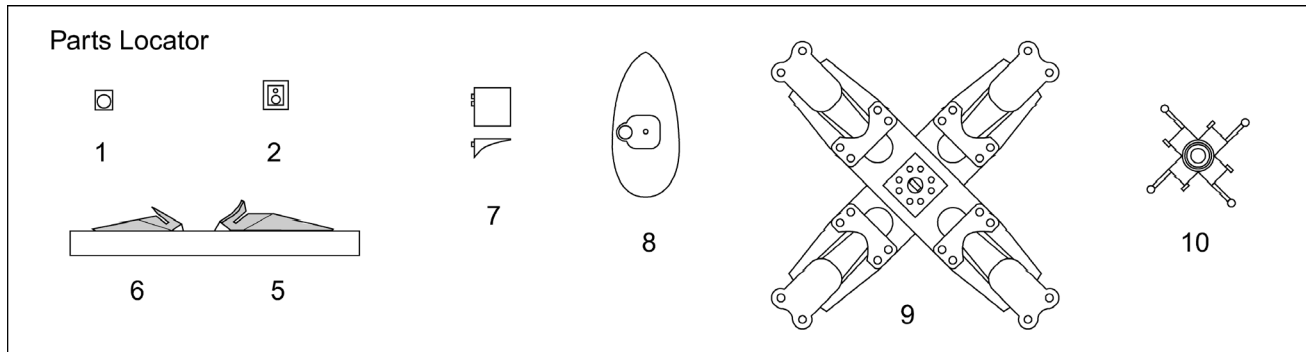


Background

The Bell 412 is the latest development of the Huey family; the basic structure is nearly identical to UH-1D which first appeared in the early 60s. While the UH-1N used a similar rotor system as predecessors and added a twin engine powerpack, the Bell 412 keeps the twin pack PT-6 engines and uses a different four blade main rotor. The rotor head makes use of the flexibility inherent in composite blades. The commercial Bell 412 was introduced in the early 80s, but its military use has been limited, probably because of the huge inventory of UH-1s still in service. However, Bell 412s are in use by more and more military forces and are now used by the RAF as training machines.

In the early 90s, Canada decided to replace its inventory of CH-136 Kiowas, CH-118 Iroquois (UH-1H) and CH-135 Twin Hueys (UH-1N) with a single multi-purpose machine. This utility transport would be used for tactical transport, support to peacekeeping missions, local SAR and disaster relief. The machine was to be a commercial type, with contracted logistic support. Specialist roles would be accommodated by fitting various kits. In 1992, the Bell 412



was chosen and in December 1997, the last of 100 CH-146 Griffons was delivered to the CAF.

A. Before you begin

Remove flash and where necessary, sand the bases off resin parts. Avoid breathing resin dust by wet-sanding where possible and using a dust mask. Remember that resin is softer than plastic so go easy on the sanding. Wash all resin parts with soapy water to remove any surface films

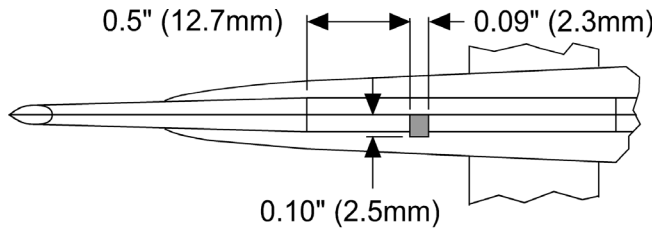


Figure 1

B. Before gluing fuselage halves together.

1. On the starboard fuselage half, measure 1/2" (12.7mm) forward from the aft end of the tail driveshaft cover. File a slot 0.090" (2.3mm) wide and 0.100" (2.5mm) deep through the tailshaft cover and

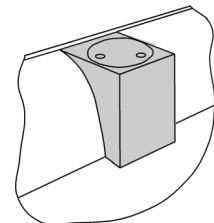


Figure 2

slightly into the boom itself. Glue in the GPS mount (part 1) so the top of the box is flush with the top of the driveshaft cover. Refer to Figures 1 & 2.

