

## EMERGENCY MEDICAL SERVICE

Installation of interiors and systems on EMS and SAR helicopters

**Airbus Helicopters**  
**AS365 series**

Installation and certification of EMS interiors and systems with customised layout based on customer's needs.

Airlift holds **3 Supplemental Type Certificates (STC)** for AS365 with **8 helicopters modified** plus various minor changes.

As operator, Airlift has more than **20 years or experience from EMS and SAR operation** with the AS365

### Customers:

**Scandinavian MediCopter** (AS365), Sweden

**SAAB** (AS365), Sweden

**Multiflight / Great North Air Ambulance** (AS365), UK



### DESCRIPTION

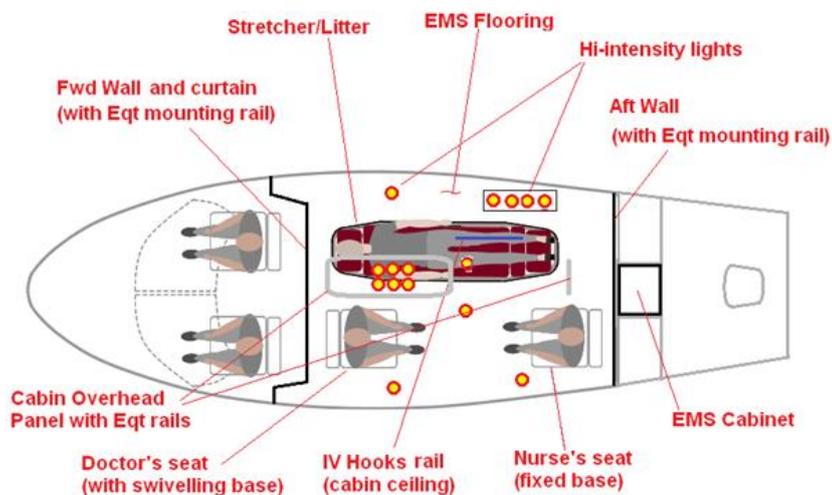
The technical solution here proposed is divided in different "packages" that can be separately selected by the Customer:

- Single stretcher (longitudinal) cabin layout, including: patient loading system/stretcher, seats, cabin flooring, forward and aft cabin walls, medical equipment mounting, curtain between cabin and cockpit and cabin intensity LED-lighting (Package A, 2 alternatives);
- EMS Communication: 3rd EMS Cabin Intercom (Package B, 2 alternatives);
- EMS Communication: Mission Radios (Package C);
- EMS Communication: GSM Phones (Package D);
- EMS Communication: Mission Computer (Package E);
- EMS Electrical Power (Package F);
- EMS Air and Suction (Package G);
- EMS Liquid Oxygen System (Package H);
- EMS Aft cabin Cabinet (Package I)
- EMS Cabin Overhead Panel (package J)
- Medical Equipment qualification (Package K).

## SINGLE LATERAL STRETCHER CABIN LAYOUT (ALTERNATIVE 1) [PACKAGE A1]

The first alternative of cabin layout comprehend a single lateral stretcher installation, right or left hand side depending on Customer preferred patient loading side (from the Aft cabin doors) and two medical seats. The patient is loaded from cabin AFT door (standard door or sliding door).

The following figure illustrates the cabin configuration.



Configuration details:

- **Stretcher installation** (Lateral on R/H or L/H side): comprehends an articulated stretcher loader permitting the patient litter loading from the relative side aft cabin door; Lifeport MedDeck is chosen by the customer for this layout with relative AeroSled RS litter.
- **Medical Seats:** two TSO-C127 approved Fischer 240/305 medical attendant seats, one rear facing seat installed in fwd. cabin with (optional) swivelling base and one fwd. facing seat in the rear cabin with fixed base; Seats are installed on transversal seat rails to permit adjustment of seat position on medical crew needs.
- **Medical cabin flooring:** The Medical Floor is installed in the cabin. The PVC floor, fully EASA-CS25.853(a) compliant protects the floor panels and subfloor structure from body fluids contamination. Moreover the 2,5 mm thick flooring provides an impact protection for the floor panels. The flooring surface is plain (not "coin dotted") to permit easy cleaning and fitted with quartz/silicon carbide grains to provide an exceptional slip resistance even when the surface is wet. The flooring surface is offered in a range of different colours.
- **Fwd. cabin wall:** the wall is located between the cockpit and the cabin, right behind pilots seats. The wall permits complete segregation of the cockpit from EMS operations in the cabin. The wall, made of Teklam light aluminium sandwich panel, is 70 cm high, hold medical equipment rails and hosts power outlets (from Package F-2) and medical Air/Vacuum/Oxygen outlets (from Package G and H). Position and type of medical equipment rail is customizable. Above the wall the isolation between cockpit and cabin is granted by a curtain. The wall has to be fabricated by the Part-145 workshop (or selected Part-21 POA) according to production drawings.
- **Aft. cabin wall:** the wall is located on the rear cabin bulkhead, to avoid the modification of the rear frame. The wall, made of Teklam aluminium sandwich panel, hold medical equipment rails and hosts power outlets (from Package F-2) and medical Air/Vacuum/Oxygen outlets (from Package G and H). The wall has to be fabricated by the Part-145 workshop (or selected Part-21 POA) according to production drawings.
- **EMS Cabinet:** optional, see Package I.
- **IV Hooks Rails on cabin ceiling:** in addition to rails installed on the Fwd and Aft. walls, rails for hooks for IV Drop bags are installed in the aft cabin ceiling and for IV drop bags over the stretcher.
- **Hi-intensity Lights:** Hi-intensity LED-type dome lights are installed on cabin ceiling panels in place of standard reading lights/air outlets. In addition to those additional lights are installed on cabin ceiling

# Modification Proposal



over the patient loading door and on the Medical Overhead panel (if installed with Package J). NVIS compliant lights are available on request.

- **Medical Overhead Panel** (optional), see Package J.



**Medical Seat**



**Articulated patient loading system (MedDeck)**

**AeroSled RS litter**



**LED Hi-intensity Dome Lights**



**Fwd Cabin wall**



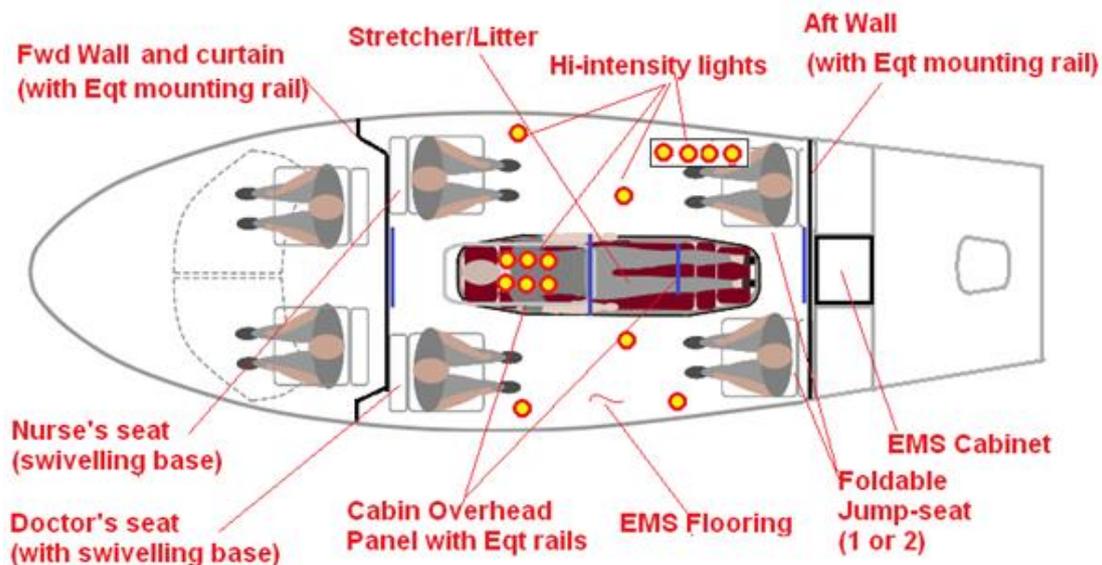
**Aft. Cabin Wall with Cabinet**



## SINGLE CENTERLINE STRETCHER CABIN LAYOUT (ALTERNATIVE 2) [PACKAGE A2]

The second alternative of cabin layout comprehend a single centreline stretcher installation, two forward medical seats, and 1 (or 2) jump-seats. The patient is loaded from cabin AFT door (standard door or sliding door).

