GROUP OMNIPOL

LET
Aircraft Industries

L 410 NG MPA

PHOTOGRAMMETRIC SCANNING, MARITIME, SURVEILLANCE AND PATROL VERSION

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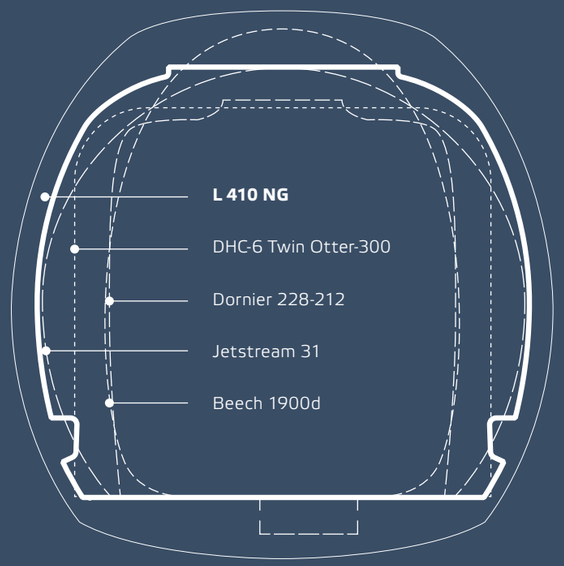
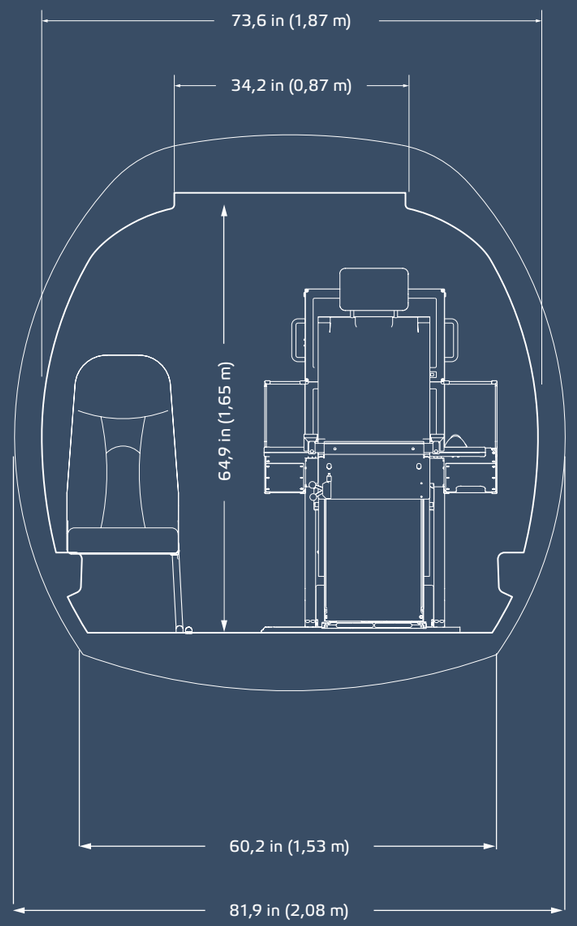
SURVEILLANCE MISSION

