ORMEC
Productivity in Motion

APPLICATION
Aerospace / Military

Airframe Assembly—Wing Join

The assembly process for airframes incorporates a series of Join tools. One is the Wing Join tool which positions the left-hand and right-hand wing sections. These wing subassemblies must be positioned for a seamless fit and then locked in place so that a mechanical join can be completed. Laser target alignment is used to control the positioning of the wing jacks.

For the airframe components to be properly joined, use of high-precision and highly reliable servo systems and software is essential. An intuitive graphical interface improves assembly operations time by providing operators the visualization of information required to control the automatic positioning. Additionally, individual adjustments to jack positions can be made via operator touch screens.

Wing Join tool automation is one of a series of motion control systems used in C-17 aircraft assembly.

Application Highlights

The system executes fully automated wing alignment. Predefined sequencing is performed to home and move the wing jacks to their preload positions, load the left and right wings, and precisely position the wings for mechanical joining.

Adjustments from an operator touch screen can be made to fine tune each wing alignment. Positioning precision is up to .001 inches.

Motions between multiple jacks on a wing are synchronized to avoid stresses on the aircraft components. Specialized software and hardware interlocks insure this coordination.

Productivity in Motion

- Improved airframe assembly operations with easy-to-use operator interface.
- Safety override features including software halts, and hard-wired e-stops.
- Decreased down time with reliable and rugged system hardware.

Backup and Recovery Strategies

- Battery backup system supports fully automatic restart and recovery routines.
- Motion cabinets and controllers can operate if the SCADA system is offline by using a directly connected PC.

System includes a badge reader for secure system access.

Operator Interface

- Single or dual touch screen operator monitors.
- Security badge reader for controlled system access.
- Remote access via wired or wireless operator pendants.

SCADA Computer

- Data collection for trending and archiving.
- RAID—redundant arrays of independent disks for secure data storage.

ORMEC Equipment

Multi-axis ORMEC Controllers

- Motion control and PLC functions with high performance computing capability.
- High speed drive based I/O with microsecond position capture servo updates.
- Sub millisecond programmable limit switch outputs.
- Drive fault protection circuits, watchdog timers and integrated diagnostics for fail-safe operation.

ORMEC Servo Drives

- High bandwidth control with high resolution motor feedback, for quick and accurate torque, velocity and position control.
- Programmable drive real-time software configuration tools.

ORMEC AC Servo Motors

- High performance, reliable with low maintenance.
- Large library of standard motors and a custom motor wizard for non-standard motor configuration.

Certified UL508A panels

- Integrated panels are built to your design specifications and are UL certified by ORMEC.

Custom integrated panels are provided with UL certification.

Operator consoles

Touch screen monitors

- Easy-to-use.
- Efficient commands.
- Secured access via card reader.

Pendant stations

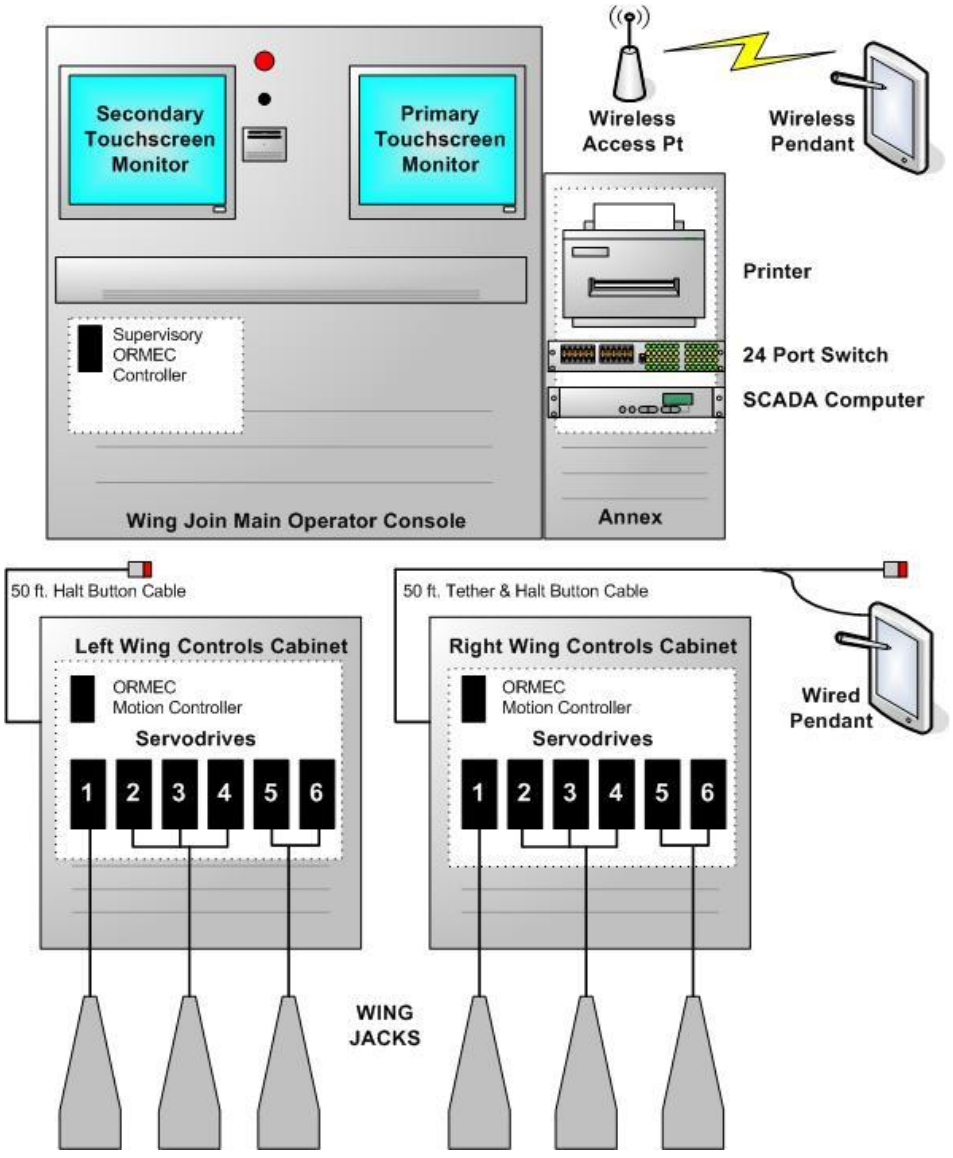
- Operator flexibility for remote access— wired and wireless.

SCADA Computer

- Historical data collection and archiving.

Backup Operation

- In backup mode, the motion controls can be independently operated with a directly connected PC.



ORMEC configuration for a typical Wing Join system.

The motion control experts at ORMEC have a wealth of experience providing motion control solutions for the aerospace industry. As your automation partner, we offer a comprehensive range of automation integration and project management services.

For more information please contact us by phone (585) 385-3520 or email us at sales@ormec.com