



Air Show into a true trade show. Some arrangement would also have to be made whereby aircraft of all sizes could be properly displayed on the ground. Lack of such facilities is the one serious weakness of Toronto's Exhibition Park, where the shows have been held for the last several years. The Park is otherwise ideal, its waterfront providing an excellent stage for the flying program (though landplanes cannot demonstrate landing and take-off performance . . . of prime interest to trade audience), while the Exhibition buildings house the Canadian International Trade Fair, which has for the past two years featured an aviation section.

Strong Support: This year particularly, the aviation section has provided very strong ground support for the air display (*Aircraft* photos of

An International Air Show

*Listen to the whistle
Hear the rumble and the roar**

THE SIGHT and the sound of the first Canadian International Air Show are now but fading memories. At the same time, because first impressions are often somewhat blurred by the shortened perspective of the moment, the weeks that have passed since the conclusion of the Show have usefully brought it into sharper focus, enabling a more objective assessment than it is possible to make during the first hot flashes of enthusiasm.

Here and now, we would like to say—with some reservations—that the 1955 edition of this annual event was a success of some proportions. It was without doubt a considerable improvement over the four previous "National" air shows, though it has far to go before an impartial observer can honestly class it with Farnborough or a Paris Salon, a comparison that the Canadian show's publicists insist on making with irritating regularity. Attempts to puff it up in this manner are premature and may retard its acceptance in industry circles.

Possibilities: This is not to say that this Canadian show does not have dis-

tinct possibilities of becoming the equal of either one of the two European displays, with all the associated prestige, but before this comes about, the Canadian organizers will have to decide whether they are planning a trade show (such as those at Farnborough and Paris), or simply an air spectacle flavored to the popular taste. At present the show leans hard toward the latter and there is a definite "show biz" atmosphere in evidence, heavy emphasis being placed on "screaming jets" and other promotion vehicles of the razzle dazzle trade.

There is no doubt that this approach draws the public in large numbers (estimated attendance this year was 150,000), but it is of dubious appeal to either the native industry or those of foreign countries. The fact that the participation of even the Canadian industry has never been as complete as it might be, is to us an indication that some companies are not clear as to just what type of a show they are being asked to enter. If it were first and foremost a trade show, few companies would care to refuse to participate.

Of course, there is also the problem of attracting a trade audience, a formidable task that would have to be undertaken if the decision were made to turn the Canadian International

many of the booths making up this section appear on the following pages). The 1955 Trade Fair ran from May 30 to June 10, and the International Air Show was held on Saturday, June 4, this timing being selected so that exhibits would be open for inspection for several days both before and after the flying program.

The future of the Trade Fair is uncertain at the moment, the Canadian Government having announced that it is withdrawing its support. There is some possibility that the Ontario Government may take over, but failing that, it appears that the Fair will have to close down, a step that would be detrimental to the International Air Show.

So much for comment and speculation about the Air Show in all its phases; now, on with the flying display.

in the air

THEY WILL be talking for some time about Ladislav Svab, the 42-year-old test pilot for the Motokov company of Czechoslovakia, whose handling of a Zlin 126 two-seat tandem primary trainer (vaguely reminiscent of a Cornell) was the high point of the day's flying, much to the delight of the several Russian observers in attendance. In fairness to the other

*Adapted for aviation use from, and with apologies to, "The Wabash Cannonball".

pilots who took part in the display, it should be pointed out that Mr. Svab's masterly performance involved heights and attitudes that must have made the DoT blanch. On the other hand, the other flyers adhered to the DoT's limits in letter, though probably not in spirit. But more about Mr. Svab's performance later.

The weather was warm and fine with light winds from the west—it was almost still at times—though it would have been an improvement if there had been slightly less cloud. Most of the afternoon there was an almost solid stratocumulus cover, though this opened up occasionally to let through a few streaks of sunlight that was somewhat weakened in any event by a high thin layer of cirrocumulus.

The flying display opened at 2.00 o'clock with a mass flypast of jet aircraft, fifty in all. First came 16 Sabres followed closely by 16 T-33's, with 18 CF-100's bringing up the rear. As this impressive formation of Canadian-built and largely Canadian-powered aircraft moved off to the east, two Sabre 5's moved in from the west, one flying with everything down at the bottom of the type's speed range, while the other cracked by at high speed, passing its slow-moving partner directly in front of the bleachers.

Chipper Chipmunk: This demonstration of Sabre speed range was succeeded by a chipper performance in an RCAF Chipmunk by F/L Doug Byng. This flyer's repertoire included a precise cloverleaf comprising four loops, each one of which involved a roll of 90° while on the downward side. This effectively altered direction so that each time the Chipmunk entered a new loop, it did so on a course 90° from its previous one. F/L Byng concluded his display with an inverted flypast.

Next on stage, from the east wing, were two RCAF P2V-7 Neptunes. These bold and blue aircraft made two flypasts, east to west, then one returned from the west, heading towards the bleachers at about 45°, breaking sharply some distance offshore and immodestly showing its belly to 150,000 gaping spectators.

Two RCAF Harvards moved in at this point to snarl and roar and snort through a fine demonstration of synchronized aerobatics.

