

CASESTUDY



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API between main.c and doonstack.asm

```
doonstack  
doonstack  
plusplus
```

```
"C" { /* our assembly functions have C calling convention */
```

```
DoOnStack(void); /* prototype for DoOnStack routine */
```

```
FlashErase(unsigned char *); /* prototype for FlashErase routine */  
/* Page Erase command */
```

```
FlashProg(unsigned char *, unsigned char); /* prototype for FlashProg
```

```
/* Byte Program command */
```

```
plusplus
```

Elevating Defense Infrastructure: A Pinnacle in Excellence with MASL's IACCS Data Wall Solution





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THE CLIENT

Bharat Electronics Limited (BEL), a prestigious entity in defense technology, collaborated with Millennium Automation to fortify the Annual Maintenance Contract (AMC) for the Integrated Air Command and Control System (IACCS) Data Wall across five Indian Air Force Nodes. As a premier defense solutions provider, BEL's choice of Millennium Automation underscores the critical nature of the project and the need for a reliable partner with expertise in IT systems integration for enhancing the IACCS capabilities.





THE CHALLENGE

Reliability Concerns:

- Concerns related to the reliability and continuous operation of the mission-critical defense infrastructure.

Technical Expertise Requirement:

- Requirement for specialized technical expertise in AMC services for Barco Data Walls and associated accessories.

Seamless Integration Challenges:

- Challenges in achieving seamless integration of various components within the specified Air Force Nodes.

Diverse Component Management:

- Managing and optimizing the performance of a variety of components, including switches, UPS, PDU, racks, and workstations.





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System Interoperability:

- Issues related to the interoperability of different elements within the IACCS Data Wall system.

Ensuring Continuous Support:

- The need for continuous and dedicated support to address potential disruptions and ensure uninterrupted operation.

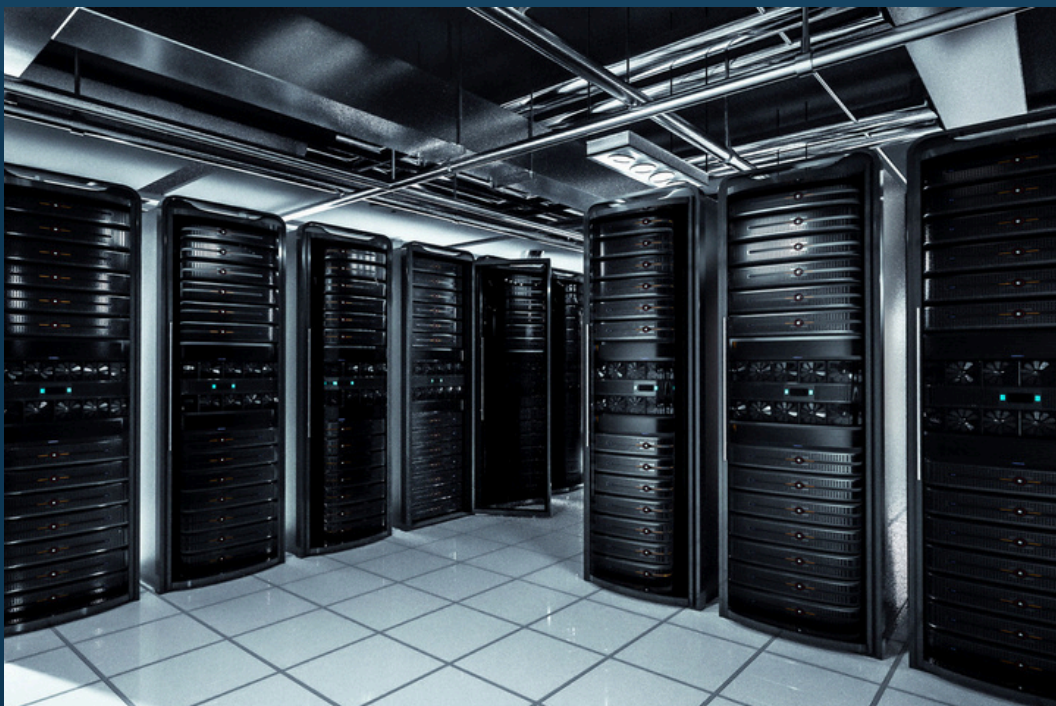
Mission-Critical Concerns:

- Addressing concerns related to the mission-critical nature of the IACCS project and its impact on defense capabilities.

Efficiency Enhancement Requirement:

- The requirement for a partner to enhance the operational efficiency and overall reliability of the IACCS Data Wall system.

These challenges underscored the client's need for a proficient and reliable partner to address complex maintenance and operational intricacies in the critical defense infrastructure.



