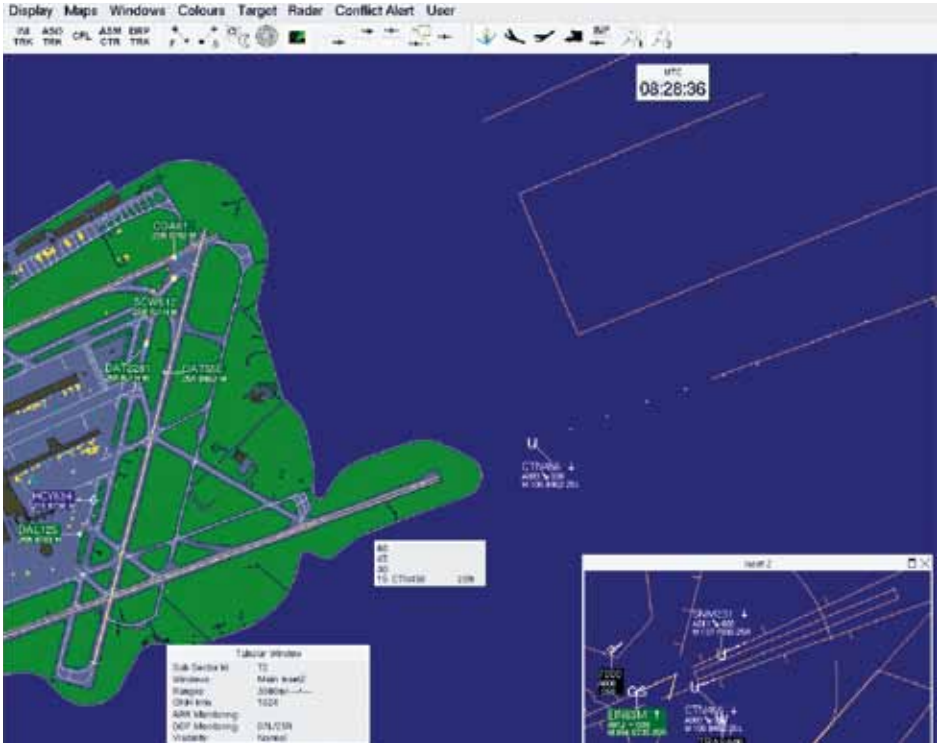
NOVA 9000 A-SMGCS

Advanced Surface Movement Guidance and Control Systems



New air traffic control tools from Indra Navia allow controllers to safely and efficiently manage increasing air traffic volumes at airports. The NOVA 9000 suite of Air Traffic Control Systems (ATCS) can deliver improved service by providing additional safety, efficiency and achievable capacity, whilst maintaining the airport's operating level in all weather conditions.

The NOVA 9000 is the world's leading system for airport surface surveillance and control. The installation base and reference sites range from the world's most demanding airports with complex layouts and configurations to medium-sized and small regional airports. The experience and knowledge obtained through these installations is passed on to new systems and new and satisfied users, resulting in the most robust and mature product available on the market.

NOVA 9000 integrates data from multiple sources to provide a comprehensive situation display of traffic on the aerodrome surface and in the surrounding airspace, with accurate and timely position and identification of aircraft and vehicles, and seamless coverage throughout the surveillance volume.

The NOVA 9000 A-SMGCS offers real benefits to you – the customer and user. The unique technology and integration capabilities include:

1. Improved situational awareness
2. Maintaining safety and traffic flow even in adverse weather
3. Safety logic (RIMCAS) that controllers can trust
4. Effective and economical information sharing (CDM)
5. Billing and statistics

NOVA 9000 A-SMGCS

Advanced Surface Movement Guidance and Control Systems

THE NOVA 9000 A-SMGCS PROVIDES

High reliability and proven performance
- Very high MTBF and availability
- Similar COTS hardware and software platform used in all NOVA 9000 systems throughout the world
- Software base from the NOVA 9000 family installed and operational in more than 100 systems at airports and control centres around the world including major international hubs such as Heathrow, Gatwick, Stansted, Charles de Gaulle, Orly, Brussels, Prague, Zurich, Dubai, Kuala Lumpur, Beijing, Sao Paolo, Toronto...

Modularity and Scalability
- Open System architecture running on the LINUX operating system
- High-speed local area network (LAN) providing data communication between units
- Similar COTS hardware and software platform used in all NOVA 9000 systems throughout the world
- Easily integrated with existing systems

Ease of implementation
- Highly configurable and easily tailored to meet the operational requirements of different users and changing conditions

User-friendly interaction
- HMI includes menus, dedicated function keys, icons, text windows, graphic windows, pop-up alerts and warnings, etc

Interoperability with other systems
- Communication with other systems using internationally recognised standards and protocols

FUNCTIONAL HIGHLIGHTS INCLUDE

Multi-sensor data fusion - up to 16 surveillance sources
- TAR (Terminal Area Radar - PSR/MSSR)
- SMR (Surface Movement Radar)
- MLAT (Multilateration)
- ADS-B (Automatic Dependent Surveillance - Broadcast)

Safety Nets:
- RIMCAS (Runway Incursion Monitoring and Conflict Alerting System)
- Taxiway and restricted area monitoring and alerting
- Route conformance monitoring and alerting

Extensive mapping:
- Up to 100 map overlays
- Temporary mapping and text

HMI functions:
- Labelled traffic situation display with inset windows
- SMR video
- Single sensor, mosaic or data fused plots and tracks
- Independent pan and zoom
- Multiple BRMs and cursor lines
- Selection of preset settings
- Label deconfliction
- Track history and prediction
- Area filtering
- Independent brightness controls

Higher-level functions:
- Electronic Flight Strips
- Taxi routing tool
- Control and monitoring of stop bars and taxiway centreline lighting

Maintenance facilities:
- Remote control and monitoring of the entire system
- Recording and playback facilities

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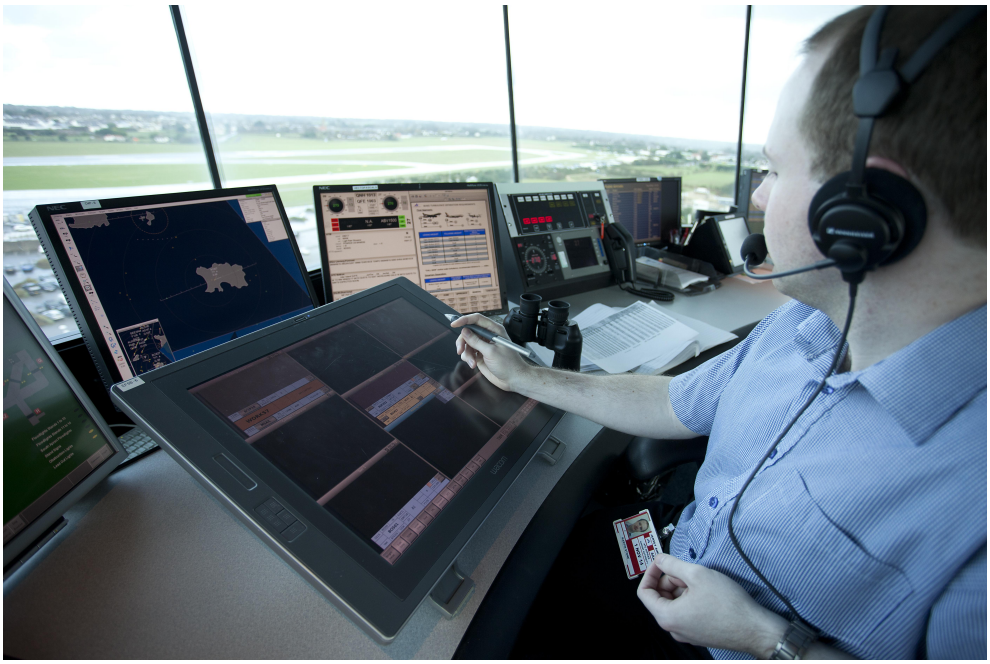
NOVA 9000 EFSS