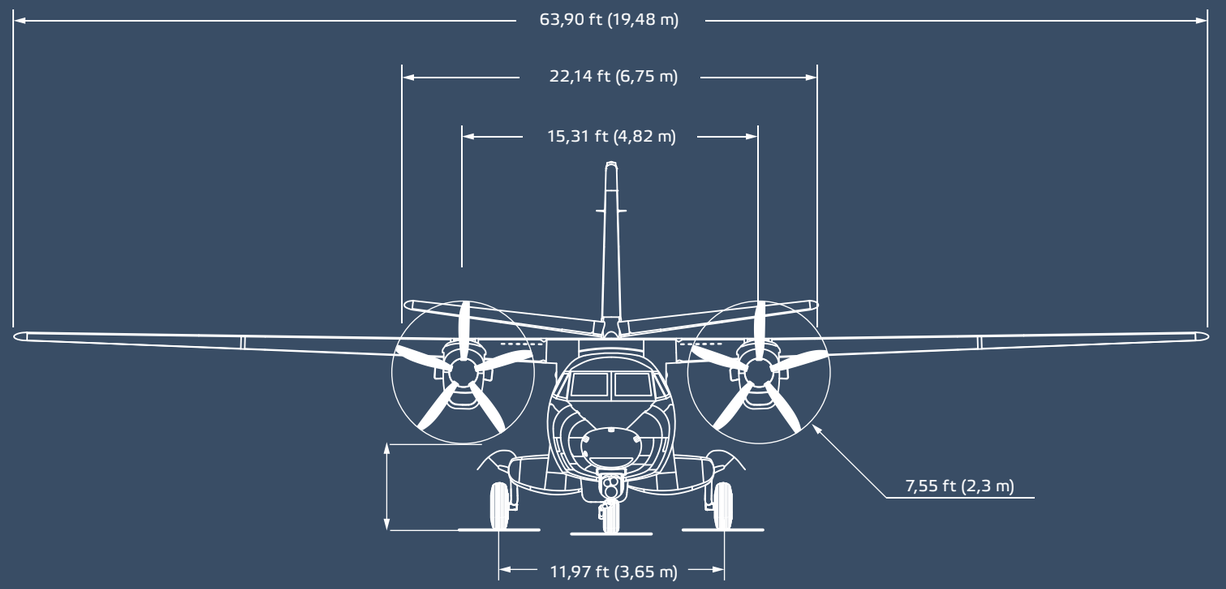
L 410 NG

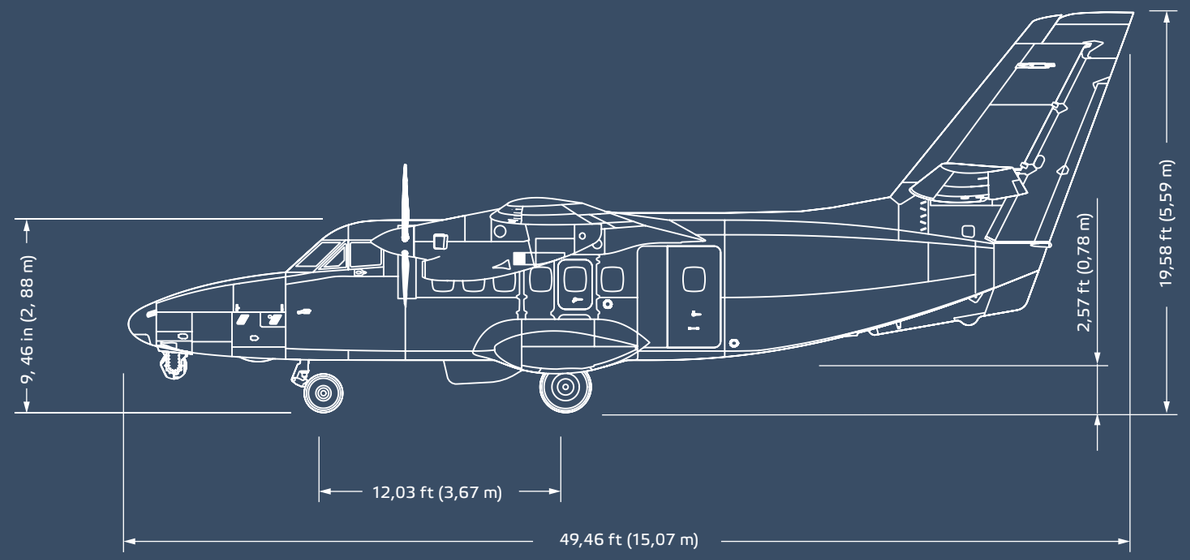
The Most Spacious Cabin

Dimensions and Weights









Dimensions

Passenger Cabin Volume	632 ft^3	17,9 m^3
Passenger Door	31 x 57,5 in	0,8 x 1,46 m
Cargo Door	49,2 x 57,5 in	1,25 x 1,46 m

Weights

Max. Take-off Weight	15 432 lb	7 000 kg
Max. Landing Weight	14 991 lb	6 800 kg
Max. Zero Fuel Weight	14 551 lb	6 600 kg
Max. Fuel Weight	4 087 lb	1 854 kg
Max. Fuel Weight with tip tanks	4 947 lb	2 244 kg

Flying Beyond Expectations

Performance

Max. Range Rating (1700 RPM) @ 10 000 ft, ISA

Standard Mission Equipment, 2 pilots + 2 operators/observers	1 134 NM	2 100 km
Standard Mission Equipment, 2 pilots, Ferry Flight	1 134 NM	2 100 km

Max. Range with tip tanks (1700 RPM) @ 10 000 ft, ISA

Standard Mission Equipment, 2 pilots + 2 operators/observers	1 220 NM	2 260 km
Standard Mission Equipment, 2 pilots, Ferry Flight	1 350 NM	2 500 km

Max. Endurance (1700 RPM) @ 10 000 ft, ISA

Standard Mission Equipment, 2 pilots + 2 operators	7.7 hrs	464 min
Standard Mission Equipment, 2 pilots + 2 operators, with tip tanks	8.6 hrs	515 min

Climb Rate (1700 RPM) **@ 10 000 ft,** ISA, SL

Both Engines	1 673 fpm	8,5 m/s
Single Engine	335 fpm	1,7 m/s

Take-off Distance (1700 RPM) @ 10 000 ft, MTOW, SL, ISA	1 936 ft	590 m
Landing Distance (1700 RPM) @ 10 000 ft, MTOW, SL, ISA	1 969 ft	600 m

Power Plant

The GE H Series engine features sophisticated technologies such a 3D aerodynamic airfoil designs, blisk (bladed disk) compressor rotors and high temperature materials. These technologies deliver more shaft horsepower, improved engine fuel efficiency and increased temperature margin, significantly increasing hot-day takeoff capability and high-altitude performance. GE H85-200 engine features an advanced reduction gearbox which lowers maximum propeller speed from 2 080 RMP to 1 950 RMP, resulting in external and internal noise reduction.

The unique configuration of the engine simplifies maintenance by eliminating the need for recurrent fuel nozzle maintenance and periodic hot section inspections.

- Model: GE H85-200
- Producer: GE Aviation Czech, s.r.o.
- Proven design, successor of M601 engine 4 500 + pieces delivered
- Two-shaft, free turbine, reverse-flow design
- Take-off Power: 634 kW / 850 SHP
- Flat rated temperature: 31ºC
- Max. continuous power: 634 kW / 850 SHP
- TBO: 3 600 FH
- Dry engine weight: 204 kg
- HSI (hot section inspection) is not required
- None Fuel nozzle inspection

- Model: AV-725
- Producer: Avia Propeller, s. r. o., Czech Republic
- Propeller speed: 1 950 RPM
- TBO: 3 600 FH / 6 600 FC
- Weight: 79 kg (174 lb)
- Low noise level
- Possibility to transport blades separately
- Metal double-action highly efficient AV-725 propellers are extremely durable and resistant to rough conditions on unpaved airstrips. Propellers are equipped with a system of automatic and manual feathering.


OK-NGA
OK-NGA
GARMIN
GARMIN
GARMIN
AEROBATIC MANOEUVRES PROHIBITED
MAX FLIGHT LEVEL 20 000 ft
LEFT ENGINE
RIGHT ENGINE
FLAPS

L 410 NG MPA

System Description

Airborne mission management system provides an integrated solution for sensor operation, sensor data acquisition and sensor fusion and supports flight operations and visual / electronic surveillance of the reconnaissance aircraft.

The entire mission system functionality is provided via the graphic user interface (GUI) on the mission system console. At the same time, the mission system provides awareness to the ground station operator through its data linking capabilities.

» Flight Operations

The mission equipment provides situational awareness in all phases of flight through a display indicating the location of the aircraft and the associated flight plan and track in relation to the chart selected by the operator.
Further, the mission system includes a comprehensive flight planning capability reducing cockpit workload and reaction time for missions. Flight plans can be displayed on the Cockpit Information Display.

Finally, the mission system can receive or transmit up-to-date information on the operation through a number of reports, typically briefing, position, asset status, and sighting reports.

» Visual and electronic Surveillance

With the various sensors (Search radar, EO/IR sensor, Direction Finder and AIS transponder) the mission system provides substantial electronic search capabilities. In a typical mission, Search radar, Direction Finder and AIS transponder will detect targets; typically, the EO/IR sensor will be applied to identify a specific target. Identification is supported through the ISAR mode of the radar and the AIS transponder.

During a visual search, EO/IR information is available within the mission system to support the visual activities. Compared to the visual observers, the EO/IR sensor will deliver better resolution and can therefore improve search activities.

» Data Linking

The transfer of data to a ground station is a key capability of the system. The equipment available will support the transmission of data, images and videos to a ground operating base.

