
Airborne
Systems®
WHERE TECHNOLOGY »TAKES FLIGHT

Leslie Irvin in his descent of the first-ever freefall parachute jump in April of 1919.

About Airborne Systems

Our history began 100 years ago in 1919 when Leslie Irvin, the founder of the Irvin Air Chute Company, made the **first-ever freefall** parachute jump using the first manually operated rip cord. As the world's premier parachute designer and manufacturer, we continue to honor Irvin's legacy through our ongoing achievements.

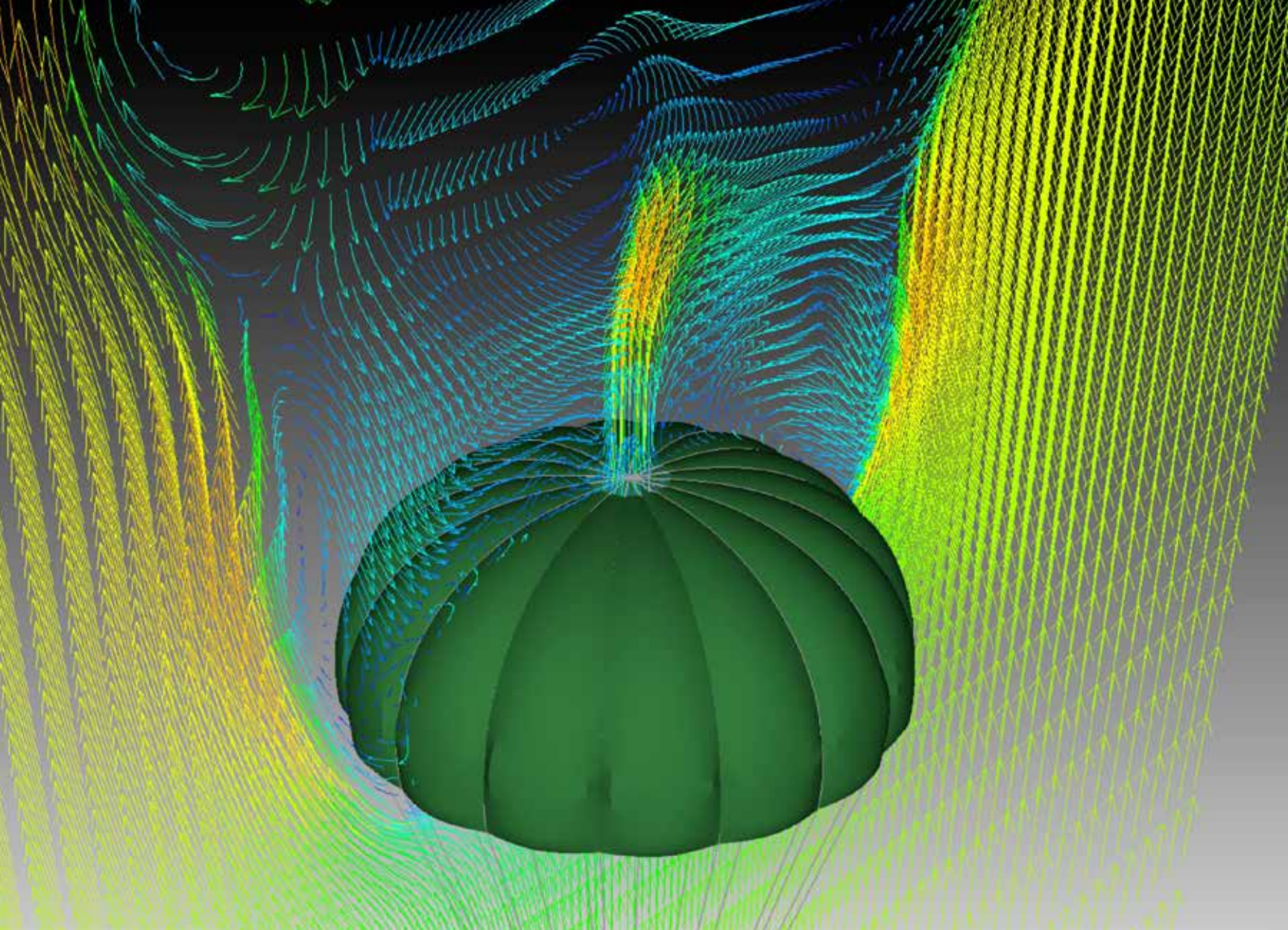
1919 100 2019 Years of INNOVATION

Research and Development

Our in-house Research and Development group continues our 100+ year tradition by designing and testing innovative, purpose-built, military parachute systems. Our full range of products are continuously in use across the globe, providing a robust base of experience that continually shapes the development of future products.

Space and Recovery

The Space and Recovery business unit is dedicated to providing our customers with unparalleled technical expertise and experience. Our Space Systems focused engineering group is the world's leader with respect to Entry, Descent and Landing Systems (EDL) for crewed space flight applications, booster recovery systems, and planetary exploration missions. Airborne Systems has extensive experience in the design and development of EDL systems for various space applications and has the distinction of providing the recovery system for Discoverer XIII, the first man-made item ever recovered from orbit in 1960, up through the latest NASA and commercial crew space capsules. Our Air Systems focused group provides unique aircraft, drone, helicopter, cargo, and weapon system deceleration and recovery parachute and airbag solutions.



Engineering and Design

World-Class Design and Engineering Services

From the T-11 Troop Parachute to the Mars Guided Landing System, Airborne Systems approaches product design from a military perspective. We understand the exacting requirements of airborne military operations and engineer products to consistently meet those quality and performance demands.

Continuous Monitoring of Product Performance

Airborne Systems follows fielded products to ensure they provide maximum capability to the user. This is done through continuous education, training, and support in the field.

A Culture of Progress Through Design Enhancements

We listen to customer feedback and follow through for suggested improvements. This is why many of our products have variable configurations to meet very specific requirements in the field. This culture of listening allows our engineers to think ahead and mold the next generation of products to fit mission requirements.

Military-grade products must utilize the latest technology, be user-friendly, and have the durability to last—in short, be extremely reliable. Airborne Systems provides that level of reliability in every product.

Engineering and Design Services Include:

- Fabric design
- Computer modeling & systems analysis
- System engineering
- Mechanical design
- Control systems
- Product testing
- Program management

PERSONNEL PARACHUTES

OXYGEN SYSTEMS

NAVIGATION

TROOP PARACHUTES

TOWED JUMPER

SPACE AND RECOVERY

GPADS / JPADS

TRAINING PROGRAMS

Intruder® (RA-1)

The Intruder®, Type Classified by the U.S. Army as RA-1, was developed to replace the MC-4 Ram Air Parachute System. It features improvements to glide performance, canopy handling characteristics, and weight carrying capacity. The canopy design provides a stall resistant ability that significantly reduces the potential for jumper injury on landing.

Main and Reserve Canopy

The main canopy for Intruder® is a nine-cell, hybrid construction capable of three deployment methods:

- Double Bag Static Line (DBSL)
- Over-the-Shoulder Ripcord
- Bottom-of-Container, Throw-Out Pilot Chute (BOC)

The Intruder® incorporates a collapsible slider, resulting in a completely silent canopy during flight. Incorporation of vents in Intruder's® reserve canopy allow it to meet demanding requirements for height loss, during opening and throughout the entire performance range.

Harness Container

The harness container for Intruder® incorporates a unique proprietary bio-contour harness structure that evenly distributes the weight of the system across the jumper's shoulders. The proprietary bio-contour harness greatly improves the comfort and fit of the harness container, which is capable of accommodating all mission essential equipment such as weapon tie-down points, radio pouches, and the use of oxygen systems.

Glide Ratio	4:1
Min Deployment Altitude	1067 m (3,500 ft) AGL
Max Deployment Altitude	7620 m (25,000 ft) AMSL
Canopy Area	33.4 m^2 (360 ft^2)
Number of Cells	9
Max All Up Weight	204 kg (450 lb)
Min All Up Weight	76 kg (167 lb)

RA-270

RA-270 is the latest addition to the RA Intruder® Family of Systems. Designed with smaller weight ranges in mind to suit a wider range of passengers, the RA-270 allows ease of use while bringing exceptional functionalities.

Canopy

RA-270 features the same planform used in the RA-1 and RA-360 systems. With its smaller size, this parachute is perfect for military training. It is a great tool for students to learn how to fly and jump with small equipment, while maintaining the same flight characteristics as the RA-360. It can be used as a training system for students. It can also be used as an operational military system for jumpers with lower all-up weight (AUW) requirements.

Harness Container

The harness container incorporates Airborne Systems Bio Harness, which evenly distributes the weight of the system across the jumper's shoulders — greatly improving the comfort and fit of the system.

Standard features include equipment rings and weapon tie down points. Available options include radio pockets, oxygen pouches, and an ergonomic HAHO seat.

An Accelerated Freefall (AFF) version is also available, including extra handles on both leg straps to be held by the AFF instructor, and a left (reserve) side bottom of container (BOC) release.

