indra

DEFENSE AND SECURITY

COMMAND, CONTROL, COMUNICATION, COMPUTER AND INTELLIGENCE SYSTEMS

Defense and security in five continents

indracompany.com

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The most advanced dual-use technologies have been successfully applied in C4I products

Introduction

Indra is the leading Spanish company in C4I systems applied to air defense and air operations planning, management and control , both for in-land and out-of-area scenarios. In the last 25 years Indra has fully developed, customised, tested and installed in its final operative environment several IOC centers for the Spanish Air Force and major South American countries, the most recent fully compliant with NATO standards (ACCS).

The most advanced dual-use technologies in radar, data processing, COTS HW&SW design, displays, shelters, data and voice communications and simulation have been successfully applied in a broad line of scalable C4I products, either fixed or in deployable configurations.

Scope

C4I systems implemented by Indra, designed in accordance with ACCS (NATO) specifications, satisfy all the requirements to constitute modular, scalable, upgradeable, customised Air Defence and Air Operation planning systems with the aim of supporting all the functions associated to the exert of the air sovereignty, being adaptable to any radar/link deployment and to any national defence authorities requirements.

Benefits

Cost savings

• Low power and volume COTS equipment

• Low cost maintenance

• COTS network and base software

• Standard implementation languages and OSs

Safety

• Modern and field proven technologies (several IOC systems world wide)

• Redundancy in processing and communication equipment with automatic reconfiguration

• Powerful system monitoring aids

• Ergonomic HMIs with optimised access to information and alerts

Support services

• Full documentation based on quality military standards (MIL-STD-498)

