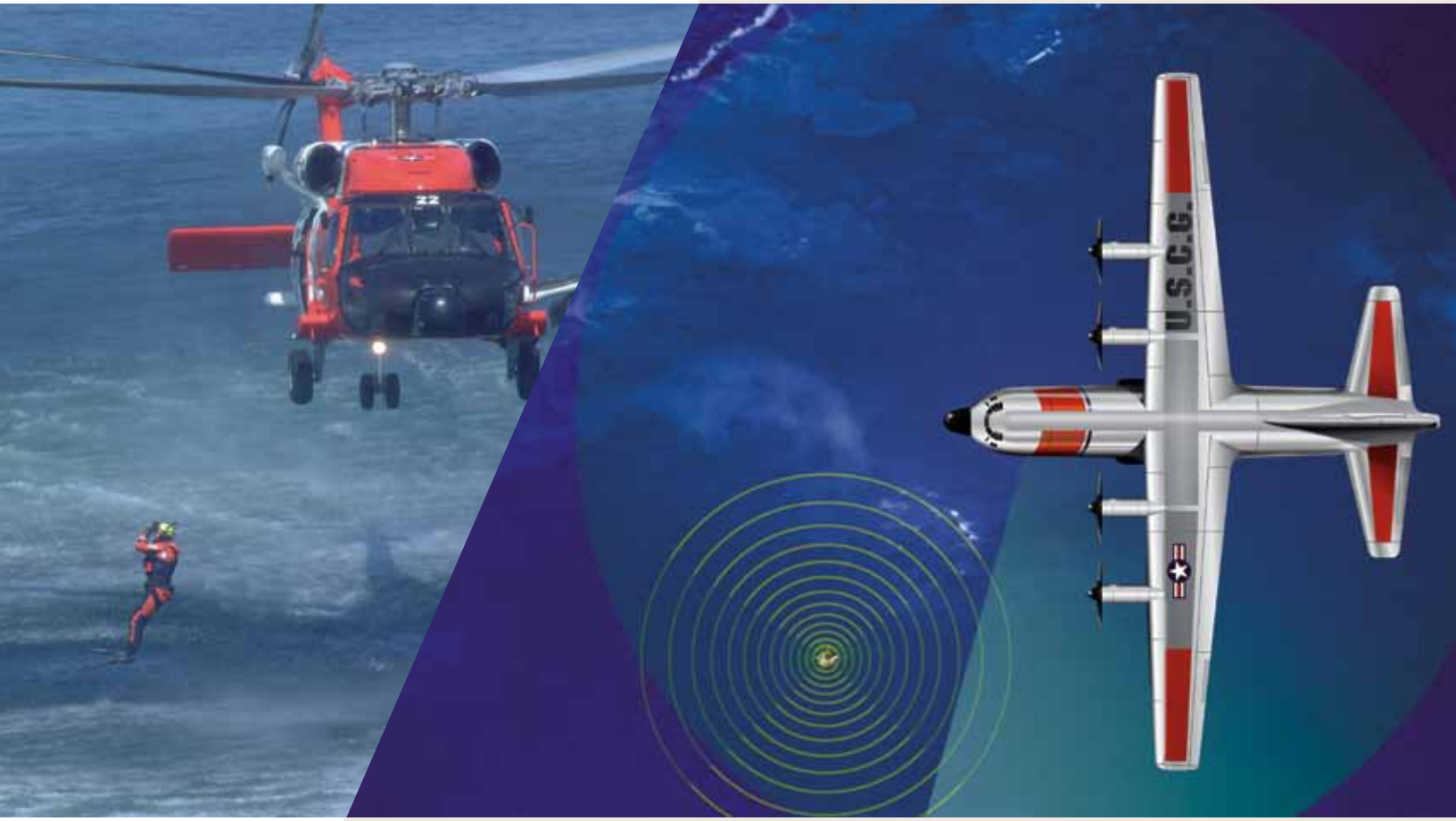