Glide Ratio	4:1
Min Deployment Altitude	915 m (3,000 ft) AGL
Max Deployment Altitude	7620 m (25,000 ft) AGL
Canopy Area	25.1 m^2 (270 ft^2)
Number of Cells	9
Max All Up Weight	132 kg (290 lb)

Intruder® Instructor Parachute

The Intruder® Instructor Parachute System is designed for Jumpmasters and Military Freefall Instructors. It is the smallest Intruder® parachute, allowing for greater mobility in the aircraft and during free fall. This smaller parachute offers performance similar to the RA-300 and RA-360, while providing the jumper (instructor) with a more responsive canopy.

Intruder® 230 Main

The main canopy offers high-glide performance for maximized offset and handling agility, along with high-level stability and forgiveness across the entire flight to minimize injury on landing. Similar to other Intruder® canopies, the pressurized stabilizers are a major contributor to performance capability.

The stabilizers begin working during deployment, helping spread the bottom surface in a smooth and consistent manner. They reduce wingtip vortices during flight and increase glide performance. The pressurized stabilizers also improve the canopy's performance in deep brakes when preparing to land by forcing the canopy to track directly forward with no lateral slip or slide. In short, the pressurized stabilizers add to the performance capabilities of the Intruder® throughout the entire flight profile.

Intruder® 210R Reserve

The reserve canopy is a variation of the Intruder® parachute family. It keeps the main attributes, such as stability and safe flight, but its opening characteristics have been modified for compatibility with the stringent criteria of the TSO C23f.

INTRUDER® 230 MAIN

Glide Ratio	3.5:1
Max All Up Weight	106 kg (234 lb)
Forward Speed @ 200 lb (91 kg)	12.2 mps (40 fps)
Rate of Descent @ 200 lb	3.7 mps (12 fps)

INTRUDER® 210R RESERVE

Max All Up Weight	106 kg (234 lb)
Max Operating Speed	150 KTAS
TSO C23f	pending

RA Intruder® Family Specifications

	RA-1 / RA-360*	RA-270	RA-300
Glide Ratio	4:1	4:1	4:1
Min Deployment Altitude (Freefall)	1067 m (3,500 ft) AGL	1067 m (3,500 ft) AGL	1067 m (3,500 ft) AGL
Min Deployment Altitude (DBSL Mode)	1067 m (3,500 ft) AGL	915 m AGL - 3000 ft AGL	1067 m (3,500 ft) AGL
Max Deployment Altitude	7620 m (25,000 ft) AMSL	7620 m (25,000 ft) AMSL	7620 m (25,000 ft) AMSL
Canopy Area	33.4 m^2 (360 ft^2)	25.1 M^2 (270 ft^2)	27.9 m^2 (300 ft^2)
Min All Up Weight	76 kg (167 lb)	75 kg (155 lbs)	64 kg (141 lb)
Max All Up Weight	204 kg (450 lb)	132 kg (290 lb)	163 kg (360 lb)
Main Parachute Deployment Methods	Spring Loaded Pilot Chute Double Bag Static Line Bottom of Container Throw Out Chute	Spring Loaded Pilot Chute (shoulder or hip ripcord) Double Bag Static Line Bottom of Container Throw Out Chute (both (sides of the container on the AFF version) Direct Bag Static Line (<90 KIAS)	Spring Loaded Pilot Chute Double Bag Static Line Bottom of Container Throw Out Chute

**Also available in MMS*

Even in full brake, the Hi-5 canopy doesn't stall. The toggle pressure is light even while carrying heavy weight.

Hi-5

Hi-5 is the most advanced and innovative canopy since the invention of ram air parachutes. It has the reliability and safety of the RA-1 but surpasses its performance in handling, glide ratio, and rapid descent.

Glide Modulation

Hi-5 has a built-in Glide Modulation System which allows a jumper to adjust the glide ratio anywhere between 5:1 and 1:1. Glide modulation is controlled by an additional set of toggles placed on the front risers. The jumper can adjust the glide ratio while steering the canopy. This is extremely useful for adjusting the position in a stack, or for landing safely in a tight drop zone.

Hi-5 is available in a variety of sizes:

- Hi-5 270
- Hi-5 300
- Hi-5 320
- Hi-5 370
- Hi-5 420

Hi-5 is designed to be a main-on-main system. This gives the jumper the advantage of the same performance under their reserve parachute in the event of a cutaway, and also enables the jumper to maintain position in the stack and make the intended target.

Hi-5's canopy can be used with Airborne Systems' Multi-Mission System (MMS), RA-1, and the new Edge harness containers.

Glide Ratio	5:1
Min Deployment Altitude	1067 m (3,500 ft) AGL
Min Deployment Altitude (Freefall)	1524 m (5,000 ft) AGL
Max Deployment Altitude	7620 m (25,000 ft) AMSL
Canopy Area	34.4 m^2 (370 ft^2)
Number of Cells	11
Min All Up Weight	95 kg (210 lb)
Max All Up Weight	220 kg (485 lb)

Multi-Mission System (MMS)

Airborne Systems' Multi-Mission System (MMS) harness container is capable of multiple deployment methods while retaining all of the features of the h/c used on the RA-1. Conversion from pilot chute to drogue configurations is quick and does not require any tools.

The MMS harness container can be configured in any of six modes:

- Release-Away Static Line (RASL) drogue
- Jumpmaster set drogue
- Hand-deployed drogue
- Over-the-shoulder rip cord
- Bottom-of-Container, Throw-Out Chute (BOC pilot chute)
- Double-Bag Static Line (DBSL)

MMS incorporates our proprietary bio-contour harness for optimum comfort. The bio-contour harness evenly distributes the weight of the system across the back instead of concentrating it narrowly on the shoulders.

MMS can be ordered with six or eight equipment attachment points and inboard or outboard emergency handles. There is an optional High Altitude High Opening (HAHO) seat for improved comfort.

Detachable radio and oxygen pouches are available. They can easily be added or removed to make the system less bulky when not in use.

The PS-2 was chosen by the United States Marine Corps as the replacement for their legacy system.

PS-2

Chosen and type-classified by the United States Marine Corps to replace their legacy multi-mission system, PS-2 is the latest high performance system offered by Airborne Systems. The system features a harness container capable of both bottom-of-container pilot chute and droguefall deployment methods. The drogue system utilizes a new center-of-pack-mounted drogue release with several key features:

- Horizontal jumper position while in droguefall
- Safety system causes drogue to release if the main container opens
- Two-stage drogue collapse eliminates the "trap-door" effect when the drogue is released
- Innovative proprietary drogue design is stable and consistent during droguefall

The harness container incorporates eight attachment points. High attachment points with outboard handles provide the user with maximum ability to customize equipment attachments. Additional attachments include oxygen and radio pouches which can be set up on either side of the jumper.

Air vent padding ensures the harness fits comfortably while maintaining maximum airflow to cool the jumper. Primary and secondary drogue release handles are located in standard positions to ensure easy transition for jumpers.

The PS-2 is offered with either a small (28 m^2/300 ft^2) or large (34 m^2/370 ft^2) Hi-5 canopy. Each size uses the Hi-5 canopy for both the main and reserve and features a Glide Modulation System boasting a 5:1 glide ratio with the ability to easily transition to a 1:1 glide ratio with a simple control input. A K-9 harness is also available for any configuration.

The Hi-5 canopy with the PS-2 container offers:

- 75 kg (165 lb) to 193 kg (425 lb) All Up Weight (AUW)
- Glide ratio of 5:1
- Ability to adjust glide ratio anywhere between 5:1 and 1:1 to increase jumper accuracy and maintain tight canopy formation across a wide weight range
- Silent canopy
- Ease of use
- Ease of maintenance

	PS-2 SMALL	PS-2 LARGE
Min All Up Weight	75 kg (165 lb)	104 kg (230 lb)
Max All Up Weight	122 kg (270 lb)	193 kg (425 lb)
Surface Area	28 m^2 (300 ft^2)	34 m^2 (370 ft^2)
Min Deployment Altitude	1219 m AGL (4,000 ft AGL)	1524 m AGL (5,000 ft AGL)
Max Deployment Altitude	7620 m AMSL (24,999 ft AMSL)	7620 m AMSL (24,999 ft AMSL)
Max Glide Ratio, No Wind	4.7 to 5.0:1	4.7 to 5.0:1

The SOLR® 3000 and SOLR® 4500 psi bailout bottles provide a vast increase in available oxygen, increasing the safety of operations.

SOLR® 3000 and SOLR® 4500 Bailout Bottles

With the technological advances and development of the Intruder® and Hi-5 parachute systems, today's High Altitude High Opening (HAHO) and High Altitude Low Opening (HALO) parachute operations call for farther offsets and higher altitudes to reach a target area. Airborne Systems has developed a full line of oxygen products, known as SOLR®, (Special Operations Long Range), to meet the demands of the new higher gliding parachutes.