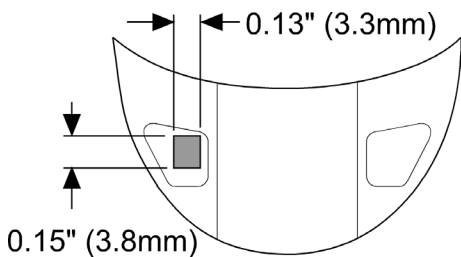


Figure 3

2. On the starboard nose access panel, cut a rectangular hole as shown in Figure 3. Glue in the blade sensor assembly (part 2) from underneath and sand flush. If you are careful cutting the hole, you can leave the joint unfilled, since this assembly has a natural metal bezel which is riveted to the camouflaged fuselage.

3. Normally, CH-146s are fitted with commercial-style crew seats, although armoured seats are available for mission fits. The kit seats are not quite right, and replacement seats (parts 3) are provided. Modify the seat supports (kit parts 2A and 4A) as shown in Figure 4
4. Glue the replacement seats to the vertical arms of the seat support. Seat pan is beige with a black edge, supports are black, seat cushion is sand/beige and belts are olive drab. See photos on page 4

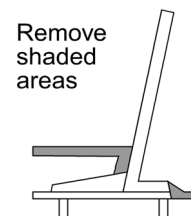


Figure 4

for details.

4. While there may be some differences in avionics fits between UH-1N and Bell 412, the basic structure is similar and the rest of the interior is virtually identical (see photo on page 4). Build the rest of the kit according to the instructions, but leave off the transmission (kit assembly E), the forward end of the engine housing (kit part 45B) and the other parts on the roof (kit parts 46A, 47A and 48A). The main rotor system will be completely replaced by new parts.

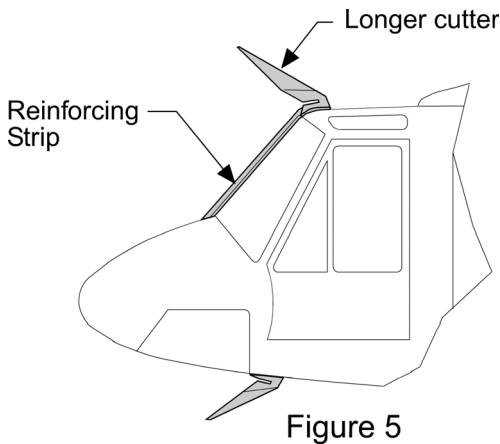


Figure 5

C. After fuselage assembly.

1. Glue the new rotor pylon (part 4) in place. Drill a 1/32" (0.75mm) hole about 1/4" (6mm) deep where marked in the rotor recess on top. This hole will serve as the rotation point for the main rotor.

2. All CH-146s are fitted with wire-strike protection devices above and below the forward cabin. See Figure 5. **NOTE: These can be installed before painting but beware, they will be fragile.** Glue the upper cutter (part 5) right at the forward edge of the roof line. The lower cutter (part 6) is in line with the rear of the nose windows. Each cutter is

supported by two small bars. They are attached on each side of the cutter, about 6 inches from the tip and bolt to the fuselage on small pads about 10 inches behind and to the side of the cutter. Use small diameter stretched sprue to represent the bars..

3. Use the piece of T section strip to represent the reinforcement in the centre of the windscreen. You will have to trim this piece to fit at the bottom of the window, and to lead it into the wire strike cutter. There is also a bar-type reinforcing structure at the top corners of the windscreen. See detail at left. This can be represented with stretched sprue, but it will be fiddly.