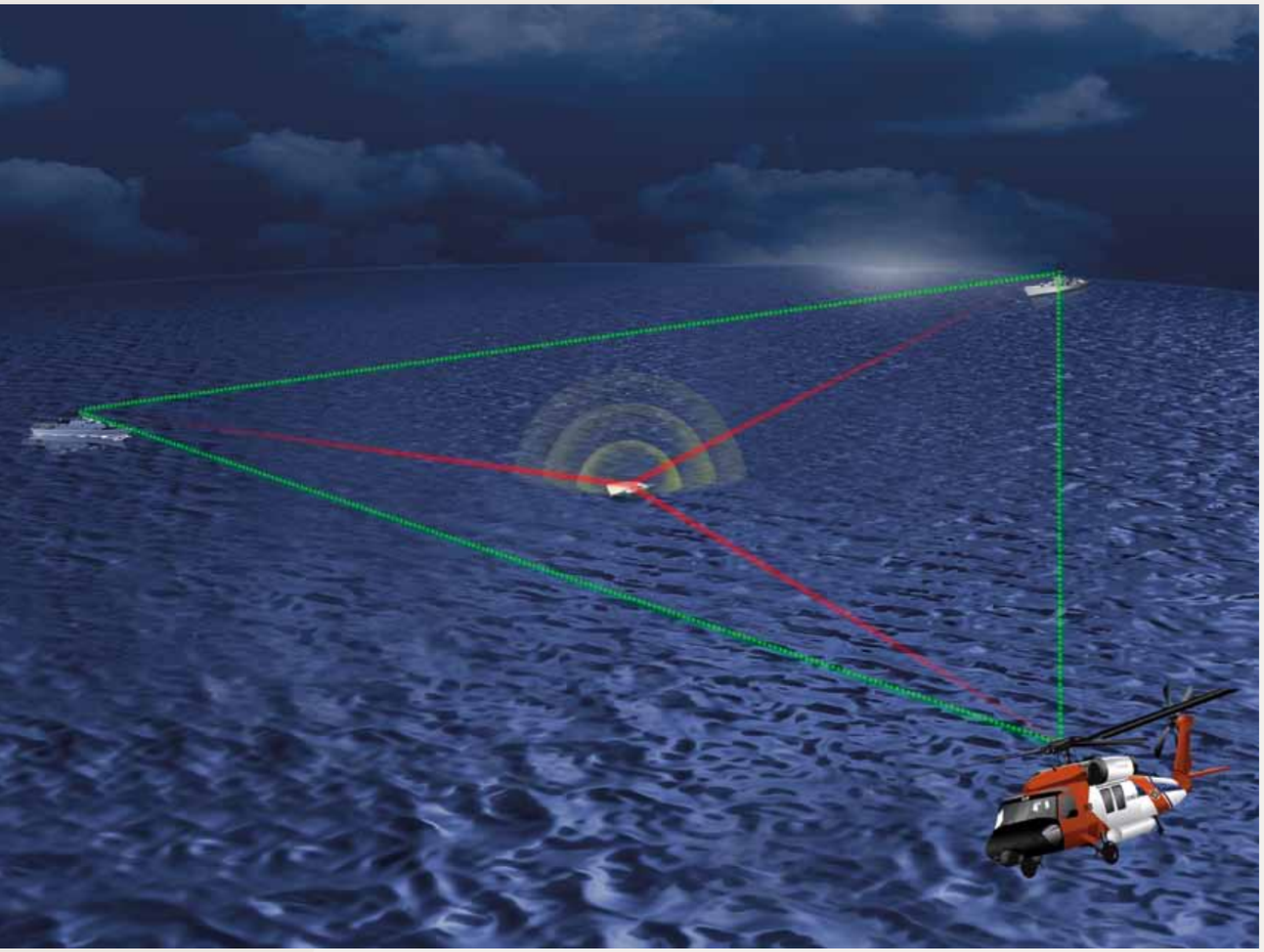
DF-430 MULTI-MISSION DIRECTION FINDER