SOLR® 3000 and SOLR® 4500 Bailout Bottles Key Features

- Lightweight, increased oxygen volume without increased weight and size
- Available in 3,000 psi (51 or 122 cubic inches) and 4,500 psi (122 cubic inches) fill pressure
- SOLR® 3000 - Over 60% more oxygen with the same bottle measurements as the 120 cubic inch PHAOS
- SOLR® 4500 – 50% more than SOLR® 3000
- Brass pressure reducer, oxygen safe up to 4,500 psig (tested at 5,395 psi)
- Universal compatibility with PHAOS and POM systems
- Low profile oxygen gauge
- Smaller manifold and provides simplified maintenance requirements over other systems
- New on / off handwheel eliminates unintentional oxygen flow shutoff for increased safety and can be easily operated with winter gloves

	SOLR® 3000 (51 CUBIC INCH)	SOLR® 3000 (122 CUBIC INCH)	SOLR® 4500 (122 CUBIC INCH)
Cylinder Fill Pressure	3,000 psi (207 bar)	4,500 psi (310 bar)	4,500 psi (310 bar)
Weight (unfilled)	2 kg (4.4 lb)	2.5 kg (5.5 lb)	2.9 kg (6.3 lb)
Expanded Gas Volume	186.9 liters at 207 bar (6.6 cu. ft. at 3,000 psi)	414 liters at 207 bar (14.6 cu. ft. at 3,000 psi)	620 liters at 310 bar (21.9 cu. ft. at 4,500 psi)
Cylinder Water Volume	51 cu. in. (.9 liters)	122 cu. in. (2 liters)	122 cu. in. (2 liters)
Cylinder Type	DOT, TC, TPED, KHK Carbon fiber wrapped, aluminum lined composite	DOT Carbon fiber wrapped, aluminum lined composite	DOT Carbon fiber wrapped, aluminum lined composite

SOLR® Oxygen Mask

The SOLR® Oxygen Mask is the next generation Military Freefall High Altitude High Opening (HAHO) oxygen supply system designed and developed for use with SOLR® 3000 and SOLR® 4500 Bailout Bottles. It is built on a modular platform allowing field maintenance and reconfiguation to become effortless.

Available for use with 100% Oxygen or Dilution

Both masks were designed based on customer feedback and requirements in the field. The SOLR® 100% oxygen mask is designed without the need for a dilution module due to the increased capacity of the SOLR® 3000 and SOLR® 4500.

The design of the mask allows for an extended service schedule and limits maintenance issues. Many of the users today have extended deployment schedules, making the maintenance of masks more difficult. With the SOLR® 100%, these maintenance schedules have been extended to 30 months for level 2 maintenance and 60 months for level 3 maintenance. All level 1 inspections can be completed in the field without the need for specialized tools or a test stand.

The SOLR® Dilution Mask changes oxygen levels based on the jumper's altitude. The dilution system allows the user to extend the overall oxygen time by 30%, giving the jumpers more time off the Oxygen Console (OXCON) than the SOLR® 100%. Both the SOLR® 100% and SOLR® Dilution Masks have been proven by customers throughout the world and have become the new standard for jump operations requiring the use of oxygen.

Key Features

- Lightweight
- On-demand regulator, no dilution (100% oxygen)
- Modular (dilution module optional)
- Compatible with SOLR / PHAOS / PHANTOM Bailout Bottles
- 5 sizes

Medium	Oxygen
Inlet Pressure	40 to 80 psi (2.8 to 5.5 bar)

OPERATING ENVIRONMENT

Temperature	-54°C to 71°C (-65°F to 160°F)
Humidity	0 to 100%, non-condensing
Altitude (ceiling)	10668 m (35,000 ft)
Helmet Attachment	OPS CORE / GENTEX / MSA / PRO TEC / TEAM WENDY

8-Man OXCON 3000 Pre-Breather

The Airborne Systems 8-Man OXCON 3000 Pre-Breather is a self-contained, multi-station, portable unit that stores and distributes regulated breathing oxygen for one to eight persons. It is compatible with the SOLR® and PHAOS systems, providing over 70% more oxygen volume over the legacy 6-Man OXCON. The increased volume gives users more flexibility in combat operations, preventing missions being threatened by lack of oxygen.

Assembly

- 8-Man consoles, can be increased up to 12-Man with expansion kit.
- 3000 psi at 2,700 cubic inch compressed volume.
- Self-contained ruggedized system that resists damage and improves safety over consoles with exposed cylinders.
- Standard configuration comes in a multitude of hose length configurations.
- Jumpmaster hose for easy aircraft configurations.
- Redesigned handles allow for ease of use.
- Wheels allow the console to be easily repositioned by a single person
- Consoles can be rigged flat, standing on end or stacked allowing for reduced aircraft configuration time and to maximize space for jumpers.

CONSOLE DIMENSIONS

Length	98 cm (38.5 in)
Width	43 cm (17 in)
Height	42 cm (16.5 in)

WEIGHT

Uncharged unit without hoses	51 kg (112 lb)
Fully Charged	64 kg (140.6 lb)

CYLINDERS

Quantity	3
Capacity	900 cu. in. (each) 2,700 cu. in. (total)
Pressure (nominal)	3,000 psi (207 bar) max
Expanded Gas Volume	9,203 liters (325 cu. ft.)

REGULATOR

Inlet Pressure	3,000 psi (207 bar) max
Outlet Pressure	65-75 psi (4.5 – 5.2 bar)

OPERATIONAL PARAMETERS

Maximum Altitude	10668 m (35,000 ft)
Minimum Temperature	-30°F (-34°C)

SOLR® 4500 Pre-Breather

The SOLR® 4500 Pre-Breather recently joined our SOLR® Family of Oxygen Systems. The SOLR® 4500 Pre-Breather was designed to replace our legacy Oxygen Console (OXCON) that has been the standard for Military Freefall operations for over 20 years. Airborne Systems has designed the SOLR® 4500 Pre-Breather to be user-friendly and portable with a small logistical footprint to meet the ever-changing needs of the modern warfighter.

Modular

One of the many advantages of the SOLR® 4500 Pre-Breather is its modular design—which allows it to be mounted quickly and easily on a multitude of military or civilian aircrafts.

Portable

The SOLR® 4500 Pre-Breather is so portable that it gives jumpers the ability to start pre-breathing outside the aircraft and then mount the SOLR® 4500 Pre-Breather on its attachment system when they step inside, all while continuing to pre-breathe.

Stealthy

Designed for clandestine operations, the SOLR® 4500 Pre-Breather and attachment system are small enough to be carried in a rucksack, leaving no evidence of parachutist activity once the jumpers exit the aircraft.

Key Features

- 4,500 psi maximum service pressure
- 285 cubic inches
- Always ON, for safe and simple operations
- Pre-Breathing time: 140 minutes @ 3048 m (10,000 ft) MSL

Medium	Oxygen
Cylinder fill pressure	4,500 psi (310 bar) DOT
Weight (unfilled)	3.75 kg (8.2 lb)
Expanded gas volume	1457 liters at 310 bar 51.5 cu. ft. at 4,500 psi
Cylinder water volume	285 cu. in. (4.7 liters)
Cylinder Type	DOT (4,500 psig) Carbon fiber wrapped, aluminum lined composite

OPERATING ENVIRONMENT

Temperature	-54° to 71°C (-65° to 160°F)
Humidity	0 to 100%, non-condensing
Maximum Altitude	10668 m (35,000 ft)


DECREASE
INCREASE
INHALATION
EXHALATION
Airborne Systems
INTERFACE 2
INTERFACE 1
MAGNEHELIC
psi
WIKA

SOLR® Portable Test Stand

The SOLR® Portable Test Stand allows personnel to verify the operational functionality of SOLR® 100% oxygen masks, 3000 and 4500 Bailout Bottles, and the SOLR® 4500 Pre-Breather. It takes just a few seconds to perform both the SOLR® bottle check and the SOLR® 100% Oxygen Mask check.

The SOLR® Portable Test Stand can be used in the field with no source of power and is able to perform all maintenance checks up to level 2 for your SOLR® equipment. It comes in a small, rugged Pelican case, weighing just 11 kg (25 lb) which makes it perfect for use in the field.

Key Features

- Self Contained (no electrical or battery power needed)
- Portable
- Light
- Rugged
- User-friendly
- Deployable
- Plug and Play

Weight	11 kg (25 lb)
Dimensions	53 cm x 43 cm x 23 cm (21 in x 17 in x 9 in)
Compatible with	All SOLR® equipment (excluding Dilution Mask), OXCON equipment

SOLR® Oxygen Booster Pump

The SOLR® Oxygen Booster Pump safely and efficiently fills high-pressure oxygen systems up to 4,500 psi. The SOLR® Oxygen Booster Pump also provides an added measure of safety during oxygen replenishment due to an innovative seal design and cooling method that enable filling at near ambient temperatures.

Four outlets and a convenient two-position switch allows users to operate the pump at two different outlet pressures. Upon reaching the preset limit, the pump will automatically shut off to prevent over-pressurization.

Factory Presets

- Accommodates filling of four systems simultaneously
- Enables filling of three systems to 3,000 psi (e.g. bailout bottles) and one system to 1,800 psi (e.g. oxygen console)
- Adjustable to accommodate filling to any pressure up to 4,500 psi.

