

The building of CF-104 “739”, as flown by David Leier



Kit: Italeri 2502 F-104 G/S Starfighter, 1:32 scale; a far superior kit to the considerably older 1:32 Hasegawa offering; model LOA: 22”

Seat: CMK Q32 145 Lockheed C-2 Ejection Seat, 1:32 scale

Windscreen/canopies masks: Montex Mini Masks F-104G/S SM 32150

Pitot: 1:32 scale Master AM-32-037 F-104 Starfighter Pitot Tube

Custom-made display case: Mark Whittaker, Montreal Aviation Museum

Shoes: from a 1:35 figurine; notepad: cut from thick brown cardboard



“739” in Europe somewhere; please note the “not red” elevator

“Success is going from failure to failure without any loss of enthusiasm.”

Winston Churchill

David Leier and the CF 104: a dream come true

My wife Linda and I arrived at CFB Cold Lake in June of 1968, from the STU (Sabre Transition Unit at CFB Chatham) and 55 hours of unforgettable flying the CL-13 Sabre (often incorrectly labelled as a CF-86 Sabre). It was now time to “strap on” the CF 104 and begin 6 months of intense training on this magnificent aircraft. My first transition flight was on the 24th of June 1968. Lining up the CF-104D (a two-seater trainer) on the runway, I was finally ready to see what this remarkable aircraft was all about.

Throttle up for a quick engine and systems check, then into full afterburner, then WOW. On take-off, I was plastered back into the seat with heavy g-force, then climbing out and levelling off at 33,000 feet. I was so far “behind” the aircraft I couldn't believe it. This aircraft was FAST! I continued along with many handling manoeuvres, then came back for circuits and landing practice.

To say the least, my first landing was memorable for all the wrong reasons: a mild case of rookie aeronautic hubris. I was going to show my instructor that I could “grease land” this aircraft, no problem. As I rounded out, I started, nay, attempted, to ease the throttle back, but due to extreme resistance, I was not able to reduce the throttle until we were on the runway! I apologized to the instructor for not being able to overcome the “throttle restriction” until we were firmly back on the runway. He then calmly explained over the intercom that the restriction I experienced was his arm locked firmly onto the throttle to prevent any rearward movement of the throttle. He explained that when you chop the power to the aircraft suddenly, its glidepath is then akin to that of a piano!!! LESSON LEARNED!

Three days later, I climbed into a single seater CF-104 for my first solo. Then, three flights later, I flew tail number 763 for my Mach 2 run. This aircraft was stripped right down, no tip tanks, no bomb racks etc., completely clean. The trip was short and sweet, that is takeoff in full afterburner to 33,000 feet, level off and accelerate to Mach 2, reduce power, and go back and land. I was warned not to use the speed brakes to slow down, just reduce the power. So, I did just that, and just reducing power felt we just hit a brick wall.

On to the meat of the whole program, low level navigation, visual bombing, and radar bombing for the next four months, culminating in a full mission trip called the TAC-EVAL (Tactical Evaluation). This final test was flown in a dual seater “under the bag” (no outside references), navigating strictly by radar. I managed to deliver my weapon six seconds late, landing 500ft at 7 o'clock, from the target. Mission accomplished.

January 1969: off to Germany

Baden-Soellingen, situated in the beautiful Black Forest, was to be our address for the next three years. We moved into the charming little town of Hügelsheim (affectionately called “HUGY”), located about two kilometres from the base. Possibly the friendliest people in all of Germany, they made us feel welcome.

We were immediately exposed to the local cuisine in one of our favorite gaststätte called The Schwann, which served the most delicious German cuisine we have ever tasted. As well, all the restaurant prices were so reasonable that we were “forced” to dine out sometimes 3 or 4 days a week (my better half loved that by the way). All in all, a wonderful welcome to Germany!

Flying for the next three or four months consisted of many low-level routes throughout Germany, France, and Belgium, all the while getting very familiar with the general terrain throughout our areas of responsibility. As well, we were introduced to many of the NATO bombing ranges at which we were authorized to practice weekly.

For two weeks each year, we were required to complete navigation and bombing qualifications. This was accomplished by flying down south to Decimomannu in Sardinia. The highlight of the qualifications was to drop a simulated 2000 lb cement “weapon” in order to experience the feel of an actual weapon release. It had a drogue chute on it to help separate it from the aircraft (like if cement was not insufficient enough!). To accomplish this drop, we were joined up on the run in with a chase aircraft. Its job was to make sure that the drogue chute deployed, and ensure that the weapon was falling away from the aircraft. The last thing we wanted, should the chute fail to deploy, was to find ourselves flying formation with a 2000lb block of cement!!! As it turned out, everything functioned perfectly and, as a bonus, I managed to win the “closest to the target” competition and its \$100 prize; every pilot contributed for the competition. My prize money did not last long however, as it was the custom for the winner to pay for the drinks and after-flight goodies.

Those shoes, you wonder

If you carefully examine the first photograph of “739”, at the top of page one of this document, you will notice a pair of shoes and a notepad underneath the aft canopy. Explanation: on the way back from Sardinia to Baden-Soellingen, we jammed our extra clothing and stuff into an empty electronics bay canister; however, as it turned out, I did not have any room left for my shoes and notepad so, as evidenced by that photograph, I had to improvise by stowing these items on top of the rear compartment covering of the e-bay!!! These are, to scale, carefully reproduced by the model builder and positioned in the model of “739”.



In May of 1970, I was selected to be part of the Canadian Team to compete in the 9th Annual NATO AFCENT (Allied Forces Central Europe) Tactical Weapons Meet, held at Spangdahlem AFB in Germany. The workup lasted from 4th May to 27th May, and included 60 hours of navigation and bombing practice to get well tuned up. The 4th ATAF, of which the Canadians were a part of, managed to win the competition. The launch schedule was 10 minutes between aircraft, in order to handle all the sorties for the day. If the aircraft aborted during start-up, that mission would be scrubbed. In order to protect each Canadian launch, we would start-up 2 fully loaded aircraft ready to go at the same time, one aircraft being the

primary and, if for any reason it had to abort, then the assigned pilot would quickly shut down and hurry over to the alternate, strap in and go. Photograph: "743" is the alternate:



A glove-less David Leier getting "743" ready for flight

As it turned out we did not have a single abort for the entire competition, which is a testament to the excellent skill and determination of our dedicated ground crews.

Canada's participation in the nuclear role came to an end in late 1970. From there, we were involved in a conventional weapon delivery role. This involved a completely different mission for the CF-104, involving new weapon delivery tactics. The low-level navigation portion did not change. The end of my CF-104 tour, and my final flight in this magnificent aircraft, came on March 14th, 1972. Flying the CF-104 was absolutely the highlight of my career as a member of the Canadian Armed Forces.

