

# EXPERIENCE **COMFORT**

**Cabin  
Interiors,  
IFE &  
Connectivity  
Services**  
By HCL

A well-crafted aircraft interior can enhance the travelers experience manifold and can assure them of a comfortable journey. We at HCL, are committed to providing best in class services for Aircraft Interiors to our customers by leveraging the comprehensive range of engineering and IT service offerings that we have.

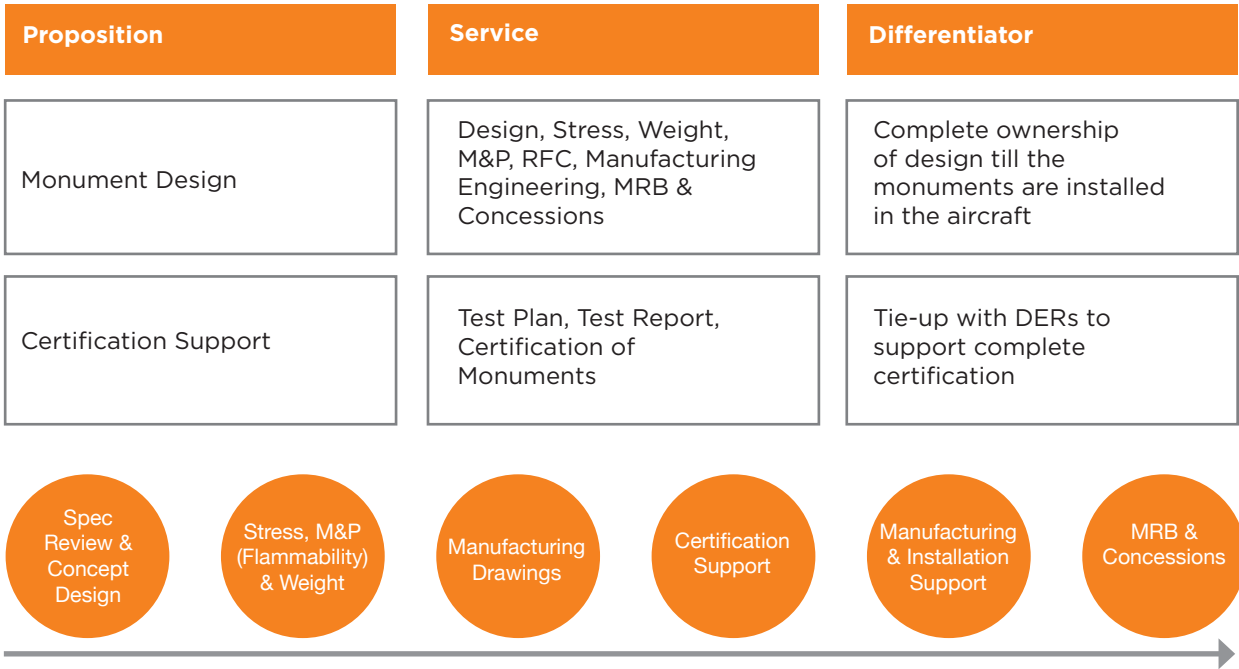
We have extensive experience in providing Aircraft Interiors services to Business Jets and Commercial aircrafts: End-to-end floor plans, Galleys, Wardrobe, Bulkhead, Lavatory, Master suite, Shower system, Tables, Partition walls, Credenza, Side wall stowage, Dado panels, etc. We can also provide complete certification support.

