



Yale of No.1 SFTS at Camp Borden in September 1940. DND Photo PL1427

Belcher Bits BK4: North American NA-64 Yale

Introduction

North American's NA-16 trainer was the sire of a long line of military trainers, the AT-6 Texan being the most famous. However, there were many other variations on the same airframe, and not all of them were used by the USAAC. In 1939, France ordered 230 NA-57 basic trainers; these aircraft were very similar to the USAAC BT-9 with fixed gear and fabric covered fuselage. Pleased with the aircraft, France followed up with an order for a more advanced trainer, numbered NA-64. This aircraft was very much an interim machine, incorporating the wing and engine of the NA-57, but with the longer, metal covered fuselage

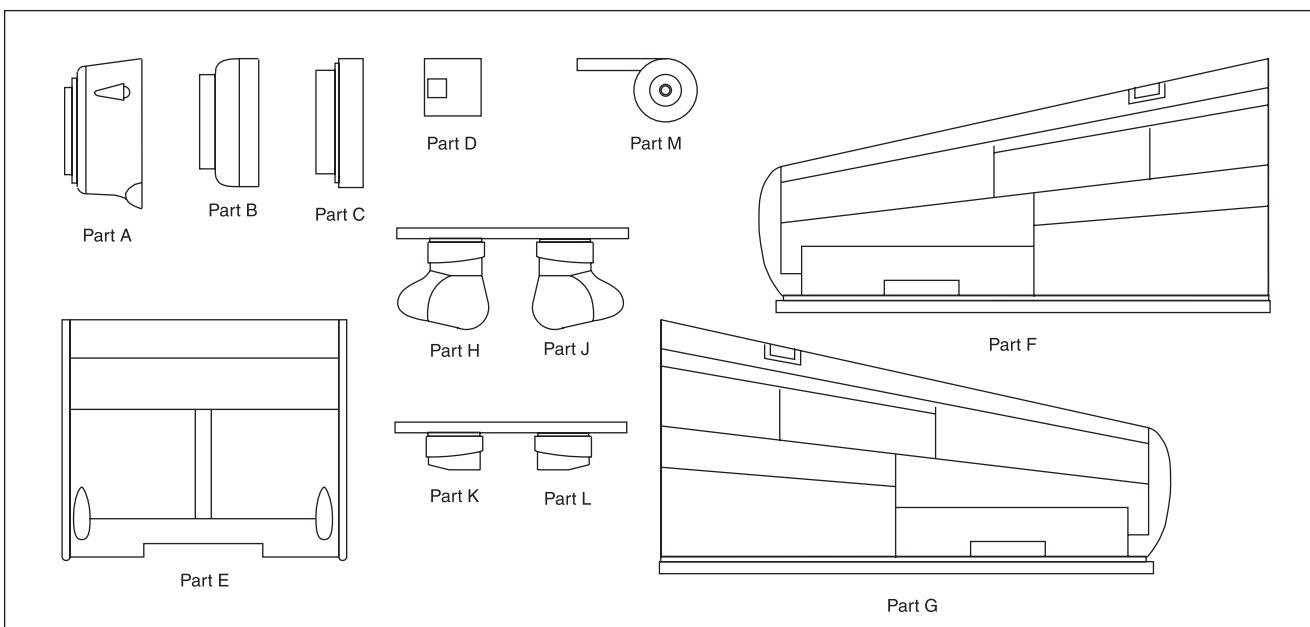
and triangular shaped rudder as seen on the AT-6 Texan. The result was a machine which resembled a BT-9 but with a metal fuselage and a Harvard canopy.

Some 111 of the 230 NA-64s were delivered to France before it fell in 1940, and some of these ended up in Luftwaffe hands. The balance of the order was taken over by the UK, and they all ended up as Yale Mk I trainer aircraft at British Commonwealth Air Training Plan bases in Canada. The Yale inherited the early BT-9 wing and its nasty stall characteristics, and when the RCAF decided that the intermediate trainer category was no required, it was used as a wireless

trainer. A number of these aircraft survived the war and have been rebuilt in flying condition, many of them misidentified as BT-9s. Unfortunately for U.S. warbird fans, the NA-64 Yale was only used by France or the RCAF and never saw U.S. service.