Electronic Flight Strip System



The NOVA 9000 Electronic Flight Strip System (EFSS) provides a modern, configurable and paper strip-less HMI for users of the NOVA 9000 Air Traffic Control Systems, or as a stand-alone electronic flight strip system which may be interfaced to other ATM systems.

NOVA 9000 systems are currently, where needed, equipped with an integrated Flight Data Processing System (FDPS). The HMI from the FDPS is provided via lists on the Controller Working Position (CWP), such as arrivals, departures, over-flights, or where interaction with the lists is required and the entering of flight plans and data, via the Flight Data Display (FDD) system. Until now, it has been usual for the FDD and FDPS to have strip printing facilities associated with them.

With the EFSS there is a modern, interactive and intuitive HMI, which may replace the use of paper strips and increase efficiency and safety.

NOVA 9000 EFSS

Electronic Flight Strip System

THE EFSS PROVIDES

HIGH RELIABILITY

Configurable definition of:

– Controller positions and roles
– Flight progress strip layouts - displayable in a variety of pre-defined formats with regard to layout, size, shape, information fields, fonts, colours and interaction capability
– Logical grouping of flight progress strips in bay areas according to phase of flight and user requirements

Means to create flight progress strips for movements without filed flight plans

Configurable manual or semi-automatic sorting of flight progress strips

Ability to write directly onto the strips (if required)

Means to input a logically correct sequence of clearances into the system, in accordance with the authority allocated to the controller role

Simple and secure electronic handover of flight progress strips from one controller role to another

Means to easily correct a mistaken action

Functionally simple design involving the controllers in a minimum number of input actions and providing fast response times. Often-used functions can be executed with single-stroke actions

Self-explanatory and easy-to-use layout, reducing training requirements

Important information for controllers' tasks visible at all times

Assistance in preventing mistakes through logical availability of functions dependant upon operations

Significant cost savings compared with paper strips

PLATFORM

Same hardware platform as other NOVA 9000 processing units

Linux operating system

Mouse and/or touch-screen and stylus input devices

Portrait or landscape format displays

High, proven MTBF

Very high availability

OPTIONS

Interface to A-SMGCS to provide:

– Automatic logging of actual times of arrival and departure
– Alert in the event of non-conformance to a given clearance
– Highlighting of associated target on radar display

Interface to Departure Management (DMAN) tool to obtain target start-up, off-block and take-off times (TSAT, TOBT and TTOT)

Interface to taxi routing tool

CDM interface

Recording and Playback

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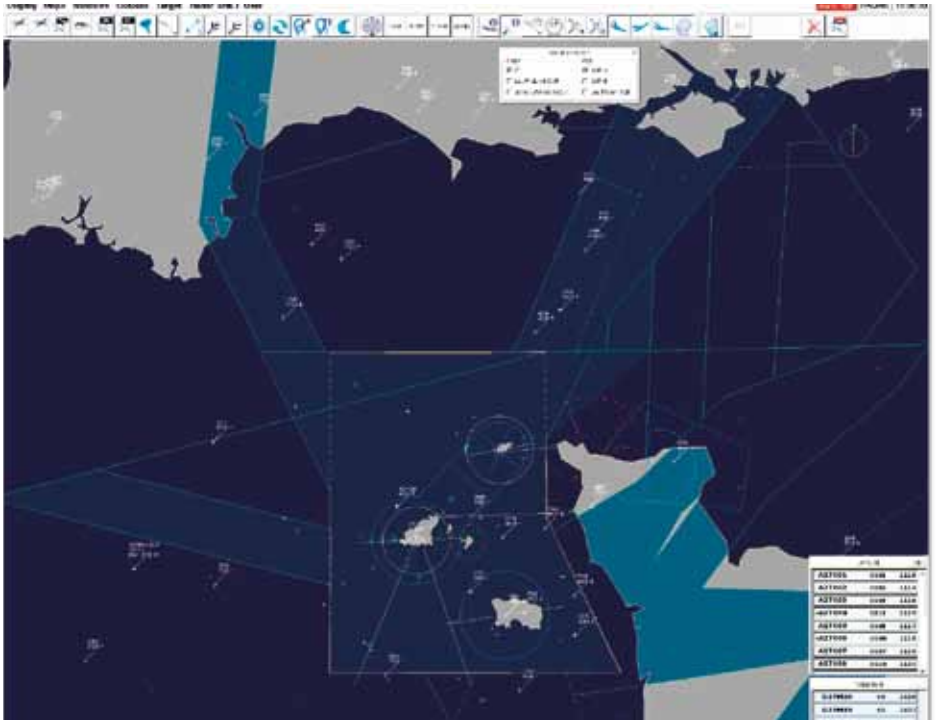
NOVA 9000 APPROACH AND ACC SYSTEMS



Since 1991, NOVA 9000 Approach Control Systems have been in operation around the clock enabling safe and efficient services to be provided at airports all over the world.

NOVA 9000 systems are modular and scalable, the Approach system may be a standalone system, or integrated with an FDPS, Electronic Flight Strip System and/or an A-SMGCS, providing a seamless transition from ground traffic situation to an approach picture and vice versa. In its ACC configuration the FDPS is included.

The NOVA 9000 Controller Working Position (CWP) provides the Air Traffic Controller with a complete traffic situation display with optimum information. The HMI is extremely flexible and configurable, permitting users to reconfigure menu items, function keys, icons, settings, and other variable system parameters with ease. Controller settings and storage of these on-line is implemented such that individual preferences and role definitions can be created and stored.

The HMI is influenced by Eurocontrol, and has been developed in cooperation with numerous civil aviation authorities throughout the world.

