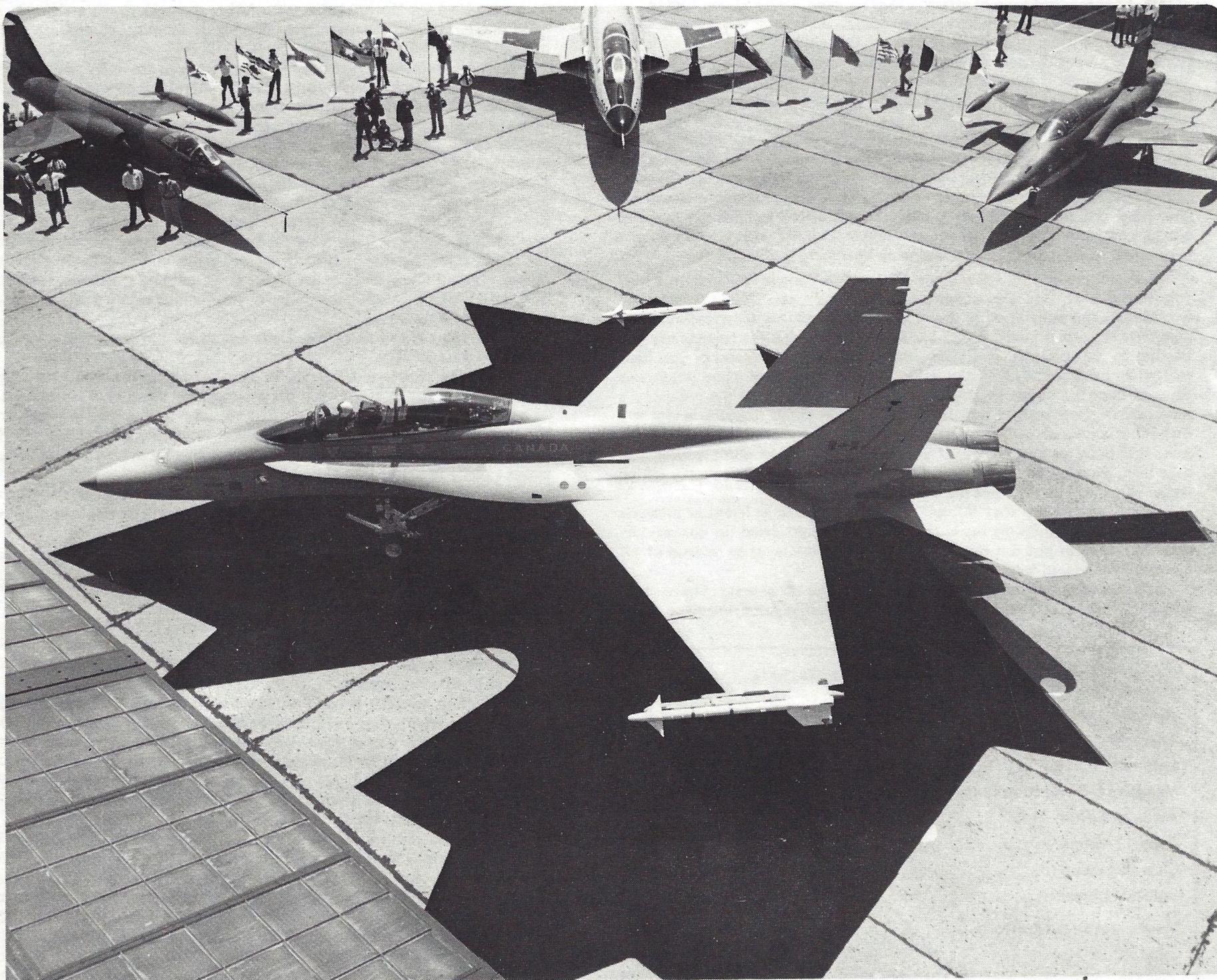


Volume 16 Number 1

# RT

 International  
Plastic  
Modellers  
Society  
of  
Canada



## CF-18 HORNET

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## COVER COMMENT

The new Canadian fighter, the CF-188 sits on a maple leaf red carpet on rollout day, July 82. In the background are the CF-104, the CF-101 and the CF-5 that the CF-188 will be replacing on active duty. Photo courtesy McDonnell-Douglas.

# CF-18 Hornet



CF-188 s/n 188901 on rollout day, 28 July 1982, St. Louis, Mo. Photo by Steve Sauve.

In terms of aircraft technology, the Canadian Armed Forces left the 1950's and entered the 1980's on July 28, 1982, the date its first F-18 Hornet was rolled out of McDonnell-Douglas' St. Louis facility.

In 1975, the Canadian government announced that it was seeking proposals to replace its current fleet of fighter aircraft. Consisting of CF-104 Starfighters, CF-101 Voodoos, and CF-5 Freedom Fighters, designs which all first flew in the 1950's, Canada's fighter element had fallen behind the state of the art, especially when compared to its N.A.T.O. allies. With the signing of the "Sale of the Century" contracts for the F-16, Belgium, Denmark, the Netherlands, and Norway had signalled that it was time for a change. Clearly, it was Canada's turn.

Immediately upon the announcement by the Canadian government that the search was on for a replacement fighter, it was made clear that the acceptability of the aircraft would not be the only (some might say not even the most important) element in any future deal. As in Europe, the concept of economic offsets was to be a featured point of the decision-making process. This was to be an especially important consideration, especially in terms of Canada's fledgling high technology industries. Regardless, the hunt was on, and the world's aircraft manufacturers were quick to take note.

Perhaps one of the most interesting aspects of a replacement aircraft competition, from an aerophile's point of view, is the number of rumours, suggestions, and "what if" scenarios which tended to circulate in its early stages. Right off the bat, exotic names and designs for consideration by Canada began to circulate, such as the F-15 Eagle, the F-14 Tomcat, the Panavia Tornado, the SAAB JA-37 Viggen, the Mirage G8, the F-16 Fighting Falcon, and the then Northrop YF-17, which later became the McDonnell-Douglas F-18 Hornet. By press watching, the keen aircraft observer could see the various designs drop from the sky. It also became clear that what the government might be willing to purchase might not be what the military wanted most. The key question became this: what could Canada afford in sufficient numbers to meet its NATO and NORAD commitments and would provide the best economic offset package? The names on the shopping list began to dwindle.

As time, literally years, went by, it became clear that only North American (read American) proposals were to be given serious consideration. The idea of either F-14 Tomcats or F-15 Eagles was grounded due to unit cost considerations, although the F-15 was a contender up until February of 1979. Confusing matters in 1979 was a change in governments, both at home and in Iran. After the fall of the Shah the new Conservative

government of Canada looked into acquiring Iranian F-14 Tomcats to meet at least part of Canada's fighter needs. The idea, however, like the Conservative government, was short-lived, and in 1980 the returning Liberal government was quick to announce that the competition had been narrowed to two designs — the F-16 Fighting Falcon, and the F-18 Hornet.

With the announcing of the short list, the competition got down to brass tacks. Canadian personnel continued evaluation testing in the U.S., and aircraft were sent to Ottawa for politicians to have their pictures taken with. Pro and con arguments flew everywhere — the F-16's single engine configuration made it unsafe for flights in Canada's north; the F-18 was an unproven design still in its testing phase; the F-16 would be compatible with those already purchased for use in Europe; the F-18 was a more rugged aircraft because it had originally been designed for use on aircraft carriers. In terms of the economic offset situation, all roads did not lead to Rome, but instead to Ottawa, as two industrial giants took turns showing off their proposals. Finally, after five years of speculation and false starts, the final decision was made. On April 10, 1982, it was announced that Canada's new fighter was to be the McDonnell-Douglas CF-18 Hornet.

What exactly is a CF-18 Hornet? Roughly speaking, Canada's version of the Hornet is identical to that already ordered for the United States Navy and Marines, with the changes being replacement of the carrier-peculiar landing system with one more suited to solid ground landings, and the addition of a cold weather survival kit and a 60,000 candlepower spotlight on the port side of the aircraft for air-to-air identification at night. When examined as a complete unit, however, it can be seen that the CF-18 represents a definite step forward for the Canadian Armed Forces.

Designed to act as the replacement for U.S. Navy/Marines F-4 Phantoms and A-7 Corsair the Hornet is capable of acting in both an attack and fighter role, something important to Canada. Fully armed, the Hornet can carry up to 6 AIM-9 heat seeking Sidewinders, 2 fuselage-mounted radar-guided AIM-7 Sparrows, and 570 rounds for its M61 20mm nose-mounted cannon. Alternate pay loads can consist of guided bombs, cluster weapons, or air-to-surface missiles. Whatever the load, the Hornet's combat range is listed as 400 nautical miles, with a speed of Mach 1.8 and 50,000 feet plys ceiling. The ferry range is 2,000 nautical miles, aided by external tanks.

As a design, the Hornet seems to stress the term "less is more". The General Electric F-404 smokeless turbofans are smaller than the J-79's currently used by U.S. Phantoms, and consist of 7,700 fewer parts. The technology of the eighties shows itself in the widespread use of plug-in

television screen read-outs in the cockpit, and in a variety of other places. One interesting feature is the built-in test panel located in the nose wheel-well, which is designed to give the servicing technician a quick picture of what is wrong with the aircraft. In flight, a similar service is offered for the pilot on his T.V. monitor. The Hornet has been designed for serviceability and survivability, allowing complete engine changes in twenty minutes and complete replacement of other parts. Another important feature of the Hornet for Canada is that it is designed for growth — minor modifications can provide an additional twenty cubic feet, while the removal of the M61 cannon frees up an additional twenty-seven cubic feet. On paper, and now in the air, the Hornet is an impressive fighting weapon, a fact recognized by Spain's recent order for 84 aircraft and Australia's contract for 75 F-18's.

Canada now has the Hornet. The first of its order 138 CF-188's (as it is now designated) was accepted in October of 1982, with deliveries to continue at the rate of two per month until September of 1988. The first Hornet, a two-seater, was sent to CFB Cold Lake, for use as a trainer by 410 Squadron. Planned Squadron conversion calls for 409 to be converted by June, 1984, 425 Squadron by November, 1984, 439 Squadron by June, 1985, 421 Squadron by December, 1985, 441 Squadron by June, 1986, and 434 Squadron by June, 1987. Baden-Sollingen based aircraft are to be in German skies by mid 1985. By 1986, it is planned to have phased out the last CF-101's and CF-104's, thus ending a long career for these types. CF-5's will continue to soldier on for some years as trainers based at Cold Lake.

What does Canada have with the Hornet? Militarily, it has a potentially efficient and deadly weapon. Economically, it has a resulting offset package ranging from work on the navigation system for the cruise missile to tourism incentives. The decision to buy the Hornet has been criticized by some for reasons such as its non-compatibility with the European F-16's, and because of the teething problems experienced in its testing phase. In any event, the decision has been made, and Canada at last will have an up to date fighter aircraft with which it can meet its defence commitments.

One final note. The Toronto Star of March 26, 1983 carried a short article on the reunion of those who worked on the ill-fated CF-105 Arrow. In it, Jan Zurakowski, the pilot who first flew the Arrow on March 25, 1958, commented on its phenomenal ability to pull 2 G's at 50,000 feet while at Mach 1.5. Zurakowski stated that "I don't think that the Hornet can do that today . . . we had an aircraft which would have lasted 30 years." What if . . . ?