Weight	75 kg (165 lb)
Dimensions	114 cm x 48 cm x 52 cm (45 in x 19 in x 20.5 in)
Boost Ratio	10:1
Filler	10 microns

Key Features

- Electrically driven pump (available in 110v/60 Hz and 220v/50 Hz
- Two position adjustable inlet shut-off valve
- Two stage design
- Two safety relief valves for high pressure and low pressure outlets
- Digital hour meter to track service life
- Simplified maintenance schedule
- Inlet regulator to adjust fill rate

jTrax® Navaid

jTrax® Navaid is a single device worn on a jumper's harness to aid in navigating to the intended Impact Point. The technology improves safety and is the same used in our Guided Precision Aerial Delivery Systems (GPADS).

System Components

- One pilot unit
- One display screen
- One support board or harness
- One back-up compass

Three Informational Displays

- Jumpmaster screen: used on the aircraft to check the progress of the flight toward the release point
- Navigation screen: used under canopy to guide the jumper toward the landing zone
- Map display: shows the area below the jumper during the flight under canopy

Successful, Safe Missions

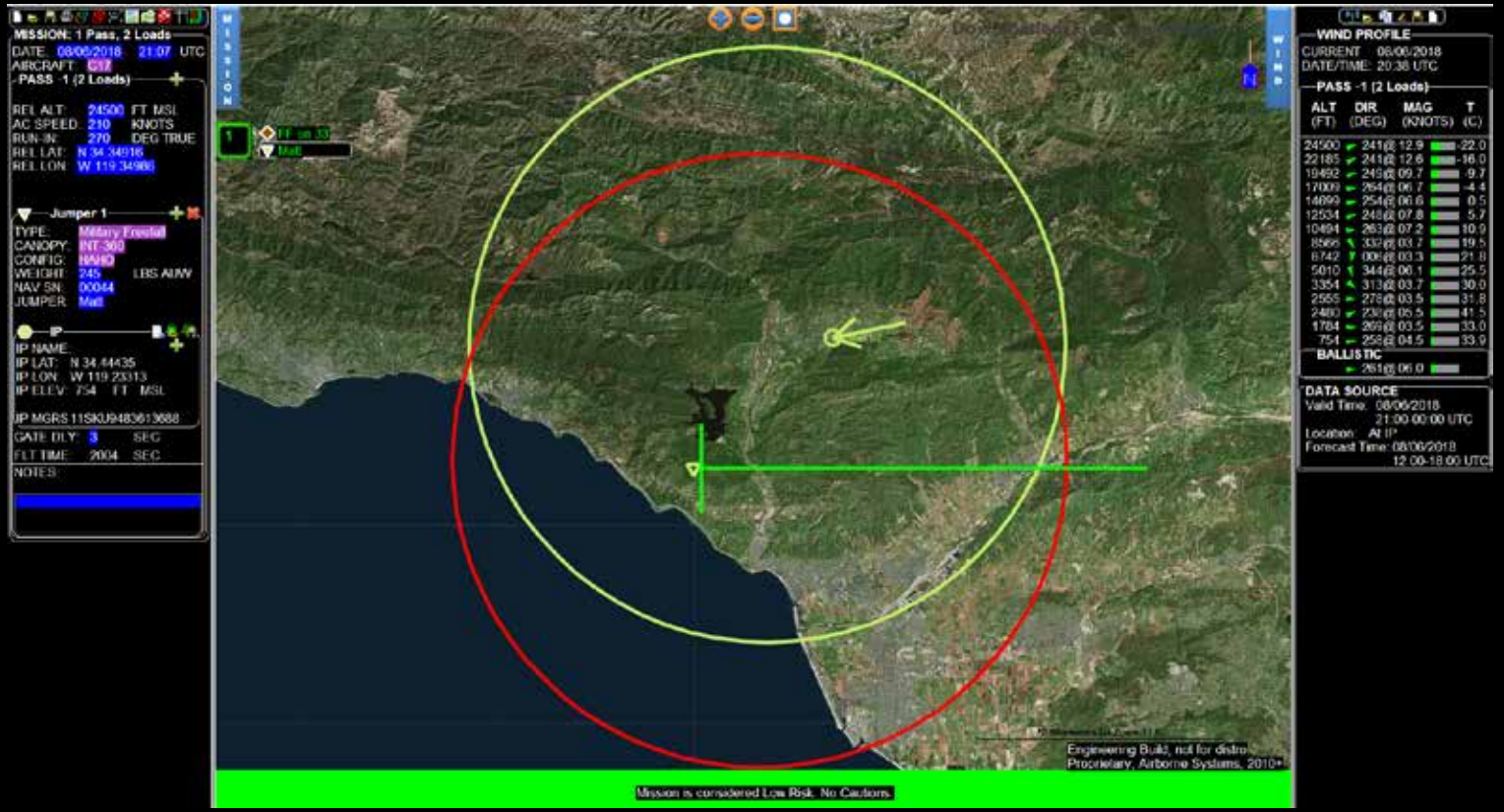
jTrax® Navaid can have one primary target and two alternate landing targets. A push button located on the jTrax® Pilot can be activated with gloves to allow the jumper to rotate through screens and landing areas.

Adaptable Mission Planner Software

jTrax® Mission Planner is proprietary software that provides mission planning for military freefall jumps as well as guided cargo drops. It allows the user to select mission parameters such as payload weight, canopy, aircraft type, release altitude, speed, heading, and Impact Point location.

jTrax® Mission Planner automatically downloads wind data and plans a mission for the optimum release point taking into account failure footprint. The user can then change to the desired release points and assess the reliability of alternate plans based on wind conditions, parachute performance, and arrival altitude. This allows customization to meet complex mission parameters without increasing risk due to unknown trajectories or performance conditions. The planned mission can then be simulated and output to satellite imagery or symbolic map for visualization and terrain assessment.

The red circles in the image below indicate the failure footprint. The green circle represents the LAR.
The JM can now alter the mission parameters and view updates to the LAR immediately.



jTrax® Mission Planner

jTrax® Mission Planner is Airborne Systems' proprietary software that allows the Jumpmaster to quickly determine the release point for personnel and Guided Precision Aerial Delivery Systems (GPADS) drops.

Three-Step Operation

- Select parachute system and All Up Weight
- Select Impact Point and exit altitude
- Select aircraft to be used

jTrax® Mission Planner automatically downloads the wind forecast from the National Oceanic and Atmospheric Administration, then calculates the Launch Acceptability Region (LAR), the region in which the team can jump and be able to reach the Impact Point. This allows the Jumpmaster to move the release point anywhere within the LAR.

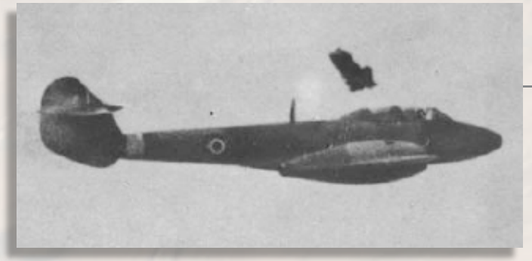
Failure Footprint

jTrax® Mission Planner provides the Jumpmaster with a failure footprint represented by a red circle. The failure footprint is the region in which the payload or team could land in the event of navigation error or system failure, providing a grid for a search team to locate the jumper or cargo.

Satellite Imagery

jTrax® Mission Planner uses satellite imagery, which allows the Jumpmaster to use the software to brief the team on obstacles, targets, and flight path to the Impact Point.

1919 Leslie Irvin makes the first freefall parachute descent; the Irving Air Chute Company is then formed in Buffalo, NY. The name included a misspelling due to a clerical error, which stood uncorrected until 1968.



1951 Martin Baker, in collaboration with Irvin, develops the first autonomous pilot seat ejection system.

1960 First aerial recovery of a space capsule launched from an orbiting satellite (Discoverer XIII) uses an Irving parachute recovery system.

1965 Irving's first mortar deployed spin stall parachute recovery system is used on the DC-9 development aircraft.

1976 Irvin develops and qualifies parachute systems for the NASA Pioneer Venus program.

1919 1929 1939 1949 1959 1969 1979

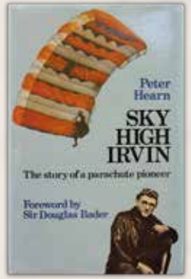
1928 Leslie Irvin opens a factory dedicated solely to the production of Irving parachutes in Buffalo, NY.

1940 Irving and GQ Parachutes produce the X-type Paratroop Parachute Assembly used throughout WWII and for over 20 years thereafter.

1963 Landing brake parachute is developed by Irving for SR-71.

1969 Para-Flite is founded and leads the development of ram air and gliding parachutes.

1983 Peter Hearn publishes "Sky High Irvin, The Story of a Parachute Pioneer", a book recounting Irvin's contributions to the parachute industry.



1998 Receive world record for the largest parachute cluster flight for the Kistler K-1 development, using six 156 ft² ringsail parachutes.

2007 U.S. Army selects Airborne Systems' DragonFly and FireFly GPADS as their self-guided parachutes.

2008 Airborne Systems successfully tests the GigaFly, setting the world record for the largest ram-air canopy carrying the heaviest weight ever flown (40,000 lb).

2018 The United States Marine Corps selects the Edge Multi-Mission Parachute System as their replacement for their legacy system.