Airborne Maritime Surveillance Mission

» **SEARCH AND RESCUE (water and land)**

1. FAR RANGE SENSORS: Search radar, SLAR, Direction finder
2. CLOSE RANGE SENSOR: EO/IR (+ search light)
3. SYSTEM FEATURES: Target data association, Sensor data coverage, Bearing to distress signal in tactical map
4. RESCUE CO-ORDINATION: Information sharing, Dropping of rescue equipment

» **BORDER PATROL, SMUGGLING PREVENTION, IMMIGRATION**

1. FAR RANGE SENSORS: Search radar, SLAR, AIS transponder
2. CLOSE RANGE SENSOR: EO/IR, SCAM & VCAM
3. SYSTEM FEATURES: Augmented reality, Target data association, Sensor data recording, Ship image database, Map flexibility

» **FISHERY CONTROL**

1. FAR RANGE SENSORS: Search radar, SLAR, AIS transponder
2. CLOSE RANGE SENSOR: EO/IR, SCAM & VCAM
3. SYSTEM FEATURES: Augmented reality, Target data annotation, Sensor data recording, Full bidirectional cueing of EO/IR with radar and AIS, On board ship image database

» **SHIP TRAFFIC MANAGEMENT**

1. FAR RANGE SENSORS: Search radar, SLAR, AIS transponder
2. CLOSE RANGE SENSOR: EO/IR, SCAM & VCAM
3. SYSTEM FEATURES: Target data association, Target data annotation, Sensor data recording, Full bidirectional cueing of EO/IR with radar and AIS, On board ship image database

» **ENVIRONMENTAL SURVEILLANCE**

1. FAR RANGE SENSORS: SLAR, Satellite imagery integration
2. CLOSE RANGE SENSOR: EO/IR , IR/UV-SCANNER, SCAM & VCAM
3. SYSTEM FEATURES: Sensor data recording/Image processing, Target data annotation, Ship image database
4. CLEAN-UP CO-ORDINATION: Information sharing, Boom allocation support, Dispersant drop support

