

A woman in a green flight suit stands in front of a dark military aircraft. She is looking off to the side with a slight smile. The aircraft's canopy and various panels are visible in the background.

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**Sikorsky CH-148
Canadian Cyclones**

**Sukoi Su-35
Old name, new plane**

**Citation Mustang
American Patriot**

**Dubai Air Show 2011
Big Business**



Canadian Cyclones

After serving for almost 50 years, the end is near for the Canadian Sikorsky CH-124 Sea King. The Royal Canadian Air Force (RCAF) is replacing them with brand new CH-148 Cyclones. This maritime version of the Sikorsky S-92 will give the Canadians the worlds most advanced maritime patrol helicopter in its class.



[Photo: FM]



[Photo: RCAF]

In 2004 Sikorsky was awarded the Canadian Maritime Helicopter Programme (CMPH) contract, based on which the Sikorsky facility in West Palm Beach, Florida will deliver in total 28 CH-148 helicopters. By the end of this year, six will be delivered in an interim phase configuration. This gives the Canadians the opportunity to start maintenance and pilot training. The other 22 helicopters will be delivered in the final configura-

tion. Once delivered, the initial six will also be upgraded to the final version, according to Paul Jackson of Sikorsky Helicopters.

"Anti Submarine Warfare (ASW) is the driver for this helicopter", said Sikorsky CMPH chief engineer Leon Silva. "For this design we used existing sub systems and took their latest versions." The Tactical coordinator (Tacco) and sensor operator

(Senso) will share a Mission Data management System (MDMS), which has two workstations. Both have a 20 inch screen and 12 inch touch screen for controlling and displaying information. Also a joystick is installed to operate the FLIR pod. The cockpit crew has Cockpit Tactical Display (CTD) that allows them to share information, which gives significant mission control from the cockpit.



[Photo: SH]

The CH-148 is the worlds first helicopter equipped with a full authority fly-by-wire system

"Changing from an ASW configuration to a 22 seats utility version can be done in just 4 hours", says Silva. The aluminium cabin floor is chosen for its robustness. Underwater egress tests with a full scale mock-up at Nova Scotia showed the need for an additional escape hatch in the cabin,

which since has been added. For a typical SAR mission the CH-148 can be equipped with a hoist. Taking into account the harsh Canadian winters, this hoist is equipped with heating mats. The Cyclone is also certified to fly into known icing conditions.

The cockpit seats are optimized for tall people. The cockpit main instrument panel has five Multi Function Displays of which the CTD is the centre one. The CH-148 is the worlds first helicopter equipped with a full authority fly-by-wire system, the only mechanical linkage to be found in the cockpit is between both collective sticks.

According to Sikorsky testpilot Glenn Knaus, this makes the pilot even more dedicated to the mission. And when flight trials prove an extension of the flight envelop, the software can be rewritten. Knaus: "Redundancy is provided by triple air-data, electrical and hydraulic systems. Rate acceleration, attitude, fly-by-wire and EGI (Embedded GPS/inertial) systems are even quadruple installed." The auto pilot enables the pilot to go into altitude or velocity mode. Next to Tactical approaches the coupled height function is ideal for SAR missions and standard NATO search patrons are uploaded in the Flight Management Computer. Also auto hover approaches can be made. In case of emergency during hover, the helicopter will go upward and gain a forward motion in just a flick of a button.

Fourth generation rotor blades and an active vibration system inherited from the S-92 civil ver-

sion give the CH-148 a comfortable ride. For ease of maintenance an Integrated Vehicle Health Monitoring System is implemented. This allows maintenance crew to perform minor corrective maintenance in between flight, thus lowering the maintenance costs.

For seaborne operations the test program is still underway. So far the Cyclone has undergone two trials at the HMS Montreal. Despite looking bigger, the CH-148 actually has a smaller footprint compared to the CH-124. "Maintenance crew were quite surprised by the remaining space available compared to the Sea King!" said Silva. 350 deck landings have already cleared the CH-148 to sea state 4. Still to come in the next series of seaborne tests, are the use of Night Vision Goggles and night landings. Also sea state 6 landings still have to be made, according Knaus.

It's clear that, with the arrival of the first CH-148 Cyclone at Nova Scotia early May, the Canadian Air Force entered a new era in maritime naval aviation. 🚁

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Photography Sikorsky Helicopters (SH), Royal Canadian Air Force (RCAF) and Frank Mink (FM)



[Photo: SH]



[Photo: SH]



