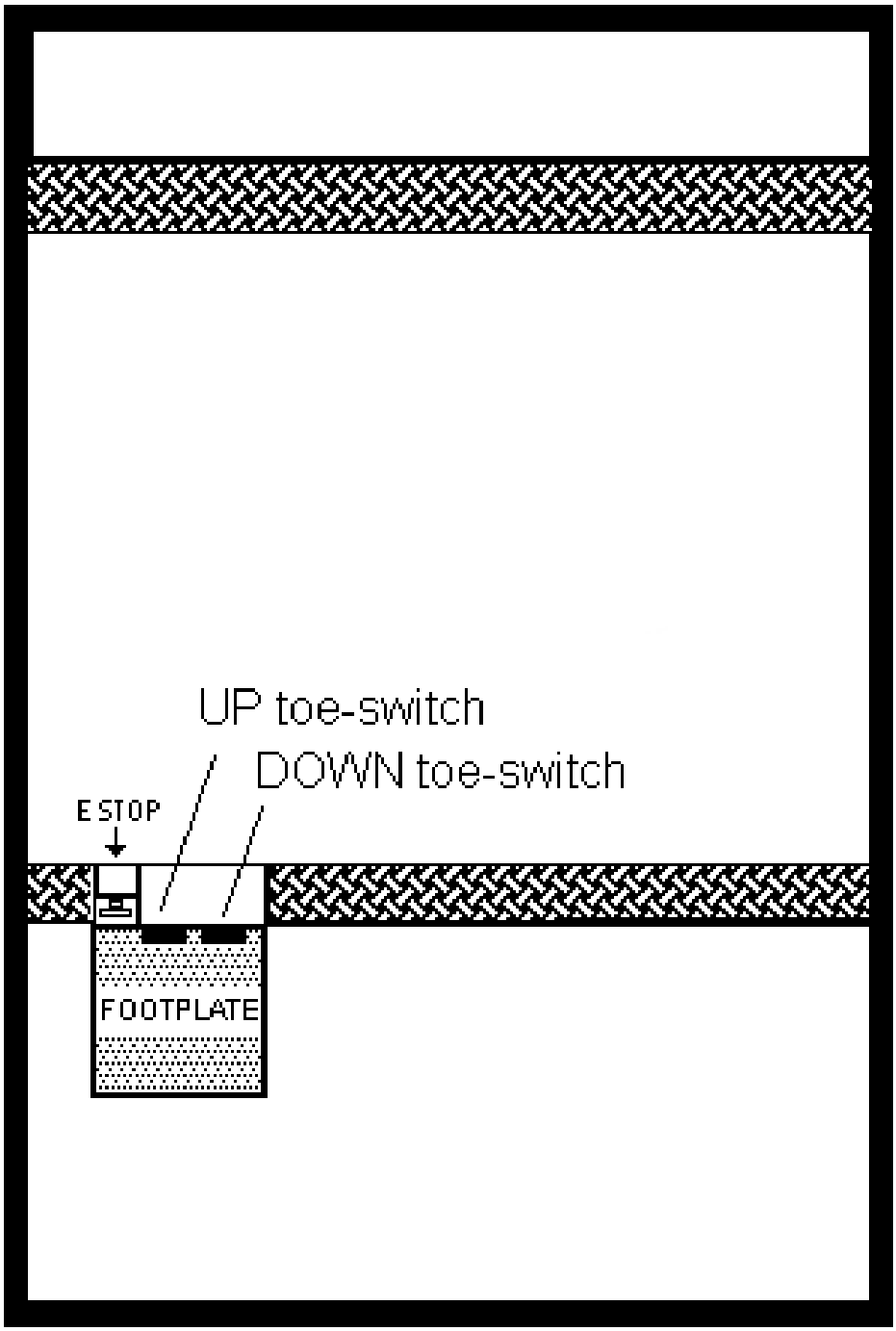
VI. Top View of Hydraulic Scissors Lift



Revised 12/17/99 SWE

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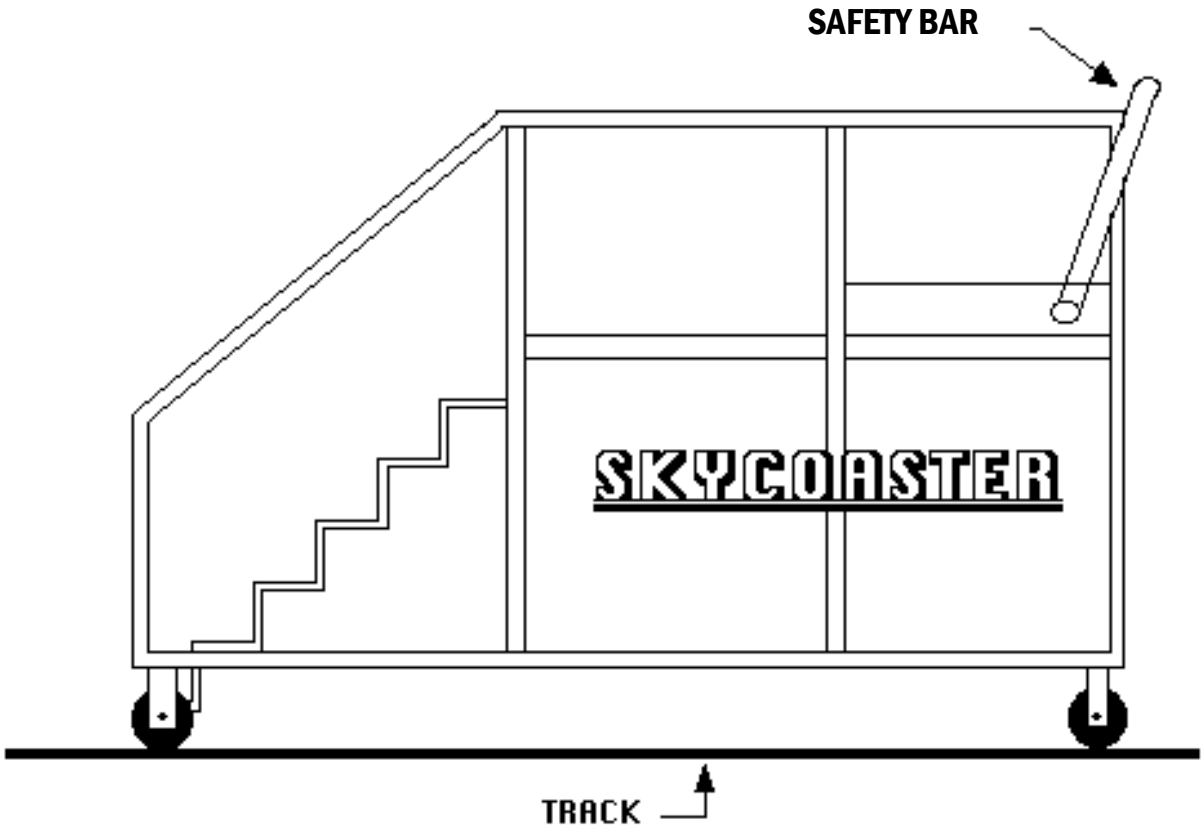
VII. Typical Rolling Boarding Platform



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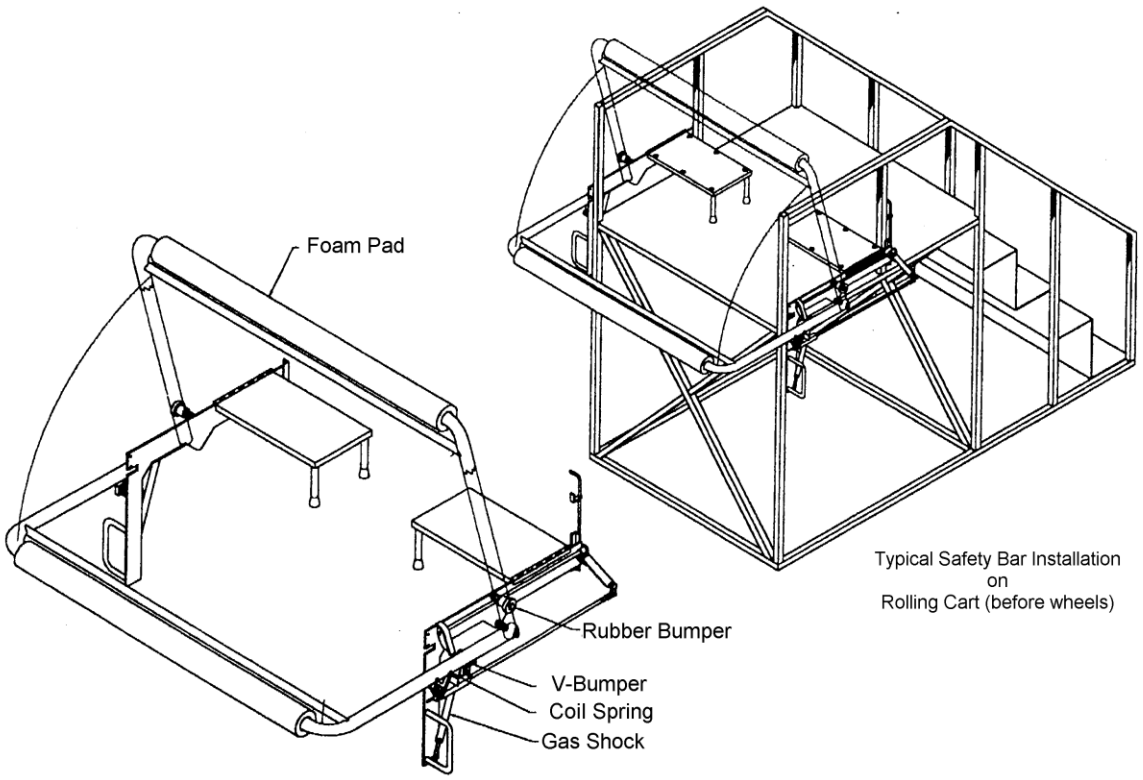
VIII. Typical Safety Bar Assembly



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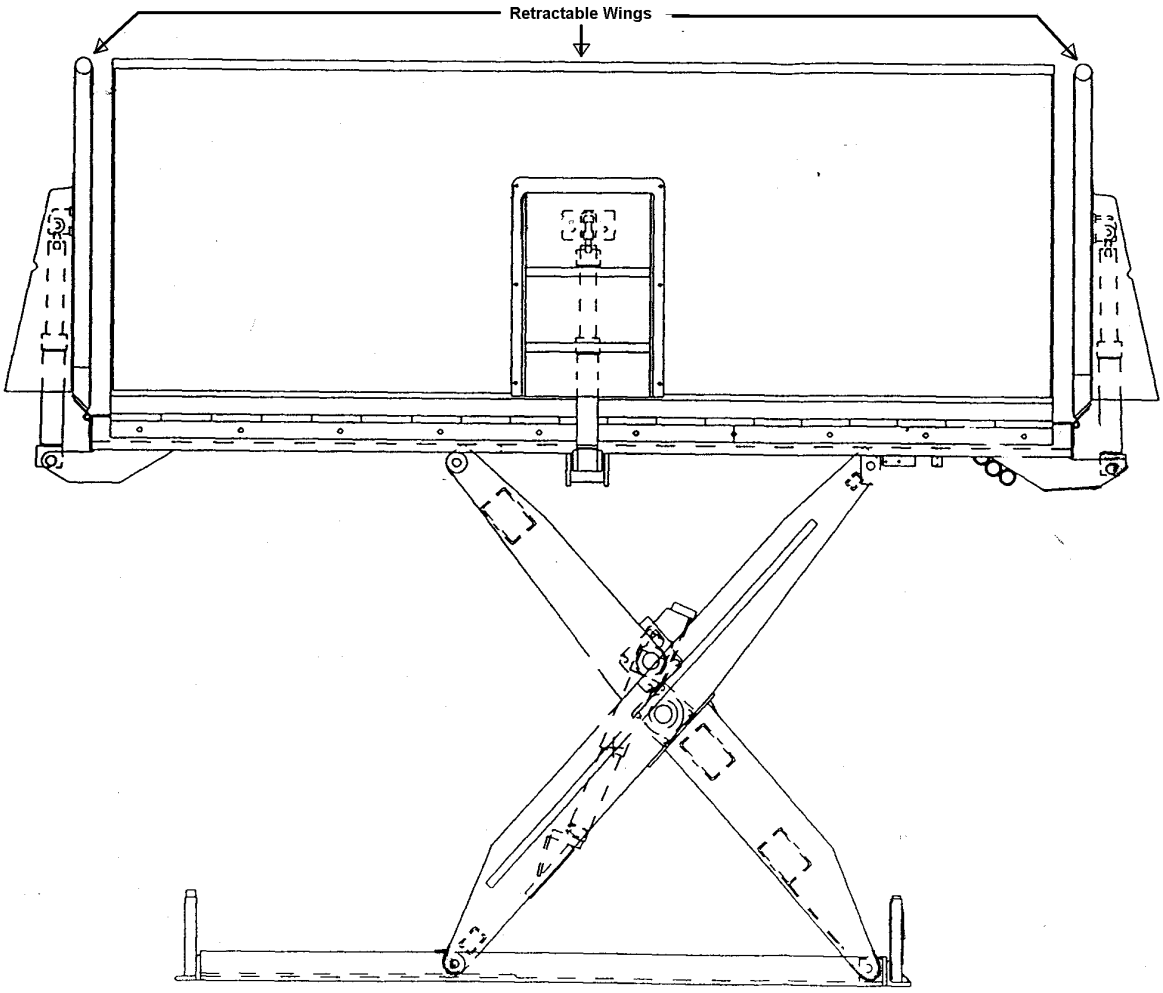
IX. Typical 5 Foot (1.52 Meters) Hydraulic Scissor Lift



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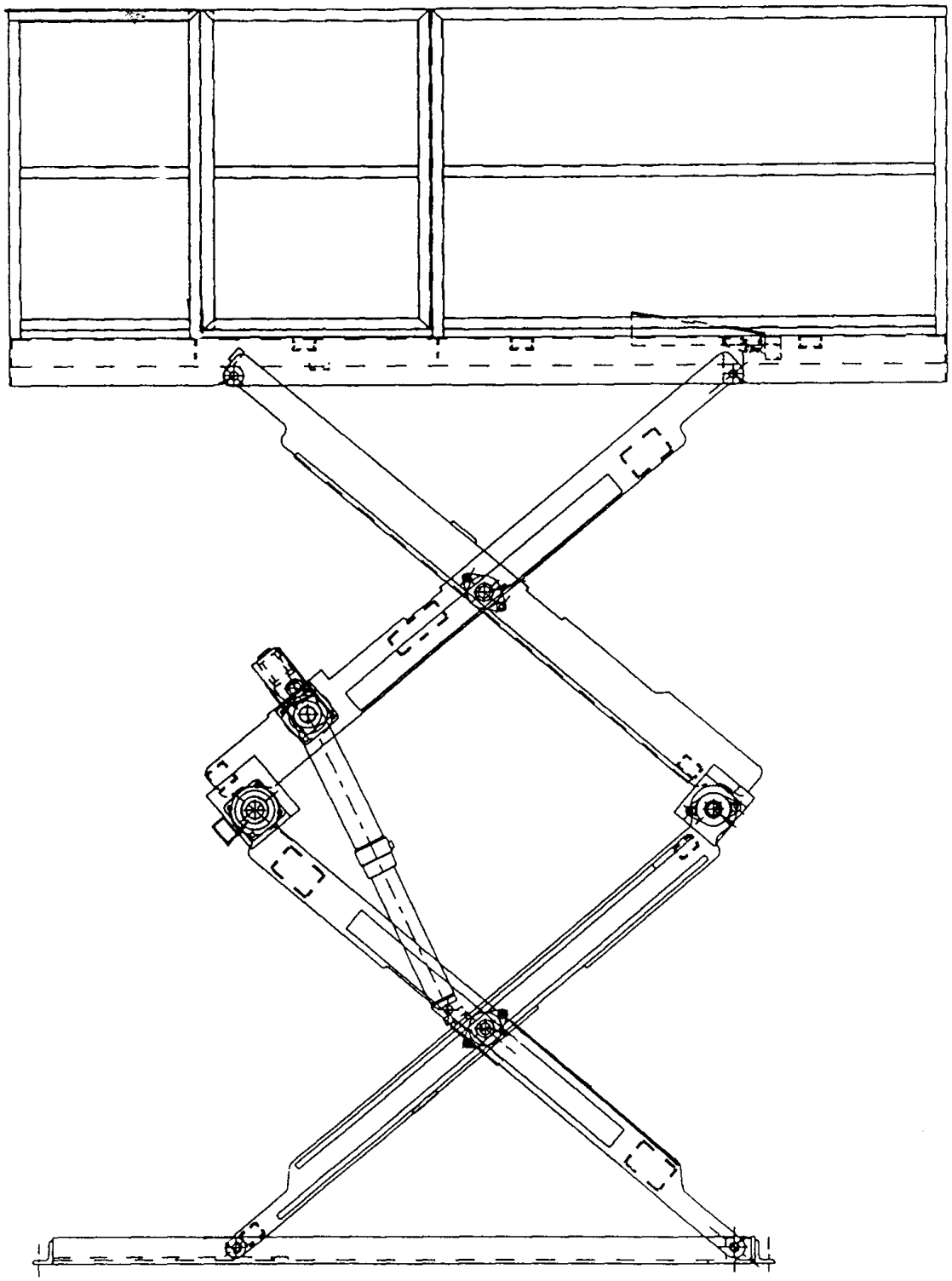
X. Typical 10 Foot (3.05 Meter) Hydraulic Scissors Lift



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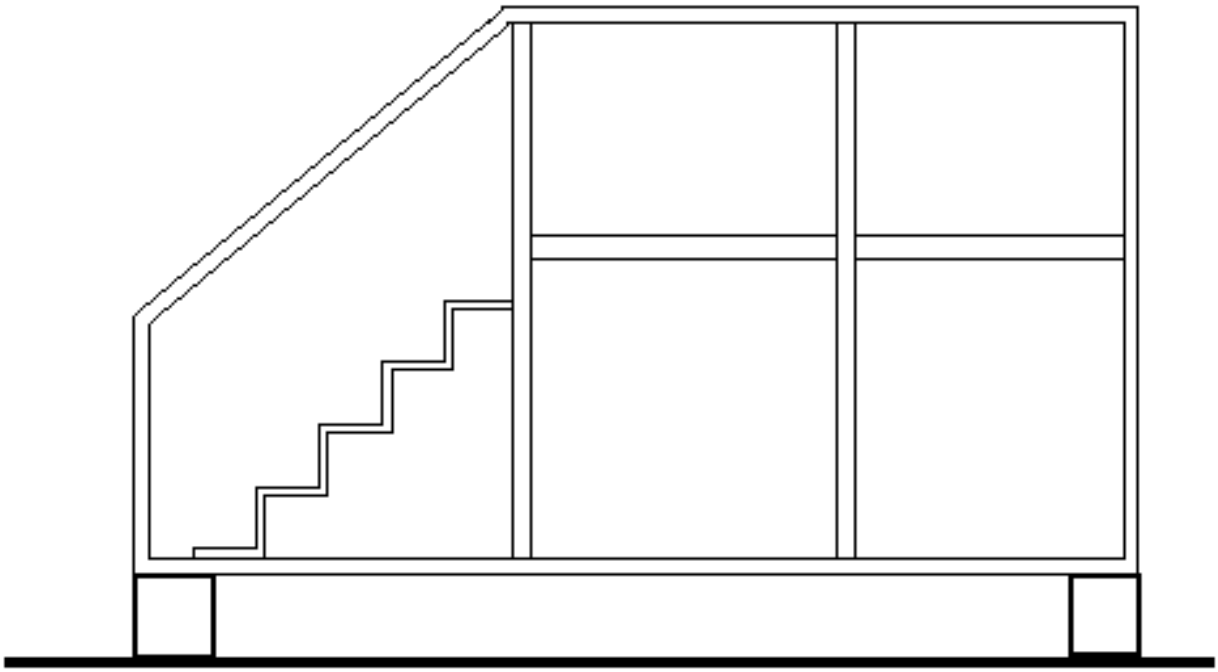
XI. Typical Workstand



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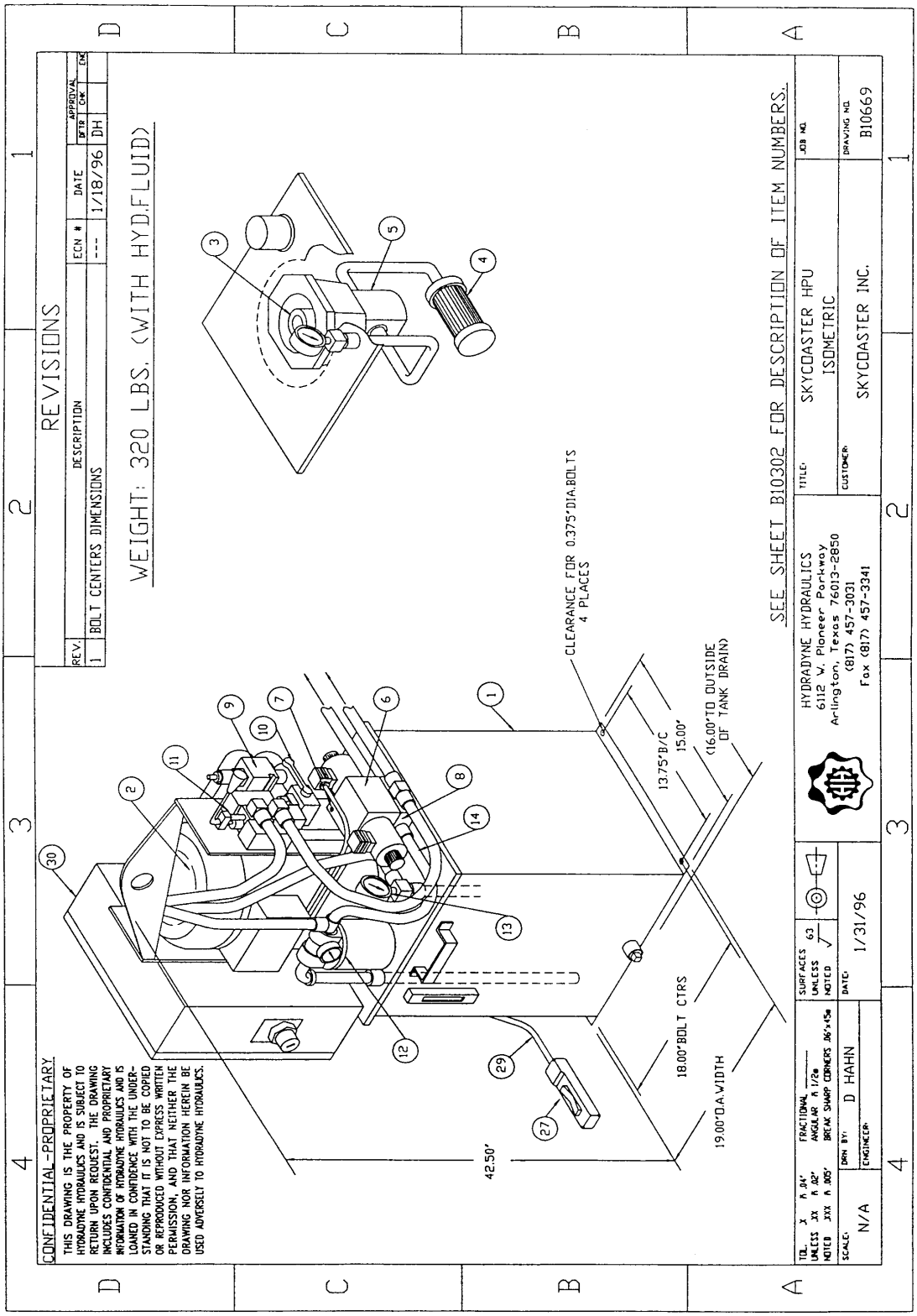
XII. Typical Winch Power Unit



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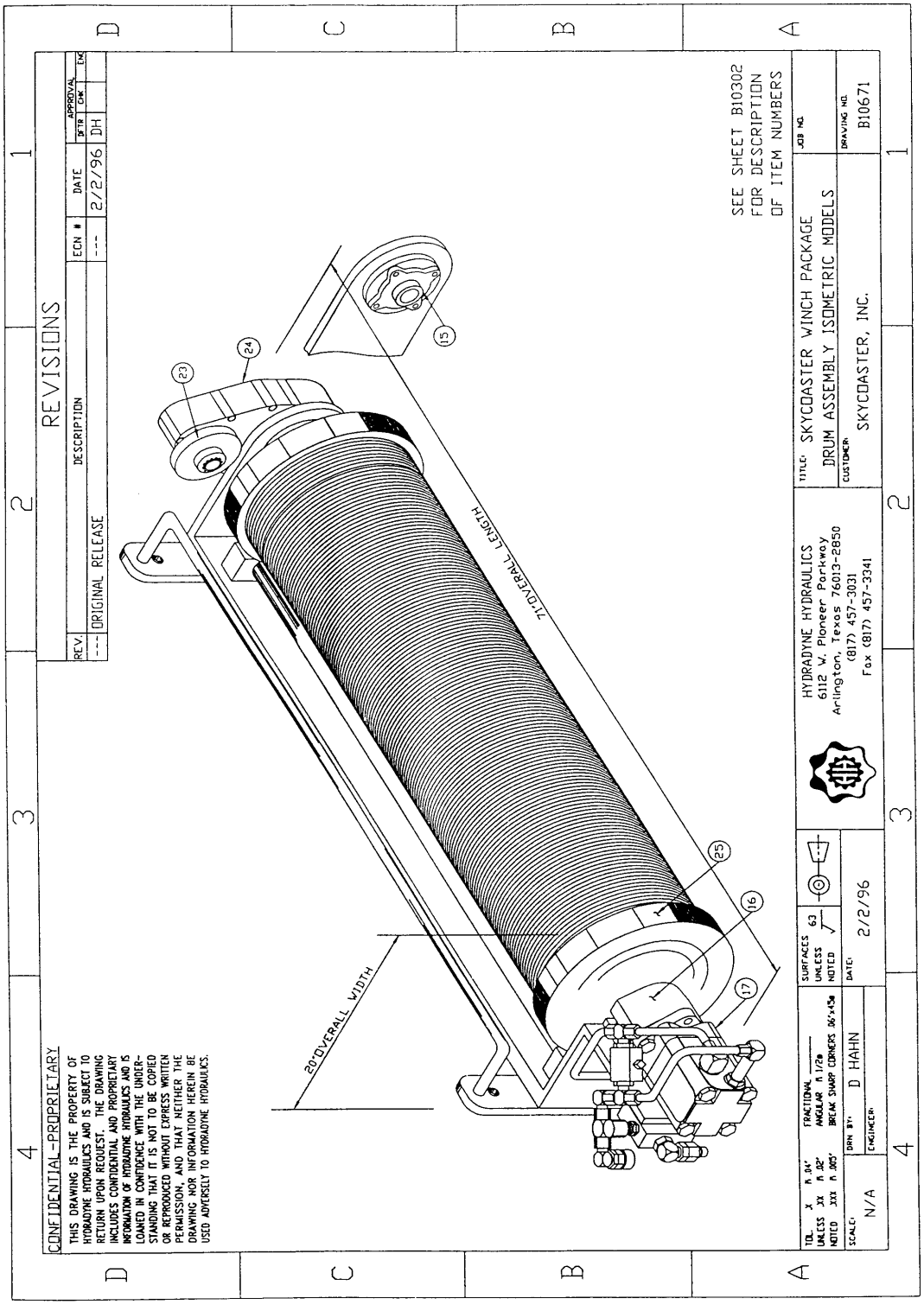
XIII. Typical Winch Drum Unit



XIV.

