



COMPANY OVERVIEW



SASMOS overview - video



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A Reliable Long Term Strategic Partner – A focused approach.



1. Stakeholder commitment to institutional approach

– Global culture, Competency, Technology and Investment



2. Partnership approach for increased value add

– Quick learning, Global affordable solutions



3. A decade of successful engagement with clients

– Scalability, De-risking and Proven track record



4. Exclusive facility for client programs

– Customization, Compliance & Global Footprint



5. Continuous improvement of Quality & Delivery

– APQP, FMEA, “Always Gold”, Sustenance to achieve Quality Excellence



6. Innovative investment for value add

– Localization, Affordability & Speed to market



SASMOS Journey - Focused Evolution

2007 - 09

2010-13

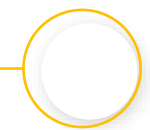
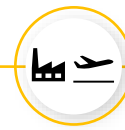
2014-17

2018-19

2019-20

2020-21

Near Future



Global Partnerships 



- Focus on Process, QMS, AS9100 Certification
- Build to Print Wiring Harness

- Entry into Electro mechanical Assy., ATE
- Entry to European Region
- Entry to Space program

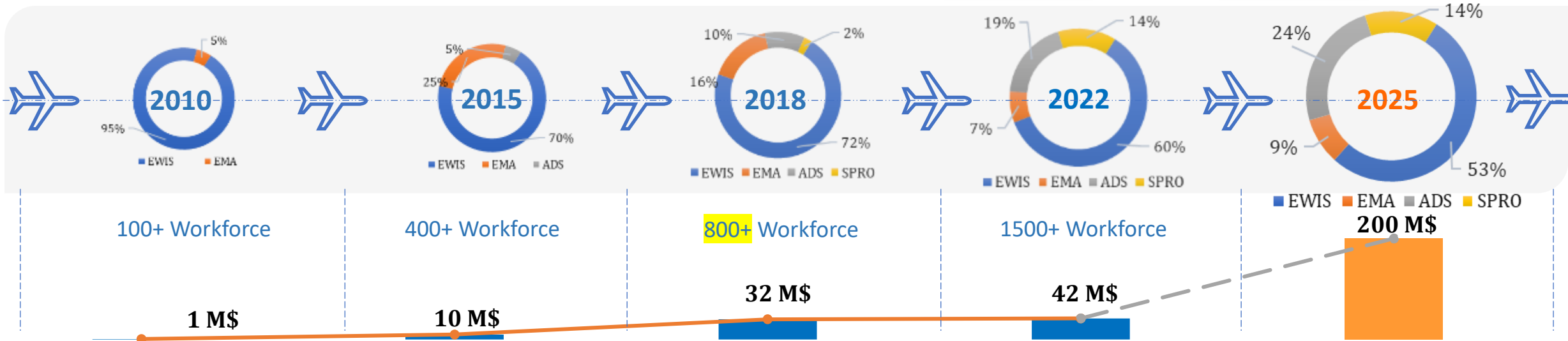
- Aircraft Harness
- Build to Specification
- Entry into Cockpit Panels
- Digital Transformation

- Entry to A&D Elec. Systems
- UK Office in 2018
- CoE for Design & Development

- SCFO Facility for Fiber Optics
- AVIRATA Facility in SEZ @ Bengaluru for A&D Systems

- 1500+ Workforce
- Acquired *Westwire* Mfg. facility in UK 2021
- Entry to Medical systems

- Mfg. Facility @ Pune
- Soon US office by 2023, Mfg. 2024



*EWIS- Electrical Wiring Interconnections Systems

*EMA- Electromechanical assemblies

*ADS - Avirata Defence Systems

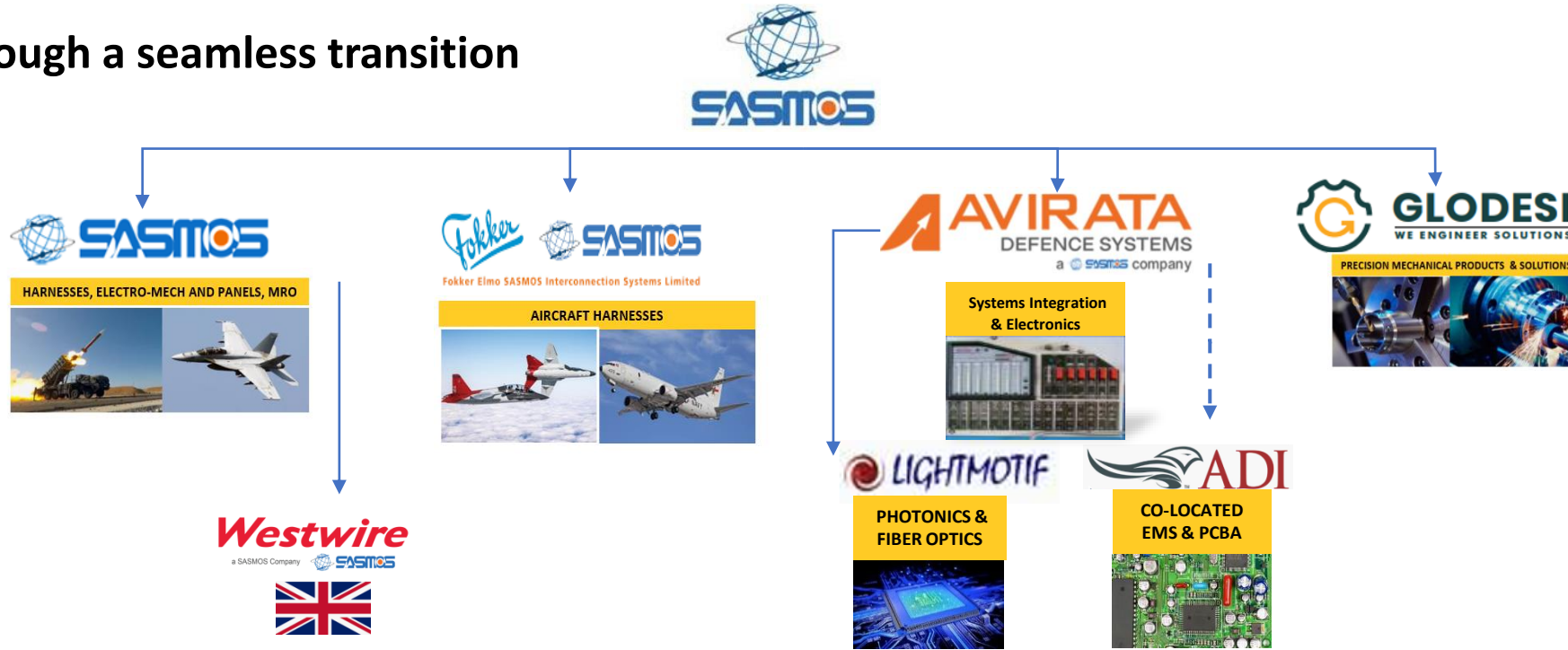
*SPRO- Speciality products

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SASMOS Group Ecosystem & Global Footprint



