Target-Towing by CF-100

RED AIRPLANES are frequently in evidence in eastern Canadian skies these days, but this coloring is strictly utilitarian and is not indicative of any political affiliation. These red airplanes are new target-towing CF-100's which have been painted a brilliant fluorescent red so that an interceptor out on aerial target practice will have no difficulty distinguishing between target and towplane.

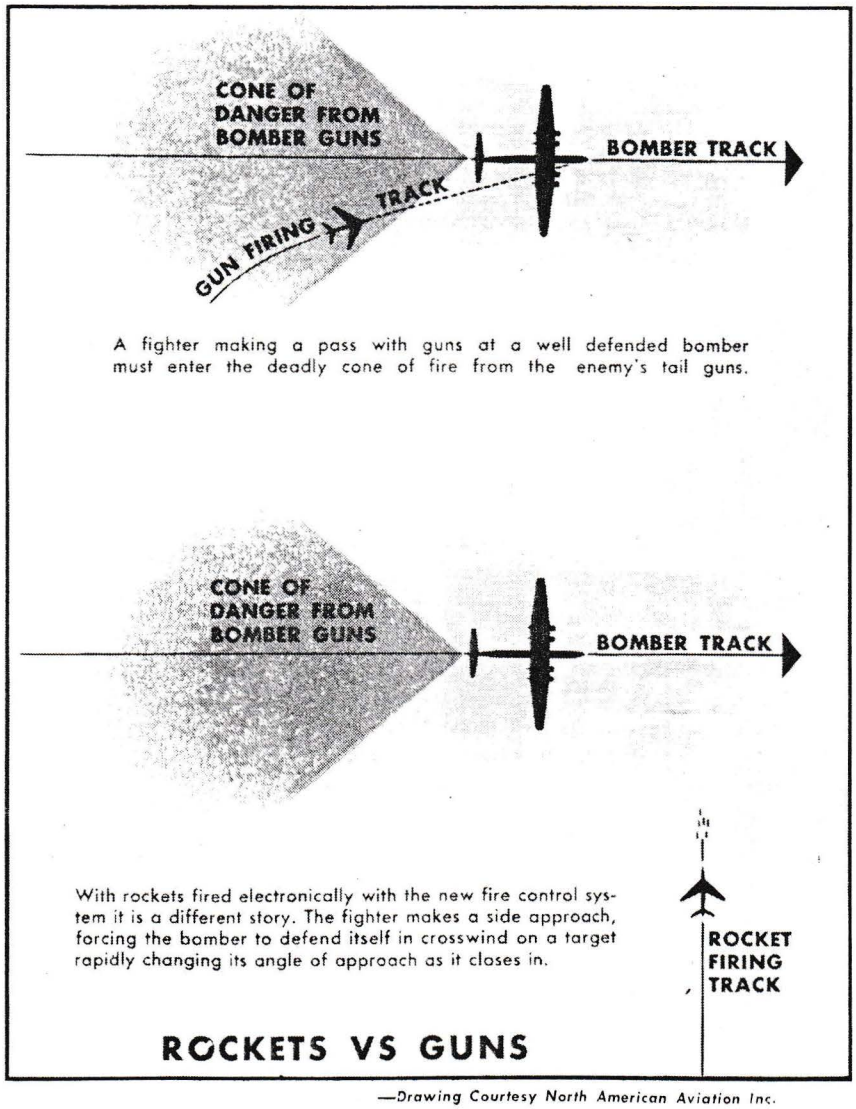
The CF-100 target tugs have been modified by Avro Aircraft Ltd. in answer to an RCAF requirement for "something fast and high to shoot at to practice the new one-pass radar-controlled collision attack technique which is the basis of present jet interceptor defence."

Changing Times: This so-called "collision attack" technique is one that fighter pilots of World War II would find passing strange, as it is completely alien to the methods taught for use with fixed-gun fighters. It has come about as a result of the rapid advance in bombers and bombing technique. Nowadays, bombers fly operationally at altitudes unheard of a few years ago. They can fly in almost any weather and drop their bombs by radar on targets they never see.

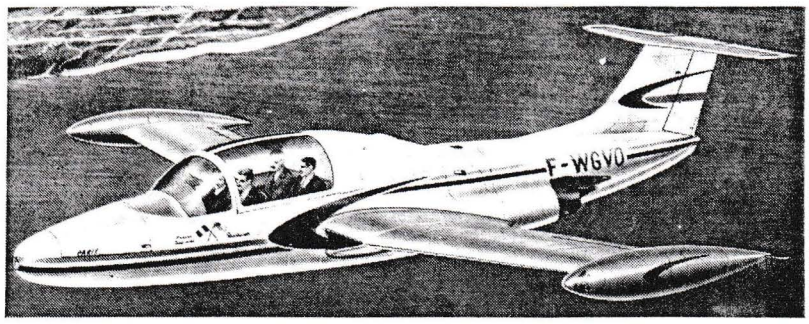
Adrian Sorrells, writing in North American Aviation's "Skyline," compares modern techniques with earlier methods thusly:

"Fixed guns must be trained on their target for a considerable length of time while they pour in enough shells to bring their victim down. To accomplish this, the fighter pilot must be continuously headed slightly ahead of his target. This makes him fly a curved course, known as the 'lead pursuit cure' [see cut]. This system works against other fighters or lightly defended bombers, but the cone of fire from the tail guns of a heavily defended bomber reduces the fighter's 'probability of survival' through the attack.

"The greatest advantage of rockets over guns is this 'probability of survival' of the fighter-interceptor, armed



—Drawing Courtesy North American Aviation Inc.