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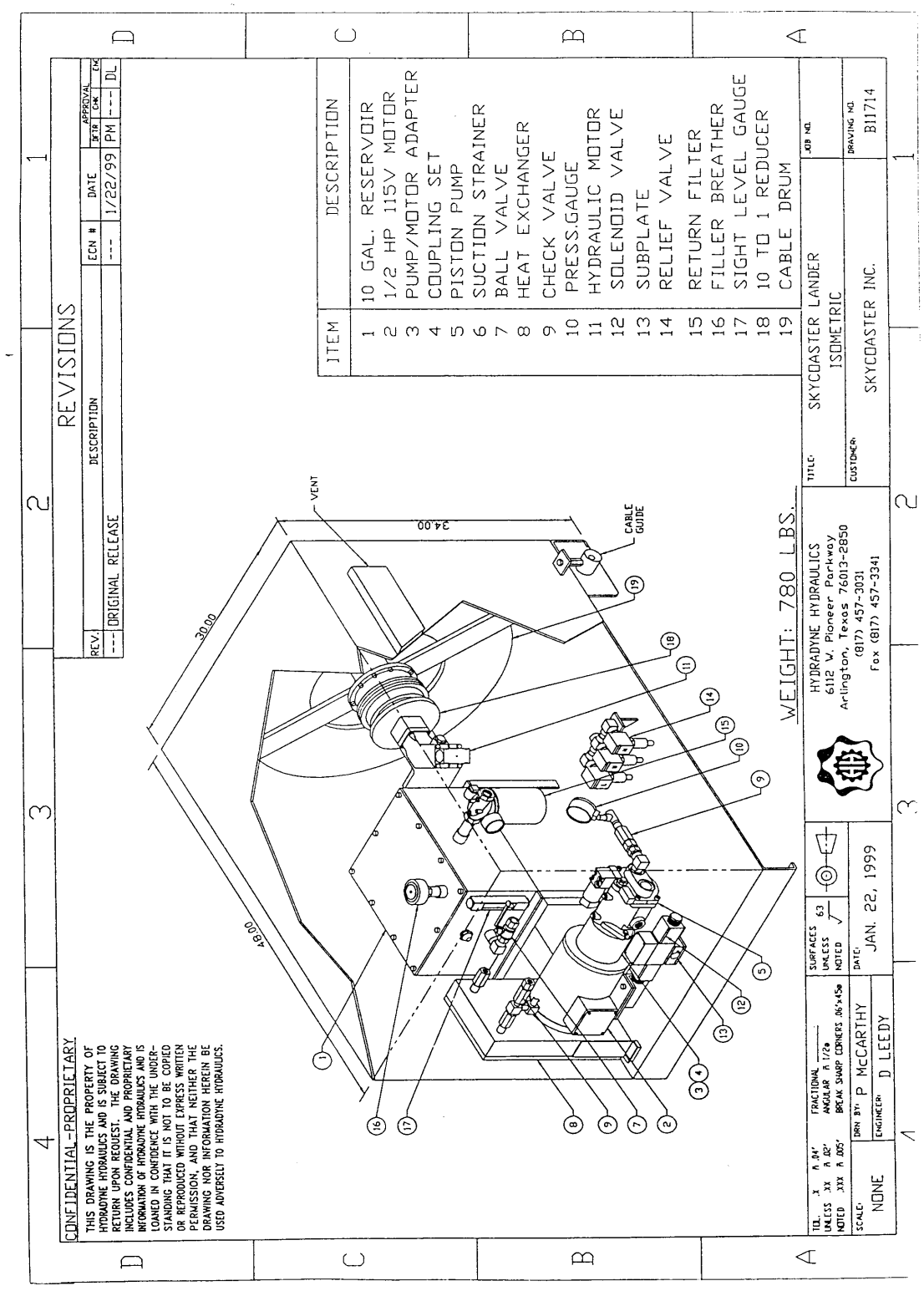
XIV. Typical Hydraulic Lander



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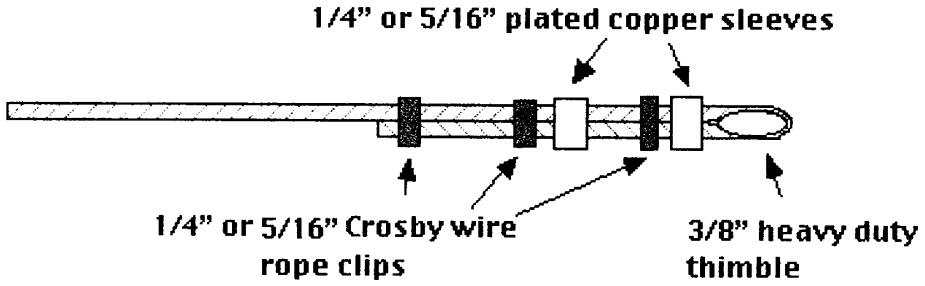
XV. Counterweight Cable Replacement

Counter Weight Cable Replacment

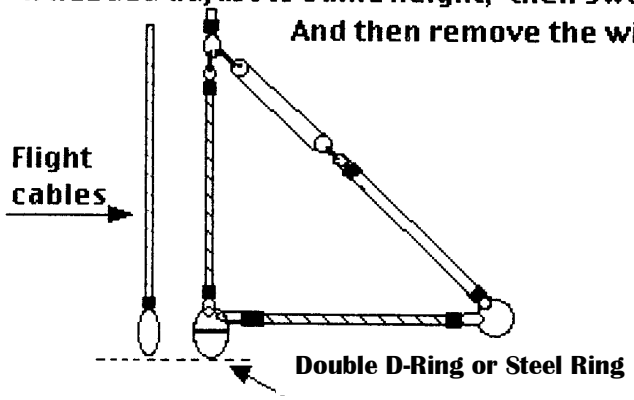
Measure and record the length of the old counterweight cable, or measure the flight cables and subtract 70" off the length, this will give you the proper length for the counterweight cable.

Depending on the size of your counterweight cable, this length will be set with three 1/4" or 5/16" Crosby wire rope clips, and two 1/4" or 5/16" plated copper oval sleeves (do not swedge at this time).



Note: do not swedge at this time!

Hang the new Counterweight cable and replace the secondary loop.
Suspend a person in a flight suit from the flight cables.
Connect a release to the double-D ring and pull straight down.
The bottom of the double-D ring should be at the same height as the load surface of the flight cable thimbles.
Measure the difference in height (if any) between the double-D ring and the flight cable thimbles.
If needed adjust to same height, then swedge the oval sleeves.
And then remove the wire rope clips.



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APPENDIX I MISCELLANEOUS DRAWINGS

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3.0 OPERATIONS

This section of the Skycoaster® Owner's Manual deals with the Operations and Operating Procedures of the Skycoaster® attraction.

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I. Age

Skycoaster® patrons are not limited by upper or lower age limits. However, to properly fit the flight suit, flyers must be at least 42 inches (1066.8 millimeters) tall and 48 inches (1219.2 millimeters) for a Sky Sled harness. Patrons may not exceed 78 inches (1981.2 millimeters for a Sky Sled Harness. (See *Section 3.5, Appendix C* for flyer qualifications. Flyer restrictions must be posted at every site.)

II. Physical and Mental Conditions

Flyers must be in good physical and mental condition - specifically not impaired by drugs or alcohol.

Flyers must not have any physical problems such as a heart condition or back or neck injuries that could be aggravated by a Skycoaster® flight.

Flyers must have the ability to grasp and hold onto the landing pole loop with both hands to slow down their flight in order to fly in a normal manner. Small children (in Pink – XS flight suits) flying with adults are the exception to this rule. Should any flyer be unable to grasp and hold onto the landing loop with both hands, the flyer(s) shall be given the option of flying and coasting to a stop without the use of any landing pole.

By reason of the restraint system inherent in the flight suits, it is necessary that flyers possess two arms sufficient to be contained and restrained by the shoulder pads, and at least one leg sufficient to be contained and restrained by a leg strap.

The degree of assistance given to transport a flyer to the attachment area and to connect to the flight cables will be determined by the individual park policy.

A mentally disabled person should be accompanied by a guardian ready to monitor the response of the person during winch-up and to limit the launch height if appropriate.

III. Weight

There is no individual maximum weight for the flyers - however the combined weight of all the flyers, in tandem or triple, will not exceed 850 pounds (385.5 kilograms).

IV. Insurance

The above patron restrictions apply provided they are compatible with the ride operator's Skycoaster® liability insurance. Otherwise, the restrictions will be modified (subject to approval of Skycoaster) to be compatible with the insurance.

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3.1 PATRON RESTRICTIONS

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The operation procedures are also known as "Flyer Walk Through for Rolling Flight-boarding Platforms" and "Flyer Walk Through for Hydraulic Scissors Lift Flight-boarding Platforms." Do not deviate from these procedures. Remember, prior to processing your first flyer, all applicable inspection check points will have been completed.

I. Flyer Walk Through for Rolling Flight-Boarding Platform

Step 1

1. Flyers arrive at the Skycoaster® site and are greeted by the Customer Representative.

2. The Customer Representative should answer all questions with the utmost confidence, as these people are entrusting your company with their well-being.

3. This should not be taken lightly. A good impression will assure positive word-of-mouth advertising for your operation.

Step 2

1. Flyers are signed-in and receive a briefing from the Customer Representative.

Step 3

1. Flyers arrive at the flight suiting area.

2. The Flight Suit Person greets the flyers. Following is an example of what an appropriate greeting may be:

3. "Hi, my name is _____. I'm going to fit you with your flight suit."

(a) Choosing the correct flight suit for each flyer is important.

(b) The following flyer heights are approximate with each size overlapping the other.

(i)	X-Large	Black	For persons 6 foot 4 inches (1.93 meters) and over
(ii)	Large	Red	For persons 5 foot 10 inches (1.78 meters) and over
(iii)	Medium	Purple	Most commonly used size for persons 4 foot 6 inches (1.37 meters) to 5 foot 10 inches (1.78 meters)

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(iv)	Small	Blue	For children or short/slender persons For persons 3 foot 10 inches (1.16 meters) to 4 foot 8 inches (1.42 meters)
(v)	X-Small	Pink	For small children 3 foot 6 inches (1.06 meters) to 3 foot 10 inches (1.16 meters)

4. Once the correct size flight suit has been determined, the following briefing should be given:

   "*Please step into the leg loops. Pull up your leg loops like you're pulling up your pants. Now clap your hands together and lean forward, bringing your arms out here."* (The flight suiter places the top of the flight suit bib at the base of the flyers neck) *"Please hold your flight suit here while I adjust your backstrap."*

   Please refer to *Section 3.5, Appendix G - I* for proper flight suit fitting and layout.

5. During fitting, the leg loops of the Skycoaster® flight suits are to be adjusted snugly against the legs of the flyers. Please note the following:

   (i) When flying disabled persons it is necessary to snug the leg loops to aid in retaining the flyer in the proper position within the suit because the flyer may not have the ability to push upon the footbar.

   (ii) When flying a very small child in a Pink (XS) or Blue (S) flight suit, the leg loops will always be snugged closed and the excess webbing will be loosely tied in knots to avoid dragging on the ground while the child is walking. This is done out of concern that a small child could remove his/her legs from the loops during the time spent awaiting the flight.

6. After the flyers are suited, they are briefed on the flying techniques, release protocol and landing procedure. The following briefing should be given:

   "Who is going to pull the ripcord? This is your ripcord. When you reach the top of the launch tower, put your hand on the ripcord. When you hear 3, 2, 1, FLY, just give it an easy pull and enjoy your flight. Now, please hold your flight suit here while I adjust your footbar.

   This is your footbar - please carry it whenever you walk so you will not trip over it.

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In order to slow you down after your flight, all flyers must grab onto the loop with both hands and hold on tight until instructed to release the loop. There is going to be pulling resistance similar to picking up a 50 pound suitcase. Are you capable and willing to do this?" (Each flyer must answer "***Yes***" in order to fly on the Skycoaster® attraction in a normal manner using a landing pole loop. The only exception to this rule is if a small child in a Pink (XS) flight suit is flying with adults. In this instance, the small child will not have to grasp the loop. Should any flyer state they are not capable and willing to grasp and hold onto the landing pole loop, the flyer(s) shall be given the option of flying and coasting to a stop without the use of any landing pole. In situations where there are multiple flyers and one or more flyer(s) cannot grasp and hold onto the landing pole loop, you must not use the landing pole. Allow the flyers to coast to a stop.)

"Do you have any questions? Have a good flight."

CAUTION: To avoid the possibility of choking, all flyers must remove any gum, mints, chewing tobacco, etc. from their mouths. Have a receptacle available for this in the flight suit area. Loose jewelry, eyeglasses or other objects such as pencils, pagers or pins on clothing must be removed and secured in the flight suit area prior to flying. Skycoaster recommends that flyers remove large key rings from their pockets.

NOTE: If a triple (3 flyers) is being flown, the flyers should be arranged with the largest (tallest/heaviest) flyer positioned in the middle.

Step 4

1. The Flight Suit Person gives the flyers a thorough check and directs them to the on-deck area.

2. Once in the on-deck area, the Flight Suit Person establishes and/or confirms the flyers positions: for example, the ripcord puller is on the right. For a triple (3 flyers), the largest (tallest/heaviest) flyer is positioned in the middle.

3. The flyers move to the ready line and stand on their respective numbers upon direction from the Flight Suit Person.

4. The Assistant Controller directs the flyers to leave the ready line and ascend the flight-boarding platform by saying:

   "Next flyers come on board".

Step 5

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1. The flyers ascend the flight-boarding platform.

2. The Assistant Controller instructs the flyers to stand on the designated location and hold their footbars. He/she attaches the flyers, left to right, to the Flight Carabiners. If children or short persons are flying, it may be necessary to have those flyers stand on the child/short person step in order to attach those flyers to the flight cables.

   (a) The flyers are connected to the flight cables using two Flight Carabiners.

   (b) Each suspension ring on the flight suits must be threaded through both Flight Carabiners.

   (c) When connected properly, the Flight Carabiners must be acclimated so that the wide portion of the carabiner is towards the flyers.

   (d) Both Flight Carabiners must be locked after all suspension rings have been connected.

   (e) After locking both Flight Carabiners, the Assistant Controller verifies that each flyer is properly attached.

   (f) He/she then hooks the upper and lower side clips when applicable.

NOTE: If your flight suits are equipped with upper and lower side clips, it is no longer necessary to connect the flight suits utilizing the purple carabiners as outlined in SB #13 and SB #17.

   (g) Please refer to *Section 3.5, Appendix G - V and VI* for further information on proper Flight Carabiner attachment.

3. Simultaneously, the Controller on the ground in front of the boarding platform, ensures the flyers are holding and not standing on their footbars.

4. When flying a double or triple, the person situated on the flyers right side will be the ripcord puller. The Controller makes eye contact with the flyer who is pulling the ripcord and ensures the flyer has been adequately briefed by asking:

   "Did they tell you about the ripcord?"

   If the ripcord puller is unsure of their duties, the Controller must brief them once again.

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5. The Assistant Controller physically verifies that all hardware is attached, each flyer is connected to the Flight Carabiners, and the Flight Carabiners are locked, the flight suit release rings are toward the launch tower and that there are no twists in the flight cables. He/she announces:

   "Carabiners Locked"

6. The Controller moves to the ripcord puller's side of the cart and visually verifies all flyers are attached to the Flight Carabiners, the Flight Carabiners are locked, the flight suit release rings are toward the launch tower and that there are no twists in the flight cables. He/she answers with:

   "Carabiners Locked"

NOTE: The only time the flight carabiners can be confirmed locked by physically squeezing the gates is when the flyers are standing, not when they are prone.

Step 6

1. After the Controller gives the verbal command "*Carabiners Locked*," he/she moves back to the front of the cart and instructs the flyers:

   "Drop your footbars, take hold of the blue bar, stand on the white bar, fall forward, and be prepared for a slight jolt."

2. In the event of lightweight or timid flyers, the Controller may assist by pulling the safety bar down into its locked position.

3. Once the flyers are prone, the Controller will instruct the flyers to

   "Let go of the blue bar and grab onto the rope."

Step 7

1. After the Controller announces "*Carabiners Locked*," the Assistant Controller turns to the right, disconnects the launch bridle from the tether strap and begins connecting the new launch release system. The new launch release system must not be connected to the flyers until they are in the prone position.

   (a) The launch release system (three-ring release) is the connecting link between the flyers and the launch bridle.

   (b) Connect the end of the launch release system with the red safety tether to the launch bridle. Connect the clips in opposite directions so that the gate of each clip is facing the other.

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(c) Connect the end of the launch release system with the two B-12 clips stitched to the black webbing to the flight suit release rings.

(i) When connecting one flyer, both B-12 clips are connected to the flight suit release ring. Connect the clips in opposite directions so that the gate of each clip is facing the other.

(ii) When connecting two flyers, connect one B-12 clip to the release ring on one flyer and the other B-12 clip to the release ring on the other flyer. Again, the clips must be connected opposite each other so that the gate of each clip is facing the other.

(iii) When connecting three flyers, connect one B-12 clip to each outside flyer only. Again, the clips must be connected opposite each other so that the gate of each clip is facing the other. Do not connect a B-12 clip to the release ring on the flyer positioned in the middle.

(d) After all B-12 clips are correctly connected, the Assistant Controller connects the ripcord of the flyer on the right side (the flyer that is going to pull the ripcord) to the pigtail of the launch release system using the ripcord snaphook.

Step 8

1. After the flyers are prone, the Controller looks at the flyers' necks and checks the fit of the flight suits.

2. The Controller also looks for loose jewelry, eyeglasses and other loose objects that may come off during flight.

Step 9

1. After the Assistant Controller finishes connecting the launch release system, he/she performs the BBL: tightens backstraps, checks buckles on the leg straps and checks legs for proper footbar positioning.

2. He/she gives a final, overall inspection of the flyers, flight suits, launch release system, side clips and flight carabiners.

NOTE: The only time the flight carabiners can be confirmed locked by physically squeezing the gates is when the flyers are standing, not when they are prone.

3. If all is ready, he/she makes this announcement:

"Clips, Carabiners, Ripcord ... Ready to Fly."

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Step 10

1. When the Assistant Controller announces "Ready to Fly," the Controller moves to the ripcord puller's side of the cart for a final, overall visual inspection of the flyers, flight suits, launch release system and flight carabiners.

2. If all is ready, the Controller announces:

   "Let's fly."

Step 11

1. The Assistant Controller lowers the fairing over the flight carabiners.

2. The Assistant Controller confirms that the Omega Carabiner that connects the launch bridle to the launch cable is locked if this is his/her first flight in this position, or if it has been more than two hours since the last check of this Omega Carabiner.

3. The Assistant Controller then descends the steps of the flight-boarding platform.

Step 12

1. The Controller moves to the front of the cart and instructs the flyers to

   "Let go of the rope."

   And holds the flyer(s) gently by the wrists. This prevents the flyers from swinging back from the front of the platform when they let go.

Step 13

1. The Assistant Controller begins moving the flight-boarding platform away from the low point into the safety area where it will be securely tethered.

2. The Controller stabilizes the flyers position over the low point.

3. As soon as the flight-boarding platform clears the flyers, the Controller picks up the winch pendant and begins winch-up.

CAUTION: Never use the manual by-pass valve to winch flyers to the top of the launch tower.

4. As the winch goes through its starting delay time, the Controller advises the flyers:

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"Hook your elbows together and keep them hooked together for the freefall. When you pass this point, spread your wings and fly."

(The Controller will emphasize the "wings spread" by extending both arms out.)

5. As the winch begins pulling the flyers back along the arc, the Controller walks beside the flight line (never on the flight line) and ensures the flyers have hooked their elbows together.

6. He/she offers words of encouragement and wishes the flyers to:

"Have a good flight."

Step 14

1. The Assistant Controller finishes pushing the rolling flight-boarding platform into the safety area and tethers the platform securely with the safety tether.

2. He/she monitors the winch operation by direct vision or if required, by video monitor.

Step 15

1. The Controller joins the Assistant Controller at the E-Stop switch station/operator's station.

2. The Controller ensures the boarding platform safety tether is in place.

3. The Controller and Assistant Controller focus their attentions on the flyers, the flight area (to ensure no unauthorized persons or objects are in the area) and the operation of the winch, either visually or if required, by video monitor.

Step 16

1. The winch is stopped at a signal from the flyers or at the top of the launch tower.

2. The Controller and the Assistant Controller visually confirm the flyers are in flight position with their elbows hooked together and that the flight line is clear.

3. After visually verifying that the flight line is clear, the Assistant Controller displays a “thumbs up” to the Controller and announces:

"Flight line clear."

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4. The Controller will visually verify that the flight line is clear and will announce:

   "3, 2, 1, fly!"

   This announcement may also be made by someone using a microphone after they have received a “Thumbs Up” signal from the Controller.

Step 17

1. During the flight time, both the Controller and Assistant Controller ensure the security of the rolling flight-boarding platform in the safety area, the position of the launch cable/counterweight, and the security of the flight area against persons or objects.

2. The Assistant Controller prepares the new launch release system for the next flight.

   (a) The launch release system consists of three forged steel metal rings that are attached to nylon webbing.

   (b) The rings are inserted through each other, starting at the bottom with the largest ring and working towards the top to the smallest ring. Insert the middle ring through the largest ring, then fold the middle ring back towards the smallest ring. Next, insert the smallest ring through the middle ring then fold it back towards the nylon loop.

   (c) Insert the nylon loop through the smallest ring then push the nylon loop through the grommet in the webbing.

   (d) Starting at the “launch cable end” of the release, begin threading the plastic coasted steel cable (pigtail) through the base of the B-12 clip, then through the nylon loop, the large ring, the base of the large ring and finally through the sleeve on the edge of the release system.

   (e) After preparing the launch release system for the next flight, the Assistant Controller attaches it to the Assistant Controller waist pouch or hangs it on the hook on the flight-boarding platform.

   (f) Refer to *Section 3.5, Appendix G - III* for further information on the Skycoaster® launch release system.

3. It is the responsibility of the Controller and Assistant Controller to ensure that the launch bridle and counterweight remain at the launch position for the duration of the flight time while visually monitoring them and the flyers. If the Down Safety Alarm activates and/or the launch bridle and counterweight begin to descend prematurely, the red E-Stop button at the E-Stop switch

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station must be pushed in, and the Controller may use the Skyhook or the manual landing pole to catch the launch bridle and pull it to the side away from the flyers while the Assistant Controller lands the flight.

WARNING!

Keep the launch cable raised to the upper limit during flight time. If the launch cable is lowered during the flight time, it could be catastrophic and fatal if the flyers strike the cables or counterweight during their flight. Reference Safety Bulletin #25.

NOTE: For those Skycoaster® operations without a hydraulic landing unit, please proceed to *Step #23*.

4. The Controller sets the hydraulic landing unit to the appropriate setting.

   (a) The Controller and Assistant Controller will discuss the estimated total weight and strengths of the flyers to determine the hydraulic landing unit setting (Light, Medium or Heavy). The approximate weight ranges set into the unit are:

Light	Up to 250 pounds (113.4 kilograms) total weight
Medium	251 – 550 pounds (113.9 - 249.5 kilograms) total weight
Heavy	Over 551 pounds (249.9 kilograms) total weight

   (b) Most landing units are automatically set to Medium when first turned ON. On these units, selecting Light or Heavy will be effective for 60 seconds – after 60 seconds the unit automatically returns to the Medium setting. Older landing units will stay at the selected setting until the switch is turned to another setting.

   (c) It is very important to set the hydraulic landing unit to the correct setting. Using too heavy of a setting may cause injury to the flyers. Using too light of a setting will allow the flyers to be pulled past the low point. When this happens, the flyers will come swinging back through the low point, and the loop could be yanked from their grasp if the rope catches a ground object such as the rubber bumper at the end of the track. If a flight is pulled past the low point, the Flight Crew should communicate direction to *"drop the loop"* after there is slack in the rope.

Step 18

1. After the flight has subsided to an appropriate speed, the Assistant Controller ascends the steps of the flight-boarding platform, lowers the right side child/short person step to prevent the landing pole from possibly hitting it and gives the warning phrase to the flyers as they pass overhead:

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*"Next time back, **everyone** grab hold of the loop **with both hands**."*

CAUTION: For the Assistant Controller to use the hydraulic landing unit, he/she must have received instruction from and have been qualified by a Site Controller at the Skycoaster® location. All initial catches in training must be made utilizing Park Personnel only.

Step 19

1. When the flyers are clear of the flight boarding platform heading into the Zoom Zone, the Assistant Controller then says to the Controller:

   "Pole, please."

1. The Controller sets the appropriate hydraulic landing unit setting; hands the hydraulic landing pole to the Assistant Controller after visually confirming that flyers are clear of the pole; verbally confirms the hydraulic lander setting with the Assistant Controller by saying, for example:

   "You've got heavy."

   And places a free hand as high as possible on the landing unit pole to offer support in the event the flyers drop the loop.

Step 20

1. As the flyers swing toward the Assistant Controller, he/she will determine if a safe catch can be made. A safe catch is one in which the landing pole will not go past the vertical position and the flyers, with the exception of small children in Pink (XS) flight suits flying with adults, are acclimated so that all flyers are able to reach and grab onto the loop.

2. If a safe catch cannot be made, the Assistant Controller will lower the landing pole out of the reach of the flyers, announce to them:

   "Next time."

   And prepare to catch them on the next swing back.

Step 21

1. If the Assistant Controller can make a safe catch, he/she carefully maneuvers the pole to place the loop within the flyers' reach, announcing the catch phrase:

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*"Everyone grab hold **with both hands** and hold on tight."*

CAUTION: It has been clearly demonstrated that Assistant Controllers who do not verbalize the "warning" and "catch" phrases loudly and clearly will not motivate all hands to grasp the loop. The result of only one of the flyers grasping the loop will be to have that person take the full force of the landing, possibly injuring their arms or shoulders. **All Assistant Controllers will use the "warning" and "catch" phrases while landing each and every flight.** Each flyer, with the exception of a small child in a Pink (XS) flight suit, must have a firm grasp of the loop with both hands during the landing. If any eligible flyer is not reaching for or holding onto the loop, the flight crew must continue to tell all flyers to grab the loop with both hands.

2. As the flyers grasp the loop and begin to swing away towards the low point, the Assistant Controller and Controller let go of the pole.

NOTE: If the flyers did not grasp the loop, but look like they might be able to catch it on the next swing back, attempt to catch them on that next swing if a safe catch can be made. The "catch" phrase must be used on each catch.

3. The Assistant Controller raises the child/short person step on the flight-boarding platform and descends the stairs.

Step 22

1. Once a successful catch has been made, the Controller then begins the winch-down by pressing and holding the winch pendant DOWN button and momentarily pressing the DOWN cycle start button at the E-Stop switch station. The launch cable position must be visually monitored to ensure it is never brought into a position where it could be struck by flyers.

2. The flyers recede toward the low point. The Assistant Controller will monitor the flight and direct the flyers to "*drop the loop*" when there is slack in the rope. This will prevent the rope from snapping back and mis-spooling.

WARNING!

In the event of a 'snap-back' of the Perlon rope, the Controller will open the reel side of the Hydraulic Lander and visually verify the Perlon rope is not mis-spooled. If it is, the mis-spool must be corrected before further use of the Hydraulic Lander.

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Step 23

1. If the catch using the hydraulic landing pole was not successful, the Assistant Controller will descend the steps of the flight boarding platform and land the flyers using the manual landing pole.

CAUTION: For the Assistant Controller to use the manual landing pole, he/she must have received instruction from and have been qualified by a Site Controller at the Skycoaster® location. All initial catches in training must be made utilizing Park Personnel only.

2. After the flight has subsided to an appropriate speed, the Assistant Controller gives the warning phrase:

   *"Next time back, **everyone** grab hold of the loop **with both hands**."*

3. As the flyers swing toward the Assistant Controller, he/she will announce:

   *"Everyone grab hold **with both hands** and hold on tight."*

   (a) To properly hold the manual landing pole, the Assistant Controller must have one hand on the end and the other hand towards the middle of the pole.

   (b) The Assistant Controller will land flights by keeping one foot behind the other during the catch and walking the flyers to a stop over the low point. Assistant Controllers who run, lean back, or slide with both feet risk injury if the flyers should let go of the loop. The manual landing pole shall never be placed in a position in which it may strike a flyer.

   (c) If the flight pulls the Assistant Controller past the low point, the manual pole becomes a spear as the flyers begin to swing back towards the low point. The Assistant Controller must give the instruction to *"Let go"* of the loop and then carefully avoid having the end of the pole strike the ground which could lead to the pole striking the flyers in the face or body.

4. Once a successful catch has been made, the Controller then begins the winch-down by pressing and holding the winch pendant DOWN button and momentarily pressing the DOWN cycle start button at the E-Stop switch station. The launch cable position must be visually monitored to ensure it is never brought into a position where it could be struck by flyers.

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Step 24

1. After the flyers are brought to a stop at or near the low point and have let go of the loop, the Assistant Controller grasps the flyers gently by the wrists or by the flight suits and stabilizes them over the low point with their feet towards the boarding platform.

2. When the Assistant Controller has the flyers stabilized and under control, the Controller disconnects the safety tether and rolls the flight-boarding platform to the flyers. Note: The child/short person steps must be in their up position during the docking process to prevent a flyer from striking the step.

Step 25

1. As the cart is pushed under the flyers, the Assistant Controller instructs the flyers:

   "Take hold of the rope, not the blue bar. Relax your knees, drop your footbars, and stand up."

2. The Assistant Controller then walks up the stairs of the flight boarding platform. He/she instructs the flyers:

   "Pick up your footbars and step back from the yellow line."

3. After the flyers are holding their footbars and are standing back from the yellow line, the Assistant Controller announces:

   "Clear."

   Lifts the safety hand latch with his/her hand and releases the safety bar with the foot-pedal.

CAUTION: Skycoaster® attractions utilizing a rolling boarding platform may not operate if any part of the safety bar is inoperable.

4. The Controller continues the winch-down and picks up the manual landing pole to place it on the hooks on the boarding platform (if the manual pole was used for that flight).

Step 26

1. After the safety bar has been raised, the Assistant Controller grasps the ripcord release cable (pigtail) of the flyer on the right and pulls the ripcord to its up-most position.

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2. He/she next disconnects the pigtail and the launch release system hardware from the flight suits and places these items in the Assistant Controller waist pouch or the bucket, which is mounted on the platform.

3. The Assistant Controller unhooks the upper and lower side clips then disconnects the flyers from the flight cables, one flyer at a time, retaining control of the suspension straps as the flyer(s) descend the steps.

4. The Assistant Controller cautions the flyers to carry their footbars, to use the handrail while descending the steps and thanks them for their participation.

NOTE: The Assistant Controller must keep the flight cables under control. Any twists in the flight cables are spun out after all flyers have left the flight-boarding platform.

Step 27

1. As the launch cable stops at the down position, the Controller lays the pendant on its stand, picks up the skyhook and walks to the launch bridle.

2. The Controller hooks the bridle and walks up the left side of the steps of the flight-boarding platform. He/she disconnects the launch release hardware from the launch bridle, places it in the pouch/bucket on the platform and removes the new launch release system from the ring on the Assistant Controller waist pouch or the hook on the flight-boarding platform.

3. He/she connects the end of the new launch release system with the two B-12 clips attached to red and black webbing to the launch bridle and tethers the launch bridle to the flight-boarding platform with the tether strap. The snaphooks should be connected to the Double-D Ring or Steel Ring in opposite directions so that the gates of the clips are facing each other.

Step 28

1. As the last flyer(s) leave the flight-boarding platform, the Assistant Controller calls the next flyers up:

   "Next flyers come on board."

Step 29

1. Cycle is now repeated, starting at Step 1.

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II. Flyer Walk Through for Hydraulic Scissors Lift Flight-Boarding Platform

Sequence begins as the flyers have just been brought to a stop after their flight. Note: Steps 1 through 4 from the "Flyer Walk Through for Rolling Flight-boarding Platforms" will be performed in the same manner.

NOTE: There are two types of Hydraulic Scissors Lifts used on Skycoaster® attractions; 5-foot Single Lift and, 10-foot Scissors Lift. The 5-foot Single lift incorporates the use of retractable sidewalls or “wings” as they are referred to in this section. The 10-foot Double Lift has stationary walls and uses a door on either side of the lift for entrance/exit. Any reference in this section to “lift wings” applies only to those sites using a 5-foot Single Lift.

Step 1

1. The Assistant Controller stands on the lift controls, holding the legs of the right-side Flyer, with all flyers facing away from the orange toe-switch cover on the scissors lift. He/she then announces:

   "Next flyers, come on board."

2. He/she then says to the old flyers:

   "Relax your knees and drop your footbars."