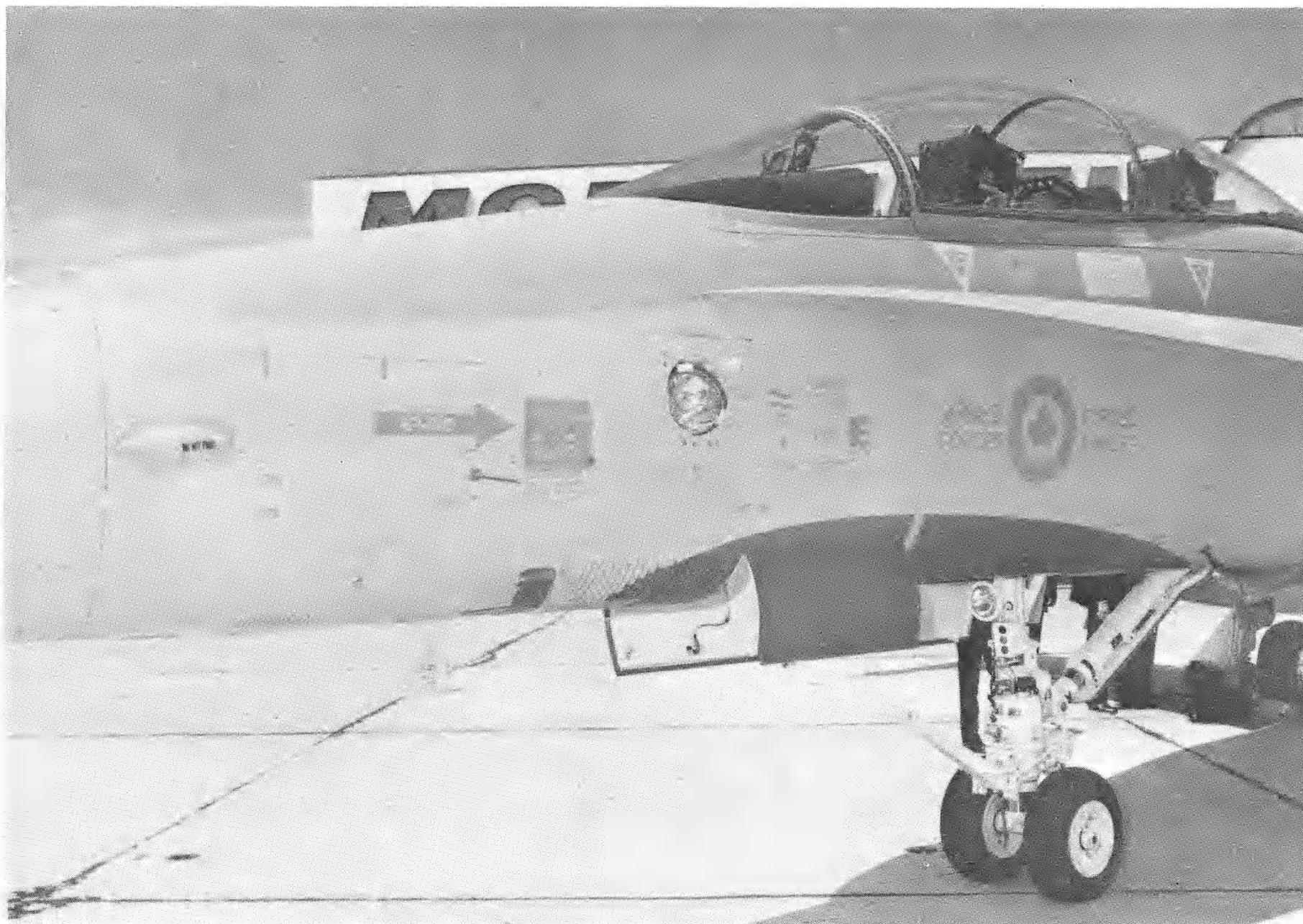
The first two Canadian Hornets, 188901 and 188902, stopped for quick refuel at CFB Winnipeg during their trip to Cold Lake for acceptance by 410 Squadron, who will be training pilots in the use of this aircraft. Above and below, Hornet 188902 complete with ferry tanks, in October 1982.



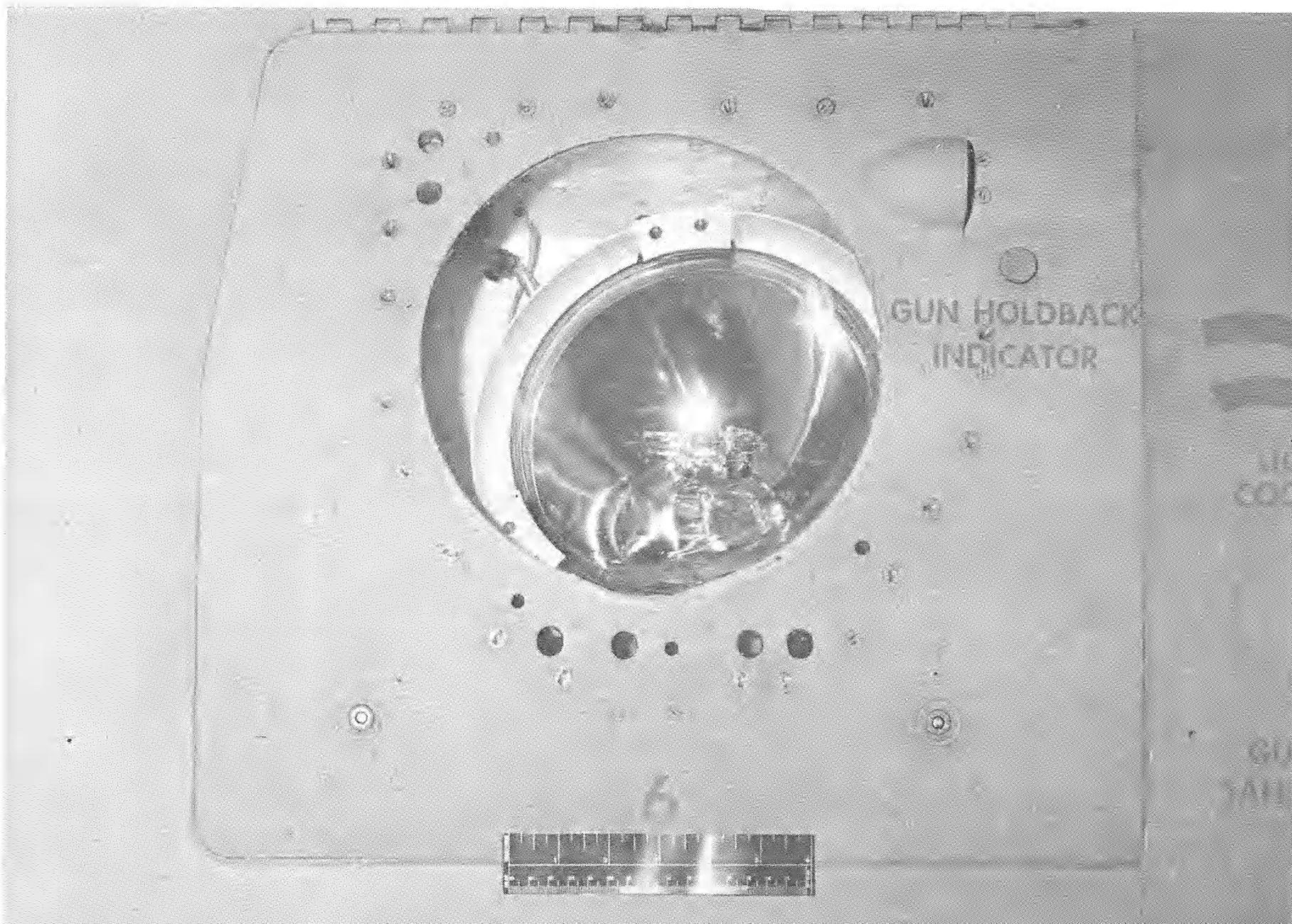


Above, another view of 188902. Note the assymetrical nose gear door openings. Below, a side view of 902's nose showing the positioning of the various markings on the aircraft. Note the night identification light, peculiar to the CF-188, mounted in the gun bay ammunition door just below the Leading Edge Extension (LEX). In this photo, you can also see the false canopy, painted in Grey FS 36118 on the lower fuselage. Note that the false canopy is common to all aircraft, representing a single seater canopy. The servicing chart on the nose gear door is black on yellow.





Above, port side nose details of a CF-188, showing the major external difference between a Canadian and an American Hornet, the Night Identification Light. This will be fitted to all CF-18's, regardless of role. Below a closer look at the light. Photo by Ed Dixon.