Greater range and accuracy for quicker rescues.



Rockwell Collins

Building trust every day



Time: the difference between a rescue and a recovery.

In many instances surviving an aircraft ditching or a ship sinking is the easy part. Now you are left alone to wait. Lost in the woods or afloat on the ocean, even in the best of weather your chance of being located is like finding the proverbial needle in a haystack.

Even if survivors have a 406 MHz Emergency Position Indicating Radio Beacon (EPIRB), a Personal Locating Beacon (PLB), or an Emergency Locator Transmitter (ELT), COSPAS-SARSAT satellites can only give searchers a general idea of their exact location. And while today's search and rescue (SAR) specialists are very good at what they do, a search can take time – and in many instances, too much time.

Thankfully for anyone who finds themself in a SAR operation, there is a proven system that gives rescuers the upper hand by pinpointing distress signals with unmatched accuracy and reliability.

Take the search out of search and rescue.

The Rockwell Collins DF-430 Multi-Mission Direction Finder picks up where COSPAS-SARSAT satellites leave off by giving rescuers the ability to pinpoint signals produced by a wide variety of civil and military emergency locator beacons in use around the world.

By providing searchers, whether land based or aboard ships, boats or aircraft, with the ability to get a spot-on bearing to a distress beacon, the DF-430 provides precise indication of survivor position thus minimizing search times.

The system's unmatched accuracy not only helps save more lives, but also saves money by greatly reducing search times and associated aircraft and vessel operational costs. And, more importantly, shorter searches keep SAR crews safer.

Multi-mission flexibility.

Alongside its outstanding civilian SAR capabilities, the DF-430 can also fulfill a number of key military roles including tactical DF missions, anti-submarine and maritime patrol missions. The DF-430 is also capable of receiving Argos beacon, and with minor adaptation, it can fulfill combat SAR missions.

The system features a flexible control architecture and can be installed as a stand-alone system or integrated with existing aircraft, shipborne or land-based SAR platforms.

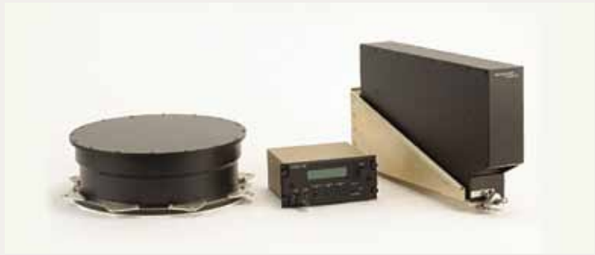
Meeting SAR needs around the world.

Due to its inherent flexibility and broad array of capabilities, the DF-430 is proving to be the ideal complement to both civilian and military SAR efforts around the world. The system is already in service with the U.S., Italian and Canadian Coast Guards (CP-140).

The DF-430 is in service with all major European forces involved in SAR missions including Belgium, Sweden, Spain, France, Germany, Italy and Greece. It is also in service with Asia Pacific forces for similar missions, such as Taiwan, Japan, New Zealand and Australia.

DF-430. One solution. One source.

For over 75 years, Rockwell Collins has been the global leader in developing highly effective, reliable and cost-effective avionics and electronics solutions to meet the changing needs of customers worldwide.



The DF-430 continues that legacy. The system has been in production for over 10 years and we have delivered over 2,000 systems to government and military SAR providers.

In an environment where every minute counts, it's comforting to know that you can rely on the Rockwell Collins DF-430 to help your SAR teams turn a search into a successful rescue.

Effectively meeting today's SAR need.

When COSPAS-SARSAT decided to phase out monitoring of the long-established 121.5 MHz and 243 MHz emergency frequencies, the goal was twofold: to dramatically reduce false alarms and to provide searchers with greater accuracy in determining the location of actual distress beacon signals.

Designed to receive many signals, including 406 to 406.1 MHz channels, the DF-430 gives SAR teams a better, more accurate tool for optimizing searches. At the heart of the unit's unmatched capabilities is the highest accuracy direction finding equipment currently available coupled with the ability to process the digital EPIRB, PLB and ELT data found in the COSPAS-SARSAT message.

That capability alone narrows the search down to a much more manageable area. But the DF-430 can do even more. If the EPIRB, PLB or ELT unit has an embedded GPS signal, then the DF-430 can take rescuers to the survivor's virtual doorstep.