1989

1991 Discovery Lands with ODC (Orbiter Drag Chute), an Irvin parachute.

1999

2001 British investment group Alchemy Partners purchases Irvin—putting Irvin, Para-Flite, and GQ Parachutes under the same umbrella, later known as Airborne Systems.

2005 Airborne Systems hosts their first Airborne Days in Eloy, Arizona. An event that has run biennially ever since, totaling seven successful events.

PARA-FLITE

IRVIN

G.Q.

AIRBORNE DAYS

See it ★ Experience it

2009

2012 Space X's Dragon capsule made the first commericial cargo delivery to the space station for NASA and resulted in a successful recovery using our parachutes.

2018 Leslie Irvin is inducted into the Skydiving Hall of Fame.

2019

2019 Airborne Systems celebrates their 100 year anniversary as the number one military parachute company in the world.

1919 100 2019

★ Years of ★

INNOVATION

tones

The T-11 has been in service for over ten years with the U.S. Army and several Allied nations. Even with increased weight-carrying capacity, the T-11 features low opening shock, a slow rate of descent, and minimal oscillation—resulting in a significant reduction in injury rates.

T-11

T-11 is a mass assault parachute system suitable for altitudes as low as 152 m (500 ft) Above Ground Level (AGL) and speeds up to 278 kilometers per hour (km/h). The T-11 system is comprised of three separate components: the T-11 main canopy, the T-11R reserve canopy, and the T-11 harness.

Main Parachute

T-11 main is an inherently stable and soft-opening main parachute. It incorporates a deployment sleeve to reduce the effect of crosswind deployment from high-speed aircraft, and a slider which controls the opening and minimizes the possibility of canopy inversions and line-over malfunctions.

Reserve Parachute

The T-11 reserve parachute is based on a high performance aeroconical design and is activated by a centrally mounted ripcord that can be pulled by either hand.

Harness Container

The T-11 harness is adjustable, capable of being sized from the 5th percentile female to the 97th percentile male. The reserve attachment points are close to the same location as the main riser attachment points. These close attachment points allow the force of the reserve deployment to be transmitted through the long axis of the jumper's body. In addition, the jumper is able to maintain a vertical orientation under the reserve canopy, enabling a safe landing.

Rate of descent at sea level with 400 lb (181.4 kg) AUW	< 5.48 m/s (< 18 ft/s)
T-11 system weight	24 kg (53 lb)
Max aircraft speed	278 km/h (150 KIAS)
Max All Up Weight	180 kg (400 lb)
Oscillation angle	Less than 5 degrees
Min Deployment Altitude	152.4 ± 38.1 m (500 ±125 ft)
Max Deployment Altitude	4877 m (16,000 ft)

MC-6

Designed for precision infiltration of airborne forces, MC-6 features the latest in advanced design for steerable troop parachutes. Developed through the Special Operations Forces Tactical Assault Parachute System program, the MC-6 utilizes the same SF-10A canopy that has been in use by U.S. Special Operations.

In service for over 20 years, the MC-6 has proven to be a safe and reliable design.

Main Parachute

The MC-6 canopy is a highly modified, 28 gore, extended skirt polyconical parachute. The canopy has a nominal diameter of 9.8 m (32 ft), which includes a unique drive system that enables the canopy to turn quickly with minimum pendular motion. The forward speed and turn rate can be controlled in flight. The low rate of descent demonstrated by this canopy allows safe infiltration into all types of drop zones, including those at high elevations.

Reserve Parachute (T-11R)

MC-6 utilizes the T-11 reserve parachute, which is used in the T-11 system.

Harness Container

MC-6 also uses the same harness as the T-11, capable of being sized from the 5th percentile female to the 97th percentile male.

Max All Up Weight	181 kg (400 lb)
Min Deployment Altitude	152 m (500 ft) AGL
Rate of descent at sea level with 173 kg (382 lb) AUW	4.9 m/s (16 ft/s)
Nominal diameter	9.8 m (32 ft)
Number of gores	28
Time for 360 turn	5 seconds
Assembled weight	13 kg (29 lb)

OCTO-11

OCTO-11 is Airborne Systems' newest troop parachute system. This parachute is an evolution of the T-11 based on 10 years of successful usage in the field and user feedback. The OCTO-11 preserves the unique qualities of the T-11, such as the soft and consistent openings, slow rate of descent, and near perfect stability, while reducing the complexity of some of the unique components. The OCTO-11 has a simplified rigging, reduced packing time, and improved responsiveness to riser slip maneuvers.

The unique design of the OCTO-11 allows for smooth, progressive openings (4 seconds) and low oscillation after canopy inflation.

Octagonal Design

The canopy is composed of 24 shaped gores, providing radials of equal length. The octagonal crown consists of eight arms joined to form a continuous hem. The hem is equipped with an anti-inversion net and no slider is required to control the opening. The corner vents are fitted with mesh to mitigate the risk of jumper entanglement.

Two toggles allow the jumper to rotate the canopy along its vertical axis while maintaining it's ballistic characteristics. No drive is created, which significantly reduces the chance of canopy collision. Effective riser slip can be induced with minimal force.

Reserve

The OCTO-11 is fully compatible with the T-11 reserve parachute.

Max All Up Weight	180 kg (400 lb)
Min Deployment Altitude	152 m (500 ft) ASL
Rate of descent at sea level with 180 kg (400 lb) AUW	< 5.5 m/s (< 18 ft/s)
Max Aircraft Speed	150 KIAS (278 km/h)
Repack cycle	365 days

Towed Jumper Release System (TJRS)

Airborne Systems' Towed Jumper Release System (TJRS) provides an additional recovery parachute to allow release of a towed jumper from the aircraft. TJRS builds on a long legacy of similar systems, updated to meet the demands of modern airborne forces.

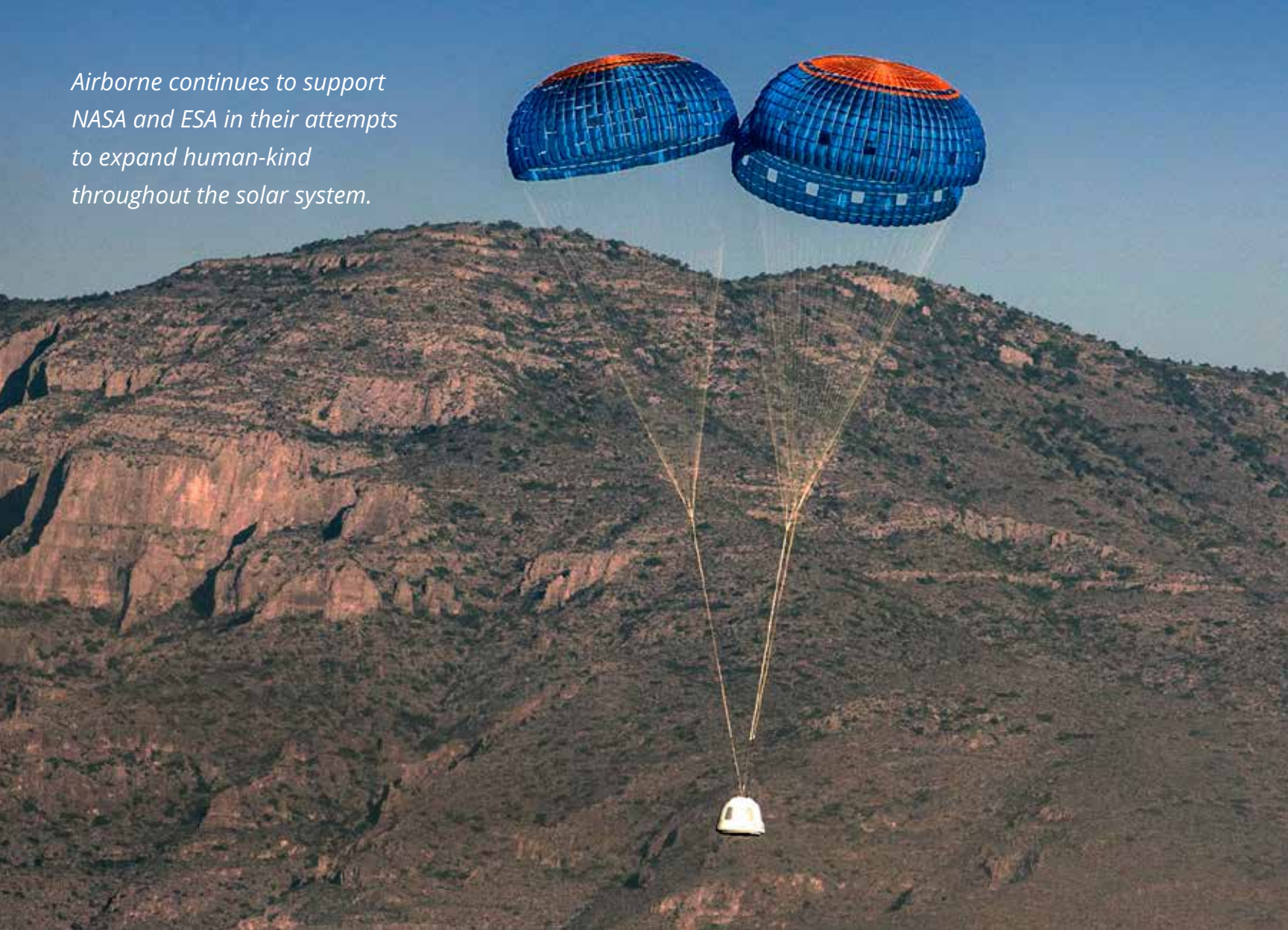
The TJRS offers a simple mode of operation:

- The TJRS static line is connected to a deck ring and the pack tray is positioned near the door.
- The TJRS probe is fed through all of the static line snap hooks, allowing the lanyard to be pulled through and centered.
- Both ends of the lanyard are connected to the TJRS riser. The system is ready to deploy.
- One Jumpmaster positions the TJRS pack tray in the door, and the other Jumpmaster uses the provided cable cutter to sever the anchor line cable.
- The snap hooks slide off the cut end of the anchor line cable, which pulls the TJRS pack out of the aircraft, and static line deployment of the recovery parachute begins.