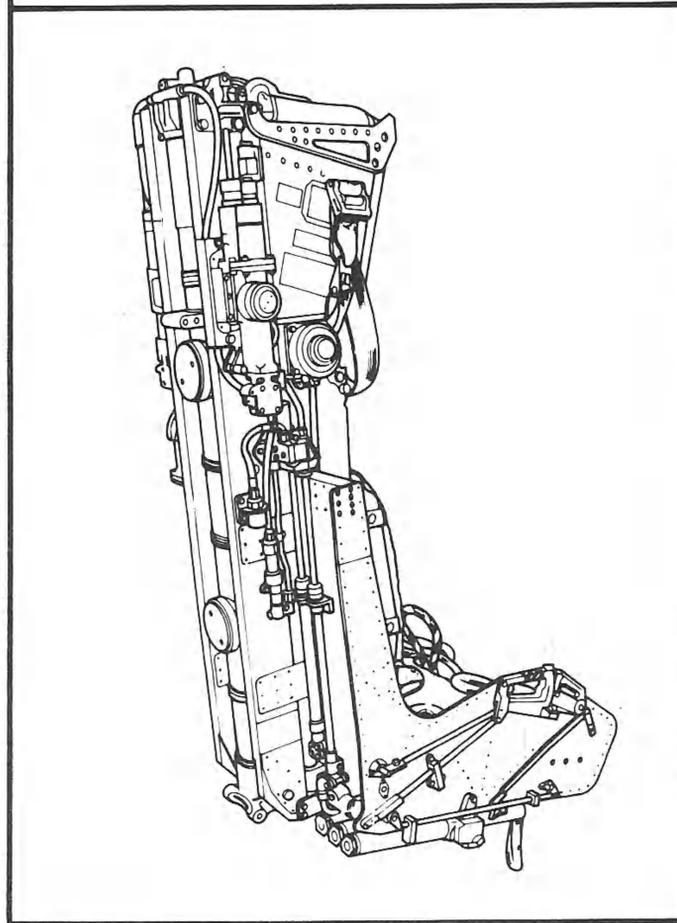
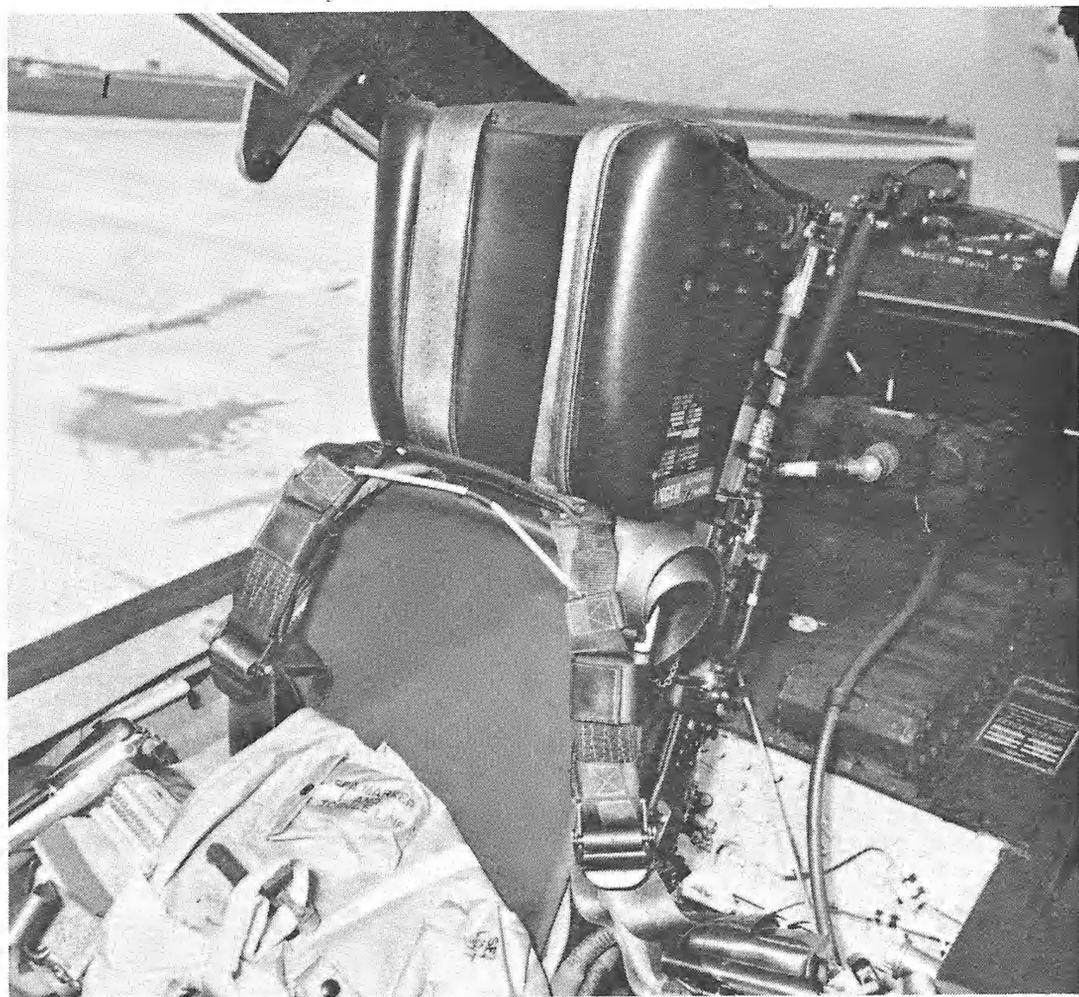
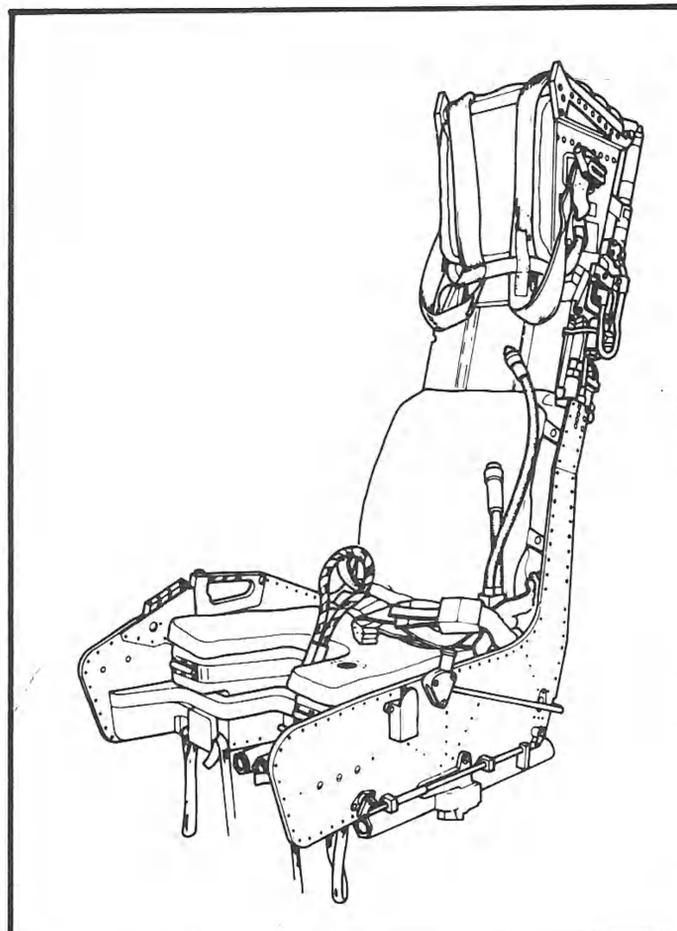




Above, one of the single seat 410 Sqn machines.

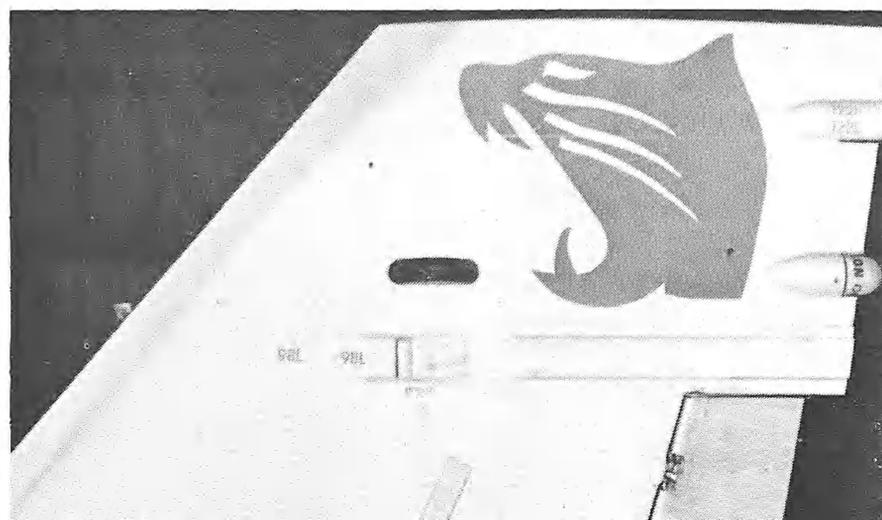
Below, one of the AETE aircraft at Cold Lake. Note camera mounts on Sparrow rack. Inset, a detail shot of the red and black AETE 'X'.  
Photos by Mike Jeffries via Steve Sauve.





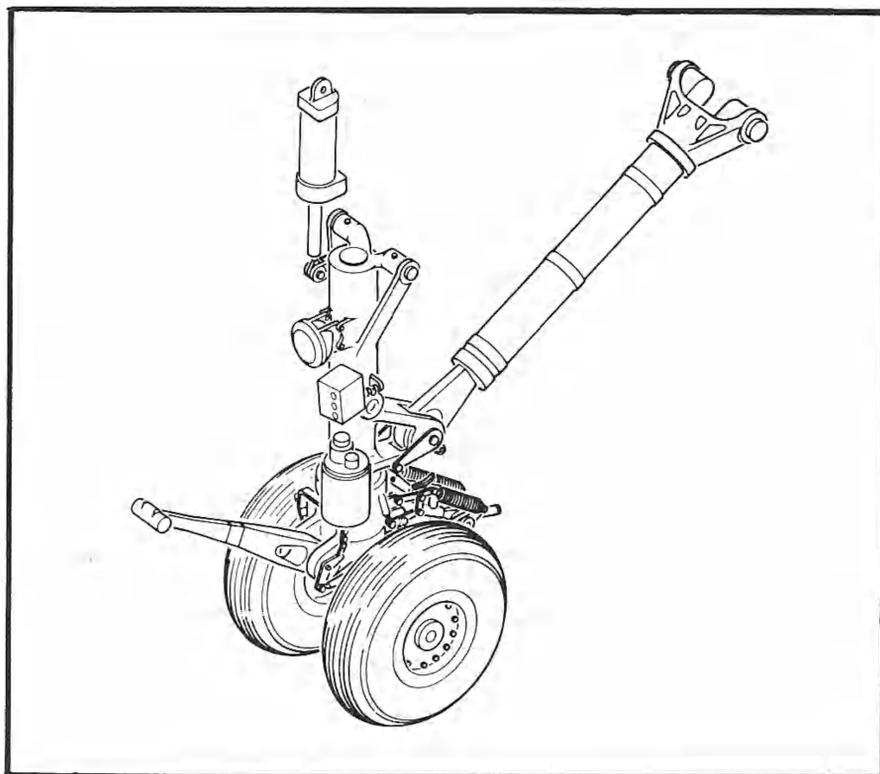
Above left, a view of the front cockpit of a CF-18. Cockpit is grey with black panels. Left, a shot of the headrest and harness detail on the rear seat. Note black headrest, which is different from most kits. The seat structure is black, with light olive brown harness and dark green backrest.

Below left, a shot of the tail serial number showing that modellers aren't the only ones to put markings on crooked. Right, is a close-up of the Cougar, when it was originally applied in dark grey paint.



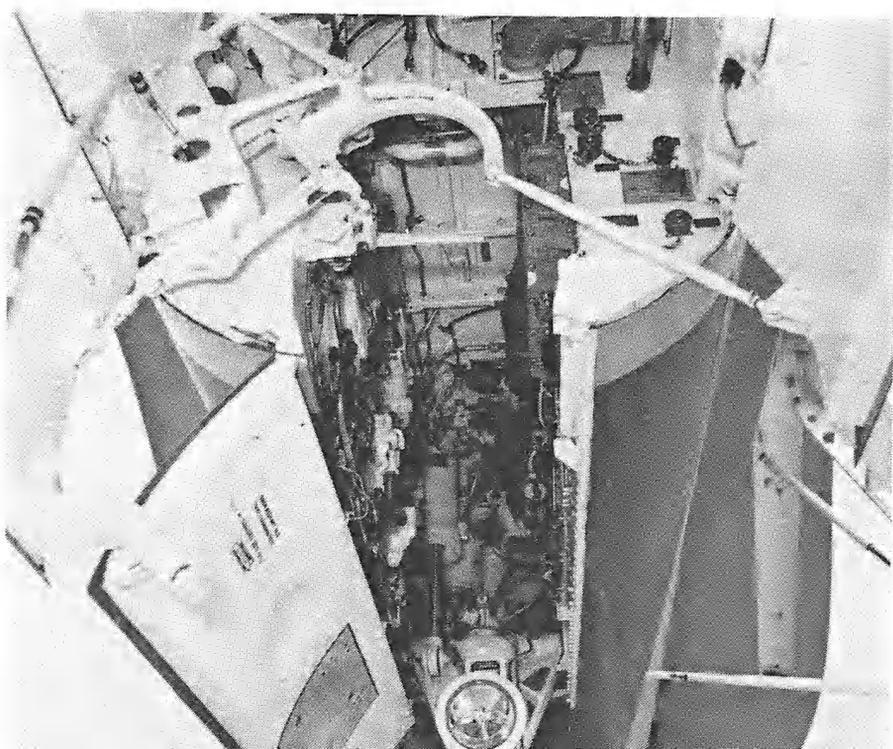
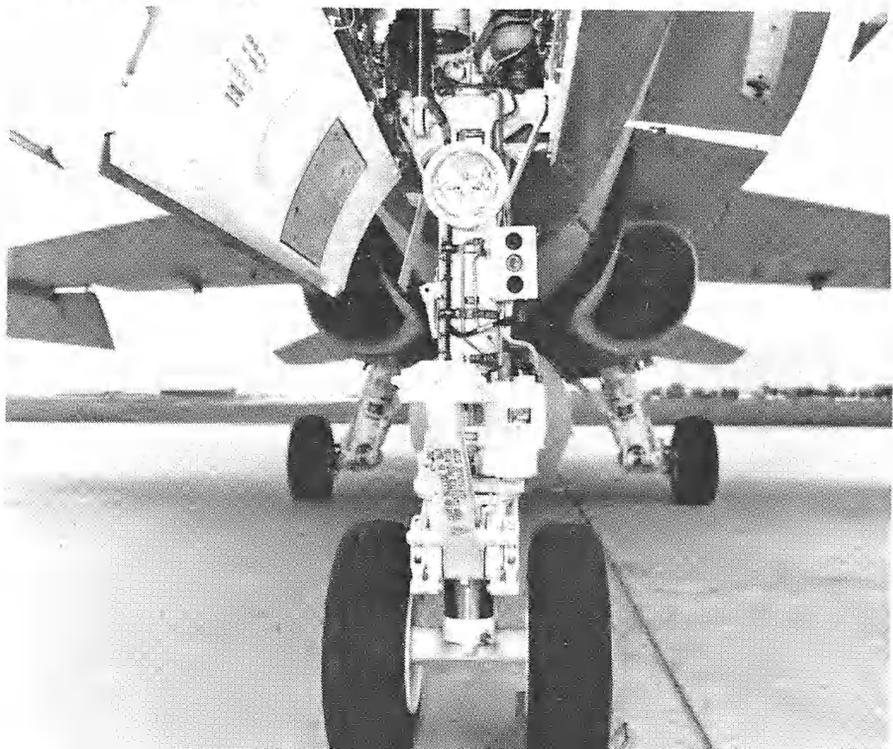


