

## Bespoke systems for challenging environments



## SERAPID IS A WORLD LEADER IN SOLUTIONS FOR THE SAFE HANDLING OF HEAVY LOADS

Our core technology is the Rigid Chain, the chain that can push. It consists of interlocking links that behave like a chain yet lock like a rigid bar, providing a safe, reliable and compact mechanical actuation mechanism with unequalled performance even in harsh environments.

### Telescopic Mast for Laser Projectors

This Telescopic Mast is designed for use in deploying a set of Virtek laser projectors at an average height of 11m. When the product is fully retracted, the laser projectors will be positioned at a height a little more than 2m. The Telescopic Mast does not require lubrication in any form other than that enclosed in the drive system gear-reducer.

The laser projectors are used to project images onto the fuselage of an aircraft during manufacture, allowing for accurate placement of composite components. Multiple images are loaded and the projector is operated at the base, changing images as needed. The sub-millimeter accuracy of the SERAPID Telescopic Mast provides unrivalled ease of accurate positioning.

These Telescopic Masts replaced fixed tower mounts and eliminated production interrupting maintenance events.



Global Tooling for Boeing

SERAPID was founded in 1972, and we have built our international reputation by providing innovative solutions on challenging projects. More than four decades of engineering expertise combined with our unique technology allows us to deliver exceptional results for the most complex projects.



Boeing Co., Seattle, Washington, USA

### Three Point Lift System

Produced for a leading aerospace manufacturer, this project provides a means to support and lift a heavy airplane wing component during painting. Eighteen lifts, made with LinkLift 50 R chain, were produced for the project. These were configured as groups of 3 to lift fully assembled aircraft wings. 6 of the lifts are located on paint carts, thereby needing Class I Explosion proof motors. The remaining lifts were floor mounted in a clean environment. All lifts are driven by their own 1.1kW servo motor, have a safety lock-out and are encased in a protective bellow. The lifts travel from 660mm to the extended height of 1 910mm. The lifts feature compact footprints for the achieved specifications.



## Vehicle Assembly Building Modification

SERAPID produced 40 LinearBeam precision motion systems for NASA's Vehicle Assembly Building (VAB) modification project.

The project involves modifying High Bay 3 in the VAB at NASA's Kennedy Space Center in Florida for the processing of the agency's Space Launch System (SLS) rocket. NASA is developing the heavy-lift SLS rocket to expand human presence to deep space destinations taking astronauts farther into space than ever before.

There are 10 platform levels each having two platform halves. As each rocket level is completed the platform halves are closed to surround the rocket. The SERAPID LinearBeams were selected to move the platforms based on stroke length, load capacity, ease of installation and an available permanent lubrication chain treatment option.



## Telescopic mast for metrology installations

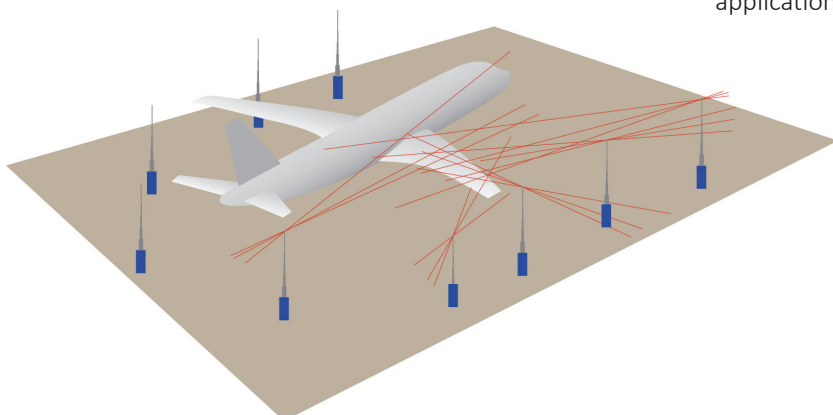
Amrikart has developed its expertise in the field of large scale metrology system integration on different aircraft assembly lines requiring high precision measurements.

To develop its innovating metrology solutions, Amrikart used SERAPID expertise in elevation systems for a geometric aircraft structure inspection installation using laser trackers. The SERAPID self supporting masts brings laser positioning accuracy thanks to the incompressibility of its rigid chain. The unit operates without hydraulics and deploys in a smooth and linear manner with very low vibration.

The SERAPID telescopic mast is used for many metrology applications because of its reliability and accuracy.