Benefits of the TJRS

- TJRS is durable and can be reused in training environments with typical parachute rigging and inspection procedures
- TJRS accommodates full weight jumpers for all U.S. military static line systems
- Self-contained kit provides all components required for operation
- The riser, probe, and lanyard can be restowed in about two minutes without rigging tools or consumables, allowing rehearsal of procedures without need for a system repack.
- Clear markings provide reminders to reinforce training

Max All Up Weight	204 kg (450 lb)
Min Deployment Altitude	244 m (800 ft) AGL
Max Deployment Altitude	5334 m (17,500 ft) MSL
Max Deployment Speed	278 km/h (150 KIAS)
Repack Cycle	365 days
Diameter (nominal)	8.72 kg (28.6 ft)



Airborne continues to support NASA and ESA in their attempts to expand human-kind throughout the solar system.

Space Systems

Human Space Flight

Airborne Systems has supported and developed multiple human space flight systems, including America's new fleet of spacecraft that are being developed to replace the Space Shuttle and take us deeper into the solar system. Today, Airborne Systems is leading the way on the design, development, and testing of the parachute landing systems for NASA's Orion Capsule, and the privately operated vehicles of commercial crew servicing the International Space Station.

Planetary Space

The Pioneer Venus Large Probe was one part of the Multiprobe Mission to send four probes through the atmosphere of Venus. Airborne Systems supported the mission by designing, fabricating, and testing the descent parachutes. Launched in August of 1978, the Large Probe successfully entered the atmosphere of Venus in December where the parachute successfully slowed the probe allowing important science measurements to be made during the descent.

Our team also supported the successful Cassini/Huygen's Probe mission to Titan. The Huygen's probe successfully landed on Saturn's largest moon, Titan, on January 14, 2005. The descent lasted two hours and 27 minutes. The probe survived another 72 minutes on the surface of Titan. This was the first—and so far only - landing in the outer solar system. Huygen's holds the record as the most distant landing from Earth.

The Airborne Systems team also provided the lightweight ringsail parachute for the Beagle 2 Mars Lander. Beagle 2 was launched in 2003 on board the European Space Agency's Mars Express spacecraft.

The lander's fate remained a mystery until early 2015 when NASA's MRO HiRISE camera located the lander and parachute. The images suggested that the Lander made it to the surface, but two of the spacecraft's four solar panels failed to deploy, blocking the spacecraft's communications antenna.

Airborne continues to support NASA and the European Space Agency (ESA) in their attempts to expand human-kind throughout the solar system. Most recently we have developed a strengthened version of the workhorse Disk-Gap-Band parachute that NASA has been using to deliver landers to Mars since the pioneering Viking Missions.

Booster Recovery

Airborne Systems has developed recovery systems for the Kistler K-1, Boeing Evolved Expendable Launch Vehicle, and also for all of the expendable launch vehicles. This includes first stage boosters from customers from the United States and internationally.

Airborne Systems has also worked with smaller launch vehicle companies to evaluate recovery and re-use options for small-sat launchers and sounding rockets. We continue to provide insight and expertise in understanding the recovery options for soft landing, water entry, mid-air-retrieval, or flight termination for several small launch vehicles for our U.S. and international customers.

Our capabilities range from guided systems that can provide precision landing to large ballistic parachutes that incorporate levels of redundancy.


AF-02

Air Systems

Airborne Systems' aircraft applications include spin/stall recovery systems for flight test, aircraft escape systems, and aircraft landing decelerators. Weapons systems include decelerators for conventional, submunitions, and special weapons. Military systems include gliding and non-gliding personnel parachutes for all class of air drop, as well as conventional and precision cargo delivery systems.

Aircraft Landing Deceleration Systems

Airborne Systems has provided landing deceleration systems for a range of different aircraft over many years. Airborne Systems is the designer and manufacturer of the F-35A drag chute system and is the only original equipment manufacturer for the F-16 deceleration system.

Aircraft Spin and Stall Recovery Systems

Airborne Systems provides complete systems including the parachute system, typically mortar-deployed, as well as the attach/release mechanism (ARM) systems, the cockpit control avionics, and support structures. A wide range of parachutes are available and are combined with the standard ARM, cockpit control systems, and ground support equipment to provide a complete system solution tailored to each specific aircraft requirement.

Aerial Targets

Airborne Systems is the designer and sole source supplier for Kratos Defense's range of unmanned aerial targets, which are in service with the U.S. Army, Navy, Air Force as well as and many overseas operators. These parachute systems have demonstrated exceptional reliability in recovery of these unmanned vehicles.

Aircraft Escape Systems

Airborne Systems produces a range of aircraft escape systems for use on ejection seats. These systems are in service on thousands of aircraft around the world. Airborne Systems designed and produced the new parachute systems in use on the most advanced ejection seats including the new ACES 5 ejection seat system.

Personnel Parachute Systems

Modern steerable and non-steerable systems are being developed as successors to the current systems in service around the world. These parachutes utilize modern planforms to give excellent stability and low rates of descent.

Cargo Delivery Parachute Systems

As the new technology personnel systems allow safe and secure deployment of personnel from lower flying aircraft, Airborne Systems is applying these lessons learned to the next generation of low level cargo delivery systems. These will complement the guided cargo systems that are suited for the high threat environments.

Inflatable Systems

Airborne Systems has developed a wide range of inflatable products starting with the production of hundreds of thousands of BSU-85 Air Inflatable Retarders in the 1960s, to the recent development of large scale Inflatable Aerodynamic Decelerators (IADs) for NASA, and airbag landing systems for drones and UAVs. This experience and subject matter expertise provides a broad capability to design, analyze, fabricate, and test inflatable and fabric structures including IADs for supersonic and hypersonic reentry, recovery and flotation devices for naval applications, inflatable deployable wings for light aircraft, pneumatic muscle actuators, emergency airbag landing systems, and deployable/transportable structures for a variety of applications. In combination with our parachute system expertise, our inflatables experience provides our customers with a unique systems approach for the recovery and protection of their valuable payloads.

Inflatable Aerodynamic Decelerators

Airborne Systems is heavily engaged in the study, analysis, design, and fabrication of large scale IADs, including both supersonic and hypersonic decelerators for high mass aerocapture and reentry for applications including Titan and Mars Landers for NASA, as well as Earth return capsules. Recent activities include NASA-sponsored development of an inflatable eight-meter diameter isotensoid for supersonic deceleration, and a demonstration mission for six-meter diameter hypersonic stacked torus decelerator.

Inflatable Wings

Airborne Systems has been at the forefront of inflatable wing development for over a decade, starting with the Gun Launched Observation vehicle with an inflatable wing, to the DARPA Extended Range Aerial Delivery System (ERADS) with a 28 ft inflatable wing.

Airbags

Airborne Systems has been involved in a broad range of airbag programs ranging from spacecraft landing systems, through drone landing systems, to emergency aircraft crash and landing attenuation. We are currently working several programs for the soft landing of cargo aerial delivery, as well as future vertical lift airframe and aircrew protection, and numerous soft landing capabilities for drones and UAVs.

Floats

Airborne Systems has developed several float and recovery devices for naval operations. The floats have extremely low leakage rates and are very durable, providing a long operational life in the severe conditions experienced at sea.

The entire GPADS family is focused on commonality between systems in regards to user interface, packing, rigging, and maintenance. This minimizes the training burden and facilitates an easy transition from one system to another.

Guided Precision Aerial Delivery Systems (GPADS)

Airborne Systems proudly offers the industry's largest family of Guided Precision Aerial Delivery Systems (GPADS)

Airborne Systems offers the broadest, most mature, and reliable line of JPADS/GPADS capabilities in the world. Spanning payload configurations from 200 to 10,000 lbs. In service by the U.S. DoD and dozens of foreign militaries, the systems have been successfully airdropped in test, training, and operationally tens of thousands of times. No other family of guided airdrop systems has been as thoroughly and rigorously qualified and proven in the field.

Airborne Systems' family of GPADS products are based around a common system architecture. All models utilize the same GPS and inertial avionics and flight software, have a common user interface, and share similar packing and rigging techniques. All deployment components remain attached to the system, and require no pyrotechnics.