NOVA 9000 APPROACH AND ACC SYSTEMS

THE NOVA 9000 PROVIDES

HIGH RELIABILITY

Very high MTBF and availability

Similar COTS hardware and software platform used in all NOVA 9000 systems throughout the world

Software base from the NOVA 9000 family installed and operational in more than 100 systems at airports and control centres around the world including major international hubs such as Heathrow, Gatwick, Stansted, Charles de Gaulle, Orly, Dubai, Kuala Lumpur, Beijing, Zurich, Sao Paolo and others

MODULARITY

Open System architecture running on the LINUX operating system

High-speed local area network (LAN) providing data communication between units

SCALABILITY

Additional working positions and additional functionality can be easily provided by adding hardware and software modules to a basic system

Easily integrated with existing NOVA 9000 systems

EASE OF IMPLEMENTATION

Highly configurable and easily tailored to meet the operational requirements of different users

USER-FRIENDLY INTERACTION

HMI includes menus, dedicated function keys, icons, text windows, graphic windows, pop-up alerts and warnings, etc

INTEROPERABILITY WITH OTHER SYSTEMS

Communication with other systems using internationally recognised standards and protocols

FUNCTIONAL HIGHLIGHTS INCLUDE

Multi-sensor data fusion – up to 16 surveillance sources

PSR
MSSR
WAM
ADS-B, ADS-C

SAFETY NETS

AFDAS – Approach Funnel Deviation Alert System
MSAW – Minimum Safe Altitude Warning
DAIW – Danger Area Infringement Warning
APW – Area Proximity Warning
STCA – Short Term Conflict Alert

EXTENSIVE MAPPING

Up to 100 map overlays

Temporary mapping and text

HMI FUNCTIONS

Traffic situation display with inset windows
PSR video
Single sensor, mosaic or data fused plots and tracks
Independent pan and zoom
Multiple BRMs and cursor lines
Presets
Label deconfliction
Track history and prediction
Area and height filtering
Independent brightness controls

MAINTENANCE FACILITIES

Remote control and monitoring of entire system
Recording and playback facilities

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NOVA 9000 TMERS

Trajectory Monitoring and Event Reporting System (TMERS)

The NOVA 9000 Trajectory Monitoring and Event Reporting System (TMERS) is an add-on to an A-SMGCS. It provides in a simple format important information to permit airport operators and air navigation service providers to track, record and analyse aircraft and vehicle operations on the ground.

TMERS is designed to monitor aircraft and (optionally) vehicle movements within the A-SMGCS surveillance coverage area in order to assess flight progress and generate event reports to specified users.

TMERS is a software module, which may be installed on the NOVA 9000 Surveillance Data Server (SDS) or on a stand-alone workstation or PC.

The input data to TMERS is target report data output from the SDS.

Data messages containing an event report are transmitted by TMERS to a user-specified client system whenever a pre-defined event is detected. Each message is time-stamped with UTC time.

A report can be output for each of the following configurable events (alphabetical order):

- A. Aborted Take off
- B. Departed
- C. Entered Runway
- D. Exited Runway
- E. Go-around
- F. Holding/stopped
- G. Landed
- H. Landing
- I. Lined up
- J. On final
- K. On stand/In block
- L. On tow
- M. Pushed back
- N. Taking off
- O. Taxiing

TMERS is configured from the NOVA 9000 Technical Control and Monitoring System (TECAMS). The TMERS package includes additional TECAMS software.

FEATURES

1. Adaptable for any airport users
2. Configurable events
3. Expandable with additional information

USES

1. CDM
2. Traffic flow statistics
3. Aerodome maintenance
4. Flight information display services
5. Billing
6. Noise monitoring
7. Ground handling services
8. Emergency services

NOVA 9000 TMERS

Trajectory Monitoring and Event Reporting System (TMERS)

NOVA 9000 TMERS

INTERFACE

LAN UTP Ethernet/Fast-Ethernet 10/100 Mbit/s (10BaseT/100BaseTx)
UDP/IP: point-to-point or multicast

INPUT DATA FORMAT

ASTERIX Category 011 or Category 062

OUTPUT DATA FORMAT

FIELD NAME	DESCRIPTION
(	Start delimiter. Fixed character indicating start of data message
SRC Id	Data source identifier (fixed ASCII character 'N' for Nova)
CALLSIGN	11 alphanumeric characters padded by spaces from the right
SSR Code	Mode-3/A SSR code. 4 octal characters (spaces if N/A)
Aircraft Address	24-bit Mode S address expressed as 6 alphanumeric characters
Reg. Number	Aircraft registration number (spaces if N/A)
Type	Type of aircraft
ADEP	Departure airport. 4 alphabetic characters
ADES	Destination airport. 4 alphabetic characters
ETA / ETD	Estimated Time of Arrival/Departure (in the form of HHMM) from flight plan
ATA / ATD	Actual Time of Arrival/Departure (in the form of HHMM)
Slot	Slot time (in the form of HHMM) if allocated (spaces if N/A)
Flight Progress	An alphabetic character, e.g. A: on Approach / G: Go-around / L: Landed / E: Exited runway / T: Taxiing
Location	Location of aircraft at time of event report (e.g. runway or taxiway identifier)
Runway	Arrival/Departure runway identifier
Occupancy	Runway occupancy time (in the form MMSS)*
Taxi Route	Taxi route identifier string**
Taxi Time	Taxi time (in the form of MMSS)***
Stand	Stand identifier
)	End delimiter. Fixed character indicating end of data message

* Runway occupancy time is defined as:
– The time from a departing aircraft detected entering the runway to the same aircraft detected to be airborne;
or – The time from an arriving aircraft detected to have crossed the landing threshold to the same aircraft detected to have crossed a runway exit into an adjoining taxiway

** Taxi route is defined by a string of taxi identifiers from the stand to the runway entry point for a departure, or from the runway exit to the stand for an arrival.
Each taxiway segment is identified by a code of one or two alphanumeric characters, eg B, RR, T5. Segments are separated by a "-" character.
Example: B-RRT5

*** Taxi time is defined as:
The time from a departing aircraft detected leaving the stand area to the same aircraft detected entering the runway;
or The time from an arriving aircraft detected to have crossed a runway exit into an adjoining taxiway to the same aircraft detected entering the stand area

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NOVA 9000 RUNWAY STATUS LIGHTS (RWSL)

In order to enhance safety at busy airports the FAA developed an advisory system called Runway Status Lights (RWSL), which is now being deployed in the US. Paris Charles de Gaulle will have the first RWSL system deployed outside of the US and will be using the Indra Navia RWSL processing system.

The purpose of the RWSL system is to reduce the number of runway incursions without interfering with normal airport operations. The RWSL system reduces runway incursions as situational awareness is increased. The RWSL system issues direct warnings to pilots and vehicle operators that the runway is unsafe for landing, crossing or take-off.

The RWSL system uses surveillance information from the NOVA 9000 A-SMGCS at the airport to establish the presence and motion of aircraft and surface vehicles on or near the runways. This will be used to control two types of warning lights embedded in runways and taxiways; Runway Entry Lights (RELs) and Take-off Hold Lights (THLs).

The RWSL will provide the NOVA 9000 A-SMGCS system with status enabling the controllers to monitor the processing and light status given to the pilots.

The Runway Entry Lights (REL) are used when the runway is unsafe for entry or crossing, and the Take-off Hold Lights (THLs) will illuminate when the runway is unsafe for departure. The system extinguishes the lights automatically, as appropriate, when the runway is safe.