When integrated over the MIL-STD-1553B and ARINC 429 busses, the DF-430 can provide the distress beacon's latitude/longitude along with its unique identifier. The pilot of a search plane simply enters those coordinates into the aircraft's Flight Management System (FMS) and flies directly to the beacon's location.

To expand the DF-430's capabilities, the unit's embedded synthesized receiver detects and enables bearing determination on any transmission type, including beacon modulation, AM and PM/FM signals over the corresponding frequency range.

DF-430 is key to the rescue of Paradox's crew.

View of the Paradox from the USCG C-130 Hercules rescue aircraft.

The U.S. Coast Guard Air Station in Clearwater, Florida, was notified that the COSPAS-SARSAT system had picked up a distress signal from an EPIRB belonging to the Paradox. The station dispatched an HU-25 equipped with conventional direction finding equipment and after several attempts was unable to locate the vessel. The aircrew estimated that the aircraft's radio gear could only detect legacy 121.5 MHz signals 20 percent of the time, which requires the aircraft to perform multiple search patterns to pick up the signal.

Along with the helicopter, the station also dispatched a C-130, which was equipped with the DF-430 system. Coast Guard Lieutenant Commander Douglas E. Williams, the aircraft's commander, details the rescue: "In this case we had a large catamaran that had completely turtled. The skipper had a battery powered Sawzall and had cut an escape hole through the hull. They had an EPIRB inside and transmitted straight up through the hole. We got a solid hit on the DF-430 multi-mission direction finder and got over the top quickly. District Seven Command Center was able to vector an HH-60J helicopter from CGAS Clearwater to complete the rescue."

Black Pearl rescue timeline of events

1. Sunday, April 26, 2009
The Black Pearl, a 55-foot pleasure boat, departs from Loch Lomond Marina in San Fransisco, California.

2. Monday, April 27, 2009 3:05 a.m.
The U.S. Coast Guard (USCG) Coordination Center in Alameda, California, responds to an EPIRB, triggered from NOAA's National Weather Service via its weather satellites, registered to the Black Pearl, 50 miles west of Costa Rica.

3. 3:05 a.m.
United States Mission Control Center receives a message from NOAA and accesses the registration information of the owner of the EPIRB. This information leads to the identification of the Black Pearl and provides SAR personnel with emergency contact information.

4. Monday, April 27, 2009 4:01 a.m.
The Coast Guard receives two possible locations from NOAA weather satellites, 138 NM south of Mexico and the Guatamala border, or 50 NM west of Cabo Velas, Costa Rica.

5. Monday, April 27, 2009 4:37 a.m.
In compliance with the Safety of Life at Sea Treaty of 1974, watchstanders at the USCG Rescue Coordination Center in Alameda contact the RCC in Costa Rica.

6. Monday, April 27, 2009 8:30 p.m.
In coordination with Costa Rican authorities, the Coast Guard cutter, The Sherman, diverts from its patrol route to begin rescue search at first light, with an ETA of 7:00 a.m.

"We want to save lives and the [DF-430] is an electronic advancement that allows us to do that. We are going to reap a number of benefits, such as savings on fuel and time. That means SAR is going to be safer for the people we are looking for and the air crews doing the mission."

U.S. Coast Guard Officer

7. Tuesday, April 28, 2009 6:30 a.m.
A Coast Guard C-130, equipped with a DF-430, from Air Station Sacramento is airborne and en route to the new search area, based on updated coordinates provided by NOAA.

8. Tuesday, April 28, 2009 7:20 a.m.
The Coast Guard C-130 aircrew spots a life raft in the vicinity of the EPIRB position and contacts The Sherman, which is approximately 50 NM away and en route.