An Executive Jet

Beech Aircraft Corporation of Wichita, Kansas, aims to be the first U.S. aircraft manufacturer to hit the executive market with a civil jet aircraft.

But this old line aviation firm does not have a suitable design of its own at a sufficiently advanced stage with which to make an early entry in this potentially lucrative market, so it is taking the bold step of sponsoring a foreign airplane — France's Morane-Saulnier MS-760—in North America. For a company whose own designs have been such notable and outstanding successes, such sponsorship is an unusual move, but Beech obviously figures that by getting a head start in this way, it can have its name firmly established as a supplier of proven civil jet aircraft by the time possible competitors can get prototypes out of their experimental shops.

One of the first steps will be to see what sort of a reception this attractive French twin-jet, pressurized, four-place airplane will get on this continent, and with this in mind, an MS-760 is being brought to North America for demonstrations this summer. The Canadian demonstrations will be sponsored by Field Aviation Co. Ltd., Oshawa, Ont., Canadian distributor for Beech.

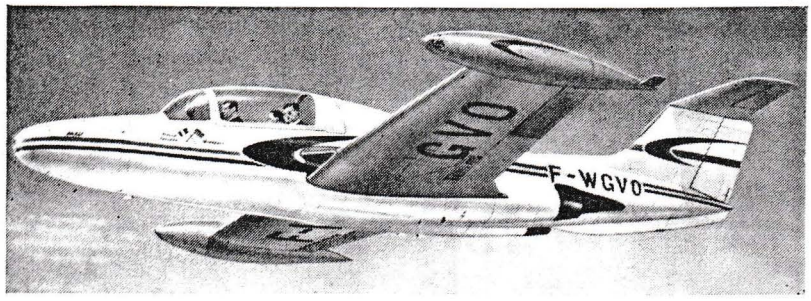
Known as the "Paris," the MS-760 is a development of the MS-755 Fleuret, a two-seat side-by-side jet trainer. Though Beech will adapt the design for the civil market, the MS-760 was originally conceived as a fast four-place liaison aircraft for military use.

At the present time, no promises are being made on delivery dates; nor are any prices being quoted on airplanes of this type when made in the U.S. However, according to Beech VP & GM Jack Gaty, "we do feel that proposed delivery dates will be reasonable, in view of the fact that the MS-760 has been well tested. We don't believe the price will be high enough to stop the prospects who can use this type of super-transportation."

The Paris has a maximum speed, at maximum gross weight of 7,480 lbs., of 405 mph. and it is powered by two Turbomeca Marbore II turbojets having a take-off rating of 880 lb. th. each. These engines are manufactured under license in the U.S. as the Continental J-69.

Commenting on her firm's entry into the jet field, Beech Pres. Olive A. Beech says: "One of the most important aspects of Beech Aircraft's working agreements with the Morane-Saulnier Co. is the fact that there is nowhere in the world another airplane of this type available for actual demonstration."

Other Data: Span, 33.3 ft.; length, 32.9 ft.; max. height, 8.5 ft.; wing area, 194 sq. ft.; empty weight with equipment, 4,325 lb.; oil & fuel, 2,350 lb.; allowance for four passengers and baggage, 805 lb.; max. gross weight, 7,480 lb.; wing loading, 38.5 psf. Performance @ max. gross—cruise @ SL, 350 mph.; @ 10,000 ft., 355 mph.; @ 20,000 ft., 350 mph.; max. range, 970 mi. @ 294 mph. @ 23,000 ft.; service ceiling, 34,400 ft.; T/O distance @ 105 mph., over 50 ft., 3,550 ft.; landing over 50 ft., 3,050 ft.; rate of climb, SL, two engines, 2,260 fpm.; minimum stalling speed, 95 mph.; max. Mach number, 0.81; cabin altitude @ 20,000 ft., 7,800 ft.



with a computing device to fire the rockets automatically at the precise instant at which they will intercept the target, need be on that target only an instant. The interceptor flies a straight-line collision course until the rockets fire. This makes the interceptor practically invulnerable to the bomber's defence because the bomber's guns must fire into a crosswind at a target whose bearing is changing rapidly. The destructive power of the rocket—one will bring down the heaviest bomber known to be flying today—is the second great advantage over guns . . ."

Target for Tonight: The target towed by the CF-100 towplanes comprises a wire and nylon banner measuring thirty feet in length and six feet in depth and attached to 12,000 feet of armoured cable which can be let out to any length desired. Just ahead of the target is a metal radar spinner which is intended to make the target easy to pick up on a CF-100 interceptor's Hughes APG-40 radar equipment. A hydraulic winch mounted in the towplane lets out or reels in the cable.

For cutting the cable over the dropping area after an exercise, Avro Aircraft devised a remote control for the standard "butterfly" device. On release, the butterfly races down the cable. Coming to a dead stop just before the target, its cutters are jerked through the cable, allowing the banner and spinner to fall away. The winch then reels in the lightened cable.

At high speed, the target exerts about 2,500 lbs. of drag. Tows cannot be made at the CF-100's maximum speed with the present targets, because the cable used will break at greater drag weights. However, new low-drag aerodynamically shaped targets are now available and with these a CF-100 could fly at near-maximum speed.

It is not feasible to stow the target aboard the aircraft, so the technique followed is to drag it off the ground about 300 feet behind the towplane. Once airborne, the cable can then be let out until the target is at a safe distance for practice attacks. No difficulties have been experienced with this technique and test pilots report that even with the target in tow, the CF-100 climbs away at about 5,000 fpm.