Value add through a seamless transition



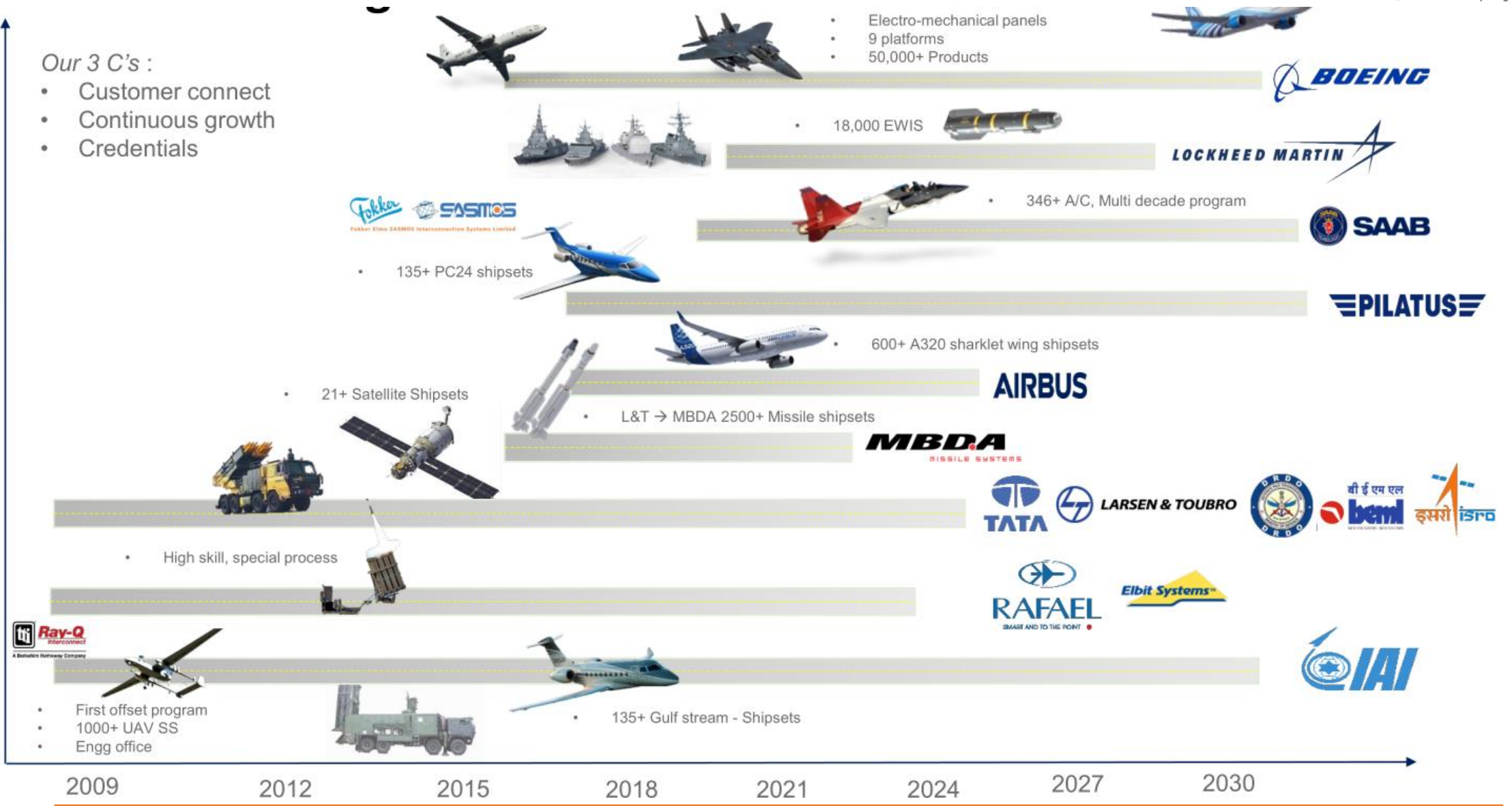
Our proximity to Global Customers : 4+1 Manufacturing Units in India, UK. Offices in India, UK, USA, Israel, France

Whitefield, Bangalore 150,000 Sq ft	Pune 12,500 Sq ft	Corp office, D&D Central Bangalore	Design Center Hyderabad	SEZ Bangalore 150,000 Sqft / 365,000 Sq ft	PM & Engg Office	Swindon, UK 10,000 Sq ft	USA (by 2023)	

SASMOS Clients

Our 3 C's :

- Customer connect
- Continuous growth
- Credentials



- Electro-mechanical panels
- 9 platforms
- 50,000+ Products

• 18,000 EWIS

• 346+ A/C, Multi decade program

• 21+ Satellite Shipsets

• L&T → MBDA 2500+ Missile shipsets

• High skill, special process

• 135+ Gulf stream - Shipsets

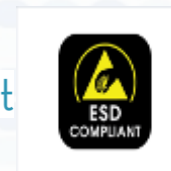
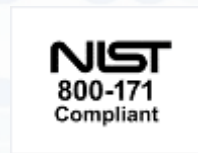
SASMOS: Audit & Certifications



AC7120 & AC7121



Compliance and Participation in trade associations



100% Success rate in 60+ Formal Audits by Global Customers, Third parties, Audit Agency with ~ 500+ person days.....