FEATURES

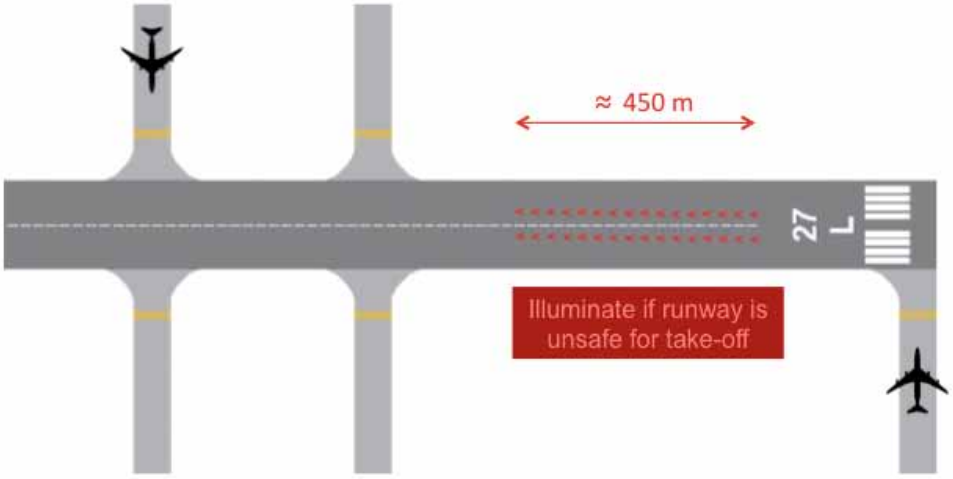
1. The system enables warnings to be provided without creating additional work for controllers
2. Increased situational awareness for Pilots and Controllers

Runway Entrance Lights (RELs)

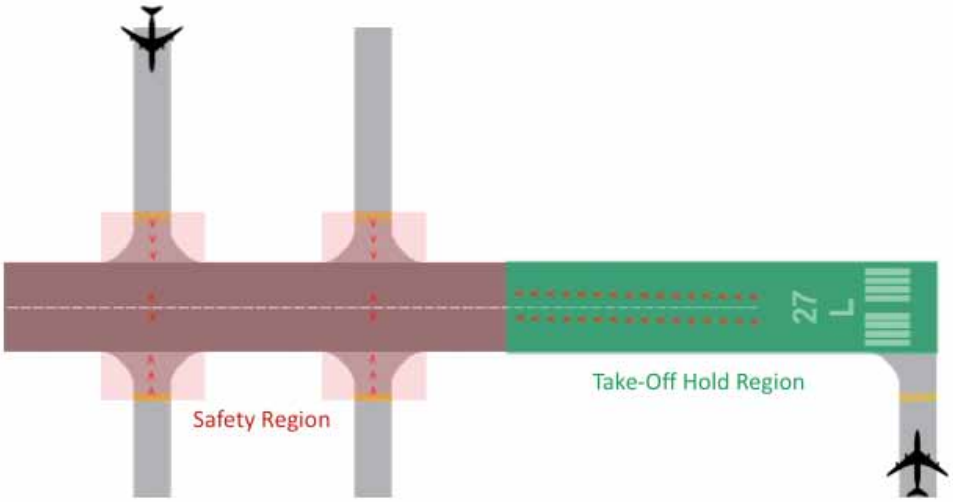
A single row of red warning lights, extending from runway holding position to runway centreline

Take-off Hold Lights (THLs)

A double row of red warning lights along runway centreline, extending 450m ahead of line-up position



Take-off Hold Lights (THLs) safety region associated with each take-off hold region



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NOVA 9000 RPS

Recording & Playback System (RPS)

The NOVA 9000 Recording & Playback System (RPS) is designed for accident or incident investigation. The system provides storage and retrieval of all relevant information at the controller working positions, including high resolution SMR video, target data, relevant operator actions and events (alarms) at each CWP. New functionality, such as screen-dump possibilities; with printing to colour laser/dot matrix printers, movie creation; enabling replay to be made on any PC, and integrated voice recording and synchronization*.

Once initiated, recording is automatic. The system records continuously for up to several weeks without operator intervention on a RAID-6 Storage System. Manual intervention is only required to extract sequences for archiving.

The secondary storage medium can be replaced simply and without interruption to recording.

Playback is performed on a separate unit which has CWP facilities for map presentation, target presentation, target data presentation trajectories, etc. This permits the reconstruction of the original traffic situation picture and events occurring at any CWP, as it was at the time of the recording.

The NOVA 9000 RPS may be delivered as a stand-alone system for use with ASRs, SMRs, or as part of a NOVA 9000 ATCS.

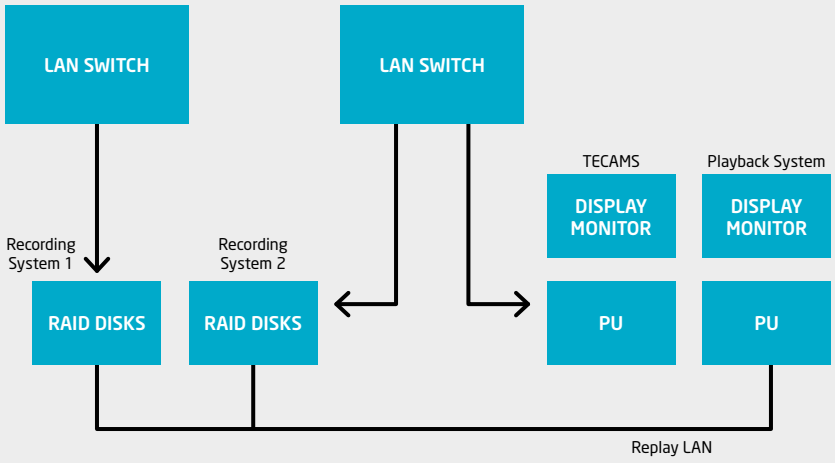
FEATURES

1. Easy to use recording
2. Separate or combined easy to use playback
3. Movie creation
4. Playback functionality on CWP type workstation
5. Long term archiving of data, data sequences to DVD/RPS
6. Media duplication
7. Separation/selection of replay data sources
8. Screen dumps
9. Recording of CWP functions (NOVA 9000 ATCS only)
10. Optional Voice channel synchronisation
11. 30 days online storage

NOVA 9000 RPS

Recording & Playback System (RPS)

NOVA 9000 RPS	
FUNCTIONS	
Recording	Start/stop/statistics Estimated time to overwrite Activity
Archiving	Sequence selection/MEDIA type
Playback	Playback/duplication CWP session selection Play/speed selection/FFWD/FRWND Data source selection Interactive/CWP playback mode Date/time search
PERFORMANCE	
Max. response time (video)	<1000ms
Synchronisation	<1000ms
Max. storage	<4.5Tbites RAID-6
Typical latency	<500mS
OPERATIONAL	
Temperature	
Humidity	
Power: **Processor** **AUX unit**	 175W, 115/230VAC, 50-60Hz 150W, 115/230VAC, 50-60Hz
Weight (max): **Processor** **AUX unit**	 15kg 7kg
Noise	Office environment (<45dBA)
EXPANDABILITY / OPTIONS	
Raw Video Processor	Allows both MTI and raw video to be processed and recorded for ASRs, or single for SMRs
Additional replay positions	
Expansion of capacity	Larger on-line storage



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NOVA 9000 RIMCAS

RIMCAS from Indra Navia is in use at more airports around the world than any other incursion alerting system, and is documented to have avoided incidents, which might have put lives at risk.