Finally, allow me to extend my heartfelt thanks to Gilles Pepin, from Montreal (Quebec), who put in countless hours to ensure that every detail of the build of this outstanding model was as prototypical as possible. Every change required, no matter how small, was relayed to me by phone, to ensure complete accuracy. Nothing was overlooked. The many accolades given to him from no less than Airfix, the famed UK kit manufacturer, attest to the skill and excellence he lavishes on every building project he completes. Visit the lengthy Airfix tribute:

<https://us.airfix.com/community/i-build-because/gilles>

My bucket list of entries into my man cave is finally complete. I'm a very happy man!!!



A very parched David Leier looking for a biergarten, *any* biergarten ...



**Twenty minutes later, David, and his equally thirsty wingman Laurence Sianchuk, are both still looking for that elusive biergarten ... Moments later:
victory**





Please note the 1:32 “REMOVE BEFORE FLIGHT” pitot tube sock is removable. The pitot tube on a real CF-104 did droop slightly, as shown on the photograph of the fully static restored of the Winnipeg CF-104 “12703”, on page 17. However, I did correct the excessive droop after the final photography

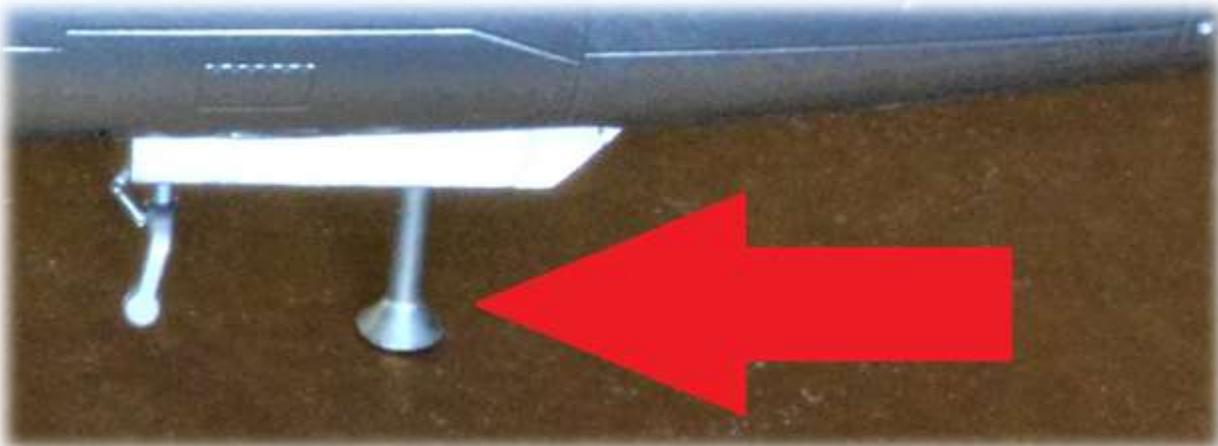




I added the engine trolley wheels from the unused (by me) tail dolly



Painted chrome, using Canadian Tire Spray Chrome, and sealed with Future Wax



Add a 2" wood screw to protect the fairly fragile nose gear strut



Tail paint scheme



Red arrow: Canadian Aircraft Grey 501-109 (+/- FS36480): 5 parts Tamiya XF-12 JN Grey, 3 parts Tamiya X-2 Gloss White, 1 part Tamiya XF-18 Medium Blue; I brewed this quite a while ago, so I might now have used a variation of this recipe

Purple arrow: Tamiya XF-53 Neutral Grey

Yellow arrows: Alclad II Lacquer Dark Aluminum ALC 103; this lacquer is more akin to stain than paint and, in my humble opinion, the correct consistency; may require two light coats to accomplish the task to your satisfaction

Elevator: as this aircraft operated in Europe, it is painted Tamiya X-2 Gloss White, as are the wings (both upper and lower surfaces, as per the wishes of its recipient)

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Below: The
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Decals



CF-104 STARFIGHTER RCAF+3 MARKINGS

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OVERALL POLISHED ALUMINUM (NATURAL METAL). TAIL PORTION ALTERNATES BETWEEN STEEL, DULL ALUMINUM, AND NATURAL ALUMINUM.

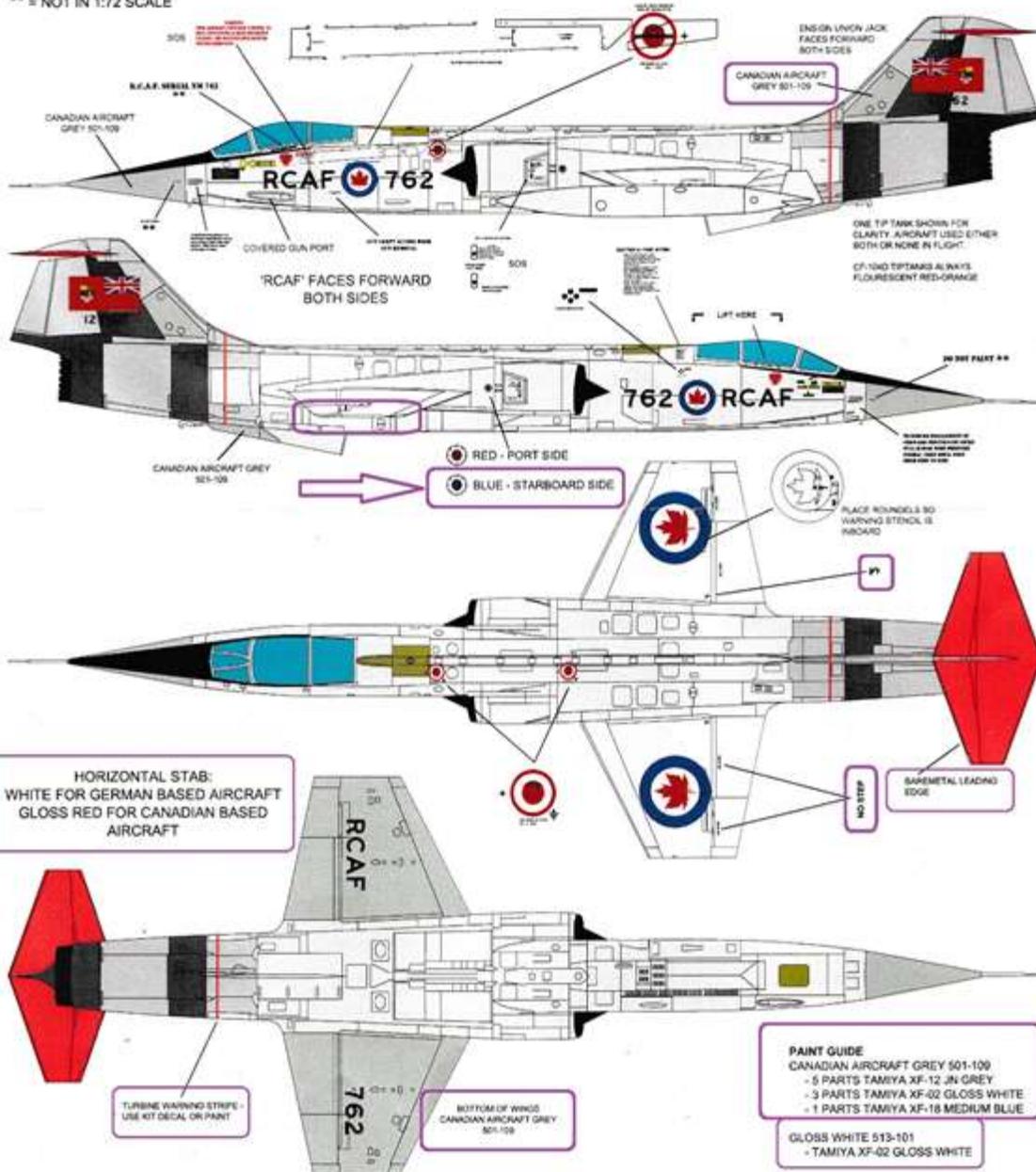
TOP OF WINGS ARE GLOSS WHITE (513-101)