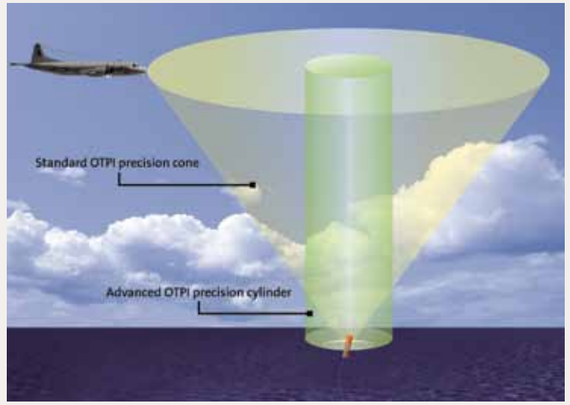
Tuesday, April 28, 2009 9:48 a.m.
After dropping a radio and supplies from the C-130, The Sherman made radio contact with the survivors, confirming them to be from the Black Pearl.

The men were retrieved by a USCG Small Boat and returned to The Sherman, where they were determined to be in good health.

Story line courtesy United States Coast Guard by: Petty Officer 3rd Class Levi Read

Multiple military applications.

The same unsurpassed direction finding capabilities that make the DF-430 an invaluable addition to government and civilian SAR operations are equally beneficial to many branches of the U.S. and allied coalition forces.



Anti-Submarine Warfare.

The standard DF-430 features an advanced On Top Position Indicator (OTPI) precision cylinder. This strategic capability enables the rapid and accurate localization of sonobuoys through a clear visual indication when the aircraft flies directly over a target during Anti-Submarine Warfare (ASW) operations. The DF-430 computes advanced OTPI when connected to the aircraft's MIL-STD-1553B bus, providing accuracy within 100 yards CEP – at altitudes above 200 feet and independently of ground speed.

To further enhance its role as an ASW device, the DF-430 also features Bearing Lag Compensation, DF Computed Indication and Combat SAR upgradeability.

Bearing Lag Compensation.

The DF-430 uses the heading information to compute the aircraft's turn rate and cancel the bearing lag caused by the received signal filtering delay. This makes the bearing indication much less sensitive to the aircraft's maneuvering.

DF Computed Indication.

The DF-430's bearing indication is protected against interference from onboard transmissions by blanking. During the blanking process, the DF-430 continues to compute and provide estimated bearings using the current heading information and the last measured bearing in order to prevent false indications.

Combat SAR.

Often undertaken in areas controlled by hostile elements, Combat SAR (CSAR) missions are among the most dangerous faced by both the survivor and rescuers. Whether at sea or on land, these critical missions are always a race against time, the elements and hostile forces. To give your forces a head start in their life-and-death race, the DF-430 can be upgraded to the RSC-125G Personal Locator System.

When upgraded, the DF-430/RSC-125G can identify and locate all common military distress beacons including AN/PRC-112/112B/112B1/112G/ and AN/PRC-434 beacons in the 225-320 band.

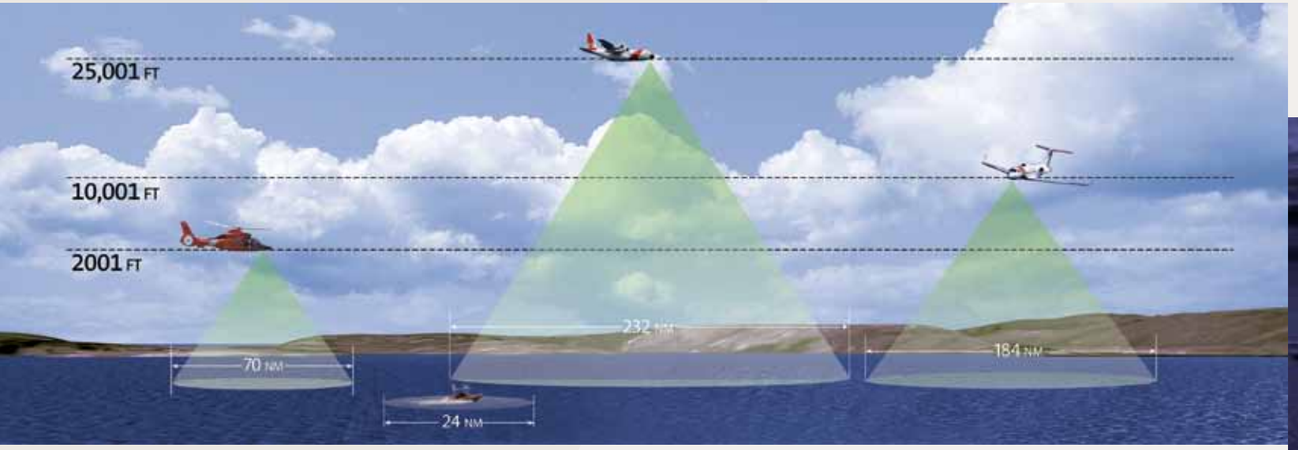
DF-430 is key to the rescue of Black Pearl's crew.