The Kit

This kit includes a complete 1/48 Occidental Harvard Mk II kit, necessary resin parts to convert the kit to an NA-64, a set of EZ Mask canopy masks and a decal sheet with schemes for four Yales.



Resin Parts Guide

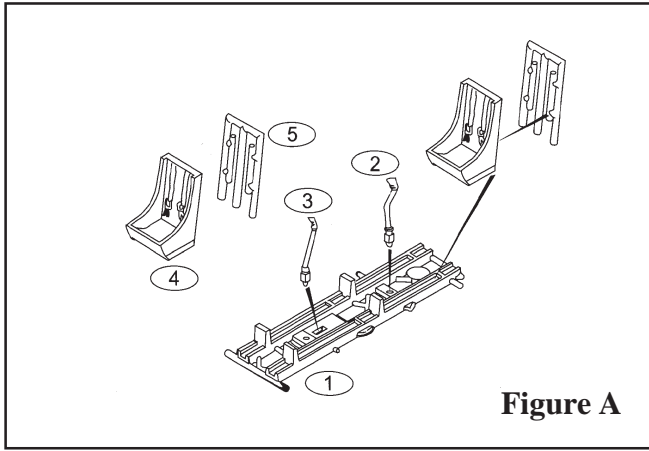


Figure A

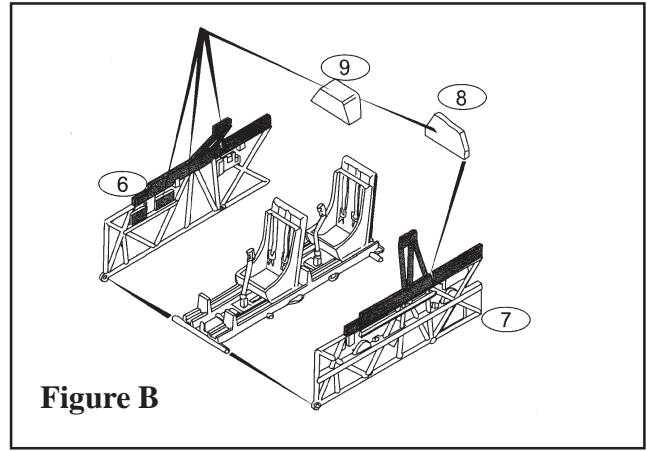


Figure B

Fuselage

Assemble the kit interior, using Figs A and B. Interior colour is aluminum lacquer. Seats would have been bare metal; the pilots used seat pack parachutes. Paint the instrument panels

and side consoles black; the instruments can be picked out with a white pencil, or by careful drybrushing.

Glue the fuselage halves together with the upper cowling piece (part 15) and forward instrument panel (part 12)

using Fig. C. Part 10 may need a little trimming to allow the fuselage halves to mate properly. Also note: If you glue on part 15 so it lines up with the front of the fuselage halves, there will be a small gap at the leading edge of the canopy rail. Fill this gap with small bits of plastic, since the canopy will not fit properly if you simply move part 15 back. I would also recommend leaving off the tailwheel until the end.

Using Fig. D, cut off the forward fuselage where indicated. Glue on the accessory section (resin part A); the protrusions on the back of this part should key in with the lower section of the fuselage. Fill seams in the upper cowling area. I would recommend filling and rescribing the panel lines for the three small panels aft of the cut ... they are not scribed the same on both sides of the kit parts, and it would probably look better if they were symmetrical.