BOTTOM OF WINGS, RADOME, TAIL PATCH, AND REAR PORTION OF UNDERSIDE FIN ARE CANADIAN AIRCRAFT GREY (501-109). ANTIGLARE IS SEMI-GLOSS BLACK.

GUN PORT SHOULD BE COVERED AND EXPENDED SHELL EJECTOR LEFT OFF.

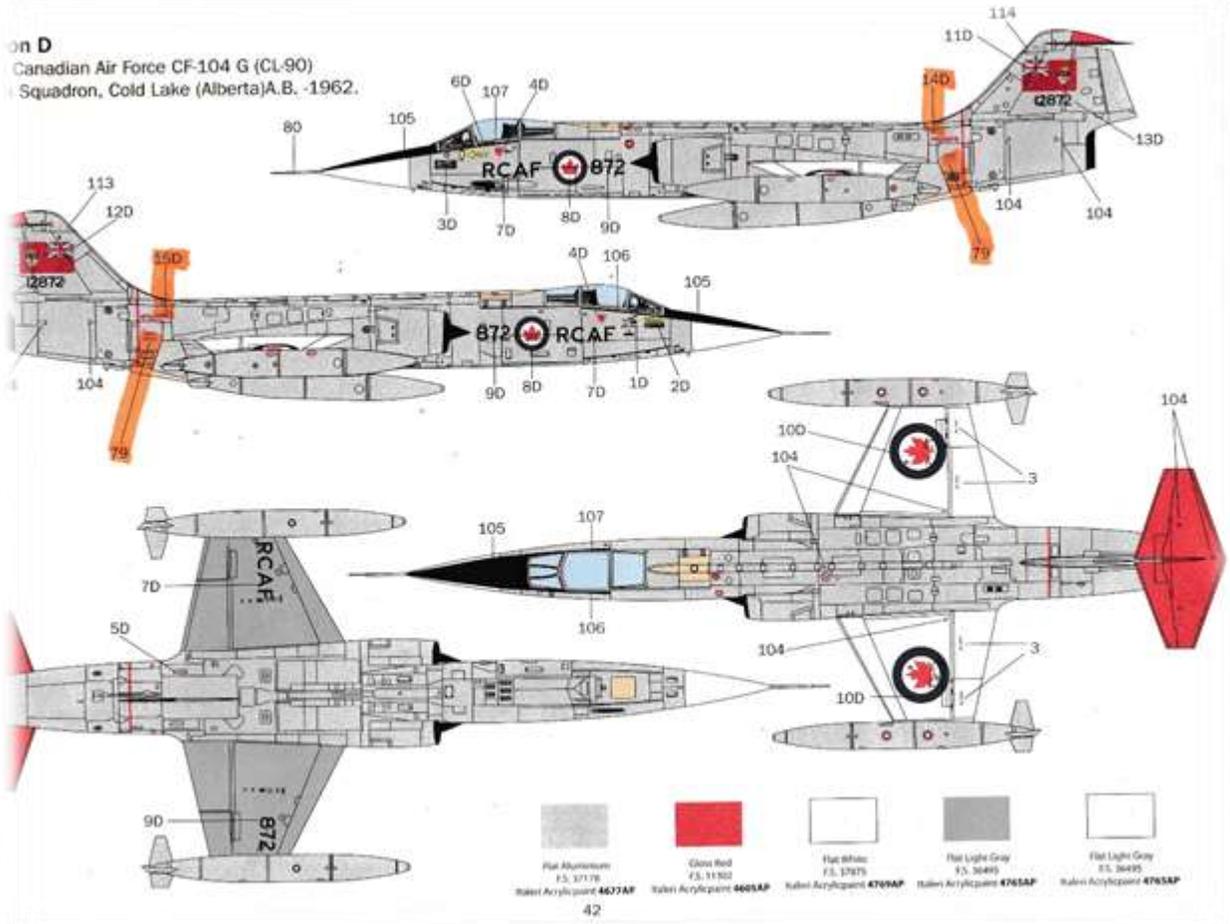
SOS = SAME OTHER SIDE

** = NOT IN 1:72 SCALE



on D

Canadian Air Force CF-104 G (CL-90)
Squadron, Cold Lake (Alberta)A.B. -1962.



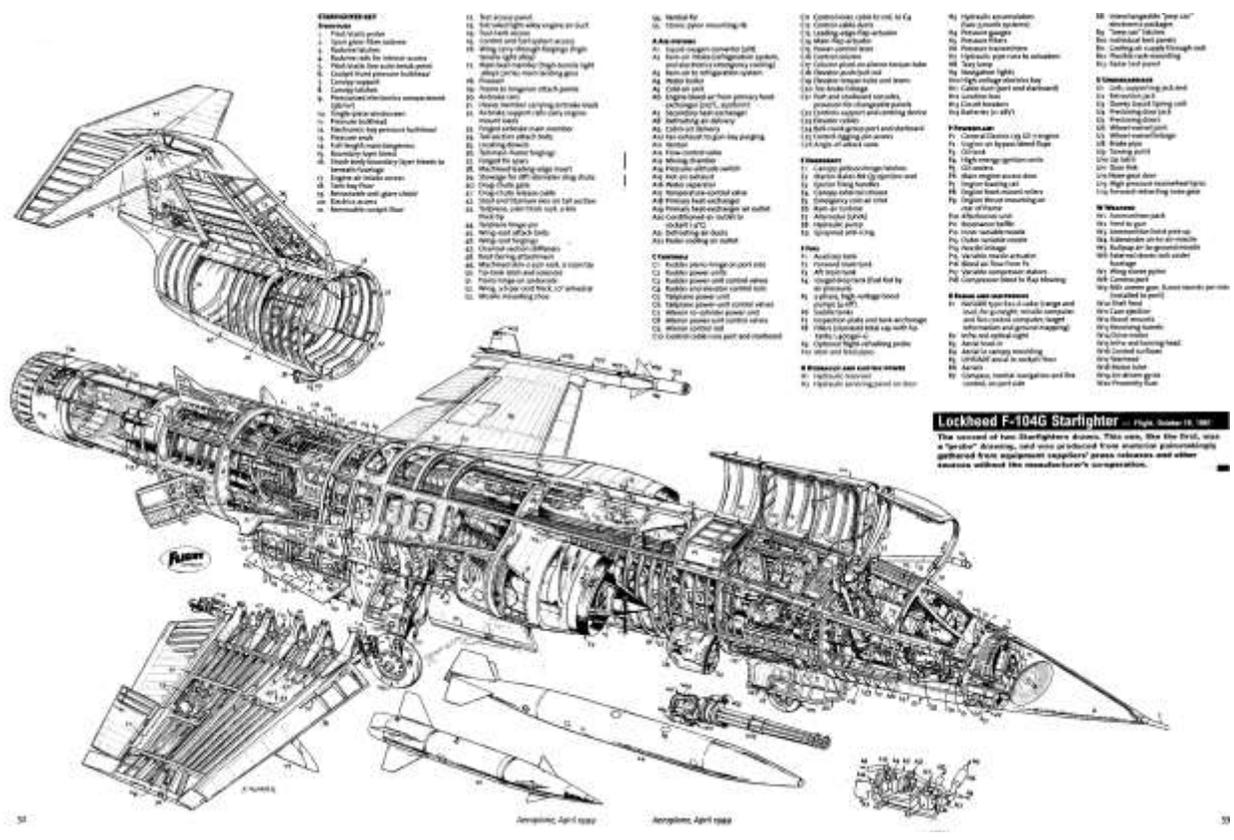
Kit-supplied data stencils are extensive to a fault; orange markings indicate the ones I had installed at the time I scanned these three drawings