Monitoring of aircraft starts 10 miles from the threshold, and includes glide slope and localiser monitoring. As the aircraft nears the threshold, runway checks are performed. Having landed, distance, time and acceleration checks are performed against departures and any other object on the runway strip. For security, restricted area and authorised access may be applied to aircraft and vehicles.

As new sensor technology is implemented at airports, including ADS and Mode-S Multilateration, RIMCAS is adapted to permit more advanced safety logic. Even using a single SMR, RIMCAS provides advanced functionality and numerous safety scenario configurations.

All RIMCAS logic is configurable to suit different scenarios and airport configurations.

The system is approved and operational at more than 15 airports on four continents (London Heathrow, Paris CDG and Toronto amongst others).

FEATURES

1. Easily adaptable/configurable
2. Selection of monitoring on/off)
3. Programmable alert levels
4. Configurable colours and audible alerts
5. Manual or automatic visibility setting
6. Uses multi-sensor data fusion for processing

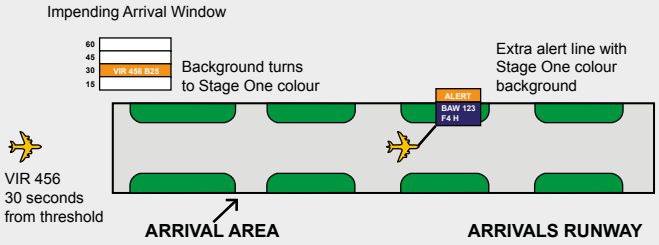
NOVA 9000
RIMCAS

FUNCTIONS

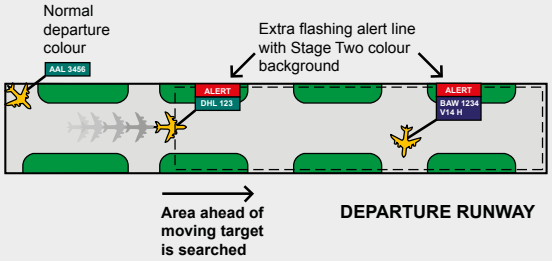
Monitoring of:

1. Approaching/landing
2. Departure
3. Departure lineups
4. Opposite direction
5. Restricted areas
6. Runway crossing
7. Taxiway separation
8. Crossed stop bar
9. Runway status

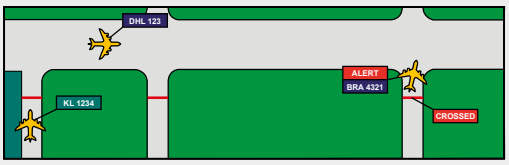
ARRIVAL/LANDED



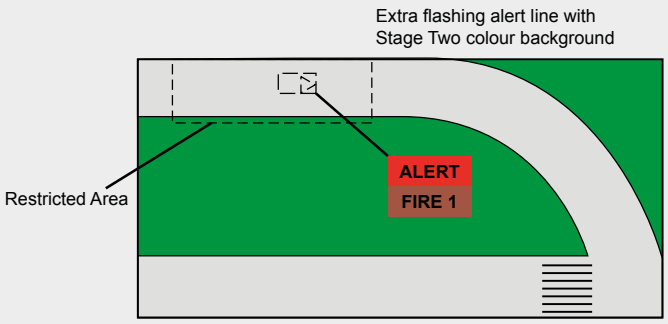
DEPARTURE/CROSSING



STOP-BAR CROSSED



RESTRICTED AREA



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NOVA 9000 ATM

Air Traffic Monitor (ATM)

The NOVA 9000 Air Traffic Monitor (ATM) provides the tower controller with a simple clear picture of the traffic pattern up to a range of 30 Nm. Radar information is overlaid maps showing extended runway centre-lines and geographical features as required.

In its simplest form, the ATM may be a standalone system with a single MSSR/PSR plot input, or provided as part of a NOVA 9000 Approach system with integrated A-SMGCS functionality.

The NOVA 9000 ATM is capable of handling the highest traffic densities, safely and efficiently. Processing systems can include the optional Approach Funnel Deviation Alerting System (AFDAS) to alarm controllers of aircraft deviating from the nominal approach path. Raw video may be presented using the RANC processor, and transmitted via low cost fibre-optic cross-site links.*

FEATURES

1. Multi-level menu of selectable functions
2. Synthetic display presentation of target position indicators with leader lines, labels and track history superimposed on a selection of maps
3. Inset display window, with independently selectable range and off-centring
4. Tabular data block

NOVA 9000 ATM

Air Traffic Monitor (ATM)

NOVA 9000 ATM	
PERFORMANCE	
Max. response time (video)	<1000ms
Max. no. targets (PSR/SSR plots)	500
Typical latency (max. input)	<300 ms
OPERATIONAL	
Temperature	+5°C - +30°C
Humidity	10-80%, non-condensing
Power (processor)	175 W, 115/230 VAC, 50-60 Hz
Weight (processor)	15 kg (max)
Noise (processor)	Office environment (<45 dBA)
FUNCTIONS	
Centre	
Off-centre	
Presets	
Reset	
Range	
Range rings	
Set ref	
BRM	Lat/lon
Compass rose	
Inset display	
Overlay selections	
Label rotate	
Trail dots	
Synthetic trail selection	
Prediction vectors	
Prediction vector selection	
Brightness	
QNH input	
PSR video	On/off (optional)
PSR afterglow	
EXPANDABILITY OPTIONS	
PSR Data Processor	Allows both MTI and raw video to (RANC) be displayed on the ATM. Either as single channel, or both overlaid with different intensities. Selection of afterglow
Assistant Working	Provides local code/call-sign Position (AWP) database and flight plan data, permits SSR/call-sign conversion and output of flight strips
Approach Funnel Deviation	Provides the controller with alarms should an aircraft be too far left/right or up/down of the runways extended centreline
Minimum Safe Altitude	Provides alarms should an aircraft Warning (MSAW) cross a boundary with a minimum height attribute
Approach control system	Expandable to a full NOVA 9000 approach control system
A-SMGCS	Expandable to a full NOVA 9000 Advanced Surface Movement Guidance and Control System