• Guarantee and logistics: Installation checkout and follow-on field support

• Training in HW/SW maintenance and operational tasks

• Financial assistance

Adaptability

• Scalability in working positions and external links

• Functional modularity and configurability through database

• Open hardware architecture for easy system growing

• Interoperability thanks to standard external data links
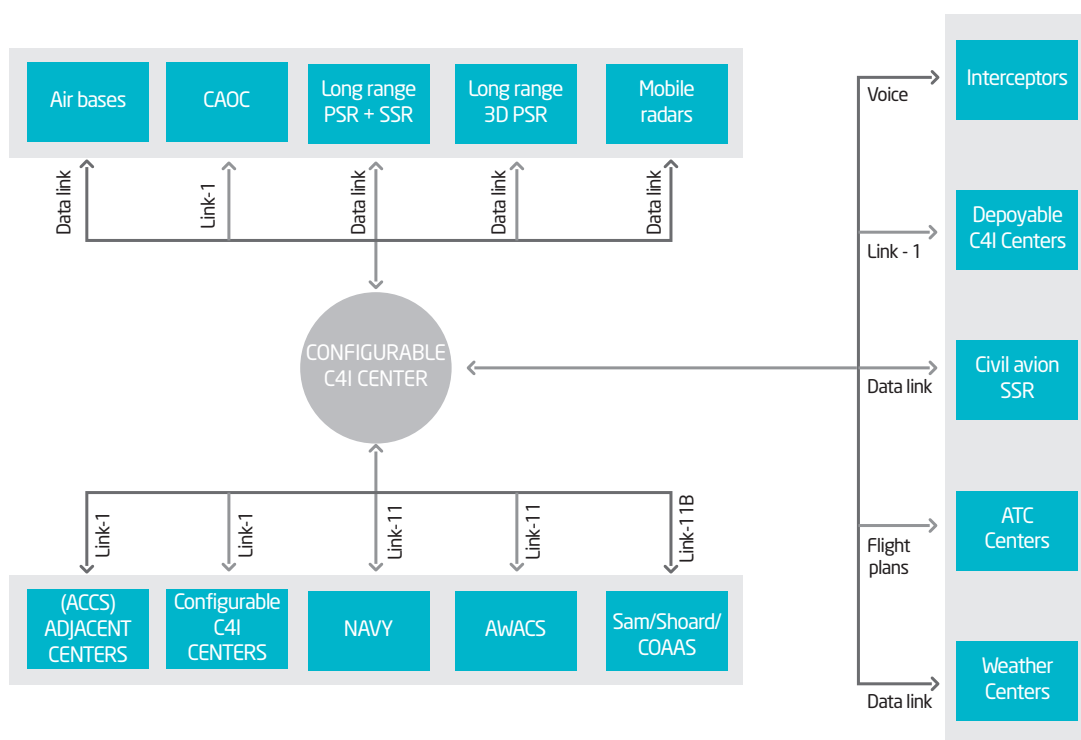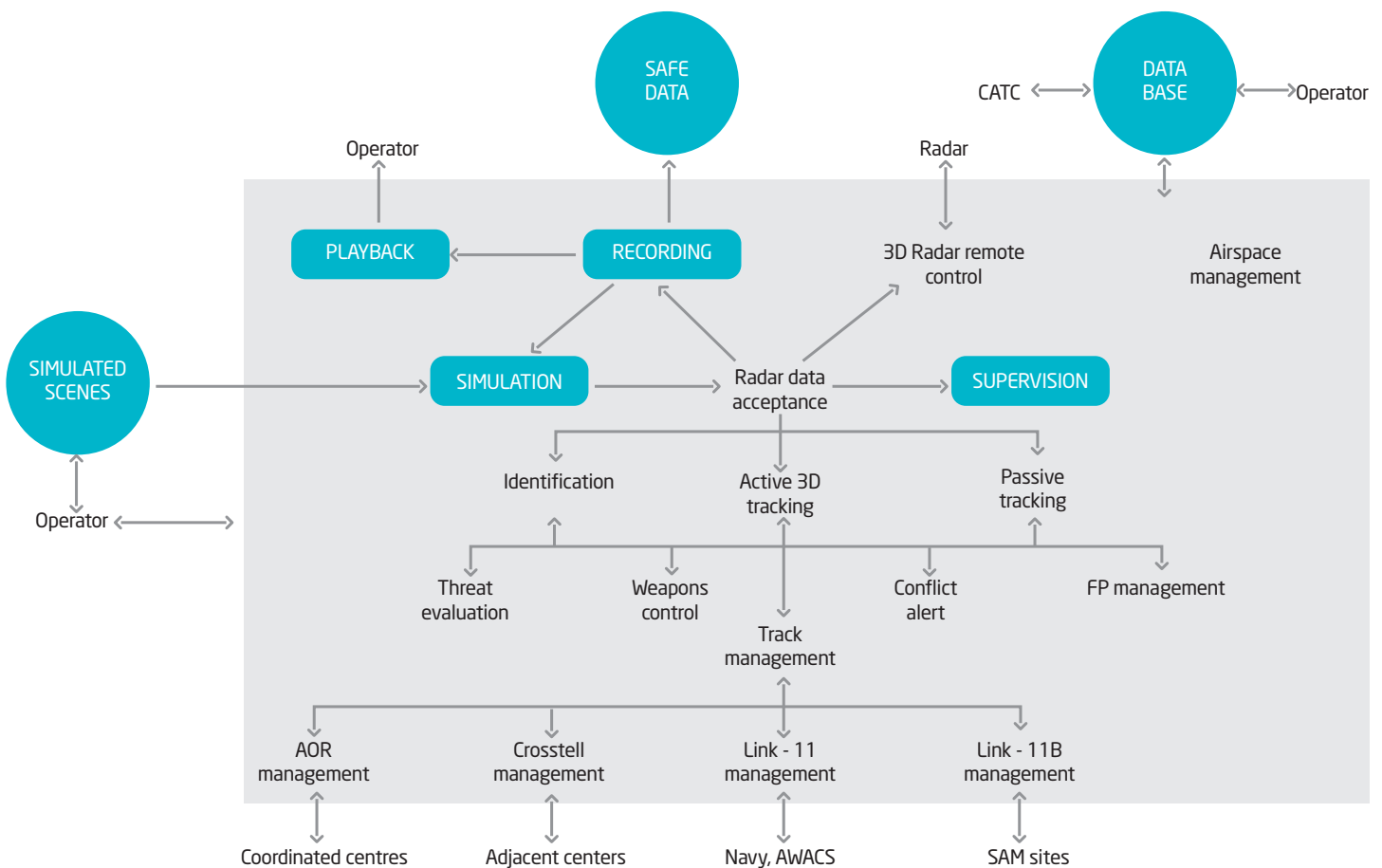
Operational functions

