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*Compiled by Bill Gunston, OBE, FRAeS
**Argentina**

**Cicaré Helicopteros SA**

The Gen Juan D Perón 1642, Piso 3º, Of 30, Buenos Aires

e-mail: info@cicare.com.ar


Web (2): www.cicare-europe.com

Technical Director: Augusto U Cicaré

President: Fernando Cicaré

Cicaré Helicopteros formed 6 October 1993 to exploit the work of prolific helicopter-, engine- and pump designer, Augusto Cicaré, whose CH-1 had first flown in 1958. CH-7 is marketed by Helisport of Italy, while Argentine company's initial success was with SVH-3 helicopter simulator, first tested in October 1994. CH-11 single-seat helicopter with contemporarising motors, powered by a 0.55 kW (0.75 hp) Rotax 0.816 two-stroke, flew in 1998 and remains under development. CH-14 was evaluated in 2007 by Argentine Army Aviation; continued to be promoted in 2012. In addition, Cicaré is working with AAA on developing two other helicopters: side-by-side two-seater; and five-seat CH-16 in collaboration with Aeris Navegador de Spain (which was, under this arrangement, Cicaré providing technical assistance with latter's helicopter programmes. Cicaré also has agents in Brazil and Australia/New Zealand.

**Cicaré CH-7B Spirit**

*Type:* Single-seat ultralight helicopter/kitbuilt.


*Customers:* Some 20 sold by April 2011 to customers in Argentina, Australia (five by end of 2011), Brazil, New Zealand and elsewhere.

*Cost:* Flyaway EUR74,995; kit includes engine EUR69,995; plus tax (2011).

*Design Features:* Sport helicopter; evolved from CH-6 and CH-7 Angel, offering improved performance and viability from cockpit.

*Powerplant:* One 134 kW (180 hp) Lycoming HIO-360-G1A flat-four.

*Fuselage:* Structure of welded tubular 4130 steel; skids of 4130 steel and aluminium; composites main- and tail rotor blades; aluminium empennage, composites nacelle and fuel tanks.

*Dimensions:* Height: 2.10 m (6 ft 10¼ in); width: 1.77 m (5 ft 9¾ in); length, rotors turning: 8.63 m (28 ft 5½ in); rotor diameter: 3.00 m (9 ft 10¾ in); tail rotor, tail rotor diameter: 1.07 m (3 ft 6¼ in); height, rotors turning: 3.97 m (13 ft 0¾ in).

*Weights and Loadings:* Empty weight: 265 kg (584 lb); Max T-O weight: 430 kg (948 lb).

*Performance:* Cruising speed, normal: 104 kt (194 km/h; 120 mph); Endurance: 2 hr 30 min.

*Accommodation:* Door each side.

*Equipment:* Navigation and conspicuity lights.

**Cicaré CH-12**

*Type:* Two-seat helicopter.

*Programme:* Proud-of-Concept CH-2002 flew in September 2001 as unenclosed air vehicle with 1217 kW (1630 shp) Laboda GFL-2500 turbocharged. Turbine power not proceeded with. However, developed as CH-12, of which prototypes L-141D2 revealed at Argentine AIAA Convention, 13 to 16 April 2010. European marketing began at Aero '11, Friedrichshafen, 13 to 16 April 2011.

*Agreement announced 10 October 2012 for CH-12 to be manufactured by FAAFA in Argentina.

*Design Features:* Pod-and-boom configuration, latter braced by V-struts and supporting empennage of fin, underfin and starboard half-tailplane.

*Structure:* Chassis of welded tubular 4330 steel; skids of 4330 steel and aluminium; composite main- and tail rotor blades; aluminium empennage; composite nacelle and fuel tanks.

*Dimensions:* Height: 2.11 m (6 ft 10½ in); width: 1.77 m (5 ft 9¾ in); length, rotors turning: 8.63 m (28 ft 5½ in); rotor diameter: 3.00 m (9 ft 10¾ in); tail rotor, tail rotor diameter: 1.07 m (3 ft 6¼ in); height, rotors turning: 3.97 m (13 ft 0¾ in).

