

# A Primer on the CC-295 SAR Aircraft

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The Government of Canada has procured a new fleet of 16 C295W twin-turboprop, fixed-wing aircraft configured for search-and-rescue (SAR) missions from Airbus Defence & Space for the Royal Canadian Air Force (RCAF).

The new C295W search-and-rescue aircraft will be used to perform critical SAR duties in each of Canada's SAR regions, in conditions ranging from the North Atlantic, to the Arctic, across the Rocky Mountains to the Pacific Ocean. Scheduled to be delivered between 2019 and 2022, the CC-295 SAR aircraft are intended to replace the RCAF's existing SAR fleet comprising of six CC-115 Buffalo and ten CC-130H Hercules aircraft.

#### C295W Fixed-Wing Search and Rescue (FWSAR) Program

Airbus Defence & Space received a prime contract award worth \$2.4B (Cdn) from the Government of Canada in December 2016 for the delivery of 16 C295W aircraft in a search-and-rescue configuration for the FWSAR aircraft replacement program.

Airbus will provide engineering, training, maintenance and in-service support services for the aircraft under the contract, which has a base period of 11 years. In addition, the company will build a new simulator-equipped training complex in Comox, British Columbia, to provide training for the CC-295 pilots.

Canadian-based simulation and training services provider CAE is responsible for the supply of full flight simulators. Airbus Defence, in collaboration with Provincial Aerospace, formed a joint venture designated AirPro SAR Services (AirPro) for providing repairs, upgrades and depot level maintenance for the FWSAR programme for a period of 20 years.

L-3 Wescam, a manufacturer of electro-optical sensors and targeting systems and Lockheed Martin Canada were selected to provide mission systems components for the 16 C295W transports.

#### C295W aircraft design and features

The RCAF's CC-295 search-and-rescue aircraft will have a 12.7 m (41 ft) pressurized cabin with a large floor area. It will be manned by two pilots, one flight engineer, one Air Combat Sys-



tems Officer (ACSO) and two SAR technicians.

The aircraft features a fixed-wing design with a wing span of 25.81 m and a wing area of 59 m<sup>2</sup>. Blended winglets are attached to the wings to improve the aircraft's aerodynamic efficiency. The aircraft's retractable tricycle landing gear enables the flight crew to perform take-off and landing operations safely in difficult terrain conditions. A large ramp door is fitted in the rear of the aircraft to provide easy access for search and rescue equipment and CAF personnel. An additional escape hatch for the crew has also been added.

#### C295W cockpit and avionics

The C295W SAR aircraft incorporates a Night Vision Imaging System (NVIS)-compatible cockpit and advanced avionics suite. Featuring Head-Up-Displays (HUDs) and an Enhanced Video System (EVS), the cockpit provides improved situational awareness, allowing the RCAF to perform search-and-rescue missions more effectively in all weather conditions. The onboard digital avionics will provide flight safety and enhanced mission effectiveness, while reducing the pilot workload. The aircraft is also fitted with a FITS (Fully-Integrated Tactical System) mission system, which integrates the tactical information and mission sensors.

#### Sensors aboard C295W SAR aircraft

Canada's CC-295 SAR aircraft will be equipped with a MX-15 multi-sensor imaging system beneath its nose to localize, track, identify and detect targets in day / night and difficult weather conditions.

Developed by L-3 Wescam, the payload system can house up to six high-definition imaging and laser sensors such as laser rangefinder, laser illuminator, and Electro-Optical / Infrared (EO / IR) cameras. The installation of the MX-15 has necessitated relocation of the twin landing / taxi lights from the nose landing gear to a fairing just above the MX-15.

A multi-mode search radar is fitted under the fuselage to provide an unobstructed 360° field of view. It can detect, recognize, classify and track both land and water-based objects such as fishing vessels, merchant ships, inflatable boats and small craft up to a distance of 200nm.