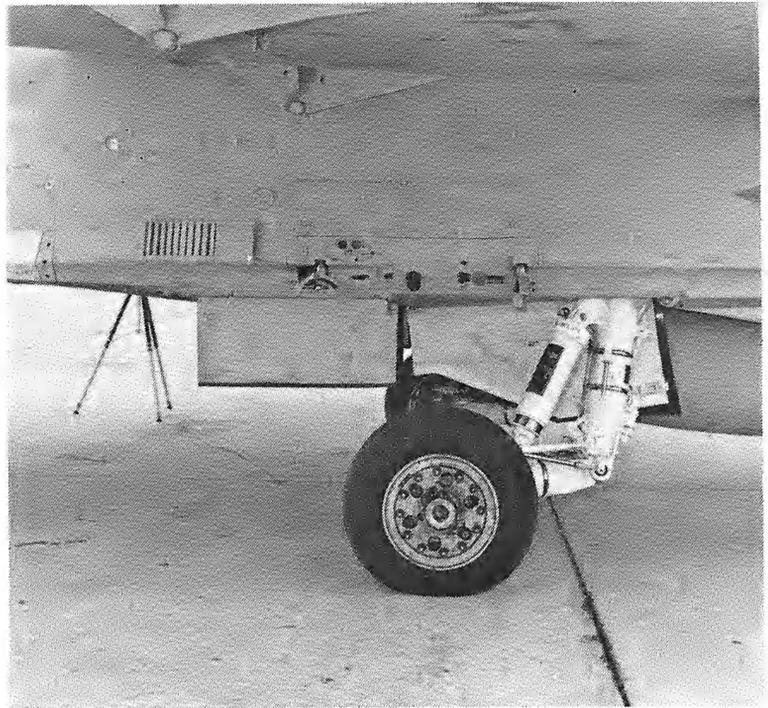
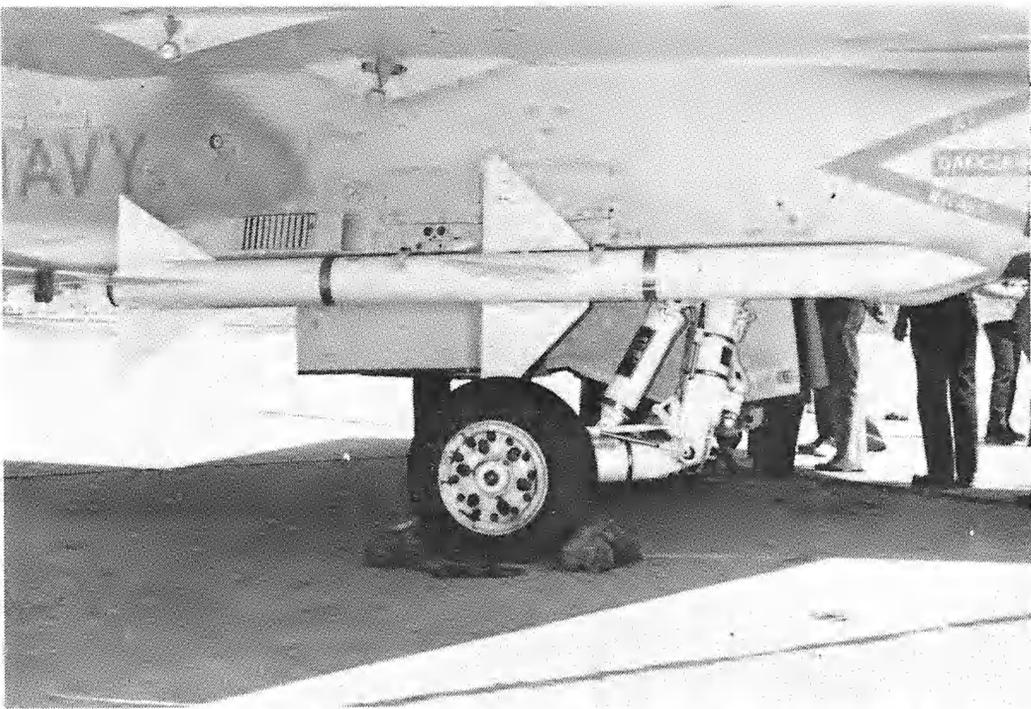
The built-in boarding ladder. All white, including recess in LEX, except for outside of left side which forms cover. Note the latches shown in the photo on the right.



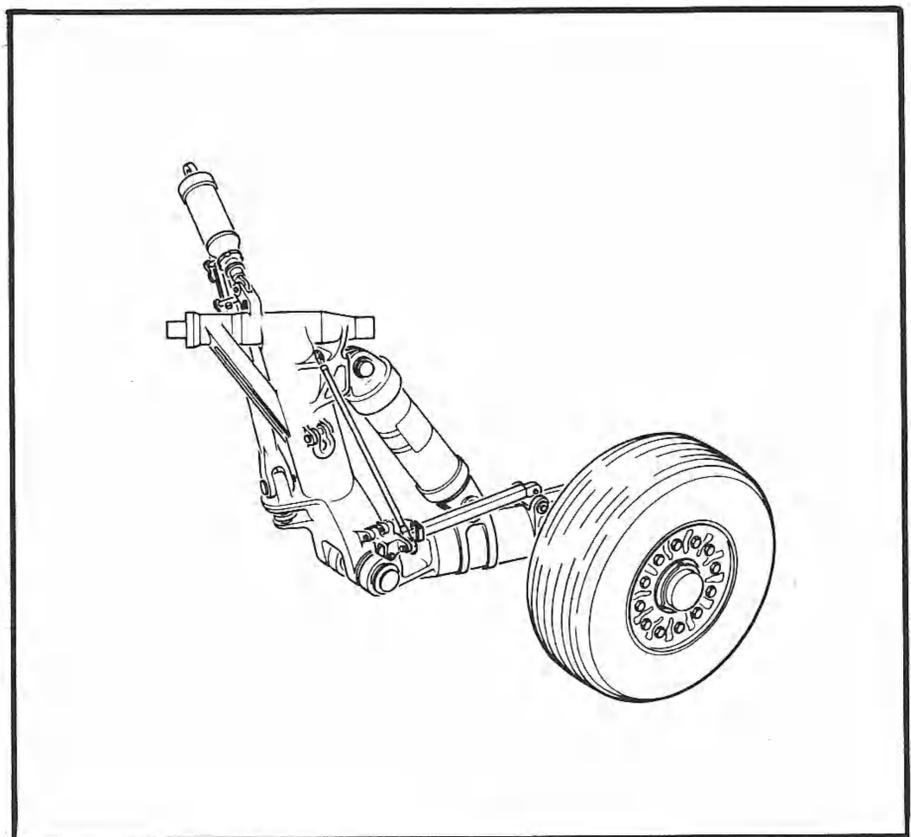
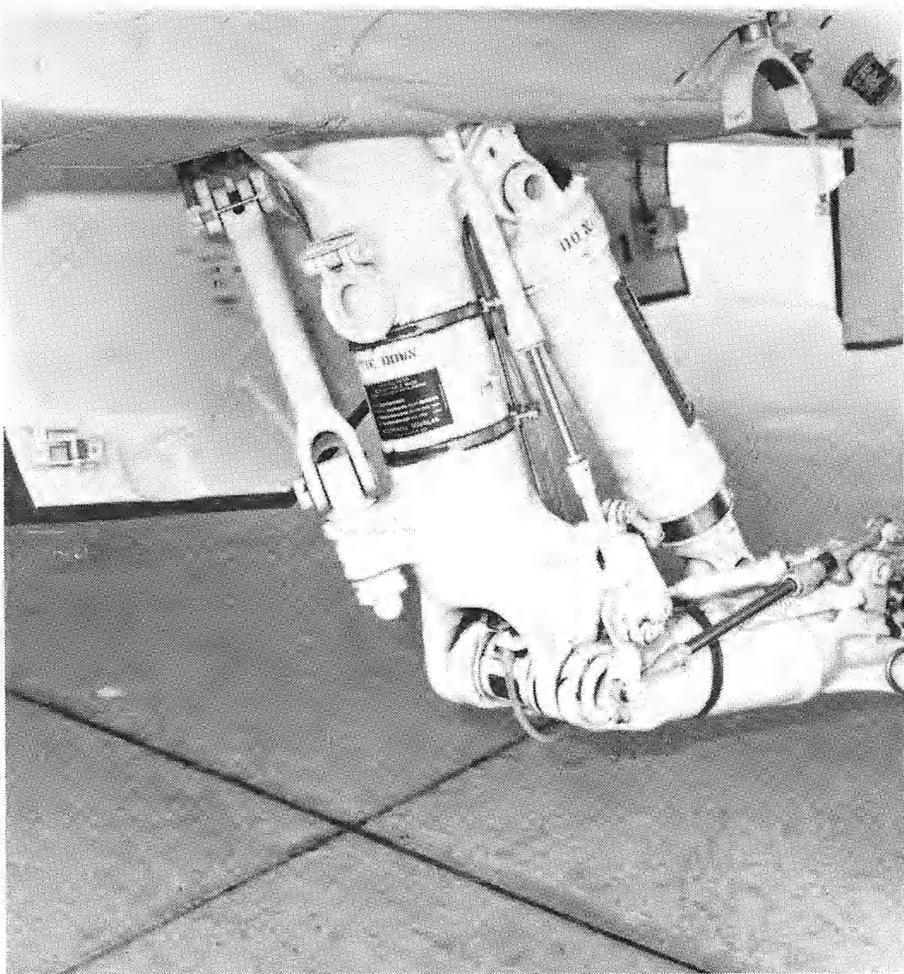
## NOSE LANDING GEAR

Left side of nose gear. Note position of "Remove before flight" streamer. Although this is a US machine, the details are the same on the CF-188, right down to the approach light and carrier launch bar. Colour is gloss white, with chromed cylinder shafts. The data panels are black with silver lettering.