*Weights and Loadings:* Empty weight: 265 kg (584 lb); Max T-O weight: 430 kg (948 lb).

*Performance:* Cruising speed, normal: 104 kt (194 km/h; 120 mph); Endurance: 2 hr 30 min.

*Accommodation:* Two persons, side by side, with dual controls; door each side.

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Hirobo HX-1 single-seat helicopter

Hirobo HX-1

Type: Single-seat ultralight helicopter

Programme: Unveiled at Japan International Aerospace show in October 2012, at which time Hirobo had already been developing an electric-powered research aircraft. First free flight was then planned for early 2013. May be used in optionally piloted guise for rescue of persons from inaccessible places.

Dimensions, External

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall length</td>
<td>1.475 m (4 ft 10 in)</td>
</tr>
<tr>
<td>Overall height</td>
<td>2.44 m (8 ft 0 in)</td>
</tr>
<tr>
<td>Max. T-O weight</td>
<td>180 kg (396 lb)</td>
</tr>
<tr>
<td>Altitude, Service ceiling</td>
<td>2,000 m (6,560 ft)</td>
</tr>
<tr>
<td>Cruising speed</td>
<td>48 kts (90 km/h; 55 mph)</td>
</tr>
<tr>
<td>Endurance</td>
<td>22 hr (41 km/h; 25 mph)</td>
</tr>
</tbody>
</table>

Weights and Loadings

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty weight</td>
<td>70 kg (154 lb)</td>
</tr>
<tr>
<td>Max. T-O weight</td>
<td>180 kg (396 lb)</td>
</tr>
<tr>
<td>Rotors turning</td>
<td>2.505 m (8 ft 2½ in)</td>
</tr>
<tr>
<td>Weight</td>
<td>70 kg (154 lb)</td>
</tr>
<tr>
<td>Rotors diameter, each</td>
<td>2.505 m (8 ft 2½ in)</td>
</tr>
<tr>
<td>Overall length</td>
<td>4.00 m (13 ft 1 in)</td>
</tr>
</tbody>
</table>

Areas

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>12.57 m² (135.3 sq ft)</td>
</tr>
<tr>
<td>Wing</td>
<td>4.00 m² (43.05 sq ft)</td>
</tr>
</tbody>
</table>

Power Plant

Design Features

Produced by Hirobo, a Japanese manufacturer known for its ultralight helicopters. The HX-1 is designed for research and development purposes, particularly for autonomous flight applications.

Hirobo Ltd

535-274 Miyashita-cho, Fuchu-shi, Hiroshima 726-8604

Tel: (+81) 847 41 67 39
Fax: (+81) 847 41 80 52

Web: www.hirobo.co.jp

President: Kotaro Matsusaka

After earlier existence (1949-77) in the textiles industry, Hirobo transformed its business to become a major manufacturer of ultralight helicopters. Its products are known for their quality and reliability.

JAXA SST

Type: Supersonic airliner

Programme: Begun as indigenous project in 1997 by National Aerospace Laboratory of Japan, and Japan Aerospace Exploration Agency (JAXA). It has taken part in several international research collaborations, including the CTDC project (Civil Transport Development Corporation) from 1973 until recently. Current development is focused on reducing sonic boom and engine noise, and improving fuel efficiency.

JAXA SST: Subscale flight demonstrator for low-drag design concept, with natural laminar flow wing section. It is designed to validate the low sonic boom design concept, and is scheduled to make its first flight in 2013.

Current Versions: NEXST-1: Subscale flight demonstrator for low-drag design concept, with natural laminar flow wing section. It is designed to validate the low sonic boom design concept, and is scheduled to make its first flight in 2013.

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Supersonic Transport; (4) D-SEND programme (see below). Flight test demonstrations, as one of the D-SEND project’s key technologies to validate the low sonic boom design concept, are planned to continue from 2010 to 2013.