3. The Controller walks to the low-point switch station while holding down the winch pendant DOWN button,

4. The Expediter meets the Controller at the low-point switch station after leaving the next flyers at the ready line.

5. The flyers are suspended stationary over the low point above the scissors lift.

6. The next flyers are at the ready line.

Step 2

1. The Controller transfers the pendant to the Expediter to continue winch-down, then boards the scissors lift.

2. The Expediter takes control of the winch pendant, ensuring the DOWN button is continually pressed and presses the RAISE enable button on the low-point switch station.

3. The Controller ensures the next flyers are coming on board.

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4. The next flyers walk onto the lift.

Step 3

1. The Assistant Controller and Controller ensure everyone is on board, standing clear of the lift wings and that straps of footbars are not in pinch grooves of the lift.

2. The Expediter continues bringing the launch cable to the DOWN position.

3. The flyers are still suspended over the low-point.

4. The next flyers stand on the marked positions holding their footbars.

Step 4

1. The Assistant Controller announces:

   "Clear, going up."

   Then steps on the footplate and UP toe-switch to raise the lift.

2. The Controller directs the flyers:

   "Flyers, grab hold of this wall and help yourself stand up."

3. The Expediter ensures that the launch cable is completely DOWN and then lays the pendant on the low-point switch station.

4. The flyers have dropped their footbars and prepare to stand up on the lift.

5. The next flyers stand on the marked positions holding their footbars.

Step 5

1. The Assistant Controller grasps the ripcord release cable (pigtail) of the Flyer on the right and pulls the ripcord to its up-most position.

2. The Controller assists the flyers in standing.

3. The Expediter walks beneath the launch bridle with the skyhook.

4. The flyers stand on the lift.

5. The next flyers continue standing on the marked positions holding their footbars.

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Step 6

1. The Controller directs the old flyers:

   "Flyers, turn and face me, stand on the black line and pick up your footbars."

2. When all flyers are holding their footbars, the Controller turns to the next flyers and makes certain that the Ripcord Puller has been properly briefed:

   "Did they tell you about the ripcord?"

   If the ripcord puller is unsure of their duties, the Controller must brief them once again.

3. The Assistant Controller disconnects the pigtail and launch release hardware and places them in the Assistant Controller waist pouch.

4. The Expediter hooks the launch bridle with the skyhook.

5. The next flyers stand on the marked positions holding their footbars.

Step 7

1. The Assistant Controller unhooks the upper and lower side clips, slides the carabiner fairing up and unlocks the flight carabiners, disconnects flyer's flight suits from the flight cables and maintains control of the twisted flight cables. The Controller may assist in unhooking the upper and lower side clips.

2. The Expediter walks beside the lift with the skyhooked launch bridle.

3. The flyers continue standing on the black line with footbars in hand.

4. The next flyers continue standing on the marked positions holding their footbars.

Step 8

1. While undoing twists in the flight cables, the Assistant Controller announces to the flyers:

   "All flyers change places, please."

2. The Controller helps flyers change places.

3. The Expediter remains standing beside the raised lift with the skyhooked launch bridle.

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4. The flyers change places with the next flyers making sure that the ripcord puller is on the flyers right side as they are facing the previous flyers.

NOTE: At this point, the "flyers" become the "previous flyers" and the "next flyers" become the “flyers”.

Step 9

NOTE: If a triple (3 flyers) is being flown, the flyers should be arranged with the largest (tallest/heaviest) flyer positioned in the middle.

1. The Assistant Controller attaches the flyers, left to right, to the Flight Carabiners.

   (a) The flyers are connected to the flight cables through the use of two Flight Carabiners.

   (b) Each suspension ring on the flight suits must be threaded through both Flight Carabiners.

   (c) When connected properly, the Flight Carabiners must be acclimated so that the wide portion of the carabiner is towards the flyers.

   (d) Both Flight Carabiners must be locked after all suspension rings have been connected.

   (e) After locking both Flight Carabiners, the Assistant Controller verifies that each flyer is properly attached.

   (f) He/she then hooks the upper and lower side clips when applicable. The Controller may assist in hooking the side clips from the flyers front side to expedite the attachment process.

NOTE: If your flight suits are equipped with upper and lower side clips, it is no longer necessary to connect the flight suits utilizing the purple carabiners as outlined in SB #13 and SB #17.

   (g) Please refer to *Section 3.5, Appendix G - V and VI* for further information on proper Flight Carabiner attachment.

2. The Controller stands directly in front of the new flyers and directs new flyers:

   “Stand close together, drop your footbars, stand on the white bar and hook your elbows together.”

   The Controller then moves to the side of the right-side flyer.

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3. The Expediter remains standing beside the lift with the skyhooked launch bridle.

4. The previous flyers stand on the lift with footbars in hand.

Step 10

1. The Assistant Controller physically verifies that that each flyer is connected to the Flight Carabiners, that the Flight Carabiners are locked, that the flight suit release rings are toward the launch tower and that there are no twists in the flight cables. He/she announces:

   "Carabiners Locked"

NOTE: The only time the flight carabiners can be confirmed locked by physically squeezing the gates is when the flyers are standing, not when they are prone.

2. The Controller visually verifies all flyers are attached to the Flight Carabiners, that the Flight Carabiners are locked, that the flight suit release rings are toward the launch tower and that there are no twists in the flight cables. He/she answers with:

   "Carabiners Locked"

3. The Assistant Controller announces:

   "The floor is going to fall away. Clear, going down."

   Then steps on the footplate and DOWN toe-switch and assists the left-side flyer in swinging prone. The DOWN toe-switch is activated just long enough to help the flyers to a prone position. Note: The Assistant Controller must remove his or her foot from the footplate quickly, at the instant the flyers start to swing prone. Lowering the lift too far makes the connection of the launch release system difficult.

NOTE: The 'Clear, going down.' is a warning to the Expediter that the lift is descending.

4. The Controller assists the right-wing flyer in swinging prone.

5. The Expediter holds the launch bridle in position for the Assistant Controller to grasp easily.

6. The flyers swing forward into prone position.

7. The previous flyers remain standing on the lift with their footbars in hand.

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NOTE: The Controller and Assistant Controller must give assistance to the left and right side flyers during the proning process to avoid any possibility of the flyers striking their bodies against the sidewall. The Controller will grip the outside shoulder strap of the right-side flyers' flight suit and the Assistant Controller will grip the outside shoulder strap of the left-side flyers' flight suit to give control as the flyers swing prone.

Step 11

1. The Assistant Controller takes the launch bridle from the skyhook, disconnects the old launch release system, places it in the Assistant Controller waist pouch, and connects the new launch release system.

   (a) The launch release system (three-ring release) is the connecting link between the flyers and the launch bridle.

   (b) Connect the end of the launch release system with the red safety tether to the launch bridle. The clips are connected in opposite directions so that the gate of each clip is facing the other.

   (c) To connect the launch release system to the flyers, connect the end of the three-ring release with the two B-12 clips stitched to the black webbing to the flight suit release rings.

      (i) When connecting one flyer, connect both B-12 clips to the flight suit release ring. Connect the clips in opposite directions so that the gates are facing each other.

      (ii) When connecting two flyers, connect one B-12 clip to the release ring on one flyer and the other B-12 clip to the release ring on the other flyer. Again, the clips must be connected opposite each other so that the gates are facing each other.

      (iii) When connecting three flyers, connect one B-12 clips to each of the outside flyers only. Again, the clips must be connected opposite each other so that the gates are facing each other. Do not connect a B-12 clip to the release ring on the flyer positioned in the middle.

   (d) After all B-12 clips have been properly connected, the Controller connects the ripcord of the flyer on the right side (the flyer that is going to pull the ripcord) to the pigtail of the three-ring release using the ripcord snaphook.

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2. The Controller performs the BBL; tightens backstraps, checks buckles on leg straps and checks legs for proper footbar positioning.

3. The Expediter lays down the skyhook beside the low-point switch station.

4. The flyers rest in the prone position.

5. The previous flyers continue standing on the lift with their footbars in hand.

Step 12

1. The Assistant Controller visually checks the BBL, the upper and lower side clips, the launch release system, the Flight Carabiners and the ripcord. If all is ready, he/she announces to the Controller:

   "Clips, Carabiners, Ripcord... Ready to Fly."

2. The Assistant Controller confirms that the Omega Carabiner that connects the launch bridle to the launch cable is locked, if this is his/her first flight in this position, or if it has been more than two hours since the last check of this Omega Carabiner.

3. The Controller gives a final, overall visual inspection of the flyers, flight suits, launch release system, and flight carabiners. If all is ready, he/she announces:

   "Let's fly"

   Then slides the fairing over the flight carabiners.

NOTE: The only time the flight carabiners can be confirmed locked by physically squeezing the gates is when the flyers are standing, not when they are prone.

4. The Expediter moves near the end of the lift to assist the previous flyers with their exit.

5. The flyers, in the prone position, await winch-up.

6. The previous flyers stand on the lift with footbars in hand.

Step 13

1. The Assistant Controller announces:

   "Clear, going down."

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Then he/she steps on the footplate and DOWN toe-switch to lower the lift to the complete down position.

NOTE: The 'Clear, going down.' is a warning to the Expediter that the lift is descending.

2. The Controller prepares to exit the lift to begin the winch-up.

3. The Expediter directs the previous flyers:

   "Exit the lift when the lift wings are fully down."

4. The flyers await winch-up.

5. The previous flyers wait to exit the scissors lift.

Step 14

1. The Assistant Controller holds the left arm, elbow or flight suit of the center Flyer to prevent the flyers from swinging back. Once stabilized, he/she advises the flyers:

   "Keep your elbows hooked together for the free-fall. When you pass this point, spread your wings and fly."

   (The Assistant Controller will emphasize the "wings spread" by extending both arms out.)

2. The Controller exits the lift and goes to the low-point switch station. After the lift wings are fully down, the Controller presses and holds down the winch pendant UP button, and presses the UP cycle start button at the low-point switch station.

   CAUTION: Never use the manual by-pass valve to winch flyers to the top of the launch tower.

3. The Expediter ensures all previous flyers are escorted off the lift and through the exit gate. The Expediter must follow the previous flyers, not lead them, to the gate.

4. The flyers await winch-up.

Step 15

1. The Controller walks to the E-Stop switch station/operator's station continuing winch-up.

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2. The Assistant Controller walks beside the flight line, never on the flight line and offers encouragement to the flyers as they begin their ascent. He/she ensures that flyers have their elbows hooked together and wishes them to:

   "Have a good flight."

3. The Expediter, outside the gate, ensures that the next flyers are suited properly and ready.

Step 16

1. The Controller and Assistant Controller focus their attentions on the flyers, the flight area (to ensure no unauthorized persons or objects are in the area) and the operation of the winch, either visually or by video monitor (if installation is required).

2. The Assistant Controller begins to build a new launch release system from pieces in the Assistant Controller waist pouch.

   (a) The launch release system consists of three forged steel metal rings that are attached to nylon webbing.

   (b) The rings are inserted through each other, starting at the bottom with the largest ring and working towards the top to the smallest ring. Insert the middle ring through the largest ring, then fold the middle ring back towards the smallest ring. Next, insert the smallest ring through the middle ring then fold it back towards the nylon loop.

   (c) Insert the nylon loop through the smallest ring then push the nylon loop through the grommet in the webbing.

   (d) Starting at the “launch cable end” of the release, begin threading the plastic coasted steel cable (pigtail) through the base of the B-12 clip, then through the nylon loop, the large ring, the base of the large ring and finally through the sleeve on the edge of the release system.

   (e) After preparing the launch release system for the next flight, the Assistant Controller attaches it to the Assistant Controller waist pouch or hangs it on the hook on the flight-boarding platform.

   (f) Refer to *Section 3.5, Appendix G - III* for further information on the Skycoaster® launch release system.

Step 17

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1. The winch is stopped at a signal from the flyers or at the top of the launch tower.

2. The Controller and Assistant Controller visually confirm that the flyers are in flight position, with their elbows hooked together and that the flight line is clear.

3. After visually verifying that the flight line is clear, the Assistant Controller displays a “thumbs up” to the Controller and announces:

   "Flight line clear."

4. The Controller will visually verify that the flight line is clear and will announce:

   "3, 2, 1, fly!"

   This announcement may also be made by someone using a microphone after they have received a “thumbs up” signal from the Controller.

Step 18

1. If not completed, the Assistant Controller completes building the new launch release system and snaps it to a ring on the Assistant Controller waist pouch.

2. It is the responsibility of the Controller and Assistant Controller to ensure that the launch bridle and counterweight remain at the launch position for the duration of the flight time while visually monitoring them and the flyers. If the Down Safety Alarm activates and/or the launch bridle and counterweight begin to descend prematurely, the red E-Stop button at the E-Stop switch station must be pushed in, and the Controller may use the Skyhook or the manual landing pole to catch the launch bridle and pull it to the side away from the flyers while the Assistant Controller lands the flight.

WARNING!

Keep the launch cable raised during flight time. If the launch cable is lowered during the flight time, it could be catastrophic and fatal if the flyers strike the cables or counterweight during their flight. Reference Safety Bulletin #25.

3. The Controller sets the hydraulic landing unit to the appropriate setting.

   (a) The Controller and Assistant Controller will discuss the estimated total weight and strengths of the flyers to determine the hydraulic landing unit setting (Light, Medium or Heavy). The approximate weight ranges set into the unit are:

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Light	Up to 250 pounds (113.4 kilograms) total weight
Medium	251 – 550 pounds (113.9 - 249.5 kilograms) total weight
Heavy	Over 551 pounds (249.9 kilograms) total weight

(b) Most landing units are automatically set to Medium when first turned ON. On these units, selecting Light or Heavy will be effective for 60 seconds – after 60 seconds the unit automatically returns to the Medium setting. Older landing units will stay at the selected setting until the switch is turned to another setting.

(c) It is very important to set the hydraulic landing unit to the correct setting. Using too heavy of a setting may cause injury to the flyers. Using too light of a setting will allow the flyers to be pulled past the low point. When this happens, the flyers will come swinging back through the low point, and the loop could be yanked from their grasp if the rope catches a ground object such as a wing of the scissors-lift. If a flight is pulled past the low point, the Flight Crew and the Expediter should communicate direction to *"drop the loop"* after there is slack in the rope.

Step 19

1. After the flight has subsided to an appropriate speed, the Assistant Controller ascends the steps of the workstand and gives the warning phrase to the flyers as they pass overhead:

   *"Next time back, **everyone** grab hold of the loop **with both hands**."*

CAUTION: For the Assistant Controller to use the hydraulic landing unit, he/she must have received instruction from and have been qualified by a Site Controller at the Skycoaster® location. All initial catches in training must be made utilizing Park Personnel only.

2. When the flyers are clear of the workstand heading into the Zoom Zone, the Assistant Controller then says to the Controller:

   "Pole, please."

3. The Controller sets the appropriate hydraulic landing unit setting; hands the hydraulic landing pole to the Assistant Controller after visually confirming that flyers are clear of the pole; verbally confirms the hydraulic lander setting with the Assistant Controller by saying, for example:

   "You've got heavy."

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And places a free hand as high as possible on the landing unit pole to offer support in the event the flyers drop the loop.

4. The Expediter ensures the next flyers are ready to go and are waiting at the gate.

Step 20

1. As the flyers swing toward the Assistant Controller, he/she will determine if a safe catch can be made. A safe catch is one in which the landing pole will not go past the vertical position and the flyers, with the exception of small children in Pink (XS) flight suits flying with adults, are acclimated so that all flyers are able to reach and grab onto the loop.

2. If a safe catch cannot be made, the Assistant Controller will lower the landing pole out of the reach of the flyers, announce to them:

   "Next time."

   And prepare to catch them on the next swing back.

Step 21

1. If the Assistant Controller can make a safe catch, he/she carefully maneuvers the pole to place the loop within the flyers' reach, announcing the catch phrase:

   *"**Everyone** grab hold **with both hands** and hold on tight."*

   CAUTION: It has been clearly demonstrated that Assistant Controllers who do not verbalize the "warning" and "catch" phrases loudly and clearly will not motivate all hands to grasp the loop. The result of only one of the flyers grasping the loop will be to have that person take the full force of the landing, possibly injuring their arms or shoulders. **All Assistant Controllers will use the "warning" and "catch" phrases while landing each and every flight.** Each flyer, with the exception of a small child in a Pink (XS) flight suit, must have a firm grasp of the loop with both hands during the landing. If any eligible flyer is not reaching for or holding onto the loop, the flight crew must continue to tell all flyers to grab the loop with both hands.

2. As the flyers grasp the loop and begin to swing away towards the low point, the Assistant Controller and Controller let go of the pole.

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NOTE: If the flyers did not grasp the loop, but look like they might be able to catch it on the next swing back, attempt to catch them on that next swing if a safe catch can be made. The catch phrase must be used on each catch.

3. The Assistant Controller begins descending the stairs.

Step 22

1. As soon as a successful catch has been made, the Expediter brings the next flyers through the gate.

NOTE: If the flyers are still swinging and the Assistant Controller is not yet on board, the Expediter remains with the next flyers until the Assistant Controller announces "*Next flyers, come on board*."

2. Once a successful catch has been made, the Controller then begins the winch-down by pressing and holding the winch pendant DOWN button and momentarily pressing the DOWN cycle start button at the E-Stop switch station. The launch cable position must be visually monitored to ensure it is never brought into a position where it could be struck by flyers.

3. The flyers recede toward the low point. The Assistant Controller will monitor the flight and direct the flyers to "*drop the loop*" when there is slack in the rope. This will prevent the rope from snapping back and mis-spooling.

WARNING!

In the event of a 'snap-back' of the Perlon rope, the Controller will open the reel side of the Hydraulic Lander and visually verify the Perlon rope is not mis-spooled. If it is, the mis-spool must be corrected before further use of the Hydraulic Lander.

Step 23

1. If the catch using the hydraulic landing pole was not successful, the Assistant Controller will descend the steps of the workstand and land the flyers using the manual landing pole.

CAUTION: For the Assistant Controller to use the manual landing pole, he/she must have received instruction from and have been qualified by a Site Controller at the Skycoaster® location. All initial catches in training must be made utilizing Park Personnel only.

2. After the flight has subsided to an appropriate speed, the Assistant Controller gives the warning phrase:

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*"Next time back, **everyone** grab hold of the loop **with both hands**."*

3. As the flyers swing toward the Assistant Controller, he/she will announce:

   "**Everyone** grab hold **with both hands** and hold on tight."

   (a) To properly hold the manual landing pole, the Assistant Controller must have one hand on the end and the other hand towards the middle of the pole.

   (b) The Assistant Controller will land flights by keeping one foot behind the other during the catch and walking the flyers to a stop over the low point. Assistant Controllers who run, lean back, or slide with both feet risk injury if the flyers should let go of the loop. The manual landing pole shall never be placed in a position in which it may strike a flyer.

   (c) If the flight pulls the Assistant Controller past the low point, the manual pole becomes a spear as the flyers begin to swing back towards the low point. The Assistant Controller must give the instruction to *"Let go"* of the loop and then carefully avoid having the end of the pole strike the ground which could lead to the pole striking the flyers in the face or body.

4. Once a successful catch has been made, the Controller then begins the winch-down by pressing and holding the winch pendant DOWN button and momentarily pressing the DOWN cycle start button at the E-Stop switch station. The launch cable position must be visually monitored to ensure it is never brought into a position where it could be struck by flyers.

5. As soon as a successful catch has been made, the Expediter brings the next flyers through the gate.

NOTE: If the flyers are still swinging and the Assistant Controller is not yet on board, the Expediter remains with the next flyers until the Assistant Controller announces "*Next flyers, come on board*."

Step 24

1. The Assistant Controller gains control of the slowly swinging flyers by holding their flight suit leg straps until the flyers are stationary over the lift.

2. The expediter leads the next flyers to the ready line.

Step 25

1. The cycle is now repeated, beginning at Step 1.

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The operation procedures are also known as "Flyer Walk Through for Rolling Flight-boarding Platforms" and "Flyer Walk Through for Hydraulic Scissors Lift Flight-boarding Platforms." Do not deviate from these procedures. Remember, prior to processing your first flyer, all applicable inspection check points will have been completed.

III. Flyer Walk Through for Rolling Flight-Boarding Platform Utilizing a Sky Sled

Step 1

1. Flyers arrive at the Skycoaster® site and are greeted by the Customer Representative.

2. The Customer Representative should answer all questions with the utmost confidence, as these people are entrusting your company with their well-being.

3. This should not be taken lightly. A good impression will assure positive word-of-mouth advertising for your operation.

Step 2

1. Flyers are signed-in and receive a briefing from the Customer Representative.

Step 3

1. Flyers arrive at the flight suiting area.

2. The Flight Suit Person greets the flyers. Following is an example of what an appropriate greeting may be:

3. "Hi, my name is _____. I'm going to fit you with your flight suit."

(a) Choosing the correct flight suit for each flyer is important.

(b) The following flyer height limits are as follows:

(i) One Size Fits All — Dark Blue - size for persons 4 foot 6 inches (1.22 meters) to 6 foot 6 inches (1.98 meters)

4. Once the Sky Sled is presented to the flier, the following briefing should be given:

"*Please stand up straight, keep your hands together, and look straight ahead.* (The flight suiter places the top of the back/shoulder straps at the base of the

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flyers neck). *Now spread your arms, bringing them out here." "Please hold your flight suit here while I secure your back straps.*

Please refer to *Section 3.5, Appendix (Add Appendix) - I* for proper flight suit fitting and layout.

5. During fitting, the back/shoulder straps of the Sky Sled are to be adjusted so the harness sits gently against their back. Please note the following:

    (i) When flying disabled persons it is necessary to snug the back straps to aid in retaining the flyer in the proper position within the suit because the flyer may not have the ability to push upon the footbar.

6. After properly securing the back/shoulder straps the Flight Suiter shall instruct the flier:

    "Continue to look straight ahead and don't look down. I am going to adjust your footbar. This is your footbar - please carry it whenever you walk so you will not trip over it."

7. The Flight Suiter will fold the suit back connecting the snaphook to the connector ring making sure the lower spreader bar and leg straps are behind the flyer.

8. After the flyers are suited, they are briefed on the flying techniques, release protocol and landing procedure. The following briefing should be given:

    "Who is going to pull the ripcord? This is your ripcord. When you reach the top of the launch tower, put your hand on the ripcord. When you hear 3, 2, 1, FLY, just give it an easy pull and enjoy your flight.

    In order to slow you down after your flight, all flyers must grab onto the loop with both hands and hold on tight until instructed to release the loop. There is going to be pulling resistance similar to picking up a 50 pound suitcase. Are you capable and willing to do this?" (Each flyer must answer "***Yes***" in order to fly on the Skycoaster® attraction in a normal manner using a landing pole loop. Should any flyer state they are not capable and willing to grasp and hold onto the landing pole loop, the flyer(s) shall be given the option of flying and coasting to a stop without the use of any landing pole.

    "Do you have any questions? Have a good flight."

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CAUTION: To avoid the possibility of choking, all flyers must remove any gum, mints, chewing tobacco, etc. from their mouths. Have a receptacle available for this in the flight suit area. Loose jewelry, eyeglasses or other objects such as pencils, pagers or pins on clothing must be removed and secured in the flight suit area prior to flying. Skycoaster recommends that flyers remove large key rings from their pockets.

NOTE: A maximum of 2 fliers may fly together when utilizing a Sky Sled.

1. The Flight Suit Person gives the flyers a thorough check and directs them to the on-deck area.

2. Once in the on-deck area, the Flight Suit Person establishes and/or confirms the flyers positions: for example, the ripcord puller is on the right.

3. The flyers move to the ready line and stand on their respective numbers upon direction from the Flight Suit Person.

4. The Assistant Controller directs the flyers to leave the ready line and ascend the flight-boarding platform by saying:

   "Next flyers come on board".

Step 4

1. The flyers ascend the flight-boarding platform.

2. The Assistant Controller instructs the flyers to stand on the designated location and hold their footbars. He/she unhooks the snaphook from the connector ring and attaches the flyers, left to right, to the Flight Carabiners. If children or short persons are flying, it may be necessary to have those flyers stand on the child/short person step in order to attach those flyers to the flight cables.

   (a) The flyers are connected to the flight cables using two Flight Carabiners.

   (b) Each suspension ring on the flight suits must be threaded through both Flight Carabiners.

   (c) When connected properly, the Flight Carabiners must be acclimated so that the wide portion of the carabiner is towards the flyers.

   (d) Both Flight Carabiners must be locked after all suspension rings have been connected.

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(e) After locking both Flight Carabiners, the Assistant Controller verifies that each flyer is properly attached.

(f) He/She then hooks the upper and lower side clips and tandem fairings when applicable.

NOTE: If your flight suits are equipped with upper and lower side clips, it is no longer necessary to connect the flight suits utilizing the purple carabiners as outlined in SB #13 and SB #17.

(g) Please refer to *Section 3.5, Appendix G - V and VI* for further information on proper Flight Carabiner attachment.

3. Simultaneously, the Controller on the platform, ensures the flyers are holding and not standing on their footbars.

4. When flying a double, the person situated on the flyers right side will be the ripcord puller. The Controller makes eye contact with the flyer who is pulling the ripcord and ensures the flyer has been adequately briefed by asking:

"Did they tell you about the ripcord?"

If the ripcord puller is unsure of their duties, the Controller must brief them once again.

5. The Assistant Controller physically verifies that all hardware is attached, each flyer is connected to the Flight Carabiners, and the Flight Carabiners are locked, the flight suit release rings are toward the launch tower and that there are no twists in the flight cables. He/she announces:

"Carabiners Locked"

6. The Controller moves to the ripcord puller's side while still on the platform and visually verifies all flyers are attached to the Flight Carabiners, the Flight Carabiners are locked, the flight suit release rings are toward the launch tower and that there are no twists in the flight cables. He/she answers with:

"Carabiners Locked"

NOTE: The only time the flight carabiners can be confirmed locked by physically squeezing the gates is when the flyers are standing, not when they are seated.

Step 5

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1. After the Controller gives the verbal command "*Carabiners Locked*," he/she then instructs the flyers:

   "Drop your footbars, take hold of the yellow flight handles, stand on the white bar, and fall back into your suit."

NOTE: The Controller and Assistant Controller must give assistance to the left and right side flyers during the seating process to avoid any possibility of the flyers striking their bodies against the railings. The Controller will grip the outside shoulder strap of the right-side flyers' flight suit and the Assistant Controller will grip the outside shoulder strap of the left-side flyers' flight suit to give control as the flyers are seated stationary in their harness.

Step 6

1. After the Controller announces "*Carabiners Locked*," the Assistant Controller turns to the right, disconnects the launch bridle from the tether strap and begins connecting the new launch release system. The new launch release system must not be connected to the flyers until they are in the seated position.

   (a) The launch release system (three-ring release) is the connecting link between the flyers and the launch bridle.

   (b) Connect the end of the launch release system with the red safety tether to the launch bridle. Connect the clips in opposite directions so that the gate of each clip is facing the other.

   (c) Connect the end of the launch release system with the two B-12 clips stitched to the black webbing to the flight suit release rings.

      (i) When connecting one flyer, both B-12 clips are connected to the flight suit release ring. Connect the clips in opposite directions so that the gate of each clip is facing the other.

      (ii) When connecting two flyers, connect one B-12 clip to the release ring on one flyer and the other B-12 clip to the release ring on the other flyer. Again, the clips must be connected opposite each other so that the gate of each clip is facing the other.

      (iii) When connecting three flyers, connect one B-12 clip to each outside flyer only. Again, the clips must be connected opposite each other so that the gate of each clip is facing the other. Do not connect a B-12 clip to the release ring on the flyer positioned in the middle.

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(d) After all B-12 clips are correctly connected, the Assistant Controller connects the ripcord of the flyer on the right side (the flyer that is going to pull the ripcord) to the pigtail of the launch release system using the ripcord snaphook.

Step 7

1. After the flyers are seated, the Controller will thread the leg straps through the front of the Sky Sled and attach/tighten at the flier's feet. Simultaneously, the Assistant Controller will tighten the back straps.

2. The Controller also looks for loose jewelry, eyeglasses and other loose objects that may come off during flight.

Step 8

1. As the Assistant Controller is connecting the launch release system.

2. The Controller and Assistant Controller perform the BBL: The Assistant Controller tightens back straps and connects the tandem fairings (if necessary) , while the Controller checks the buckles attached to the leg straps and checks legs for proper footbar positioning.

3. The Assistant Controller gives a final, overall inspection of the flyers, flight suits, launch release system, side clips and flight carabiners.

NOTE: The only time the flight carabiners can be confirmed locked by physically squeezing the gates is when the flyers are standing, not when they are seated.

4. If all is ready, he/she makes this announcement:

"Clips, Carabiners, Ripcord ... Ready to Fly."

Step 9

1. When the Assistant Controller announces "Ready to Fly," the Controller moves to the ripcord puller's side of the cart for a final, overall visual inspection of the flyers, flight suits, launch release system and flight carabiners.

2. If all is ready, the Controller announces:

"Let's fly."

Step 10

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1. The Assistant Controller lowers the fairing over the flight carabiners.

2. The Assistant Controller confirms that the Omega Carabiner that connects the launch bridle to the launch cable is locked if this is his/her first flight in this position, or if it has been more than two hours since the last check of this Omega Carabiner.

3. The Assistant Controller and Controller descend the steps of the flight-boarding platform.

Step 11

1. The Controller moves to the front of the cart and lowers the Safety Bar using a tether strap and locks it into place. He/she then holds the flyer(s) gently by the Sky Sled. This prevents the flyers from swinging back from the front of the platform when they let go.

Step 12

1. The Assistant Controller begins moving the flight-boarding platform away from the low point into the safety area where it will be securely tethered.

2. The Controller stabilizes the flyers position over the low point holding the left arm, elbow or Sky Sled of either flyer to prevent the flyers from swinging back. Once stabilized, he/she advises the flyers:

3. As soon as the flight-boarding platform clears the flyers, the Controller picks up the winch pendant and begins winch-up.

CAUTION: Never use the manual by-pass valve to winch flyers to the top of the launch tower.

---

4. As the winch goes through its starting delay time, the Controller advises the flyers:

   "Continue to hold the flight handles for the freefall. When you pass this point, spread your wings and fly."

   (The Controller will emphasize the "wings spread" by extending both arms out.)

5. As the winch begins pulling the flyers back along the arc, the Controller walks beside the flight line (never on the flight line) and ensures the flyers have hooked their elbows together.

6. He/she offers words of encouragement and wishes the flyers to:

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"Have a good flight."