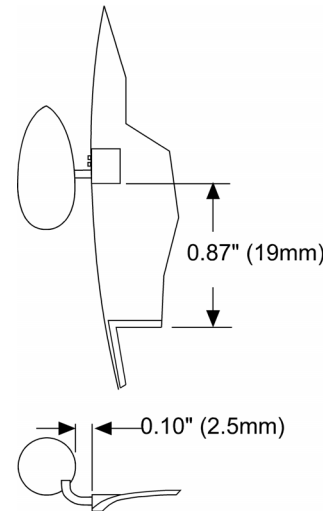


Figure 6

5. Glue the hoist mounting fairing (part 7) where indicated in Figure 6 at right. Drill a 1/16" (1.5mm) hole horizontally at the indicated point to serve as the mounting point for the hoist pylon. The two small protrusion aft of this point represent plugs for the hoist control wiring, which can be done later. **Note: Further installation of the hoist should probably wait until after painting is completed.** Bend a piece of wire to match the hoist arm in Figure 6. Drill a horizontal hole in the fairing. Glue in the arm so the free end sticks straight up.

6. Remove the moulding sprue from the nose of the hoist fairing (part 8) and sand the leading edge to a spherical shape. The small hole in the recess is the mounting point for the hoist; to its inboard side is a recessed boss which is the attachment point for the hoist arm. Pre-drill a hole in the boss. Glue the hoist onto the arm; the bottom of the hoist should be about 0.06" (1.5mm) above the top of the fairing. Glue the hoist hook (kit part 101B) into the small hole.

7. Hoist control wires run from a single point on the side of the hoist, about 0.12" (3.2mm) aft of the arm . This wire splits and go into the two plugs on the mounting fairing.

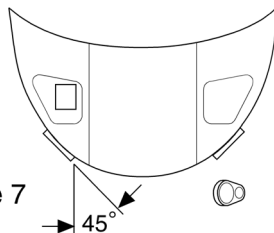


Figure 7

8. Forward radar warning receiver (RWR) mounts are fitted on each corner of the extreme nose at 45° angles as shown in Figure 7. File a small flat on the nose where indicated, remove the RWRs (part 9) from their resin base, glue in place with large end forward and fill any seams.

9. After RWRs are mounted on the tailboom just aft of the small towel-rack antennas. Move the mounting holes for these forward by 1/16" (1.5mm) and fill the old holes. File off the small taillight fairings just aft of these. The aft RWRs (part 10) mount where indicated in Figure 8. Note that these should be horizontal, not aligned with the tailboom. Use a half-round file or sandpaper wrapped around a 3/4" tube, and gently radius the back of the part at a slight angle. Glue and fill seams.

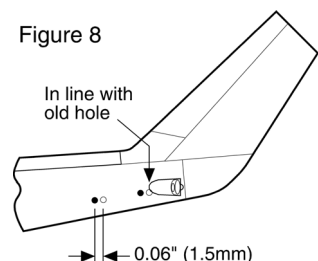


Figure 8

D. Rotary Wing Assembly

1. File a slot into each blade attachment point of the rotor head (part 11) as shown in Figure 9. Work carefully, since the tabs remaining will quite thin. Open up the half-round slots at the root of the hub.

2. Drill a 0.08" (2mm) hole completely through the centre of the pitch control spider (part 12). Cut a length of the 0.078" rod supplied to 0.5" (12.7mm) long and glue in place. Glue the top of this rod into the hole in the bottom of the rotor head, aligning it as shown in Figure 9.