The following figure illustrates the cabin configuration.



Configuration details:

- **Stretcher installation** comprehends an articulated stretcher loader permitting the patient litter loading from the relative side aft cabin door; Air Methods/United Rotorcraft Articulated Patient Loading System (APLS) is chosen by the customer for this layout with relative litter. The litter deck can be adjusted in height and translated in different longitudinal position on the mounting along its mounting pallet rails.
- **Medical Seats:** two TSO-C127 approved Fishcher 240/305 medical attendant seats, both rear facing seat installed in fwd. cabin with (optional) swivelling base on each side of the stretcher; Seats are installed on transversal seat rails to permit adjustment of seat position on medical crew needs.
- **Jump seats:** one or two foldable jump seat (Air Methods/United Rotorcraft) for observer/guest are installed on the cabin rear bulkhead.
- **Medical cabin flooring:** The Medical Floor is installed in the cabin. The PVC floor, fully EASA-CS25.853(a) compliant protects the floor panels and subfloor structure from body fluids contamination. Moreover the 2,5 mm thick flooring provides an impact protection for the floor panels. The flooring surface is plain (not "coin dotted") to permit easy cleaning and fitted with quartz/silicon carbide grains to provide an exceptional slip resistance even when the surface is wet. The flooring surface is offered in a range of different colours.
- **Fwd. cabin wall:** the wall is located between the cockpit and the cabin, right behind pilots seats. The wall permits complete segregation of the cockpit from EMS operations in the cabin. The wall, made of Teklam light aluminium sandwich panel, is 70 cm high, hold medical equipment rails and hosts power outlets (from Package F-2) and medical Air/Vacuum/Oxygen outlets (from Package G and H). Position and type of medical equipment rail is customizable. Above the wall the isolation between

# Modification Proposal



cockpit and cabin is granted by a curtain. The wall has to be fabricated by the Part-145 workshop (or selected Part-21 POA) according to production drawings.

- **Aft. cabin wall:** the wall is located on the rear cabin bulkhead, to avoid the modification of the rear frame. The wall, made of Teklam aluminium sandwich panel, hold medical equipment rails and hosts power outlets (from Package F-2) and medical Air/Vacuum/Oxygen outlets (from Package G and H). The wall has to be fabricated by the Part-145 workshop (or selected Part-21 POA) according to production drawings.
- **EMS Cabinet:** optional, see Package I.
- **IV Hooks Rails on cabin ceiling:** in addition to rails installed on the Fwd and Aft. walls, rails for hooks for IV Drop bags are installed in the aft cabin ceiling and for IV drop bags over the stretcher.
- **Hi-intensity Lights:** Hi-intensity LED-type dome lights are installed on cabin ceiling panels in place of standard reading lights/air outlets. In addition to those additional lights are installed on cabin ceiling over the patient loading door and on the Medical Overhead panel (if installed with Package J). NVIS compliant lights are available on request.
- **Medical Overhead Panel** (optional), see Package J.



## THIRD EMS CABIN INTERCOM SYSTEM (TEAM TB31) [PACKAGE B1]

The first alternative of 3rd intercom system introduce an **TEAM TB31 audio control panel** installation specifically designed for EMS missions.

Configuration details:

- **3rd Intercom Panel** is fully integrated helicopter ICS through helicopter Audio Junction Box 22R.
- **Connection to all missions radios** (as selected from Package C) via Junction box in receiving/transmitting mode and to helicopter VHF COM1 and 2 in receiving mode only.
- **Connection to Cabin GSM** phone (as selected from Package D) directly.
- **Two headset jacks** (for Doctor and Nurse) at intercom level (i.e. with radio use).
- **One patient headset jack** at interphone level (i.e. no radio use) with possibility to cut off both Mic/Audio or just the Audio from medical crew by use a PATIENT ON/OFF/LISTEN switch (to allow medical crew to communicate without being heard from the patient, but still listening to him).
- **One (or two) Observer/Guest jack(s)** (depending on seating configuration of the cabin) at interphone level with possibility to isolate the headset(s) from medical crew.
- Intercom Panel installed on **Cabin Overhead Panel** or **Cabin Aft wall** depending on the cabin interior selected between Package A alternatives.