Step 13

1. The Assistant Controller finishes pushing the rolling flight-boarding platform into the safety area and tethers the platform securely with the safety tether.

2. He/she monitors the winch operation by direct vision or if required, by video monitor.

Step 14

1. The Controller joins the Assistant Controller at the E-Stop switch station/operator's station.

2. The Controller ensures the boarding platform safety tether is in place.

3. The Controller and Assistant Controller focus their attentions on the flyers, the flight area (to ensure no unauthorized persons or objects are in the area) and the operation of the winch, either visually or if required, by video monitor.

Step 15

1. The winch is stopped at a signal from the flyers or at the top of the launch tower.

2. The Controller and the Assistant Controller visually confirm the flyers are in flight position with their elbows hooked together and that the flight line is clear.

3. After visually verifying that the flight line is clear, the Assistant Controller displays a “thumbs up” to the Controller and announces:

   "Flight line clear."

4. The Controller will visually verify that the flight line is clear and will announce:

   "3, 2, 1, fly!"

   This announcement may also be made by someone using a microphone after they have received a “Thumbs Up” signal from the Controller.

Step 16

1. During the flight time, both the Controller and Assistant Controller ensure the security of the rolling flight-boarding platform in the safety area, the position of

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the launch cable/counterweight, and the security of the flight area against persons or objects.

2. The Assistant Controller prepares the new launch release system for the next flight.

   (a) The launch release system consists of three forged steel metal rings that are attached to nylon webbing.

   (b) The rings are inserted through each other, starting at the bottom with the largest ring and working towards the top to the smallest ring. Insert the middle ring through the largest ring, then fold the middle ring back towards the smallest ring. Next, insert the smallest ring through the middle ring then fold it back towards the nylon loop.

   (c) Insert the nylon loop through the smallest ring then push the nylon loop through the grommet in the webbing.

   (d) Starting at the "launch cable end" of the release, begin threading the plastic coasted steel cable (pigtail) through the base of the B-12 clip, then through the nylon loop, the large ring, the base of the large ring and finally through the sleeve on the edge of the release system.

   (e) After preparing the launch release system for the next flight, the Assistant Controller attaches it to the Assistant Controller waist pouch or hangs it on the hook on the flight-boarding platform.

   (f) Refer to *Section 3.5, Appendix G - III* for further information on the Skycoaster® launch release system.

3. It is the responsibility of the Controller and Assistant Controller to ensure that the launch bridle and counterweight remain at the launch position for the duration of the flight time while visually monitoring them and the flyers. If the Down Safety Alarm activates and/or the launch bridle and counterweight begin to descend prematurely, the red E-Stop button at the E-Stop switch station must be pushed in, and the Controller may use the Skyhook or the manual landing pole to catch the launch bridle and pull it to the side away from the flyers while the Assistant Controller lands the flight.

WARNING!

Keep the launch cable raised to the upper limit during flight time. If the launch cable is lowered during the flight time, it could be catastrophic and fatal if the flyers strike the cables or counterweight during their flight. Reference Safety Bulletin #25.

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NOTE: When the flight in question is utilizing a Sky Sled. The Hydraulic Landing Unit **CANNOT** be used. The Assistant Controller must use the manual landing pole.

CAUTION: For the Assistant Controller to use the manual landing pole, he/she must have received instruction from and have been qualified by a Site Controller at the Skycoaster® location. All initial catches in training must be made utilizing Park Personnel only.

4. After the flight has subsided to an appropriate speed, the Assistant Controller gives the warning phrase:

   *"Next time back, **everyone** grab hold of the loop **with both hands**."*

5. As the flyers swing toward the Assistant Controller, he/she will announce:

   *"Everyone grab hold **with both hands** and hold on tight."*

   (a) To properly hold the manual landing pole, the Assistant Controller must have one hand on the end and the other hand towards the middle of the pole.

   (b) The Assistant Controller will land flights by keeping one foot behind the other during the catch and walking the flyers to a stop over the low point. Assistant Controllers who run, lean back, or slide with both feet risk injury if the flyers should let go of the loop. The manual landing pole shall never be placed in a position in which it may strike a flyer.

   (c) If the flight pulls the Assistant Controller past the low point, the manual pole becomes a spear as the flyers begin to swing back towards the low point. The Assistant Controller must give the instruction to *"Let go"* of the loop and then carefully avoid having the end of the pole strike the ground which could lead to the pole striking the flyers in the face or body.

6. Once a successful catch has been made, the Controller then begins the winch-down by pressing and holding the winch pendant DOWN button and momentarily pressing the DOWN cycle start button at the E-Stop switch station. The launch cable position must be visually monitored to ensure it is never brought into a position where it could be struck by flyers.

Step 17

1. After the flyers are brought to a stop at or near the low point and have let go of the loop, the Assistant Controller grasps the flyers by the Sky Sled and

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stabilizes them over the low point with their bodies in the direction of travel. With the flyers stabilized at the low point, the Assistant Controller will unbuckle their leg straps.

2. When the Assistant Controller has the flyers stabilized and under control, the Controller disconnects the safety tether and rolls the flight-boarding platform to the flyers. Note: The child/short person steps must be in their up position during the docking process to prevent a flyer from striking the step.

Step 18

1. As the cart is pushed under the flyers, the Assistant Controller instructs the flyers:

   "Relax your knees, kick out of your footbars, and use the railing and spreader bar to stand up."

2. The Controller continues the winch-down and picks up the manual landing pole to place it on the hooks on the boarding platform.

3. The Assistant Controller and Controller then walk up the stairs of the flight boarding platform. The Assistant Controller will instruct the flyers:

   "Pick up your footbars and step back from the yellow line."

4. After the flyers are holding their footbars and are standing back from the yellow line, the Assistant Controller announces:

   "Clear."

   Lifts the safety hand latch with his/her hand and releases the safety bar with the foot-pedal.

CAUTION: Skycoaster® attractions utilizing a rolling boarding platform may not operate if any part of the safety bar is inoperable.

Step 19

1. After the safety bar has been raised, the Assistant Controller grasps the ripcord release cable (pigtail) of the flyer on the right and pulls the ripcord to its up-most position.

2. He/she next disconnects the pigtail and grasps the ripcord release cable of the Flyer and the launch release system hardware from the flight suits and places these items in the Assistant Controller waist pouch or the bucket, which is mounted on the platform. The Assistant Controller grasps the ripcord

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release cable (pigtail) of the flier on the right and pulls the ripcord to its up-most position, hooking it to the ripcord guiding ring.

3. The Assistant Controller unhooks the upper and lower side clips, and disconnects the flyers from the flight cables, one flyer at a time.

4. He/she will ensure that the lower spreader bar and leg straps are behind the flier and will fold the suit, reconnecting the snaphook to the connector ring. The Assistant Controller will retain control of the suspension straps as the flyer(s) descend the steps.

5. The Assistant Controller cautions the flyers to carry their footbars, to use the handrail while descending the steps and thanks them for their participation.

NOTE: The Assistant Controller must keep the flight cables under control. Any twists in the flight cables are spun out after all flyers have left the flight-boarding platform.

Step 20

3. As the launch cable stops at the down position, the Controller lays the pendant on its stand, picks up the skyhook and walks to the launch bridle.

4. The Controller hooks the bridle and walks up the left side of the steps of the flight-boarding platform. He/she disconnects the launch release hardware from the launch bridle, places it in the pouch/bucket on the platform and removes the new launch release system from the ring on the Assistant Controller waist pouch or the hook on the flight-boarding platform.

5. He/she connects the end of the new launch release system with the two B-12 clips attached to red and black webbing to the launch bridle and tethers the launch bridle to the flight-boarding platform with the tether strap. The snaphooks should be connected to the Double-D Ring or Steel Ring in opposite directions so that the gates of the clips are facing each other.

Step 21

3. As the last flyer(s) leave the flight-boarding platform, the Assistant Controller calls the next flyers up:

"Next flyers come on board."

Step 22

3. Cycle is now repeated, starting at Step 1.

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IV. Flyer Walk Through for Hydraulic Scissors Lift Flight-Boarding Platform Utilizing a Sky Sled

Sequence begins as the flyers have just been brought to a stop after their flight. Note: Steps 1 through 8 from the "Flyer Walk Through for Rolling Flight-boarding Platforms Utilizing a Sky Sled" will be performed in the same manner.

NOTE: There are two types of Hydraulic Scissors Lifts used on Skycoaster® attractions; 5-foot Single Lift and, 10-foot Scissors Lift. The 5-foot Single lift incorporates the use of retractable sidewalls or “wings” as they are referred to in this section. The 10-foot Double Lift has stationary walls and uses a door on either side of the lift for entrance/exit. Any reference in this section to “lift wings” applies only to those sites using a 5-foot Single Lift.

Step 1

1. The Assistant Controller stands on the lift controls, holding the legs of the right-side Flyer, with all flyers facing away from the direction of flight. He/she then announces:

   "Next flyers, come on board."

2. He/she then says to the old flyers:

   "Relax your knees and kick out of your footbars."

3. The Controller walks to the low-point switch station while holding down the winch pendant DOWN button,

4. The Expediter meets the Controller at the low-point switch station after leaving the next flyers at the ready line.

5. The flyers are suspended stationary over the low point above the scissors lift.

6. The next flyers are at the ready line.

Step 2

1. The Controller transfers the pendant to the Expediter to continue winch-down, then boards the scissors lift.

2. The Expediter takes control of the winch pendant, ensuring the DOWN button is continually pressed and presses the RAISE enable button on the low-point switch station.

3. The Controller ensures the next flyers are coming on board.

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4. The next flyers walk onto the lift.

Step 3

1. The Assistant Controller and Controller ensure everyone is on board, standing clear of the lift wings and that straps of footbars are not in pinch grooves of the lift.

2. The Expediter continues bringing the launch cable to the DOWN position.

3. The flyers are still suspended over the low-point.

4. The next flyers stand on the marked positions holding their footbars.

5. The Assistant Controller announces:

   "Clear, going up."

   Then steps on the footplate and UP toe-switch to raise the lift.

6. The Controller directs the flyers:

   "Flyers, as you reach the floor, use the wall and the spreader bar to help you stand."

7. The Expediter ensures that the launch cable is completely DOWN and then lays the pendant on the low-point switch station.

8. The flyers have kicked out of their footbars and prepare to stand up on the lift.

9. The next flyers stand on the marked positions holding their footbars.

Step 4

1. The Assistant Controller grasps the ripcord release cable (pigtail) of the Flyer on the right and pulls the ripcord to its up-most position, hooking it to the ripcord guiding ring.

2. The Controller assists the flyers in standing.

3. The Expediter walks beneath the launch bridle with the skyhook.

4. The flyers stand on the lift.

5. The next flyers continue standing on the marked positions holding their footbars.

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Step 5

1. The Controller directs the old flyers:

   "Flyers, turn and face me, stand on the black line and pick up your footbars."

2. When all flyers are holding their footbars, the Controller turns to the next flyers and makes certain that the Ripcord Puller has been properly briefed:

   "Did they tell you about the ripcord?"

   If the ripcord puller is unsure of their duties, the Controller must brief them once again.

3. The Assistant Controller disconnects the pigtail and launch release hardware and places them in the Assistant Controller waist pouch.

4. The Expediter hooks the launch bridle with the skyhook.

5. The next flyers stand on the marked positions holding their footbars.

Step 7

1. The Assistant Controller will unbuckle the flyer's leg straps.

Step 8

1. The Assistant Controller unhooks the upper and lower side clips, slides the carabiner fairing up and unlocks the flight carabiners, disconnects flyer's flight suits from the flight cables and maintains control of the twisted flight cables. The Controller may assist in unhooking the upper and lower side clips.

2. The Expediter walks beside the lift with the skyhooked launch bridle.

3. The flyers continue standing on the black line with footbars in hand.

4. The next flyers continue standing on the marked positions holding their footbars.

Step 9

1. The Assistant Controller will attach each Flyer's snaphook to the connector ring ensuring the spreader bar and leg loops are behind the flyer. While undoing twists in the flight cables, the Assistant Controller announces to the flyers:

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"All flyers change places, please."

2. The Controller helps flyers change places.

3. The Expediter remains standing beside the raised lift with the skyhooked launch bridle.

4. The flyers change places with the next flyers making sure that the ripcord puller is on the flyers right side as they are facing the previous flyers.

NOTE: At this point, the "flyers" become the "previous flyers" and the "next flyers" become the “flyers”.

Step 10

NOTE: If a triple (3 flyers) is being flown, the flyers should be arranged with the largest (tallest/heaviest) flyer positioned in the middle.

1. The Assistant Controller unhooks the snaphook from each flyer’s connector ring and attaches the flyers, left to right, to the Flight Carabiners.

   (h) The flyers are connected to the flight cables through the use of two Flight Carabiners.

   (i) Each suspension ring on the Sky Sled must be threaded through both Flight Carabiners.

   (j) When connected properly, the Flight Carabiners must be acclimated so that the wide portion of the carabiner is towards the flyers.

   (k) Both Flight Carabiners must be locked after all suspension rings have been connected.

   (l) After locking both Flight Carabiners, the Assistant Controller verifies that each flyer is properly attached.

   (m) He/she then hooks the upper and lower side clips and tandem fairings when applicable. The Controller may assist in hooking the side clips from the flyers front side to expedite the attachment process.

NOTE: If your flight suits are equipped with upper and lower side clips, it is no longer necessary to connect the flight suits utilizing the purple carabiners as outlined in SB #13 and SB #17.

   (n) Please refer to *Section 3.5, Appendix G - V and VI* for further information on proper Flight Carabiner attachment.

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2. The Controller stands on the right-side flyer of the new flyers and directs them to:

   "Stand close together, drop your footbars, take hold of the yellow flight handles, and stand on the white bar."

   The Controller remains on the side of the right-side flyer.

3. The Expediter remains standing beside the lift with the skyhooked launch bridle.

4. The previous flyers stand on the lift with footbars in hand.

Step 11

1. The Assistant Controller physically verifies that that each flyer is connected to the Flight Carabiners, that the Flight Carabiners are locked, that the flight suit release rings are toward the launch tower and that there are no twists in the flight cables. He/she announces:

   "Carabiners Locked"

NOTE: The only time the flight carabiners can be confirmed locked by physically squeezing the gates is when the flyers are standing, not when they are seated.

2. The Controller visually verifies all flyers are attached to the Flight Carabiners, that the Flight Carabiners are locked, that the flight suit release rings are toward the launch tower and that there are no twists in the flight cables. He/she answers with:

   "Carabiners Locked"

3. The Assistant Controller announces:

   "The floor is going to fall away. Please sit back in your suit. Clear, going down."

   Then steps on the footplate and DOWN toe-switch and assists the left-side flyer in swinging back. The DOWN toe-switch is activated just long enough to help the flyers to a seated position. Note: The Assistant Controller must remove his or her foot from the footplate quickly, at the instant the flyers start to sit back. Lowering the lift too far makes the connection of the launch release system difficult.

NOTE: The 'Clear, going down.' is a warning to the Expediter that the lift is descending.

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4. The Controller assists the right-wing flyer in being properly seated in the suit.

5. The Expediter holds the launch bridle in position for the Assistant Controller to grasp easily.

6. The flyers fall back into the seated position.

7. The previous flyers remain standing on the lift with their footbars in hand.

NOTE: The Controller and Assistant Controller must give assistance to the left and right side flyers during the seating process to avoid any possibility of the flyers striking their bodies against the sidewall. The Controller will grip the outside shoulder strap of the right-side flyers' flight suit and the Assistant Controller will grip the outside shoulder strap of the left-side flyers' flight suit to give control as the flyers fall back in their suits.

Step 12

1. The Assistant Controller takes the launch bridle from the skyhook, disconnects the old launch release system, places it in the Assistant Controller waist pouch, and connects the new launch release system.

   (a) The launch release system (three-ring release) is the connecting link between the flyers and the launch bridle.

   (b) Connect the end of the launch release system with the red safety tether to the launch bridle. The clips are connected in opposite directions so that the gate of each clip is facing the other.

   (c) To connect the launch release system to the flyers, connect the end of the three-ring release with the two B-12 clips stitched to the black webbing to the flight suit release rings.

      (i) When connecting one flyer, connect both B-12 clips to the flight suit release ring. Connect the clips in opposite directions so that the gates are facing each other.

      (ii) When connecting two flyers, connect one B-12 clip to the release ring on one flyer and the other B-12 clip to the release ring on the other flyer. Again, the clips must be connected opposite each other so that the gates are facing each other.

      (iii) When connecting three flyers, connect one B-12 clips to each of the outside flyers only. Again, the clips must be connected

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opposite each other so that the gates are facing each other. Do not connect a B-12 clip to the release ring on the flyer positioned in the middle.

(d) After all B-12 clips have been properly connected, the Controller connects the ripcord of the flyer on the right side (the flyer that is going to pull the ripcord) to the pigtail of the three-ring release using the ripcord snaphook.

2. After the flyers are seated, the Controller will thread the leg straps through the front of the Sky Sled and attach/tighten at the flier's feet. Simultaneously, the Assistant Controller will tighten the back straps and connect the tandem fairings (if necessary).

3. The Controller performs the BBL; tightens backstraps, checks buckles on leg straps and checks legs for proper footbar positioning.

4. The Expediter lays down the skyhook beside the low-point switch station.

5. The flyers rest in the seated position.

6. The previous flyers continue standing on the lift with their footbars in hand.

Step 13

1. The Assistant Controller visually checks the BBL, the upper and lower side clips, the launch release system, the Flight Carabiners and the ripcord. If all is ready, he/she announces to the Controller:

"Clips, Carabiners, Ripcord... Ready to Fly."

2. The Assistant Controller confirms that the Omega Carabiner that connects the launch bridle to the launch cable is locked, if this is his/her first flight in this position, or if it has been more than two hours since the last check of this Omega Carabiner.

3. The Controller gives a final, overall visual inspection of the flyers, flight suits, launch release system and flight carabiners. If all is ready, he/she announces:

"Let's fly"

Then slides the fairing over the flight carabiners.

NOTE: The only time the flight carabiners can be confirmed locked by physically squeezing the gates is when the flyers are standing, not when they are seated.

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4. The Expediter moves near the end of the lift to assist the previous flyers with their exit.

5. The flyers, in the seated position, await winch-up.

6. The previous flyers stand on the lift with footbars in hand.

Step 14

1. The Assistant Controller announces:

   "Clear, going down."

   Then he/she steps on the footplate and DOWN toe-switch to lower the lift to the complete down position.

NOTE: The 'Clear, going down.' is a warning to the Expediter that the lift is descending.

2. The Controller prepares to exit the lift to begin the winch-up.

3. The Expediter directs the previous flyers:

   "Exit the lift when the lift wings are fully down."

4. The flyers await winch-up.

5. The previous flyers wait to exit the scissors lift.

Step 15

1. The Assistant Controller holds the left arm, elbow or Sky Sled of either flyer to prevent the flyers from swinging back. Once stabilized, he/she advises the flyers:

   "Continue to hold the flight handles for the freefall. When you pass this point, spread your wings and fly."

   (The Assistant Controller will emphasize the "wings spread" by extending both arms out.)

2. The Controller exits the lift and goes to the low-point switch station. After the lift wings are fully down, the Controller presses and holds down the winch pendant UP button, and presses the UP cycle start button at the low-point switch station.

CAUTION: Never use the manual by-pass valve to winch flyers to the top of the launch tower.

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3. The Expediter ensures all previous flyers are escorted off the lift and through the exit gate. The Expediter must follow the previous flyers, not lead them, to the gate.

4. The flyers await winch-up.

Step 16

1. The Controller walks to the E-Stop switch station/operator's station continuing winch-up.

2. The Assistant Controller walks beside the flight line, never on the flight line and offers encouragement to the flyers as they begin their ascent. He/she ensures that flyers have their elbows hooked together and wishes them to:

   "Have a good flight."

3. The Expediter, outside the gate, ensures that the next flyers are suited properly and ready.

Step 17

1. The Controller and Assistant Controller focus their attentions on the flyers, the flight area (to ensure no unauthorized persons or objects are in the area) and the operation of the winch, either visually or by video monitor (if installation is required).

2. The Assistant Controller begins to build a new launch release system from pieces in the Assistant Controller waist pouch.

   (a) The launch release system consists of three forged steel metal rings that are attached to nylon webbing.

   (b) The rings are inserted through each other, starting at the bottom with the largest ring and working towards the top to the smallest ring. Insert the middle ring through the largest ring, then fold the middle ring back towards the smallest ring. Next, insert the smallest ring through the middle ring then fold it back towards the nylon loop.

   (c) Insert the nylon loop through the smallest ring then push the nylon loop through the grommet in the webbing.

   (d) Starting at the “launch cable end” of the release, begin threading the plastic coasted steel cable (pigtail) through the base of the B-12 clip, then through the nylon loop, the large ring, the base of the large ring and finally through the sleeve on the edge of the release system.

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(e) After preparing the launch release system for the next flight, the Assistant Controller attaches it to the Assistant Controller waist pouch or hangs it on the hook on the flight-boarding platform.

(f) Refer to *Section 3.5, Appendix G - III* for further information on the Skycoaster® launch release system.

Step 18

1. The winch is stopped at a signal from the flyers or at the top of the launch tower.

2. The Controller and Assistant Controller visually confirm that the flyers are in flight position, holding the flight handles and that the flight line is clear.

3. After visually verifying that the flight line is clear, the Assistant Controller displays a “thumbs up” to the Controller and announces:

   "Flight line clear."

4. The Controller will visually verify that the flight line is clear and will announce:

   "3, 2, 1, fly!"

   This announcement may also be made by someone using a microphone after they have received a “thumbs up” signal from the Controller.

Step 19

1. If not completed, the Assistant Controller completes building the new launch release system and snaps it to a ring on the Assistant Controller waist pouch.

2. It is the responsibility of the Controller and Assistant Controller to ensure that the launch bridle and counterweight remain at the launch position for the duration of the flight time while visually monitoring them and the flyers. If the Down Safety Alarm activates and/or the launch bridle and counterweight begin to descend prematurely, the red E-Stop button at the E-Stop switch station must be pushed in, and the Controller may use the Skyhook or the manual landing pole to catch the launch bridle and pull it to the side away from the flyers while the Assistant Controller lands the flight.

WARNING!

Keep the launch cable raised during flight time. If the launch cable is lowered during the flight time, it could be catastrophic and fatal if the flyers strike the cables or counterweight during their flight. Reference Safety Bulletin #25.

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3. The Expediter ensures the next flyers are ready to go and are waiting at the gate.

NOTE: When the flight in question is utilizing a Sky Sled. The Hydraulic Landing Unit **CANNOT** be used. The Assistant Controller must use the manual landing pole.

CAUTION: For the Assistant Controller to use the manual landing pole, he/she must have received instruction from and have been qualified by a Site Controller at the Skycoaster® location. All initial catches in training must be made utilizing Park Personnel only.

4. After the flight has subsided to an appropriate speed, the Assistant Controller gives the warning phrase:

   *"Next time back, **everyone** grab hold of the loop **with both hands**."*

5. As the flyers swing toward the Assistant Controller, he/she will announce:

   "**Everyone** grab hold **with both hands** and hold on tight."

   (a) To properly hold the manual landing pole, the Assistant Controller must have one hand on the end and the other hand towards the middle of the pole.

   (b) The Assistant Controller will land flights by keeping one foot behind the other during the catch and walking the flyers to a stop over the low point. Assistant Controllers who run, lean back, or slide with both feet risk injury if the flyers should let go of the loop. The manual landing pole shall never be placed in a position in which it may strike a flyer.

   (c) If the flight pulls the Assistant Controller past the low point, the manual pole becomes a spear as the flyers begin to swing back towards the low point. The Assistant Controller must give the instruction to *"Let go"* of the loop and then carefully avoid having the end of the pole strike the ground which could lead to the pole striking the flyers in the face or body.

6. Once a successful catch has been made, the Controller then begins the winch-down by pressing and holding the winch pendant DOWN button and momentarily pressing the DOWN cycle start button at the E-Stop switch station. The launch cable position must be visually monitored to ensure it is never brought into a position where it could be struck by flyers.

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7. As soon as a successful catch has been made, the Expediter brings the next flyers through the gate.

NOTE: If the flyers are still swinging and the Assistant Controller is not yet on board, the Expediter remains with the next flyers until the Assistant Controller announces "*Next flyers, come on board*."

Step 20

1. The Assistant Controller gains control of the slowly swinging flyers by holding their flight suit leg straps until the flyers are stationary over the lift.

2. The expediter leads the next flyers to the ready line.

Step 21

1. The cycle is now repeated, beginning at Step 1.

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The Skycoaster® is designed to be a very safe system. However, human errors or deviation from the design operation could result in injuries or fatalities. This section describes examples of dangerous deviations from procedures.

I. Stunting

Stunting can include launching in any position other than belly-to-earth, head forward toward the flight structure in the Skycoaster® flight suit or seated upright, feet-first in the Skycoaster® Sky Sled.. Each Skycoaster® flight suit is designed to hold and support only one person. At no time is the use of any other harness permitted for flying. Violent rocking or pitching up and down or side-to-side prior to launch is considered stunting and is not permitted. The use of arms as airfoils to effect turns during flight is not stunting. The bending of one's body during flight to effect turns is not stunting. For safety, no stunting on the Skycoaster® attraction is permitted by staff or customers.

II. Clearances

WARNING!

The flight path must not be lowered by any means. The minimum low point is 6 feet (1.83 meters) above ground level for sites utilizing a rolling cart or scissors lift with wings, and 10 feet (3.05 meters) for sites utilizing a double scissors lift.

No personnel, including video people, will occupy an area close to the low point of the flight from the time winch-up begins until the flight has been brought to a stop. This does not include the flight crew performing the usual launching and landing procedures. "Close to" will be defined as within a circle of radius of 25 feet (7.62 meters) from the low point outward. This 25-foot (7.62 meter) radius will apply to all Skycoaster® sites.

III. Objects

Any object dropped by a flyer could become a 50 MPH (80 KPH) projectile through the Zoom Zone or beyond the designated boundaries. Therefore, no objects are to be hand carried by any flyer. Objects not allowed on Skycoaster® include items such as cameras, pets, purses, etc.

IV. Rolling Flight-Boarding Platform

WARNING!

Never allow the rolling flight-boarding platform to enter the flight area during flight time. If the flight-boarding platform rolls into the flight area during flight time, the result would be catastrophic and possibly fatal.

The result of the flight-boarding platform entering the flight area during flight time would be catastrophic and possibly fatal. Several things could cause this to happen:

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A. Gravity

The flight-boarding platform and associated tracks are designed to operate on a level grade. Installation of the Skycoaster® attraction should include a level grade for the platform operation. A sloping grade could cause the platform to roll into the flight area.

B. Wind

Strong winds could blow the flight boarding platform along the track and into the flight area, particularly if signs or banners are attached to the platform.

The flight boarding platform must be locked into the safety area during all flights on all Skycoaster® attractions utilizing this piece of equipment. To prevent a flight-boarding platform from moving into the flight line, all rolling boarding platforms must be secured in the safety area to a fixed post or other object using a safe and sound strap and carabiner.

C. Mechanical Malfunction

A mechanical mechanism has been suggested to move the platform into and away from the attachment area. Unplanned activation of such a system during flight time could be fatal. Any mechanical system must have two lockouts, must require separate actions by two persons for activation, and must be approved **IN WRITING** by Skycoaster.

D. Human Error or Inattention

The Controller and Assistant Controller are stationed with the platform in the safety area during flight time. They are responsible for security of the flight area against intrusion by persons or objects. To prevent a flight-boarding platform from moving into the flight line, all rolling boarding platforms must be secured in the safety area to a fixed post or other object using a safe/sound strap and carabiner during every flight on all Skycoaster® attractions utilizing this piece of equipment.

V. Alternate Swinging

WARNING!

Always follow proper procedures during all operations and inspections and use only equipment approved by Skycoaster. Using improper procedures and alternative equipment can cause injury or death.

Under no condition should anyone swing on the cables without following the procedures as outlined in this manual. Using alternative harnesses, connecting devices or procedures can be hazardous or fatal.

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VI. Ascending and Descending

While ascending and particularly descending the rolling flight-boarding platform, a very real possibility of serious injury from a fall exists due to tripping over the flight suit footbars. The Controller and Assistant Controller must ensure the flyers are hand carrying their footbars and must advise the flyers to use caution on the steps and to use the handrails. The Controller and Assistant Controller must be ready to physically assist anyone as needed.

VII. Launch Cable, Counterweight Cable and Counterweight

WARNING!

Keep the launch cable raised to the upper limit during flight time. If the launch cable is lowered during the flight time, serious injury or death could result if the flyers contact with the counterweight during flight.

Both the Controller and the Assistant Controller must ensure the launch cable remains in launch position until a successful catch has been made. Only after a successful catch has been made can a winch-down begin. The Controller or Assistant Controller must remain near the winch E-Stop switch at all times prior to stopping the flyers.

VIII. Alterations

As time goes on and you gain expertise in operating the Skycoaster®, inevitably you will come up with your own unique ideas and procedures that may differ from material presented in this manual. Skycoaster does not allow implementation of any new ideas until you discuss these ideas with Skycoaster. Skycoaster needs to investigate, discuss and research ideas before they can be implemented. Deviating from these guidelines without the knowledge of Skycoaster can cause loss of your license or cancellation of your insurance policy. Written authorization must be obtained from Skycoaster for any alterations or deviations from the Skycoaster® Owner's Manual. Such written authorization must be maintained on site in the most current version of the Skycoaster® Owner's Manual and available for inspection by Skycoaster personnel.

IX. Tower Climbing

Each Skycoaster® installation is provided with safety fall protection equipment for maintenance personnel who must ascend the towers for inspection, maintenance or repairs. No one is authorized to ascend without the protection given by a harness, connecting lanyard and sliding safety sleeve, which are provided with the initial installation. In addition, a separate safety runner and carabiner are provided for support and secondary protection anytime work must be performed aloft. All current Federal, State and local applicable safety regulations must be complied with.

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X. Environmental Restrictions

A. Lightning

All towers and cranes must be grounded with lightning grounding rods. Stop all Skycoaster® operations and move all personnel from the site whenever lightning is likely or possible. Skycoaster requires suspending operations when there is lightning within 5 (five) nautical miles (5.75 US Miles, 9.26 Kilometers) and forecasted to move forward.