AVIRATA (अविरता) – Sanskrit

a, Not desisting or ceasing from;
n, **perpetual**, uninterrupted, continual, unbroken



AVIRATA
DEFENCE SYSTEMS

A  **SASTROS** Company

**“One Stop Shop Near You for Electronics & More”
in Aerospace & Defence Segment to Global Customers**

Competencies in Systems Integration



DESIGN & PROTOTYPING

- Systems & Product design,
- Research and development
- Embedded systems Iirus
- Electrical, electronics, optoelectronics, photonics and Mechanical test systems
- Land, air and naval mil standards
- Over 400 man yrs. experience



SYSTEM INTEGRATION, MANUFACTURING & TESTING.

- Subsystems manufacture to print.
- Systems integration
- Ewis interconnections for aircraft, UAVs and spacecraft.
- Environmental test facility for qualification and ESS
- Space of ~390,000 sq. ft



MECHANICAL PARTS & ASSEMBLIES

- Fabricate, Machine to print
- A & D approved fab, machining and surface treatment at vendors
- Over 10,000 assemblies delivered.
- Varied vendor base



FIBER OPTICS, PHOTONICS TECHNOLOGIES

- Design & Mfr. of bespoke f/o connectivity for Aerospace & Defence
- Physical contact, collimated
- Solutions in silica (glass),
- Hard core silica (hcs)
- Plastic optic fiber (pof) fiber variants and other speciality fibers.
- Also for Enterprise, Industrial and Hyperscale

About Avirata (Avirata Defence Systems Ltd. (ADS))



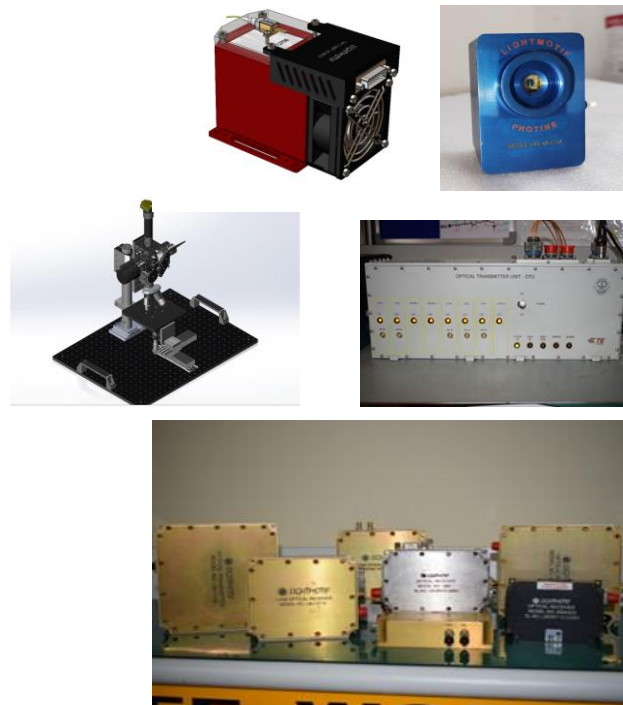
Electronics System Integration

- Testers
- Driver Panels
- Control Boxes
- Relay Boxes
- Simulator controller
- Contractor Boxes
- Fuse Box
- AC/DC Power Controllers
- Light Control Boxes
- EWIS, Wiring Harness



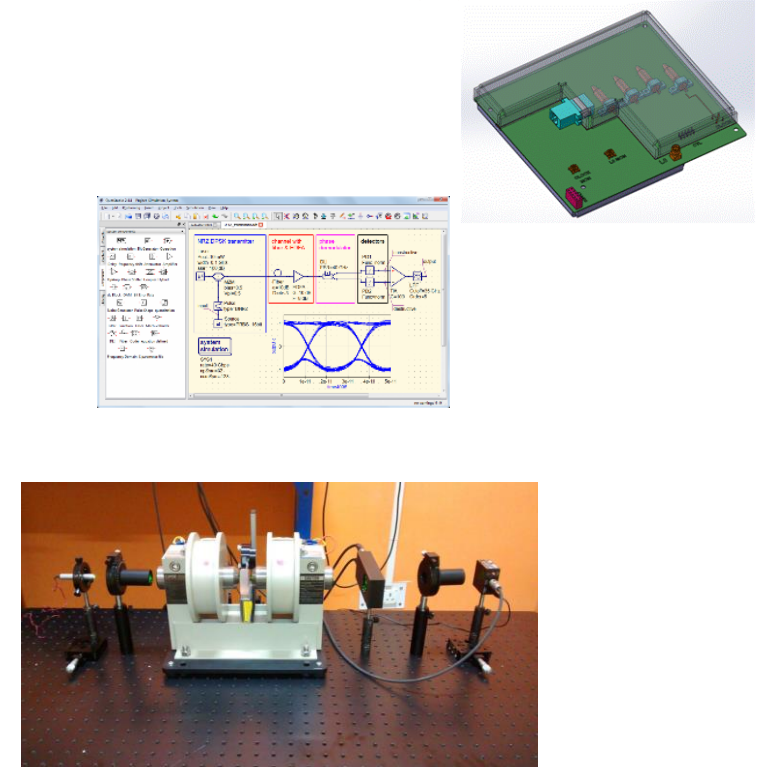
Fiber Optics, Photonics, RF

- Optical Transmitters
- Optical Receivers
- RF over Fiber Links
- Laser diode drivers
- TEC controllers
- MZM drivers
- Media converters



Services – D&D, Onboard, Onsite

- Optoelectronics and electronic circuit design
- Circuit simulation
- Thermal and vibration analysis
- Electronic enclosure design
- Automated Test Equipment



Key Differentiators



CUSTOMER FOCUS

- **Flexible & Scalable** Manufacturing Footprint supporting Quick turnaround & Short lead times.
- Ability to support Customers with Supply chain optimization , Assembly integration , Mechanical design
- **Onsite support** , Integration and commissioning
- Support for **offset programs**.
- “One-Stop” solution for our customers for **Electronics SI & Optoelectronics systems**



MANUFACTURING OPERATIONS

- Manufacturing Facility approved by Global Customers
- Well established Localised Supplier base for Mechanical parts
- Inhouse capability of internal harness designing and routing
- Inhouse NABL accredited LAB for ESS testing
- Nordson Dage Quadra 3 X ray machine for the PCBA and other critical parts Inspection
- Adding on SMT based PCBA lines – COMING UP IN 2023.