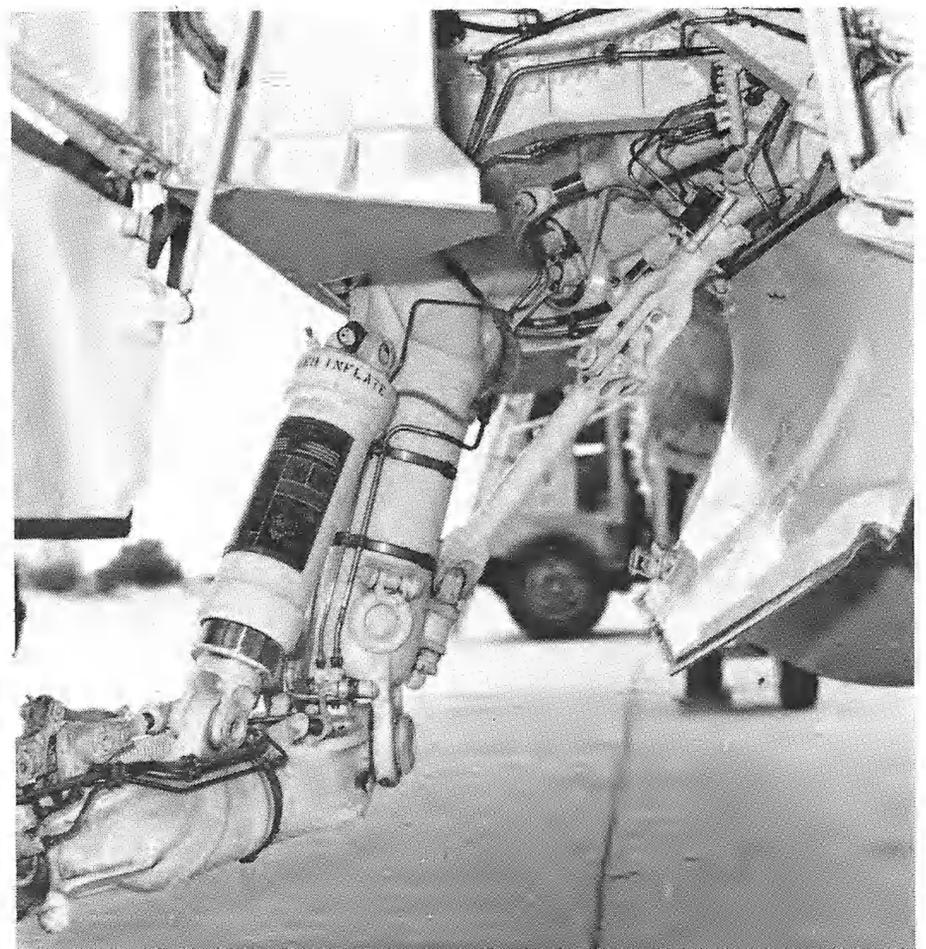
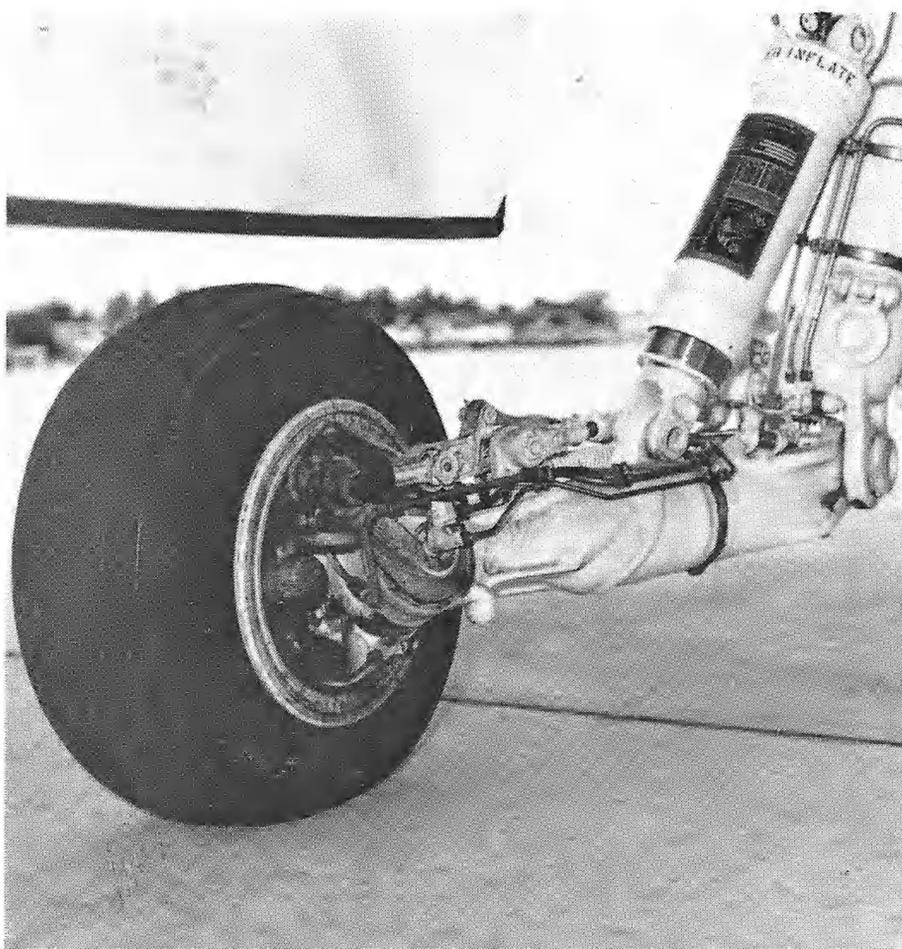


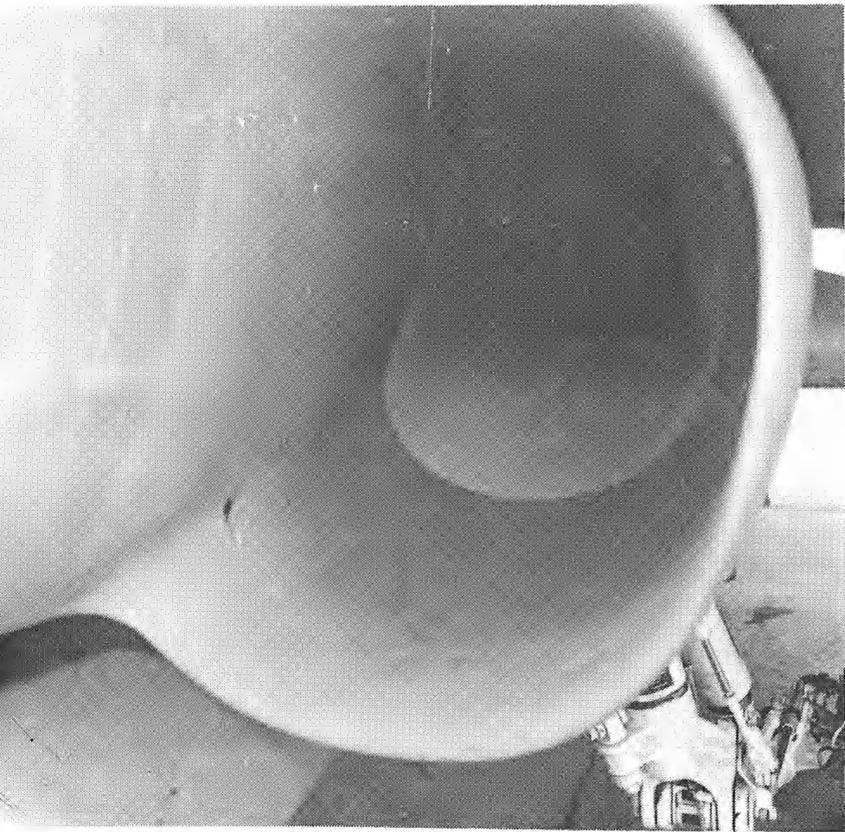


Above left, a USN F-18 with AIM-7 Sparrow. Above right, the same view on a CF-18 minus the AIM-7. Note the missile ejectors cocked off at angles and the pneumatic starting system intake behind.



**MAIN LANDING GEAR**

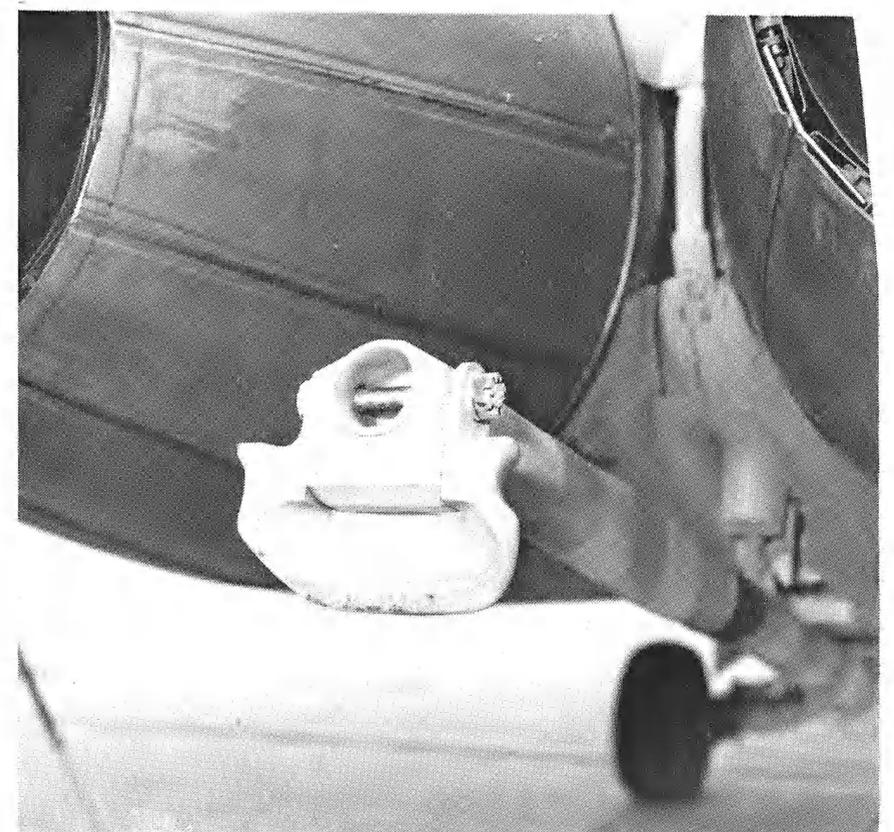




Port intake showing grey/white demarcation line inside. Good luck, modellers.