B. Wind

Skycoaster prohibits operating the Skycoaster® attraction in sustained winds of 30 miles per hour (48 kilometers per hour) or greater. It is required that an anemometer be installed, no lower than 3/4 of the way up the flight or launch towers, with the readout installed at the E-Stop Switch Station/Operator's Station.

C. Precipitation or fog

Skycoaster requires suspending operation in any precipitation or fog that obscures visibility of the flyers or flight line.

XI. Winch Operation

It is the responsibility of the Controller and Assistant Controller, during winch-up, to focus their attentions on the flyers, the flight area and the operation of the winch. The winch drum must be visually monitored by both the Controller and Assistant Controller during every winch-up. The flight crew must be alert to any mis-spooling of the launch cable on the drum or any unusual winch operation.

During continuous operations, a Site Controller, Controller or maintenance person will physically monitor one operating cycle at the winch unit at least once every two hours. This person will be alert to unusual noise, operation, oil leaks or other malfunctions.

A light directed on the winch drum is mandatory for all night operations. If the light fails, all operations will stop until the light is repaired. Normally, Skycoaster® attractions taller than 100 feet (30.48 meters) or any Skycoaster® attractions without a direct/clear line of sight to the winch, require a video monitor with the camera on the winch drum. If the video monitor fails, a Site Controller or Controller will physically monitor the winch operation at the winch location for every flight until repair to the monitor system is completed.

There must be a minimum of 10 complete cable wraps on the winch drum when the launch cable is at its normal DOWN position.

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XII. Responsibility

At least one Site Controller in possession of a current and valid Skycoaster® issued Site Controller Certification Card must be present (within the perimeter of the Skycoaster® flight operations area) during all Skycoaster® operations of any nature. One of the primary duties of a Site Controller is to ensure adherence by all staff members to the policies set forth in the Skycoaster® Owner's Manual. Any deviation from the procedures outlined in the Skycoaster® Owner's Manual could subject the Skycoaster® Licensee to enormous personal and corporate liability if an accident should occur.

Safety will always be the overriding consideration in any Skycoaster® procedure, operation or question. Upon review of conclusive evidence of deviation from procedures involving safety considerations, Skycoaster has the obligation and authority to terminate the certification of any Site Controller involved.

XIII. Emergency Equipment

The emergency equipment listed below is to be placed at various locations around the Skycoaster®. It is to be kept in good working order and used only during emergencies.

A. Fire extinguishers: Three are required with one placed near the E-Stop Switch Station, one near the Flight Suit area and one near the Customer Representative's station.

B. Flashlights: Two are required with one placed near the E-Stop Switch Station and one in the Flight Suit area.

C. E-Stop locations: There are two E-Stop Locations - one at the E-Stop Switch Station and one on the hydraulic scissors lift.

XIV. Scissors Lift with Hydraulic Wings

Although structural in nature, the wings of the scissors lift are only intended to contain the flyers and flight crew. They are not meant to be used for support, except when used by flyers to aid in standing up at the completion of their flight.

XV. All Scissors Lifts

The maximum combined weight on any scissors lift is 2000 pounds (907.18 kilograms). The maximum number of persons on any scissors lift at any one time is 10.

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Although not all possibilities can be addressed, this section has procedures for emergency procedures and unusual circumstances that may occur.

I. When to Limit Launch Height

A. Always be alert for flyers exhibiting more than the normal degree of anxiety.

B. If one or more flyers show extreme anxiety during winch-up, the Controller should stop the winch and give them the option of launching lower than the top or returning to the ground by winch-down.

II. Ripcord Disconnect

On occasion, the ripcord cable may become detached from the release cable at the snaphook connector. On rare occasions, the center Flyer's or left Flyer's ripcord may have been connected by mistake.

A. If the right-side flyer pulls the ripcord with no result, the microphone person should attempt to have the other flyers pull their ripcords.

B. If all flyers pull their ripcord without release taking place, winch the flyers down, connect the proper ripcord, explain what happened and winch the flyers back up.

III. Premature Flight

On rare occasions, a flyer being winched up may pull the ripcord prior to reaching the top. In the event of an accidental, premature flight less than three-quarters from the top, Skycoaster recommends the flyers be reconnected to the launch cable and given a second flight.

WARNING!

Once winch-up begins, a flight may occur at any time for any reason. Therefore, the flight line must be kept clear of all persons and objects anytime flyers are aloft on the launch cable.

IV. Panicked Flyer

A. If one or more flyers show extreme anxiety during winch-up, the Controller should stop the winch and give them the option of launching lower than the top or returning to the ground by winch-down.

B. If a flyer panics during flight, stay calm and use comforting words until the flyers slow down and you can stabilize them.

C. It is possible that some flyers may try to disconnect themselves prior to arriving at the flight platform. Again, use calm words of reassurance. Your ability to speak

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calmly and assure the flyers of their safety is the key to controlling and deterring this type of situation.

D. Keep the rolling flight-boarding platform in the safety area until the flyer is stabilized at the attachment point, if applicable.

V. Winch Malfunction

A. Winch failure part way UP:

1. If the winch fails to lift the flyers to the top for any reason, the flight line is to remain clear of all personnel and obstructions.

2. When the flight line is clear and the flyers are ready, the *"3, 2, 1. . . FLY"* command should be given and the flight will release as normal.

3. Do not attempt to winch flyers down with a winch or cable drum malfunction.

4. When the flyers are landed, the problem with the winch must be addressed by maintenance personnel.

B. Winch will not operate DOWN:

1. If there are aloft flyers attached to the launch cable, they cannot or will not release and the winch will not operate properly in the remote or manual DOWN mode, then the flyers will have to be lowered manually by using the hydraulic bypass valve.

WARNING!

If there are flyers aloft on the launch cable, a flight may occur at any time for any reason. Therefore, the flight line must be kept clear of all persons and objects anytime flyers are aloft on the launch cable.

2. When the flight line is clear, use a wrench on the hydraulic bypass valve at the hydraulic motor on the winch drum. Open this valve very slowly and lower the flyers at a slow controlled speed until they stop over the low-point.

3. Use the flight-boarding platform or scissors lift to stabilize and disconnect the flyers using the usual procedures.

C. Launch cable skipped one or two grooves:

On occasion, a jerky start may cause the launch cable to jump one or two grooves on the winch drum. The occasional occurrence is no cause for concern, but frequent occurrence may indicate a need for review of operator technique or necessitate winch maintenance.

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The flyers should be stationary over the low-point, not swinging back and forth, when the winch is activated UP.

The normal delay time for the winch to reach turning speed is 3 to 6 seconds after activating the UP or DOWN control switches. Instantaneous turning of the winch can cause jumped grooves and would indicate a need for adjustment, maintenance or replacement of the soft shift valve on the winch unit.

Constant or frequent mis-spooling of the cable should be addressed by maintenance personnel checking the pinch roller, cable guide alignment and cable diameter.

D. Launch cable mis-spooled or tangled on the winch drum:

WARNING!

If a problem with the launch cable occurs, stop the winch immediately. If there are flyers aloft on the launch cable, a flight may occur at any time for any reason. Therefore, the flight line must be kept clear of all persons and objects anytime flyers are aloft on the launch cable.

If the flight line is clear and the flyers are ready, the "*3, 2, 1 . . , FLY"* command should be given and the flight will go as normal. When the flyers are landed, the cable problem must be addressed by maintenance personnel.

VI. Physically or Mentally Disabled Flyers

By reason of the restraint system inherent in the flight suits, it is necessary that flyers possess two arms sufficient to be contained and restrained by the shoulder pads, and at least one leg sufficient to be contained and restrained by a leg strap.

The degree of assistance given to transport a flyer to the attachment area and to connect to the flight cables will be determined by the individual park policy.

A mentally disabled person should be accompanied by a guardian ready to monitor the response of the person during winch-up and to limit the launch height if appropriate.

VII. Accidents

In addition to these procedures, the Site Controller and all team members are to conform to procedures and guidelines outlined by Federal, State and Local authorities governing the recording and notifying of authorities about serious injuries and fatalities.

A. If there is an accident, keep all onlookers from the area. The entire staff is there to help do this.

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B. The Customer Representative is to call the proper authorities immediately and give location and type of incident.

C. The victims are not to be moved unless they are in a position that remains life threatening.

D. The Controller is to remain at the victim's side until help arrives.

E. After first aid or life saving measures are given, do not move or change anything (all personnel are to remain on site) until authorized to leave by local authorities having jurisdiction.

F. If the event has been captured on video, maintain possession of the tape pending legal counsel.

G. Complete an Incident Report Form (in *Appendix B*) according to the forms instructions and forward a copy immediately to Skycoaster

VIII. Lightning Strike

A. If lightning strikes any portion of the structure, all equipment must be inspected by a registered engineer or any other qualified inspector before opening. A complete monthly inspection must be completed before opening. A qualified inspector may be a Site Controller supervising a monthly pre-operation inspection with a top-side inspection of all structures.

B. During the inspection focus in detail on the launch tower sheave, flight cable and counterweight cable connection hardware and bushings, tower grounding rods and wires, and all electrical circuits.

C. Replace any damaged or questionable components before operating.

D. If one or more persons are struck by lightning, follow emergency procedures as outlined in *Section 3.4(VII) Accidents*.

IX. Minor Fires

A minor fire endangers equipment and poses a minor danger to customers and team members. A minor fire can be put out using one or two extinguishers. Follow these procedures in the event of a minor fire:

A. Stay calm.

B. Move all customers to a safe area away from the fire.

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C. Notify the Site Controller, Controller, Assistant Controller and Park Security. When notifying Park Security, give your name, location and details. Do not hang up until Security clearly understands the message.

D. Locate the nearest fire extinguisher and if it is the appropriate type for the fire, attempt to put out the fire.

E. The Site Controller or Controller should remain in control of the situation until Security arrives.

F. Gather information, complete an Incident Report Form (in *Appendix B*) according to the form's instruction, and forward a copy immediately to Skycoaster

X. Major Fires

A major fire poses a serious risk to customers, team members and equipment. Anyone who is not experienced using fire extinguishers should not attempt to put out a major fire. Follow these procedures in the event of a major fire.

A. Stay calm.

B. Move all customers to a safe area away from the fire.

C. Notify the Site Controller, Controller, Assistant Controller and Park Security. When notifying Park Security, give your name, location and details. Do not hang up until Security clearly understands the message.

D. Assist with crowd control until the situation is resolved.

E. Gather information, complete an Incident Report Form (*in Appendix B*) according to the form's instructions, and forward a copy immediately to Skycoaster

XI. Unusual Natural Events (Severe Storm, Earthquake, etc.)

A. Immediately suspend Skycoaster® operations.

B. For safety, all team members and customers must move away from the Skycoaster® attraction.

C. During a storm, take appropriate shelter.

D. When conditions permit, perform a monthly inspection if any damage to the structure or surrounding area is suspected. If questions persist, contact a registered engineer for further assistance.

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APPENDIX A DAILY INTAKE SHEETS

Use the Daily Intake Sheet to record your daily sales. Start each day with a new intake sheet. Keep your Daily Intake Sheets in chronological order in a three ring binder.

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Skycoaster® Daily Intake Sheet

Day:_____ Date:_____ Site Location:_____

Flyer Full Name	Flight No.	$ 1st Flight	$ 2nd Flight	$ 3rd Flight	$ Video	$ Shirt	$ Charge	$ Cash	Line Total
TOTALS									

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Anytime there is an accident, near accident or potential for an accident, this Incident Report Form must be completed in its entirety and a copy of it must be faxed or emailed immediately to Skycoaster. If multiple persons are claiming injury, one Incident Report must be completed for each alleged injured person.

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Anytime there is accident, near accident, or potential for an accident, this Incident Report Form must be completed in its entirety and a copy of it must be faxed or emailed immediately to Skycoaster. If multiple persons are claiming injury, one Incident Report must be completed for each alleged injured person.

Site Name and Address

Name: _____

Street: _____

_____

City: _____ State: _____ Zip: _____

Name of Person Involved in Incident

Name: _____

Street: _____

City: _____ State: _____ Zip: _____

Social Security Number: _____ Age: _____ Sex M _____ F _____

Phone: (home) _____ (work) _____

If a minor, name of parent or guardian: _____

Details of Incident

(use additional pages if necessary)

Date of Incident: _____ Time of Incident: _____

Number of Flyers on Flight: _____ Position of Flyer Involved in Incident: _____

Details of Incident: _____

_____

_____

_____

Details of Physical Injury (if any): _____

_____

_____

_____

Statement

All the information listed above is true and correct to the best of my knowledge.

_____ _____

Print Name of Involved Flyer Signature of Involved Flyer

Signed on this the _____ day of _____ , _____

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Action Taken by Site: _____

_____

_____

_____

Condition of Injured Person upon Leaving Site: _____

_____

_____

Name and Address of Witnesses

Witness1 Name: _____ Phone: _____
Address: _____

Witness 2 Name: _____ Phone: _____
Address: _____

Witness 3 Name: _____ Phone: _____
Address: _____

Flight Crew Information

Site Controller Name: _____ Phone: _____
Address: _____

Controller Name: _____ Phone: _____
Address: _____

Asst Contlr Name: _____ Phone: _____
Address: _____

Expediter Name: _____ Phone: _____
Address: _____

Flight Suiter Name: _____ Phone: _____
Address: _____

Statement

All the information contained in this Incident Report is true and correct to the best of my knowledge.

_____ _____

Print Name of Incident Reporter Signature of Incident Reporter

Signed on this the _____ day of _____ , _____

This report has been reviewed by: _____ _____

Print Name of Site Controller Signature of Site Controller

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Have a sign made that meets appropriate legal and industry standards showing a description of the Skycoaster® attraction and restrictions for participation. This sign must be posted in a clear location visible to all potential flyers at all sites and contain at least the following information. Tailor height and speed specifications for your location.

SKYCOASTER®

"EXPERIENCE FLIGHT"

SOAR FROM 100+ FEET (30.48 METERS)
REACH SPEEDS 50+ MPH (80 KPH)
1, 2, or 3 PEOPLE CAN FLY TOGETHER FLIGHT SUITS.
1 or 2 PEOPLE CAN FLY TOGETHER IN SKY SLEDS
THE FUN AND EXCITEMENT OF SKYDIVING AND HANG GLIDING COMBINED.

FLYER QUALIFICATIONS

MINIMUM HEIGHT 42" (1066.8 mm) TALL (FLIGHT SUITS)
MINIMUM HEIGHT 48" (1219.2 mm) TALL (SKY SLEDS)
MAXIMUM HEIGHT 78" (1981.2 mm)TALL (SKY SLEDS)
NO AGE LIMITS
NOT PREGNANT
NOT IMPAIRED BY DRUGS OR ALCOHOL
NO BACK, NECK OR HEART PROBLEMS
IF YOU HAVE ANY MEDICAL, PHYSICAL OR MENTAL PROBLEMS THAT MAY CAUSE DOUBTS, DO NOT FLY.

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APPENDIX C DESCRIPTION AND QUALIFICATIONS

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APPENDIX D SAFETY MEETING LOGS

When you hold safety meetings, have everyone attending sign the log sheet. Keep the log sheet in a three ring binder as part of the record for training.

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Skycoaster® Employee Safety Meeting Log

Date:_____ Conducted by: _____

Time:_____ Title:_____

Location: _____

Signatures of Employees Present

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Skycoaster® Employee Safety Meeting Log

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APPENDIX E TRAINING AND CERTIFICATION

The following training guidelines are required to be completed by all Skycoaster® personnel prior to being certified in each position on the Skycoaster® attraction. As mentioned before, it is the responsibility of the Senior Site Controller to ensure that each employee has completed these steps.

I. General Skycoaster® Training

A. Each new Skycoaster® employee is to receive a copy of the most recent Skycoaster® Owner's Manual for his or her use at all times. The employee must have received this manual prior to training on any position of the Skycoaster®.

B. After distributing the manual to the new employee, the Senior Site Controller (or a supervising Site Controller designated by him/her) will review the manual with the employee.

C. After both the supervising Site Controller and the employee feel the information has been appropriately discussed, the employee may begin training on the Skycoaster®.

D. The supervising Site Controller will discuss the sequential order of training new personnel on the Skycoaster®. It is necessary that training of all employees be done in the same manner: Flight Suit Area, Expediter, Assistant Controller then Controller.

E. In each of the four Skycoaster® positions, the supervising Site Controller will demonstrate the position (with the new employee observing) until he/she feels the employee is ready to work the position.

F. Once the employee in training begins physically working the position, the supervising Site Controller must directly observe the new employee for a minimum of the first 2 hours in that position. When the supervising Site Controller feels comfortable with the work of the employee, he/she can designate another certified employee to observe the employee in training for the remainder of the 8 hours (10 hours for the positions of Flight Suit Person, Assistant Controller, and Controller at sites utilizing a Sky Sled).

G. No employee in training will be certified in a position until he/she has completed a minimum of 8 hours in that position (10 hours for the positions of Flight Suit Person, Assistant Controller, and Controller at sites utilizing a Sky Sled).

H. A Skycoaster® Training & Certification Worksheet must be completed for each employee prior to the employee being certified in each position.

I. After an employee is certified, he/she will be authorized to work unsupervised in that position.

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II. Site Controller Training and Certification

A. New Site Controllers may only be certified by a Skycoaster representative.

B. All Site Controller candidates must be 18 years old and furnish proof of age at the time of certification.

C. All candidates must complete a minimum of 8 hours of training in each position as Flight Suiter, Assistant Controller and Controller prior to testing for certification (10 hours in each of these positions if utilizing a Sky Sled). If your site uses an Expediter, they must also complete 8 hours in that position. This training must be completed before the Skycoaster representative comes to your site.

D. A Skycoaster® Employee Training & Certification Worksheet must be completed for each candidate.

E. Upon arrival, the Skycoaster representative will request copies of all worksheets for your Site Controller candidates. If a worksheet is not produced when requested, that employee will not be allowed to test for Site Controller certification.

F. The Skycoaster representative will evaluate candidates based on flight line performance, overall attitude and the results of their written test. A score of 90% or higher must be obtained to pass the written test.

G. Upon review by the Skycoaster representative, any candidate who fails the flight line performance or written test may be authorized to take a re-test. One re-test may be scheduled for either the practical exam or the written test after a period of 7 days. The practical re-examination requires that a representative return to your site at your expense. To be eligible to re-take the written test, the candidate must have received a score of 74% or higher on the initial test. A written re-test may be received via email, mail, facsimile or courier and must be returned and received at Skycoaster, for grading, not more than 30 days after the issue date. Any decision made by the Skycoaster representative concerning a candidate will be final.

H. Returning Site Controllers are only required to pass the written test with a score of 90% or higher to be recertified as Site Controllers. If a re-test is required, a score of 74% or higher must have been obtained on the previous test.

I. If a Site Controller certification is not renewed each year, a practical, as well as a written test must be completed to re-certify.

J. Refer to *Section 1.4* of this manual for further information.

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Skycoaster® Employee Training and Certification Worksheet

Skycoaster® Site/City: _____

Employee Name: _____ Signature: _____

Senior Site Controller Name: _____ Signature: _____

Names of Supervising Site Controllers: _____

Position	Hours	Date	SC Initials	Emp Initials	Comments
*** Each employee must receive a copy of the Skycoaster® Owners Manual for their own personal use ***					
Skycoaster® Owners Manual - Distribute and Review					
Flight Suit - Introduction* (pg 23-24, 105-107, 134-136)					
2 Hrs direct Site Controller supervision	1				
	2				
8 Hrs additional supervision	1				
	2				
	3				
	4				
	5				
	6				
2 Hrs additional supervision (Sky Sled Sites Only)	7				
	8				
Flight Suit Certification					
Expediter - Introduction* (pg 24, 120-133, 146-157)					
2 Hrs direct Site Controller supervision	1				
	2				
6 Hrs additional supervision	1				
	2				
	3				
	4				
	5				
	6				
Expediter Certification					
Assistant Controller - Introduction* (pg 22-23, 107-133, 136-157)					
2 Hrs direct Site Controller supervision	1				
	2				
8 Hrs additional supervision	1				
	2				
	3				
	4				
	5				
	6				
2 Hrs additional supervision (Sky Sled Sites Only)	7				
	8				
Assistant Controller Certification					
Controller - Introduction* (pg 22, 108-133, 137-157)					
2 Hrs direct Site Controller supervision	1				
	2				
8 Hrs additional supervision	1				
	2				
	3				
	4				
	5				
	6				
2 Hrs additional supervision (Sky Sled Sites Only)	7				
	8				
Controller Certification					

* The introduction includes a review of the Skycoaster® Owners Manual pages listed and must be completed before the employee is trained in the respective position.

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The following Skycoaster® Royalty Report must be completed weekly or monthly and faxed to Skycoaster.

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SKYCOASTER®
Royalty Report

(All currency to be reported in US Dollars)

Date: _____

Owner: _____

Site: _____

Week of: _____ 20____

- or -

Month of: _____ 20____

A. FLIGHTS Gross Revenue

No. of Flights: _____ = $_____

FLIGHT ROYALTY @ ___% OF GROSS REVENUE = US$_____

B. PRODUCTS AND SERVICES: Gross Revenue

T-Shirts: No. Sold: _____ = $_____

Videos: No. Sold: _____ = $_____

Misc: No. Sold: _____ = $_____

TOTALS: No. Sold: _____ = $_____

PRODUCT AND SERVICES ROYALTY @ ___% OF GROSS REVENUE = US$_____

Less Withholding Taxes (for International sites only) US$_____

*TOTAL ROYALTY DUE: US$_____

* Please enclose your check for the total amount due with this report.

Operations Office: 116 Log Canoe Circle Stevensville, MD 21666

Tel: 888-801-0303 * Fax: 443-249-8999 * Email: info@rideentertainment.com.com

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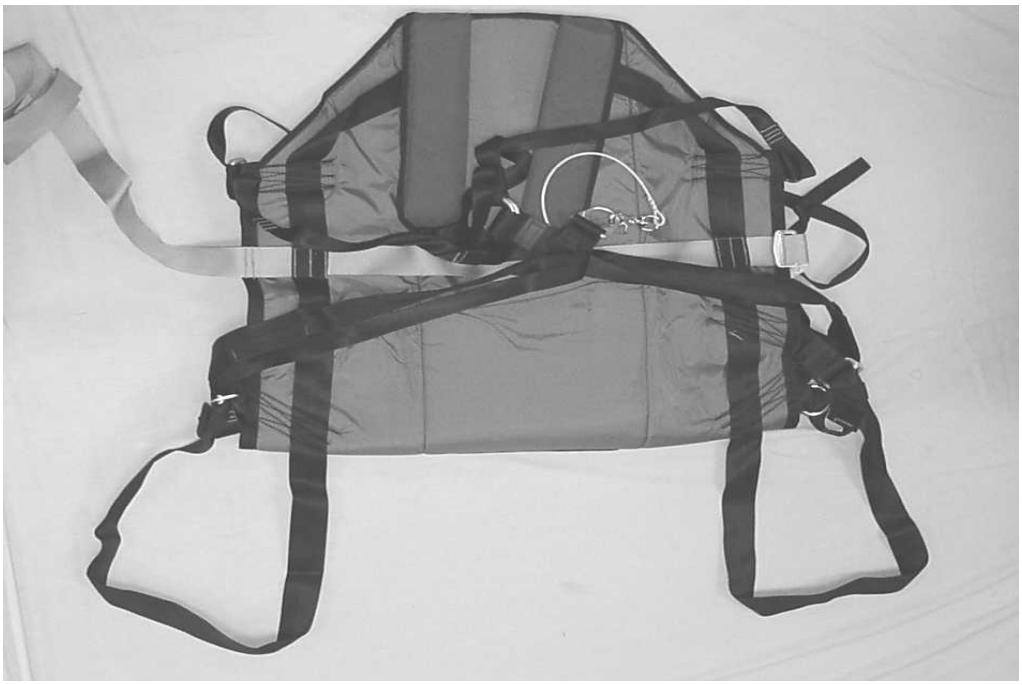
I. Flight Suit Layout



Good Flight Suit Layout

Bad Flight Suit Layout – suspension strap under leg loop.

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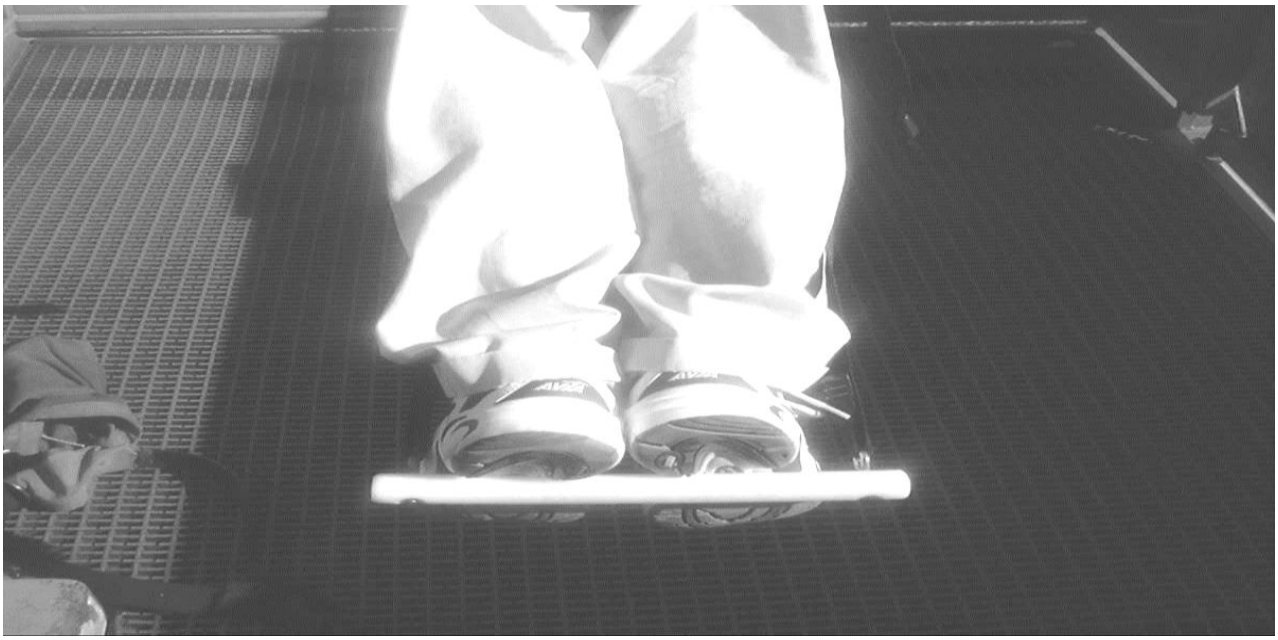
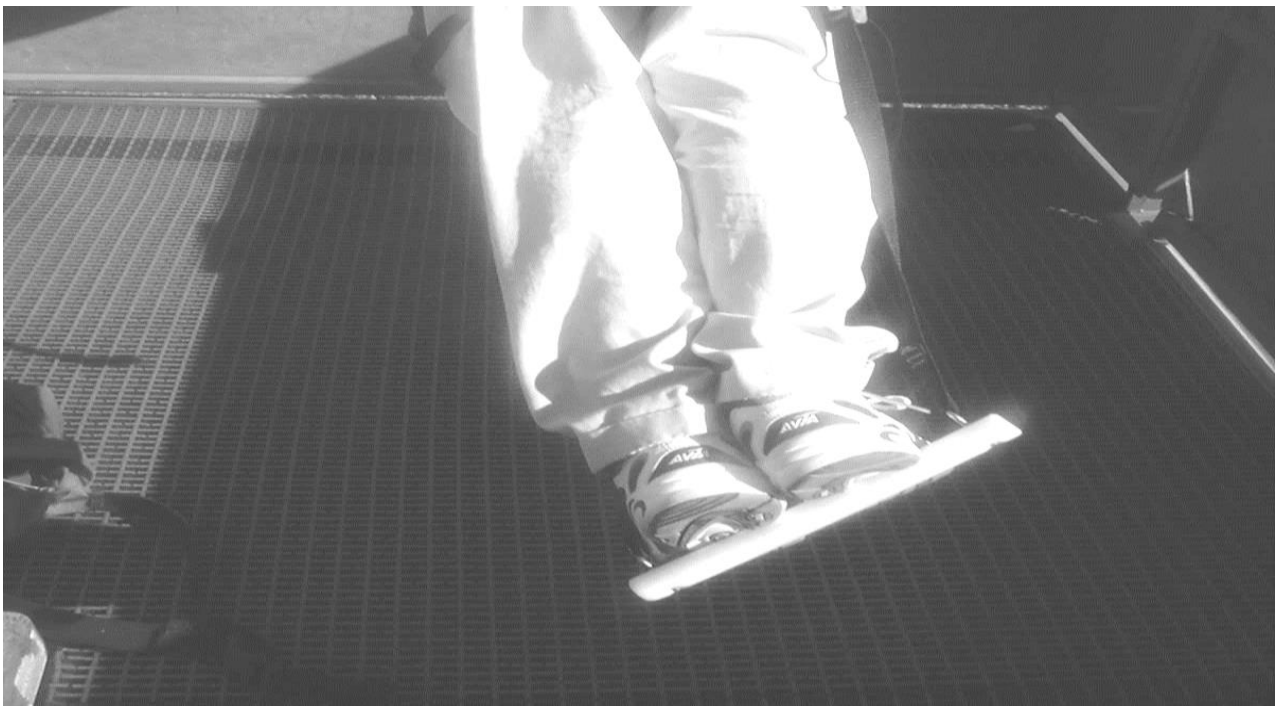
II. BBL Check (Footbar Adjustment)



Good BBL check: footbar straps properly adjusted.



Bad BBL check: footbar straps mis-adjusted.