HUMAN CAPITAL

- Highly skilled work force with high level competency in soldering process, electronics assembly, Fibreoptic termination and Mechanical assembly process.
- IPC certified operators and Technicians

R & D Centre

FACILITY

Located in central business district, Bengaluru & photonics design center in Hyderabad

- Product engineering
- Design, development and prototyping
- Research programs

RESOURCES

- **30 ENGINEERS** working for (Electronics, Photonics, Mechanical & Fiber Optics)
- More than 400 man years of cumulative aerospace & defence design & application experience and competence on various platforms, customers, segments
- Dedicated design software packages for design.



Avirata – IPT Approach



Strategic Alignment and Scalable Approach

- 1400+ highly skilled human resources
- Scalability with proven track record
- Inhouse NABL accredited **Environmental Test Lab**
- Digitally enabled shopfloor & processes



- Operational excellence
- Project Management approach
- Continuous Improvement & Performance
- Key investments



Testers



Laser Marking Machine



Vibration Machine



Thermal Chambers



Digital PCR & RVI



X-Ray



3D printing



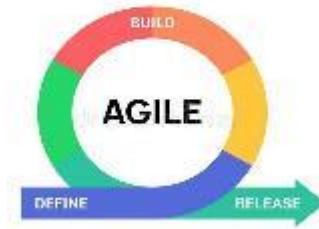
PROJECT MANAGEMENT / TEAM COLLABORATION

METHODOLOGY

TEAM COLLABORATION

CONFIGURATION MGMT

ENGG WORKFLOW



CLIENT COMMUNICATIONS

CONFERENCING

CLIENT COLLABORATION



Inhouse Lab: NABL Accredited Test Facility

EQUIPMENT

1. ELECTRO-DYNAMIC SHAKER – 1000 KgF

- VIBRATION
- SHOCK
- ACCELERATION

2. HUMIDITY AND THERMAL CHAMBERS

- - 70 to +180 DEG C
- 5 DEG C/ MIN and 10 DEG C/ MIN LINEAR

3. THERMAL CHAMBER

- - 70 to +180 DEG C
- 5 DEG C/ MIN LINEAR

INHOUSE CAPABILITY

- NABL ACCREDITED
- MIL – STD – 810
- JSS 55555
- ESS TESTING



Electrodynamic Shaker 1000 KgF



Thermal Chamber -70 to 180 deg C

Electronics Systems & Subsystems Experience



Electronics system integration for Air defence Fire Control Radar (ADFCR) project

- 5 types LRU, 500 + units supplied
- Electronics system integration
- Localization of mechanical parts
- ESS testing at inhouse NABL accredited Lab



Firing Control Computer(FCC)



Gun Interface Unit (GIU)



Optical Electrical Connection (OEC)



Wireless terminal (WT)



Remote Computer Terminal(RCT)

Program Overview

- Currently India Operates 352 nos. of ARV WZT-3 armoured recovery vehicles to recover T-72 and T-90 battle tanks. The ARV is built originally by Poland on a T-72 hull.
- The 352 nos. are being overhauled and the above mentioned systems are being refurbished by SAMSOS.
- In addition 196 nos. of new vehicles will be fitted with the SAMSOS developed systems over the next 3 years.

SASMOS Scope

- Design, development, integration, installation, commissioning, qualification and certification with Complete upgradation of below systems
 - ELECTRICAL SYSTEM developed at SASMOS
 - ELECTRICAL CONTROL SYSTEMS for Hydraulics developed at SASMOS
 - Complete FIRE SUPPRESSION SYSTEM
 - Locally Outsourced turnkey owing to paucity of time to meet deadlines

Starting System Upgrade



Driver's Panel Upgrade



Lighting Controller Upgrade



Gyrocompass Development



Hydraulics Control System – Design Refreshed



Other recovery aggregates and testers developed in-house



Electronics Test Benches

- Proven Track record as design, development, manufacturing, validation, customising ATE
- Internal Harness design, Manufacturing and routing
- Cost optimization through Supplier consolidation & Localisation of Mechanicals
- Assembly integration and Basic Electrical testing
- 500 + Units delivered to major OEM's such as Honeywell, Collins Aerospace , IAI etc
- Capability of both BTP and BTS types projects



Electronics / Electrical box build assemblies



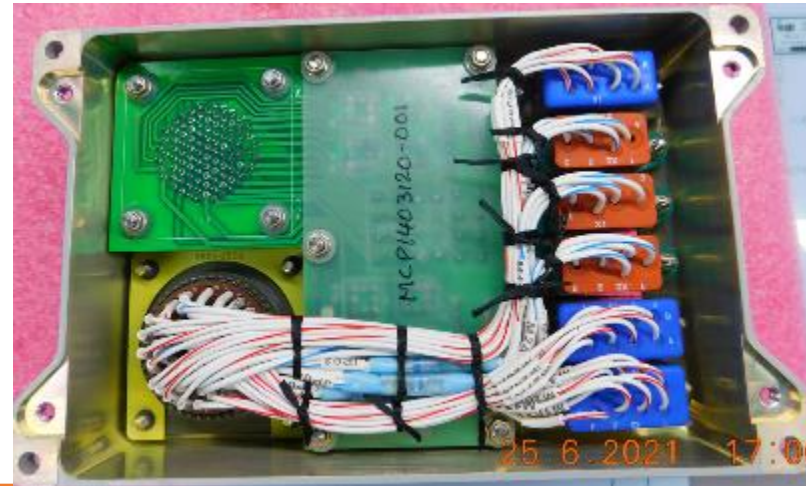
CONTACTOR BOX assembly



Relay BOX assembly



Fuse BOX assembly



Power Supply Unit for Semiconductor Test Benches



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FO Interconnect Solutions across platforms

Ground Systems

Platforms:

Tactical Communication; Satcom; Radio Networks;
Surveillance networks; ROVs; Radar systems

Interconnect Solutions:

D38999 – SIII; Arinc 801; Expanded Beam; TFOCA II & TFOCA
Hybrid, CTOS & Ruggedized ODVA Interconnect solutions; Media
Conversion Solutions

UAV Systems

Platforms:

Ground Shelter communication; Telemetry; on-board
communication

Interconnect Solutions:

D38999 – SIII (MIL 29504 & MPO connects); Expanded Beam; Arinc
801; VITA Back planes; CTOS; Media Conversion Solutions (RF over
fiber)

Naval Systems

Platforms:

Switch Distribution Networks; Radar & Sonar systems; ROVs

Interconnect Solutions:

D38999 – SIII; Arinc 801; Expanded Beam; Ruggedized ODVA
Interconnect solutions; Media Conversion Solutions, Hybrid FO
interconnects, FBG based sensors; Hermetically sealed interconnects
& Bulkhead/feedthroughs

Aviation Systems

Platforms:

Cockpit Electronics; Backplane Systems (VITA 66.1 & 66.4)
ARINC 600, 801,803, 804, 818, & 809

Interconnect Solutions:

EN4165 based Modular FO Interconnects with Luxcis contacts &
Expanded Beam connectors, EBOSA termini & DMC modules with
Luxcis contacts; MPO Backplane interconnects etc. and Media
Conversion Solutions (RF over fiber)

Weapon Systems

Platforms:

Gun Control Systems; Missile Launch stations; Shelter
communications

Interconnect Solutions:

D38999 – SIII; Expanded Beam; CTOS & Ruggedized ODVA
Interconnect solutions; Media Conversion Solutions

Field repair Services

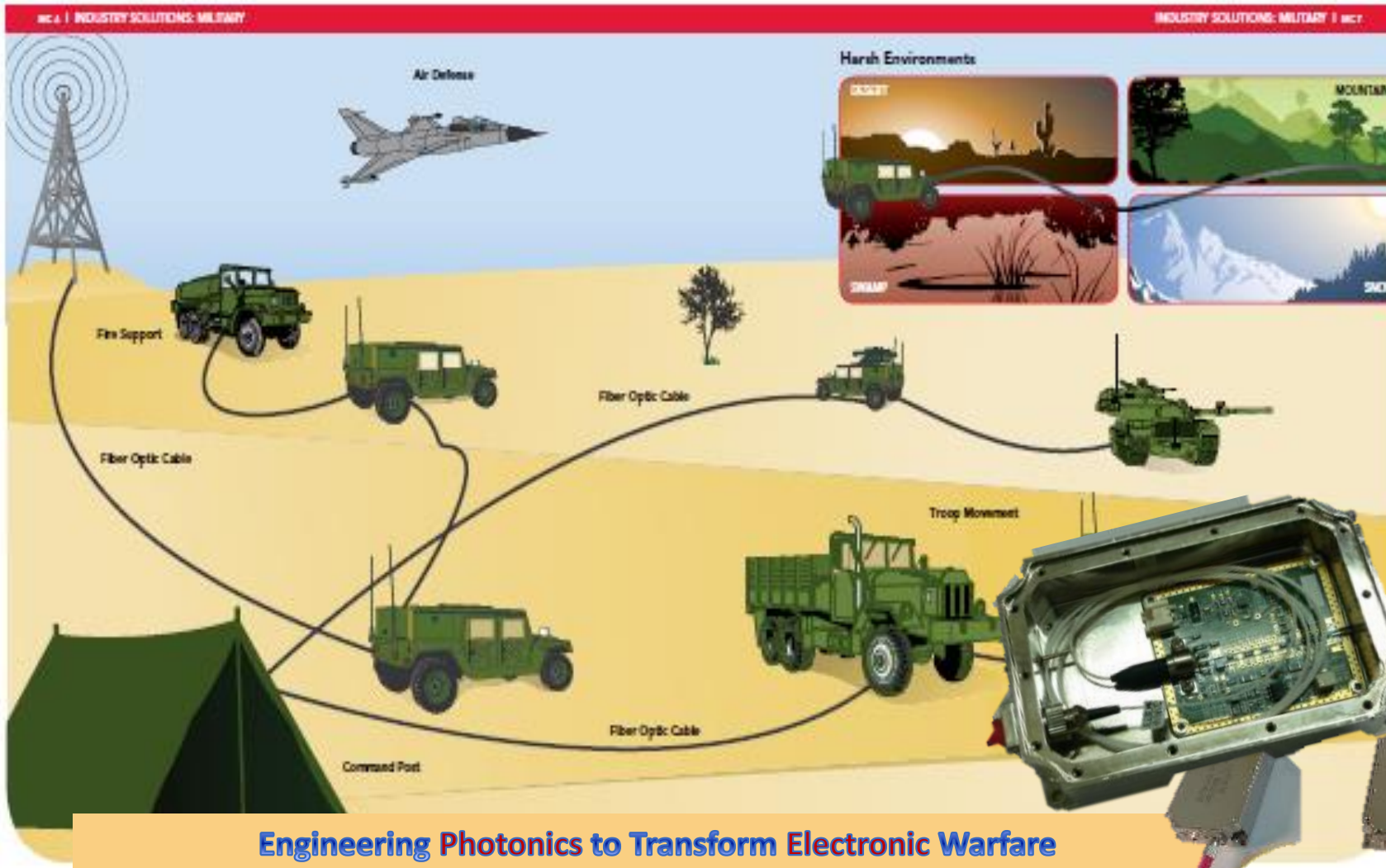
Services offered:

Field Splicing, Repair and on-site & on-board termination &
Installation of FO interconnectivity systems.
Field Inspection, Cleaning & Testing solutions.

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Photonics Offering Overview



Microwave Photonics

SatComm

Photonic Radars

Remote Antenna

EW Systems

Media Converters

Tactical Interconnectivity

Engineering Photonics to Transform Electronic Warfare



Military Ground Tactical Communication & Surveillance Systems



Ground Tactical
Communication
Systems



Ground Satellite
Communication
Systems



Combat Vehicles
Communication
Systems



Remotely Operated
Vehicles (ROV) for
Surveillance



Weapon
Communication
Systems



Ground Communication
Systems for UAVs

Typical FO Interconnectivity products which SASMOS can supply for the above areas of application



Expanded Beam
FO products



Butt-Mate FO products



Customized FO Harnesses with Expanded Beam & Butt-Mate
Connectors



Customized Opto-Electronics modules,
Media Converters.



