Tactical aircraft selection — Northrop F-5A-15

Performance and suitability for Canada's role tipped the scale

By John Gellner

● Following long and careful evaluation and deliberation an improved version of the Northrop F-5 has been selected in the competition for a tactical aircraft for the RCAF.

For what it may be worth, we at Canadian Aviation are well satisfied with this choice, having always considered the F-5 the best weapons system at present available for the mission for which the Canadian tactical aircraft is intended, and having said as much frequently in these columns.

The sum of $215 million has been allotted for the F-5 program and no more. There is to be no cost escalation as was seen in the Avro Arrow project of unhappy memory, and more recently in the completed—but just as unfortunate—CF-104 program.

One F-5A (the standard single-seater version) will cost about $900,000, the two-seater F-5B a little more. When everything else connected with the program is added—licensing fees, simulators, some test-and development costs, spares, munitions, ground equipment (and every foreseeable cost of this kind will be added, for the whole operational life span of the aircraft) —there will be money for 120 to 125 F-5s. This will be enough to equip four squadrons of 18 aircraft each, and to have another 50, or so, as replacements, for training, and for any subsidiary function the F-5 may be able to perform.

80% Canadian content

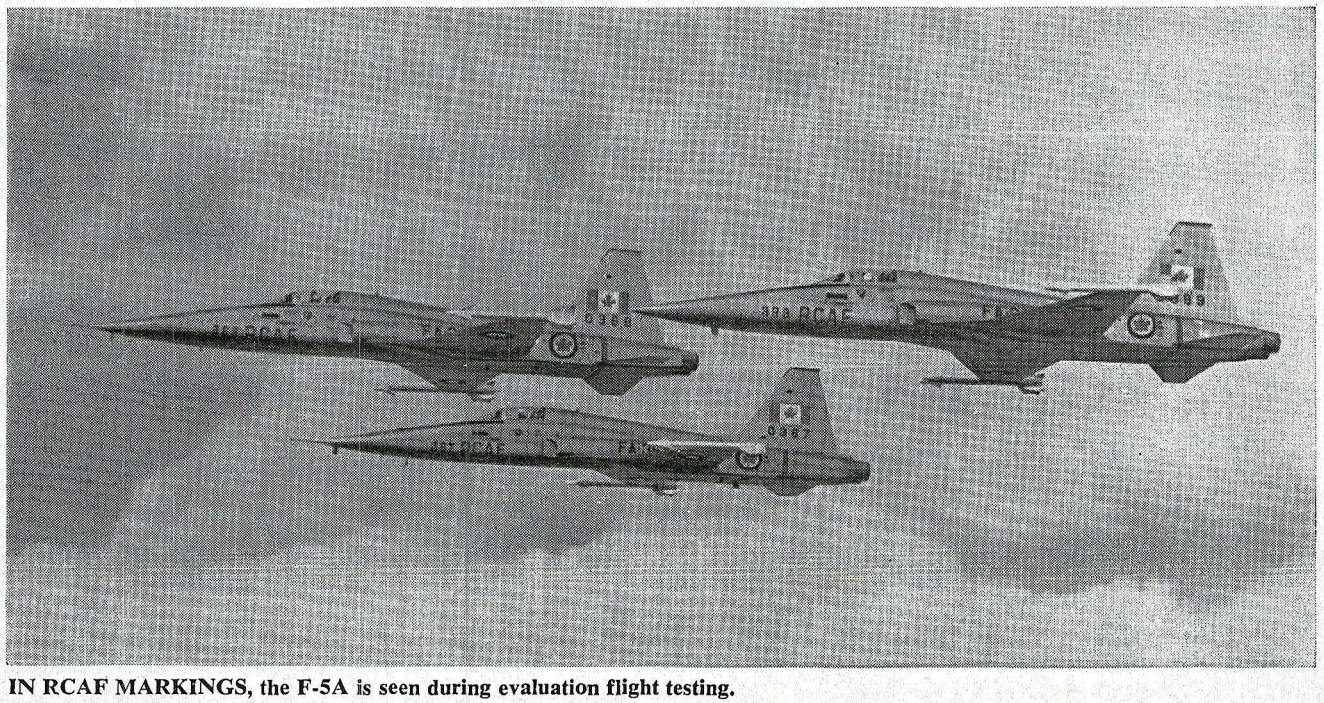
The airframe will be built at Canadair Ltd., Montreal, the G.E. J-85-15 engines by Orenda in Toronto, and much of the ancilliary equipment will also be manufactured by various Canadian firms. Detracting from the "Canadian content" of the RCAF F-5s, will be the U. S. produced weapons, especially the guided missiles. But even so, a realistic estimate (erring, if anything, on the pessimistic side) is that at least 80% of the $215 million will go to Canadian industry.