System Configuration

» **MAIN OPERATOR CONSOLE**

» **PORTABLE DISPLAY UNIT (COCKPIT)**

» **SEARCH RADAR**

» **EO/IR SYSTEM**

» **SIDE LOOKING AIRBORNE RADAR (SLAR)**

» **IR/UV-SCANNER**

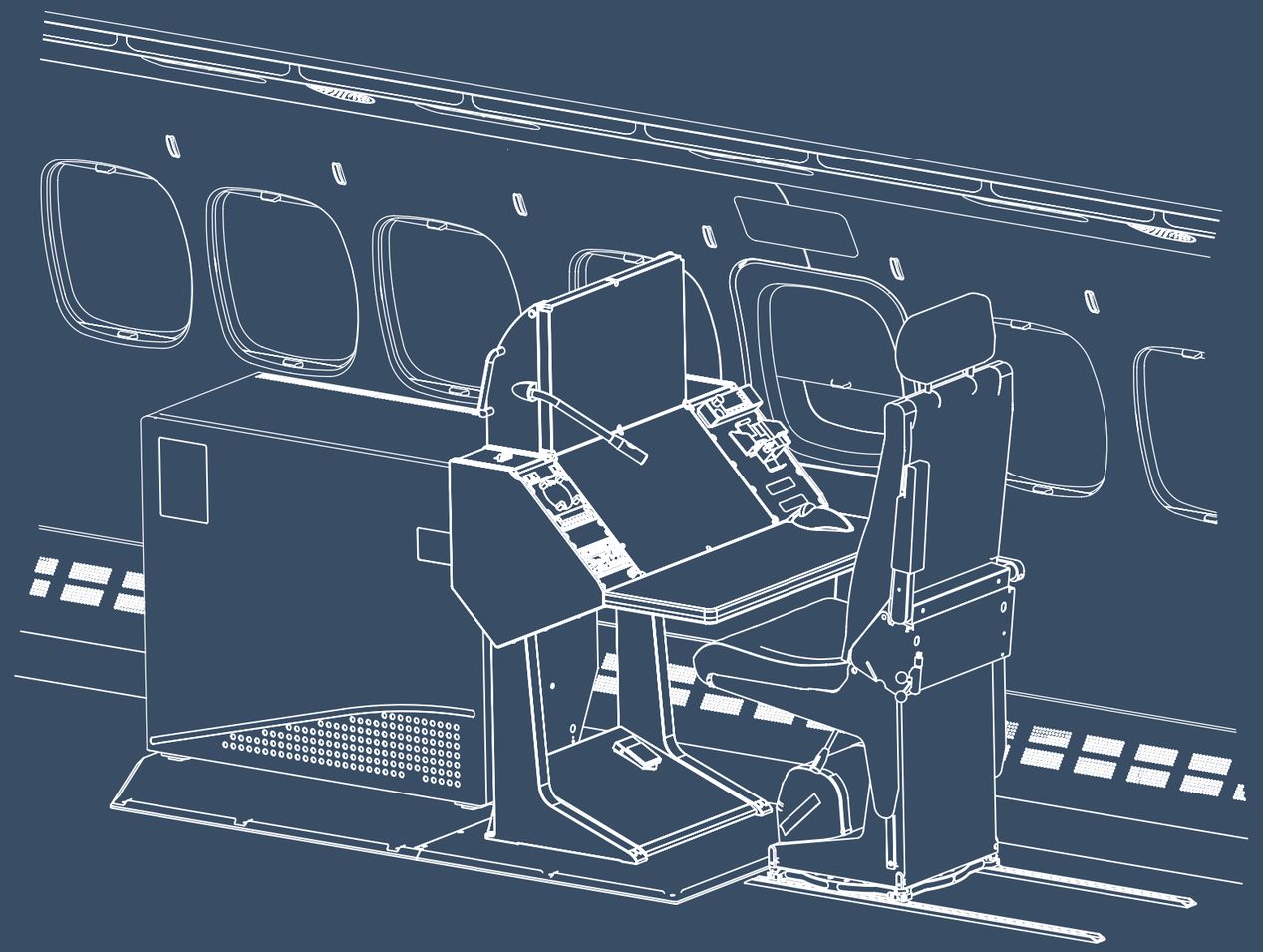
» **RADIO DIRECTION FINDER**

» **DIGITAL CAMERA, VIDEO CAMERA**

» **HIGH SPEED SATCOM**

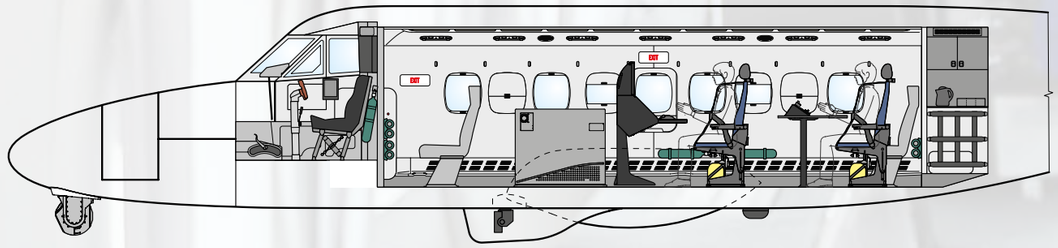
» **SEA/MARINE VHF**

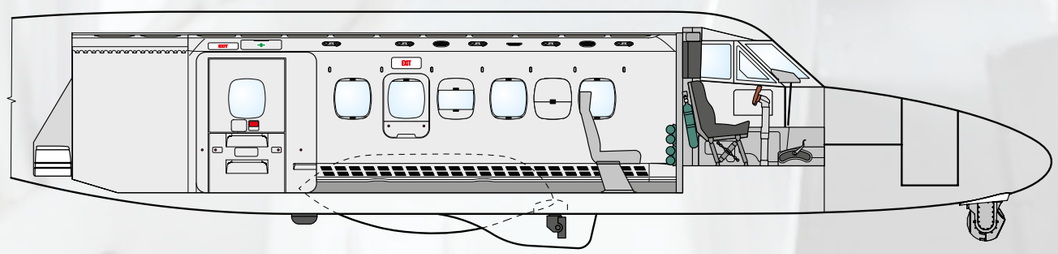
» **AIRCRAFT INTERCOM**

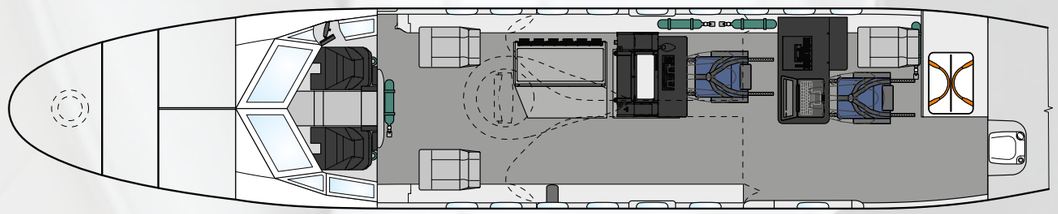


Standard Cabin Layout

- Spacious cabin
- Cabin layout tailored to customer requirements
- Maximum comfort for mission operators
- Special work places for two operators
- Seats for other missions specialists







Mission Equipment

SEARCH RADAR

Osprey search radar provides high performance sea surveillance, notably against „difficult targets“, land surveillance with wide swath, very high resolution ground mapping, small and low speed ground target indication, high performance air-to-air surveillance, tracking and intercept. Tracks from search radar can be displayed on the moving map, allowing to compare and merge them with tracks from other sources. All actions applicable to tracks can be used, e. g. EO/IR slaving.

» Lightweight radar with 360-degree scanning capability with belly-mounted antenna

» Wide range of capabilities from small target detection to long range search

» Excellent reliability

SLAR

» High resolution surveillance of large areas of the surface

» The swath width is 160 Km (80 Km to each side of the aircraft)

» Strong enhancement of details

» Outstanding performance in small target detection

» The improved signal processing and geo-referencing allows the images to be geo-corrected into the on-board GIS

EO/IR

For the Electrooptic and Infrared imaging system/sensor is used L3Harris WESCAM MX-15 True HD system. It is a multi-sensor, multi-spectral fully digital and high definition imaging system in a line replaceable unit configuration (LRU) and is the ideal imaging system for Medium-Altitude Covert Intelligence, Surveillance & Reconnaissance and SAR missions.

Wescam MX15 EO/IR System

The optoelectronic payloads of the MX-15 are installed in a rugged high performance 15” gimbal. This 4-axis stabilized turret with internal passive isolator provides excellent stabilization performance. For high target location accuracy an IMU is mounted to optical bench, supplemented by a built-in GPS receiver.

» Hight Sensitivity Color daylight imager, HD 1920 x 1080 pixel, continuous zoom

» Thermal imager, cooled MWIR, SD 640 x 512 pixel, step zoom

» High Sensitivity Color spotter, HD 1920 x 1080 pixel, step zoom

» Eyesafe Laser Rangefinder

» Automatic video tracker (AVT)

» Image blending

» Geo-pointing with internal GPS

» Integrated IMU

A hand controller (HCU) with dimmable backlight will be accessible on the mission operator console and provides to the mission operator the full control of the EO/IR system during day and night operation. The EO/IR video outputs are split up and directly connected to the inputs of each of the monitors. This provides latency-free display on each of the screens in arbitrary layouts, e. g. full screen or picture-in-picture. Real-time video will be available in the cockpit, too, by using the Cockpit Information Display (CID).

DIRECTION FINDER

We propose for the Airborne Targeting System the RHOTHETA RT-600A which covers the conventional 121.5 MHz, 243 MHz and 156.8 MHz SAR frequencies as well as the 406 MHz COSPAS/SARSAT satellite emergency frequency.

AIS TRANSPONDER

As airborne Automatic Identification System (AIS) we propose the Saab Transpondertech R4A MkII airborne AIS transponder as component of the Airborne Targeting System. The proposed AIS transponder includes full transceiver functionality, which means that it is possible to receive messages from all AIS units within range and also transmit selected information from the aircraft. Transmission capability is particularly useful for missions such as SAR operations, fleet management and even surveillance flights where it is occasionally desired to reveal the own position or to interrogate selected vessels for more data.

AeroMission provides following capabilities to use the AIS transponder during operations

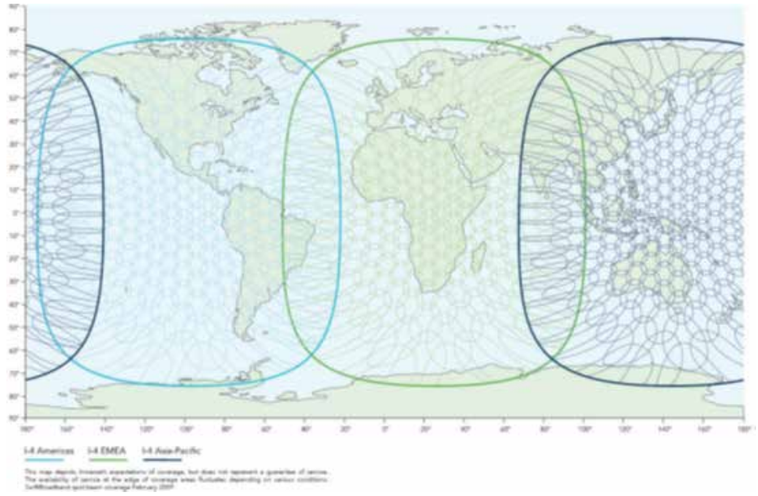
1. The management of AIS target information, this includes:
    - » Handling of the received AIS information as sensor contact
    - » Establishment of AIS track history for selected targets
    - » Selective Display of AIS related information on a Moving Map display
    - » Fusion of AIS contacts with other sensor contacts of the same target to a multi-sensor track
2. Initialisation of an interrogation of a selected AIS station (target)
3. Coding and encoding of binary data (safety related messages) according to the ITU-R M.1371-1-based standard
4. Message display
5. Transmission of messages and support of Digital Selective Calling (DSC) symbols

Communication System

SATCOM SWIFTBROADBAND SYSTEM

SwiftBroadband is an Inmarsat packet-switched service that offers in-flight Internet connectivity. The system can support video streaming, too. The SwiftBroadband service is provided through the Inmarsat-4 satellites.