- Search, beacon and strobe radar data control and format validation
- Multiradar MPVU fusion based on 2D+h Multiple-Model kalmanfilters and deferred data association
- 2D/3D ECM automatic processing for passive track update and analysis for incursion size evaluation
- Automatic identification by spatial analysis and flight plan conformance monitoring
- Automatic flight plan-track correlation

- Automatic threat analysis, ranking and display of hostile tracks and potential objectives vulnerability
- Short-term approach and collision alerts of all air traffic against own interceptors
- Automatic computing and supervision of air defense missions (intercept, CAP, refuel, RTB)
- Management of information exchange with external systems (Link-11, Crosstell, SAMs/SHORADs)

- System and external tracks (Link-11, Crosstell, SAMs/SHORADs) association and fusion
- Engagement and ID responsibility coordination with external entities (Link-11, Crosstell, SAMs/SHORADs)
- Remote operation of 3D radar sites
- Automatic ACO processing, update, validation and ACM display

Support functions

- HW/SW monitoring and diagnosis for failure detection, isolation, performance monitoring and reconfiguration
- Off-line graphical editor for exercise preparation and storage

- Real-time simulation of air routes including radar clutter and noise effects
- Simulation at the message level of all radar and external sources data (Link-11, Crosstell, SAMs/SHORADs)
- Configurable recording of operational and input data

- Playback: Replay of real air situation synchronized with voice recording
- Analysis and report formatting of operational data
- Automatic and manual processing chain switch between main servers
- Integrated database with security management

## Hardware architecture and controller displays

Operational multifunction consoles

- Integrated air defense and communication console
- C4I console
- Radar control and supervision
- Touch panel communication system
- System monitor abd configuration tools
- On-line integrated help (CBT)
- Local map generator
- Personalised workstation configuration
- Standard symbology

C4I operational modes

- Director (AD)
- Weapons Allocator (WA)
- Controller (C)
- SAM Allocator (SA)
- Identification (ID)
- RAP Production (RP)
- Surveillance Operator (SO)
- Data Link Network Management (DLNM)