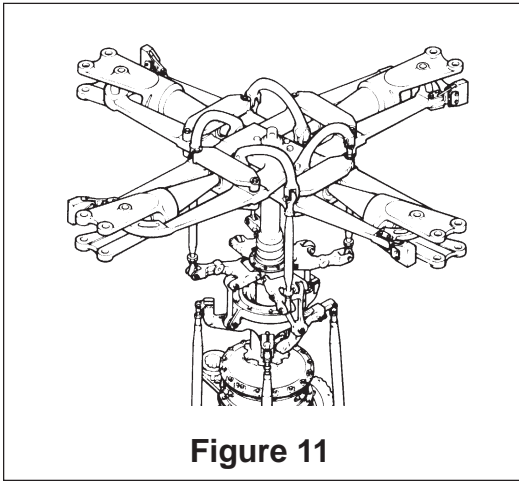


Figure 11

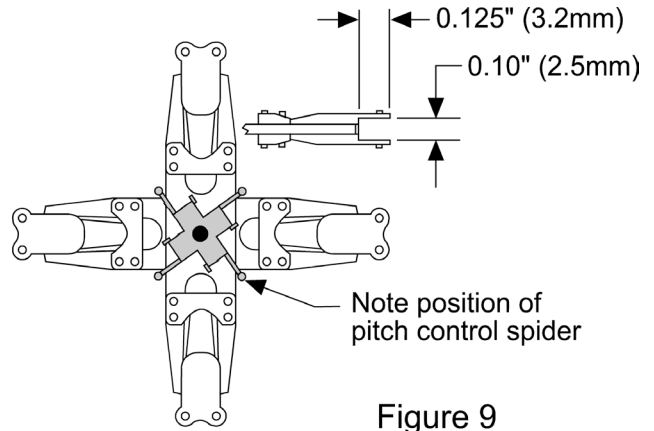


Figure 9

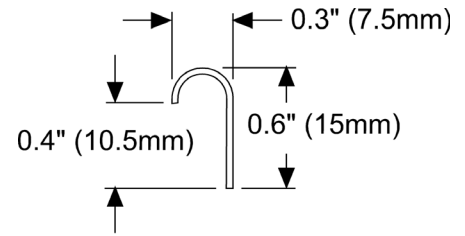


Figure 10

3. The pitch control arms can be made from plastic rod, stretched sprue or brass wire in an inverted J shape as shown in Figure 10. These arms are definitely simplified ... refer to Figure 11 for more details if you wish to try adding more fidelity. Note that because of the overlapping nature of the rotor head main beams, two of these arms will be 0.05" (1.5mm) longer than the other two. Glue the bottom of these arms into the sockets at

the ends of the spider arms. Glue the other end to the root of the blade hub, right in the middle of the half-round slot from D.1

4. To remove the blades from the backing, score along the base and gently bend out. The blade should break off neatly.

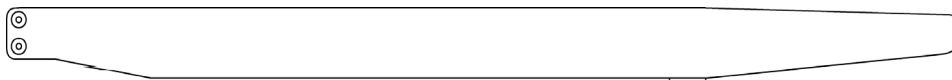


Figure 12

Trim tab

Sand the leading edge to restore the airfoil shape. For each blade, glue three small pieces of plastic strip (0.01" x 0.04" x 0.19" long) to the trailing edge where indicated to represent the trim tabs. Glue each blade into the filed slot.

NOTE: The rotor turns counter-clockwise viewed from the top.

5. The small protrusion in the top centre of the rotor head represents the lifting eye, and it should be carefully drilled out and opened up. I suggest this be done after all other work has been completed to avoid breaking it when handling.

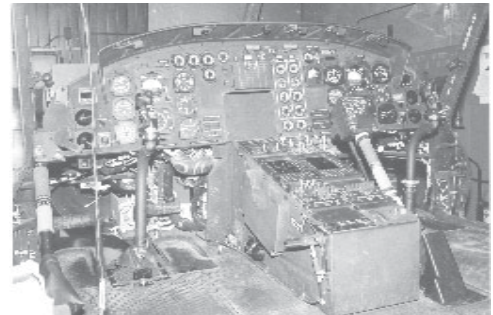
Main rotor head components are light grey with natural metal details, blades are black above and below, with 6 inch yellow tip.

6. The final step is to drill a small hole in the bottom of the pitch control spider, insert a wire to act as an axle and fit it into the transmission fairing.