SwiftBroadband is available over the Inmarsat-4 satellite constellation, providing near global coverage.



The graphical presentation indicates the coverage of the service.

SwiftBroadband services are very flexible by allowing combining a number of different contexts. For example, the total bandwidth can be utilized by a combination of a packet-switched service and a streaming service, providing concurrent telephony at the same time.

VIDEO STREAMING

Video streaming can be supported by using a dedicated encoder based on Digital Barriers' TVI technology in combination with a server on ground.

Bandwidth provided by the SwiftBroadband service does not allow streaming of full-resolution full-frame-rate HD video. The TVI system uses sophisticated proprietary algorithms to maximise usage of limited bandwidths. It ensures a more efficient representation of detail at lower network bandwidths, particularly where motion levels are high, when compared to standard encoding methods like H.264, see below comparison table. It has to be noted that, while this method provides real-time streaming, some latency due to the satellite connection and en-/decoding is inevitable.

TVI also includes a high-resolution enhancement function, allowing remote retrieval of detail in frames and areas of interest. Whilst using this function, the observer on ground is also able to view the real-time video stream – and thereby ensuring that situational awareness is not compromised.

The video stream is decoded and managed on a ground-based server. The server ensures reliable video streaming by monitoring the available network bandwidth and making any necessary adjustments to video streaming “on the fly”. Clients on different kinds of platforms, including iOS and Android, can connect to the server via internet or local network.

INTERCOM

Special mission intercom DVCS6100 from Becker Avionics

Four Audio Control Units (ACU) are proposed:

» 1 in the combined Operator Workstation/Equipment Rack

» 1 on the right-hand side of the cabin, accessible from the two right-hand forward seated passengers

» 2 on the flight deck (pilot / co-pilot side)

The cockpit ACUs are replacing the existing intercom panels providing connectivity between cabin and cockpit as well as access to the primary and mission comms for the pilots.

Cabin and cockpit crew will have access to:

» Primary VHF1/2 (cabin crew listen only)

» V/UHF 1/2

» VHF Marine

» Direction Finder

» SATCOM

» Mission Computer System (replay)

VHF/UHF AVIATION RADIO

Installation of XM6013 of the Rohde&Schwarz, M3AR family, ensures the airborne communications in the frequency range from 30 MHz to 400 MHz. It is software defined, multiband-capable airborne transceivers with a dedicated antenna and the control panel GB6500. This compact and lightweight radio with high transmit power up to 20 W in AM mode and up to 30 W in FM mode is suitable for communications with military and civil air traffic control e.g. 8,33 kHz channel spacing or offset carrier receive operation and approved for jet and propeller aircraft as well as helicopters and UAV. The control panel of the V/UHF radio will be mounted on the Operator Workstation (OPWS). The V/UHF aviation radio is connected to the mission INTERCOM system, the XM6013 transceiver is mounted in the EQCO.

ICOM VHF/DSC MARINE RADIO

The ICOM IC-M400BB VHF/DSC marine transceiver is proposed to ensure the radio communication in the marine VHF/DSC band. The transceiver will be controlled via the mission management system, allowing convenient operation from each AeroMission client. As an option the hand controller HM-195B can be offered on request.

The DSC output is interfaced to the mission system to retrieve DSC distress messages and to track the corresponding distress signals in AeroMission.

Mission Integrator System

MISSION COMPUTERS

The Mission Integrator System comprises two identical extreme rugged high performance computers of type Adlink HPERC-IBR-Hx for mission data serving and operator displays. One of the extreme rugged computers is installed in the Operator Workstation, the second in the Equipment Console.

The Mission Integrator system with its connection to all other subdevices, create the heart of the system, provides:

» Acquisition, processing and storage of data

» Graphical user interface for the operator

» Cockpit Information Display, providing mission information to the flight crew

» Ethernet interface for optional operator laptops

» Data communication

VIDEO SERVER

The Video Server AD-DVS is designed for airborne applications and is a three-channel video encoder for live streaming applications.

MISSION COCKPIT INFORMATION DISPLAY

AeroMission is supporting dedicated AeroMission clients for the flight crew, the Cockpit Information Displays (CID). In the proposed solution the Portable Mission Display (PMD) TacView® from CMS will act as an interactive CID in the cockpit. The AeroMission software will be executed in a version adapted to the pilot's needs and with regard to flight safety.

Some of the functions accessible to the pilots by means of this interactive CID are:

» Display of the AeroMission moving map

» Display of sensor tracks e.g. Radar, AIS, aircraft track, flight plans

» Homing guidance

The portable mission display TacView provides to the cockpit crew mission data and video and can be operated in different display modes, e.g. mixed mode for displaying mission video and map or in the Map / EHSI mode for mission flight guidance.

LAPTOP SYSTEM FOR SECOND OPERATOR

A ruggedized 15" Laptop system with installed AeroMission® software is available as workstation for the second Operator.

Working positions of OPS #1 and OPS #2 are assigned to different fields of activities to share the workload of the mission tasks. To avoid interference by using specific AeroMission® functions between the OPS #1 and OPS #2, each working position gets dedicated groups of access rights to these functions. Only one working position at a time can hold such group of access rights, to have exclusive access to dedicated system functions.

STORAGE DEVICES

An external solid state hard disk is used as back-up medium for the database. All mission relevant data will be replicated during the flight from the primary hard disk – mounted internally in the mission computer – to the external hard disk.

OPERATOR SCREENS

The Operator Workstation provides two touch screen displays allowing viewing images from EO/IR HD sensors in full resolution.

The selected displays of type Quadrant Avionics Integra VX-1021-100 providing the following features:

» Full HD 1920 x 1080 pixel resolution

» 2 x DVI-D / 2 x PAL / 2 x HD-SDI

» Touch Control via RS-232

» Up to four inputs displayed concurrently

» Free scaling and positioning of each input

» Remotely controllable via RS-232

» 28 VDC

IR/UV LINE SCANNER

The IR/UV Line Scanner is a standard sensor for airborne oil spill monitoring.

» Detection of highly reflective features on the sea surface such as oil spills and biogenic surface films

» Imaging remote sensor for thermal mapping applications

» Basic sensor for automatic creation of thematic maps of the oil spill scene (automated scene analysis)

» Highly resolved mapping of very thin and thick oil layers on the water surface

OPERATOR MISSION SEAT

A Multi-Functional Operator's Seat (MFOS) is proposed for the Mission Operator.