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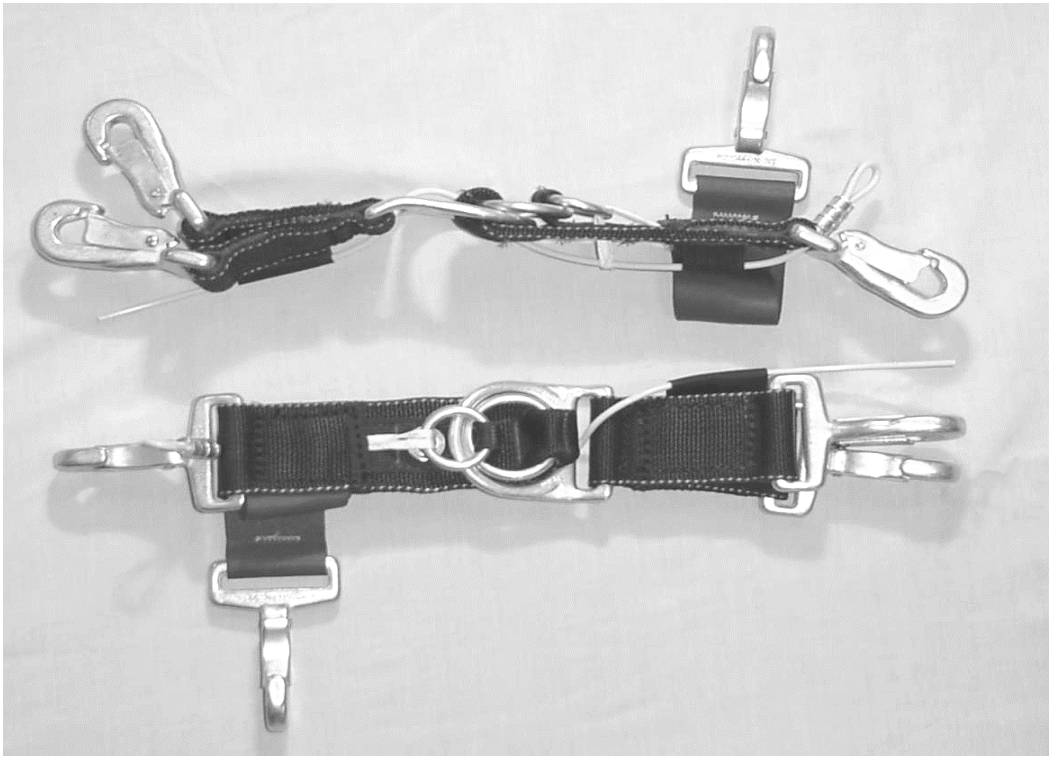
III. 3-Ring Release Assembly

Good 3-Ring Assembly (3 different views).



Bad 3-Ring assemblies

Top – large ring is backwards

Bottom – both small & medium rings are through big ring.

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IV. Backstrap

Good backstrap routing.

Bad backstrap routing (suspension strap under backstrap)

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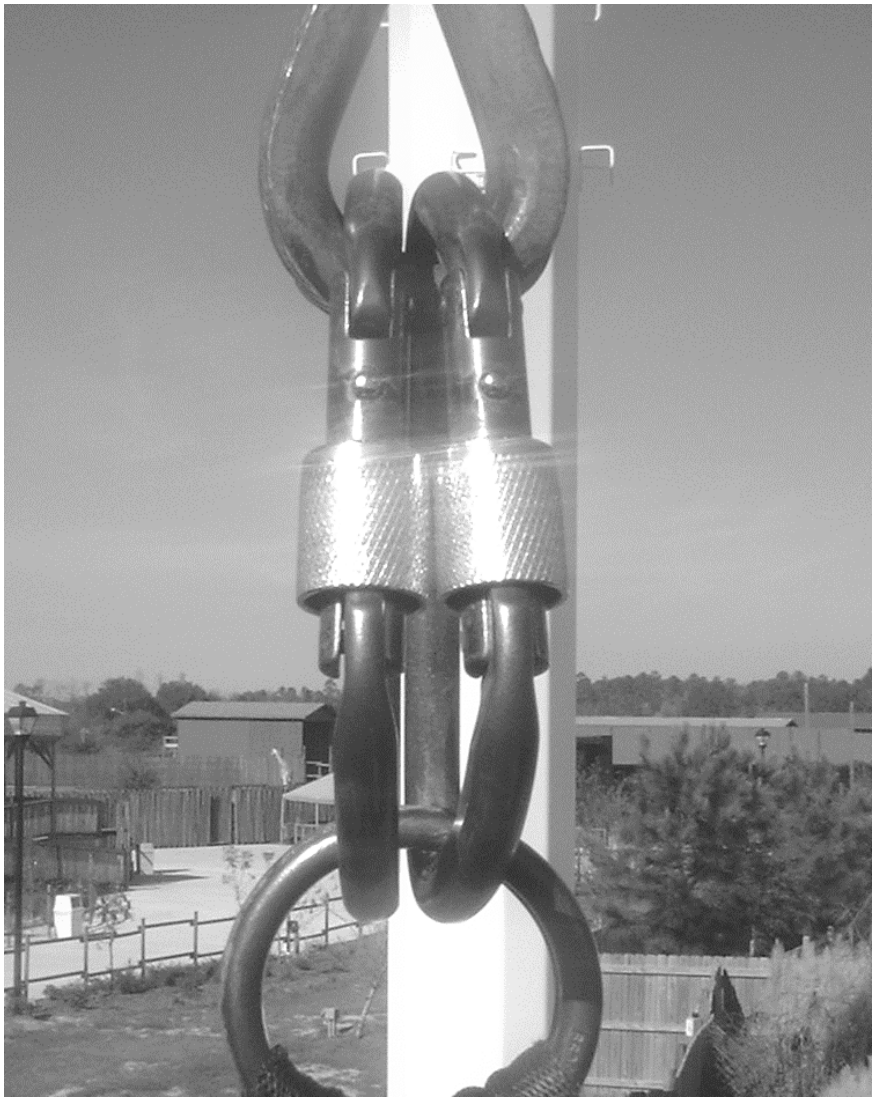
V. Flight Carabiner Attachment (Good)



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VI. Flight Carabiner Attachment (Bad)

Both gates unlocked

One suspension ring off both carabiners

One gate unlocked

One suspension ring on only 1 carabiner

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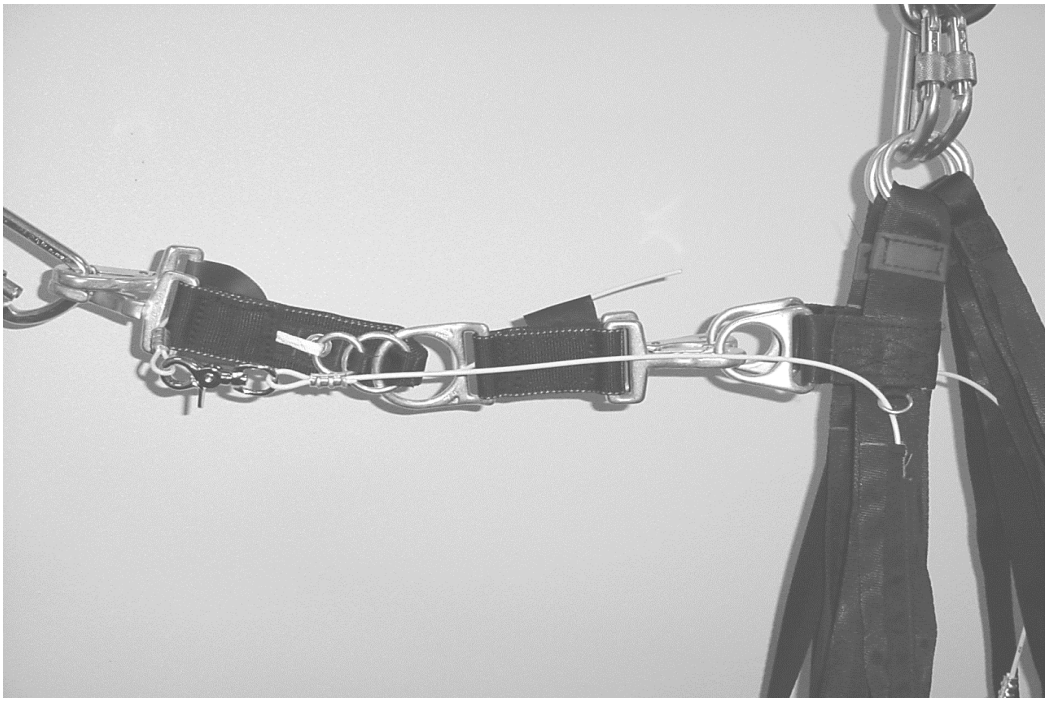
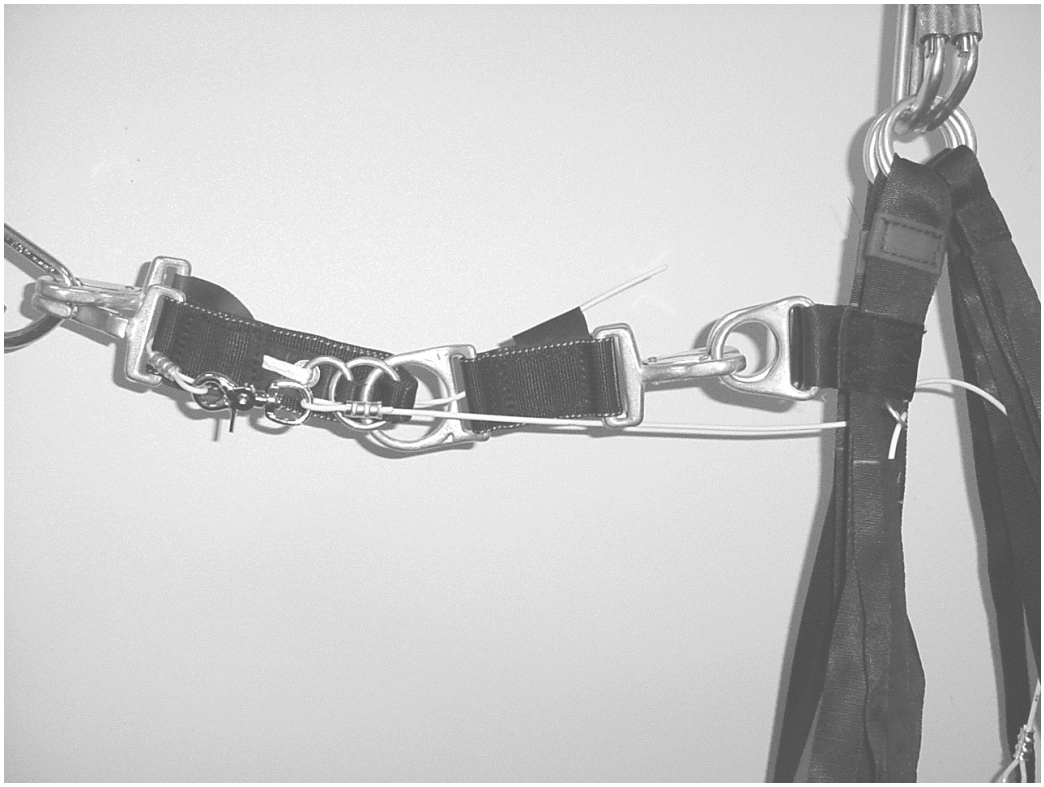
VII. Ripcord Hook-Up



Good ripcord routing



Bad ripcord routing (around suspension straps).

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

As necessary, Skycoaster issues safety bulletins. Keep all bulletins in this section of the manual for future reference and training. Have all crewmembers read and follow bulletins carefully.

The following is a brief description of the subject matter of the Safety Bulletins, and their current status:

SB#1 Launch cable

Incorporated in Operation Manual, Pre-operation Inspection Procedures section.

SB#2 Operation during thunderstorms

Incorporated in Operation Manual, Safety Guideline section.

SB#3 Operation with non-certified personnel

Incorporated in Operation Manual, Staff section.

SB#4 Launch cable inspection

Incorporated in Operation Manual, Pre-operation Inspection Procedures section.

SB#5 Winch visibility

Incorporated in Operation Manual, Operation Procedures section.

SB#6 Fall protection/work aloft safety

Incorporated in Operation Manual, Pre-operation Inspection Procedures and Safety Guideline sections.

SB#7 Foreign object damage to winch drum

Incorporated in Operation Manual, Pre-operation Inspection Procedures section.

SB#8 Skycoaster® items taken out of service

No operational changes required, incorporated in Operation Manual, Pre-operation Inspection Procedures section.

SB#9 Launch release (3-Ring) secondary connectors

Superseded: all new 3-Rings have the secondary connectors built in.

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB#10 Site Controller age requirements

Incorporated in Operation Manual, Staff and Training and Certification sections.

SB#11 Rolling boarding platform use

Incorporated in Operation Manual, Operation Procedures section.

SB#12 Flight area access/signs

No operational changes required, incorporated in Operation Manual, Pre-operation Inspection Procedures section.

SB#13 Flight suit interconnection via carabiners

Superseded: all flight suits now have built-in connection devices. New procedures incorporated in Operation Manual, Operation Procedures section.

SB#14 Use of hydraulic landing unit (when to raise the HLP)

Incorporated in Operation Manual, Operation Procedures section.

SB#15 Winch-down operations

Incorporated in Operation Manual, Operation Procedures section.

SB#16 Hydraulic landing pole construction

No operational changes required.

SB#17 Flight suit interconnection via carabiners

Superseded: all flight suits now have built-in connection devices. New procedures incorporated in Operation Manual, Operation Procedures section.

SB#18 Hydraulic Scissors lift with movable wings

Incorporated in Operation Manual, Operation Procedures and Safety Guidelines sections.

SB#19 Breaking of banners

No operational changes required.

SB#20 Flyer connection to flight carabiners

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

Incorporated in Operation Manual, Operation Procedures section.

SB#21 Omega 4100kg carabiner

Incorporated in Operation Manual, Operation Procedures section.

SB#22 Use of hydraulic landing unit (weight setting selection)

Incorporated in Operation Manual, Operation Procedures section.

SB#23 Launch bridle inspection/maintenance

Incorporated in Operation Manual, Pre-operation Inspection Procedures section.

SB#24 Use of hydraulic landing unit (when flyers are instructed to drop the loop)

Incorporated in Operation Manual, **with changes**, Operation Procedures section.

SB#25 Launch bridle/counterweight entering flight path

No operational changes required.

SB#26 Launch cable 'skips' / launch cable replacement

No operational changes required.

SB#27 Stunting

No operational changes required.

SB#28 Hydraulic Lift Platform Maintenance

Incorporated into Owner's Manual, Inspection Log Sheet

SB#29 3-Ring Release

No operational changes required.

SB#30 Hydraulic Lift Platform Maintenance

Additional inspection points added to those noted in Service Bulletin #28.

SB#31 Triangulated Flight Bracket Catwalk and Support

Specific inspection procedure outlined.

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB#32 Lattice Skycoaster Tower Inspection Procedures

Specific inspection procedure outlined.

SB#33 Flight Suit Footbar Hardware Inspection

Specific inspection procedure outlined.

SB#34 Flight Suit Recall

Outlined specific recall procedure for affected Flight Suits.

N-001 Skycoaster Owner's Manual Clarification

Clarification of language and action to be taken in prior Safety Bulletins incorporated into the Owner's Manual.

N-002 Footbar straps

Specific adjustment procedure outlined.

SA-001 Footbar straps

All flight suits have been fitted with nylon replacement footbar straps.

SB#35 Footbar straps

All flight suits have been fitted with nylon replacement footbar straps.

N-003 Maintenance Procedures

Clarification of maintenance procedures not previously outlined in Owner's Manual.

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #1

An accident recently occurred where the launch cable broke at 100 feet or more from the Flyers, while Flyers were being hoisted aloft.

The result was a premature flight, with the launch cable in tow behind the Flyers. The launch cable "whipped" 3 people, causing minor injuries.

THIS IS A POTENTIALLY SERIOUS SITUATION, WHICH COULD RESULT IN INJURY OR DEATH OF FLYERS OR SPECTATORS!

Do not operate the Skycoaster® with a launch cable other than 1/4 inch galvanized cable that has been inspected according to the Owner's Manual. Specifically, do not use a launch cable that is frayed, kinked, "bird caged" or otherwise deformed. If a cable is damaged, immediately cease operating the Skycoaster® until the cable is replaced.

We highly recommend that you keep a spare cable on site, since a damaged cable must be replaced immediately, before further operation of the Skycoaster®.

Additionally, inspect all cable guides on a bi-weekly basis. Replace the component if it shows excessive wear or grooving.

We do not believe this problem can occur if the cable is properly inspected on a regular basis.

DO NOT FAIL TO PROPERLY INSPECT AND MAINTAIN YOUR LAUNCH CABLE!

SB #1 9/93

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #2

This Bulletin covers operation of Skycoasters® in the presence of thunderstorms.

WARNING! SERIOUS INJURY OR DEATH CAN OCCUR IF LIGHTNING STRIKES A SKYCOASTER® LAUNCH TOWER OR SUPPORT STRUCTURE. RISKS OR SERIOUS INJURY OR DEATH ARE GREATLY INCREASED IF THE TOWERS ARE NOT PROPERLY GROUNDED.

Tall towers act as "lightning rods" for weather based on electrical activity. Since the Skycoaster® towers are likely the highest points in the area, they are most likely the first objects to be hit. **DO NOT WAIT FOR THE CRASH OF LIGHTNING AND THUNDER CLOSE BY -- SHUT DOWN THE SKYCOASTER® ANYTIME THUNDER OR LIGHTNING IS IN THE VICINITY! THE FIRST STRIKE WILL LIKELY BE TO THE SKYCOASTER® TOWERS!**

Ground all towers (and cranes on temporary installations) according to local electrical codes. This should be a minimum of two ten foot long ground rods, connected to the towers with "00" copper wire. Metal fences should be grounded separately, at least every 50' of fence length.

During a "shut-down" for lightning, **all customers and employees should leave the site**. Do not use this opportunity to work on equipment, or remain close to the towers, or metal fences surrounding the towers.

It is difficult to predict when and where the "first strike" will occur. A thunderstorm can form directly overhead and the first bolt of lightning could hit your Skycoaster® site. There will be no thunder preceding the hit as a warning.

Don't take a chance! Close down in advance!

SB #2 10/25/93

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #3

This Bulletin covers operation of Skycoasters® with unauthorized personnel.

It has been brought to our attention that certain Skycoaster® owners have been operating the site with Site Controllers that have not been trained by Sky Fun 1, Inc. *This is specifically in violation of the Operation Manual*. Owners who allow this can be subject to revocation of their license agreement.

Site Controllers may train other crew members, but the Site Controller must be trained by Sky Fun 1, Inc.

If you find that you do not have sufficient Site Controllers to operate your Skycoaster® site, then you may arrange with Sky Fun 1, Inc. to factory train additional Site Controllers either at your site or at another location.

Remember that any deliberate deviation from the procedures outlined in the Operation Manual could subject the Skycoaster® Licensee to enormous personal and corporate liability if an accident occurs. While the insurance company would pay the claim for a suit initiated by a customer, the insurance company could then sue the licensee for breach of the agreement.

If you have any questions about crew requirements or training, contact Sky Fun I, Inc. immediately.

SB #3 10/29/93

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #4

This Bulletin covers Daily Launch Cable Inspections.

With reference to the Skycoaster® Operating Manual, **a full length launch cable inspection will be done <u>daily</u> prior to any operations**. The procedure is:

1. Complete your inspection at the base of the launch tower per the Daily Inspection Log.

2. Inspect the area between the nylon pinch roller and the grooved winch drum for foreign objects or debris.

3. Clear all personnel away from the winch drum and launch cable, turn the winch ON, shift to manual control, winch UP until the launch cable bumper gently contacts the sheave at the top of the tower.

4. Check the position and condition of the UP marker tape flags on the launch cable. Replace as necessary.

5. Fold a rag around the launch cable below the marker flags. Hold the two ends of the rag in one hand and slowly lower the launch cable to the DOWN marker tape flag while visually inspecting the launch cable and using the rag to check for any broken wire strands or damage along the launch cable.

6. Check for the correct positioning of the DOWN marker flag by standing on the flight-boarding platform and pulling on the release as if to connect to flyers. The tension pulled in the launch cable should be approximately 25 pounds (11.34 kilograms). If necessary, adjust the amount of launch cable OUT by moving the winch drum UP or DOWN and adjust the tape marker accordingly.

7. Disconnect the launch cable from the launch bridle at the Omega 4100 kg carabiner. At this point, allow the counterweight cable, counterweight and launch bridle to hang freely so that any accumulated twists in the counterweight wire may rotate out.

8. Have a crewperson pull tension on the launch cable at the bumper while winching out to within 1 - 2 turns remaining on the winch drum. While pulling out, grasp the bumper, not the carabiner, in order that any accumulated rotations or twists in the launch cable will be allowed to relax.

9. Walk the launch cable from the bumper to the UP marker inspecting for kinks, broken wire strands or other damage. Replace any damaged launch cable with a new cable.

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

10. Have a crewperson pull tension on the launch cable at the bumper. Use a wooden stick to guide the launch cable on the grooved drum and slowly rewind cable onto the drum using manual control.

11. Visually inspect the lower portion of the counterweight wire for condition. Visually confirm that the quick link connectors on the counterweight and launch bridle are closed. Use Loc-tite medium thread-locking compound on any quick link connector whenever closing. Inspect the launch bridle for condition and closed quick links.

12. Re-connect the launch cable to the launch bridle with the Omega 4100 kg carabiner. Securely lock the carabiner.

13. Note: Some launch cables at some locations show a tendency to "untwist" or "birdcage" particularly within the first 5' - 15' from the rubber bumper. If you see this tendency in your launch cable, you should:

1) Each day during the pullout of your launch cable, be sure to allow any accumulated twists or rotations to come out by allowing the launch cable to rotate freely while pulling out. Hold the rubber bumper, not the carabiner.

SB #4 3/31/94

Revised 1/1l97

Revised 1/1/99

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #5

This Bulletin covers Winch Visibility.

With reference to step 11, page 16 of the Skycoaster® Operating manual, it is the responsibility of the Controller and Assistant Controller during winch-up to "focus their attentions on the flyers, the flight area to ensure no unauthorized persons or objects and the **OPERATION OF THE WINCH**".

THE WINCH DRUM MUST BE VISUALLY MONITORED BY BOTH THE CONTROLLER AND THE ASSISTANT CONTROLLER DURING WINCH-UP ON EACH AND EVERY FLIGHT.

The Flight Crew must be alert to any mis-spooling of the launch cable on the drum or any unusual winch operation. The UP flag marker must be monitored to ensure the cable is stopped with the bumper no closer than 6 inches from the sheave at the top of the launch tower.

It was brought to our attention that the TV winch monitor was inoperative for a 1-2 week period at one site. We visited two sites where winch lights were nonexistent.

IF TV MONITOR IS INOPERATIVE, THE SKYCOASTER® IS INOPERATIVE. IF THE WINCH LIGHTS ARE INOPERATIVE, THE SKYCOASTER® IS INOPERATIVE.

Ensure that the flight crew has all the necessary equipment to monitor the winch operation on **EACH AND EVERY** flight. A TV monitor failure during busy operations would dictate that a Site Controller or Controller physically monitor the winch operation from the power unit.

SB #5 3/31/94

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #6

This Bulletin covers Fall Protection and Work Aloft Safety.

The Skycoaster Operation Manual is clear that whenever inspection or work above ground is needed, **SAFETY FALL PROTECTION IS REQUIRED**. All Skycoasters built beginning in 1994 are being provided with two sets of fall protection equipment. If your site has but one set, you should immediately call Sky Fun 1 and order an additional set. Do not wait until someone is in trouble or injured aloft to get your site prepared.

Sky Fun 1 policy **REQUIRES** that fall protection equipment be used by **ANYONE** ascending Skycoaster structures. This includes outside contractors doing work at your site. Your Site Controllers should equip these contractors and instruct them in the proper use of fall protection equipment.

Sky Fun I policy requires all tools or other items carried aloft to be securely tethered to the climber and that the area below and around the structures be cleared of all personnel with regard to the danger of falling objects.

Paragraph 12, page 12 of the Skycoaster Operating Manual indicates "any object secured to the tower must have redundant connections to preclude any danger from falling objects". This means that any lights, speakers, flags, signs, etc. must be securely attached with more than one bolt, clamp or other means. Wire rope "chokers" with a quick link or shackle are convenient devices to provide backup attachments to the towers.

SB #6 3/31/94

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #7

This Bulletin covers Foreign Object Damage (FOD) to Winch Drums.

There have been two incidents of damage to nylon pinch rollers and a damaged grooved winch drum which was most likely caused by the presence of a tool or object being pulled into the roller / drum area.

Each day, during the Daily Inspection and after completing any work in the winch area, inspect the winch drum area for the presence of any foreign objects or debris. Damage of this nature can be very costly but is easily preventable.

SB #7 3/31/94

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #8

This Bulletin covers Skycoaster items taken out of Service.

ANY Skycoaster Operational Items, including but not limited to, cables, carabiners & harnesses, that are taken out of service on the Skycoaster are not to be used for any other purpose. They are to be destroyed or returned to Sky Fun 1 for disposal. If you choose to destroy them, please send a letter to Sky Fun 1 detailing what the item is, the reason it was taken out of service, the serial number if any, the date and method of disposal.

SB #8 5/24/94

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #9

This Bulletin covers the Launch Release Secondary Snap Connectors.

Ref: Skycoaster Operating Manual, pg. 15, CARABINERS AND CONNECTING HARDWARE Paragraph 2, Launch release System:

As was discussed at the January Safety Meeting in Orlando, there have been numerous reports of the launch release disconnecting from the launch bridle at the top of the launch tower at the instant of flyer launch. To reduce the danger of persons on the ground being struck by a falling launch release, we are sending all Skycoaster locations four (4) Secondary Snap/Lanyard Connectors to be installed on all launch releases being used on all Skycoasters. This means that all launch releases will be connected to the launch bridle by two (2) independent snap connectors.

On occasion, the spring snap on the connectors may become deformed or bent so that the snap will not stay closed. A connector in this condition must be repaired or replaced before use. Repair by opening the wings of the snap with a screwdriver and lightly oil the hinge pin. A connector with a broken spring must be discarded and not he used for flight.

Upon receipt of this bulletin, the enclosed snap connectors, and photographs showing installation and use, install the secondary connectors on your launch releases immediately.

Complete the enclosed form to certify your receipt and installation of the secondary connectors and return the form to Sky Fun 1, Inc.

SB #9 3/1/95

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #10

This Bulletin changes the required age of Skycoaster Site Controllers:

Site Controller: Responsible for overseeing all operations of site. Shall be versed in all operations, procedures, staffing and training. Ultimately responsible for all actions and processes of SKYCOASTER. **Site Controller must be 19 years of age, and will have completed a factory authorized training program and have attended all factory required safety meetings. A Site Controller must be physically present during all Skycoaster operations.**

A Site Controller will be in possession of a current and valid factory issued Certification Card.

Certification Cards are valid for a period of one year and will be renewed upon completion of re-certification requirements - generally met by participation in a Safety Seminar and completion of a written test.

SB #10 5/08/95

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #11

This Bulletin covers operational use of the rolling boarding platform.

Recently an incident occurred while a portable unit was being tested by an employee after set-up and before the Skycoaster was open to the public.

The employee was winched to the top of the launch tower by a Certified Site Controller using the manual control on the winch. The boarding platform was not moved away from the low point of the flight path and secured - as is required by the Skycoaster Operation Manual. When the employee pulled the ripcord and launched, he struck the left hand rail of the boarding platform with his head on the first swing through and then struck the right hand rail on his return swing. Miraculously, this individual was not killed but did suffer a broken jaw, bruised/cracked ribs, and several other very serious cuts and bruises.

The Skycoaster Operation Manual states very clearly "**THE CONTROLLER ENSURES THAT THE BOARDING PLATFORM SAFETY TETHER IS IN PLACE**" before the launch signal is given to the flyers. This requirement applies to **anyone** flying the Skycoaster - employee or customer.

This Operator was extremely fortunate the employee was not killed or injured far more seriously than he was.

Every Site Controller, Controller and Assistant Controller must be aware of the location of the boarding platform at all times and those directly responsible for moving and tethering it must be especially vigilant that it is out of the flight path.

SB #11 8/30/95

Revised 1/1/98

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #12

This Bulletin covers flight area access and signage.

In a recent incident, a preoccupied Skycoaster employee walked from the flight suit area into the flight area, and through the low point as a flight went by. A flyer's arm struck the employee's head, with no injury to the employee and a hairline fracture of the flyer's arm. Had this incident occurred early in the flight, not just prior to landing, the injuries would have been much more serious.

This incident occurred at a site having very adequate fencing, but **NO GATE** at the entrance to the flight area from the suiting area.

TO ASSIST IN PREVENTING FUTURE INCIDENTS OF THIS NATURE, ALL LOCATIONS MUST:

A. Close the flight area to all unauthorized and unnecessary persons.

B. Inside the flight area, all authorized and necessary persons must remain clear of the flight line during flight time.

TO FURTHER THESE GOALS, THE FOLLOWING WILL BE REQUIRED WITHIN 10 DAYS AT ALL SKYCOASTER LOCATIONS:

1. In addition to the fencing already required around the Skycoaster operating area, all entrance and exit points will be protected with **self-latching gates**. Ropes or chains across these openings **are not acceptable**!

2. Warning signs will be on the entrance gates:

   If a separate exit gate is used, this warning sign will be posted:

3. All flyers waiting at entrance gates will be under the control of an employee at all times - either a Flight Suit person or a trained and designated Expediter, who will escort flyers to and from the boarding lift at the appropriate times. The "far gate" on dual Skycoaster installations will have an Expediter on duty at all times both sides are operational. Flyers are not to be sent to the "far gate" to wait unless the gate is staffed by an Expediter.

4. No persons, other than the flight crew, i.e., Controller and Assistant Controller and persons directly under the control of the flight crew, are to be within the flight area (the fenced area) during flight time. Flight time is defined as when winch-up begins, until the flight is stopped at the low point. Other persons, such as microphone, video, maintenance, supervisory, or management personnel

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

inside the flight area, are to remain with the flight crew at the E-Stop/Operator's Station during flight time, under the direct control of the flight crew.