## THIRD EMS CABIN INTERCOM SYSTEM (NAT AMS44) [PACKAGE B2]

The second alternative of 3rd intercom system introduce an **“Dual User” NAT AMS44 audio control panel** installation specifically designed for EMS missions.

The installation is similar in functions to the one illustrated above (Package B-1), but integrates the “Dual User” function of the AMS44 panel allowing the two medical crew (Doctor and Nurse) to speak independently on two different channels (e.g. Doctor and Nurse speaking at the same time on two different channels Radios/Phone/Intercom).



On the other side the AMS44 has the disadvantage (in respect to the TEAM TB31 panel) not having a volume control for each channel, but only a master volume control for all radios.

## EMS COMMUNICATIONS: MISSION RADIOS [PACKAGE C]

**EMS Communication system** can be installed with **Mission Radios** from different types and in different quantities (e.g. multiple mission radios installation) depending on the radio network available in each country for the type of mission.

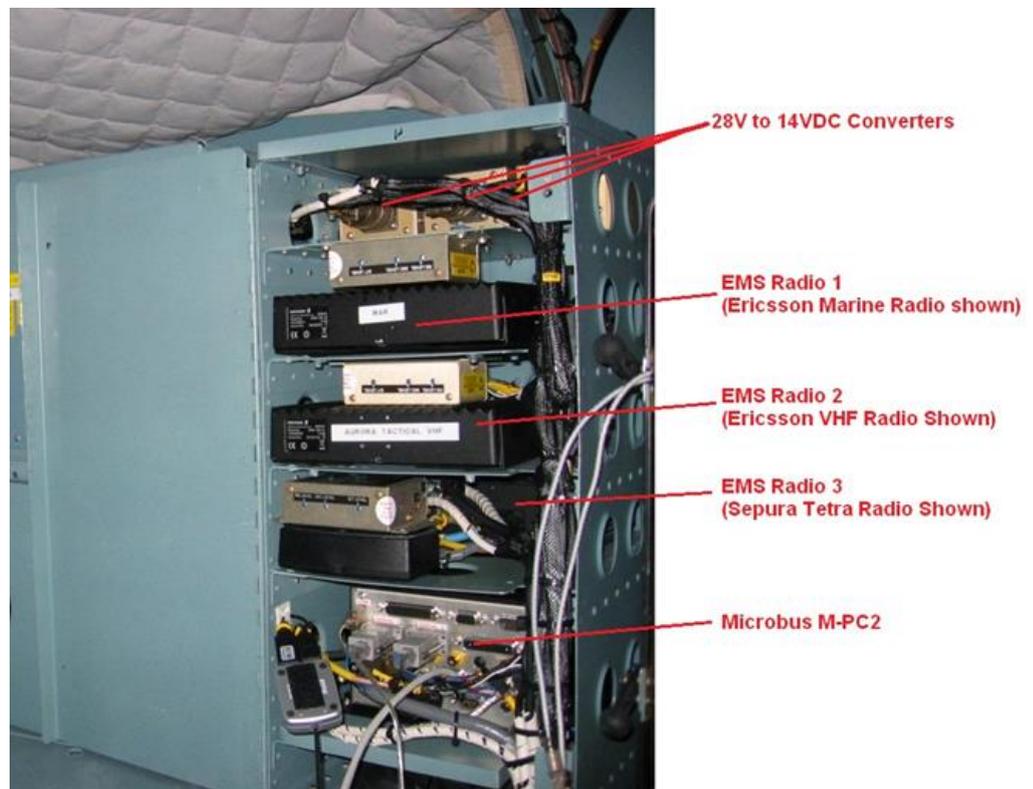
Airlift has experience with multiple radio installation of different models:

- Sepura Tetra Radio (SRG-3500/SRG3900) (also in multiple TETRA transceivers with single control panel – depending on tetra models);
- Ericsson Aurora/VHF/SOS radio (C54);
- Ericsson Marine Radio (C52);
- FM radio (NAT NPX138).