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D-SEND programme (see below). Flight test demonstrations, as one of the D-SEND project’s key technologies to validate the low sonic boom design concept, are planned to continue from 2010 to 2013.

JAXA SST: Subscale flight demonstrator for low-drag design concept, with natural laminar flow wing section. It is designed to validate the low sonic boom design concept, and is scheduled to make its first flight in 2013.

D-SEND programme (see below). Flight test demonstrations, as one of the D-SEND project’s key technologies to validate the low sonic boom design concept, are planned to continue from 2010 to 2013.

The current D-SEND project (see entry for JAXA SST) was launched in 2010 to validate JAXA’s original concept (demonstrator) to reduce the sonic boom of supersonic aircraft. Second stage of D-SEND was due to take place in 2013.

A single-seat, electric powered research aircraft was in the early development stages by the Innovative Aircraft team in 2011. A prototype electric motor developing 40 kW (54.4 hp) has been produced.
### SLA80, SLA95i, SLA100

**Weights and Loadings**

- **Weight**
  - Weight empty: 268 kg (590 lb)
  - Max T-O weight: 400 kg (882 lb)

**Performance**

- **Rate of climb, max, at 5000 ft**
  - 259 m/min (850 ft/min)
- **Never exceed speed**
  - 107 kt (198 km/h; 123 mph)
- **Max level speed**
  - 82 kt (152 km/h; 94 mph)
- **Cruising speed, at 4800 rpm**
  - 70 kt (130 km/h; 81 mph)
- **Stalling speed, flaps down**
  - 33 kt (62 km/h; 38 mph)

- **g limits**
  - +4/–2

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**Reality**

**Reality Aircraft Ltd**

Unit 7, The Centurion Centre, Castlegate Business Park, Old Sarum, Salisbury, SP4 6QX

Tel: (+44) 1722 421612

e-mail: info@realityaircraft.com

Managing Director: Terry Francis

Director: Kate Mather

Reality previously marketed the Easy Raider, for which it has world rights, except in the USA. By early 2012, nine Easy Raiders had flown in the UK (one was subsequently written off) and further two were under construction. US partner, JustAirCraft LLC, developed the Escapade for which it previously supplied components. The Escapade has the characteristics of a high-wing monoplane with two auxiliary bracing struts each side. The empennage has a conventional horizontal tailplane and V-struts below, and both surfaces are non-aerofoil. The wings fold horizontally for storage; the tailplane is braced to the V-struts. The fuselage is conventional and manual. The tailwheel is a type 6 solid wheel. The structure is fabric-covered, and a glass-fibre fairing surrounds the auxiliary struts.

**Escapade Kid**

**Type:** Single-seat ultralight/kitbuilt.

**Programme:** Lunched at Sport & Leisure Aviation Show at Birmingham, UK, 29 to 30 November 2008, when prototype G-OKID displayed, having been registered four days earlier. By early 2011, development work had been completed, including installation and testing of different engines; fitting of an optional ballistic parachute recovery system; and addition of the V-struts. The Escapade aeroplane is based on Just AirCraft Escapade/Highlander, designed and built in the USA, although Highlander version is not available in Europe. Accordingly, refer to Just AirCraft for a description.

**Escapade Kid and One**

**Type:** Single-seat ultralight/kitbuilt.

**Programme:** Launched at Sport & Leisure Aviation Show at Birmingham, UK, 29 to 30 November 2008, when prototype G-OKID displayed, having been registered four days earlier. By early 2011, development work had been completed, including installation and testing of different engines; fitting of an optional ballistic parachute recovery system; and addition of the V-struts. The Escapade aeroplane is based on Just AirCraft Escapade/Highlander, designed and built in the USA, although Highlander version is not available in Europe. Accordingly, refer to Just AirCraft for a description.

**Escapade Kid**

- **Flyaway or kit.** As described.
- **Escapade One:** Non-SSDR version; similar to Kid, but allowing empty weight above 115 kg. Available as kit only, as demanded by SCAR Section S.