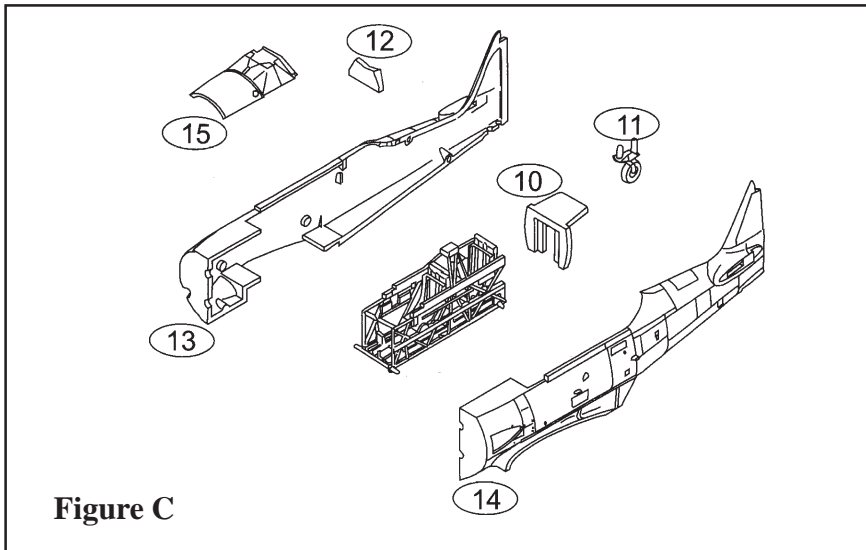


Figure C

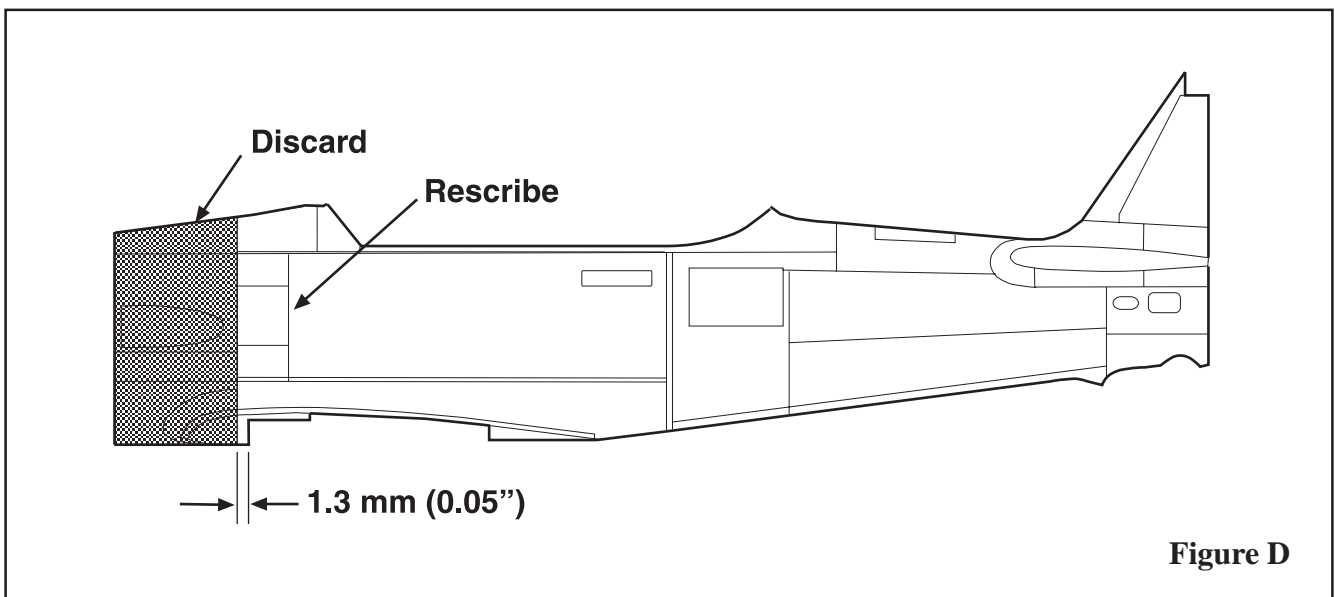


Figure D

Cowling

The cowling is supplied in two pieces (the forward cowling as part B and the rear cowling and engine face as part C). I would suggest painting the engine before assembly. The interior of the cowling was also probably natural metal, but could have been zinc chromate primer. Remove the moulding ring from the front cowling, sand the cowling lip to a smooth radius and glue to the rear part, lining up the keyed slot at the top. Fill the seam between the two. This whole assembly can be painted and attached later if you prefer ... the cowling assembly has a slot on its back face which registers with a small block on the accessory section to ensure the cowling only fits one way.