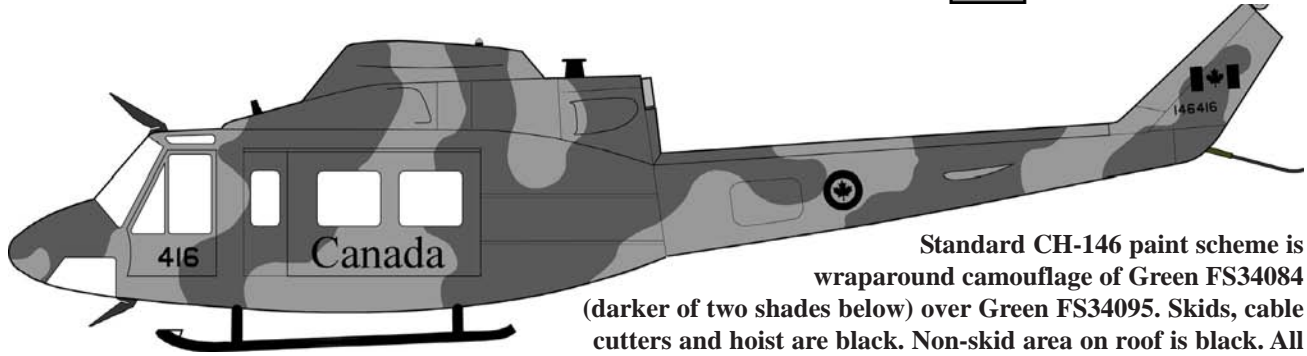
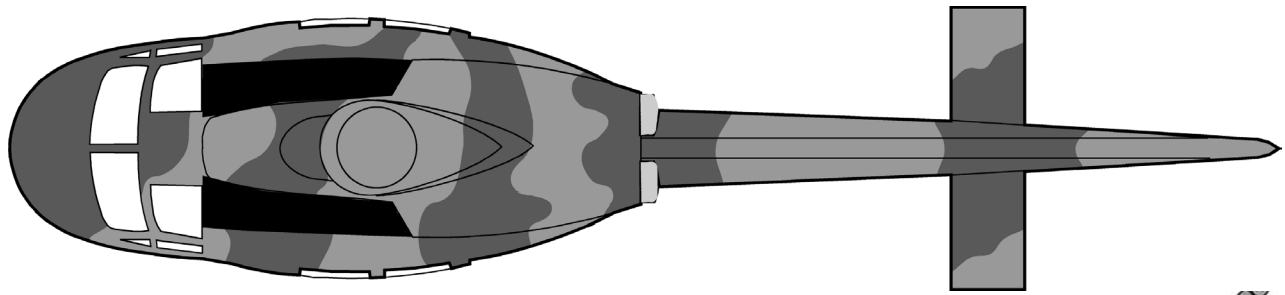
E. Final Assembly

1. The blade antenna (kit part 47A) can be modified in shape and attached behind the transmission fairing where shown on the side views on page 4. Another small blade antenna can be made and fitted to the forward fairing.