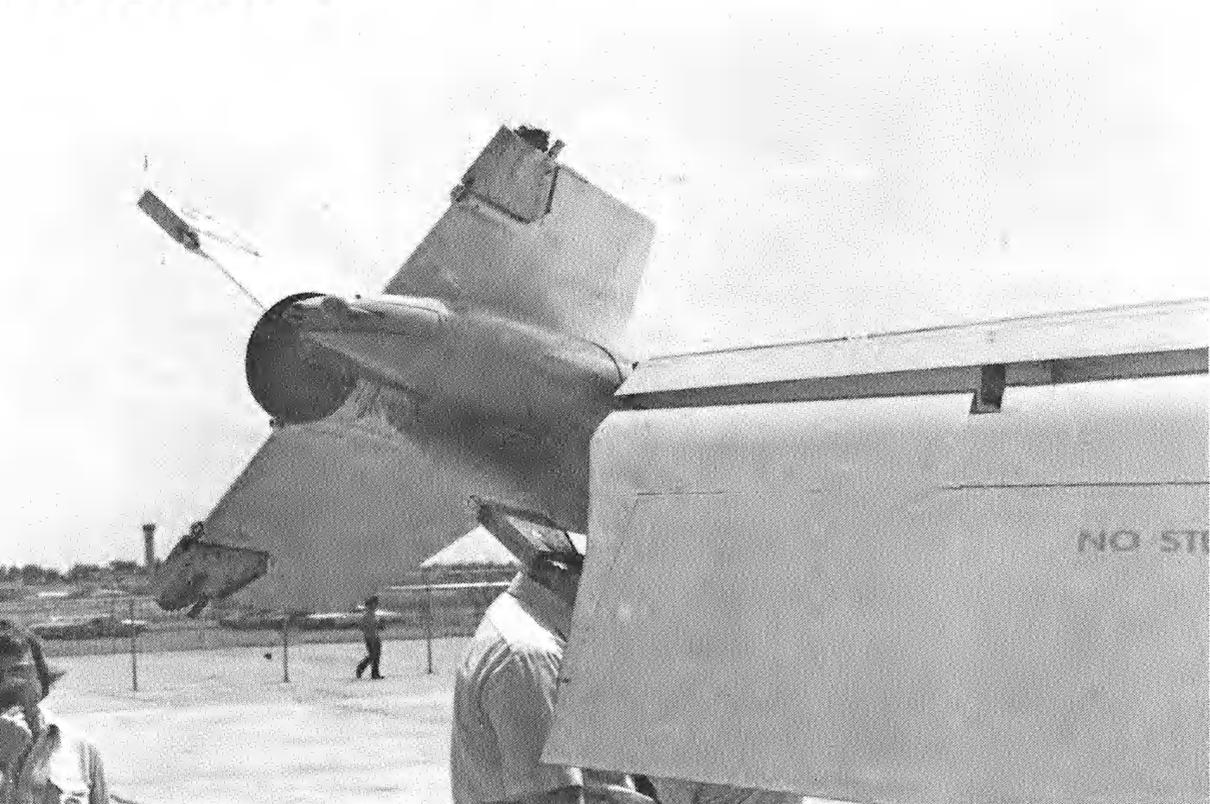


Port intake showing round vents and very fine screening on splitter plate.

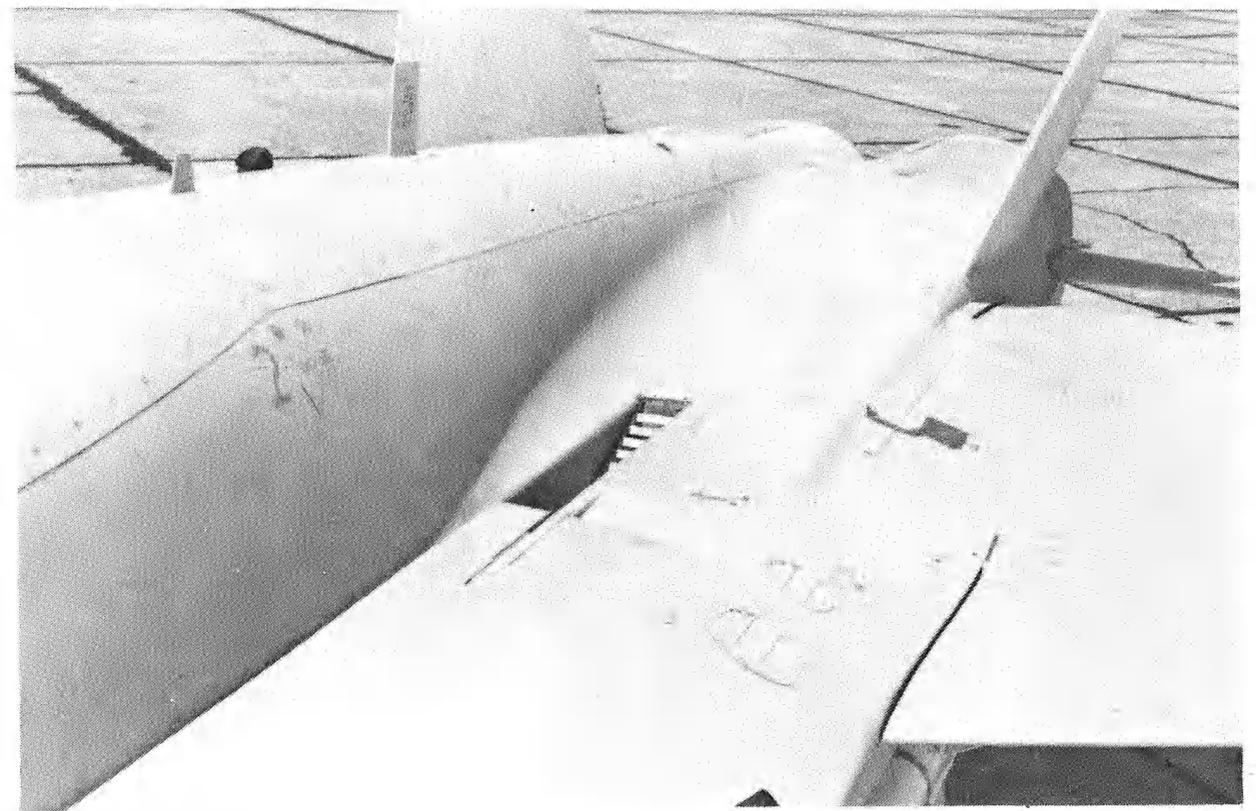


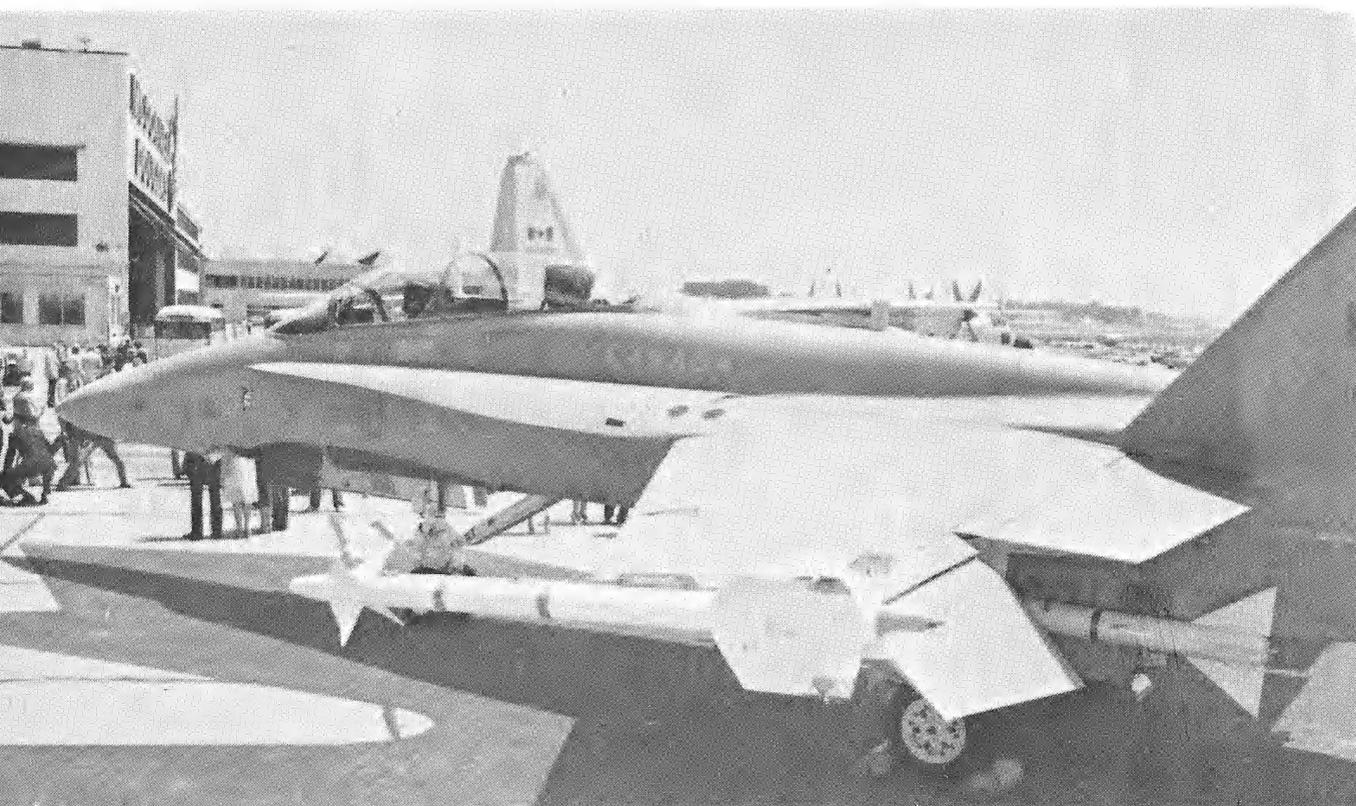
Tailhook detail. It appears that this part can be replaced as it wears.

Below, the port aileron on the latest wing configuration extends to the end of the wing and is notched to clear the AIM-9.

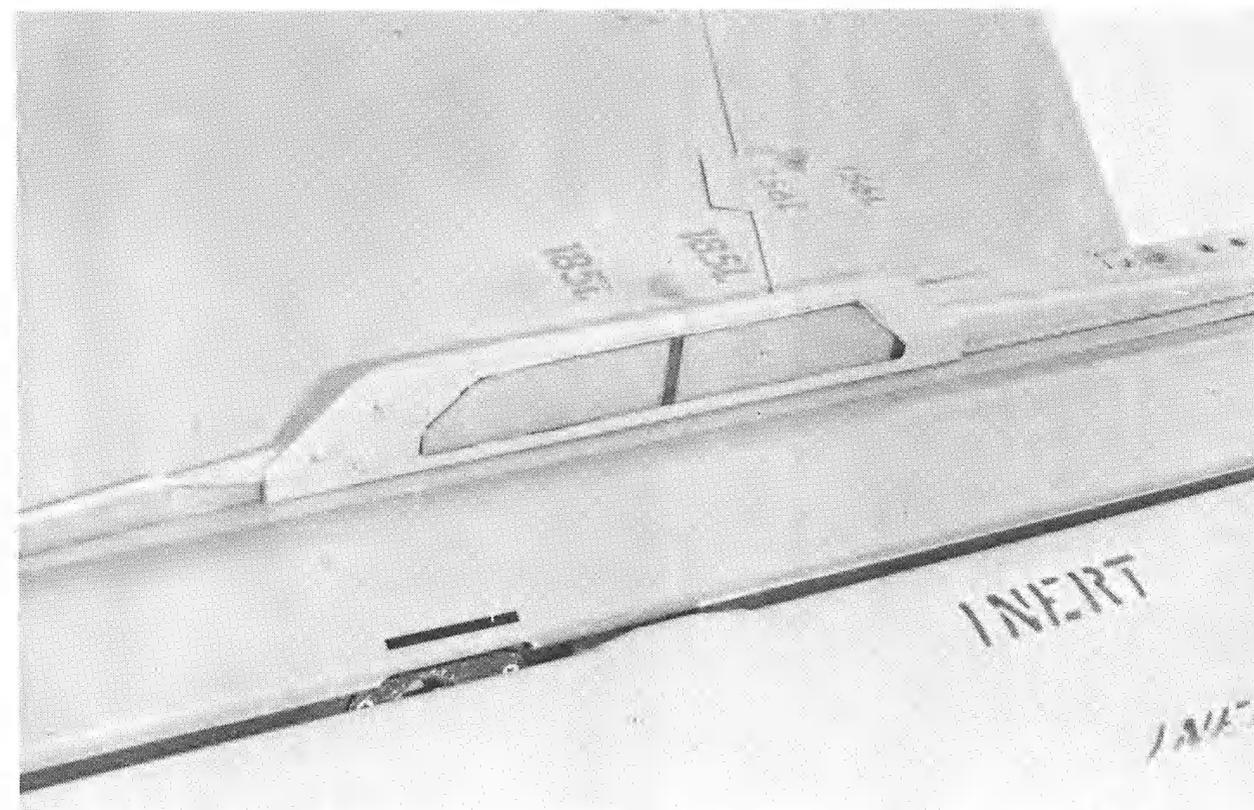


Below, a view showing the only slot that remains open on the LEX. The rest were closed in an effort to improve performance.