Starboard wing tip tank details; please note both wingtip tanks are removable, as per the wishes of the recipient



Why white wings? Not a camouflage paint scheme for Canadian winters. Rather, anti-flash white; the purpose of the color was to reflect some of the thermal radiation from a nuclear explosion, protecting the aircraft and its pilot. Even though the Canuck Models decal placement sheet suggests to paint the underneath of the CF-104 wings Canadian Aircraft Grey, the same color as the underneath of the nose cone, the recipient wished to have the bottom of the wings painted anti-flash white, just like the top of the wings.

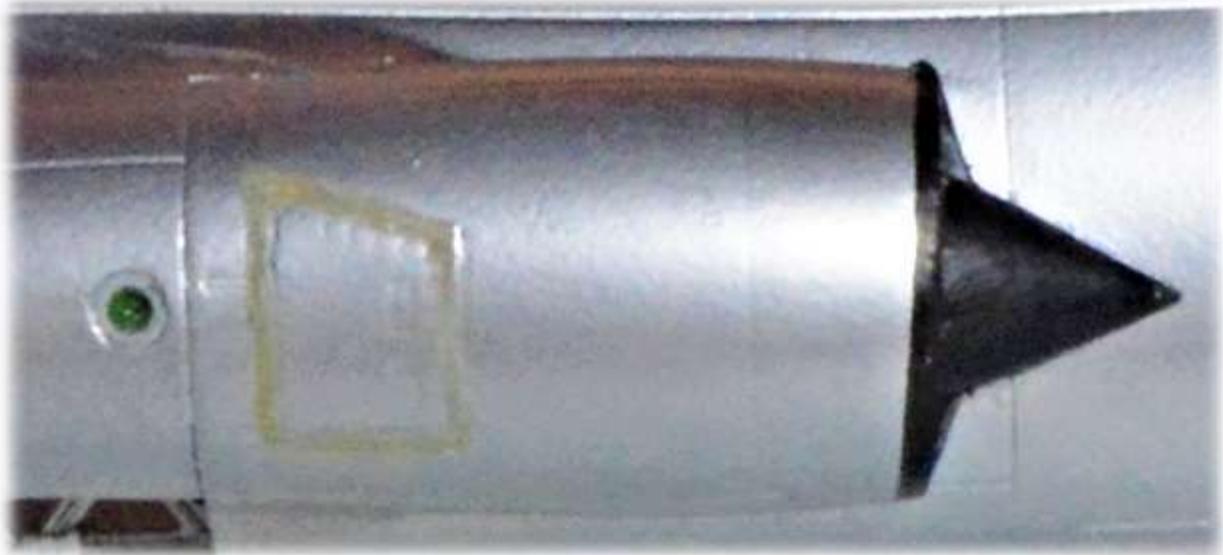


Link to diagram above:
<https://www.sas1946.com/main/index.php?topic=30100.48>
 Very easy to navigate once blown up



Sacrificial business card inserted in the gap between the shock cones and fuselage for painting the shock cones and the spraymat anti-icing (the "leading edge" of the intakes) flat black. The Hasegawa kit does not have the feature of that thin gap, thus painting of the shock cones a tricky proposition at best. Just one of the many advantages of this Italeri kit. Apply *many* coats of Future wax before even trying to use diluted Tamiya XF-1 Flat Black paint over the chrome paint. Remove the Tamiya flex tape as soon as flat black is dry.

Remove the Tamiya flex tape as soon as flat black is dry.



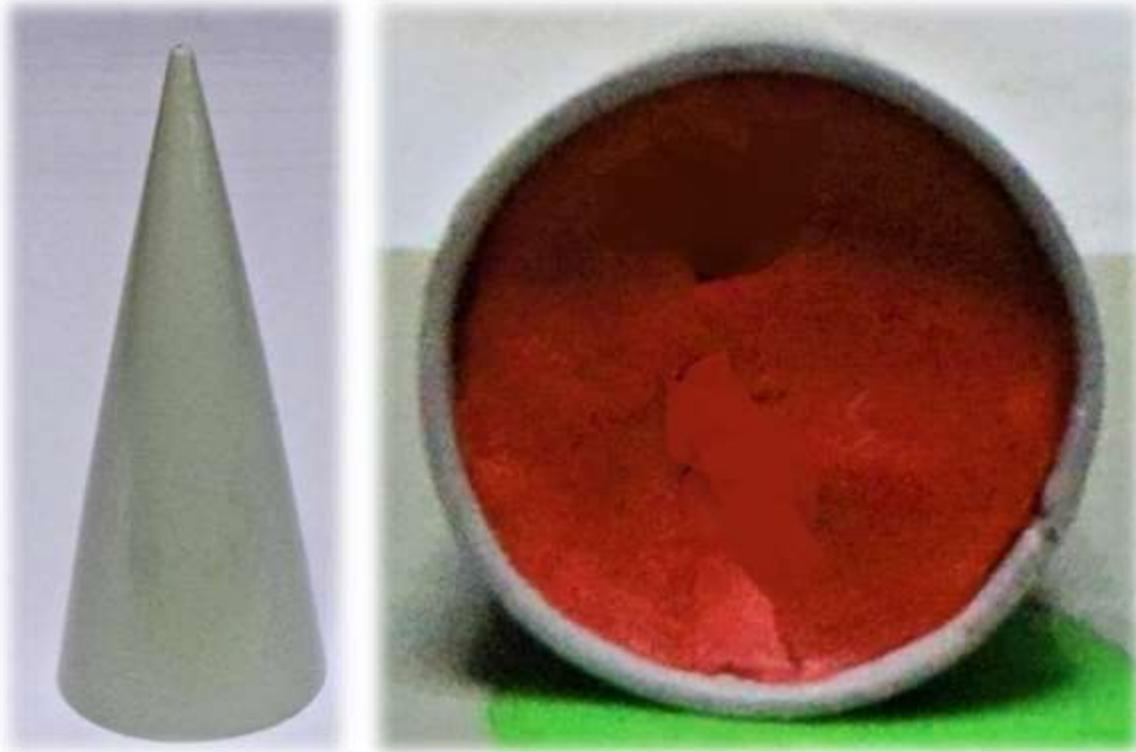
Engine air intake hatches freehand painted Canadian Aircraft Grey 501-109; anti-icing edges and shock cones painted flat black; lights, painted from the inside, unmasked