What do we get for the money?

Not what the "victory through air power" enthusiasts wanted—and there are still some in the older age groups in the RCAF and among retired air marshals. They do not like the F-5—and have said so quite forcibly during the time the choice was being made—because it is not the "mostest".

The F-5 is slower than some fighter aircraft now in service, and it has less ceiling. It is not laden with "black boxes"; it is not a nuclear weapons carrier. It can only help win a war in co-operation with other arms. Consequently the "Blimps" were in favor of yet another of the behemoths of the nuclear age—the McDonnell F-4 Phantom at the very least, and preferably the General Dynamics F-111. But fortunately, reason prevailed.

The point is that the RCAF tactical aircraft need not be the mostest—indeed, it could not do its job properly if it were. We do not require another nuclear weapons carrier. The nuclear powers are looking after the deterrence of nuclear war, and they possess ample means for that. According to recent estimates there is now the equivalent of 15 tons of TNT available to deter (if this is the right



IN RCAF MARKINGS, the F-5A is seen during evaluation flight testing.

expression) every single human being on earth.

Nobody really believes any more that a limited nuclear war is possible. If we had been convinced in the first place through the warnings of those who did not believe, we could have saved upward of one billion dollars for the nuclear weapons systems Canada has in her arsenal. The wars that have been fought since 1945, that are being fought now, in Vietnam, on the Malaysian-Indonesian borders, and in the Yemen, and that we have to be prepared to fight if we must, are conventional wars of all sizes and shades.

Such wars can neither be deterred nor won by air power alone. The Korean War demonstrated that with complete mastery of the air, and with the enemy's forward troops at the end of a supply line 200 miles long, planes alone could not stop hordes of coolies carrying 50 lb apiece on their backs, and that they could not dislodge entrenched troops supplied by these coolies.

Mobile Command role

What airplanes are indispensable for is to protect one's own supply lines, on land, over the sea, and in the air, and to help ground troops to win land battles. And this is what the Canadian F-5s will do within the framework of the Mobile Command, the newly created, operational air-land-sea force.

The fact that flexible, highly mobile, hard-hitting, conventional military forces are the prime military requirement of our time, has taken the Western leadership a long time to realize. The F-5 itself is a good example of just how long.

First available in 1955!

Under the company designation N-156, the F-5 was first offered by Northrop to the U. S. government in 1955. It was an unfavorable time. John Foster Dulles' "massive retaliation" was the accepted politico-military doctrine and the "victory through air power" boys held sway. Anything that did not have nuclear and global capabilities was no good; the modest little N-156 was turned down flat as an operational aircraft.

However, in 1958, a modified version of the N-156 was accepted by the USAF as a supersonic trainer and designated T-38 Talon. In the past seven years, Northrop has delivered 460 of these aircraft to the USAF. Orders for another 174 are on the books, and 126 more are programmed but not yet ordered. This program which uses a large percentage of parts and equipment identical to those on the F-5, kept development work on the operational aircraft alive.

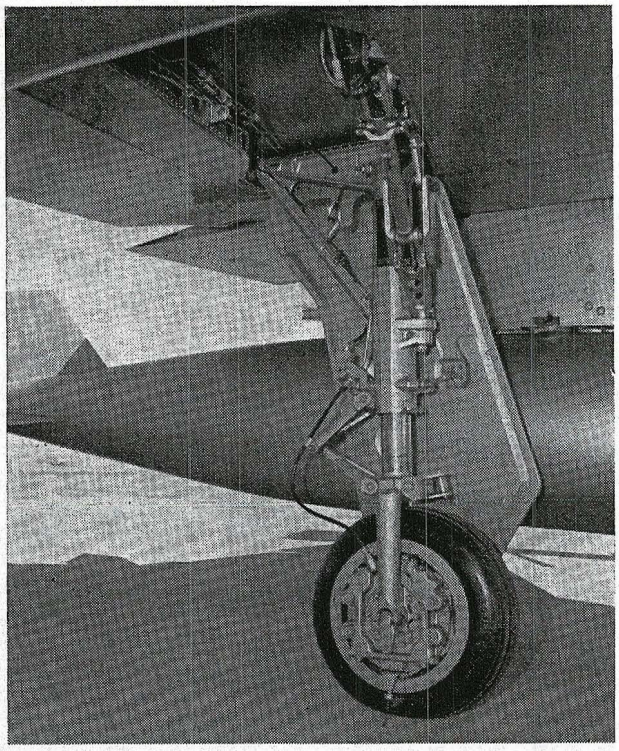
Northrop persisted in the face of a complete lack of official interest, and despite the passing of years which made the sale of a 1955 aircraft progressively less likely. In 1962 the U. S. Department of Defense took another look at the F-5 (or "Freedom Fighter" as it came to be known) and found that it might just fill the bill for allies getting equipment under the Military Assistance Program.

