

## The Flight Inspection System for Multi-Purpose Aircraft

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### ABSTRACT

While much effort is placed due to increasing requirements and efficiency of the flight inspection operation, the single most expensive factor in most operations is the aircraft itself. For many organizations, it would be a beneficial factor to be able to utilize the aircraft or aircraft fleet in more than one single mission. Multi mission utilization may provide the organization with a quick and sustainable cost beneficial operation. Well planned flight inspection missions and the routine of the inspections will show the availability of the aircraft.

This paper and presentation will highlight these matters, and give typical examples of such multi-purpose aircraft where the Flight Inspection System is used as the sole workstation for all different special mission operations. It will discuss several of the main factors giving the possibility to operate such multi-purpose aircraft in conjunction with the flight inspection system. The main focus is to give ideas on how to utilize the flight inspection system and aircraft to a greater extent using the onboard flight inspection system as your workstation.

### KEEP THE AIRCRAFT IN THE AIR!

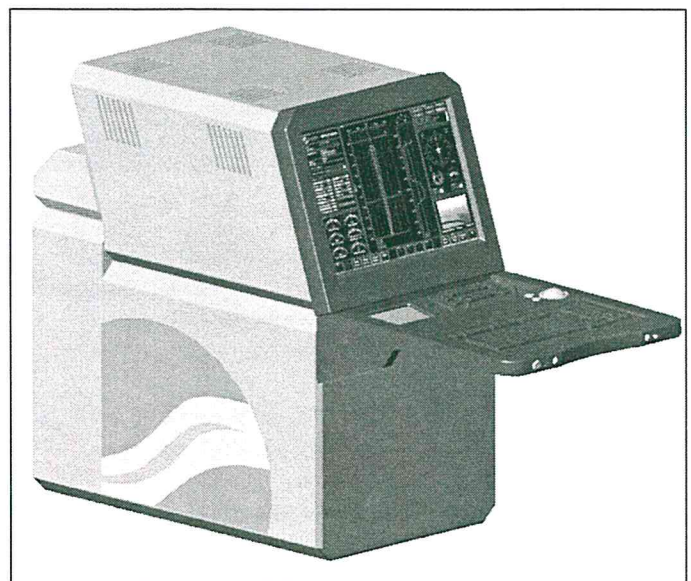
A purchase of an aircraft with the purpose of fulfilling the requirements, recommendations and at the same time providing a cost effective flight inspection operation is a great step for any organization, and usually it requires a large budget, especially for the operation of the aircraft itself. In our times, the steadily increased strive for an always more cost effective and productive operational solution, calls for a multi-role or multi-purpose aircraft that will be in the air as much as possible is obvious. An appropriately configured aircraft with a flight inspection system will provide exactly this multi purpose use that the organization is looking for.

### FLIGHT INSPECTION SYSTEM AS THE PRIMARY MISSION EQUIPMENT

The flight inspection system is a complex system in the sense that it has the ability to accommodate the interface to various avionic communication protocols as we know them. The UNIFIS 3000 will comply with recommendations and requirements of a flight inspection operation. It will supply your organization with adequate equipment and avionics that will fulfill this primary task of the multi-role aircraft. However, the UNIFIS 3000 interface capability has been expanded to allow further interface capabilities to other sensors and equipment used for other types of missions. The common factor is that the flight inspection system will remain as your operating workstation throughout several special mission applications.

### "YOUR OFFICE ONBOARD"

The flight inspector will ideally spend most of his time in the aircraft. Therefore, as a minimum, today's Flight Inspection Systems should be equipped to give the operator a workstation where he/she can in addition to the flight inspection work, perform any standard office work. Enroute from the navaid's flight check location and back to the home base, during a long haul flight, the operator should have access to office type programs accommodated by the flight inspection system to write letters, fax'es, documents, able to do calculations, FI report preparations and estimates.



UNIFIS 3000, for multi purpose applications

Furthermore, it is important that the Flight Inspection System can present the documents on an onboard printer or store the relevant documents on a standard PC-compatible storage device, such as a diskette or USB-key. This is in order for the operator to transfer the work to any standard stationary computer or laptop. With these types of system opportunities the operator can help the organization taking part in some of the workload that he/she had to do on a ground based office computer. This will also give the operator the possibility to finish all of his/her work before returning to the base and omit the necessity to spend long evening hours in the "office on the ground".

### FLIGHT INSPECTION SYSTEM AS A TOOL FOR OTHER SPECIAL MISSIONS

In many cases the equipment / avionics and graphical interface of the Flight Inspection System can be used to support or assist other missions.

In a combined Flight Inspection / air ambulance configured aircraft, the medical crew can utilize the communication transceivers and intercom system in the flight inspection system.