Above, 188901 on rollout in St. Louis. Note the latest fashion in formation lighting sticking up above the body of the Sidewinder AIM-9.



A detail of the upper starboard wingtip formation light, another being located on the bottom.

Below, CF18 18808 at CFB Winnipeg, June 1983. The plane, sporting current markings was flown by the CO of 410 Squadron, LCol Dequetteville.



# MODELLING THE CF-18 HORNET

(Editor's Note: The following information was condensed from the Modeller's section in the Detail and Scale book on the F-18. These books are good references for the many details involved in modern U.S. aircraft, and the F-18 book, like the others, contains a section reviewing all available kits of the aircraft, with suggested improvements as they apply. Since most F-18 kits represent prototype or development aircraft, there are several areas which require work if you wish to depict a production example, and the Detail and Scale booklet has 2 pages devoted just to these.)

Depending on the kit you wish to use, there may be five areas requiring modification to represent production F-18's.

The horizontal tailplanes originally had a snag on the inboard leading edge. This must be filled in so that the leading edge is straight. Originally, the leading edge extension (LEX) surfaces were slotted next to the fuselage along most of their length. For production examples, most of these slots have disappeared. Now, all that remains is the rearmost slot. Fill in the others to a scale 106-111 cm (42"-44") from the rear wall of the slot. The forward edge of the slot is angled at 21°, and the remaining LEX is smooth

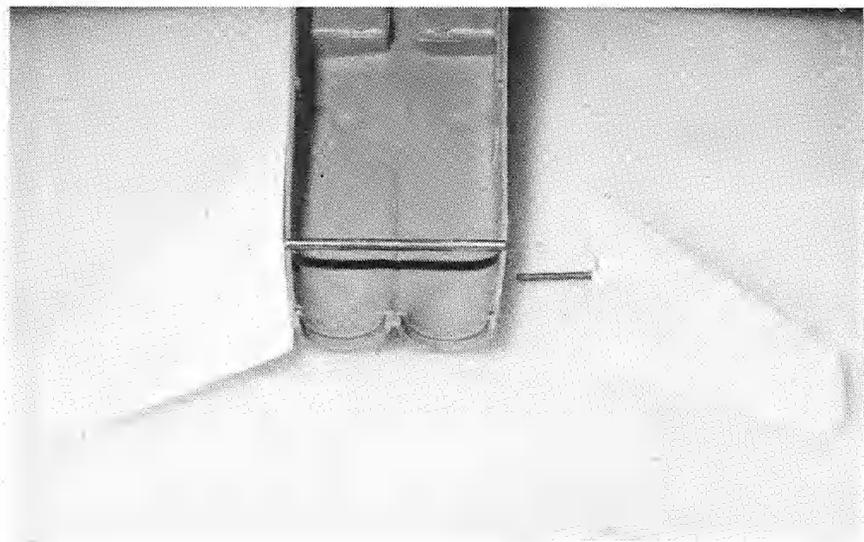
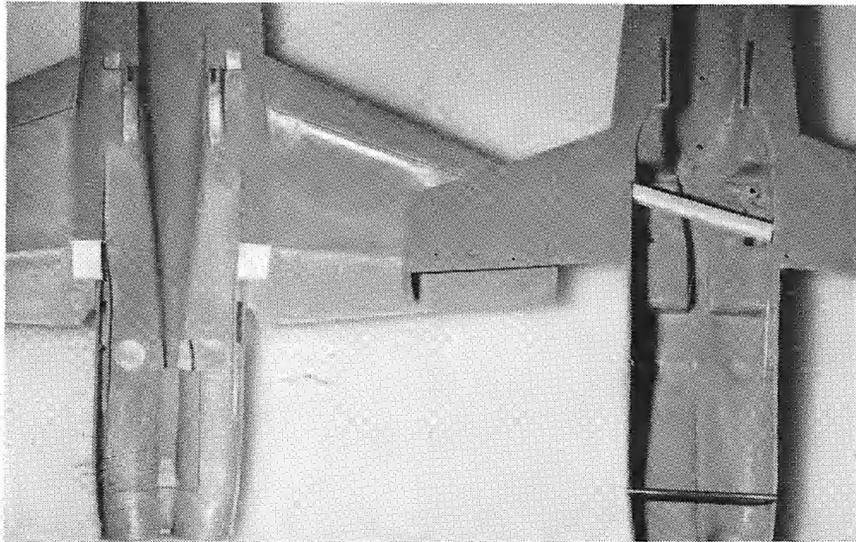
top and bottoms.

The wing leading edge is also straight now and this involves fairly straightforward surgery. Draw a line from root to wingtip, parallel to and 4 scale inches back from the leading edge of the inboard section. Everything ahead of this line should be removed, and the new leading edge should be filed and sanded to a slightly blunted, not sharp, edge. The new leading edge should pass just ahead of the wing hinge fairing.

The lower fuselage will probably require some work involving new grilles just forward of the nose wheel gear door, and ECM blisters under the intakes. Check photos for placement of these. Your kit may also require addition of the gun muzzle section.

Finally, the ailerons extend now out to the wingtip. A little filling and scribing will solve this, and you will find photos in this issue to show you details of this area. Note that the end of the aileron is notched to clear the AIM-9 Sidewinder missiles.

For more detailed hints on building a CF-188, see the suggestions below.



## CONSTRUCTION SUGGESTIONS

The following notes apply to the new Monogram A-18 Hornet in 1/48th scale only. This is because the kit has most of the major production modifications already done, and because the author, Steve Sauve, happens to prefer that scale! Many of the suggestions can, of course, apply to other kits as well.

A. Remove flap section from lower half of kit and rebuild the opening in upper half. (I have no idea why Monogram did the kit that way.)

B. All the Monogram Hornets I've purchased seem to suffer from the same problem—the wings don't seem to fit very well into the upper half of the kit. To build the kit as is may entail more filling than is necessary. Try spreading and bracing the lower half of the kit with a sturdy section of sprue to close the gaps on the wingtip join line.

C. I didn't like the way Monogram has provided for fitting the stabilator. To build the way they want will mean some difficult filling and some

very tricky masking of the CF-18 camouflage colours. Consider trying this method: Dry fit the upper and lower halves of the kit and open the stabilator opening with a round file to accept a 2.4mm (3/32") diameter brass tube. Cut this brass tube to a length of 43.5mm (1-23/32") and 'super-glue' it into the lower half of the kit. Now remove one of the stabilators and drill a 1.6mm (1/16") hole at the point of removal. Insert another brass tube in the hole, 1.6mm (1/16") x approx. 19mm (3/4") long. Use the original cross bar on the other stab for reference to get the correct angles, and 'super glue' in place. Don't worry too much about getting the position perfect as the brass can be gently bent into final position when dry. When you're happy with the first one, repeat the operation with the other stabilator. If you want the whole thing to move when the model is finished, fit a short length of .8mm (1/32") brass rod into the 1.6mm (1/16") tubing when mounting the stabs on the Hornet. Whatever you do, I think this will prove an easier model to make. On a final note, the engine cans, parts 9, will have to

be shortened slightly to make room for the brass. This is not too much of a problem, as you had to get rid of the mould marks at the bottom of the cans anyway!

D. Because of its complexity, the nose gear moulding had to be greatly simplified on the kit. Without a whole lot of work, you can really improve on it.

a. Separate the upper and lower sections of the nose gear by first removing the cylinder at the back of the gear which actuates the launch bar. What you should be concerned with is keeping the cylinder and the flat disc on the gear intact.

b. Cut the upper and lower sections apart just below the large flat disc (this is the pivot point for the nose steering).

c. Clean up these three sections by rounding off the flat disc on the upper section, as well as flattening the bottom. The truly ambitious may want to hollow out the flat portion of the yoke that connects the gear leg to the training arm. The lower portion should have all the remnants of the small struts removed, leaving the mounting points intact. For strength, I chose to replace the lower gear main strut with brass tubing, ending in a hole drilled into the upper section.

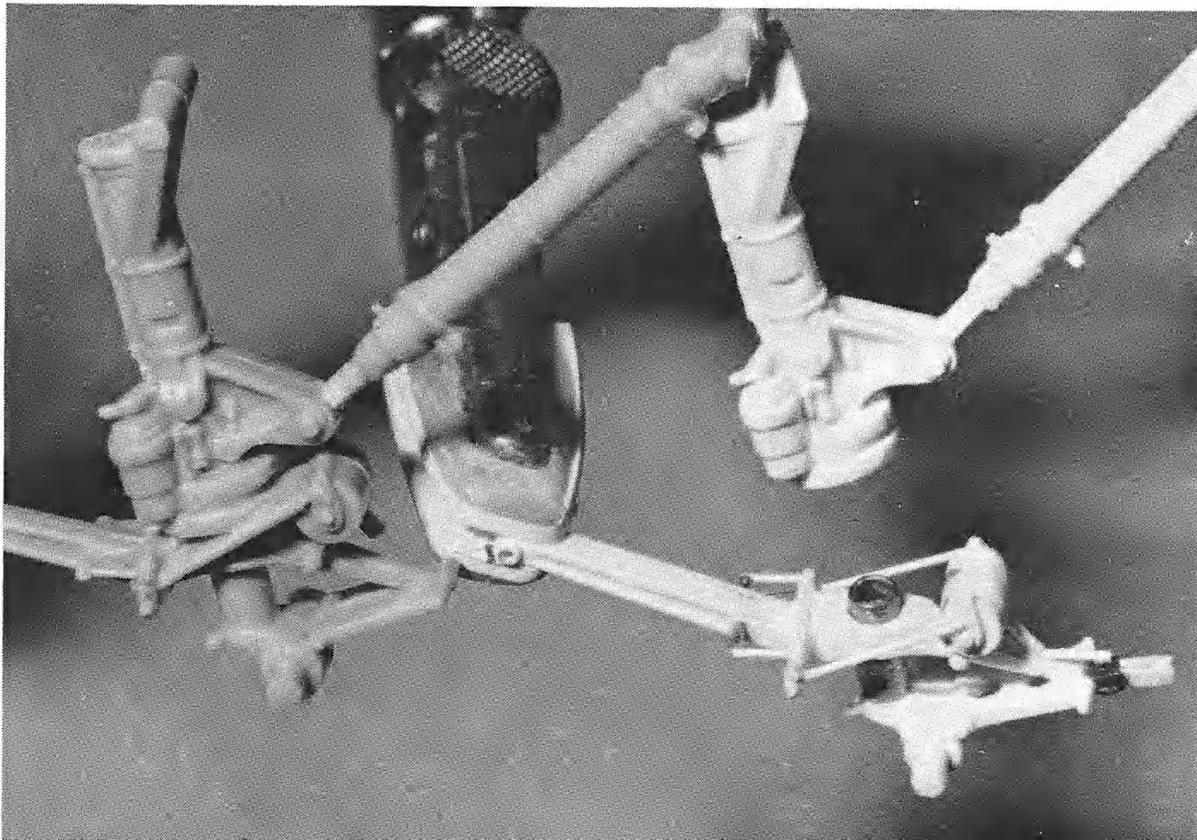
d. The small cylinder need only be rounded off, leaving the two small arms on the ends of it.