GPADS avionics includes a commercial GPS option for Selective Availability Anti-Spoofing Module (SAASM) MIL GPS, 3-axis IMU (gyros, accelerometers, magnetometers), and a barometric sensor. In a GPS-denied environment, the flight software will dead reckon to the target using its inertial and barometric sensors.

All systems are supported by Airborne Systems' jTrax Mission Planner airdrop software and are compatible with the USAF CAT airdrop mission planning software.

The MicroFly II® AGU provides SAASM GPS integration via external mounting and connection to a Defense Advanced GPS Receiver (DAGR) handheld device.

MicroFly II®

MicroFly II® is Airborne Systems' Ultra Light Weight Guided Precision Aerial Delivery System (GPADS), offering significant upgrades over all legacy ultra light weight GPADS. New capabilities include High Altitude Low Opening (HALO) droguefall, lithium iron-phosphate battery technology, and a membrane keypad. The Autonomous Guidance Unit (AGU) is significantly lighter at only 12 kg vs. the previous 19.5 kg.

The MicroFly II® is configured for gravity airdrop using a Release Away Static Line (RASL). A variety of large and small body aircraft with ramp or door operations and rotary wing aircraft are supported.

Droguefall capability is fully integrated and controlled by the AGU. Simple to rig and program, the AGU controls transfer of the drogue to main canopy with no additional components to maintain or inspect. Transfer to the main canopy can be initiated based on above-ground elevation, or time from exit.

MicroFly II® supports RA-1, MC-4/5, and MS-360 main canopies. Main and reserve military freefall canopies can be converted for use on the MicroFly II® AGU. The RA-1 configuration includes a silent slider (patent pending), which has been modified to eliminate noise while the canopy is in flight. The RA-1 configuration also offers best-in-class glide ratio for maximum target offset.

MicroFly II® supports the combo airborne mission. In autonomous mode, the system flies a predictable pattern, honing towards the Impact Point and then loitering upwind of the Impact Point, followed by an upwind landing.

Alternatively, remote control of the system is supported via a handheld device, which allows control of the system for any portion of the flight.

Canopy	Intruder® 360 (RA-1)	MC-4/MC-5
Gross Rigged Weight Min	113.4 kg (250 lb)	90.7 kg (200 lb)
Gross Rigged Weight Max	227 kg (500 lb)	227 kg (500 lb)
System Weight	22 kg (49 lb)	22 kg (49 lb)
Surface Area	33.4 m^2 (360 ft^2)	34.4 m^2 (370 ft^2)
Min Deployment Altitude	1067 m (3,500 ft) AGL	1067 m (3,500 ft) AGL
Max Deployment Altitude	7468 m (24,500 ft) AMSL	7468 m (24,500 ft) AMSL
Max Glide Ratio, No Wind	4:1	2.5:1
Deployment Method	Release Away Static Line (RASL) Droguefall HALO or HAHO	Release Away Static Line (RASL) Droguefall HALO or HAHO

FireFly®

FireFly® is Airborne Systems' 2K Guided Precision Aerial Delivery System (GPADS) capability. With nearly a decade in the field, FireFly® is the true workhorse of the GPADS family worldwide. With thousands of test and operational drops in every conceivable condition, FireFly® is the most mature GPADS in existence. It is configured for High Altitude High Opening (HAHO) deployment using a Release Away Static Line (RASL). It is typically rigged to conventional A-22 CDS payloads, but other configurations are supported. The system is qualified for airdrops from the C-17, C-130, and a variety of rotary wing and small body aircraft.

Deployment of the canopy is controlled by a patented multi-grommet slider and Autonomous Guidance Unit (AGU) actuated deployment brake cleat, eliminating the need for pyrtotechnic cutters. These features vastly reduce rigging complexity, cost, and logistics of large GPADS parafoil systems. The 19-cell, 95 m^2 (1,025 ft^2) main canopy is a robust design with superior flight characteristics.

Since its adoption and fielding by the U.S. DoD under the JPADS 2K program of record, Airborne Systems has continued to improve the system. The Sealed Lead Acid (SLA) batteries have been replaced with a Lithium Iron-Phosphate (LiFePo4) battery, reducing AGU weight by 7 pounds. LiFePo4 batteries reduce battery maintenance burden (increasing recharge cycle from 3 months to 1 year) and increase safety.

In addition to the U.S. DoD configuration, we customize systems to meet the specific requirements of individual customers. Radio-equipped configurations of the FireFly® also support the combo airborne mission. Both commercial and SAASM GPS (removable enclosure) variants are available.

Gross Rigged Weight Min	295 kg (650 lb)
Gross Rigged Weight Max	1089 kg (2,400 lb)
System Weight	73.5 kg (162 lb)
Surface Area	95 m^2 (1,025 ft^2)
Min Deployment Altitude	1067 m (3,500 ft) AGL
Max Deployment Altitude	7468 m (24,500 ft) AMSL
Max Glide Ratio, No Wind	3.25:1
Deployment Method	Release Away Static Line (RASL)

FC Mini

Airborne Systems' FC Mini is a one-time (1T) use alternative to the MicroFly II®. The purpose of the 1T configuration is to minimize the cost of executing a GPADS mission when it is known that recovery of the system will not be practical. FC Mini uses an MC-4 canopy developed by Airborne Systems, which minimizes unit cost while maintaining performance.

The FC Mini Autonomous Guidance Unit (AGU) is designed to minimize cost and logistics. It is constructed of wood to minimize the amount of potential Improvised Explosive Device (IED) material. The AGU has a single actuator for canopy control, flies in half-braked mode and does not flare upon landing. The removable Lithium Iron-Phosphate (LiFePo4) battery can be stored and maintained separately. The AGU includes the standard LCD screen and keypad for mission programming and status monitoring. The FC Mini AGU is substantially lighter than the MicroFly II® (2.7 vs 12.7 kg).

The parachute and AGU are packed at Airborne Systems by certified staff and shipped to the customer ready to be rigged to a payload, limiting the logistics burden of the system to storage and periodic battery maintenance. Training, proficiency, and repack of the parafoil system has been eliminated.

FC Mini's primary missions are team insertions where recovery of the parachute system is undesirable; however, the system is also utilized for humanitarian or military resupply. Combo airdrop is supported in autonomous mode only.

Canopy	1T MC-4
Gross Rigged Weight Min	91 kg (200 lb)
Gross Rigged Weight Max	227 kg (500 lb)
System Weight (canopy only)	9.5 kg (21 lb)
Surface Area	33.4 m^2 (370 ft^2)
Min Deployment Altitude	1067 m (3,500 ft) AMSL
Max Deployment Altitude	7468 m (24,500 ft) AMSL
Max Glide Ratio, No Wind	2.5:1
Deployment Method	Release Away Static Line (RASL)

FlyClops® 2K

Airborne Systems' FlyClops® 2K is a one-time (1T) alternative to FireFly®. Like FC Mini, it minimizes the cost of GPADS missions when recovery is unlikely. FlyClops® 2K incorporates a 1T alternative to the standard FireFly® canopy, maintaining the same architecture and performance characteristics, while reducing construction cost. FlyClops® 2K is qualified to the same deployment envelope as a standard FireFly®.

The FlyClops® 2K Autonomous Guidance Unit (AGU) is made of wood and features a single actuator for half-braked canopy control and no-flare landing. There is also a removable Lithium Iron-Phosphate (LiFePo4) battery, and LCD screen with keypad. It is lighter than its FireFly® counterpart (11 vs 38.5 kg).

Like FC Mini, the parachute and AGU are delivered packed and ready for rigging to a payload, reducing the logistical footprint and total ownership cost of this GPADS.

The FlyClops® 2K is ideal for mass resupply humanitarian operations where precision landing is critical and airspace and other threats may be a concern. For operational military resupply missions, it eliminates the burden of recovery and retrograde. It has been authorized for use from a variety of aircraft and has been fielded by several foreign militaries and other government organizations.

Assuming the system is stored in accordance with standard environmental conditions for parachute systems, FlyClops® 2K has a five-year shelf life with no repack.

Gross Rigged Weight Min	318 kg (700 lb)
Gross Rigged Weight Max	998 kg (2,200 lb)
System Weight (canopy with AGU)	33 kg (72 lb)
Surface Area	95 m^2 (1,025 ft^2)
Min Deployment Altitude	1524 m (5,000 ft) AMSL
Max Deployment Altitude	5334 m (17,500 ft) AMSL
Max Glide Ratio, No Wind	3.25:1
Deployment Method	Release Away Static Line (RASL) or Droguefall

JPADS 2K MAGU

Airborne Systems' proprietary JPADS 2K MAGU (Modular Autonomous Guidance Unit) is another alternative to the FireFly, developed by Airborne Systems in support of the U.S. DoD 2K JPADS Pre-planned Product Improvement Program (P3I) .

Four Major AGU Components

- Parachute interface frame
- Avionics module
- Actuator module
- Battery module

The Selective Availability Anti-Spoofing Module (SAASM) GPS has been integrated into the avionics module and is not removable. The battery module uses Lithium Iron-Phosphate (LiFePo4) battery technology.