Orders were placed for F-5s for the Phillipines, South Korea, Nationalist China, Iran, Greece and Turkey. Then Norway (which is not receiving MAP aid) asked to be allowed to cancel an existing F-104 contract, and to substitute for it one for F-5s. Norway has since ordered 64 Northrop F-5s.

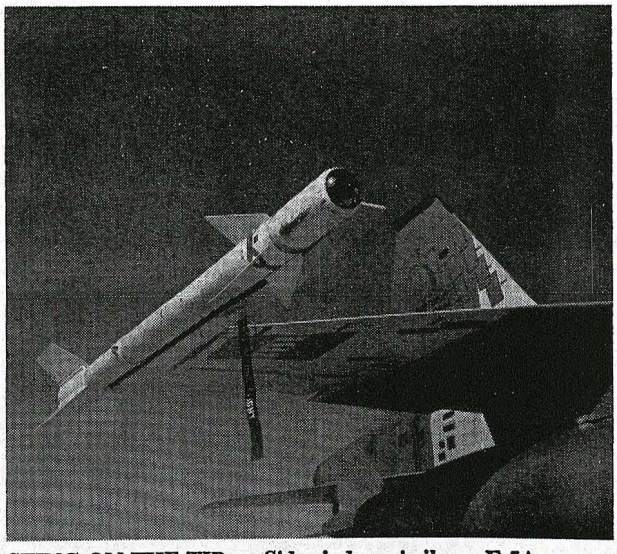
Growing American involvement in the Vietnamese war brought the realization that the USAF's tactical aircraft, which needed long, reinforced runways and were difficult and expensive to maintain, were not suitable for a guerilla war. The old and comparatively primitive Douglas A-1E and A-1H Skyraiders showed they could do a better job in Vietnam than the powerful, modern F-105s of Tactical Air Command.