Amrikart RC Inc. , Brossard, Quebec, CA





Red Viking for Sikorsky Helicopter, Lockheed Martin

## Helicopter Machining Centre

Designed for use in the measurement of helicopter door openings for final machining, this single Telescopic Mast unit is made to extend a maximum height of 8m and lift a load of 68kg.

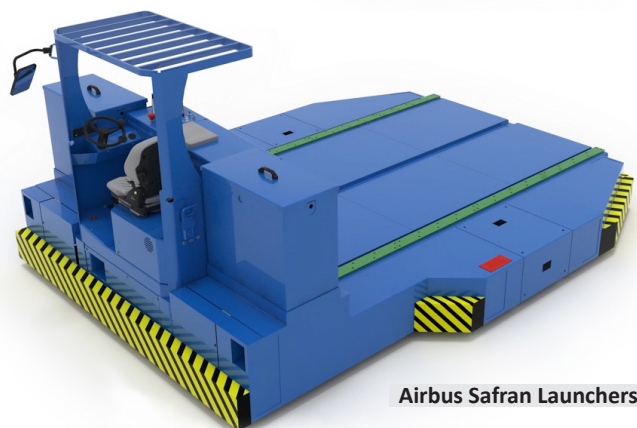
The unit is made of 6 telescopic extruded, hard anodised, square aluminum tubes ranging in size from 82mm to 163mm. Composite plastic pad bearings were mounted in each tube to minimise the clearance between tubes to make the assembly as rigid as possible. Intermediate chain guides provide column support over the entire chain stroke. A 5-return chain storage magazine holds the idle chain.

The chain and other components were treated with a ferritic nitrocarburising (FNC) process to minimise the need for any lubrication.

## Driver-operated truck

After 20 years of service, ARIANE Group has returned to SERAPID to replace a driver-operated truck, located in a plant in France where Ariane rocket nozzles are produced. The equipment's robustness, reliability and long service life left an easy decision to call on SERAPID for its replacement.

This on-board driver self-propelled cart is used to transport, load and unload nozzles in the designated production zones. SERAPID designed a new cart with the same characteristics fulfilling the client specifications while adapting the control to current technology.



Airbus Safran Launchers



## Telescopic Platform Man Lift

Made of telescopic tubes of smooth extruded aluminum, the platform provides a stable and quick lift. With incremental positioning and a traveling pendant on the lift platform, it's an easy to use product.

The lift's compact footprint measures only 0.61sqm. Lift heights range from 1.2m retracted to 4.3m extended. The unit has a weight capacity of 225 kg and has fixed handrails.