The carburetor air intake (resin part D) is glued on to this square block on the top of the accessory section. Some Yales were seen without any intake scoop, others had a squared off job, but the one supplied with this kit represents the original design.

The exhaust collector ring and pipe (resin part M) can be glued to the front of the engine; the pipe sticks out the small hole in the side of the cowling.

Tail Area

The port (part 28) and starboard (part 27) elevators can be glued in place and seams filled. The Yale did not have rudder-mounted tail lights or an adjustable rudder trim tab; instead it used a small external metal tab which was ground-adjusted. This is good because the Occidental rudder has a very thick trailing edge. By careful sanding of the trailing edge, you can sand off the lights and the scribed trim tab AND reduce the thickness at the same time. You will also

remove some of the fabric details of the rudder but like most kits, these are a little too prominent anyways! The top of the rudder is also a little thick and would look better if thinned down. Once the rudder is sanded, cut a piece of 0.010" x 0.030" styrene strip, 6.3 mm (0.25") long. Glue this to the trailing edge of the rudder where indicated in Figure F. It may be better to paint the rudder separately (at least for the French scheme) and glue it on later.

Wing

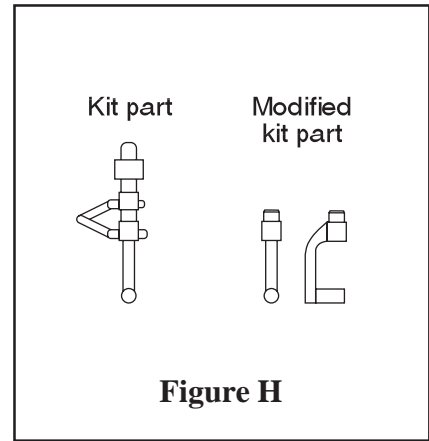
I recommend doing the wing separately from the fuselage ... since it involves gluing new outer wing panels on a new centre section, it will be easier to ensure the same dihedral on both wings. Carefully scribe and break the centre section (part E) and the port and starboard outer wings (parts F and G) from their pour sprues. It is easier to work on the trailing edges before the parts are joined. Glue the outer wings to the centre section; note that it incorporates the complete fairing strip, so the outer wing parts are centred on the butt edge. All three are moulded with the flaps section raised; it would be possible to use kit parts to represent the flaps but a lot of work to modify the wings.

When dry, fit the completed wing to the fuselage. Some filling will be required at the joint between the wing and the resin accessory section, as well as a bit along the root.

Landing Gear

Check your references ... early NA-64s were seen with full spats, while later on, the lower section was removed. It may make sense to paint these items separately and glue in place when the model is completed; note the open sections face outboard.

If you are opting for full spats, cut off the spats (resin parts H starboard & J port) from their base and paint. The Occidental kit provides three tires, one with a diamond tread pattern. Toss it in the spares box, and sand the line tread patterns off the other two tires ... if you can reduce their width slightly, they will look better. Reduce the thickness of the wheels (part 35) by sanding the back face slightly. The wheels and their covers (part 36) can be glued together and painted separately from the tire. The in-



ner face of the tire should be natural metal. The final step is to glue the tire into the spat.

For those a/c with lower section of the spats removed, abbreviated fairings are also provided. Cut off resin parts K (port) and L (starboard) from their base; again, you may wish to paint these separately and glue on later. Modify the kit landing gear as shown in Fig.H. These shortened gear legs (painted natural metal) fit into the holes in the fairings. The wheels and tires are finished as above, and fit on the kit axles.