The MFOS from Martin Baker company offers the following features:

» Certified with Air Worthiness Release (AWR)

» Integrates directly into cabin floor or with a pallet

» Traverses fore/aft and laterally

» 5 inches vertical adjustment

» Rotates 360° in 15° increments

» Seat folds to increase cabin volume

» Stand up or 4 or 5 point harness

Operator's Training

Mission System Operation and Maintenance Training Program for up to 6 mission operators is proposed with a duration of two weeks. It contains a theoretical part as well as practical training at the customer's base. The practical training will be carried out on ground and in flight. In addition, pilot familiarization for up to 6 pilots is included.

The training will cover the following key elements:

» AeroMission system training

» EO/IR system provided by the sensor manufacturer

» Radar system provided together with the sensor manufacturer

The training courses are held in English. The training documents will be provided in English. The trainers use Power Point based training material. Aerodata provides the training material in paper form as well as in electronic format.

The training for the operators is consists of following main objectives:

» Operators shall be familiar with the system layout and the functionality of the system elements and the contribution for managing the mission

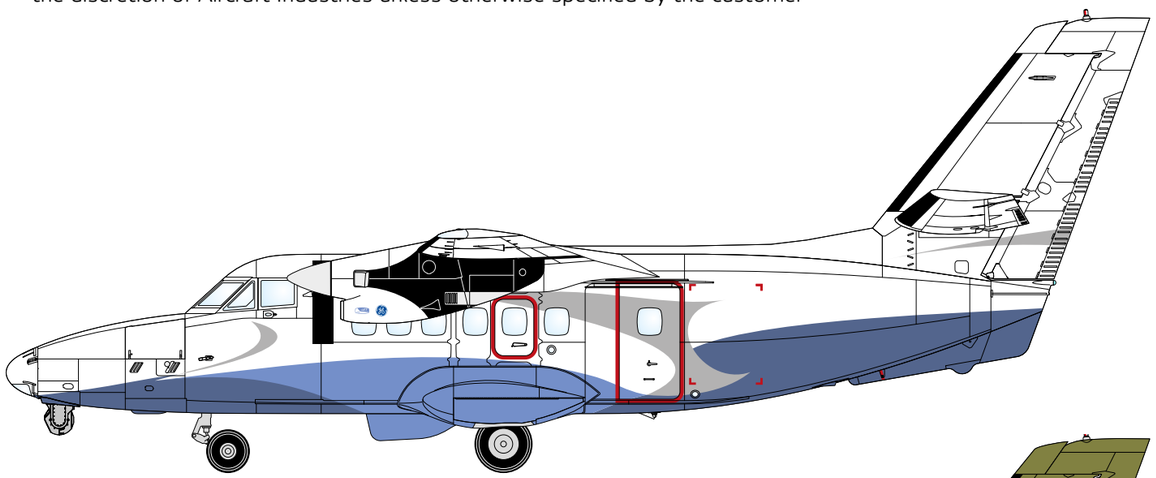
» Operators shall be familiar with the operation of the operator workstation and its related features

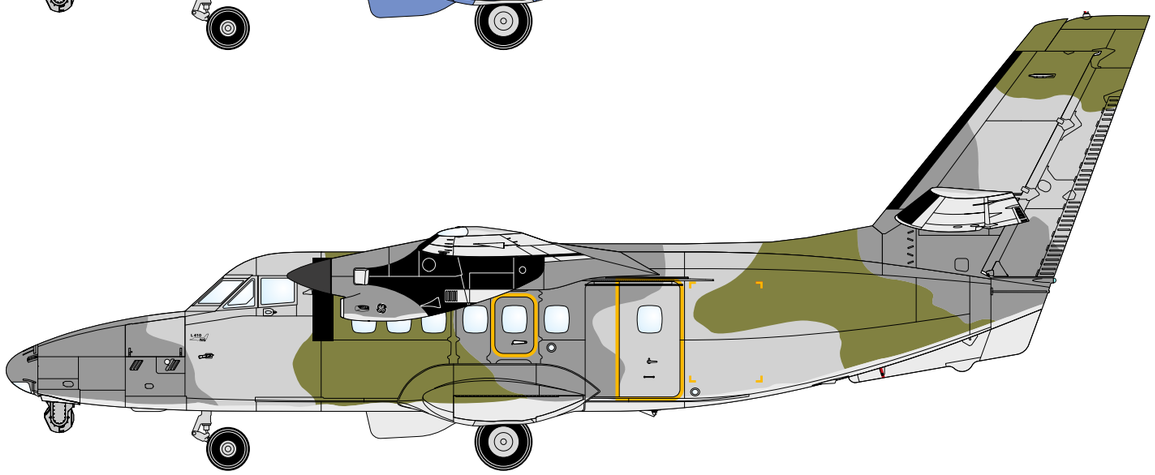
» Operators shall have the knowledge to fully operate the mission system equipment