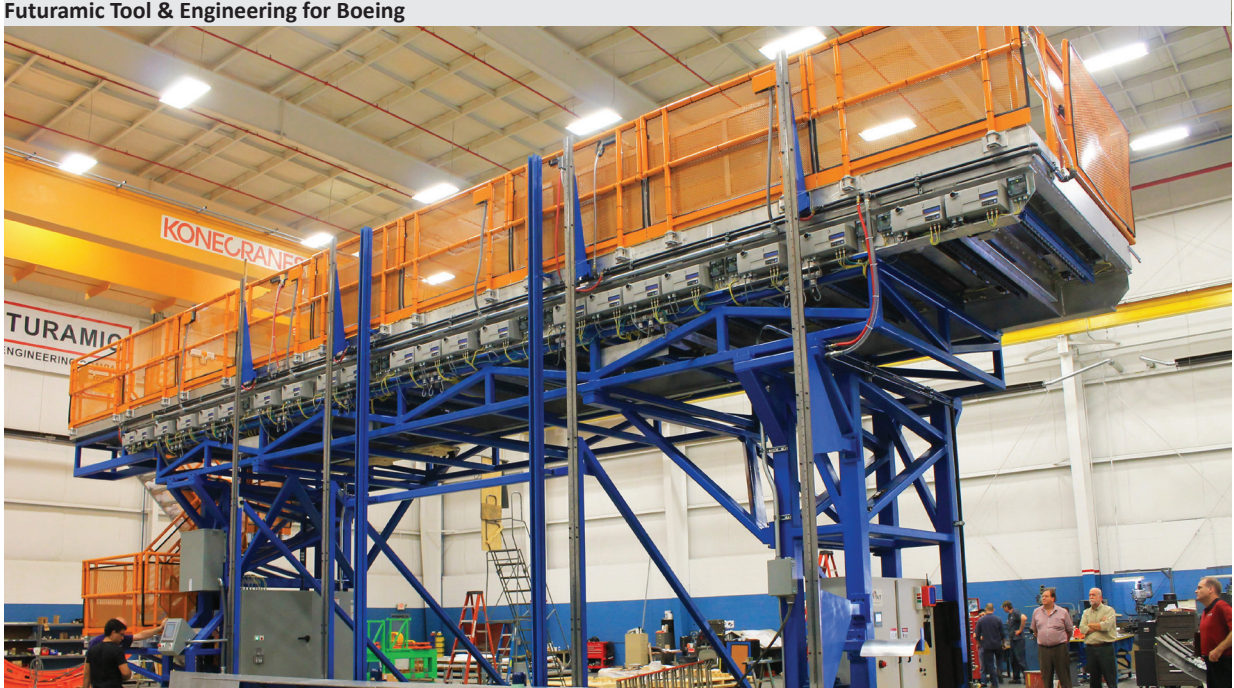
Honda Plant, USA

## Stationary Work Platform

The platform is 4.6m high by 12.2m long and provides a stable work area for a team of mechanics at the upper level. The unique design uses a row of SERAPID LinearBeam driven motorised extension units traveling out up to 178cm from the main platform to fit against the curved fuselage of the plane. A swivel feature on the extension units allows them to be further adjusted to the shape of the aircraft. Each unit is individually powered, and can be advanced or retracted incrementally, allowing the units to be positioned very close to the fuselage.

On the opposite side there is a 9,8m long LinearBeam powered tool shelf running the length of the platform for bringing work items to the level of the workers. Unlike a cable or turn-screw mechanism, the LinearBeam experiences no bind and stretch; and with the addition of the treated chain, lubrication is virtually eliminated. The LinearBeam provides a smooth, stable and clean movement ideal for composite manufacturing.

## Futuramic Tool & Engineering for Boeing



## SERAPID RANGE OF PRODUCTS : A RELIABLE AND ROBUST ALTERNATIVE TO HYDRAULIC SYSTEMS

### Heavy duty telescopic column

*A complete, self-supporting and compact system*

The telescopic lifting column designed by SERAPID meets the demand of a growing market for compact lifts. This purely mechanical drive system is based on our Rigid Chain Technology and is easy to install even in difficult environments, can be configured for specific functions, and requires only minimal installation space. The system consists of a LinkLift drive which stabilises the extended lifting chain and the load. It forms a unit specifically designed for applications where the loads cannot be guided. Easy to install, no excavation work or tunnel boring is required because the retractable lifting chain is stored in a compact magazine at the ground level. In operation, the applied lifting forces are transferred to the base plate, making for superior stability.



The telescopic lifting column is available in different sizes and options, for all industrial sectors, depending on the needs of the customer. For larger installations, the units can be grouped and the operation easily synchronized.

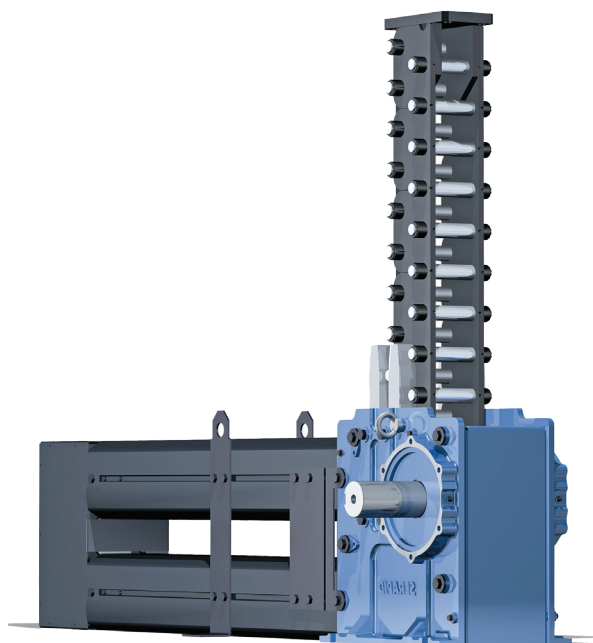
### LinkLift

*High stability*

LinkLift actuators prove their performance capabilities in the toughest environments. The chain is made with unique block-shaped links placing the centre of gravity right in the geometric center. When aligned and interlocked with each other, they form a lift column with high stability and rigidity, and when retracted, the chain coils back into a compact storage magazine.