Different models can be installed on customer request.

Configuration details:

- Each mission radio is installed on helicopter avionic racks behind the cabin.
- **External antenna** installed behind tail fin.
- **Radios integrated on helicopter Audio Junction Box** and available to both flight and medical crews.
- **Radio control panels installed on cockpit pedestal panel or on cabin Dzus rail (on Cabin Overhead Panel or Cabin Aft wall** depending on the cabin interior selected between Package A alternatives).
- Installation of additional **portable control panels** (available only for some radio models) in cabin.
- Possibility to **integrate radio control panel in the touch screen of the Microbus M-PC2 computer** (see Package E) by use of “virtual panels”, without need to install the real control panel (software available only for some radio models).
- In case of lack of spare audio channel on ICS system the mission radio selection can be controlled via a separate switch.
- In case of multiple radio installation a dedicated EMS Radio Rack can be installed in the baggage compartment. Rack to be fabricated in aluminium plate and Teklam aluminium sandwich panel by the Part-145 workshop (or selected Part-21 POA) according to production drawings.



## EMS COMMUNICATIONS: GSM PHONES [PACKAGE D]

EMS Communication system can be installed with two **GSM Phones** (such as Nokia 810 or similar).

Configuration details:

- **One GSM Phone installed in cockpit for use by the flight crew** with handset on pedestal panel and phone display on instrument panel.
- **One GSM Phone installed in cabin for use by the medical crew** on mid-cabin door post on LH side (easily accessible from doctor seat).
- Both GSM **fully integrated in helicopter ICS.**
- **GSM antennas installed under helicopter belly** under the cabin.
- If the “Intensive Care EMS Power System” Package is selected (Package F) both phones can remain **powered by the EMS Battery or under Shore Power on the ground** also when the helicopter busses are unpowered (via phone handset).



Antennas installation under cabin



Cabin GSM installation on door post in mid-cabin (LH side)



Pilot's GSM on pedestal panel

## EMS COMMUNICATIONS: MISSION COMPUTER [PACKAGE E]

EMS Communication system can be integrated with a **Microbus M-PC2 mission computer**. The M-PC2 computer is a rugged computer featuring:

- **Windows** operating system;
- **Data transmission on 3G/GPRS network** for mission data and medical data transmission;
- **Moving map** features (integrated **GPS**);
- Possibility to **control Mission Radios via “Virtual Panels”** avoiding to install the real radio control panel on the helicopter (available for some radio models such as Tetra SRG-3500/3900, Ericsson C52, Ericsson C54).

Configuration details:

- Rugged centrino based computer (running full windows OS) with **integrated GPS, 3G/GPRS connection.**
- Computer installed on helicopter avionic rack or alternatively on a dedicated **EMS Radio Rack.**
- 8,4 inches **touch screen installed on helicopter pedestal panel.**

- Optional **second 8,4 inches portable touch screen** and keyboard for cabin use.
- **Built in battery** for system stability (protecting the computer from shutting down during power buses transitions).
- **GPS antenna** installed on cabin roof (can be integrated with Tetra GPS antenna via a dedicated splitter).
- **GPRS data antenna** on the top of the antenna fin (under fairing).
- If the “Intensive Care EMS Power System” Package is selected (Package F) the M-PC2 computer can remain **powered by the EMS Battery or under Shore Power on the ground** also when the helicopter buses are unpowered, allowing the reception of mission information at any time.



#### Note:

- Computer software and its use are not included in this offer nor covered by the Change.
- Software use may be subject to local operational approval and its certification is responsibility of the operator.

#### EMS ELECTRICAL POWER: INTENSIVE CARE POWER SYSTEM **[PACKAGE F]**

The EMS Power system introduce an **Intensive Care Power System** on the helicopter, offering the following features:

- **Availability of 14VDC, 28VDC and 220VAC power** for EMS use through outlets around the cabin as well as for cabin Hi-intensity lighting and EMS communication systems.
- Addition of an **EMS Bus on the helicopter fully integrated with other helicopter buses** with Bus Tie connection logic;
- **35Ah EMS Battery pack** allowing prolonged full electrical power to EMS Power system on the ground (where Shore Power is not available), or in flight in case of helicopter generator failure.
- **Shore Power (from ground 220VAC)** to EMS Power system (14VDC, 28VDC and 220VAC);
- EMS Power features (EMS Battery and Shore Power) **integrates with EMS Communications** options (Packages C, D and E), **EMS Air/Vacuum and Oxygen** and **Hi-intensity lighting** (Package A1 or A2).