## Aircraft Cabin & Interiors Service Offerings





# Completions Engineering



## Completions: Experience Summary

Manufacturer	Platform	Interior Work Statements	Details
Bombardier	Global Express XRS/5000/6000	40+	<p>Interior Monuments – Concept, detail &amp; installations; Galleys, Lavatories, Wardrobes, Credenzas, Seats, Divans, Bulkheads, etc.</p> <p>Systems: Water, Waste, Oxygen, ECS, Lighting, Entertainment</p> <p>Structural interfaces, attachments, floor structure, Full Floor Plans, Zones, Structural Mods</p>
	Global 7000	15+ Tails	Interior Monuments – Design, Analysis, Weights, M&P, Change Management, DQ, DA and shop support
	Challenger 850	14	Interior Monuments – Concept, detail & installations; Galleys, Lavatories, Wardrobes, Credenzas, Seats, Divans, Bulkheads...
	Challenger 605	4	<p>Systems: Water, Waste, Oxygen, ECS, Lighting, Entertainment</p> <p>Structural interfaces, attachments, floor structure</p>
Boeing	777	3	Design & Installation: Galleys, Master Suites, Guest Suites, Master & Guest Lavatories
	747-8i/SP	3	Cabin Liner Kit Design and Installation
	767	1	Installation of CTT Zonal Dryer System
	737 BBJ	5	<p>Interior Monuments – Concept, detail &amp; installations; Galleys, Lavatories, Wardrobes, Credenzas, Seats, Divans, Bulkheads...</p> <p>Systems: Water, Waste, Oxygen, ECS, Lighting, Entertainment</p> <p>Structural interfaces, attachments, floor structure, Full Floor Plans, Structural Modifications</p>
	737	1	Lavatory redesign
Airbus	A340	1	Installation of Cabin Liner Kit
	A330	2	Design & Installation: Master Suites, Guest Suites
	A320	1	Lavatory redesign
Dassault	900	1	Change Management/Design, Interior Refurbishment

**We have 3,000+ person-years of work on multiple programs IFE Partnerships for 15+ years with dedicated labs for our customers**

**IFE & Cabin Management System (CMS) : Experience Summary**

Segment	Platform	Work Experience	Details
ATS – IFE Systems	Single / Twin Aisle Systems	Working with major IFE Tier-1 suppliers; 1,800+ Man years of engineering work.	<ul style="list-style-type: none"> <li>• Architecture, Design, Componentization and implementation</li> <li>• Airlines specific features implementation, configuration and Systems testing</li> <li>• Multiple Release management</li> <li>• Fly-along support</li> </ul>
Business Jets – Cabin Management Systems	Bombardier: Global 5000, Global XRS & Challenger CL604/CL605	950 Tails configuration; 600+ Man years of engg work.	<ul style="list-style-type: none"> <li>• Sys Requirements Specification, Architecture, Design (HW, SW), Componentization and implementation</li> <li>• Tail specific feature implementation, configuration and Systems testing</li> <li>• Tail systems testing and release from offshore</li> <li>• Field support @business jet end customer locations</li> </ul>
	Dassault: F2000, F900, F5X, F7X, F8X	360 Tails configuration; 500+ Man years of engg work.	<ul style="list-style-type: none"> <li>• Sys Requirements Specification, Architecture, Design (SW), Componentization and implementation</li> <li>• Tail specific feature implementation, configuration and Systems testing</li> <li>• Aftermarket support</li> </ul>
	Gulfstream 450/550	100+ Man years of engg work.	<ul style="list-style-type: none"> <li>• Sys Requirements Specification, Architecture, Design (SW), Componentization and implementation</li> <li>• Tail specific feature implementation, configuration and Systems testing</li> <li>• Aftermarket support</li> </ul>
	VIP & VVIP tails (Boeing 737, Boeing 777, Airbus A340)	28 Tails configuration.	<ul style="list-style-type: none"> <li>• Tail specific feature implementation, configuration and Systems testing</li> <li>• Aftermarket support</li> </ul>

# In-Flight Entertainment & Connectivity(IFEC) Systems Exposure

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## In-Flight Entertainment Systems

- Hi-Fi Audio, MPEG Audio Video & Imaging
- In flight Games, Telephony
- Content management tools
- UI themes, design, implementation
- Platform : Linux, Android, WinCE, Embedded Windows NT
- Architecture : Distributed, Seat Centric, Wireless (with and without seat unit)

## Peripheral to IFE/Cabin system

- Integration of EFB device with CMS
- Cabin Application development on EFB device
- Ground based web portals - BITE reporting, Aircraft configurations, Content packaging



## Cabin Management Systems

- Games application integration
- Platform: NT (Server), WinCE (Client)
- PCU controls (Variants)
- Touch Screens (Matrix / Continuous)