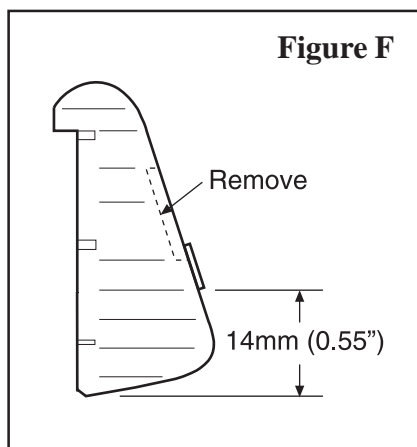
The tail wheel from the kit (part 11) is used without modification.

Canopy

Depending on the way you like to deal with canopies, you may want to fit the fixed portions such as the windscreen (part 49) and the rear canopy section (part 53a) prior to painting. The Occidental kit includes optional canopy sections for early and later Harvards; be sure to use the early ones with the additional canopy frames; kit parts 50a (front), 51a (middle) and 52a (rear).

This kit includes a set of EZ Mask canopy masks for your convenience. This self-adhesive film is pre-cut to fit the Occidental kit canopy, and will definitely save you time in masking. Mix a small amount of detergent with water, use a sharp knife to lift the canopy mask section off the backing and a pair of tweezers to dip it in the soapy water. Place it where indicated on the canopy; the soapy water will allow you to move it into position. Once the mask is properly positioned, press it in place and pat it dry. Once all the masks are positioned and dried, the canopy is ready for painting.

Figure F



Final Steps

Following painting, clear wing landing light covers part 48 (starboard) and 48a (port) are glued in place on the port and starboard wings respectively. The Occidental kit does not make any attempt to show the lamps (and so neither do the resin wings); these could be made from small bits of sprue or railroad lamp lenses.

On the starboard side just aft of the accessory section are two small venturi. Too small for resin parts, you should make these up from stretched

sprue ends.

Glue the pitch control weights (parts 24A) to the kit prop (part 24) hub. The prop is natural metal with black on the rear faces of the blades.

References:

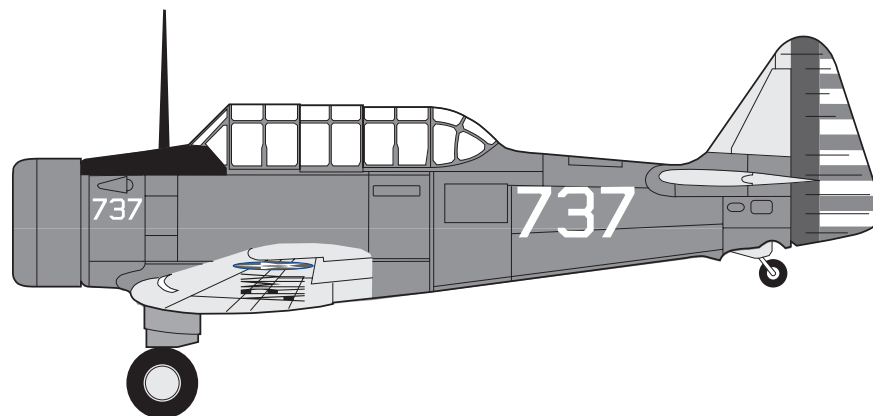
1. **North American Aircraft 1934-1998 Vol. 1**, by Norm Avery, published by Narkeiwicz / Thompson
2. **North American NA-16/AT-6/SNJ**, Warbird Tech Series Volume 11, by Dan Hagedorn, published by Specialty Press
3. **T-6 Texan in Action**, by Larry Davis,

Squadron/Signal Publications.