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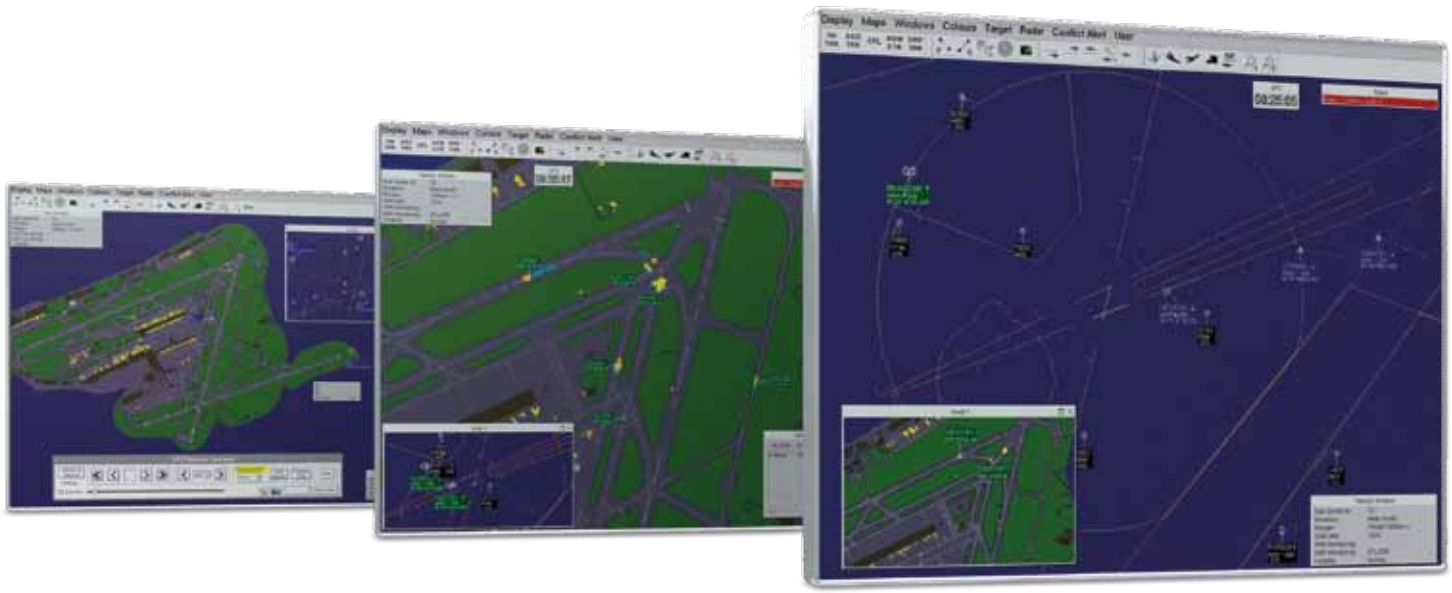
NOVA 9000 ATCS

Air Traffic Control System



Harmony between air traffic controllers and the technology they use is essential for safe flight operations. Harmony develops from having total confidence in that technology.

The NOVA 9000 Air Traffic Control System (ATCS) can be delivered with a range of primary and secondary radars, multilateration, ADS-B or other sensor interfaces to provide a complete and integrated surveillance solution. From a simple radar display, to a fully integrated Advanced Surface Movement Guidance and Control System (A-SMGCS), or an Area Control Centre (ACC), Northrop Grumman Park Air Systems offers the ultimate user friendly and modular solution.

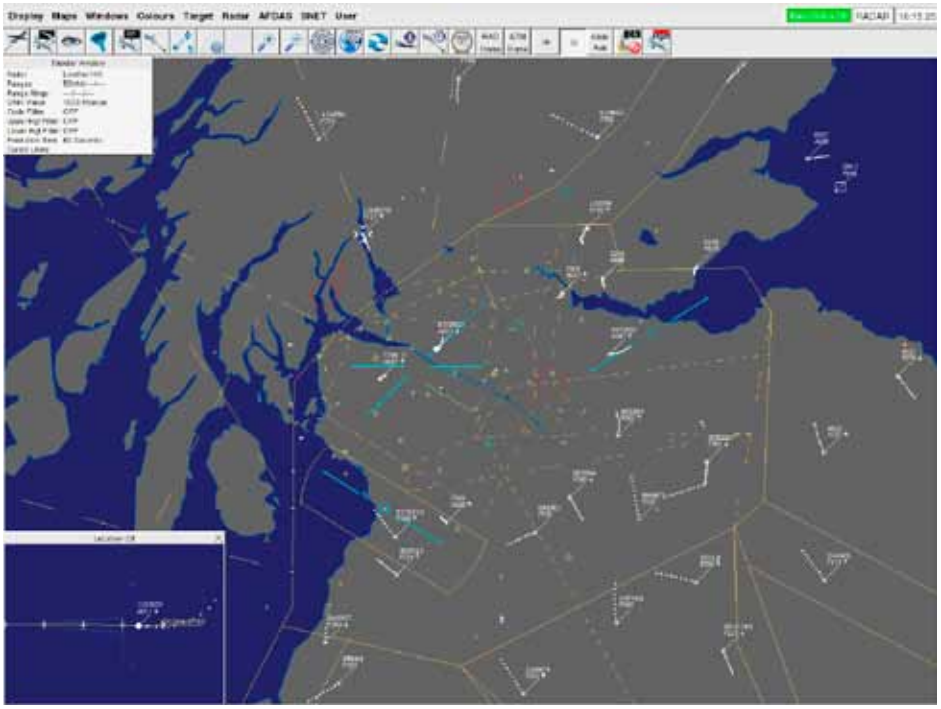
The NOVA 9000 system offers a seamless transition from a ground traffic situation to a full ACC air traffic picture. The Controller Working Position (CWP) provides the controller with a complete traffic situation display with optimum information. CWPs may be individually configured according to the tasks carried out at each position, ensuring that operators are always presented with the right information at the right time.

Developed in accordance with Eurocontrol specifications and other international bodies, the NOVA 9000 HMI is designed to be extremely flexible and configurable, permitting users to easily adapt the system according to controller roles and their changing needs.

Safety in air traffic control is paramount. The NOVA 9000 has an installed base that extends throughout the world and has been subjected to some of the most stringent quality controls and tests that exist. From the largest international airports to the smallest local control towers, the NOVA 9000 ATCS delivers the highest quality and safety assurance levels.

NOVA 9000 ATCS

Air Traffic Control System



As new sensors and higher processing performance of equipment becomes available, the safety logic systems are extended with more advanced and new functions to cope with increased traffic and safety levels. Even a single tower display position can be provided with the most advanced safety logic from a choice of the following:

- **STCA**. Short Term Conflict Alert
- **DAIW.** Danger Area Infringement Warning
- **MSAW.** Minimum Safe Altitude Warning
- **AFDAS.** Approach Funnel Deviation Alert System
- **RIMCAS.** Runway Incursion Monitoring and Conflict Alert System

All of the above ensure the monitoring and conflict alerting of a flight from gate to gate.

Indra Navia has unrivalled experience in interfacing many different sensors and data sources, processing the information and providing a clear and unambiguous display to the controllers. As a result, greater air traffic efficiency can be achieved.