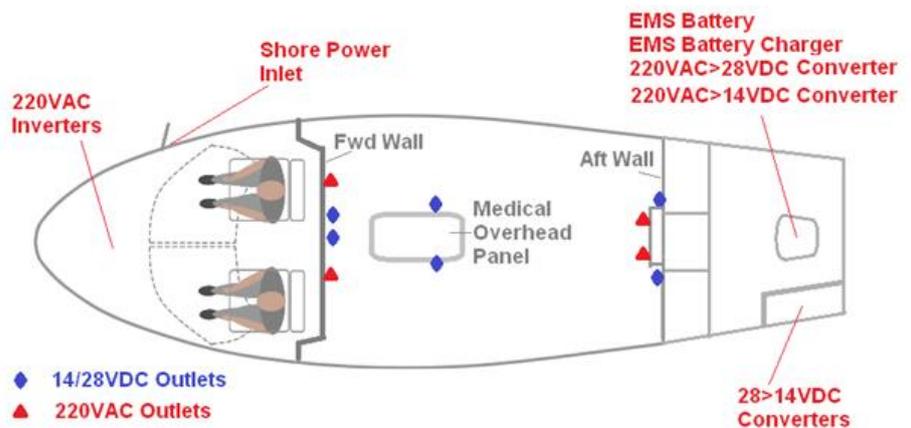
#### Configuration details:

- **EMS Bus fully integrated in helicopter electrical system with automatic bus-tie logic.**
- **35Ah EMS Battery pack** (two 12VDC lead acid batteries) installed under baggage compartment.
- **Two 220VAC inverter** powered by EMS Bus to power **two set of outlets in the cabin** (4 outlets each).

# Modification Proposal



- **Two/three 14VDC converters** to power dual 14/28VDC outlets (6 ea.), as well as 12VDC communication systems (radios, computer, GSM phones).
- **Shore Power intake** (located next to helicopter Ground power inlet) permits to power the full EMS Power system from ground 220VAC standard power.
- **EMS Battery charger**, driven from one 220VAC inverter in flight and from Shore power on the ground to maintain EMS Battery fully charged (located under baggage compartment).
- **14VDC and 28VDC converters** (powered from 220VDC shore power) to run 28VDC and 14 VDC EMS systems (outlets, communication, Lighting) on the ground while helicopter busses are unpowered giving unlimited autonomy to the medical crew on the ground.
- All brackets/shelf to be fabricated in aluminium plate and Teklam aluminium sandwich panel by the Part-145 workshop (or selected Part-21 POA) according to production drawings



EMS Power Battery Pack (35Ah), Ground power converters (14/28VDC) – 220VAC Inverters.



Aft Wall power outlets – EMS Radio Rack/Power distribution in Baggage Compartment.

## EMS AIR AND SUCTION [PACKAGE G]

EMS layout features pumps driven Air and Suction system delivered to cabin via dedicated outlets (hospital AGA standard) in the cabin.

Configuration details:

- **Two Air Pump** and **two Vacuum Pump** installed in a dedicated cabinet in the forward baggage compartment (LH side).
- **Air and Vacuum outlets** (AGA standard) installed on both forward and aft cabin walls.
- Pumps controls available to the medical crew on the **cabin overhead control panel**.
- **Pressure indicators** available on the cabin aft wall.
- All brackets/shelf to be fabricated in aluminium plate and Teklam aluminium sandwich panel by the Part-145 workshop (or selected Part-21 POA) according to production drawings



EMS Air and Suction Control panel.



Air/Vacuum and Oxygen Outlets – Air and Vacuum pump assy (open).

## EMS LIQUID OXYGEN SYSTEM [PACKAGE H]

EMS Oxygen is provided by a **Liquid Oxygen Unit** and distributed through the cabin via dedicated outlets (hospital AGA standard)

Configuration details:

- **10 liter Liquid Oxygen system** providing **8000 liters of gaseous oxygen**.
- **Oxygen outlets** (AGA standard) installed on both forward and aft cabin walls.
- **Quantity indicator** available on the cabin aft wall.