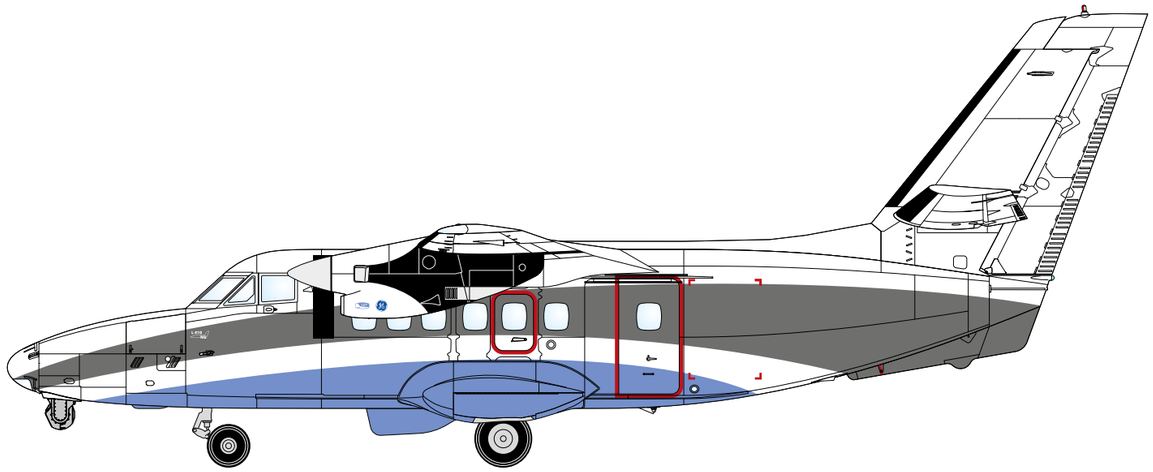
External Paint Scheme

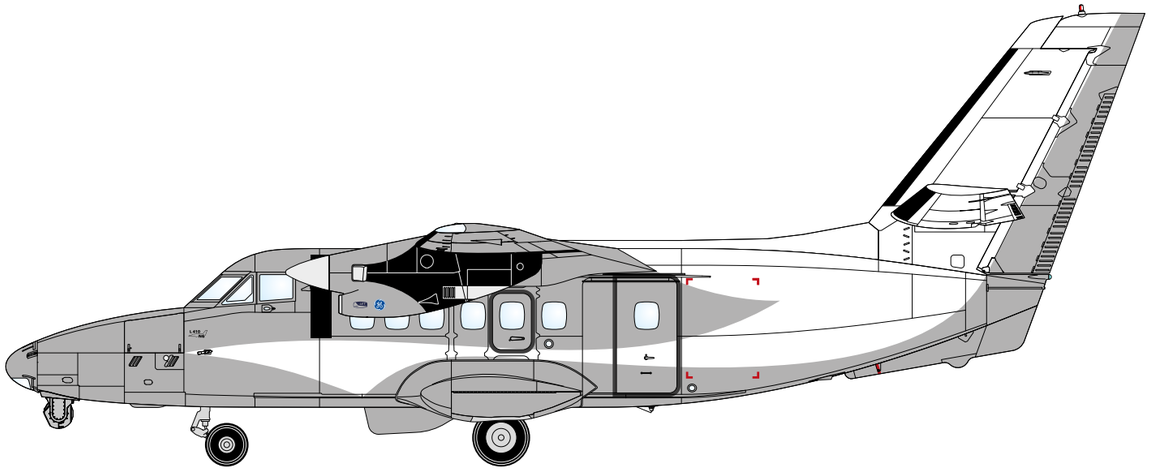
Specialists of Aircraft Industries can design an attractive aircraft livery based on operator's expectations or his fleet colours, logos or special markings, taking into account unique L 410 NG shapes and requirements of standards and regulations. Painting will resist adverse climate conditions as well as extreme use of the aircraft.

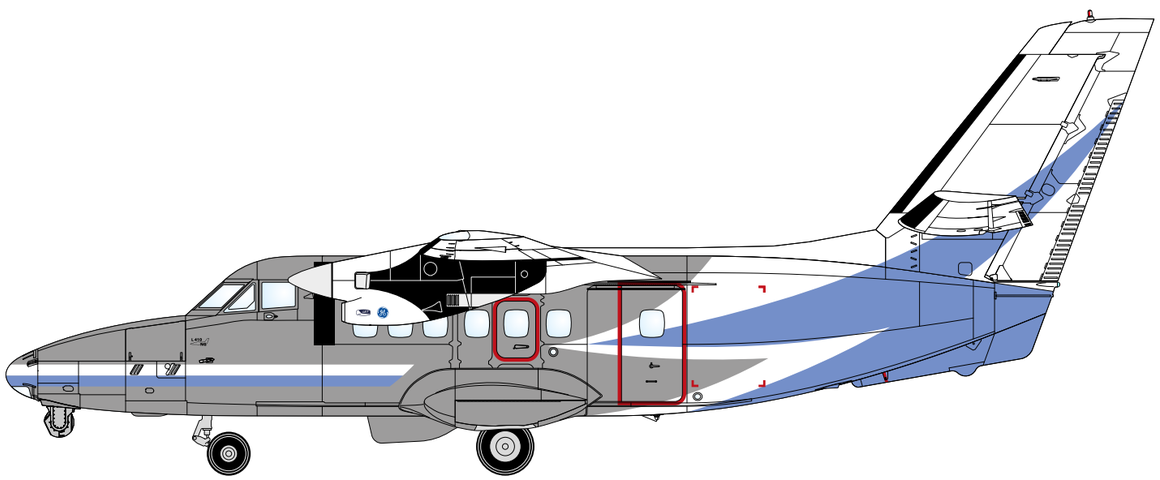
- Customer can choose from standard external schemes listed in catalogue provided by Sales Representative
- External schemes can be prepared based on customer specification and a price quote will be provided on request
- Unless clearly specified (location, color), registration markings will be applied per EASA/FAA regulations
- Placement of Aircraft Industries and model logos is effected by individual paint schemes, and will be applied at the discretion of Aircraft Industries unless otherwise specified by the customer











Mission Profile

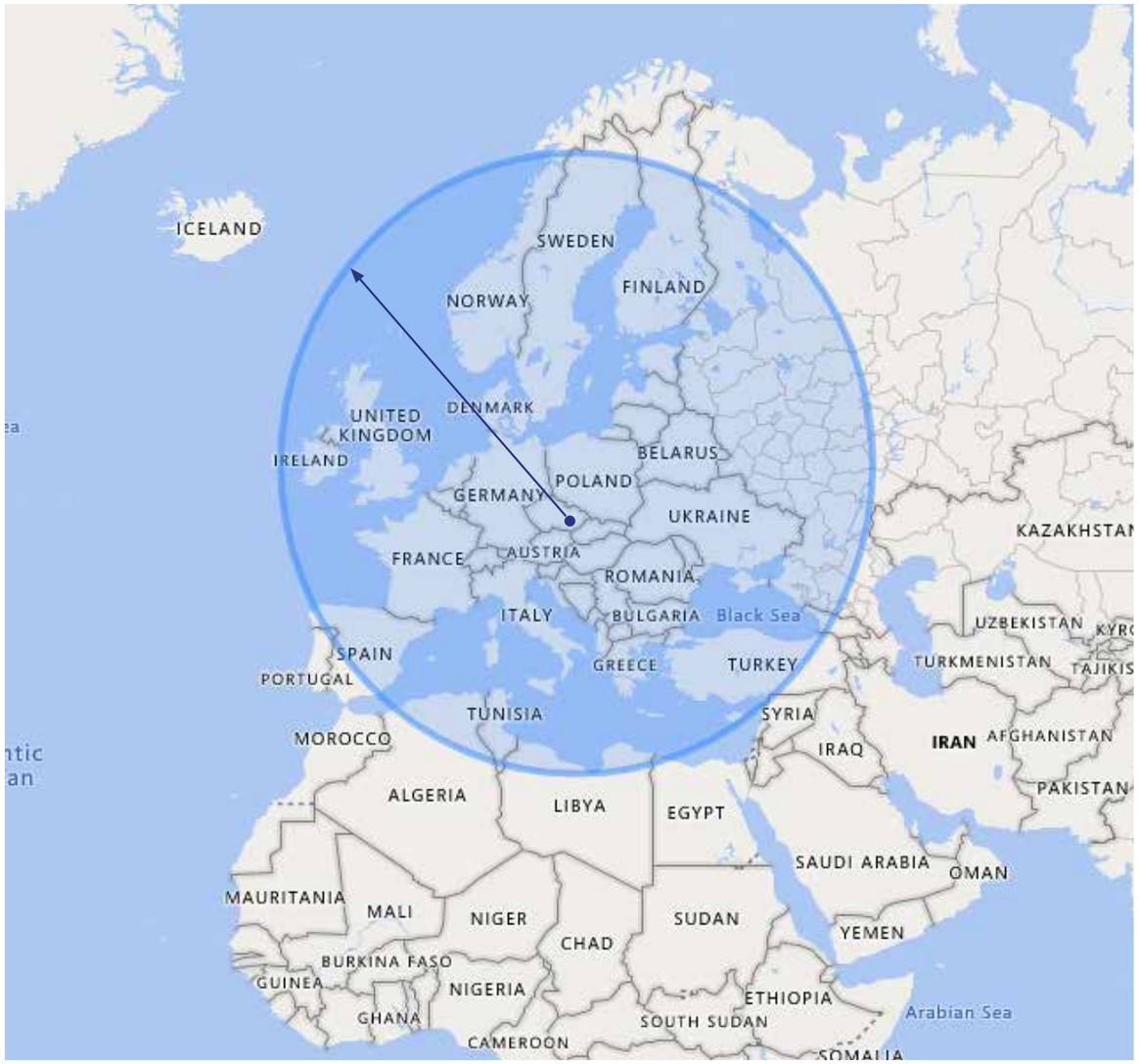
Standard Mission Equipment, 2 pilots + 2 operators » Range: 2 100 km