“739” history: May 1, 1962 to Cold Lake; February 11, 1962 to Canadair; March 31, 1964 to 1 Wing; September 29, 1965 to 4 Wing; May 6, 1974 to SAL (Scottish Aviation Limited) for wing work and cannon installation, returned to Baden; December 6, 1978 to NWI (Northwest Industries) for DLIR (Depot Level Inspection and Repair), returned to Baden; became the 1980 Tiger; January 16, 1986 transferred to Turkey, delivered on January 21, 1986 to 62-739/8-739 wfu (withdrawn from use) and displayed at Erhac Air Base, Malatya, Turkey

*Excerpt from: Canadian Starfighters: The CF-104 and CF-104D in Canadian Service 1961-1986
by Patrick Martin, 2015*

Nose cone



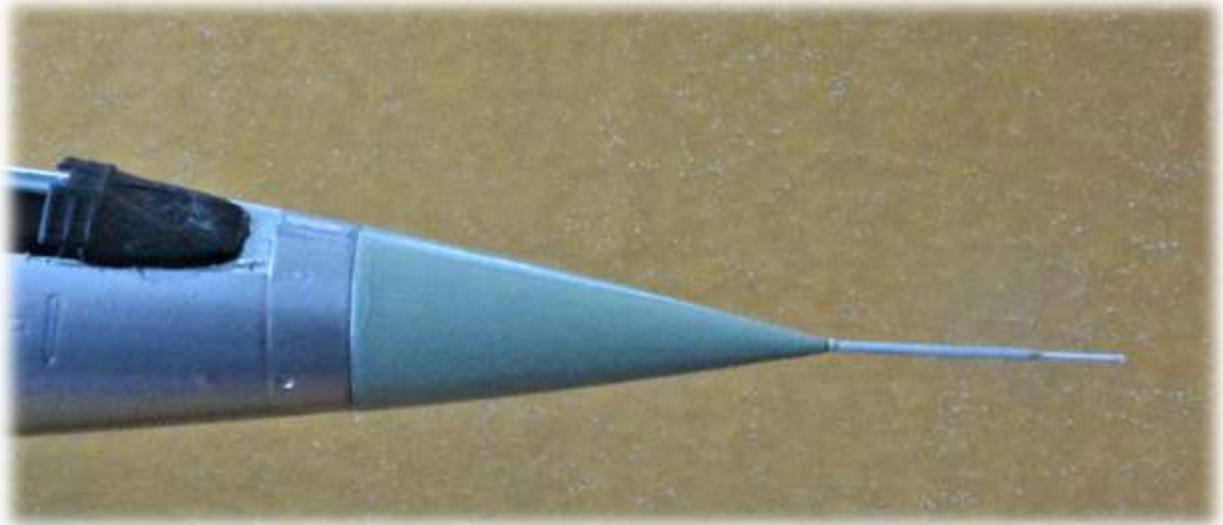
Painted Canadian Aircraft Grey. I use playdough as added weight



Pitot tube, restored CF-104 "12703", Canadian Starfighter Museum, Winnipeg, Manitoba



Master AM-32-037 F-104 Starfighter Pitot Tube, temporarily attached to a length of plastic tubing with thick-gel CA for ease of painting the red stripe over the white Tamiya primer



Nose cone attached, with temporary kit-supplied plastic pitot tube



2mm Tamiya flexible masking tape, painted gold so as to be able to precisely see where it is when applied to white-painted pitot tube



Before cleaning up the pitot tube paint job



Not quite done yet, but one gets the idea

Nose anti-glare, stabilizer



Note the stabilizer bare metal leading edges

Main landing gear doors



Ready to work underneath the model. Note the front landing gear tire is now attached



Windscreen and canopies



Camera pod on F-104Gs



CF-104: no camera pod

The camera pod was removed using a **RED-HOT** X-Acto blade, then sanded down



Completely masked insides of windscreen/canopies

As a rule, I do not trust masks of any kind for wheels, canopies, The Montex Masks SM 32150 contain two sets of windscreen/canopy masks, one each for the inside and outside of said transparent parts. The inside masks would be difficult to install, and I do not see the need to use the Montex masks, as I far more trust full masking with Tamiya 1/2" white flexible tape. I will free-hand paint the main canopy insides if required.

Step 38J: the canopy frame is a challenge. The closing handle (part 11c) is tricky to install (apply cement and let it cure +/-4 minutes before attaching the handle), and I gave up on the PE mirrors (parts 9PE); in their stead, I made my own out of 15/64" polystyrene card stock, primed and painted these tiny bits, and attached these in the proper place at the correct angle. Arrows on the photographs below:



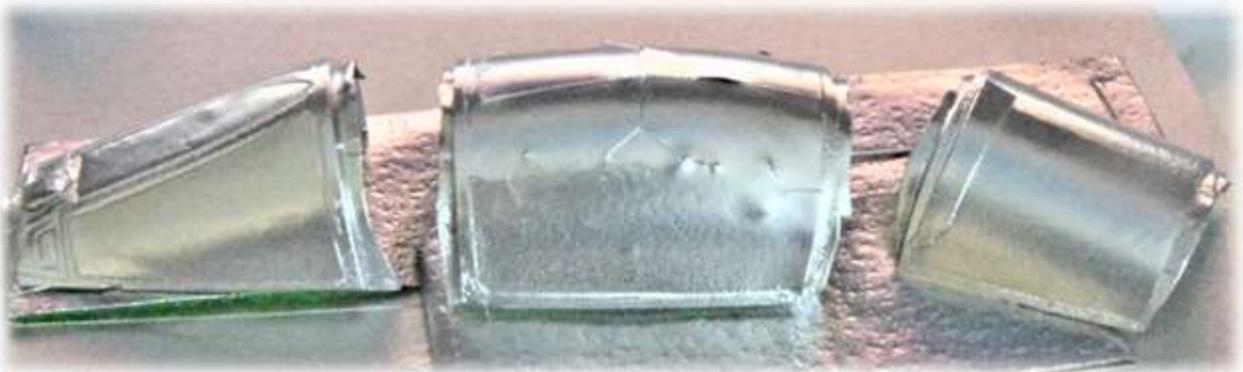
Now, on to the exterior Montex masks: even though, as a rule, I do not trust clear parts masks, in the case of this model, I had no choice, as I wished to use the exact same automotive chrome spray paint with which I painted the model. First, secure the parts on a piece of cardboard as seen here; makes attaching the masks far easier. Once the masks were all in place, I Future-waxed (with a few Q-tips)