Each NOVA 9000 Air Traffic Control System is delivered with minimum risk and may be expanded or configured to suit individual needs. The benefits of the unique technology platform include:

BENEFITS

1. Low life-cycle cost
2. Reduced number of spares
3. Easily configurable and adaptable HMI
4. Cost-effective expansion and upgrades

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NOVA 9000 AIRPORT COLLABORATIVE TOOLS (ACT)

The NOVA 9000 Airport Collaborative Tools (ACT) provides a presentation of realtime and stored information of aircraft movements to users of a NOVA 9000 system and other parties such as; airlines, security, fire stations, ground handlers.

Information is distributed using the clients existing LAN and computer equipment. Statisitcal data, movement logs and traffic situational displays can be presented to the user in a standard web browser.

The information presented in addition to the traffic window typically includes:

1. Time calculations: runway occupancy time; taxi to/from stands and runways; time on stand; de-icing time; departure queue time and arrival waiting time for stand.
2. Event counts: number of movements for each threshold and for the entire airport.
3. Cumulative counts: average time spend on stand; taxiway and runway usage.

BENEFITS OF ACT

1. Enables air traffic controllers to predict and monitor traffic flow, delays and possible bottlenecks to support decisions for efficient flow
2. Provides key stakeholders with the latest information about the traffic and expected delays for efficient planning and communication to customers
3. Assists airport operations to plan airport maintenance: tarmac, runway inspection, etc

NOVA 9000 AIRPORT COLLABORATIVE TOOLS (ATC)

TECHNOLOGY

ACT consists of one or several servers running in an open environment. Server hardware and Linux OS version can be tailored to suit the task and organisation.

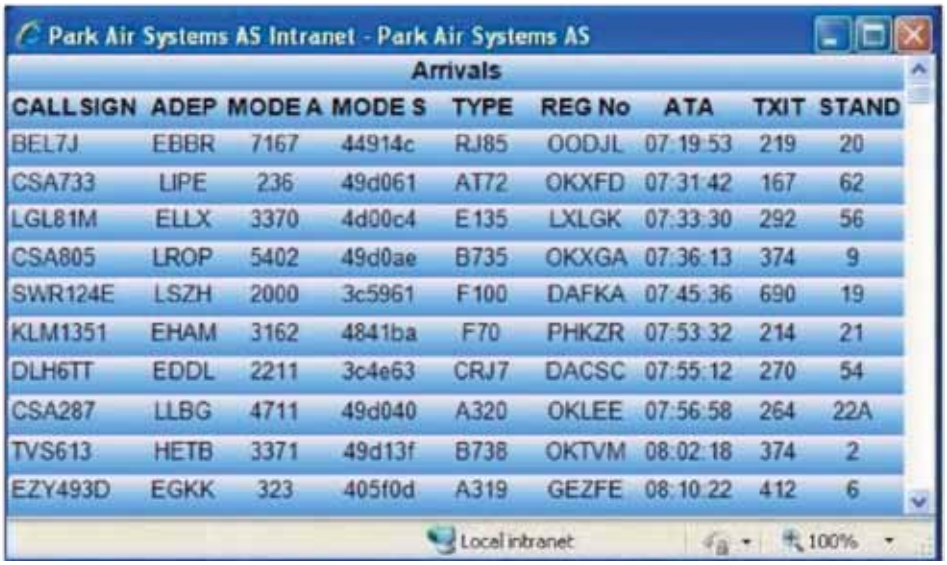
An ACT Server handles the following functions:

WEB SERVER

Run a web server that serves web pages to remote display clients. As an option authorisation of clients/users can be enabled and provided with a login to access the web server.

DATA SERVER

Receives traffic data sent from the NOVA 9000 operational system. Any realtime data is feed over TCP to the connected web clients running inside the browsers on the remote displays.



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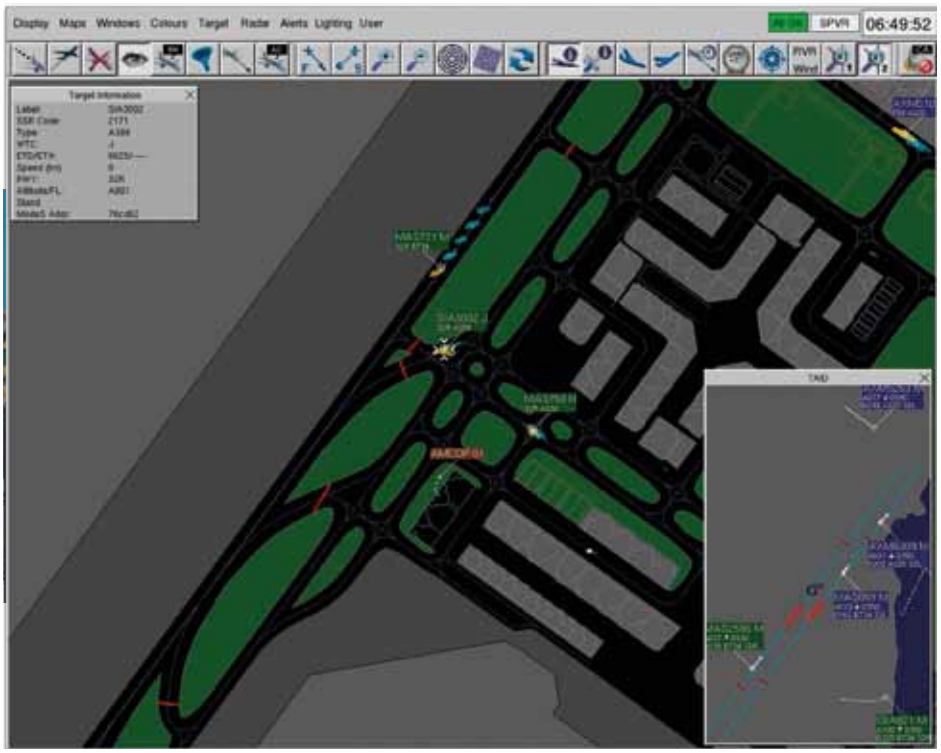
NOVA 9000 AGL

Airfield Ground Lighting



The NOVA 9000 SMGCS system may be expanded with an interface to the airports air/ground lighting system (AGL)*. This provides the controller with the possibility of selecting predefined routes for aircraft to and from the runways/stands, or creating and selecting temporary routes directly from the NOVA 9000 SMGCS CWP.

In addition, the AGL interface permits control of stop bars, permitting them to be cycled, or selecting them on or off.