Standard Mission Equipment, 2 pilots, Ferry Flight » Range: 2 100 km

» Max. Range Rating, FL140, ISA conditions

» Reserves: 45 min. holding

» *Centre: LKKU Kunovice*



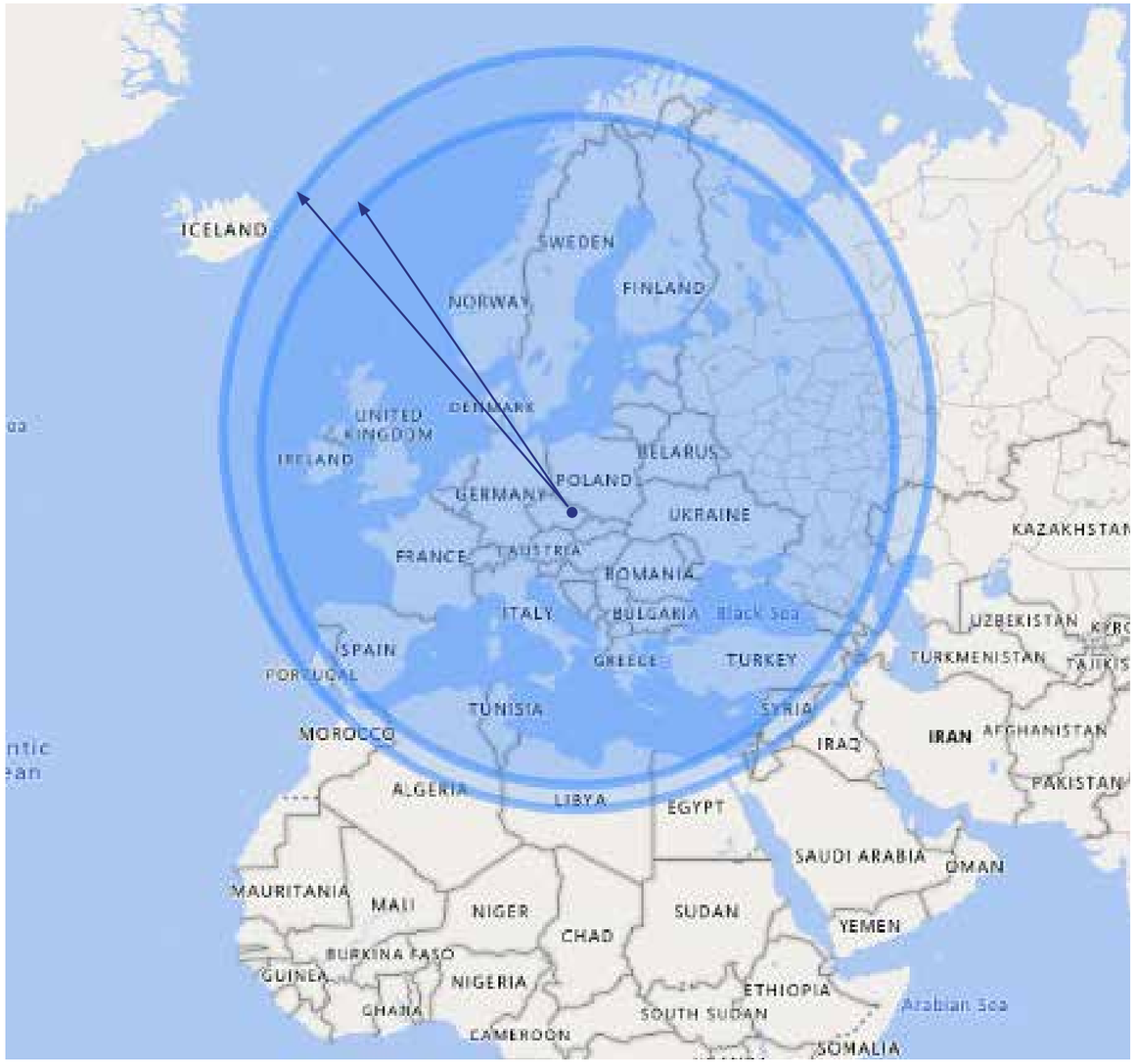
Standard Mission Equipment, 2 pilots + 2 operators, with tip tanks » Range: 2 260 km

Standard Mission Equipment, 2 pilots, Ferry Flight, with tip tanks » Range: 2 500 km

» Max. Range Rating, FL140, ISA conditions

» Reserves: 45 min. holding

» *Centre: LKKU Kunovice*



Customer Support and Services

At Aircraft Industries, we understand that our responsibility to our customers extends far beyond the aircraft sale. We are committed to providing the resources necessary to ensure the safe and reliable operation of our aircraft, and we will be with you at every step of your aircraft's lifecycle. We offer a wide range of products and services to support your mission requirements and regular operations.

- **24/7 SERVICE -** AOG technical consultations, warranty claims, spare parts
- **FAST SPARE PARTS DELIVERY**
- **ASSISTANCE AT YOUR BASE** - by our licensed ground and flying staff
- **TECHNICAL CONSULTATION** - consultations and specific assistance related to inspections, repairs
- **ROUTE AND ECONOMIC ANALYSIS**
- **AIRCRAFT MAINTENANCE**
- **REGULAR BULLETIN SERVICE**
- **SERVICING AND TESTING EQUIPMENT** - special equipment delivery for aircraft maintenance
- **L 410 TYPE RATING TRAINING** for pilots (ATO) and for engineers (MTOA) in EASA (Part 147 approved Training Organization)

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