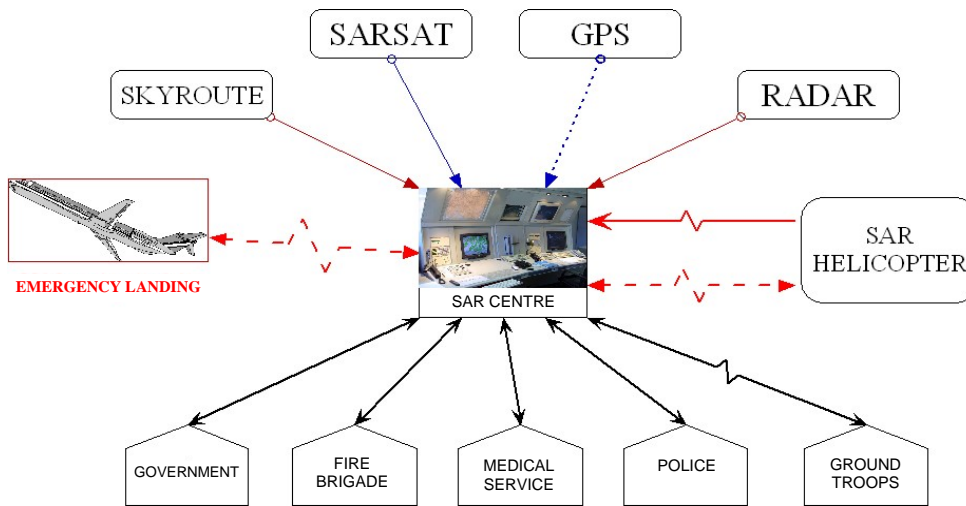


# LETVIS SAR SEARCH AND RESCUE OPERATIONS SYSTEM / CENTRE

LETVIS® SAR is a control and information system for military and civil Search and Rescue (SAR) Centers. This system is designed for the control of search and rescue operations aimed at person recovery in case of aircraft accidents or in emergency states. Operators are provided with information on current and planned civil/military air traffic, meteo data, aeronautical data, parameters of controlled flights, information on terrain clearance in search and rescue areas as well as on search operation progress. The system enables all the information to be analysed on real-time basis in order to effectively control not only the SAR helicopters but also local Ground-based SAR Teams.

SAR system, generally, consists of the following parts:

- Ground Control and Co-ordination Centre dealing with data collection and analysis, support to decision-making process and real-time operation control at multi-organizational level. The Centre includes the subsystems such as:
  - data collection and analysis/processing
  - geographical information
  - alert of involved authorities
  - VHF/UHF A/G communication
  - G/G ground communication
  - receipt, transmission and analysis of special data (video, thermal camera data)
- Execution unit, that includes:
  - fully equipped SAR helicopter(s), capable of operating under any weather conditions for 24 hrs a day to transmit the data, collected in terrain, to the Centre and of prompt carrying out a rescue operation in case of emergency. The following navigation and search equipment is recommended for of the SAR helicopter :
    - avionics equipment for IFR flights
    - full navigational equipment for helicopters flights in compliance with IFR
    - VHF/UHF/HF communication equipment
    - search light
    - FLIR search system with data recording and real-time transfer system
  - other, particularly ground rescue facilities from local sources, such as fire brigade, medical service, police, etc.



The main mission of SAR centre is to coordinate the activities of the respective parts of SAR system with the aim of making their utilization in case of emergency. To achieve that, it is necessary to ensure perfect data and information exchange between the ground units and the aircraft – i.e. helicopter. The ground-based control centre has to receive the most precise information on the flight position of the helicopter during the entire operation and to keep up permanent communication. This is ensured by complementing the hybrid communication system by UMTC , or GPRS, VHF, as well as those of satellite communication system intended for data transfer, especially the information on the actual position of rescue means obtained via Global Positioning System (GPS).

**The Control and Co-ordination Centre of LETVIS® SAR system is equipped with:**

- ❑ Workstation (WP) for map and data display integrated with system for calculation of SAR operation areas
- ❑ WP(s) for display of real and planned information and complementary aeronautical information
- ❑ system for synchronized voice/data communication recording
- ❑ system for voice/data communication between co-operating units
- ❑ system for receipt and transmission of video data information from the board of a rescue helicopter

**Main capabilities:**

- records evaluation of flight path and flight parameters before the loss of the target or emergency alert
- area identification for search operation execution based on target parameters evaluation
- pre-flight data processing and transmitting to SAR helicopter navigation system
- iterative refining or extending the search area
- drawing the search areas, inserting the symbols, marks and notes for SAR progress recording
- setting the optimal trajectory between two points using vehicles characteristics, relief and terrain parameters
- monitoring / control of SAR progress; receipt, processing and display of position data of SAR vehicles equipped with GPS receivers
- display, maintenance and update of databases:
  - procedures for SAR operations
  - telephone directory (police, medical ambulance, fire brigade)
  - description and technical specification of aircraft types and ground vehicle types
  - aeronautical data of the controlled area
- support to measurement of geographical coordinates in various (S42, WGS84) geographical systems
- reception, processing and distribution of video data from the SAR helicopter
- interface for voice/data communication
  - automatic set up a connection with SAR coordinating units (rescue teams, police, etc)
  - automatic sending of fax messages with maps for support of SAR operation to local police station and local authorities
  - fax / e-mail messages handling
- support operations for:
  - retrieval according to geographical coordinates
  - display of a digital terrain model in search area
  - retrieval of map objects according to name
  - distance and area measurement
  - map editor - definition of new map objects

**Extended capabilities** of SAR Centre are provided by the LETVIS® RDD WP displaying the radar air picture and by the LETVIS MON/ADP system ensuring creation of voice/data communication records of all SAR actions. The above mentioned workstations enable:

- monitoring of current civil / military air traffic
- monitoring of scheduled civil / military air traffic
- observance of weather conditions, and other aeronautical data in controlled area
- recording of SAR operation progress incl. SAR actions taken
  - creating a voice record from law frequency inputs, telephone (analogue and ISDN) lines, radio stations
  - time-synchronized voice and data communication record,
  - creating an archive, handling with recorded data including the possibility of their storage on DVD or CD media
- replaying records including voice communication,
- creating a printed output form including map sources and selected air situation.