Supersonic and STOL

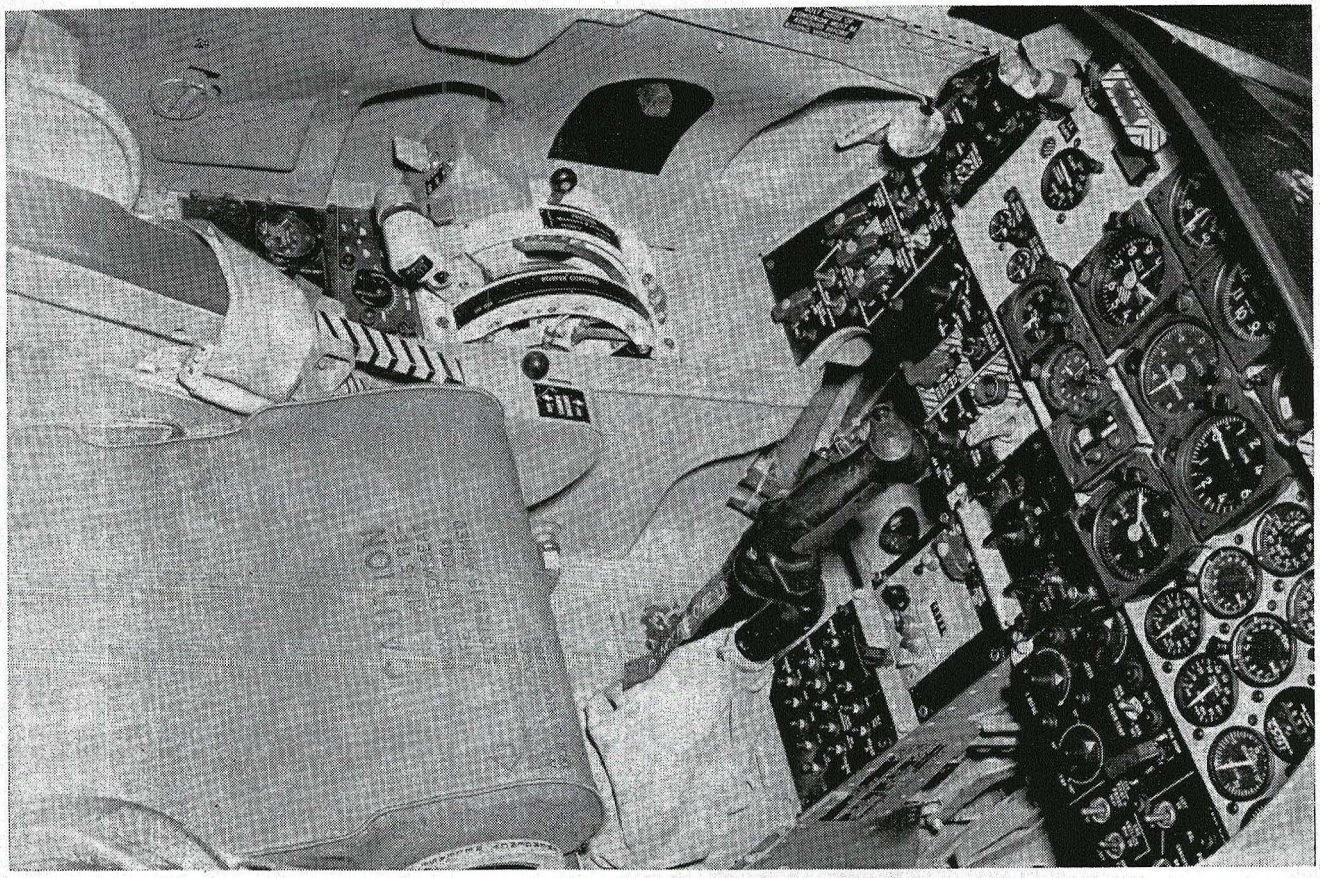
The need became apparent for a supersonic aircraft that could operate from rough short fields, was undemanding in terms of manpower as well as of money, and was cheap to operate and maintain. This has revived hope for a USAF order for the F-5, and it was reported last month that a special USAF unit equipped with 18 of these aircraft is to be deployed in South Vietnam this fall for combat evaluation. It is expected that an initial USAF order for about 200 of the improved F-5s will result.



MAIN GEAR detail on Northrop F-5A.



STING ON THE TIP — Sidewinder missile on F-5A.



COCKPIT DETAIL of the Northrop F-5A is revealed in this Howard Levy picture.

The Northrop Cinderella story had to be told, because it teaches a valuable lesson: Western politico-military thinking—and that includes Canadian, because we did not think for ourselves but felt compelled to follow the American lead—was bad in the years when it was obsessed with the global, nuclear war. As a result, after the expenditure of billions of dollars, the West has discovered that it does not have the material it requires for a run-of-the-mill conventional war like that in Vietnam.

Persistence paid off

Canada today, has not one fighting aircraft that could be used to advantage in conventional warfare, the only type of war in which we could conceivably be embroiled. And it is due strictly to the dogged persistence of some individuals in and out of the services, who were not prepared to leave military thinking to the Jacks-in-office and the ivory-tower theorists, and to industrial firms such as Northrop, that we now have the like of the F-5 equipment suitable for conventional warfare that is available practically "off the shelf".

Some 15 different types of aircraft were considered before the Canadian decision to buy the F-5. After the first series of eliminations four types remained in contention:

- The Grumman A-6 Intruder was eliminated first. A big two-seater with the crew placed side by side, twin-engined, subsonic but with excellent range and load carrying capacity and complete electronic equipment for every conceivable mission and contingency, the A-6 was adjudged too complicated for the task, and at a unit price of about $3 million much too expensive.
- The Douglas A-4 Skyhawk, a naval single-seat (and latterly two-seat), single-engined, subsonic aircraft, could probably have been had at $750,000 apiece. It was eliminated because it was found to be behind other types in overall performance, and at the same time not capable of substantial development. Production of the A-4 for the USN had already ceased.
- The Ling-Temco-Vought A-7 VAI another single-engined, subsonic single-seater, will be the next tactical aircraft for the USN. It should be a good one, but is still in the development stage, and its forecast price of $1.4 million is high compared to the F-5's.
- The Northrop F-5. In the final elimination with the A-7, the F-5

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Industry participation

To get the Northrop CF-5 into the arsenal quickly it is likely that, initially, some components will be manufactured in the States. But after this, the complete airframe will be built, and the aircraft assembled, in the Montreal plant.