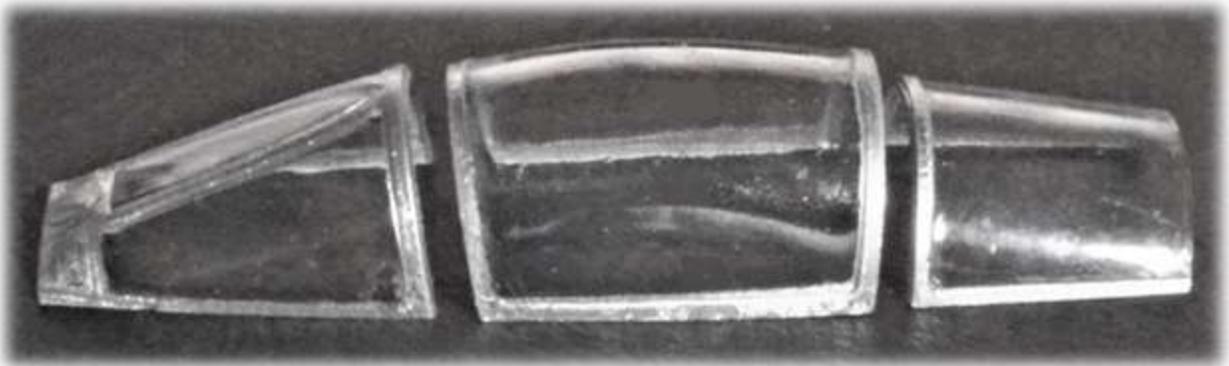


the edges of the masks to make sure there would be no bleeding of the spray paint. The adhesive on the masks is excellent, and leaves almost no residue on the parts; whatever residue

remains can be removed with a Q-tip dipped in Future wax. I still abhor masks 😊.

Caution: the main canopy masks have small slits on three of the sides, presumably to accommodate the upward bulge of the canopy; carefully lift the pair of masks, making sure you insert an X-Acto blade underneath one edge of each slit to lift the masks from the backing paper, or it will tear. Seal the slits with Future wax.





To attach the “handled and mirrored” canopy frame, use any liquid polystyrene cement that is applicable with the provided bottle cap brush. First, test fit, then SPARINGLY apply the cement on the long horizontal part of the frame, allow to set completely, and repeat for the front end and the other side:



Note the “LIFT HERE” decal



Handle painted black; my own mirrors

STARFIGHTER IN CANADIAN SERVICE: CF-104

A modified ex-USAF F-104A was supplied to Canadair as an initial pattern aircraft for CF-104 production. The type was originally designated the "CF-111" and had the company designation of "CL-90". Deliveries of the CF-104 began in 1961, with the first rolled out on 18 March 1961 and performing its first flight from Palmdale, California, ten days later. A total of 200 CF-104s was built for the RCAF, and except for an operational conversion unit at Cold Lake, Alberta, they were all used in Europe as part of Canada's NATO commitment.

The CF-104 was almost identical to the F-104G. It was powered by the J79-OEL-7 turbojet, a J79-GE-7A built under license by Orenda of Canada. CF-104s were originally tasked with the nuclear strike role; the Vulcan cannon and gunsight were not fitted. These aircraft were converted to the tactical strike role in the early 1970s, to be refitted with the Vulcan cannon and gunsight. External ordnance for tactical strike included dumb bombs, CRV 70 unguided rocket pods, and the British Hunting Engineering BL755 cluster bomb.

Since CF-104Ds were intended as strike aircraft, they used the R24A version of the NASARR radar that deleted air-to-air capability. Some CF-104s were wired to carry a Vinten conformal reconnaissance pack under the belly, but they were not given a different designation. The variation in Starfighter reconnaissance configurations is a confusing subject.



The RCAF obtained 38 "CF-104D" two-seaters that were similar to the TF-104G. These were all Lockheed-built machines and were originally designated "CF-111D", though some sources claim they were known as "CF-113s". The last 16 of the CF-104Ds featured a slightly upgraded standard of equipment and were given

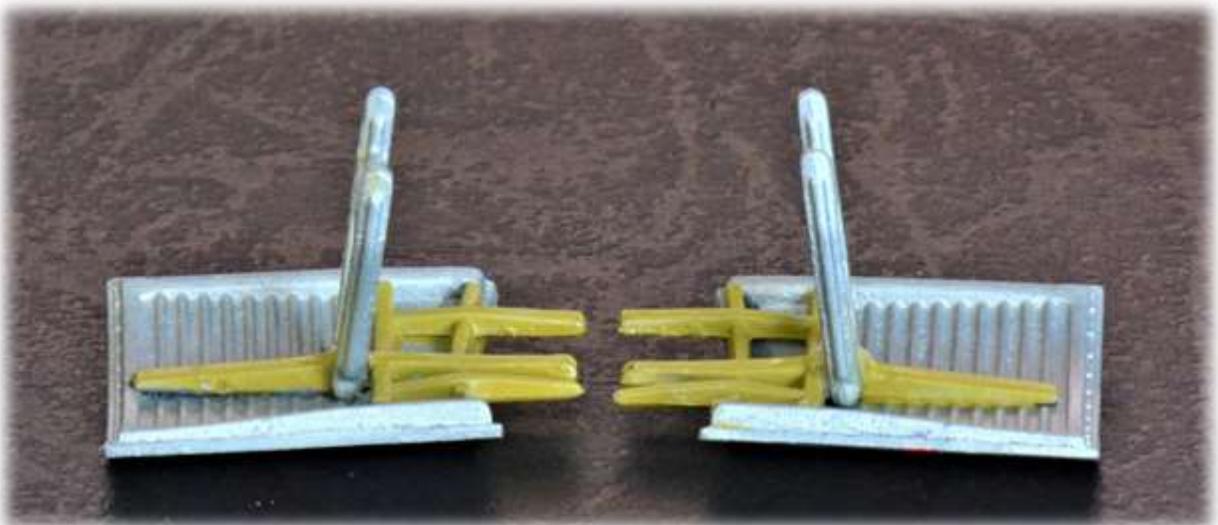
the designation of "CF-104 Mark 2". The Canadians also considered obtaining the "CL-41R", a version of the Canadair CL-41 Tutor jet trainer with NASARR radar and a Starfighter-style needle nose, to help train Starfighter aircrew, but though a prototype was flown, the RCAF decided not to buy it. After completion of RCAF production, the US Defense Department awarded a contract with Canadair to build 140 F-104Gs for supply to US allies under MAP.

