

# Maritime Patrol Aircraft P-1 and Cargo Aircraft C-2



Source: Ministry of Defense (MOD)

*The fixed-wing maritime patrol aircraft P-1 has been developed as a successor of the P-3C, which is currently used by the Maritime Self-Defense Force, to conduct many different missions including wide scale warnings, surveillance and patrol in the surrounding sea areas of Japan.*

*The cargo aircraft C-2 is the largest aircraft made in Japan developed as the successor to the C-1 and other aircraft in the Air Self-Defense Force. The C-2 is mainly intended to quickly deploy operating forces in emergency situations and conduct air transportation necessary for completing activities of the Self-Defense Force in time of peace.*

*We have significantly reduced development costs by jointly developing them at the same time.*

## Introduction

There are growing needs for wide-scale early warning and surveillance in the seas surrounding Japan and for the Self-Defense Force to perform air transportation activities.

## 1 Background

In 2001, we were designated as the lead company to develop the P-1 maritime patrol aircraft and C-2 cargo aircraft, and started designing and manufacturing various prototypes. Following delivery of the first mass-produced P-1 in 2013, mass production continued steadily before we receiving a bulk order for 20 aircraft in 2016. Since conducting the first prototype C-2's maiden flight in 2010, we have enhanced the design through a rigorous series of tests to complete development at the end of FY2016. We are now mass-producing C-2 aircraft.

## 2 Product overview

### (1) P-1

The size and weight of the P-1 airframe are about the same as those of the current P-3C (**Table 1**).

The P-1 employs the world's first practical fly-by-light flight control system, which offers outstanding resistance to electronic magnetic interference. Moreover, the newly developed sonobuoy and radar systems feature improved capabilities for detecting submarines and suspicious ships. Powered by the new, domestically developed high-bypass-ratio turbofan engines (IHI's F7-10), the P-1 outstrips the current P-3C both in mission capability and airframe performance.

In addition to the radar, the P-1 also carries various sensors such as infrared, sonobuoy, and magnetic anomaly detection systems to search for and locate potential seaborne threats. And a bomb bay beneath the fuselage

**Table 1 Comparison between maritime patrol aircraft P-1 and P-3C**

Item	P-1	P-3C
Engines	F7-10 (Turbofan)	T56 (Turboprop)
Length (m)	38.0	35.6
Wingspan (m)	35.4	30.4
Overall height (m)	12.1	10.3
Basic take-off weight (t)	79.7	56.0

and missile pylons under the wings transform the aircraft into a formidable attack platform. Defending the P-1 against missiles is its flare deployment system (**Fig. 1**).

**(2) C-2**

The C-2's maximum take-off weight is about three times heavier than that of the current C-1 (**Table 2**).

The C-2, with the largest airframe ever developed in Japan, outperforms the current, similar-looking C-1 in terms of speed, loading capacity, and cruising range. It is also capable of aerial refueling to extend its range and time aloft. Moreover, the brand-new flight management system and labor-saving load management system reduce operator workloads. Powering the C-2 is a pair of General Electric



Source: Ministry of Defense (MOD)

**Fig. 1** Avoiding missiles by deploying flares

**Table 2** Comparison between cargo aircraft C-2 and C-1

Item	C-2	C-1
Engines	CF6-80C2	JT8D
Length (m)	43.9	29.0
Wingspan (m)	44.4	30.6
Overall height (m)	14.2	9.99
Maximum take-off weight (t)	141	45

CF-6 high-bypass-ratio turbofans. Possessing a reputation for reliability, these are the same engines employed on the Air Self-Defense Force's KC-767s and E-767s.

The cargo compartment is 15.7 m long and 4 m high with a large back door that opens vertically. This door doubles as a loading ramp that allows vehicles such as trucks to drive straight into the cargo bay for transportation by air (**Fig. 2**). This door can also open during tactical missions for aerial delivery of cargo and paratroopers (**Fig. 3**).