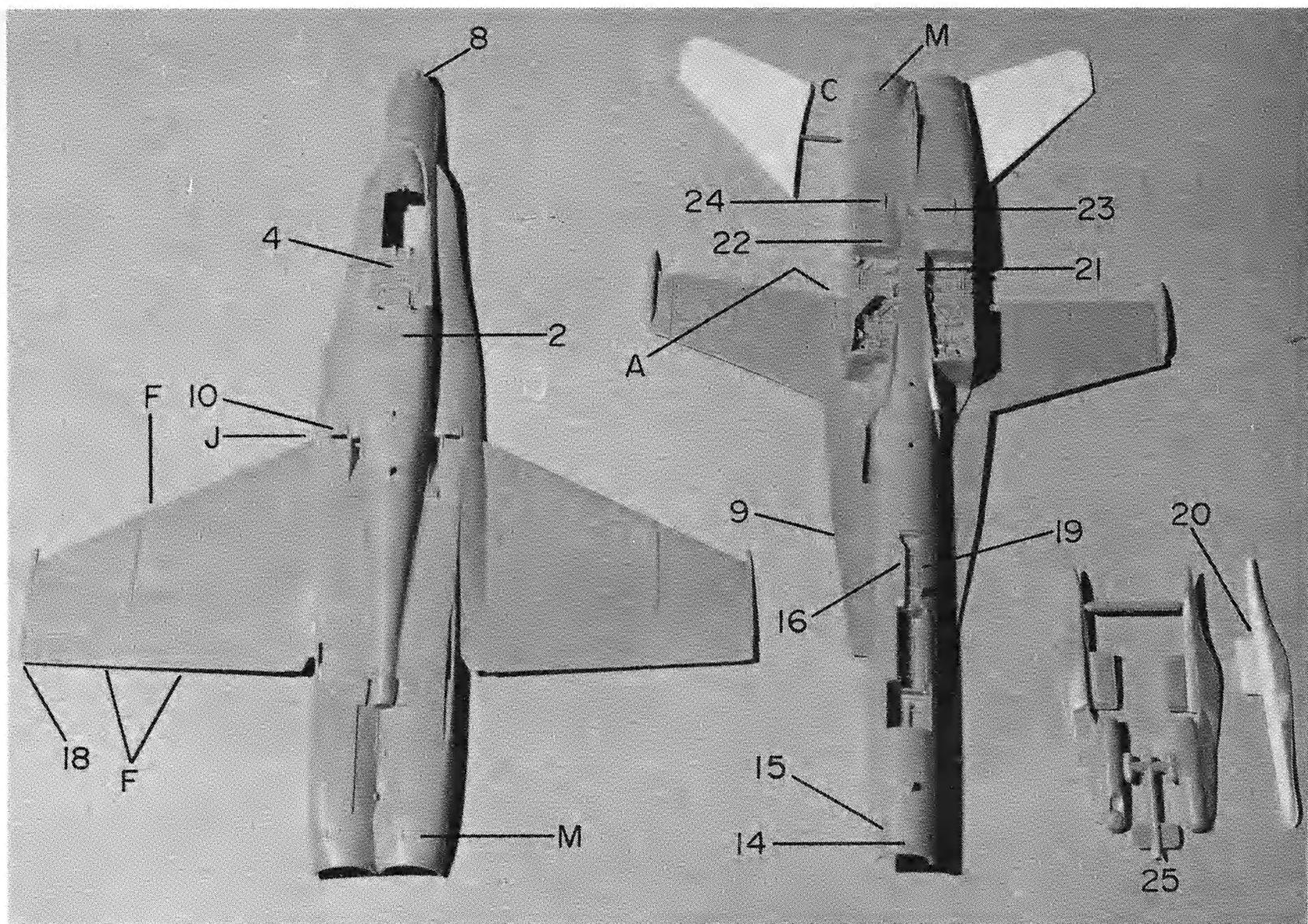
e. By reference to photos, add on the the various small struts and devices with brass wire, stretched sprue, and plastic strip.

E. The main gear requires far less work than the nose gear. About all I could justify was hollowing out the big 'knee joint' where the main and trailing leg join each other, and add some plastic rod to represent the pivot.

F. Again for the really keen, consider dropping the ailerons and flaps. From all the Hornets I've seen the ailerons start to droop soon after engine shutdown, followed by the stabilators and flaps. The leading edge flaps also drop down, but they seem to do so well after the trailing edge devices. Note also that the stabilators droop tail-down, and that they are capable of differential movement, which is evident even on the ground.

G. The engine intakes cry out for attention, but I'll tell you now—I haven't figured out how or even if I'm going to attempt to create a smooth intake tunnel all the way back to the intake feet.





Letters refer to construction suggestions on previous page. Numbers refer to modifications on this page.

F404, which is just about at the trailing edge of the wing. Those red intake covers are beginning to look mighty tempting.

H. The arresting hook, part 20, could stand a little work. See a good closeup photo of this for the mods needed to the hook itself.

J. The two small circular grilles by the port wing leading edge resemble the CF-188's in position only. I replaced mine with model railroad photo-etched brass.

K. The inboard pivots for the flaps, part 44, need a pair of small holes. One goes in the forward half, between the aft locating pin and the trailing edge, and the other goes in the aft half in a similar position. I believe this is where the ground flap lock is installed.

L. If you're going whole hog with the cockpit, try gluing some 5 thou plasticard to the sides of the consoles and trim them for a good fit under the cockpit ledge. With the card in place, it takes on a much tighter look without the traditional gaps between the consoles and cockpit slides.

M. The small rectangular grilles at the tail of the Hornet are actually flush with the fuselage skin. In closeup, they are a series of small holes as opposed to a wire mesh.

## CF-18 MODIFICATIONS

1. Night Identification Light in portside ammunition loading door.
2. Fill screens behind the cockpit on the spine of the aircraft. They appeared on some early Hornets, but not the CF-18.
3. Change the ejection seat headrest shape to that in the photos.
4. The screen on the rear deck behind the seat is of a different shape from that on the kit.
5. Add bumps to the sides of the canopy frame on both the CF-18A and B.
6. The ECM antennae under the intake mouths are very poor. Check photos and note that they are of a different size and shape on each side.

7. The flare and chaff dispensers require some attention. There is one under each intake, behind the ECM antenna. Note that on the Canadian fleet, these dispensers have not as yet been fitted. In their place is a simple aluminum blanking plate covering the opening until these devices have been procured.

8. The gun muzzles could use some work. A check of photos will show that the central 'bump' is not quite as prominent as is shown on the kit. Also consider opening the holes completely.

9. The boarding ladder (outlined on the lower portside of the LEX) is about right, but it does not extend to the outboard edge as indicated. Fortunately, the joint line between the upper and lower halves of the kit describes the missing edge nicely.

10. There are two small vents, one on each LEX, in the open position. These vents appear closed a lot of the time, and certainly when the aircraft is shut down. (In fact, I've only seen one photo showing them in the extended position.)

11. The nose and main gear could use some work. (See photos and construction suggestions.) If you don't plan a major rebuild of the nose gear, you should at least add the box with the three small lights (top to bottom—Green, Yellow, Red). Something to watch out for is the removal of the launch bar and associated hardware for the Canadian Hornets.

12. Note that the roughly shaped channels on the inner faces of the undercarriage doors are correct. That big 'dimple' on the nose gear door is also right.

13. The small antennae on part 23 appeared on early Hornets, disappeared on early CF-188 and reappeared on later CF-188's. Check your references.

14. There is another small ECM 'bump', centered under the nose of the aircraft in the same relative position as the two other 'bumps' behind the radome. (They could use some improvement, too.)

15. Monogram didn't go all the way with the new grilles on the nose. There is one more to be

added down low on each side, between the radome and first belly antenna.

16. Add a small probe on the port fuselage, near the tail end of the nosewheel well. It is located down low on the side, just above the false canopy area.

17. The formation lighting system on the wingtips is located over and under the Sidewinder rail. They are not very well done; see photos. (Kit parts 48 & 49.)

18. The outboard ends of the ailerons are still not quite right. Extend them right out to the tips, and reshape the current wingtip as per photos.

19. There are a pair of vents at the tail end of the nosegear well. Remove the one on the port side and replace it with a small, flat-sided scoop which extends into the airstream. It appears to be flexible.

20. If you don't mount Sparrows on your Hornet, add the pairs of missile ejectors, which are half-circle shaped.

21. There is a very fine screen between the rear main undercarriage doors. It is in the rectangular scribed box in this position on the kit.

22. The two dimples immediately aft of the main wheel well do not have cross bars; they are vertical shafts with a green aluminum finish.

23. The large central depression is the APU exhaust, and should be turned into a shaft as well (and painted as blackened metal).

24. The prominent inlets are the wrong shape and should be reduced in size. The current Hornet's are almost flush.

25. With the A-18 kit, remove the FLIR and LST (or get alternate parts out of the original Monogram F-18). Current plans do not call for their procurement by the Canadian Forces.

26. For wing stores use Vertical Ejection Racks (VER) for side by side carriage of weapons. Do not mount MER's or TER's. Canada has no plans to buy these items as the VER, in tests, has shown higher accuracy, and hence the need for fewer weapons for the job.

# SOME CF-18 COLOR NOTES

(Part numbers refer to 1/48th Monogram Kit)

1. Steel gun muzzle. A.E.T.E. (Cold Lake) aircraft have yellow-brown fibreglass plugs filling the muzzle openings as the cannon has been removed to make room for test instrumentation.
2. Pitot probes are dark natural metal.
3. The majority of antennae are USN Light Gull Grey with DO NOT PAINT stencilled in black.
4. Aft part of fuselage Sparrow launcher is Light Gull Grey with DO NOT PAINT stencilled in black.
5. There is a panel between the grills under the nose painted Light Gull Grey.
6. The three ECM bumps on the nose are Light Gull Grey.
7. The two ECM antennae under the intakes are Light Gull Grey.
8. Undercarriage parts are gloss white, along with the inner faces of the doors, wheel wells, and wheel hubs.
9. There is red trim to all the edges and the inner faces of the undercarriage doors. Also note that the outer edges of parts 75, 63 and 71\* have this red trim, as these doors overlap when the gear is retracted.
10. There is a yellow servicing chart on the inner face of part 25, aft of the 'dimple'.
11. Aircraft boarding ladder, support struts, and well are gloss white.
12. Cockpit. The inside of the canopy frame, cockpit ledge, rear deck, and all canopy/fuselage mating surfaces are matt black. The basic cockpit colour is light grey, with the various control panels in black (you'll need photos). The headrest is semi-gloss olive green nylon. On the canopy/windscreen there is a red/brown (about the same colour as car primer) strip bonding the plastic to the metal. Note that it is on the inside of the canopy.
13. There are red/green lights on the LEX, the underwing fairing by the aileron, and the Sidewinder rails.
14. The interior of the intakes is grey for about 76 cm (30") and then gloss white.
15. If you build a model with the canopy up, the pressurization seal is light grey.
16. The arrestor hook consists of alternating white and grey stripes, with one black stripe in the middle.
17. The radome has a creamy yellow nose section, with a natural metal tip.
18. Weathering. From what I've seen, it's mostly confined to the APU area on the belly, and the main wheel hubs, both areas getting pretty filthy. Oddly though, the undercarriage borders are immaculately clean. The rest of the Hornet is keeping fairly clean at this point, with very little wear and tear showing.

\*Parts 27 & 28 on the F-18 prototype kit.