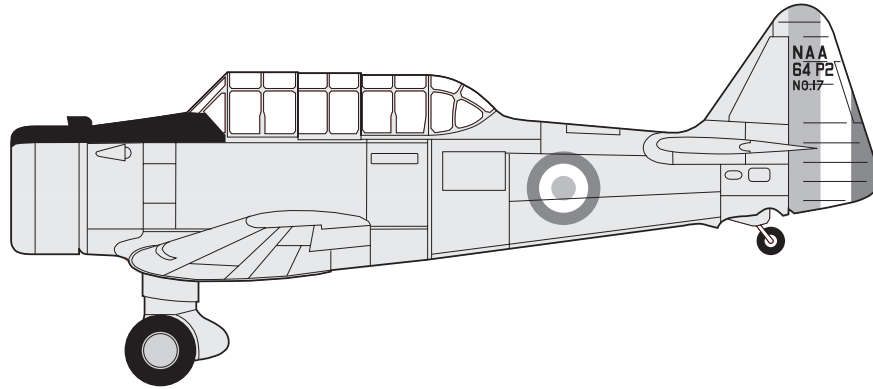
4. **Harvard!** by Dave Fletcher and Doud Macphail, publisher DCF Flying Books. (the best Yale reference by far!)
5. **Riding Herd on the Thundering Texan** by Peter Bowers, Wings October 1986 (Part I) and Dec 1986 (Part II)
6. **The Empire Builder** by Owen Gault and Vital Ferry, Air Classics October 1976.
7. **Air Force Colors Vol. 1** by Dana Bell, Squadron/Signal Publications

Decal Sheet Guide

Luftwaffe	<p>Belcher Bits NAA 64 P.2 No. 85</p> <p>BK4: Yale NAA 64 P.2 No. 85</p>	Note: Fuselage roundels
Armee de l'Air	<p>NAA 64 P2 NO.17</p> <p>NAA 64 P2 NO.17</p>	RCAF no. 3441 and 3448

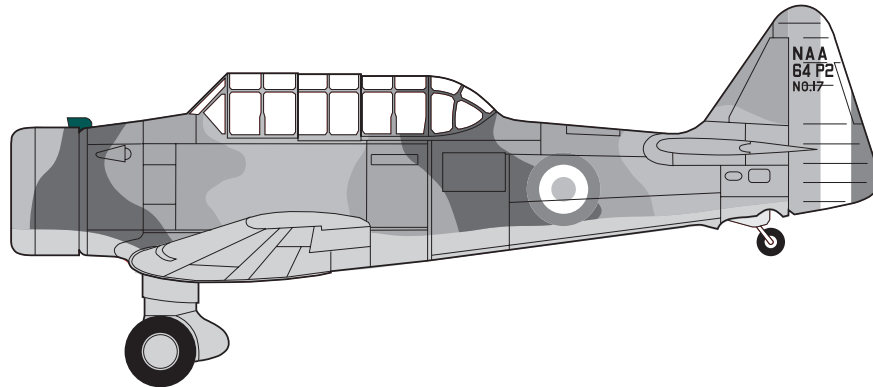


No, you can't make this scheme from the decal sheet, and just as well ... the North American NA-64 Yale never appeared in USAAC markings. Someone should tell the USAF Museum this, because they have one just like this, described as a BT-14 with a BT-9 engine. Not even close. In fact, it is an ex-RCAF Yale, restored to flying condition and painted to represent a BT-9 by Challenge Publications, then donated to the USAF Museum. Trainer Blue fuselage with white letters, yellow wings and tail; very attractive if it were real ... but it's not!



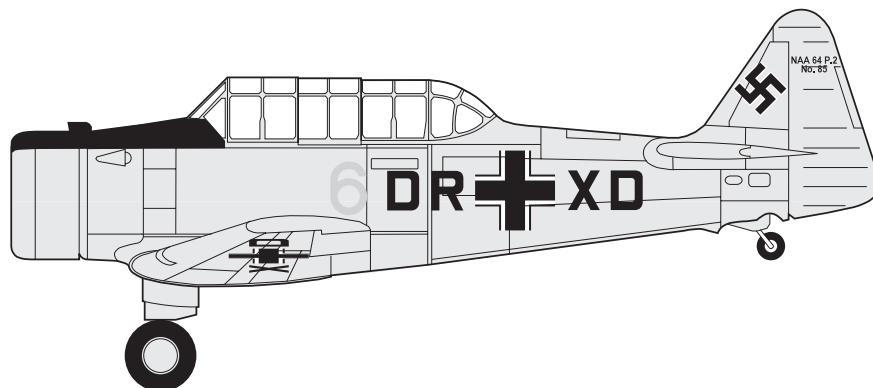
This scheme is admittedly a guess. NA-64s delivered to France were probably delivered in natural metal overall since references on French machines diverted to the RCAF do not make mention of any paint stripping. In 'Harvard!' p.43, a photo of an early RCAF Yale clearly shows evidence of an earlier round marking on the rear fuselage. Standard French practice was to have roundels above and below both wings. The rudder carried the French designation 'NAA 64 P2' (for perfectionnement or advanced training) and the a/c number.