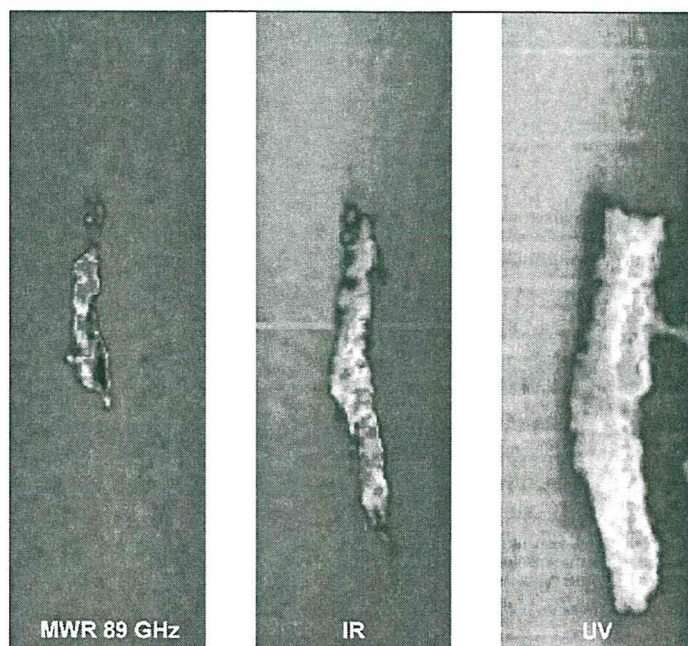


**Air ambulance**

The communication transceivers can be used whenever necessary to communicate with external ground personnel when assistance or coordination with medical centers is required. The cockpit interfaced intercom system of the Flight Inspection System can be used locally to communicate with the patient or to communicate with the flight deck. This is done in a quiet environment using comfortable headsets. Minimal training (one hour) on the flight inspection system should be necessary in order to operate the system for these specific needs or other similar needs requiring the necessity to communicate comfortably with other people.

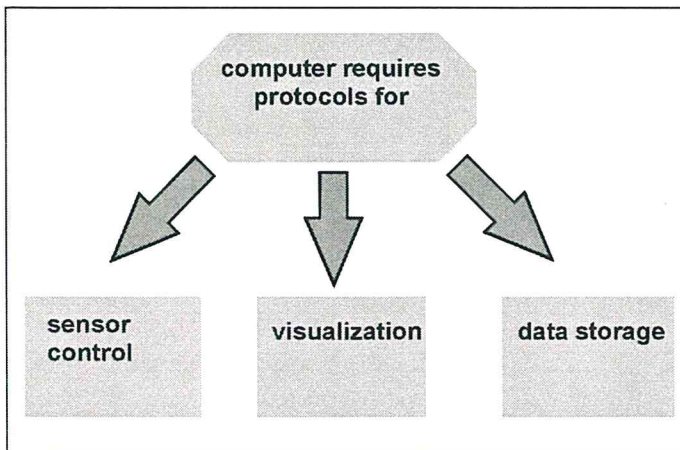
Several countries are having quite a challenge with electromagnetic interference and interference due to transmissions from unknown stations. The common sources are illegal transmissions from amateur operators, or even electromagnetic sources not known to cause interference in the avionics frequency band. Adding 1-2 antennas (depending on system configuration) during the initial installation of the UNIFIS-3000 flight inspection system into the aircraft, will allow the system (when appropriately configured) not only to find the interfering frequency, but it will also be able to find the location of the source with a small margin of uncertainty. Dedicated detachable system units can further be used by ground personnel to pinpoint the exact source location. This tool may solve mysteries!

The UNIFIS 3000 has a real time base commonly known within the aviation and space industry. It is easily interfaced and configured with sensors and mission equipment required to meet special mission needs. Some important use are important to mention, where the core of the mission is still the UNIFIS 3000 flight inspection system interfaced to airborne equipment. The different ranges of operations are search and rescue, forest fire detection, maritime surveillance, air pollution detection and oil spill detection. These tasks are accomplished by using Infrared/Ultraviolet Line Scanners, Microwave Radiometers, and Imaging Laser Fluorosensors. The distribution, quantity and type of pollution can be determined online. All sensors are connected a flexible sensor network.



**Oil spill detection and identification by the use of different sensors**

Each sensor represents an autonomous unit within each network.



All information is stored on file to support the interdiction of polluters. Camera pictures and video records provide additional information. A Forward Looking Infrared system (FLIR) with active, converted laser illumination can also be integrated, enabling vessel identification by reading the ship's name during nighttime. The 360° maritime surveillance radar is best suited for different ranges and situations encountered in search and rescue operations. Combined with a Track-While-Scan system, the radar reduces the special mission operator workload, especially in complex situations when up to 20 targets may exist.

With these sensors interfaced to the UNIFIS 3000 system as the primary workstation, you will achieve state-of-the-art solutions for maritime surveillance, pollution detection and search and rescue operations.

## REMOVAL OF THE FLIGHT INSPECTION SYSTEM

Even when the Flight Inspection system has the main mission role, there will always be occasions when the System must be removed. This can be due to transportation that requires the space or when the aircraft is due for maintenance. It is therefore important for the operator to be able to remove the flight inspection system quickly. Due to modern lightweight composite material technology, the time it takes to remove and reinstall the complete flight inspection system including all harnesses, should not exceed 40-50 minutes. Detachable sections should make up the console and it should be possible to handle the sections by one person without the necessity of any special tools. To have an aircraft on the ground for a lengthy period due to a new mission preparation is valuable time wasted.

## CONCLUSION

The flight inspection system should be both equipped and configurable to interface several special mission equipment and sensors used for a variety of airborne applications according to each individual customer requirements. More intensive and a wider area of operation for a single aircraft will make the operation more cost effective.

