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**THE MANAGEMENT SYSTEM SOCAT  
FOR CSAR MISSIONS**

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**Abstract:**

This paper deals with the upgrading of the SOCAT helicopter. The Roumanian Air Force have developed many programs – this modernization of the IAR 330 Puma helicopter makes part of it.

In the first part of the paper is presented the SOCAT management system – a modern system ”built” to ensure successful missions, but also for search and rescue, transport troops or combat search and rescue (CSAR) in difficult places to get to. There are showed the main performances and operational capabilities. The accurate navigation over long distances, at low altitude and in areas with obstacles following the configuration of the terrain, day or night, in any kind of weather condition, ”HOCAS” concept (hand on collective and stick)- the use of weapons on board without taking the hands on the flight orders, the pilot having the possibility of piloting and command the system without looking in the cabin, is more one of the helicopters capabilities.

Then the SOCAT management system is presented through its external and internal components: EOP (Electro Optical Pod), CHAFF/FLARE (dipoles countermeasures), AADS - Air and Direction Sensor (integrated coordination), HOCAS (hand on collective and stick), control panels (AAP, ACP, R&LWR, CHAFF/FLARE, IFF), MFD- multifunction display, MFCD-multifunction color display, HMRC, MSD (mass storage device), VCR (video cassette recorder);

Next in the paper are met the principles of the training for the CSAR missions. CSAR (combat search and rescue) is one of the most complex methods of the rescue the personnel, that may be found in a hostile terrain. The principles of CSAR missions are: the rapid response capacity, the interoperability, the mobility, the flexibility, the simplicity.

Finally, the SOCAT system program appeared as a necessity of interoperability with NATO structures.

The squadron commander got more responsibilities, being capable to apply the new methods of management of it, but also the pilots need to utilize this system in their new future missions.

*Key words: SOCAT system, CSAR, external components, internal components, principles of CSAR;*

## **1. Introduction**

In the new requests that the Romanian Air Force should accomplished, in the same time when entering in N.A.T.O, have developed programs of compatible with the N.A.T.O forces. From these programs made part also the modernization of the helicopter IAR-330 PUMA. This modernization was possible with the collaboration between an Israelite company ELBIT SYSTEMS Ltd. and a producer of helicopters IAR SA BRASOV.

The modernization of the helicopter IAR-330 PUMA consists in the implementation of some systems of avionics and weapons of the last generation. The performance of the program began in 1996, the first flight being done on May 26, 1998 on Ghimbav aerodrome, the program ending in June 2005.

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This modernization has transformed the helicopter IAR-330 in a multifunctional helicopter capable to make utility and combat missions in the most difficult environment but also in any kind of weather condition.

## **2.The management system SOCAT**

The management system SOCAT, the research of the optoelectronic system and anti-tank combat, is a modern system that ensure the capabilities for the accomplished mission of research, saving, recovery and transport of troops from inaccessible places.

The main missions for which this helicopter is used, are:

- Anti-tank, ground attack
- Escort
- Air-support
- Transport, Medical evacuation
- Search-rescue, combat search and rescue
- Airspace interdiction

### **2.1. The main performances and the operational capabilities**

The main performances and the operational capabilities of the helicopters IAR-330 modernized with the system SOCAT consists in:

- the discovery, the identification and the control of the means of fighting of the enemy and of the living forces from a distance and great precision;
- accurate navigation over long distances, at low altitude and in areas with obstacles following the configuration of the terrain, day or night, in any kind of weather condition.
- “HOCAS” concept(hand on collective and stick)- the use of weapons on board without taking the hands on the flight orders, the pilot having the possibility of piloting and command the system without looking in the cabin;
- the communication and the transmission of research data, from the tactical field of the ground station and to other aircraft in a real time;
- the automation of the operation of planning and the analysis of the execution of flight missions, leading to reduced time of flight training mission and enhancing the response;
- the increase survival capability in the battlefield;

The management SOCAT system includes integrated air and ground units (fig.1), consisting of the following elements:

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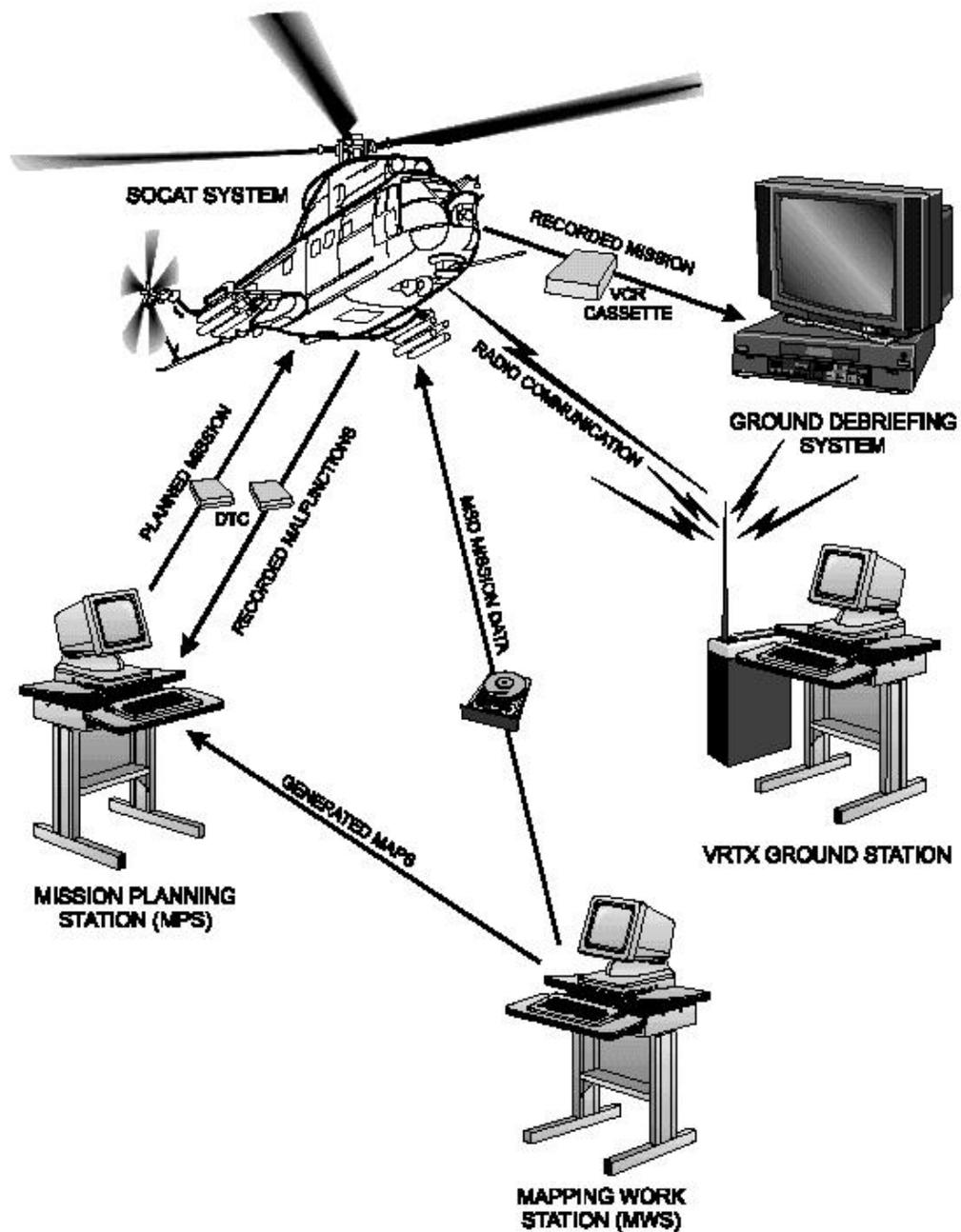


Figure 1 The SOCAT system management

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*Air system* (the modernized helicopter I.A.R-330);

- Mapping Work Station (MWS);
- Mission Planning Station (MPS);
- VRTX Ground Station (VRTX);
- Ground Debriefing System;

The air system is located on the helicopter and is composed of two groups:

- the avionics system;
- the weapons system.

***The management of avionics system is composed from:***

External and internal components:

- EOP (Electro Optical Pod)
- rotary cannon
- across launchers
- CHAFF/FLARE (dipoles countermeasures);
- AADS- Air and Direction Sensor (integrated coordination);
- HOCAS;
- control panels (AAP, ACP, R&LWR, CHAFF/FLARE, IFF);
- MFD - multifunction display, MFCD - multifunction color display;
- HMRC (helicopter multirole computer);
- MSD (mass storage device);
- VCR (video cassette recorder);

The internal components are grouped in: the main interface consists of CIU, MFD, MFCD and the secondary interface consists of HOCAS, PD, LHG, RHG, HMD.

The earth system is composed from MPS, MWS, VRTX and a ground station.