The prototype NA-64 was given an experimental US civil registration (NX-13397, carried in 3" black letters on the fin) and was retained at North American until the end of the contract; it had very small roundels on the upper wings, and no fuselage roundels.



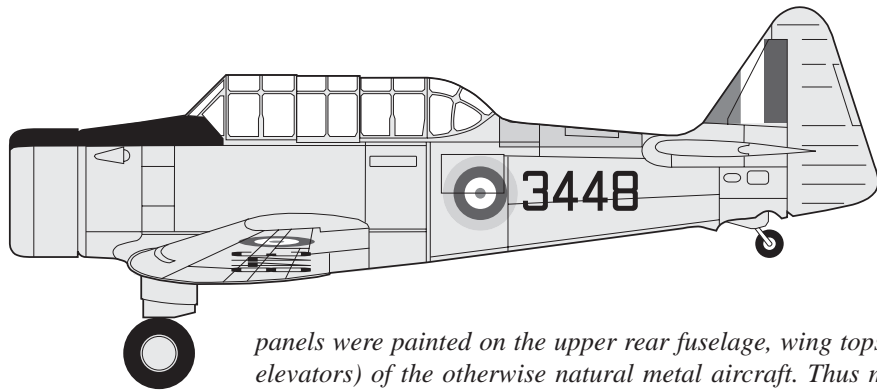
Photos of French NA-64s in service are very rare, likely because France was overrun so soon after delivery. There are a few photos of the NA-57 which can be distinguished by their early BT-9 style rudder, and these give some idea about the camouflage. However, at least one photo exists which shows the NA-64 in camouflaged finish with roundels on the fuselage and upper wings. No details are given for the other side or upper camouflage layout, because no information exists to confirm it. The colours (dark green, dark brown and dark blue-grey over light blue-grey) are a guess as well, although it would seem reasonable that they would be the same as used on other aircraft of the same time frame. For the layout of the colours, use something similar to a Dewoitine D.520.

Ref: RT Vol 17 No.2



A number of captured NA-64s were taken into Luftwaffe service. Yellow 6 (DR + XD) served with A/B 116 at Goepfingen, helping pilots familiarize themselves with US equipment. Overall natural metal, aluminum doped rudder and ailerons and black anti-glare panel. D+R under starboard wing, X+D under port; no above-wing markings except for the crosses.