Multiple stop bars, e.g. at runway entry holding positions, may be grouped together and switched on or off simultaneously. The AGL interface also contains extensions to the Runway Incursion Monitoring and Conflict Alert System (RIMCAS©), for stop bar crossing and route conformance monitoring and alerting

FEATURES

1. Virtual and physical stop bars
2. Control and monitoring of stop bars including stop bar intensity
3. Monitoring of target position reports
4. Monitoring of routes
5. Fixed and temporary route control
6. Group facilities
7. All parameters set from NOVA 9000 TECAMS
8. Audio/visual alarm monitoring
9. Monitoring of AGL incursion sensors
10. Stop bar and light segment status display

* Requires AGL systems with digital computerised control & monitoring

NOVA 9000 AGL

Airfield Ground Lighting

NOVA 9000 AGL	
PERFORMANCE	
Communication failure logic	
Max number of virtual stop bars	>200
Max number of physical stop bars	>200
Max number of stop bar groups	>25
Max number of controlled segments	>1000
Max number of fixed routes	>100

An aircraft in normal position not crossing the stop bar

An aircraft after crossing the stop bar with the alarm function on

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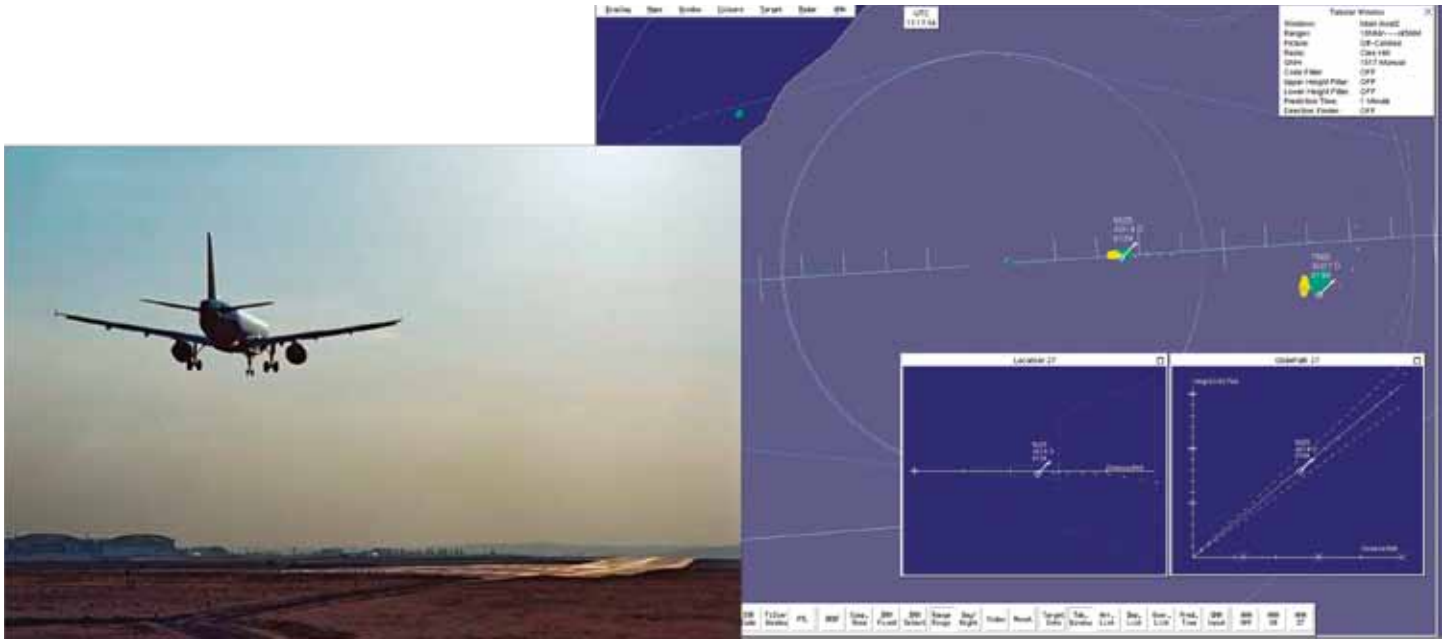
NOVA 9000 AFDAS



The NOVA 9000 Approach Funnel Deviation Alert System (AFDAS) provides the tower controller with a simple clear indication of whether an aircraft is on the glide-slope, and/or localizer during its final approach.

Should the aircraft veer from the nominal approach funnel, both audible and visual alerts will be provided.

AFDAS consists of a simple HMI to select which runway is in use, and can optionally display two windows, one showing lateral deviation from the runway centre line, the other vertical deviation (altitude) from the glide-slope.

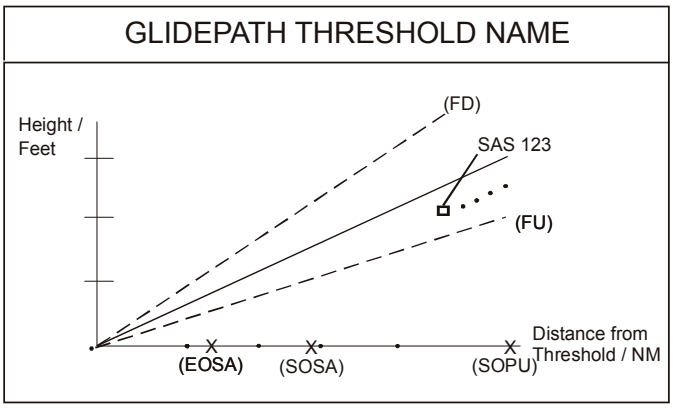
AFDAS is a software module, which may be used together with the NOVA 9000 Approach system, or a stand-alone NOVA 9000 ATM.

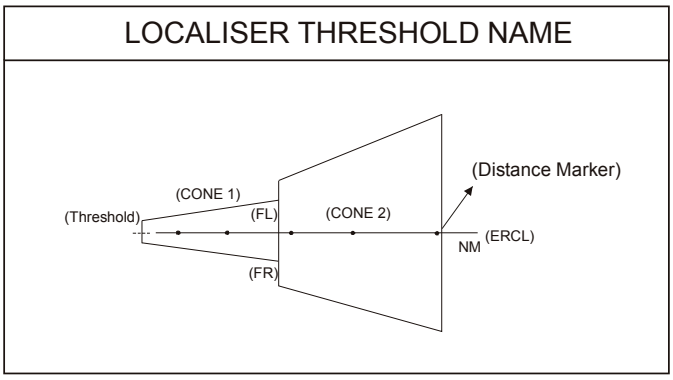
FEATURES

1. Menu selection of up to 8 runways
2. Resizable windows for glide-slope and localiser
3. Configurable (on/off) audible alarm
4. Visual alarm (aircraft symbol/label turns red)
5. NOVA 9000 Approach/ATM position
6. Requires valid C-mode
7. Requires SSR coverage to within 2 miles

NOVA 9000 AFDAS

NOVA 9000 AFDAS	
PERFORMANCE	
Update	As per radar source
Operational	Up to 10 Nm
OPERATIONAL	
Max. No. runways	8
Mode C required	
SSR coverage to 2 miles required	





Note (Names in brackets will not be drawn on CWP)
only describe text for this document

Cone 2 = Pick Up Area
Cone 1 = Special Alert Area
ERCL = Extended Runway Centre Line
EOSA = End of Special Alert
SOSA = Start of Special Alert
SOPU = Start of Pick Up

FD = Fly Down Line
FU = Fly Up Line
FL = Fly Left Line
FR = Fly Right Line

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