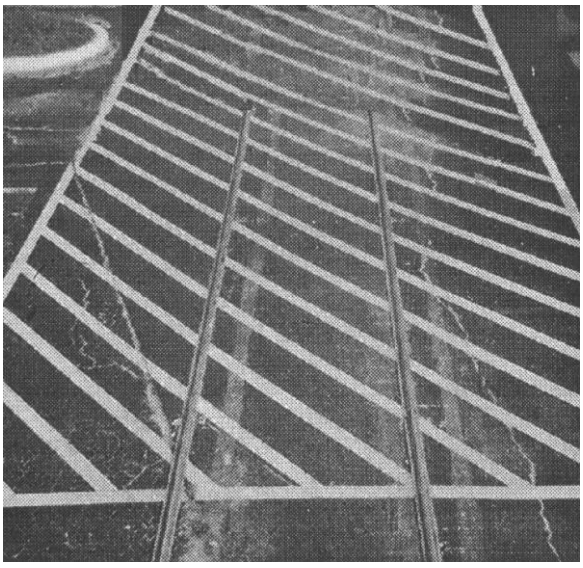
5. To raise and maintain everyone's awareness of the location and danger of the flight line, all sites will:

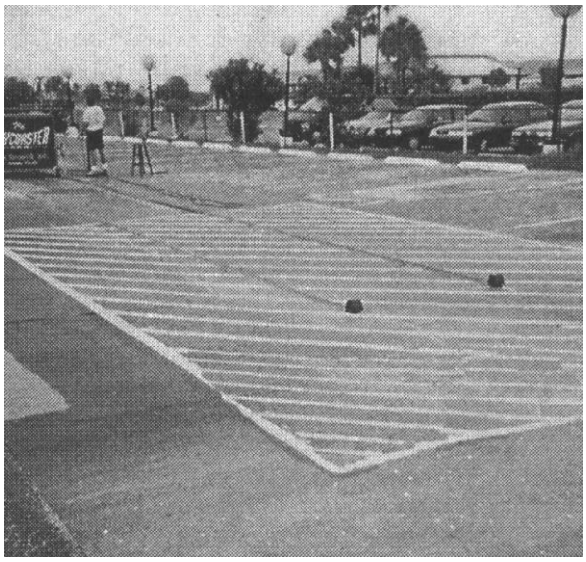
   a. Mark a line or zone across the entrance/exit paths in a manner clearly indicating the danger zone of the flight path. Portable Skycoaster's, or others operating on a non-paintable surface, will use plastic traffic cones for this purpose. (**SEE PHOTOS**)

   b. Mark a line or zone across the area between the E-Stop/Operator's Station and the low point in a manner clearly indicating the danger zone of the flight path. Skycoasters operating on a non-paintable surface will use traffic cones. (**SEE PHOTOS**)

   c. Mark a line or zone across the path a video person or any other person within the flight area might take through the flight line. The danger of the flight line will be indicated with paint and/or traffic cones. (**SEE PHOTOS**)

EVERY EMPLOYEE MUST BE AWARE AT ALL TIMES OF THE FLIGHT AREA, THE FLIGHT PATH, THE DESIGNATED SAFETY AREA AROUND THE FLIGHT PATH AND THE LOCATION OF ALL PERSONS WITHIN THE FLIGHT AREA. SAFETY OF FLYERS AND EMPLOYEES REQUIRES CONSTANT ATTENTION.





SB #12 9/15/95
Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #13

This Bulletin addresses flyers being turned 180 degrees during the slowing/landing process.

In a recent incident, a flyer suffered a cut on the head when struck by a footbar when the other flyer was rotated 180 degrees during the landing process.

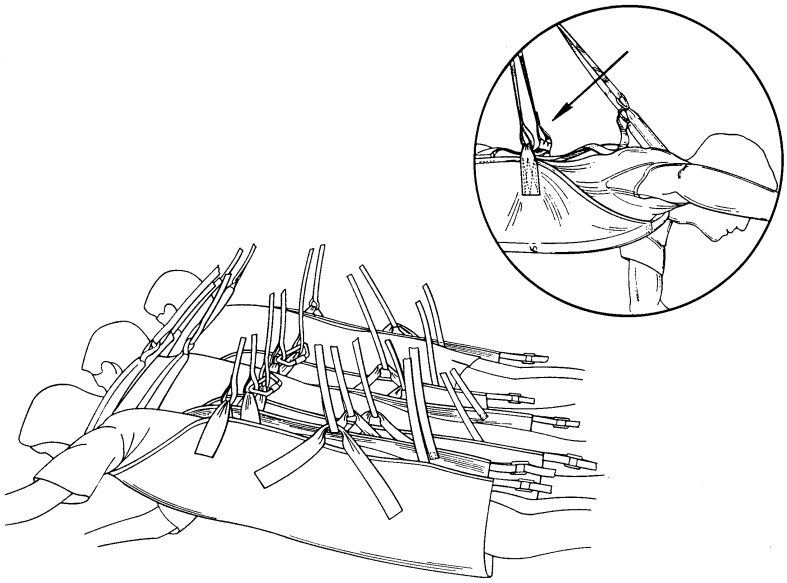
To eliminate or reduce the possibility of future occurrences, all locations must interconnect the Flight Suits of all flyers as part of the connection process prior to winch-up.

Adjacent Flight Suits will be connected with a locking carabiner through the sewn loops of the suspension straps directly beneath the flyer's arms. This will require one (1) locking carabiner for a tandem flight, and two (2) locking carabiners for a triple flight. The drawing below will clarify the carabiner attachment location.

All existing Skycoaster locations are being sent two or four carabiners, as required, with this bulletin. All Skycoasters installed after the date of this bulletin will be supplied carabiners at the time of installation and training. These particular carabiners were specially selected for their notch-free gate system to eliminate snagging on the sewn loops during their removal after each flight.

SB #13 04/16/96

Revised 1/1/97



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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #14

This Bulletin addresses all Skycoaster locations utilizing a Hydraulic Landing Unit.

To eliminate the possibility of a careless Assistant Controller snagging the feet of a Flyer prior to landing, **ALL ASSISTANT CONTROLLERS WILL ASCEND THE WORKSTAND WITHOUT THE LANDING POLE IN HAND**.

Effective immediately, the "warning" phrase, "*Next time back, EVERYONE grab hold of the loop*" will be given by the Assistant Controller while the pole is laying on the ground.

After the Flyers have cleared the area above the workstand, flying back toward the Zoom Zone, the Assistant Controller will say, "Pole, please". The Controller will then raise the pole to the Assistant Controller to complete the landing.

SB #14 06/07/96

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #15

This Bulletin addresses all Skycoaster locations; both those utilizing a Scissors-Lift Flight-boarding Platform and those utilizing a Rolling Flight-boarding Platform.

To further reduce the possibility of a launch cable being lowered into the flight path and striking the Flyers, **WINCH-DOWN WILL BEGIN *AFTER* THE FLYERS HAVE SUCCESSFULLY GRABBED THE LOOP OF THE HYDRAULIC LANDING POLE OR THE MANUAL POLE**.

A Scissors-Lift operation utilizes a position of an Expediter. The Expediter continues winch-down after relieving the Controller of the pendant.

This new procedure will not delay production cycle time.

SB #15 06/07/96

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #16

This Bulletin addresses the Hydraulic Landing Unit pole.

In a recent incident, a solo Flyer injured a finger by grasping the foam pad on the end of the pole, instead of the loop. It was determined that the most probable cause was the finger slipping under one of the tie-wraps used to secure the foam pad to the pole.

TO ELIMINATE THE POSSIBILITY OF A FUTURE OCCURRENCE, THE COMPLETE FOAM PAD ON THE END OF ALL HYDRAULIC LANDING POLES WILL BE COVERED WITH TAPE.

The daily pre-operation inspection at all locations will confirm the foam pad is covered with tape and no portion of the pole it protruding from the foam at the end of the pole. Tape should be applied to the pole and foam to prevent the foam from slipping down the pole and leaving the pole exposed at the end. A pole exposed at the end is subject to breakage and is a hazard to the Flyers' hands during the landing process.

SB #16 06/07/96

Revised 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #17

This Bulletin addresses flyers being turned 180 degrees during the slowing / landing process when the flight suits are interconnected with either snaphooks and rings or the purple flight suit carabiner.

There have been incidents of flyers turning 180 degrees during landing when only one flyer in a double or triple grabs the landing loop - even with the snaphook / ring installed.

To eliminate or reduce the possibility of future occurrences, all locations must interconnect the Flight Suits of all flyers as part of the connection process prior to winch-up.

Using the purple flight suit carabiners furnished previously, the suits are to be connected as follows: Blue and Purple Flight Suits are to be connected through the sewn loops of the bottom or last suspension strap. The Red Flight Suits are to be connected through the sewn loops of the third or next to, last suspension strap. This connection must be made after the flyers are in the prone position as the loops will not necessarily line up while the flyers are in the upright position.

The only carabiner authorized for this application is the purple carabiner furnished by Sky Fun 1 prior to the installation of the snaphook / ring on the upper suspension strap. These particular carabiners were specially selected for their notch-free gate system to eliminate snagging on the sewn loops during their removal after each flight.

SB #17 1/1/97

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #18

This Bulletin addresses the use of the Scissors Lift Flight-boarding Platform with Hydraulic Wings.

Under no circumstances is anyone to lean or push on the wings of the Scissors Lift while they are in the upright position. The wings are intended **only** to contain the crew and passengers on the boarding platform and are not meant to be used for support.

Furthermore, no person is to step or stand on the wings while they are in or moving through the horizontal position. The wings are not a structural device of the boarding platform and putting any additional stress or weight on them while they are unsupported could result in a mechanical malfunction. It is still permissible to walk across the wings when they are in the full down, supported position.

SB #18 7/3/97

Revised 1/1/98

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #19

This Bulletin addresses the practice of breaking banners at the low point for Grand Openings, etc.

Because of the high possibility of injury to flyers breaking banners that are improperly constructed, it is **required** that Skycoaster, Inc. be contacted for specific instructions on banner construction and placement. Written permission must be obtained from Skycoaster, Inc. prior to a banner break, or a Skycoaster, Inc. employee must be on hand.

SB #19 7/3/97

Revised 1/1/98

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #20

This Bulletin addresses the procedure for connecting flyers to the Flight Carabiners.

All Flight Suits without the red tie cord are being returned from Inspection/Maintenance with a red flag attached immediately below the suspension rings. By counting the number of red flags and/or red tie cords, the Flight Crew can easily ensure that all flyers are correctly attached to the Flight Carabiners.

To eliminate the possibility of all Flyers not being attached to the Flight Carabiners, the Controller will visually check the flight carabiners, the red flags and/or red tie cords and the suspension rings of each flyer after hearing the verbal command "Carabiners Locked" from the Assistant Controller. The Flyers will not be allowed to go prone until the Controller has confirmed that all Flyers are attached to the Flight Carabiners. At that time, the Controller will agree by making the announcement "Carabiners Locked". The Flight Crew will then prone the Flyers.

The following is the procedure as it will read in the 1998 Skycoaster Operation Manual:

> The Assistant Controller attaches the flyers, left to right, to the Flight Carabiners and verifies that each flyer is attached.
>
> The Assistant Controller then hooks the Upper and Lower Side Clips.
>
> The Assistant Controller physically verifies that all hardware is attached and each flyer is connected to the Flight Carabiners. He or she announces "Carabiners Locked".
>
> The Controller visually verifies all Flyers are attached to the Flight Carabiners and answers with "Carabiners Locked".

SB #20 7/28/97

Revised 1/1/98

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #21

This Bulletin addresses the Omega 4100kg carabiner.

To eliminate the possibility of the Omega 4100kg carabiner becoming unlocked and possibly opening during a flight, the Assistant Controller will be responsible for ensuring the locking gate is tightly closed and locked prior to flying his/her first flyers. This check will take place before winch-up on the first flight after a change of Assistant Controllers. The Controller will be responsible for confirming that the Omega is locked.

SB #21 10/8/97

Revised 1/1/98

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #22

This Bulletin addresses the use of the Hydraulic Landing Unit.

Due to the possibility of injury to guests and/or equipment damage or failure, the Hydraulic Landing Unit is to remain on **one setting only** while the flyers are being caught and landed. The Flight Crew is to choose the weight setting prior to administering the "warning" phrase and the setting is to remain the same for the duration of the catch.

The Flight Crew is not authorized to change the weight setting on the Hydraulic Landing Unit once the flyers have grabbed hold of the loop.

SB #22 10/8/97

Revised 1/1/98

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #23

This Bulletin addresses inspection and maintenance of the Launch Bridle.

The cable components of the Launch Bridle are covered with rubber hose to prevent possible damage to the release mechanism, caused by the "whipping" action when the flyer pulls the ripcord.

Because of this, it is not possible to see any damage to the horizontal leg of the cable that may result from the bridle being hooked with the Skyhook and pulled forward to the rolling cart or hydraulic lift. This damage most often consists of broken strands and most often occurs at the end of the swedge on the release end of the bridle near the double "D" ring - the end closest to the flyers.

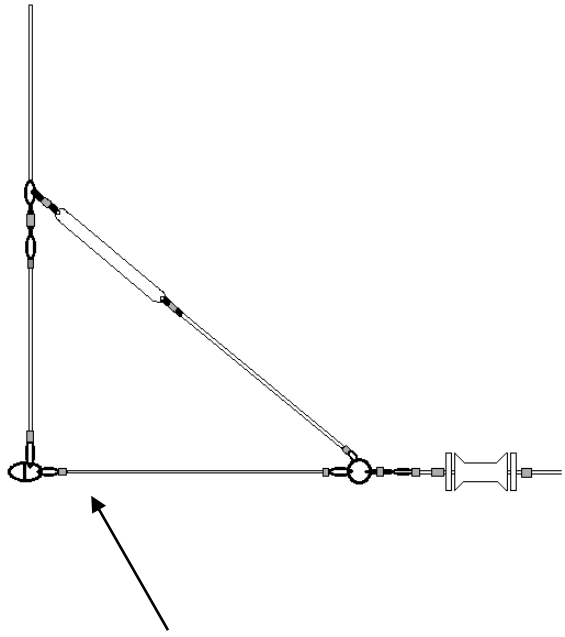
If these broken strands were to go undetected, the bridle could separate while flyers are being winched to the top.

Effective immediately, the daily inspection is to include an inspection of the horizontal leg of the bridle (see below), by pulling the rubber hose back from the swedge to check for broken wires. If broken wires are found, the bridle is to be replaced immediately.

In the future, all new bridles will have clear hose installed.

SB #23 5/14/98

Revised 1/1/99



Area of possible damage

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #24

This Bulletin addresses the Hydraulic Landing Unit.

When the loop on the hydraulic landing unit is released while there is tension on the perlon rope it will spring back toward the machine - much like a stretched rubber band will spring back. When this happens, the rope can be damaged or jump off the reel and wrap around the shaft. The next time the rope is pulled, it will not unwind and the loop will be jerked out of the hands of the flyers.

Effective immediately, the Assistant Controller is to direct the flyers to drop the loop **only** when there is slack in the rope. If the loop is dropped when the rope is tight, or if the loop or rope catches on something and causes the rubber band effect, the Controller and Assistant Controller are to inspect the lander to ensure the rope has not jumped off the spool. They are also to inspect the rope for damage. If either has occurred, the lander is not to be used until the problem has been corrected.

SB #24 7/7/98

Revised 1/1/99

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #25

This Bulletin addresses the possibility of the launch cable/bridle entering the flight path during flight.

In the event the launch cable/bridle enters the flight path through either an electrical or hydraulic malfunction or operator error, the flight crew must be ready to take immediate action. After the flyers come to a stop at the top of the launch tower, the Controller must release the "up" button on the pendant, check and receive agreement from the Assistant Controller that the flight line is clear and then give the countdown. Both the Controller and the Assistant Controller should visually monitor the launch cable/bridle after the flyers pull the ripcord. If the launch cable/bridle begin to descend while the flight is still in progress, the Controller should immediately push the red e-stop button. If there is an electrical malfunction, this will cut off electrical power to the winch and stop the descent. If there is a hydraulic malfunction, this will be immediately apparent as the e-stop button will not stop the descent. In that event, the Controller should use the Skyhook or the manual landing pole to catch the launch cable/bridle and pull it to the side away from the flyers while the Assistant Controller lands the flight.

The Skycoaster must not be operated until a thorough inspection has been done and any malfunction corrected. If the cause is determined to be operator error, that Controller and/or Assistant Controller must be taken off the flight line. Skycoaster, Inc. must be notified immediately via telephone or fax.

SB # 25

8/9/99

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #26

This Bulletin addresses correcting a launch cable "skip" on the winch drum and changing the launch cables.

If the launch cable "skips" a groove, the manual control should be used to winch the cable down until the skipped groove is reached and then winch back up to the proper position. Great care should be taken that the launch cable not be unwound off the drum to the point that no turns of cable remain on the drum and the copper stopper on the end of the launch cable is allowed to come out of the keyway in the drum. If the copper stopper is allowed to come out of the keyway, the cable will unwind up the tower, pass over the sheave and fall to the ground - possibly causing damage to people and property.

The procedure for changing a launch cable is outlined in the Skycoaster Operations Manual, beginning on page 129. These directions should be closely followed and close attention paid to prevent the last turn of the cable on the winch drum from being unwound and allowing the copper stopper to come out of the keyway. As with correcting a "skipped" grove, if the copper stopper is allowed to come out of the keyway, the cable will unwind up the tower, pass over the sheave and fall to the ground - possibly causing damage to people or property.

SB # 26

8/9/99

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SAFETY BULLETIN TO ALL SKYCOASTER OWNERS

SB #27

This Bulletin addresses Stunting.

In a recent incident, two employees were severely injured while stunting after the site had closed for the night and the lights had been turned off. They turned themselves 180 degrees and launched facing the launch tower. In addition, the single employee operating the winch did not move the rolling cart completely into the safety area and did not tether it. As a result, the flyers impacted the cart three times. The incident was witnessed by a police officer who stated in his report that "I could also smell the odor of intoxicants coming from……"(the two flyers).

Every one of the contributing factors listed above are **specifically** prohibited by not only the Skycoaster Operations Manual, but by common sense and could have resulted in the deaths of the employees. If operators / employees become bored with flying the Skycoaster in the correct, safe, prescribed manner, they should stop flying - not try to make it more exciting. Any Site Owner or Site Controller that accepts and / or condones this type behavior should immediately discontinue Skycoaster operations.

ANY SITE CONTROLLER INVOLVED IN THIS TYPE OF VIOLATION WILL HAVE THEIR CERTIFICATION SUSPENDED OR CANCELLED AND THE PURCHASE AND LICENSE AGREEMENT FOR THE SITE COULD BE CANCELLED.

SB # 27

7/18/00

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Bulletin No.:	28
Release Date:	May 8, 2002
Effective Date:	May 15, 2002
Page:	1 of 2

SERVICE BULLETIN

Ride Manufacturer: Skycoaster, Inc.

Affected Production Dates: All

Ride Name: Skycoaster®

Affected Serial Nos.: All utilizing hydraulic lift platforms

Abstract of Issue: This bulletin addresses the inspection and maintenance of the hydraulic lift platform. Usage over time can fatigue welds and material. Safe operating procedure must include new Weldment inspections and NDT testing.

Reason for Release: Incidents of Weldment fatigue and material failure have been experienced in the field. A failure in these components could result in a scissors lift collapse.

Action to be Taken: Currently, the daily inspection specifies visual identification of areas that may have *"cracked or worn paint that might signal a change in operating or structural characteristics of the lift"*.

With the introduction of this Service Bulletin, we now specify that Magna Flux testing must be made to areas shown on the attached drawing. Magna Flux testing must be done immediately and at a minimum of annually for seasonal lifts and semi-annually on lifts that are operated on a year-round schedule.

The areas that require Magna Flux testing are subject to fatigue and potential separation.

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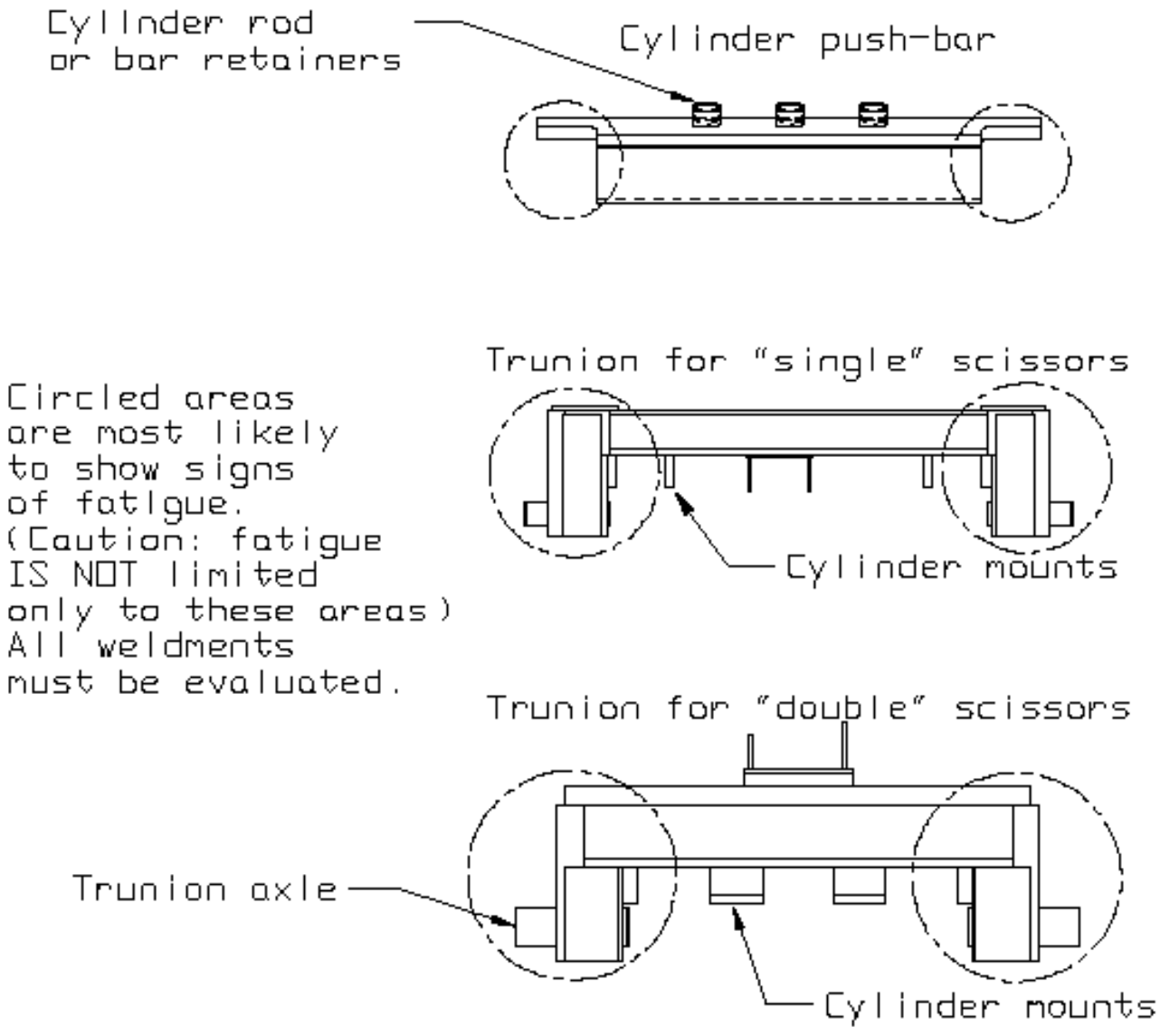
These new inspection procedures are effective immediately and will remain in effect from this day forward.

If deficiencies are identified, immediately remove the unit from service. A qualified lift repair technician can perform repairs at the lift factory or on-site. If necessary, replacement structural components are available for installation in place of the component that has been deemed non-serviceable.

If you have any questions, please call Skycoaster at (303) 678-9803.



Weldments may vary from that shown

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Bulletin No.: 29
Release Date: June 6, 2002
Effective Date: June 6, 2002

SERVICE BULLETIN

Ride Manufacturer: Skycoaster, Inc.

Affected Production Dates: All

Ride Name: Skycoaster®

Affected Serial Nos.: All utilizing new style 3-ring release

Abstract of Issue: This bulletin addresses the revised version of the standard 3-ring release, which incorporates the use of larger stainless steel clips.

Reason for Release: Reports have surfaced of the new style 3-ring release with the larger stainless steel clips falling to the ground from the double D connector at the top of the launch tower upon release of the flyers. This could be a hazard to any individual underneath or within the vicinity of the launch tower. If your site is using 3-ring releases with the B-12 clips exactly like the ones used on the side of the flight suits, this Service Bulletin does not affect you.

Action to be Taken: All sites that have purchased and received the new style 3-ring releases with the larger stainless steel snap clips will be sent replacement 3-ring releases that have the original smaller zinc plated snap clips. These components will be sent to each park free of charge as soon as they become available from the manufacturer.

Until the replacement 3-ring releases are received, we are recommending that the newer style 3-ring releases not be used if an original style release is available. If no original style 3-ring releases with the zinc plated snap clips are available for use, please make certain that the controllers are correctly attaching the snap clips to the double D connector in opposite directions as outlined in the Skycoaster® Owner's Manual.

If you have any questions, please call Skycoaster at (303) 678-9803.

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Bulletin No.: 30

Release Date: October 29, 2003

Effective Date: October 29, 2003

SERVICE BULLETIN

Ride Manufacturer: Skycoaster, Inc.

Ride Name: Skycoaster®

Affected Production Dates: All

Affected Serial Nos.: All sites utilizing 5-foot single scissors-lift hydraulic lift platform

Abstract of Issue: This bulletin addresses the inspection and maintenance of the hydraulic lift platform. Usage of the lift over time can fatigue welds and material. Safe maintenance procedure must include weldment inspections and NDT procedures.

Reason for Release: An incident of weldment fatigue and material failure has been experienced in the field. A failure of these components could result in a scissors lift collapse.

Action to Be Taken: With the release of this service bulletin, Magna Flux testing must include the base of the scissors-lift cylinder cups at the bottom of the lift cylinder. Magna Flux testing must be completed immediately on this component. This testing must be completed at a minimum of once annually for seasonal sites and semi-annually on lifts that are operated on a year-round schedule and is in addition to the testing areas noted on Safety Bulletin 28 issued on May 8, 2002.

These new inspection procedures are effective immediately and will remain in effect from this day forward.

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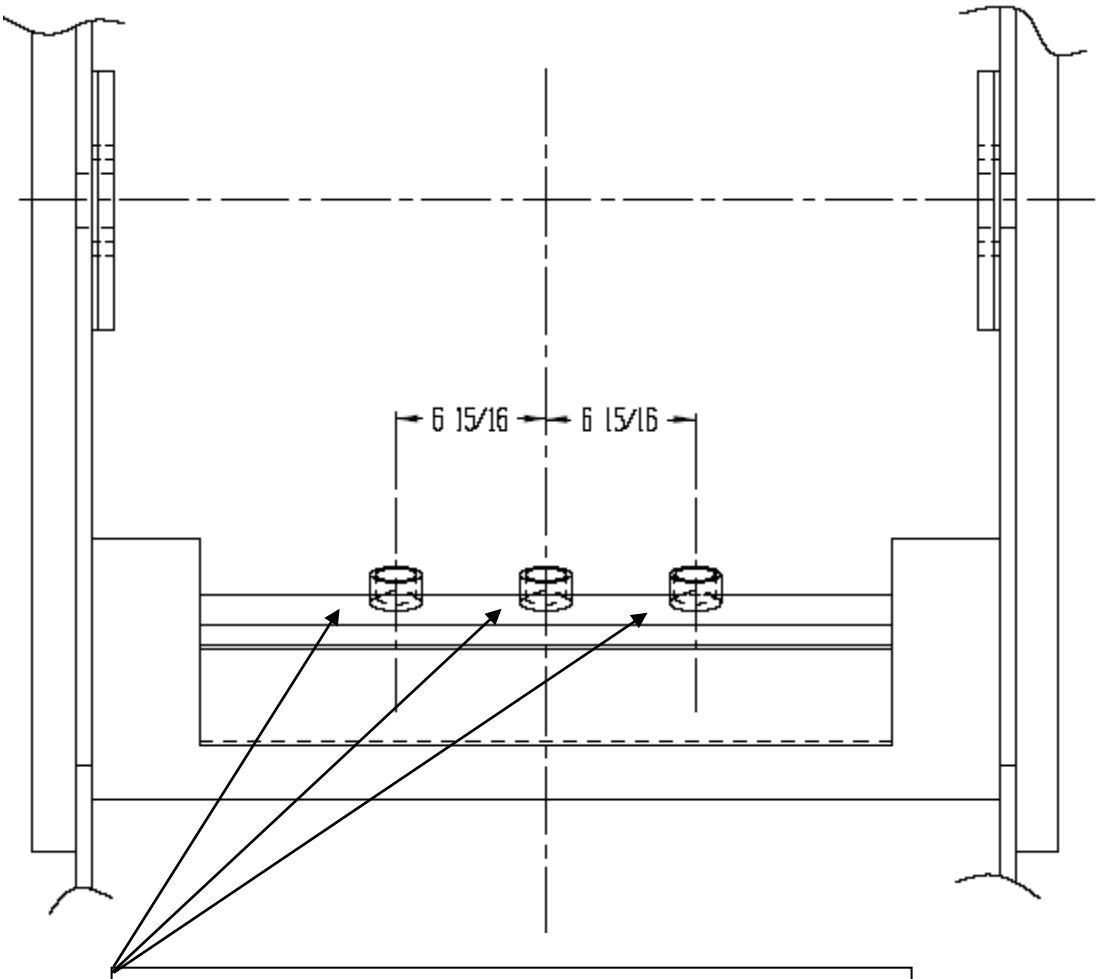
If any deficiencies are identified, immediately remove the unit from service. A qualified lift repair technician can perform repairs at the lift factory or on-site. If necessary, replacement structural components are available from Skycoaster for installation in place of the component that has been deemed non serviceable.

If you have any questions, please call Skycoaster, Inc. at (888) 801-0303.



The welds at the base of the scissors lift cylinder cups must be included in the required NDT inspection.

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Bulletin No.: 31

Release Date: May 28, 2004

Effective Date: May 28, 2004

Pages: 3

SERVICE BULLETIN

REQUIRES COMPLIANCE IN THE NEXT SEVEN DAYS

Ride Manufacturer: Skycoaster, Inc. **Affected Production Dates: All**

Ride Name: Skycoaster® **Affected Serial Nos.: All Skycoaster® attractions utilizing the triangulated Flight Bracket Catwalk and Support, including Crane mounted attractions. [1]**

Abstract of Issue: This bulletin addresses the inspection and maintenance of the triangulated Flight Bracket Catwalk and Support found on various lattice and crane mounted Skycoaster® attractions. Existing maintenance and inspection procedures must be followed, along with an additional inspection underneath certain components within the next seven days and on a monthly basis thereafter.