This telescopic ability, coupled with its low maintenance requirements, provides a product that is a ideal alternative to hydraulics and jacks screws.

The standard range has load capacities up to 15 tons dynamic per lift column, and up to 8m lifting height. Simple modifications allow heights up to 20m to be achieved. Our complete range of models allow solutions to match your exact specifications.



## RollBeam & LinearBeam

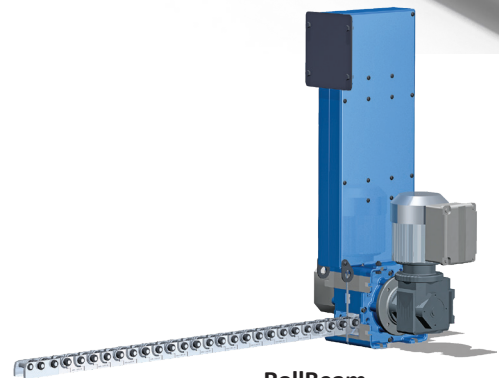
### *Push-Pull horizontal movement*

The RollBeam and LinearBeam range of linear-actuator systems represents the most universal implementation of SERAPID's widely used and proven Rigid Chain Technology.

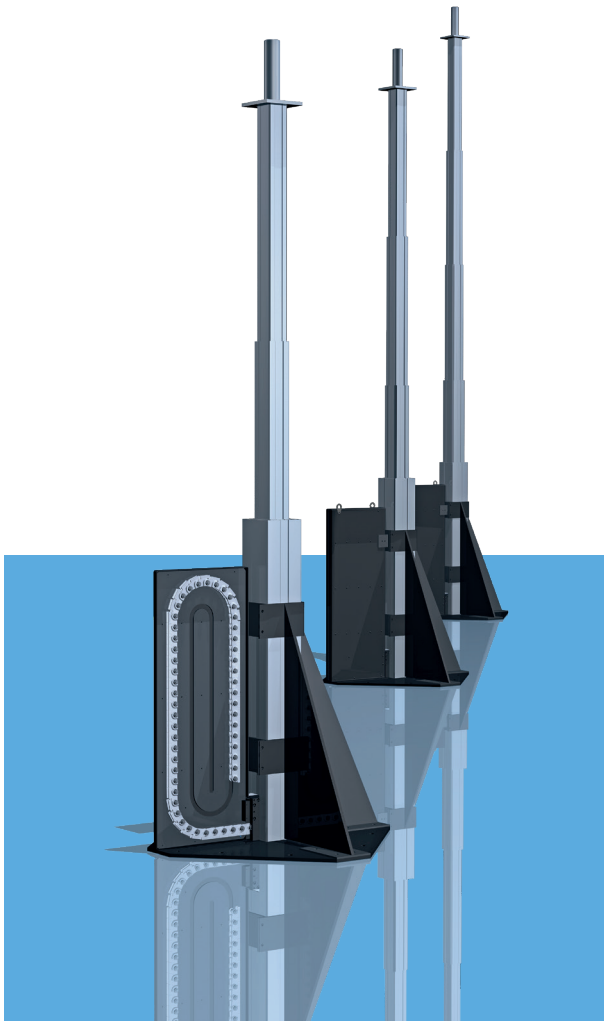
Standard models cover applications up to 50 tons at a practically unlimited stroke. Special versions allow for operation in harsh environments. The RollBeam features telescopic functionality. The LinearBeam features heavy load and high speed functionality. Both can be used either vertically or horizontally.



**LinearBeam**



**RollBeam**



## Telescopic mast

### *Reliable, stable and easy to use*

Telescopic Mast has been designed for unsurpassed stability under all types of conditions, including a version in compliance with MIL-STD-810G Specification.

In addition to the unique push-pull characteristics of the SERAPID Rigid Chain - the backbone of the system - there are multiple engineered elements, such as intermediate guides and snug-fitting pad bearings, to ensure safe and reliable lifting. This gives the lift column a high static capacity allowing it to remain stable while holding a load for indefinite periods.

The mast is readily programmed for precise, incremental and repeatable movement for raising or lowering the load.

### They trust us :

- Bombardier
- Airbus
- Boeing
- EDAG Engineering GmbH
- General Dynamics
- NASA
- Northrop Grumman
- ATR
- Tardec

- US Army
- US Navy

#### National Laboratories :

- Fermilab
- Los Alamos
- Oak Ridge
- Sandia
- Savannah River



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