F. R. Kearns, president and general manager of Canadair, has stated the engineering, manufacturing and supply of equipment for the new aircraft will be spread throughout every major segment of the Canadian aerospace industry. Canadair's participation in the program will be about 45% of the total dollars involved.

Mr. Kearns announced that they should be able to deliver the first aircraft to the RCAF in about 18 months.

The GE J85-15 engines will be built by Orenda at Malton, Ont., and other companies that have been mentioned in the subcontracting team include Jarry Hydraulics, Montreal (landing gear), and Dominion Rubber, Kitchener, Ont. (fuel cells).

It is estimated the four year CF-5 production program will engage an average of 2,100 people employed by some 60 companies. Chances of continued production are increased by the growing acceptance of the Northrop F-5 around the world, and Canadian participation through defence production sharing.

Improved F-5A-15 for the RCAF

The improved version of the Northrop F-5 developed for the Royal Canadian Air Force and evaluated by an RCAF team at Edwards AFB, Calif., in June, has two 4,300 lb thrust GE J85-15 engines in place of the 4,080 lb-13s. It will be designated the CF-5.

Electrically operated louvered doors have been added at each side of the aft-fuselage to provide additional air for the turbines during take-off, and a two-position nosewheel strut is fitted to increase the angle of attack three degrees for take-off.

These modifications are said to have improved take-off performance by about 25% and a USAF test team at Edwards certified that the dash fifteen model had a 37,000 fpm rate of climb—considerably more than credited to the aircraft in the following figures obtained through Canadian sources.

Empty weight	8,283 lb
Take-off gross weight without external stores	13,550 lb
Maximum external stores	6,200 lb
Maximum take-off weight	20,000 lb
Take-off distance	2,050 ft at 13,550 lb 4,800 ft at 20,000 lb 3,000 ft at average configuration and load
Landing distance	2,150 ft
Landing speed	135 knots
Maximum ferry range with external tanks	1,500 miles
Combat range	300 to 400 miles (depending on configuration)
Maximum speed	Mach 1.4
Sea-level rate of climb	29,500 fpm
Combat ceiling	50,000 ft

Armaments: Two M-39 20 mm cannon and a combination of GAR-8 Sidewinder air-to-air missiles; GAM-83A Bullpup air-to-ground missiles; Shrike anti-radar missiles; free-flight rockets (in four pods); napalm containers; conventional bombs.

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was considered to have the following advantages: It is supersonic (Mach 1.4). This means little during the actual combat stage since bombing, has to be done at subsonic speed, but a lot during approach and withdrawal. Speed also gives the F-5 added flexibility; it could, for example, be used in a pinch for surveillance of Canadian air space, side by side with the CF-101 Voodoo.

The twin engined configuration weighed greatly in the F-5s favor. Applying a common rule-of-thumb for military jet aircraft, this should give it a 3 to 1 safety advantage over single-engined aircraft in peacetime; 5 to 1 in war. It is considerably cheaper and will be at least as sturdy and easy to maintain as its contemporaries.

Significant from the industry and production viewpoint is the fact that world-wide sales, and deliveries under MAP, are under way, and Canadian firms working on the F-5 program have thus at least a chance of getting into this developing market.

There are, of course, some disadvantages. For example the limited range of the F-5 is only part compensated for by in-flight refueling facilities, but its advantages decidedly outweigh the drawbacks. In fact, everything considered the choice of the F-5 was reasonable on all counts.

For once an aircraft procurement decision was reached with its intended mission firmly in mind, and on the basis of a realistic appraisal of the world military situation and of Canada's probable involvement.

The pocketbook of the long-suffering taxpayer, who in the past has often shelled out money for military hardware of doubtful utility, is being spared as much as this is possible when a modern weapons system is being purchased—and the contribution of Canadian industry has been taken into consideration. Hallelujah!

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