THE SEARCH



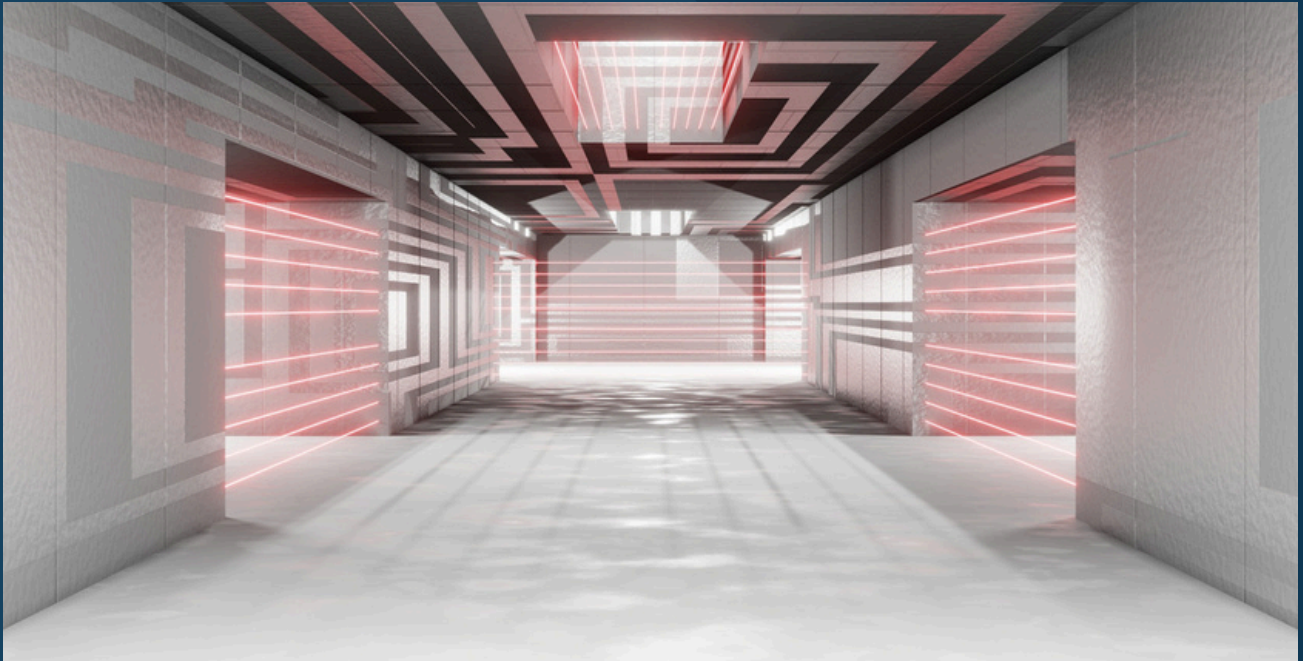
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In the quest for a dependable partner to address the complex challenges associated with maintaining and optimizing the Integrated Air Command and Control System (IACCS) Data Wall, Bharat Electronics Limited (BEL) embarked on a meticulous search. The criteria for selection involved finding a partner with proven expertise in Annual Maintenance Contract (AMC) services, particularly in the realm of defense infrastructure.





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SCOPE OF WORK

The scope of work for the Annual Maintenance Contract (AMC) project undertaken by Millennium Automation for the Integrated Air Command and Control System (IACCS) Data Wall at five Indian Air Force Nodes was extensive and meticulously detailed. The project encompassed a wide range of tasks and responsibilities to ensure the seamless operation and optimization of the mission-critical defense infrastructure.

Key components and activities included:

Supply, Installation, and Maintenance:

- Comprehensive supply, installation, and maintenance of critical components, such as Data Wall cubes, Omni bus, Controllers, Engines, Graphics cards, DVI cards, Switches, UPS, PDU, Racks, Workstations, and more.





Quantitative Specifications – Bill of Quantities (BOQ):

- A detailed Bill of Quantities (BOQ) specifying quantities for various equipment, ensuring clarity in the procurement and installation process. Notable items included 96 Data Wall cubes, 20 Data Wall Controllers, 224 Encoders, 12 1KVA UPS, 8 30KVA UPS, 40 Split AC units, 16 OWS Workstations, 8 Switches, 4 Wall Management Software, and 8 Time Controllers.

System Integration Services:

- Acting as a System Integrator Partner, ensuring the seamless integration of diverse components within the specified Air Force Nodes to enhance overall efficiency.

AMC Services for Barco Data Walls:

- Providing top-notch AMC services for Barco Data Walls and associated accessories, ensuring the reliability and efficiency of the entire IACCS system.

Nodes Covered Under AMC Support:

- Comprehensive coverage of five Indian Air Force Nodes, namely Barnala (Punjab), Wadsar (Gujarat), Jodhpur (Rajasthan), Ayanagar (Basant Nagar), and Ambala (Haryana).

Warranty Support Services:

- Delivery of warranty support services, including the deployment of Resident Engineers, to guarantee the successful operation of the IACCS Data Wall systems. The detailed scope of work outlined Millennium Automation's commitment to delivering a holistic solution, addressing the unique challenges of maintaining and optimizing the IACCS Data Wall across diverse Air Force Nodes.





THE SOLUTION

Millennium Automation, as the selected partner for the Annual Maintenance Contract (AMC) project, implemented a comprehensive solution to address the intricate challenges associated with the Integrated Air Command and Control System (IACCS) Data Wall. The strategic solution encompassed various aspects, ensuring the seamless operation, optimization, and reliability of the mission-critical defense infrastructure.