## In Flight Games

- Games application integration
- Platform: NT (Server), WinCE (Client), Linux, Android
- PCU controls (Variants)
- Touch Screens (Matrix / Continuous)



## IFE/CMS Systems Network

- System Backbone – RF, Ethernet, Fiber Optics, 1394 wirewire
- Network security and Firewall functions
- Network Management using SNMP

## Mobility Services

- Mobile devices integration with CMS
- UI and Native Application development on iOS, Android platforms



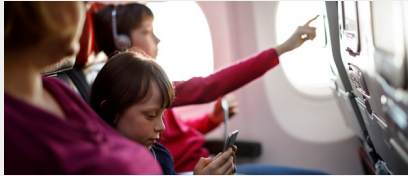
## In flight Telephony

- Design and development of Application software & diagnostics routine for the Telephony (VoIP) module
- Development of core diagnostics framework and message handler
- Integration with Telephony system

## Satellite Communications

- Broadcast, Broadband and Mobile services over Satellite
- Bandwidth Management
- Integration with SOC
- Spectrum & Feeder link management

# PROOF POINTS



## Next Gen Inflight Entertainment System for customer's IFE core system

### CUSTOMER CHALLENGE

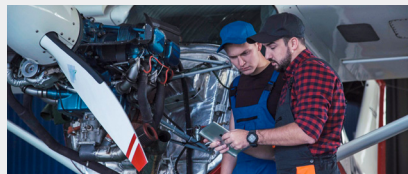
- Seat back Media Player unit for the Single Aisle Commercial Aircraft
- Product styling and usability according to the current market trend
- To comply with Aerospace standards and seat manufacturing standards

### HCL VALUE PROPOSITION

- HCL owned complete product development & Compliance (HW, SW, Mechanical, Compliance testing & POC, POD, POM build)
- HCL owned Program Management
- Ability to accept & play inputs from passenger mobile devices
- Hardware design to support higher display sizes
- Single display unit for Seat mount / Arm mount and Control panel

### VALUE DELIVERED

- Reduction in product replacement time by 60% with innovative QRM (Quick Release Mechanism)
- End customer satisfaction with improved usability
- Increase market share through innovative product
- Design for Cost & Design for Low Power



## Testing | Smart ATE for Cabin Systems of a Tier I Aerospace Supplier

### CUSTOMER CHALLENGE

- The automated test stations are costly, space consuming
- High maintenance is required and every UUT needs specific software development
- Comprehensive Test/Measuring equipment's are used for multiple channel switching, A/V quality measurements, discrete handling etc., which increases the test solutions cost and testing time

### HCL VALUE PROPOSITION

- SMART ATE is generic test solutions platform to support functional and acceptance testing of legacy and future product lines from cabin systems
- Primary features testing include the A/V, Communication interfaces, Discrete and analog interfaces/peripherals.
- Quality of A/V signals generated is in compliance with AV OEM group committee

### VALUE DELIVERED

- Eliminated the need of costly, space consuming, high maintenance required ATE racks and minimizes the test solution development time.
- SMART ATE is 'extensive SW and minimal HW which eliminates manual A/V analysis using Oscilloscopes
- The Re-usability of SMART ATE saves cost by reducing expenditure in future products



## Cabin Seats – Modular Control development for a Tier I Aerospace Customer

### CUSTOMER CHALLENGE

- Delays or pauses during full spectrum of actuator travel
- System noise via quiet-operation actuators
- Fault in tolerance with its distributed architecture design
- Poor collision avoidance and jam detection technology

### HCL VALUE PROPOSITION

- Revolutionary modular system architecture
- Increased fault tolerance with its distributed architecture design
- Enhanced diagnostic capabilities provide superior troubleshooting and fault isolation capabilities
- System can be powered via mcX power supply module, aircraft power or alternate regulated power source

### VALUE DELIVERED

- Coordinated motion control ensures no delays or pauses during full spectrum of actuator travel
- Reduced system noise via quiet-operation actuators
- Industry leading safety zone collision avoidance and jam detection technology
- Enhanced system diagnostics and BITE

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