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Air & Naval Communication & Defence Systems



Ship-Board
Communication
Systems



Radar & Sonar
Communication
Systems



Ground Communication
Systems for UAVs



Air Defence Systems

Typical FO Interconnectivity products which SCFO can supply for the above areas of application



Butt-Mate FO products
in MIL Grade Circular
connectors



Expanded Beam
FO products;
Hybrid Expanded Beam FO Products



Customized FO Harnesses with Expanded Beam &
Butt-Mate Connectors



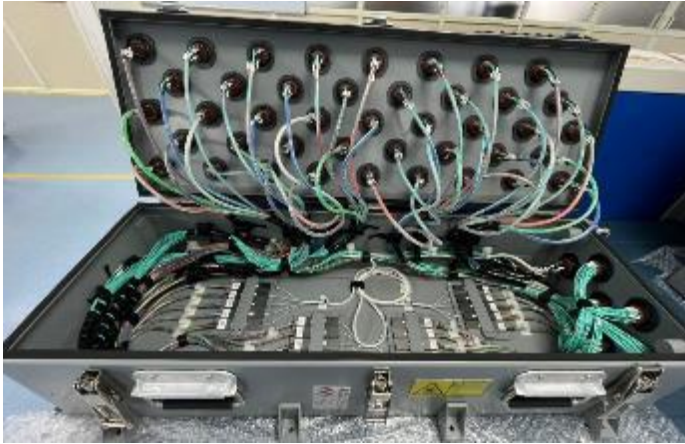
Customized Opto-Electronics modules,
Media Converters.



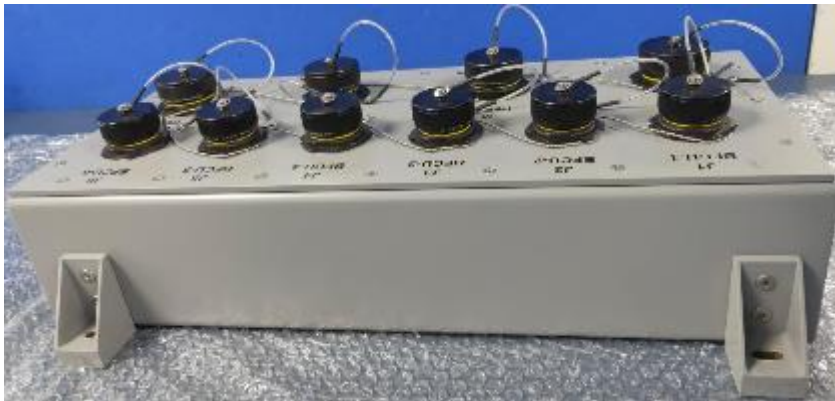
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Radar Systems connectivity in Ships



FOJB



OJB

Design/Qualify/Manufacture

- Full-blown Design & Development of Ruggedized Fiber Optic Junction (FOJB) & Optical Junction Boxes for Naval Radar Systems.
- Junction boxes housing low loss Optical Splitters of 1 x 24 configuration of SM Bend Insensitive properties. FO Skew properties of 0.25 ns achieved via design. Component selection ensures 26dBm of optical power validation through the network.
- 600+ FO connections inside the FOJB of dimension 900mm(L) x 311mm (W) x 212.5mm (D) Holds ~ 1.3 Kms of fiber inside the Box. Proven expertise of Designing and handling of high fiber count inside compact enclosures.
- Boxes are designed to handle serviceability in the field including splicing; Water sealed rivets capable of handling 100 psi adopted in the design.
- Full blown EQT and ATP tests performed as per MILstandards.
- FEA performed on the Box Designs; Dynamic & Static tests subjected on the box as per specifications; fatigue analysis at the weld joints, fasteners and rivets performed.

Key Environmental parameters:

- Operating Temperature: -40 ° C to +85 ° C
- Vibration: 5-500Hz
- Shock: 30g
- Acceleration: 2.5g, all axes (3 m/sec velocity)
- Salt Spray: 500 Hrs.
- RoHS Compliant.

Key Standards:

- MIL-STD-810H, Method 514.8, Category 4;
- BV-0240, Diagram 6 Area II in appendix B
- MIL-STD-810H, Method 516.8, Proc. I
- MIL-STD-810H, Method 513.8, Proc. I& II
- MIL-STD-108E
- MIL HDBK 454B (fungus resistance)

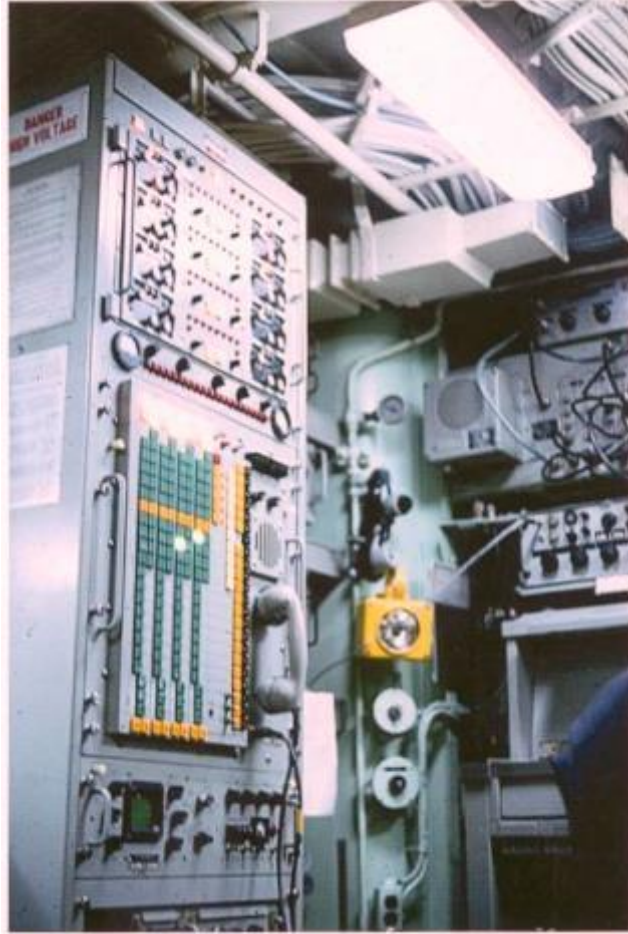


- Tactical FO Cable Interconnect solutions for shelter connectivity.
- Deployment accessories for ease of “field installation”
- High endurance cabling solutions to impart more reliability in the field.
- Rodent resistant & rodent deterrent features inbuilt into the product design
- Ruggedized media conversion solution also offered in the shelters.