- Sensor Coordination and Performance (SCP)
- Simulation Operator (SIM)
- Training Operation Responsible (TOR)
- Playback Operator (PLBK)
- Manual Data Entry (MIO)
- Technical Supervision (STCC)
- Planning Position (PLA)
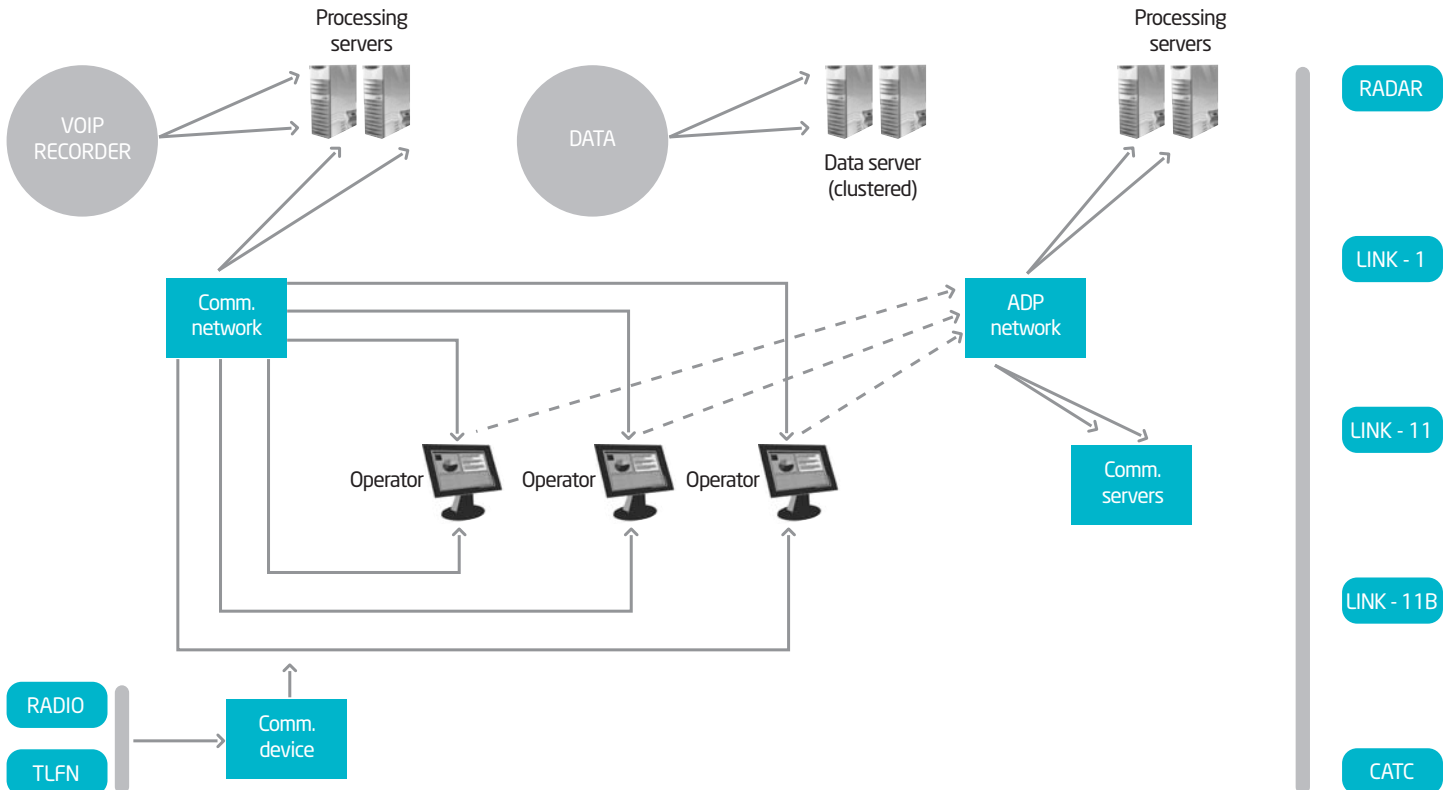
Command extensions and tools

Force deployment planning

- Aircraft, radar and SAM/SHORAD deployment planning on GIS cartography
- Edition of radar, SAM/SHORAD and aircraft characteristics and deployment
- Multiradar coverage computation at selectable altitude levels
- SAM/SHORAD surveillance and fire coverage computation
- Action radii of deployed aircraft at different profiles (BBB, BAB, ABA...)

Command support data base

- Logistics
- Intelligence
- Personnel
- Communications
- Operations

Operations planning decision aids

EDIATO

- Air operations plan management in structured standard sections
- ATO generation for all NATO air missions (SEAD, AI, SAR...)