### (3) Simultaneous development of common-use components

We employed a design principle in which the C-2 and P-1 share the following components: structural parts such as cockpit windshields, outer half of wings, and horizontal tails; and equipment such as display units, inertial reference units, flight control computers, auxiliary power units (APUs), anti-collision lights, and landing gear retraction system control units. Shared components



Source: Ministry of Defense (MOD)

Fig. 2 Driving a truck into the aircraft



Source: Ministry of Defense (MOD)

Fig. 3 Air drop

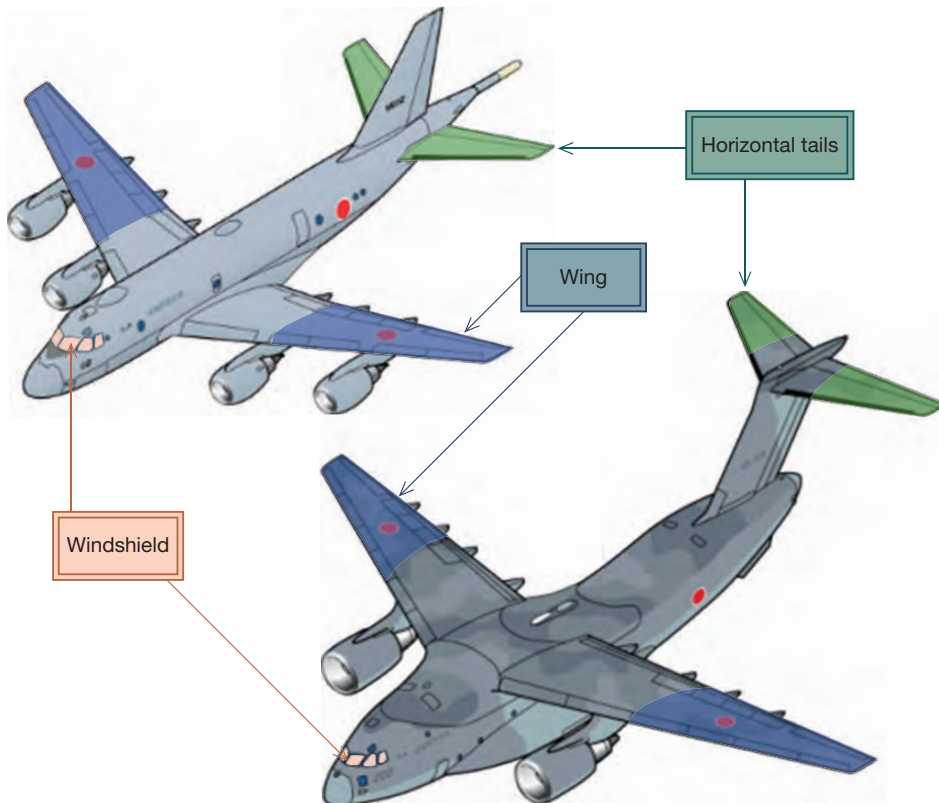


Fig. 4 Shared structural parts of fuselage (left: P-1, right: C-2)

account for about 25% of the aircraft's weight, and about 75% of the total number of installed systems are common pieces of equipment (Fig. 4).

## Conclusion

The new P-1 and C-2 have been simultaneously developed through the combined efforts of the Ministry of Defense and Japanese aircraft manufacturers. The P-1's

development concluded in FY2013, and the C-2's finished in FY2016. Currently, the Self-Defense Force is operating the first to fifteenth P-1 planes and the first to seventh C-2s for national defense. We will continue to deliver these mass-produced aircraft and support the troops' operation of them, as well as propose export of these aircraft and develop derivative models.

Shoichiro Fujita

### Contact

MPA & C-X Project Engineering Department,  
 Defense and Aerospace Project Division,  
 Aerospace Systems Company  
 Tel: +81-58-382-5577 Fax: +81-58-382-6176