“End-End” Photonics based Optoelectronics solutions offered



Switch Distribution Network (SDN) Systems



- Fiber Optic Interconnectivity for Naval Switch Distribution Networks onboard ships.
- 1 Gbps to 10Gbps networks wired with FO Interconnectivity.
- Arinc 801, MIL ST & SC based FO connectivity products supported
- Connectivity between Core Switch, Distribution Switch, EES VSP, MPIO's and Server Racks with in the SDN.
EES: Ethernet Edge Switch; VSP: Switch platform; MPIO: Multiple Input/output switch
- Low Loss FO Interconnectivity links in the order of IL <0.15 dB per link manufactured and supplied from SASMOS.
- FO cables terminated onboard ships – P15B & P17A – Destroyer class ships.



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Sonar Systems connectivity in Ships



- Ruggedized FO Interconnectivity of “Butt-Mate” and “Collimated” variants for Sonar Systems.
- Arinc 801, MIL ST & SC & Expanded Beam connector-based FO connectivity products supported.
- Cables with Rodent resistant, Rodent Repellent designs customized to the requirements.
- Special Shipboard cables terminated with Arinc 801 low loss FO connectors with specialized strain relief back shells
- Media Conversion solutions offered. (MM & SM variants of Media converters offered)



Specialized Shipboard FO cable

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Onboard Termination of FO Cables in the SDN – P15B & P17A class ships



- Deployment of Highly skilled Fiber Optic Technicians to terminate FO cables on-site in customer's location to execute on-board termination in a timely & accurate manner.
- On-Site termination can be on-board ships by mapping cabin architecture on-board ship and determination of polarity & fiber path required for the SDN.(both at Equipment end & LRU end)
- Full fledged Fiber Optic Termination, Polishing & Testing kit in place to support on-site termination of different variants of FO connectors. (Mil-Grade & Non-Mil grade)
- Capable of handling Armoured, Break-out, Unarmoured FO cables & Hybrid FO cables on-site.
- Termination of FO Cables, Routing in the LRUs, Testing, Identification & Installation of FO cables on-board as per customer requirement.

AVIRATA – ADI

Strategic Partnership – to Offer “One Stop Shop” solutions from the Best of Both worlds for System Integration



CAPABILITY

- Surface Mount Technology
- Through Hole Technology
- Automatic Optical Inspection
- Flying Probe Test
- X-ray Inspection System
- Environmental Stress Screening
- Conformal Coating
- BGA Rework
- Class 10000 Clean Room
- Parylene Coating System
- Well established ERP System



CCA: 6-layer



- Highly populated Mixed technology single side
- SMT, PTH wave solder & hand soldering
- PCB, mixed technology
- SMT, PTH wave solder, hand soldering
- Short stand-off rivets