EDIACO

- Georeferenced graphical edition of all NATO standard ACMs
- Spatio-temporal operative validation of ACMs and ACOs

Plan viewer

- Time and logistic validation of air operations plans
- Weapons effectiveness analysis for optimal target assignment
- Route planning

Air mission planning

- Detailed air route planning on GIS georeferenced cartography
- Aircraft independent and reconfigurable
- Aircraft manoeuvres and envelopes characterisation editor
- Plant and profile graphical display and edition of air routes
- Multisegment (ground-to-ground) A/A and A/G missions
- Computation of time/distance/fuel and non specified altitude/speeds
- Automatic insertion of missing (required) segments within the air route
- Previsualisation and printing of pre-configurable pilot book
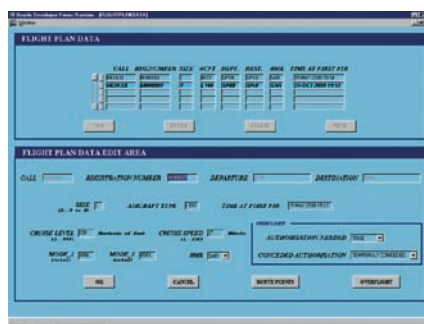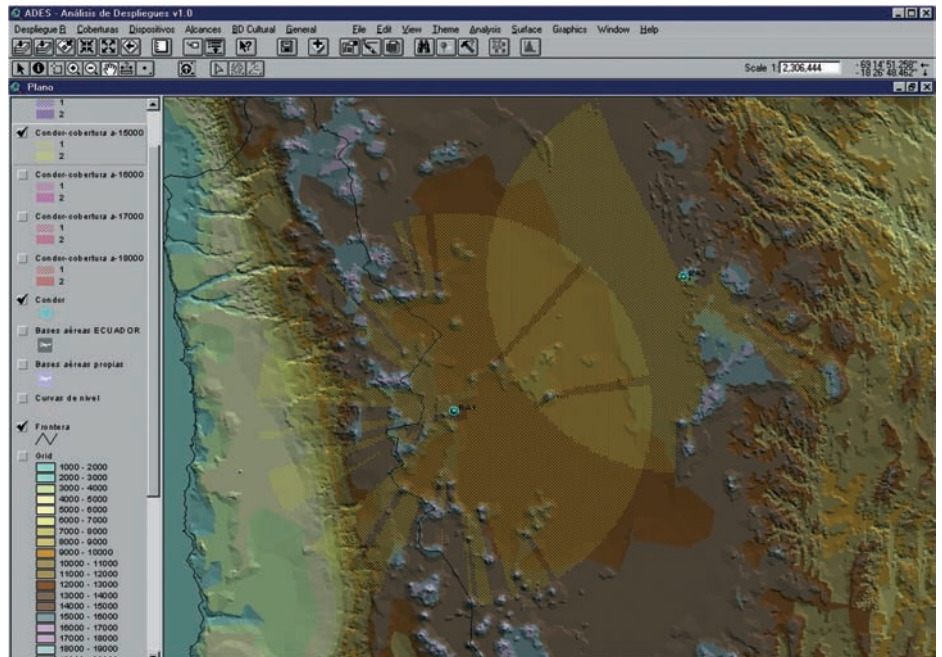
Design and technical features

TYPICAL MEDIUM SIZE CENTER CONFIGURATION (Configurable at user request)	
Situational display (sit)	1200 NM x 1200 NM
Active+passive tracks	500+100
Air missions	50
Flight plans	500
Radar	10
Radar interfaces	DDE / HDLC / ASTERIX
Atc link	1
Link - 1	4
Link - 11B	8
Link - 11	4 (no SSB)
Large screen video/data projectors	1
PERFORMANCE FIGURES	
Reliability	MTBF > 10000 hours
Maintainability	MTTR < 30 minutes
Availability	> 99,995 %
SOFTWARE DEVELOPMENT	
NATO validated compilers	ADA, C/C++, Java
HMI	X-Windows, GIS
HARDWARE/ SOFTWARE PLATFORM	
Operating systems	IX (Linux, Solaris, Tru64)
Real time support	Multithreaded
Security	C2 level
Safety	HW redundancy + shared disks
Monitoring	Network traffic supervision
Data base	ORACLE / PostgreSql