Reason for Release: A crack formed in a location which was visible, but was not detected before a section of pipe located on the triangulated Flight Bracket Catwalk and Support failed. No injuries resulted from this incident, however failure of this component could adversely alter the flight path of the flyers unexpectedly. Such a failure could have a potential for serious injury. While the incident took place on a crane mounted attraction located in a sea side (potentially corrosive) environment, we are requiring that all rides using the triangulated Flight Bracket Catwalk and Support be inspected.

Action to Be Taken: Currently, the weekly inspection procedures specify that the flight tower structure (among other components) be visually inspected. (See item 28 of the Skycoaster® Inspection Log located at page 52 of your 2004 Owner's Manual.)

1 If you have any doubt whether this Service Bulletin applies to your attraction contact Skycoaster, Inc. before operating your ride.

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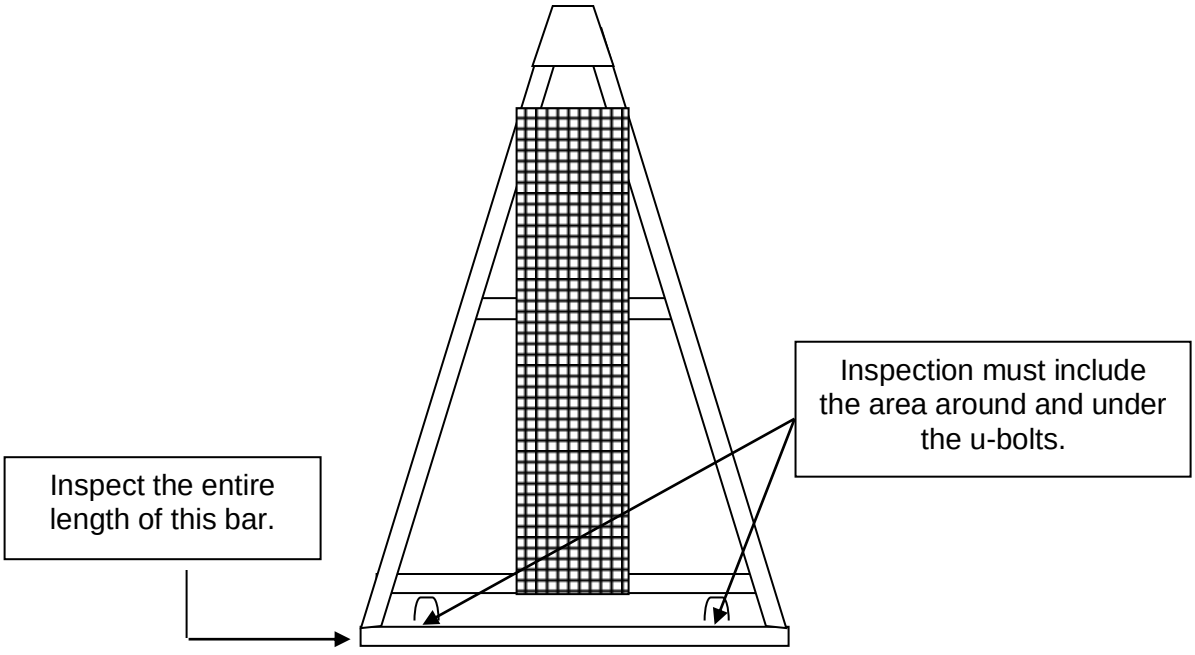
With the introduction of this Service Bulletin, we now require that all lattice and crane Skycoaster® sites utilizing the triangulated Flight Bracket Catwalk and Support perform an inspection of the Flight Bracket Catwalk and Support focusing on the support pipe which attaches the Catwalk to the flight tower. Inspect for cracks along the length of the pipe and/or cracks around the U-bolt mounting holes. The U-bolts will have to be loosened or completely removed to perform this inspection. Loosen each U-bolt individually, inspect and retighten before inspecting the next area. Follow all appropriate safety precautions while conducting the inspection.

If any deficiencies are found, immediately take the attraction out of service and contact Skycoaster, Inc. You are required to report the results of your first inspection of these components to Skycoaster, even where no deficiencies are found.

The inspection of these components must be included in each subsequent monthly and annual inspection.

This new inspection procedure is effective immediately and will remain in effect from this day forward.

Please refer to the drawing below for specific areas to be inspected.



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VERIFICATION OF INSPECTION

You are required to complete this form and fax it back to Skycoaster, Inc. at (410) 643-9304 within the next 7 days. You are not authorized to operate your attraction after June 4, 2004 if you do not comply with this Service Bulletin and return this form to Skycoaster by that date.

Ride Name _____

Site Location _____

___ Check here if your ride is not equipped with the triangulated Flight Bracket Catwalk and Support

___ Check here if your attraction is Crane mounted.

Date Inspected _____ Inspected By _____
(Print Name)

Findings of Inspection _____

_____

_____

_____

Signature _____

If you have any questions, please contact Skycoaster, Inc. at (888) 801-0303.

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Bulletin No.: 32

Release Date: October 5, 2004

Effective Date: October 5, 2004

SERVICE BULLETIN

Ride Manufacturer: Skycoaster, Inc.

Affected Production Dates: All Lattice A-Frame and Lattice Arch Skycoaster attractions

Ride Name: Skycoaster®

Affected Serial Nos.: All Lattice A-Frame and Lattice Arch Skycoaster® attractions

Abstract of Issue: Skycoaster, Inc. is outlining inspection procedures which must be followed during each weekly tower inspection of a Lattice A-Frame or Lattice Arch Skycoaster® attraction. This procedure will identify components which may need to be repaired or replaced.

Reason for Release: Skycoaster, Inc. wants to ensure that all Lattice Skycoaster® attractions towers are properly inspected. To do so, it is necessary for all sites to fully understand the correct component terminology and inspection procedures. This Service Bulletin reviews the terminology and lattice structure inspection procedures in detail in order to help facilitate proper inspections.

Action to Be Taken:

Component Terminology

- Primary Axis - The centerline along the component. For example, in a steel angle, the primary axis is the line along the length of the component at the "V" joint.
- Kink – A misalignment of a portion of a u-shaped Toe or angle Leg which is only a few inches long with proper alignment on adjacent portions.
- Bend – A permanent deformation from a straight line of the primary axis of a component.
- Lattice Arch Skycoaster® Leg – A somewhat flattened "U" shaped component found on the outside three corners of the flight and launch towers. In cross-section the Leg has three major components –

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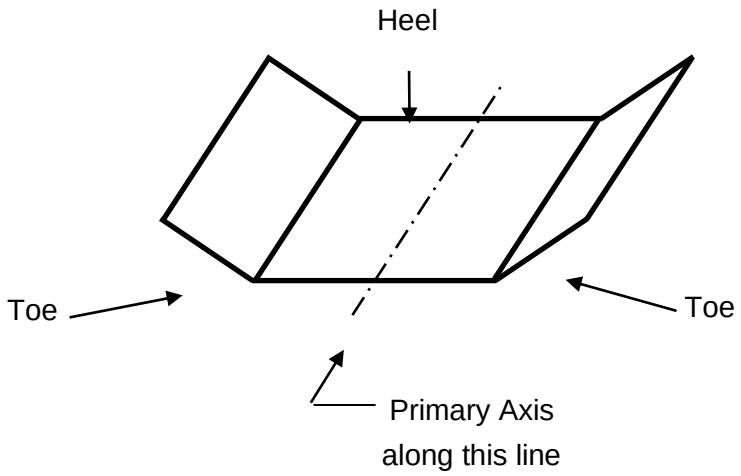
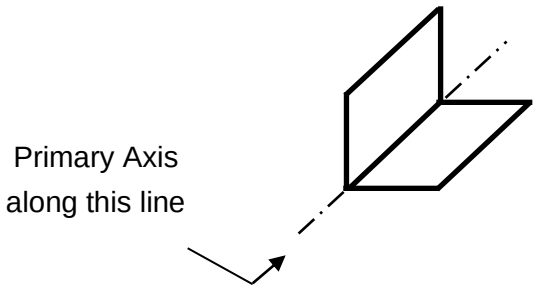
one Heel and two Toes. The Heel is the flat area in the middle of the component and the Toes are the two angled edges on the outside of the component (see diagram below).



- Lattice A-Frame Skycoaster® Leg – Steel angle vertical component found on the outside corners of each tower (see diagram below).
- Lacing – Diagonal piece of steel angle which spans between the Legs of the tower. Lacings are manufactured of a thinner (lighter) material than the Legs.
- Strut – Horizontal piece of steel angle which spans between and is essentially perpendicular to the Legs of the tower. Struts are also manufactured of a thinner material than the Legs.



This drawing depicts Legs on a Lattice A-Frame Skycoaster® as well as Lacings and Struts on all Lattice Skycoaster® attractions

NOTE: Lattice Skycoaster® designs vary slightly from location to location. Although your design may differ from the descriptions above, the inspection procedure remains the same.

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Inspection Procedure

Lattice A-Frame Skycoaster®

- Legs – Inspect the full length of each Leg and document any kinks or bends found. If any single Leg has; a) adjacent kinks in both faces, b) a twist in both faces or, c) if the primary axis is bent, notify Skycoaster, Inc. with details and digital photographs.
- Lacings and Struts – Inspect each Lacing and Strut for kinks or bends. If any single Lacing or Strut has; a) adjacent kinks in both faces, b) a twist in both faces or, c) if the primary axis is bent, notify Skycoaster, Inc. with details and digital photographs.

Lattice Arch Skycoaster®

- Legs – Inspect the full length of each Leg and document any kinks or bends found. If on any single Leg; a) kinks or bends are found in adjacent toes or an adjacent toe and heel or, b) if any primary axis is bent, notify Skycoaster, Inc. with details and digital photographs.
- Lacings and Struts – Inspect each Lacing and Strut for kinks or bends. If any single Lacing or Strut has; a) adjacent kinks in both faces, b) a twist in both faces or, c) if the primary axis is bent, notify Skycoaster, Inc. with details and digital photographs.

If you have any questions about the inspection procedures, please do not hesitate to contact Skycoaster, Inc. The toll-free telephone number is (888) 801-0303.

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Bulletin No.: 33

Release Date: March 31, 2006

Effective Date: March 31, 2006

SERVICE BULLETIN

Ride Manufacturer: Skycoaster

Affected Production Dates: All

Ride Name: Skycoaster®

Affected Serial Nos.: All

Abstract of Issue: New and repaired/serviced flight suits may not have proper Zinc Plated Nylon Insert Locknuts fastening footbar eyebolts to the nylon footbar.

Reason for Release: The Skycoaster vendor that manufactures new flight suits and performs the required annual inspection on existing flight suits may have used standard hex nuts in place of the required zinc plated nylon insert locknut on new and/or repaired flight suits. A standard hex nut may become loose and/or fall off the eyebolt which could lead to the nylon foot bar becoming unattached from the flight suit. If this were to happen during flight, the footbar may strike someone on the ground possibly causing injury.

Action to Be Taken: An immediate inspection of all flight suit foot bars must be completed to ensure that each footbar eyebolt is attached to the nylon footbar with zinc plated nylon insert locknuts, commonly referred to as "nylocks". The nylock nut can easily be identified as it is slightly raised near the center of the nut and has an off-white nylon liner on the inside diameter of the nut.

If any eyebolts are found to be attached with standard hex nuts, the flight suit must immediately be taken out of service and repaired by removing the standard hex nuts and replacing them with zinc plated nylon insert locknuts. Zinc plated nylon insert locknuts are available from Skycoaster or may be purchased at any hardware/home improvement store. The correct size of zinc plated nylon insert locknut required is 1/4-20.

The inspection of each flight suit must be completed no later than Friday, April 7, 2006. After each flight suit has been inspected/repaired, please complete the form found on page three of this Service Bulletin and fax it to Skycoaster no later than Friday, April 7, 2006.

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If you have any questions about the inspection/repair procedure, please do not hesitate to contact Skycoaster. The toll-free telephone number is (888) 801-0303.

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Service Bulletin 33
March 31, 2006

Site Name: _____ Date: _____

_____ Number of flight suits inspected

_____ Number of standard hex nuts found on footbar eyebolts

By signing below, I am confirming that all flight suits at the site named above have been inspected as outlined in Service Bulletin 33 and all standard hex nuts found were replaced with zinc plated nylon insert locking nuts.

_____ _____

Print Name Signature

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Bulletin No.: 34

Release Date: April 19, 2006

Effective Date: April 19, 2006

SERVICE BULLETIN

Ride Manufacturer: Skycoaster

Ride Name: Skycoaster®

Affected Production Dates: All

Affected Serial Nos.: Skycoaster Flight Suits serial numbers 7000 and higher and those flight suits with the serial numbers listed on page 2 of this Service Bulletin

Abstract of Issue: Unusual fraying of the suspension straps on a small number of new flight suits has been observed in the field.

Reason for Release: The fraying has occurred on the suspension straps that are found near the top and bottom of the flight suit and continue on to the suspension rings. If the fraying were to continue unchecked, it is possible for the suspension strap to break and become disconnected from the flight suit.

Action to Be Taken: All Skycoaster flight suits with serial numbers 7000 and higher must immediately be taken out of service and returned to High Energy Sports, Inc. Furthermore, any flight suit that had suspension straps replaced during the annual inspection/repair will have to be returned to High Energy Sports, Inc. The flight suits affected are listed by serial number on the next page. High Energy Sports, Inc.'s address is as follows:

High Energy Sports, Inc.
1081 Shepard Street
Unit A
Anaheim, CA 92806

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(714) 632-3323

Flight suits with the following serial numbers had suspension strap service completed during the annual inspection/repair and must be taken out of service immediately and returned to High Energy Sports, Inc.

4265	4249	4518	4557	4582	4583
4585	4605	4670	5018	5046	5087
5088	5091	5101	5129	5159	5192
5197	5201	5223	5232	5237	5239
5250	5287	5289	5290	5302	5318
5327	5332	5334	5336	5343	5368
5377	5380	5385	5387	5397	5404
5480	5485	5489	5499	5546	5553
5557	5565	5932	5973		

Ship all flight suits using Skycoaster's DHL account. Log onto www.dhl-usa.com to print shipping labels and arrange for a pickup. International sites will have to contact their local DHL shipping office for shipping details. Skycoaster's DHL account number is 787969338.

Every effort will be made to return all flight suits as soon as possible. If you have any questions about this Service Bulletin, please do not hesitate to contact Skycoaster. The toll-free telephone number is (888) 801-0303.

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F3 Amusements, LLC
6780 South 1300 East
Cottonwood Heights, UT 84121

Phone: (888) 801-0303
Fax: (410) 643-9304
Email: Info@skycoaster.com

Notification No.: N-001
Release Date: January 15, 2009
Effective Date: January 15, 2009
Supersedes: N/A
Completion Date: N/A

NOTIFICATION

Ride Manufacturer: Skycoaster, Inc

Affected Production Dates: All

Ride Name: Skycoaster®

Affected Serial Nos.: All

Abstract of Issue: Clarification of language and action to be taken in prior Safety Bulletins to be incorporated into the Owner's Manual.

Reason for Release: To clarify issues previously disclosed and outlined in prior Safety Bulletins to describe procedures to be outlined and made a part of the Owner's Manual.

Action to Be Taken: Attached pages must be added to the Owner's Manual for further reference.

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Cottonwood Heights, UT 84121
www.skycoaster.com

COMMUNICATION:
Telephone: (888) 801-0303
Facsimile: (410) 643-9304
info@skycoaster.com

Safety Bulletin 1 Issued September 1993
Revised January 1997

Launch cables can now be sized 7/32", 1/4" or 5/16". Damaged launch cables may be repaired if applicable. Cable guides must be inspected on a weekly basis.

Safety Bulletin 3 Issued October 1993
Revised January 1997

All new Site Controllers must be certified by a Skycoaster representative, however all Site Controller candidates may be trained on-site by park personnel as outlined in the Operations Section of the Owner's Manual.

Safety Bulletin 4 Issued March 1994
Revised January 1997
Revised January 1999

All launch cables must be inspected per the procedures as outlined in the Maintenance Section of the Owner's Manual.

Safety Bulletin 8 Issued May 1994
Revised January 1997

Skycoaster only requires proof of destruction for Skycoaster Flight Suits. It is no longer necessary to inform Skycoaster of any other component removed from service nor is it necessary to return any component to Skycoaster for disposal.

Safety Bulletin 10 Issued May 1995
Revised January 1997

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The age requirement for all Site Controllers will be outlined in the Introduction and Operations Sections of the Owner's Manual.

Safety Bulletin 13 Issued April 1996
Revised January 1997

All flight suits currently certified for use are equipped with at least one side clip. Therefore a locking carabiner is not required to inner-connect the flight suits.

Safety Bulletin 17 Issued January 1997

All flight suits currently certified for use are equipped with at least one side clip. Therefore a locking carabiner is not required to inner-connect the flight suits.

Safety Bulletin 18 Issued July 1997
Revised January 1998

The wings of the scissors lift are structural in nature, however; they are designed only to contain the crew and passengers on the boarding platform and are not meant to be used for support other than to assist the flyers in standing up at the end of their flight.

Safety Bulletin 20 Issued July 1997
Revised January 1998

The connection of the flyers to the flight carabiners shall be performed in accordance to the procedures as outlined in the Operations Section of the Owner's Manual.

Safety Bulletin 21 Issued October 1997
Revised January 1998

The Assistant Controller is responsible for confirming that the Omega carabiner is locked.

Safety Bulletin 24 Issued July 1998
Revised January 1999

Only the Controller is required to inspect the hydraulic landing unit if a mis-spool has or may have occurred.

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Safety Bulletin 26 Issued August 1999

The procedure for correcting a skipped groove is outlined in the Emergency Procedures Sub-Section of the Operations Section of the Owner's Manual.

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Phone: (888) 801-0303
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Email: Info@skycoaster.com

Notification No.: N-002
Release Date: April 19, 2009
Effective Date: April 19, 2009
Supersedes: N/A
Completion Date: N/A

NOTIFICATION

Ride Manufacturer: Skycoaster, Inc

Affected Production Dates: All

Ride Name: Skycoaster®

Affected Serial Nos.: All

Abstract of Issue: Adjustment of Skycoaster® flight suit footbar straps.

Reason for Release: On Saturday, April 18, 2009, two Skycoaster® sites experienced a failure of the footbar strap webbing on their recently serviced Skycoaster® flight suits. In both instances, the integrity of the main webbing of the flight suit was not compromised and the guest safety was not at risk.

Action to Be Taken: Although it is very early in our investigation into this matter, we want to make it clear to all sites that the purpose of the footbar is to provide comfort to the guest and to help keep the guest's shoulders firmly against the shoulder straps. The footbar straps are to be adjusted so that the footbar is snug against the flyers feet when the flyer's legs are completely extended (straight). Adjusting the footbar straps too tightly will not only make it difficult for the flyers to straighten their legs, but may cause unnecessary wear and tear to the footbar straps. It is the responsibility of the flight crew to ensure that the footbar straps are properly fitted during the BBL inspection.

Furthermore, pursuant to the Skycoaster® Owner's Manual, all flight suits must have a thorough inspection prior to each day's operation. If any single component of the flight suit is deemed questionable, the flight suit should be taken out of service until effective repairs can be completed.

If you have any questions, do not hesitate to contact Skycoaster at (410) 643-3313.

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Safety Alert No.: SA-001
Release Date: May 15, 2009
Effective Date: May 15, 2009
Supersedes: N/A
Completion Date: N/A
Page: 1 of 1

SAFETY ALERT

Ride Manufacturer: Skycoaster, Inc

Ride Name: Skycoaster®

Affected Production Dates: All

Affected Serial Nos.: All Skycoaster Flight Suits with serial numbers 0000 – 8146

Abstract of Issue: Closure of all Skycoaster® attractions until replacement footbar straps can be installed on all effected Skycoaster® flight suits.

Reason for Release: It has been reported to Skycoaster that there have been failures of the footbar strap webbing on recently serviced Skycoaster® flight suits. The footbar straps are manufactured of Polypropylene webbing and the tearing failures were confined to the same location on the Polypropylene webbing. All sites will be receiving new footbar straps which will be made with nylon. Nylon webbing is used for all other straps on the Skycoaster® flight suits.

Action to Be Taken: Closing the Skycoaster® attraction until the nylon replacement footbar straps are received and installed. The Skycoaster attraction should be closed effective immediately.

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Safety Bulletin No.: SB-035
Release Date: May 15, 2009
Effective Date: May 15, 2009
Supersedes: Safety Alert SA-001
Completion Date: Upon Receipt

SAFETY BULLETIN

Ride Manufacturer: Skycoaster, Inc

Affected Production Dates: All

Ride Name: Skycoaster®

Affected Serial Nos.: All Skycoaster® Flight Suits with serial numbers 0000 – 8146

Abstract of Issue: Interim solution to allow use of Skycoaster® flight suits prior to installation of nylon replacement footbar straps.

Reason for Release: Earlier today, Skycoaster issued a Safety Alert calling for the closure of all Skycoaster® sites until replacement footbar straps are received and installed. The footbar is for the comfort of the rider, and not a part of the rider's safety. The rider is fully retained in the flight suit without consideration of the footbar.

The Safety Alert was issued due to the chance of a footbar separating from the flight suit and possibly striking someone in the surrounding area. This Safety Bulletin addresses this concern, allowing continued operation.

Action to Be Taken: In order to use existing flight suits prior to the installation of the nylon replacement footbar straps, a secondary safety rope must be installed on each flight suit between the footbar and the flight suit. Cut a length of 7mm perlon rope to 72" and tape the ends so that the rope does not unravel. Alternatively, nylon rope of at least .25" may be used. Thread one end through the webbing loop that the ancra buckles attach to and the other end through the eyebolt on the nylon foot bar. Pull the two ends together and tie a simple double overhand knot (see photos on following page for details). Once installed, the ropes do not need

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to be adjusted for each flyer. Note that once the nylon replacement footbar straps are installed, the secondary ropes described herein are to be removed.

Do not overtighten the footbar straps when adjusting for each flyer. The footbar straps are to be adjusted so that the footbar is snug against the flyers feet when the flyer's legs are completely extended (straight).

If you have any questions, please call Skycoaster at (410) 643-3313.

Photo showing secondary loop attachment at flight suit ancra buckle loop.

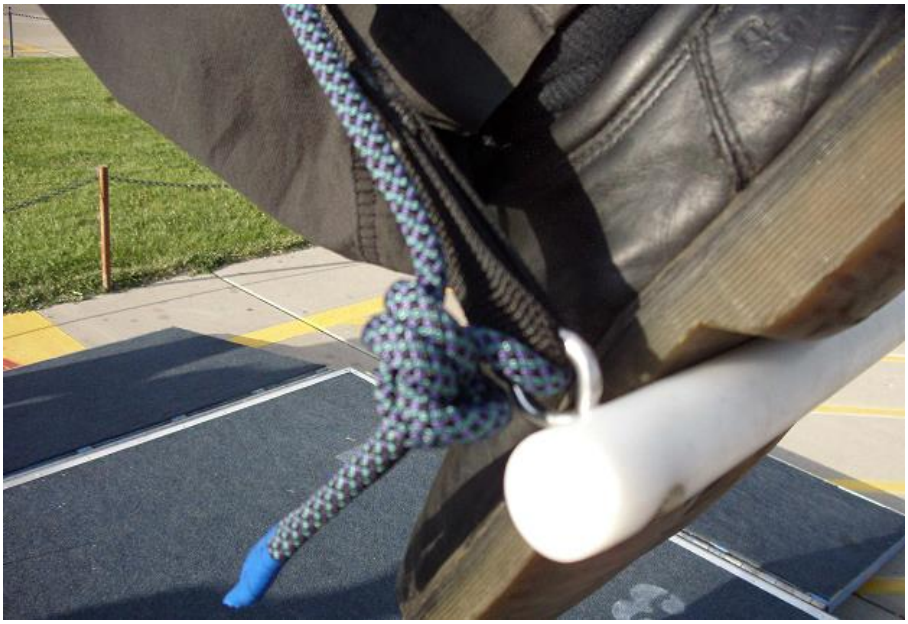

Photo showing secondary loop attachment at nylon footbar eyebolt.

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Notification No.: N-003
Release Date: March 24, 2011
Effective Date: March 24, 2011
Supersedes: N/A
Completion Date: N/A

NOTIFICATION

Ride Manufacturer: Skycoaster, Inc

Affected Production Dates: All

Ride Name: Skycoaster®

Affected Serial Nos.: All

Abstract of Issue: Clarification of proper maintenance procedures on hydraulic winch unit and launch cable.

Reason for Release: To clarify maintenance procedures not previously outlined in Skycoaster® Owner's Manual.

Action to Be Taken: Attached pages must be added to the Skycoaster® Owner's Manual for further reference.

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During a recent pre-operations inspection, a Skycoaster® site experienced a condition in which a proximity switch did not stop the winch drum at the flight position and the cable bumper washers and cable bumper were pushed off the end of the launch cable. Upon investigation of the incident, it was determined that the zinc plated copper sleeves were improperly swaged onto the launch cable.

Section 2.2 Appendix F III of the Skycoaster® Owner's Manual outlines the correct procedure for setting the proximity limit switches on the hydraulic winch cable drum. The switch shim tool provided with your winch drum should be used as an initial guide to set the proper distance between the top of the limit switch and the cable. However, bear in mind that minor adjustment up or down may be necessary to ensure proper operation of the limit switch. Furthermore, ensure that the proximity limit switch mounting bracket is acclimated so that the limit switch is perpendicular to the surface of the winch drum.

Every Skycoaster® hydraulic winch drum power unit has been fitted with a Hydraforce aluminum body pressure relief valve as shown as item number 9 in the Skycoaster® Owner's Manual Section 2.2 Appendix I XII. This is a safety backup to prevent excessive pressure within the hydraulic system. Skycoaster is now recommending a monthly test to ensure that this pressure relief valve is functioning properly. To perform this test, simply disconnect the two hydraulic lines at the winch hydraulic motor, lift up the control handle on the manual valve and observe the pressure gauge on the power unit. During this test, the pressure gauge will read approximately 2000 psi. However, depending upon the condition of your equipment, it may be necessary to increase the pressure setting up a maximum of 2750 psi if your winch is unable to lift heavy flights to the top of the launch tower. To adjust the pressure relief valve, place an Allen head wrench into the set screw at the top of the valve and using an open end wrench, loosen the lock nut at the base of the set screw. Turn the set screw clockwise to increase pressure or counterclockwise to decrease pressure. After the adjustment has been made, retighten the lock nut while holding the Allen head wrench so that the desired setting is maintained. Reattach the hydraulic hoses at the winch hydraulic motor after the test has been completed or any adjustments have been made.

The Skycoaster® Owner's Manual states in Section 2.2 Appendix F I(7); "Using the proper tools and techniques, swedge the launch bridle end of the launch cable using the appropriate heavy-duty thimbles and zinc plated copper sleeves, copper stopper, two 3 or 4 inch (76.2 or 101.6 millimeter) steel discs and the rubber bumper." To clarify this statement, note that the proper swaging of a zinc plated copper sleeve/copper stopper involves the following:

- Using the correct swaging tool.
- Selecting the proper sleeve size for the corresponding cable size.
- Swaging the sleeve in the proper cavity of the swaging tool with the required number of sleeve compressions.

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- Gauging the compressed sleeve to measure the after swage diameter of the compressed sleeve.

Once you have determined that you have the proper tools and components, the following procedures must be followed to ensure a proper swage. Please note that the photos illustrate proper swaging technique only. Please refer to Skycoaster® Owner's Manual to determine number of zinc plated copper sleeves/copper stoppers to be used in your application.

1. Place the sleeve to be compressed in the proper size cavity in the swaging tool. Insert the cable through the sleeve with a length of cable equal to or greater than the cable diameter to extend beyond the length of the sleeve to achieve maximum holding power.

2. Keep the jaws of the swaging tool at right angles to the sleeve to be compressed, making sure the sleeve is aligned in the jaw grooves. Close the tool completely.

3. The zinc plated copper sleeve must be compressed four (4) times to be finished properly.

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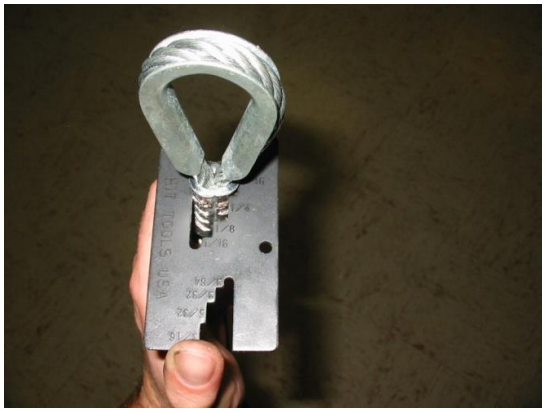
4. Use a swaging gauge to check proper after swage diameter. The compressed sleeve should slide freely into size slot of gauge.



The proper swaging of a copper stopper follows the same procedures outlined above with the exception of item #3. In this case, use the 1/4" swaging tool cavity for both the 1/4" and 5/16" copper stoppers and after the first swage, turn the stopper 90° and compress again in the same groove. When checking a compressed copper stopper in the swaging gauge, both the 1/4" and 5/16" copper stoppers should slide freely into the 1/4" slot.

The tables shown below outline the correct tool, sleeve and cavity to be used for each cable size. Please refer to this table when performing maintenance on your attraction.

Table for Zinc Plated Copper Sleeves			
Cable Diameter	**Tool Size**	**Sleeve Size**	**Cavity Size**
5/16"	1/4" – 5/16" Crimper	5/16"	5/16"
1/4"	1/4" – 5/16" Crimper	1/4"	1/4"
7/32"	7/32" Crimper	7/32"	7/32"

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Table for Copper Stoppers			
Cable Diameter	**Tool Size**	**Stopper Size**	**Cavity Size**
5/16”	1/4" – 5/16” Crimper	5/16”	1/4"
1/4”	1/4" – 5/16” Crimper	1/4"	1/4"
7/32”	1/4" – 5/16” Crimper	1/4"	1/4"

Skycoaster is making a video of proper swaging techniques available to all sites. Please contact Skycoaster if you are interested in obtaining a copy of this video. If you have any questions about this notification, please do not hesitate to contact Skycoaster. The telephone number is (410) 643-3313.

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