EMS Liquid Oxygen System unit (open). – cabin Air/Vacuum and Oxygen pressure and quantity indicators

## EMS AFT WALL CABINET [PACKAGE I]

Aft Cabinet located in the tunnel between cabin and baggage compartment to provide storage capacity for EMS equipment/materials.

Unlike the first alternative this cabinet has to be fabricated in aluminium plate and Teklam aluminium sandwich panel by the Part-145 workshop (or selected Part-21 POA) according to production drawings.

Interior can be customised according to customer request. a cargo net secure the content of the cabinet from falling out.



## EMS CABIN OVERHEAD PANEL [PACKAGE J]

EMS cabin overhead panel is installed in the forward central cabin ceiling. The panel has different functions in conjunction to other EMS Power, Hi-intensity lighting, EMS Air/Vacuum/Oxygen, and Mission communications packages.

Configuration details:

- **Standard Dzus rail** to install 3rd ICS panel, radio control panels as well Air/Vacuum/Oxygen/Inverter controls (from Packages F, G and H).
- Location of different **14/28VDC outlets**, **doctor/nurse headset jacks** as well as different interphone functions switches (from Packages B and H).
- Location of **Hi-intensity lights** (4 or 6 units).
- **Quick access door** to internally installed units (some EMS communication system units can find place inside).
- **Medical equipment /IV Hook rails**.
- The Overhead panel has to be fabricated in aluminium by the Part-145 workshop (or selected Part-21 POA) according to production drawings.



## EMS MEDICAL EQUIPMENT QUALIFICATION [PACKAGE K]

Different type of medical equipment can be introduced in the installation and qualified for use in flight. Equipment and models has to be defined by the customer.

Airlift has experience with installation of different type/models of medical equipment:

- Propaq MD Monitor/Defibrillator (including Defibrillator use in flight);
- Lifepak 12 and 15 Medtronic Physio Control Defibrillators
- Niki T34 Siringe driver;
- Oxylog 3000 ventilator;
- ParaPac 200D Ventilator;
- SSCOR Inc' portable Vacuum pump;
- Twins 121 infusion pump.

Different models can be installed on customer request.

Configuration details:

- Each medical equipment to be attached to the equipment mounting defined for each cabin layout (design of brackets to fit the equipment on the equipment mounts/rails is not included in the package, as are products normally available).
- Qualification of the units for flight use involve physical and electromagnetic compability testing of the single unit.

## CONDITIONS & COMPATIBILITY LIMITATIONS

### PLEASE NOTE THAT THIS PROPOSAL IS INTENDED DESCRIPTION ONLY!

This presentation has been prepared using different EMS modification certified by Airlift (3 STC and different minor changes). Each installation could need modification from the configuration here described, due to differences between AS365 series or due to availability of components.

Compatibility with each helicopter configuration and with installation already in place to be evaluated.

## DOCUMENTATION DELIVERED

Approval Form, installation instructions, material list, drawings, wiring diagrams, instructions for continued airworthiness, rotorcraft flight manual supplement.

## KIT

All parts shall be ordered separately at vendors indicated in the material list.

## APPROVAL

| Approval | STC Number | Type/Model                  | Notes |
|----------|------------|-----------------------------|-------|
| EASA     | 10017102   | AS365 C,C1,C2,C3,N,N1,N2,N3 |       |
| EASA     | 10017289   | AS365 N3                    |       |
| EASA     | 10029680   | AS365 N,N1,N2,N3            |       |

Airlift AS is an EASA Part-21 Subp. J Approved Design Organisation (Approval No. EASA.21J.315).

## CONTACT INFORMATION

For order placement or request of information contact Airlift AS Design Organisation at +47 57 71 81 00 or via email at [design@airlift.no](mailto:design@airlift.no) or visit our website [www.airlift-doa.com](http://www.airlift-doa.com).

**For a complete catalogue of our EASA Part-21 Approved Changes visit: [www.airlift-doa.com](http://www.airlift-doa.com)**