Canadian Starfighters originally flew in natural metal colors. They were later repainted with a light gray bottom and a disruptive pattern of dark green and olive drab on top, and were finally painted overall dark green. Late in their service lives, Canadian CF-104s were fitted with an RWR system, with antennas located under the nose and under the jet pipe.

The RCAF phased out their Starfighters in the mid-1980s, with the type being replaced by the McDonnell Douglas F/A-18 Hornet. Despite the bad press of the F-104 in Luftwaffe service, it was the Canadians who had the worst attrition rate, with 110 destroyed in crashes, about 46% of the total -- though the RCAF also put substantially more hours on their Starfighters than did the Germans. After their retirement from RCAF service, many CF-104s and CF-104Ds were passed on to other air arms (Turkish Air Force, for example).



Speed brakes, if deployed



The kit actuators can pivot to the desired angle. After test-fitting, I cemented, using capillary CA, these actuators in place

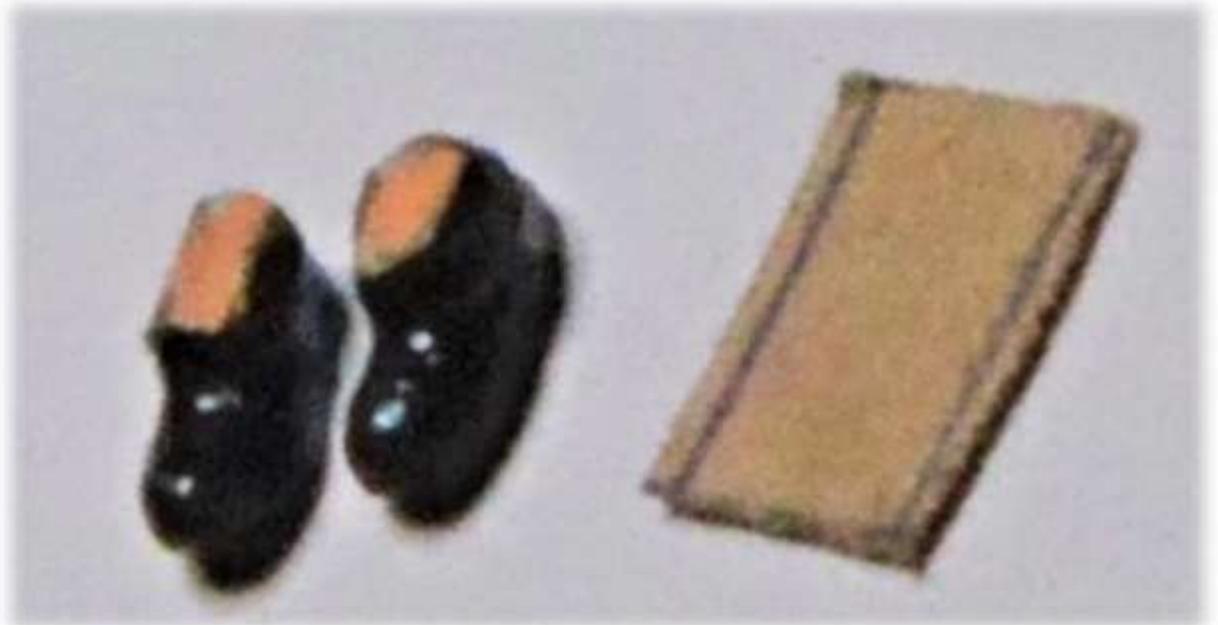


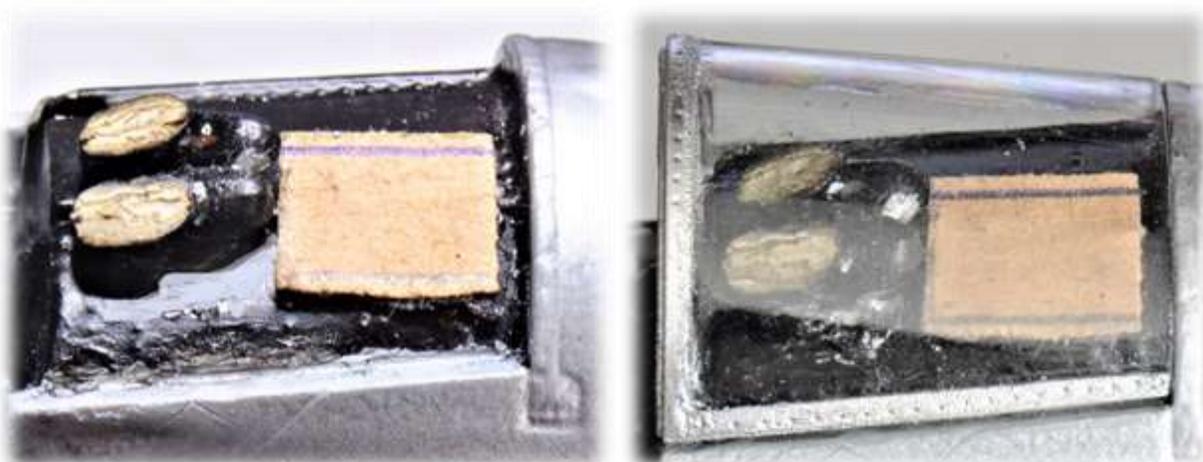
Now, test-fitting the speed brake assembly on the fuselage, with the cemented actuator; looks just right

And now, for a little bit of fun



Above and below: photograph taken while flying from Sardinia to Baden-Soellingen (Germany) by Captain Art Cameron, 33 000 feet, Mach .91





Size of the shoes and notepad: 10½, in 1:32 scale; David Leier's real shoes and notepad did not fit in the emptied electronic bay canisters for the journey from Sardinia to Baden-Soellingen!