The SAR aircraft also features an Automatic Identification System (AIS) that is capable of transmitting and receiving text messages. The AIS is used to identify and locate aircraft, ships, land-based installations, and navigational aids with AIS transponders.

## Sensor Specifications:

### Search Radar

- Multi-mode radar for detection, localization, classification, and tracking of targets over water and land – all weather, day or night
- Maximum range of 200 nm, tracking 100+ surface targets while scanning
- Detects: Ocean-going fishing vessels or merchant ships between 80-200 nm; Small craft or inflatable boats up to 35 nm; and, SAR mode provides the capability of distinguishing and recognizing ground contacts

### Electro-Optical/Infrared sensors

- Stabilized, high magnification imaging sensors greatly extend detection, recognition, and identification range
- Multi-spectral imaging (daylight, low light, and thermal) enables search operations under sub-optimal conditions, such as overcast, dusk, and even complete darkness
- Target geo-location eases handoff to ground personnel
- EO/IR sensors lend themselves to search automation

Search operations are more efficient and economical, with better outcomes”

## Automatic Identification System (AIS)

- Capability to identify and locate ships, aircraft, land bases and navigational aids equipped with AIS transponders
- Fully Integrated Tactical System (FITS)
- Ship data provided: position, dimensions, destination, ship name, MMSI and call sign
- Transmit / Receive text messages capability

## C295W propulsion details

The Canadian CC-295 SAR aircraft is powered by two Pratt & Whitney Canada (PWC) PWC 127G turboprop engines, rated at 2,750 shp each. The engines incorporate off-set reduction gearbox, reverse flow combustor, two-stage power turbine, and electronic engine control. Mounted on the wings, each engine drives 6-bladed Hamilton Sundstrand (Type HS-586F-5) 3.94 m (12 ft 11 in) diameter composite propellers, complete with auto-feathering and synchro-phasing, providing high manoeuvrability and an enhanced operation in hot and high conditions.

## Performance of C295W SAR aircraft

The maximum cruising speed of the CC-295 search and rescue aircraft is 260 kts (480 km/h) and the normal cruising altitude is 7,620 m (25,000 ft). The aircraft is designed to withstand extreme variations in temperature.

## SPECIFICATIONS

Dimensions: Overall Length 24.50 m / 80 ft 3 in; Overall Height 8.65 m / 28 ft 5 in; Wing Span 25.81 m / 84 ft 8 in; Cargo Hold Length (ramp excluded) 12.70 m / 41 ft 8 in; Cargo Hold Height 1.90 m / 6 ft 3 in; Cargo Hold Width 2.70 m / 8 ft 10 in; Cargo Hold Volume 64 m<sup>3</sup> / 2,260 ft<sup>3</sup>

Weights: Maximum Take Off Weight 23,200 kg / 51,000 lbs; Maximum Landing Weight 23,200 kg / 51,000 lbs; Internal Fuel Weight 6,150 kg / 13,600 lbs; Maximum Payload 9,250 kg / 20,400 lbs

## Engine (x2)

Pratt & Whitney PW-127G 2,645 shp 1,970 kW (up to 2,920 shp with Auxiliary Power Reserve (APR))

Performance: Maximum Operating Altitude 9,100 m / 30,000 ft; Maximum Cruise Speed (TAS\*), \*The true airspeed (TAS; also KTAS, for Knots True AirSpeed) of an aircraft is the speed of the aircraft relative to the airmass in which it is flying: 260 knots / 299 mph / 480 km/h

Range with Maximum Payload: (9,250 kg / 20,400 lbs) 700 nm / 1,300 km; Range with 6,000 kg / 13,200 lbs; Payload 2,000 nm / 3,700 km; Range with 3,000 kg / 6,600 lbs Payload 2,500 nm / 4,600 km; Maximum Range (Ferry) 2,900 nm / 5,400 km





*All photos courtesy of Airbus Defence & Space*