Upon recovery, the operator can break down the AGU, expediting the recovery or limiting recovery to high value or secure components (i.e. the avionics). Components of AGUs can be mixed and matched depending on available modules when assembling a complete AGU.

MAGU shares the LCD screen and keypad with the FireFly® AGU. The standard FireFly or 1T FireFly canopies may be used. However, the MAGU is not intended for one-time use.

MAGU has been fielded by U.S. DoD to replace the standard FireFly® AGU. It is fully qualified to the same flight performance envelope and environmental qualifications as the FireFly®. The U.S. DoD configuration uses Draper flight software, but a version with Airborne Systems' proprietary flight software is available.

Gross Rigged Weight Min	295 kg (650 lb)
Gross Rigged Weight Max	1089 kg (2,400 lb)
System Weight	73.5 kg (162 lb)
Surface Area	95 m^2 (1,025 ft^2)
Min Deployment Altitude	1067 m (3,500 ft) AGL
Max Deployment Altitude	7468 m (24,500 ft) AMSL
Max Glide Ratio, No Wind	3.25:1
Deployment Method	Release Away Static Line (RASL)

RazorFly

RazorFly is Airborne Systems' 4K GPADS capability. The RazorFly was specifically designed for precision airdrop of the Polaris MRZR family of vehicles. It has been qualified for use from the C-130 and C-17 using a Special Operations Combat Expendable Platform (SOCEP) and double A-22 CDS, though other platforms may be used. The RazorFly weight range is 1134 to 2041 kg, allowing for accompanying loads when rigged with lighter MRZR variants and similarly sized vehicles. RazorFly is configured for High Altitude High Opening (HAHO) deployment using a Release Away Static Line (RASL).

In order to maximize survivability and mitigate rollover potential of the MRZR on landing, the RazorFly uses a split confluence fitting. Positioned between the Autonomous Guidance Unit (AGU) and MRZR payload, the split confluence exits the aircraft as a single unit. Following the completion of the canopy deployment sequence (45-60 seconds), the split confluence releases, separating the harness into left and right sides. This ensures that the heading of the MRZR vehicle stays aligned with the heading of the canopy for landing. A powerful no-stall flare also minimizes impact velocities. Upon landing, the parachute system can be removed from the payload without the use of tools, expediting the operational use of the MRZR.

The RazorFly has also been designed for maximum commonality with the FireFly® system to minimize the training/qualification/proficiency burden of adding the capability.

It deploys in the same configuration as the FireFly®. The 23-cell, 162 m^2 (1,740 ft^2) canopy was specifically designed for optimum flight performance with the MRZR but also shares the robust design features of the FireFly® canopy.

Radio-equipped configurations of the RazorFly also support combo airborne missions. Commercial and SAASM GPS variants are available.

The RazorFly has been qualified by the U.S. DoD and is in use by U.S. Special Operations Forces.

Gross Rigged Weight Min	1134 kg (2,500 lb)
Gross Rigged Weight Max	2041 kg (4,500 lb)
System Weight	113 kg (250 lb)
Surface Area	162 m^2 (1,740 ft^2)
Min Deployment Altitude	1524 m (5,000 ft) AGL
Max Deployment Altitude	7468 m (24,500 ft) AMSL
Max Glide Ratio, No Wind	3.5 to 3.75:1
Deployment Method	Release Away Static Line (RASL) HALO

Through its qualification by the U.S. DoD, the DragonFly is the most mature 10K GPADS capability available on the market. Over 500 systems have been fielded.

JPADS 10K DragonFly®

DragonFly® is Airborne Systems' 10K GPADS capability, qualified and fielded by the U.S. DoD under the JPADS 10K program of record and in use by several foreign militaries. Type V, combat expendable platform, and quad CDS payload configurations are supported. The system supports both gravity High Altitude High Opening (HAHO) deployment via Release Away Static Line (RASL) and parachute extraction from the aircraft. In the extracted configuration, there is no deviation from standard air force procedures. The system is qualified for use on the C-17 and C-130.

Gross Rigged Weight Min	2223 kg (4,900 lb)
Gross Rigged Weight Max	4536 kg (10,000 lb)
System Weight (canopy only)	230 kg (508 lb)
Surface Area	325 m^2 (3,500 ft^2)
Min Deployment Altitude	3048 m (9,999 ft)
Max Deployment Altitude in a C-130	7468 m (24,500 ft) AMSL
Max Deployment Altitude in a C-17	5486 m (17,999 ft) AMSL
Max Glide Ratio, No Wind	3.5:1
Deployment Method	Release Away Static Line (RASL) [gravity] or Extraction

The DragonFly® main canopy boasts the same robust design features as the FireFly® and RazorFly. With 35 cells and a surface area of 332 m^2 (3,570 ft^2), DragonFly is Airborne Systems' largest commercially available ram air canopy. Riggers with experience on FireFly® or RazorFly will transition with ease to packing and rigging this larger canopy. Only a modest increase in packing area is needed to support DragonFly® rigging.

DragonFly® may utilize a split confluence when required for vehicle or other high value payloads. Both commercial and SAASM GPS (removable enclosure) variants are available.

Unicross

Unicross is a low cost alternative to standard cargo delivery parachutes. Its design is suitable for humanitarian drops and war-related operations when the recovery of the parachute is not practical. These include, but are not limited to:

- Food and water resupplies
- Medical supplies
- Makeshift drop zones
- Drops over water

Unicross Family of Systems

Unicross is available in three sizes (150, 500, and 2200) to accommodate a wide range of payload weights. See the chart below for weight range details.

Advantages

- **Economical solution throughout**: Each part of the system is designed with cost efficieny in mind while still allowing for multiple uses.
- **Easy drop and recovery**: The Release Away Static Line (RASL) eliminates the requirement to recover the deployment bag into the aircraft. Also, the Unicross can be dropped from any cargo ramp and paratroop door equipped aircraft.
- **Tie-in panel construction**: The Unicross parachute is built with two types of interchangeable panels (crown and wing panels). This offers a major reduction in maintenance time, and repairs can easily be made in the field as no sewing is required.

	UNICROSS 150	UNICROSS 500	UNICROSS 2200
Min Deployment Altitude	91 m (300 ft) AGL	183 m (600 ft) AGL	600 ft (183 m) AGL
Max Deployment Altitude	3048 m (10,000 ft) MSL	3048 m (10,000 ft) MSL	3048 m (10,000 ft) MSL
Payload Range	34 - 79 kg (75 - 175 lb)	113 - 317.5 kg (250 - 700 lb)	454 - 1451.5 kg (1,000 - 3,200 lb)
ROD m/s @ kg (ft/s @ lb)	8.5 m/s @ 68 kg (28 ft/s @ 150 lb)	7.6 m/s @ 227 kg (25 ft/s @ 500 lb)	8.5 m/s @ 998 kg (28 ft/s @ 2,200 lb)

Training Programs

The ISO 9001:2008 certified Airborne Systems Training Facility provides a complete turnkey solution to the training needs associated with the purchase and sustainment of our full line of products. From qualified instructors completely familiar with military jump and cargo drop requirements, to programs for maintenance and packing techniques—a wide range of training programs and courses are available.

Fully Equipped and Strategically Located

- On-site aircraft support from one of the largest DoD approved aircraft providers
- The highest number of days for good weather in the U.S. according to National Oceanic and Atmospheric Adminstration (NOAA)
- A 1,500 square foot, padded packing mat and a parachute suspension bar that allows up to twelve jumpers to pack, enabling a group of 24 jumpers or 8 riggers to train simultaneously
- The large landing zone footprint allows for the required safety margin for GPADS drops
- Ability to facilitate high altitude jumps up to 7620 m (25,000 ft)

Students are assessed and given feedback during each course as well as detailed training records and course certifications upon graduation.

Training can also be provided at regularly scheduled intervals in order to maintain proficiency levels for both the use and maintenance of the equipment, to train new personnel, and to educate customers about expanding product lines and capabilities.

Airborne Systems' new equipment training courses can be conducted at the Airborne Systems Training Facility in Eloy, Arizona USA or in-country at the customers own military installation.

All courses can be customized to meet the customer's requirements and may even be combined if required.

INDIVIDUAL TRAINING COURSES

- T-11 Course
- MC-6 Course
- RA-1 (Intruder®) Course
- Hi-5 Course
- Multi-Mission Course (MMS)
- PHAOS/ OXCON/ SOLR Course
- Oxygen Maintenance
- Oxygen Operator
- GPADS/JPADS Course
- jTrax® Mission Planner Course

TACTICAL AND ADVANCED TRAINING COURSES

- Combo Drop Course

www.airborne-sys.com

Airborne Systems New Jersey
5800 Magnolia Avenue
Pennsauken, NJ 08109 USA

Airborne Systems California
3100 W. Segerstrom Avenue
Santa Ana, CA 92704 USA

Airborne Systems Training Facility
4760 North Lear Drive
Eloy, AZ 85131 USA

Airborne Systems®

WHERE TECHNOLOGY »*TAKES FLIGHT*

Photo courtesy NASA/JPL-Caltech