Here are the key components and features of the solution:

System Integration Expertise:

- Leveraging its role as a System Integrator Partner, Millennium Automation brought in-depth expertise to seamlessly integrate diverse components within the Air Force Nodes. This expertise was crucial for enhancing the overall efficiency of the IACCS project.





Data Wall Cubes:

- Executed a meticulous installation of 96 Data Wall cubes, ensuring precise alignment and optimal functionality in the 8x3 matrix configuration.

Omni Bus and Controllers:

- Installed Omni bus and Controllers, integrating them seamlessly with the Data Wall to facilitate centralized control and efficient data distribution.

Graphics and DVI Cards:

- Implemented a strategic installation of Graphics and DVI cards, essential for rendering high-quality visuals on the Data Wall, contributing to enhanced situational awareness.

Switches and UPS Systems:

- Installed Switches and UPS systems to ensure robust networking capabilities and uninterrupted power supply, critical for continuous Data Wall operation.

Racks and Workstations:

- Deployed Racks to organize and secure components efficiently, while Workstations were strategically placed for operators to manage and monitor the Data Wall with ease.

Encoders and Wall Management Software:

- Integrated 224 Encoders seamlessly into the system, enhancing data encoding capabilities. The installation of Wall Management Software provided centralized control and monitoring capabilities





Time Controllers:

- Installed Time Controllers to synchronize operations across the Data Wall, ensuring temporal coherence in the display of critical information.

Split AC Units:

- Strategically placed and installed 40 Split AC units to maintain optimal operating temperatures, safeguarding the longevity and performance of sensitive equipment.

OWS Workstations and Network Switches:

- Positioned 16 Operator Workstation (OWS) units for efficient monitoring. Network Switches were strategically installed to manage data flow seamlessly.

Comprehensive Cabling:

- Executed a comprehensive laying and integration of electrical and network cables, ensuring an organized and efficient system infrastructure.





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LCD Displays:

- Installed LCD Displays to complement the Data Wall, enhancing the overall visual experience and contributing to effective information dissemination.

CAT6 Network Cabling:

- Employed CAT6 Network Cabling for high-speed and reliable data transmission, supporting the demands of the intricate Data Wall system.

Facility Management & Services:

- Provided Facility Management & Services to ensure the overall maintenance and operational readiness of the installed components.

The phased installation of these critical components showcased our commitment to precision, reliability, and optimal performance in each facet of the Integrated Air Command and Control System (IACCS) Data Wall.





THE OUTCOME

Enhanced Operational Efficiency:

- The implemented solutions resulted in a substantial enhancement of operational efficiency within the Integrated Air Command and Control System (IACCS) Data Wall. The strategic integration of components and optimized maintenance practices contributed to streamlined operations.

Uninterrupted Data Wall Performance:

- The meticulous installation and maintenance efforts ensured the uninterrupted performance of the Data Wall system. This reliability is critical for mission-critical defense operations, fostering confidence in the seamless functioning of the IACCS project.

Optimized Visualization and Control:

- The precision installation of Data Wall cubes, graphics cards, and controllers led to optimized visualization and control capabilities. This improvement in situational awareness is crucial for effective decision-making in Air Force operations.

Seamless Data Flow and Networking:

- The strategic placement and integration of switches, encoders, and network cabling resulted in seamless data flow and networking. This achievement is instrumental in maintaining real-time communication and coordination across Air Force Nodes.

Temperature Control and Equipment Longevity:

- The installation of Split AC units and comprehensive cabling addressed temperature control, ensuring optimal conditions for equipment longevity. This contributed to the sustained performance of critical components.





Centralized Control with Wall Management Software:

- The integration of Wall Management Software facilitated centralized control and monitoring. This centralization streamlined the management of the Data Wall, contributing to a more efficient and responsive operational environment.

Improved Situational Awareness:

- The holistic optimization of components, including LCD displays and Time Controllers, improved overall situational awareness. This outcome is crucial for effective decision-making and response in dynamic defense scenarios.

Efficient Facility Management:

- The provision of Facility Management & Services ensured the overall efficiency and readiness of the installed components. This comprehensive approach contributed to the longevity and optimal performance of the entire IACCS Data Wall system.

Proactive Issue Resolution through Warranty Support:

- The deployment of Resident Engineers and the provision of proactive warranty support services demonstrated a commitment to resolving issues swiftly. This proactive approach contributed to the reliability of the Data Wall during the critical warranty period.

The outcomes of the critical project with Bharat Electronics Limited (BEL) underscore Millennium Automation's success in delivering a solution that not only met the outlined scope of work but exceeded expectations. The enhanced operational efficiency, reliability, and optimized performance of the IACCS Data Wall stand as a testament to our commitment to excellence in defense infrastructure maintenance.





This case study stands as a testament to MASL's commitment to excellence. Through strategic collaboration, we enhanced defense capabilities, ensuring mission-critical reliability and advanced situational awareness. Our innovative solutions position us as a trusted partner in shaping a secure future.





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“Transform your business with our proven solutions and elevate to new heights”.

GET IN TOUCH !



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