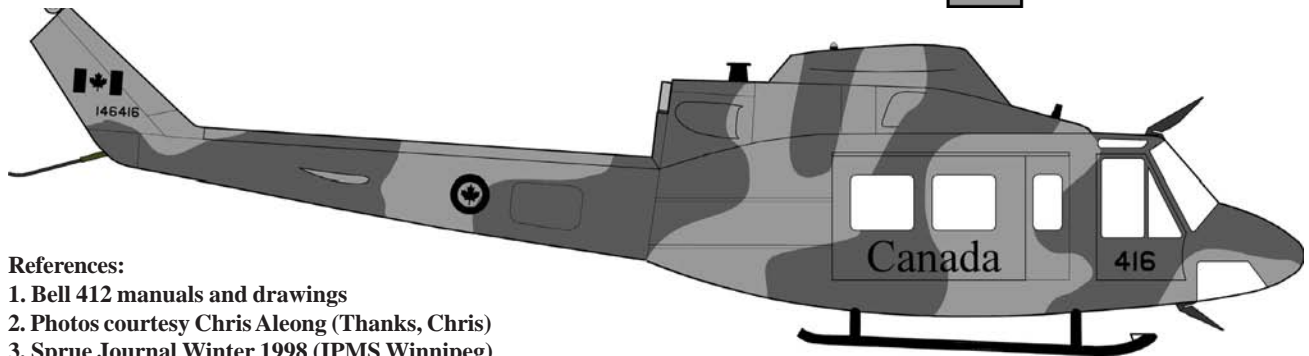
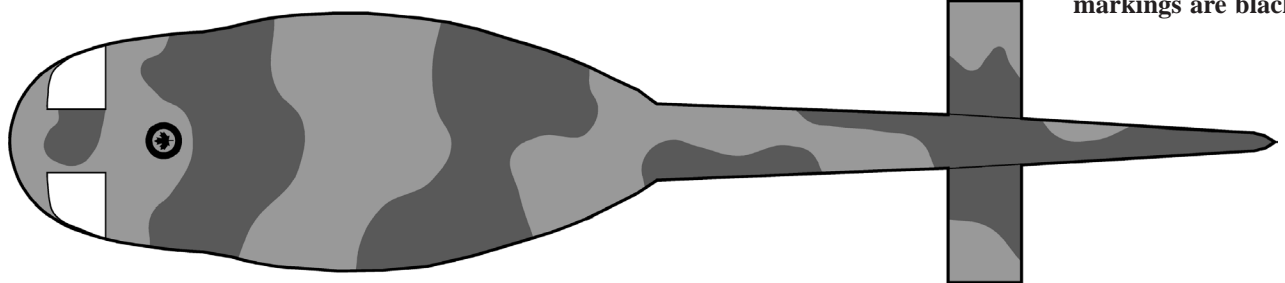
2. All machines have mounting plates for chaff and flare dispensers, although the dispensers would only be fitted if required for operations. The mounting plates are 0.3" (7.5mm) square and are mounted on either



Above, a view of the instrument panel and centre console. Photos by Chris

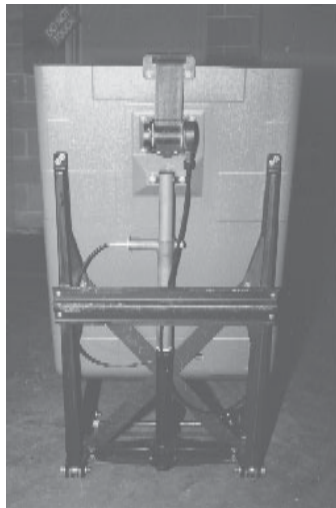
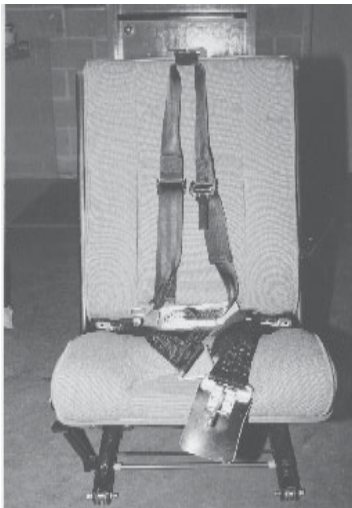


Standard CH-146 paint scheme is wraparound camouflage of Green FS34084 (darker of two shades below) over Green FS34095. Skids, cable cutters and hoist are black. Non-skid area on roof is black. All markings are black.



References:

1. Bell 412 manuals and drawings
2. Photos courtesy Chris Aleong (Thanks, Chris)
3. Sprue Journal Winter 1998 (IPMS Winnipeg)
4. Canadian Armed Forces Aircraft Finish and Markings by Patrick Martin



Front and rear view of crew seat, courtesy of Chris Aleong