The search for the Black Pearl started early on a Monday morning when the Eleventh Coast Guard District Rescue Coordination Center in Alameda, California, received and confirmed a 406 MHz EPIRB signal. The USCG then issued an Automated Mutual-Assistance Vessel Rescue System (AMVER) alert and contacted the rescue coordination center in Costa Rica.

Several AMVER vessels responded to the alert but only one, The Sherman, a high endurance cutter, was diverted to the search area. That vessel was unable to locate any signs of distress during its search efforts. Along with the AMVER alert to ships in the area, the USCG also dispatched a C-130 from its Air Station in Sacramento, California, to conduct an aerial search.

Using the DF-430, the C-130 crew was able to locate the boat's distress signal and drop food, water and a radio to the two survivors. The Sherman was then able to sail to that location and rescue the two mariners from their life raft 50 miles off the west coast of Costa Rica.

Photo courtesy United States Coast Guard.



Airborne SAR applications.

Because the system utilizes standardized components, it is virtually an off-the-shelf installation. For example, DF-430's processor uses the MIL-STD-1553B data bus so it is easily integrated into the avionics currently found on SAR platform aircraft and helicopters. In addition, the system's flush-mounted antenna is a direct drop-in replacement for existing DF-301 antennas so no modifications to the aircraft's airframe are necessary.

To date, the DF-430 has been installed on a growing number of aircraft and helicopters in SAR service for government, civilian and military operations around the world.

Fixed wing:

Airbus A400M

Beechcraft 1900D

Boeing 767 Tanker Transport

EADS HC-144A Ocean Sentry

CASA CN-235

Dassault HU-25 Guardian

Bombardier Learjet

Lockheed C-130

Helicopters:

NH Industries NH-90

Mil MI-8

PZL W-3

Eurocopter Super Puma and MH-65

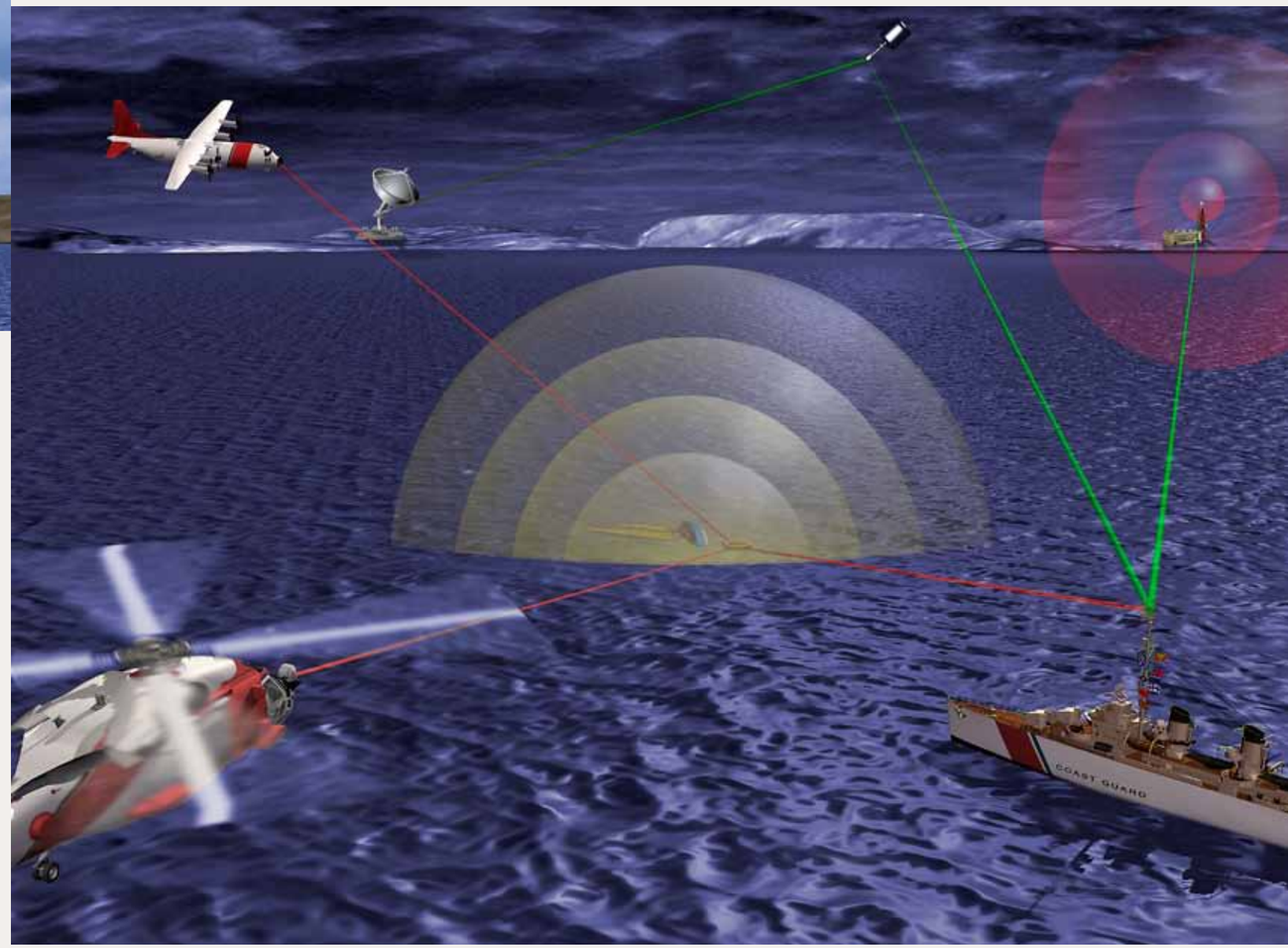
Sikorsky Black Hawk, MH-60, S-70A, S-70B and S-92

Shipborne and land-based applications.

The small size and low power requirements of the DF-430 also mean that it can easily be installed on a ship's mast or a land-based antenna. The Italian Coast Guard has the DF-430 installed on many of its SAR vessels.

The U.S. Coast Guard has a requirement for 406 MHz direction finding as part of the Rescue 21 advanced direction finding communications system. When fully deployed, Rescue 21 will provide DF coverage throughout the continental U.S., Hawaii, Guam, Puerto Rico and the U.S. Virgin Islands, as well as modified coverage in Alaska and along the U.S. western rivers. Altogether it will cover 28,000 miles of coastline. Rockwell Collins has conducted studies that indicate the DF-430 could be easily modified to meet this requirement.

Easy, flexible installation on land, sea and air SAR platforms.



DF-430. Meeting next-generation SAR needs.

The DF-430 not only meets all of today's civilian, government and military SAR needs, its flexible digital architecture ensures that it will be easily upgradeable to fulfill tomorrow's requirements.

For example, the system will require only a software upgrade to be fully compliant with all future COSPAS-SARSAT frequency requirements. The DF-430 is also already able to host the new 406 MHz downlink protocol, which will be part of the 30-satellite Galileo constellation that is scheduled to be operational in 2015.

The DF-430/RSC-125G will also meet emerging military CSAR needs by being easily upgradeable with the Combat Survivor Evader Locator (CSEL) waveform to ensure seamless interoperability with the new PRQ-7 CSEL combat survival radio.

Building trust every day.

Rockwell Collins delivers smart communication and aviation electronic solutions to customers worldwide. Backed by a global network of service and support, we stand committed to putting technology and practical innovation to work for you whenever and wherever you need us.
In this way, working together, we build trust. Every day.

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