Ref: RT Vol.17 No.2



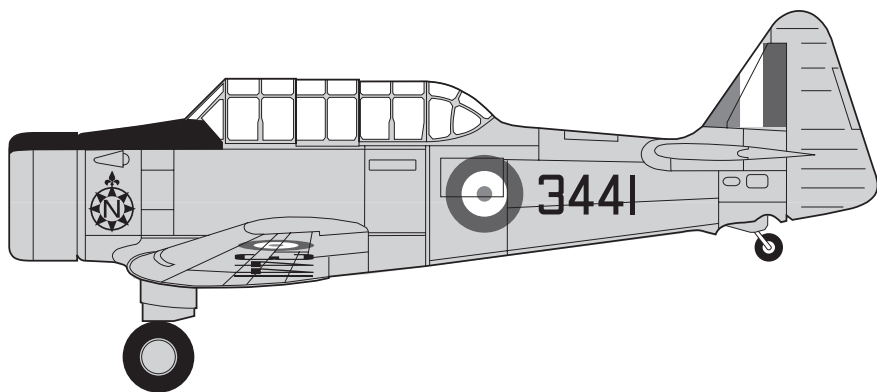
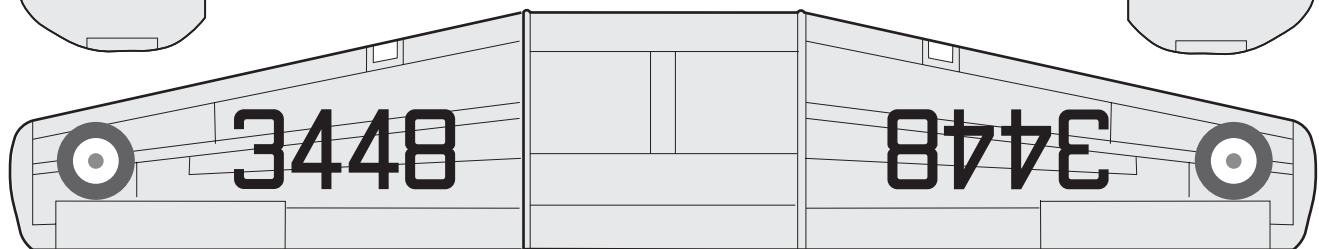
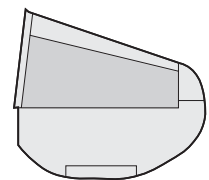
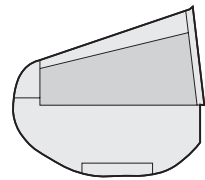
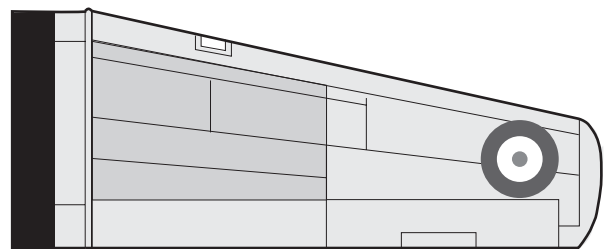
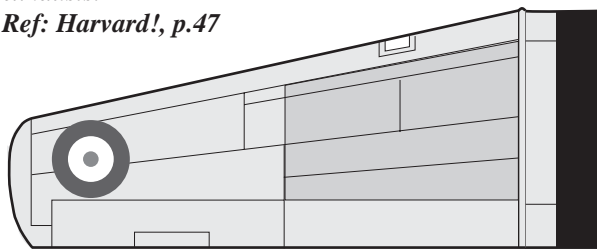
s/n. 3448, No.14 SFTS, Aylmer, Ont 1941 (not confirmed)

When the NA-64s were first taken over, changes were limited to some mods to the cockpit (the French throttle system is opposite to RCAF practice) and some minor cosmetic changes. The rudder was re-doped aluminum, fin flashes and RCAF roundels were painted on. Furthermore, yellow high visibility

*panels were painted on the upper rear fuselage, wing tops (see below) and horizontal stabs (but not elevators) of the otherwise natural metal aircraft. Thus marked, this aircraft is typical of the early scheme worn by Yale intermediate trainers. Typical underwing markings for RCAF aircraft had the *a/c* number in large letters as shown below. The number was also carried on the rear fuselage aft of the roundel.*

Yales, like Harvards, were modified to incorporate cockpit heating. An extended exhaust pipe through which a cockpit heater pipe ran allowed student pilots to survive the cold Canadian winters. Most, though not all early scheme Yales are seen with the short pipe sticking out of the cowl. By the time they were converted to wireless trainers, most Yales would have had extended exhausts.

Ref: Harvard!, p.47



s.n. 3441, No. 6 SFTS, Dunnville, Ont, 1942

This aircraft is actually an intermediate trainer, although it is painted in the late Yale scheme of overall trainer yellow (similar to FS 13538) typical of Yale wireless trainers. This scheme is identical to the earlier scheme except the fuselage roundel is the A type instead of the A1 type with yellow outer ring.

Aircraft at Dunnville had the compass North markings carried on the forward fuselage; many also had a compass rose carried on the wheel covers.

Wireless trainers are easy to distinguish because they had an antenna mast carried forward of the canopy ... they also replaced the rear instrument panel with equipment racks to carry the wireless equipment.

Ref: Harvard!, p.44