

TPS

Torres positioning system

ACCURATELY LOCATES AIRCRAFT COMPONENTS TO OBTAIN BEST FIT

When it comes to positioning systems technology, MATORRES is setting the pace. In terms of quality, design and sheer product innovation, we're passionate about giving customer nothing but the best. So when it came to developing jig less range, we talked to some real experts, —our customer— and built the TPS based on the results of that research.

The MATORRES positioning system, TPS, is an in house developed system to accurately locate in space the aircraft components to allow the best fit among them. It is a new generation of reconfigurable assembly jigs equipped with integrated 'on line' measurement systems and using NC controlled reconfiguration axes for parts motion / repositioning.

It reduces the assembly time required in the jig and it is capable of producing highly consistent and traceable assemblies substantially rising the overall quality standards. MATORRES positioning systems as an integrated



system designed to support measure and reposition the different parts involved at the final assembly position.

TPS positioning software is an MATORRES proprietary software package that defines and controls all the system parameters related to the parts positioning process.



FUSSELAGE INTEGRATION SYSTEMS

Flexible Assembly Cells that allows the assembly of multi program fuselage sections versions at passenger and freighter configurations, in which the Process Flow and Lay Out definition are performed at concurrent engineering phase. Additional outsourced companies were included in the team under MATORRES supervision.

At that assembly line different concepts were used, joining the highest technology of reconfigurable assembly jigs equipped with integrated 'On line' measurement systems, with parts pre assembly and later transfer to final assembly jig.

High flexibility based in the capability to control up to 56 CNC axes on 28 TPS positioners, being the necessary reconfiguration performed from the HMI of the system in less than 1 minute. Two Laser Tracker units are included providing position readings to the MATORRES TPS Software which calculates the best fit.

All process and jig functionality are controlled from an operator control desk, ensuring the safety and the product quality





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HORIZONTAL STABILIZER INTEGRATION SYSTEMS

Automated assembly system to integrate/form Horizontal Stabilizers and later works as integration of the formed Horizontal Stabilizer in the Tail Cone.

Also all necessary material handling and transporting systems are part of the scope of work. Other technologies, such as drilling and riveting could be added to the cell automate further the process. All process and jig functionality are controlled from an operator control desk, ensuring the safety and the product quality.

One fixed Laser Tracker unit is included providing data to the MTORRES TPS Software which calculate the best fit, creating a specific part program, which will be executed, in an interpolated mode, to reposition the parts to its best geometrical position and helps the operator to have a smooth motion for part to part alignment.

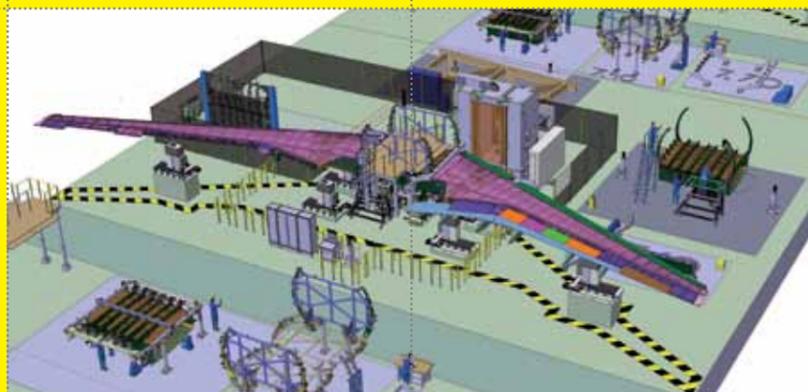
This smooth motion is provided by 6 high accuracy TPS positioners in the system with a total of 12 CNC Axes. Depending on the part configuration different interfaces have been developed.

- Vacuum cup, with maximum tilt angle will be 10° in any direction, guarantee a suitable holding of the part.
- Multi-program interface frame, that allows to clamp by mechanical fixtures, different size of aircraft HS, without any modification.
- Customized clamping system.

WING INTEGRATION CELLS

Final Wing Integration Cells have been designed to assure the best balance between operation cost vs quality / geometrical performance.

A jigless concept, fully integrated with the Boxes manufacturing process, includes the most flexible and versatile positioning system TPS, based on movement and perfect positioning control of the wing parts.



PROGRAMS



• A350



• Airbus A380



• Airbus A400M



• B787



• Comac C919



• Embraer KC 390



• Falcon 7X



• Irkut MS21

System, easily scalable, has been designed to integrate the most complex wing design based at two or three parts by NC high accuracy controlled positioners and external position feedback system based at Laser Tracker.

High capacity automated machining process, drilling/ riveting/milling equipment TDRILL/TRIVETER/TMILL, has been incorporated to provide a highly powerful assembly cell, as the machines provide full automatic processes including:

- Real Joint Measurement processes, to be incorporated in the best fit calculations, reducing the joint gap and step and increasing the wing structural and aerodynamic performances.
- Automatic drilling process, with high performance in terms of capacity and accuracy, reducing the total recurring cost.
- Automatic milling process, as a result of the real measures taken at the joint, the pieces involved could be directly milled reducing the need of shimming, increasing the total structural wing capacity.