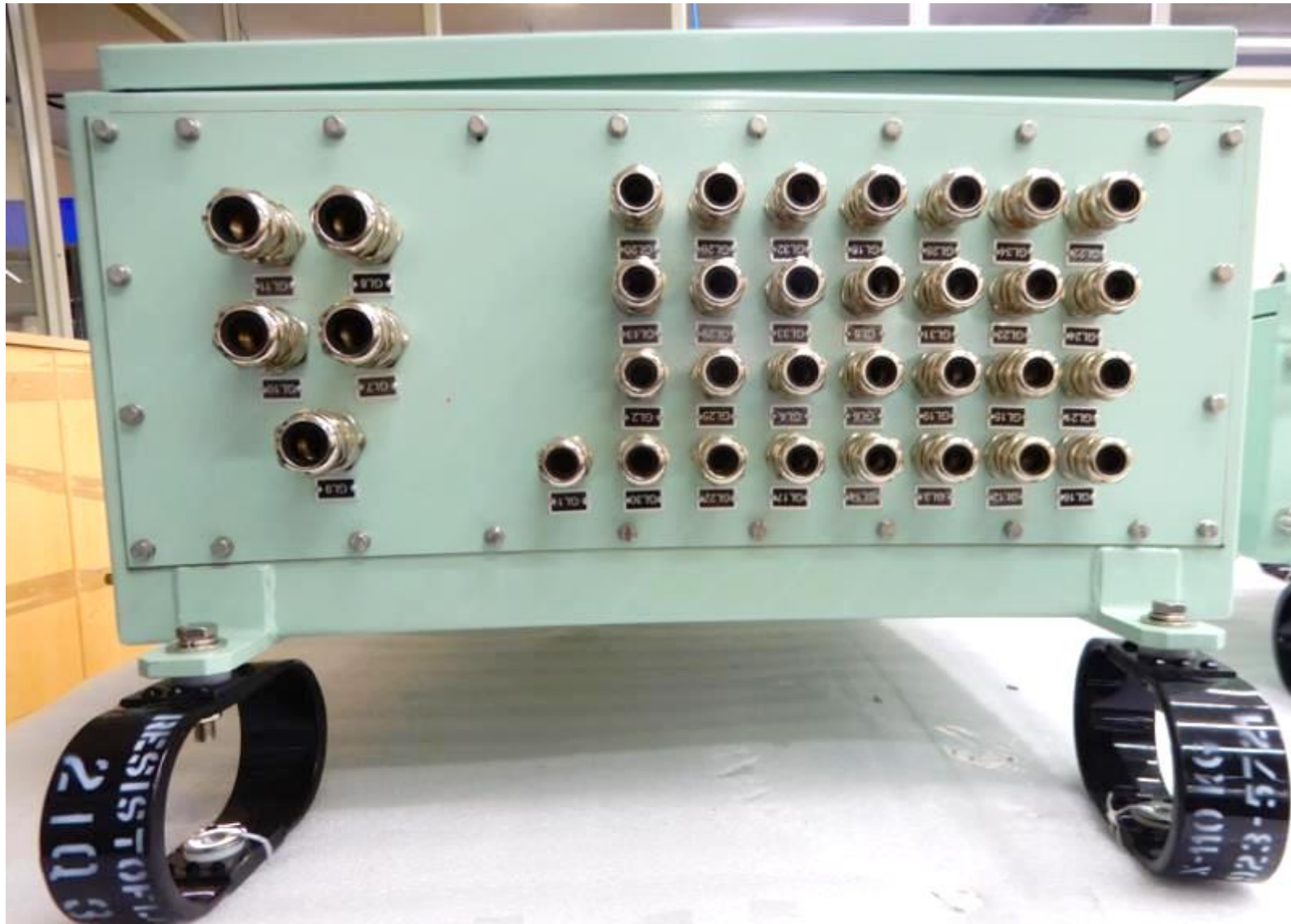
CCA:12-layer

- Gold pad, 900 components (0805, SOT, QFP, 119 PIN connector).
- Mixed technology (SMT, PTH wave solder & hand soldering).
- Acrylic Conformal coating.
- Undergoing 100% FPT (Flying Probe Test) and ESS (Environment Stress Screen)



Photos of System Integration Builds by Avirata Defence Systems

BOX Build Capabilities – Naval Application



BOX Build Capabilities – Naval Application



BOX Build Capabilities

Complex Wiring connections



Box Builds with PCBA



BOX Build Capabilities



BOX Build Capabilities – Military Tank



Drivers Panel



Limit Switch



MAK 1.2



Inverter



Relay Box



Removable Panel



SP Mak



Crane Control
Panel



Lighting Control
Panel



Oil Level Limit
Switch

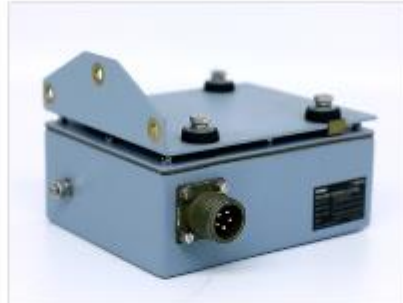
BOX Build Capabilities – Military Tanks



Ammeter



Testers



Welder Controller

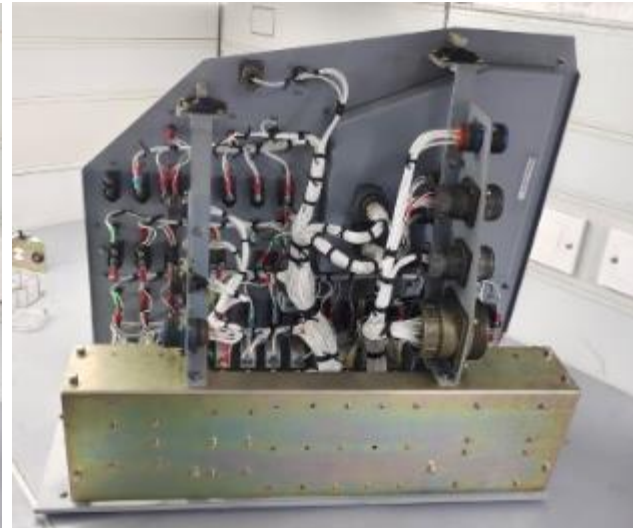


Fuel Limit Switch



Dozer Control

Driver's Panel



Electronics / Electrical box build assemblies



CONTACTOR BOX assembly



Relay BOX assembly



Fuse BOX assembly



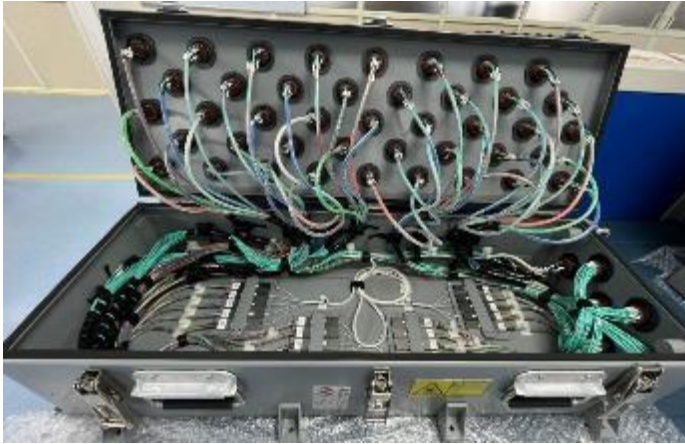
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Electronics Test Benches

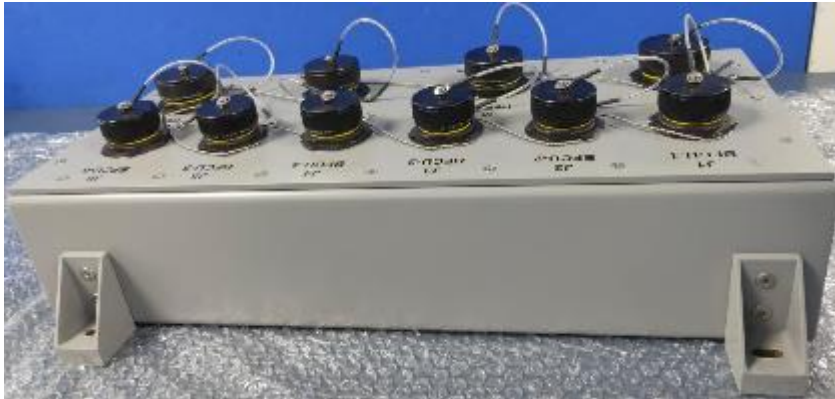
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- BV-0240, Diagram 6 Area II in appendix B
- MIL-STD-810H, Method 516.8, Proc. I
- MIL-STD-810H, Method 513.8, Proc. I& II
- MIL-STD-108E
- MIL HDBK 454B (fungus resistance)



THANK YOU

CONNECT US



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