## **2.2. The management and the principles of the training for the missions CSAR**

The combat search and rescue (CSAR) includes reporting, location, identification and the return of the isolated personnel under the control of its own forces under existing or potential enemy resistance.

CSAR is one of the most complex methods of recovery of the personnel because it assumes the synchronization of some forces and elements which is possible not have acted until then together.

Another element that distinguishes the CSAR mission between the other military actions is its fundamental and recreational nature and this makes it difficult the achievement surprise and taking the initiative, too.

The purpose of the training and the employment scale of the CSAR operations can vary pretty much.

Due to the utilization of the rescue forces in the theatre of the actions, the informations regarding the tactical situation, the planning and coordination, the analysis of the risk and the utilization of the fast, continuous and safe communication are essential in the achievement of the goal.

For a better understanding why it is necessary the training of all the participants to the CSAR operation, must be specified that there is a fundamental difference between CSAR and SAR, even these two may be confounded.

SAR is defined as a use of utilities (aircraft, ships, vehicles, specialized rescue teams and equipment), for looking and saving the personnel found in the emergency conditions in a permissive environment, free from the threats.

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The CSAR operations take place in a theatre of actions, the involved personnel in these operations (even the survivors and also the savers) being properly trained and equipped. The CSAR represents detect, location, identification, the rescue of equipments found in a hostile land in time of crisis or war.

While the CSAR operations normally put the accent on the recovery of the personnel found in critical situation, these can be done for saving the military ally personnel with the help of the equipment and a proper training.

### ***The principles of the CSAR mission:***

***The rapid response capacity-*** the timely response is crucial in the achievement with success of the CSAR mission.

The chance of the rescue can be increased through a fast action and for this, the CSAR units must be capable to respond rapidly when it is necessary.

***The security of the operations-***the CSAR missions are uncertain and vulnerable.

All the possible measures must be taken for thwart a possible information of the enemy in that of reducing the risk of not fulfill the mission.

The specific available measures include the training and protection of the isolated personnel reports, the escaping plan and the communication procedures.

***The interoperability-*** the interoperability of different combined forces is essential in the effort's economy for a successful recovery of the isolated personnel;

***The mobility-*** is essential that the CSAR forces to be capable during the day or night in any kind of weather condition.

***The flexibility-*** the CSAR plans must be flexible having the aim of allowing to all the resources to be engaged in the most efficient method;

***The simplicity-*** the CSAR plans must be well clarified for an easier understanding, to be simple to be executed having the purpose to get a maximum probability of success to fulfill the mission.

***The command and effort unit-*** the mission commander ensures that all the participant forces will action like a whole for final goal having the purpose of accomplish with success the rescue mission.

The role of the helicopter's squadron IAR-330 SOCAT in the CSAR is that of providing means of isolated personnel recovery with crews capable to action as recovery vehicle but also as rescore.

The personnel also must be prepared to action in certain circumstances as OSC (On Scene Commander).

The CSAR missions can be planned as an immediate reaction in the case in which the missions can be rapidly launched or can be planned as a deliberate reaction when the planning and training are asked.

The time, the effort and lives can be lost if the survivor's location did not carefully established and also was not checked if there is enough time. The first mission is to locate and confirm the survivor's location.

The decision of trigger the research in a hostile zone and the use of methods and tactics of proper searching must carefully evaluated. There are preferred the observation systems in infrared during the night. If the recovery is not considered eminent, the position of the survivor must not be compromised, in addition the method of searching must be decided taking into account the level of threat.

### **3. Conclusion**

The SOCAT program appeared as a necessity of interoperability with N.A.T.O structures. Once with the avionics modernized SOCAT helicopters, appeared the necessity of the approach from other principles of the squadron management in that of training for new specific missions.

This domain of the SOCAT system is one of a special complexity because of its multiple capabilities that offers. This information was necessary given the fact that the base of information on this system is pretty tied besides those which explores it.

The main purpose of this paper is to highlight several aspects regarding the use of the I.A.R 330 Puma helicopter with its avionics SOCAT system and especially about the main destination of this- CSAR missions.

The squadron commander that has the I.A.R 330 SOCAT helicopter got many responsibilities because of these complexity increase mission that is capable to execute in the context of a new battlefield. In this sense, the squadron commander must know and apply new methods of management in the training for the fight of his subordinates and also he must be capable to plan, organize, coordinate and check the squadron in every mission that this does it. It was necessary the adaptation to training methods and pilots evaluation in accordance with the specific of new types of missions which they will have to fulfill.

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