**Customers:** First built aircraft had been completed by 2011.

**Costs:**
- Complete kit GBP19,999 with F33 and Oratex fabric, or GBP21,999 with Aero 40 engine. flyaway: GBP24,999 with F33 or GBP26,999 with Aero 40; all plus tax (2012).

**Design Features:** Originally for sub-115 kg (253 lb) empty weight) single-seat deregulated (SSDR) class. Escapade Kid is the Escapade model available in Europe, with ESCAP model available for US market. Reality Escapade Kid is a conventional design.

**Structure:** Fabric-covered, welded steel tube. Wing built on two tubular spars, one forming leading-edge. Empennage surfaces non-aerofoil. The wings fold horizontally for storage, remaining horizontal. The fuselage is conventional and manual. The tailwheel is a type 6 solid wheel. The structure is fabric-covered, and a glass-fibre fairing surrounds the auxiliary struts.

**Landing Gear:** Tailwheel type, fixed. Two fanned-in side V-struts braced to lower longitudinal, with composite engine cowling. Propeller: 2-blade, ground-adjustable pitch propeller. Optional 2-blade, 3-blade, or 4-blade propeller.

**Power Plant:**
- One 18.1 kW (24 hp) Hirth F33 single-cylinder, two-stroke engine driving a 2-blade, fixed-pitch propeller. Optional 29.8 kW (40 hp) Aero 40 single-cylinder, two-stroke, or 29.8 kW (40 hp) Newton rotary engine.

**Equipment:**
- Optional ballistic parachute recovery system.
Northrop Grumman E-2 Hawkeye

Type: Airborne early warning and control system

Programme

Development Milestones

- E-2D
  - First flight
    - 27 Oct 01
  - First delivery
    - 19 Jan 06

- Subsequent versions
  - E-2C
    - First flight, production
    - 23 Sep 72
    - First flight
    - 20 Jan 77
    - First flight, production
    - 23 Sep 72

- E-2D
  - Official go-ahead (SDO contract award)
    - Aug 04
  - First flight
    - 3 Aug 07
  - First delivery (joint production aircraft)
    - 29 Jul 10


Current versions - E-2D: Current service version (as detailed; baseline aircraft (65 built) had AN/APS-123 or AN/APS-125 radar; replaced in production by "Group II" version (25 built) with AN/APS-138 radar). In closing stages of 2004, US Navy processed only four active "Group II" aircraft; assigned to VX-20 at Atlantic, Virginia; these have since been retired and supplemented by "Group II" aircraft from FY04–07, which lack radar, but including wiring and hardware systems to facilitate future conversions; final new-build TE-2C (166503) delivered to US Navy in FY2010 with Group II radar; first new-build TE-2C (167929) delivered to Royal Navy in December 2011, with final two shipped to US in November 2011 for upgrade.

Hawkeye 2000: Derived from the E-2C.

First flight, production 23 Sep 72

- Initial trials of upgraded mission computer installed on second Group II aircraft (164109) began with first flight on 24 January 1993 and were completed in July 1993, at which time authorisation given for low-rate initial production of new mission computer. Although flight trials revealed software problems that delayed production of new mission computer by about a year, navigation systems and operational evaluations undertaken with five modified aircraft in 1999–2001. All were Group II aircraft fitted with MUQ and ACIS (see below) elements of proposed Hawkeye 2000, further two delivered to Pusan River for initial evaluation by May 1999. Aircraft arrived at Point Mugu from August 1999, joining YW-117 for operational evaluation from October, with latter phase including deployed duty aboard a carrier for full battlefield operations. In meantime, another E-2C (161844) used to test further development of Hawkeye 2000 prior to delivery; hardwaresystemstofacilitatefutureconversion;firstnew-buildTE-2C(166503)deliveredtoredesignE-2DastheHawkeye2002.Keyelementwasmissioncomputerupgrade(MCU),withnewarchitecturebasedonPowerPC300Series.

Hawkeye 2000: Derived from the E-2C.

Hawkeye 2000: Derived from the E-2C.

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