I did install the speed brakes deployed, just for fun; I then attached these retracted on the actual completed model



Custom display cases

These exquisite custom display cases are made by a true artist, Mark Whittaker. Their bases are covered with glued 100-grade 9" x 9" grey sandpaper; the expansion joints are first scribed with a wood awl, then darkened with a regular graphite pencil, constantly sharpened; the excess graphite is "blown" away with a hairdryer



Display case "tarmac"



Now, the aircraft is in its "hangar"

Shipping the models



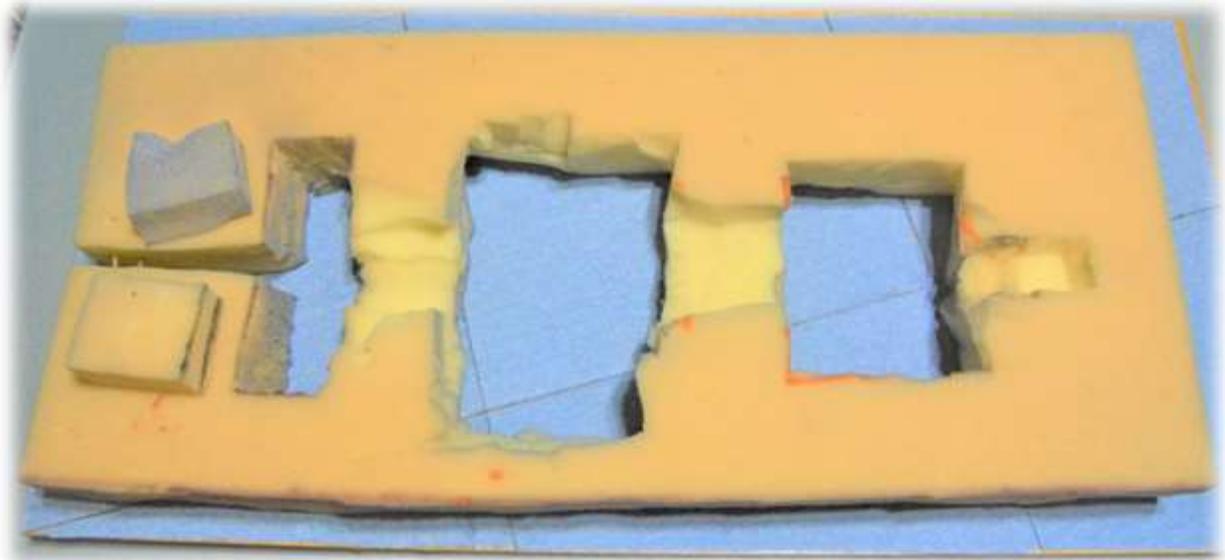
Custom shipping crate by Mark Whittaker; this crate will hold both the 1:32 CF-104 "739" and the 1:32 CL-13 (aka Sabre, seen further on) "280" models in their respective display cases; destination: Surrey, BC; a distance of 4,500 kms as the crow flies. Hence, a serious shipping crate is required; external dimensions: 32" x 20" x 20"



Crate carried in my home by Mark Whittaker and my better half Helen

Packaging the CF-104 ready for shipment

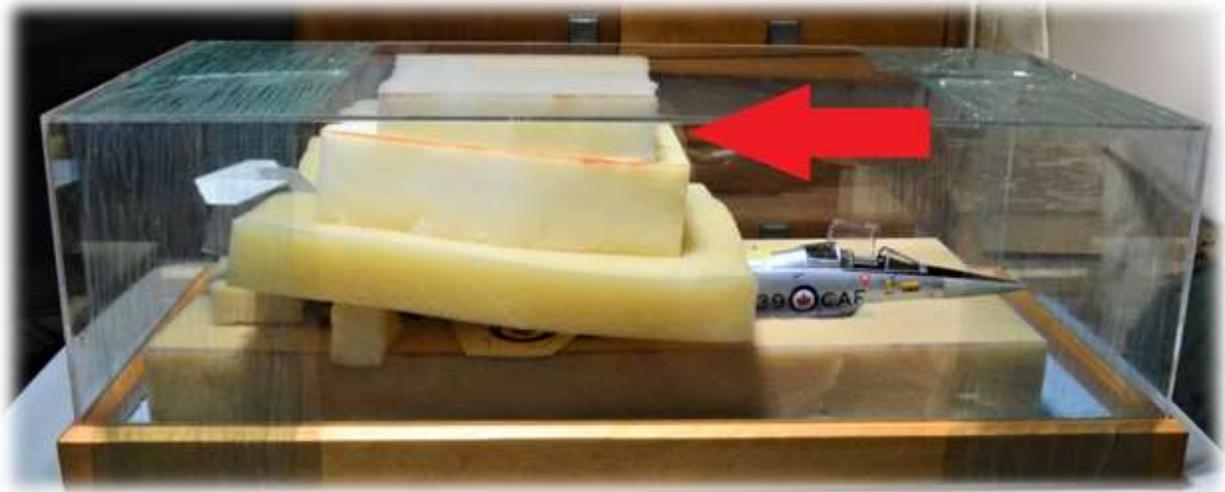
Please note I am using a Nikon 18-55mm lens at 18mm, so there is a slight "fisheye" distortion effect in the following photographs of this section



2" thick memory foam working jig atop display case base



Model atop working jig; jig provides ample clearance for all three landing gear wheels not to touch, even under compression, the display case base; the canopy is carefully cemented, and the model will be shipped with the canopy in the opened position, as there will be zero pressure on it



Level flying at altitude 10'

The carefully measured thickness of the memory foam compression pads (arrowed in red) which keeps the model securely in place once the display case cover is closed, and the cover held in place with industrial plastic film. Ascertaining that there is precisely the correct amount of compression pressure is crucial (as in not too much) if shipping in cold weather months, lest the acrylic cracks in below freezing temperatures



Upside down flying at altitude 11'

CL-13 packed in its “hangar”





Display case base screwed from the underneath of the shipping crate and to the bottom of said shipping crate



**5/32" white foam board, cut to size;
CL-13 display case placed on top**



Two pieces of 2" thick memory foam on top of CL-13 display case, 18" long x 10" wide, placed to act as a compression pad



Off to the shipping firm!



On its way!



"Fragile: no prolonged exposure to Donald Trump please"

The four models I built for David Leier



**CL-13 Sabre Mark 5 "280", 1:32", on my website;
visit <https://www.heritagemodelaircraft.com/italeri-cl-13-280-1-32>**



CT-114 Tutor "093", 1:48, on my website; visit <https://www.heritagemodelaircraft.com/hobbycraft-ct-114-tutor-068-1-48>



CT-133 Thunderbird "423", 1:48, on my website; visit <https://www.heritagemodelaircraft.com/great-wall-hobbies-ct-133-423-1-48>



**Shipped to Surrey, BC, in April 2021:
1:48 CT-114 Tutor "093" and 1:48 CT-133 Thunderbird "423"**



Gallery









Try to find the unpainted and very visible finishing nail on the model; hint to its location: top portion of the fuselage, forward of the engine intakes. If you do find it, email me at gfpepin@sympatico.ca and let me know what you think of this “improvisation”



David and his "765"; a few weeks later, "765" involved in a serious bird strike; no injuries; David not involved in the incident, but "765" is now cooling its jets at the bottom of the Muskeg, north of Cold Lake AFB, due to an unscheduled meeting with a large bird



CF-104 "12704", on permanent display at the Montreal Aviation Museum

My business card (below) features my first 1:32 build of a CF-104, namely "12704", using the much older Hasegawa kit; it has its own foibles, the most obvious being the non-prototypical engine intakes shock cones. Use the newer and superior Italeri kit, despite its excessively deep and wide panel lines.

Heritage Model Aircraft



Website: <https://www.heritagemodelaircraft.com/>

Gilles Pepin, MBA

gfpepin@sympatico.ca