After the Harvards flew off, two Cansos came out of the east in a slow flypast at about 200 feet, circled 360° and landed in front of the crowd,

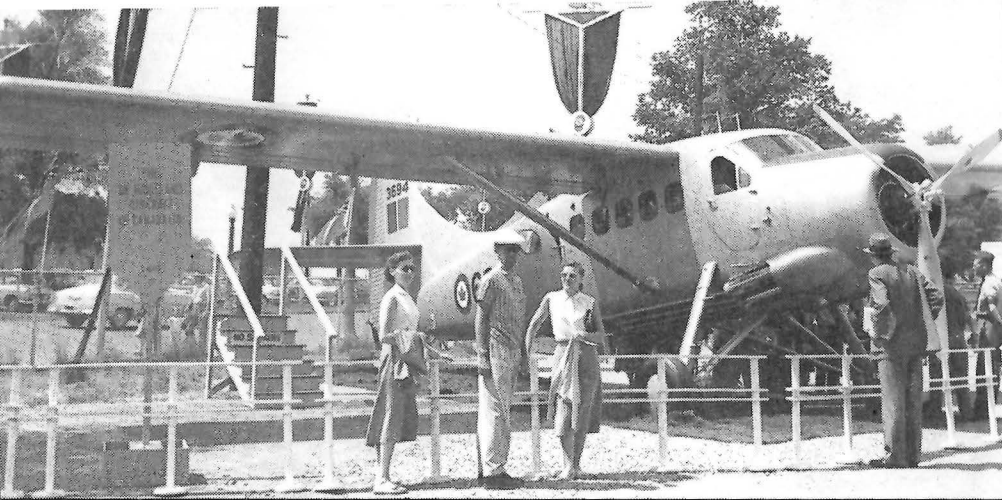


RCAF Piasecki H-21 does its nimble best for an appreciative audience.

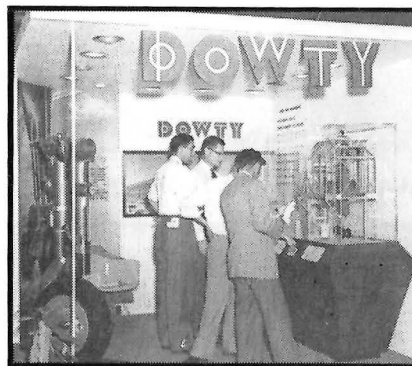


GOVERNOR-General's race winners, L to R: C. Moore, 4th; Ford Auburn, 1st; Mrs. D. Rungeling, 3rd; J. Williams, 2nd. Below is the Bristol Sycamore.

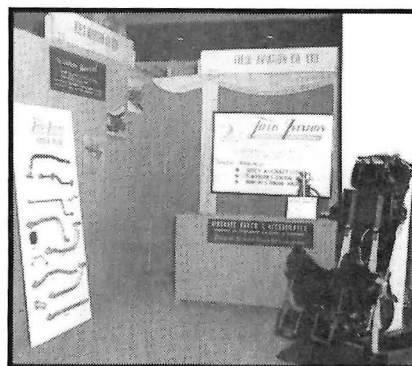




Among the Trade Fair outdoor exhibits was this combined RCAF/de Havilland Canada display, which featured a search & rescue Otter. Below, left, the Canadian SKF stand had an attractive backdrop made up of Sabre and CF-100 models before a moving background. Full line of SKF bearings was shown.



Above, right, Dowty of Canada showed cutaways of CF-100 main and nose landing gear legs, as well as a model of its new 175,000 lb. drop test rig. Below, left, main items of interest at the Field Aviation booth were a display of tube bending and a Martin-Baker seat fitted with GQ harness.



At right, Canadian Steel Improvement booth displayed samples of forgings and castings produced in its Etobicoke, Ont., plant. Below, Lucas-Rotax showed wide range of equipment, including high altitude fuel system, high altitude generating system, cutaway fuel pump, turboprop electric system, etc.



settling ponderously into the lake's still waters, snouting in till it appeared that they were going to submerge completely. Each turned 180° to paddle slowly back to a suitable starting point for take-off. The two boats took off simultaneously, the far one firing its Jato bottles as it got on the step and storming into the air with the out-of-character alacrity of a cow departing from the vicinity of an electrified fence. By the time the other Canso had broken free of the water, its invigorated partner was some 300 feet in the air.

Sideways: With a final flypast by the Cansos, during which one fired its Jato bottles in demonstration of their acceleration powers, an RCAF Piassecki H-21A sidled shyly on stage. The big twin-rotor machine curtsied cooly three times then moved over the lake to an Air Force rescue launch, from which it hoisted an alarmingly limp looking airman. Coming back close to the crowd, it moved sideways along the waterfront, spun like a girl showing off a new dress, and danced and bobbed up and down from just above the water to about 100 feet in the air. At the conclusion of the H-21's lighthearted performance, it landed on the boulevard to the right of the bleachers.

An amphibious Beaver made a high-speed flypast from the east, did a 180° lowered its wheels on the downwind leg, turned 180° again and flew by to show off its unique dual purpose landing gear. It circled again, meantime retracting its wheel gear, then did a touch & go landing inside the breakwater. DH Canada's George Neal, the pilot, finished off his performance by demonstrating the maneuverability of his mount over its speed range.

Enter the USN Reserve as represented by two P4Y-2 Privateers and four escorting Corsairs. The Privateers did a couple of flypasts on their own while the Corsairs peeled off and flew off over the lake, presumably to collect their thoughts before returning for a line astern pass and a somewhat straggly simultaneous roll. The four fighters then reformed in box formation, circled and again changed formation, making a high-speed pass in finger four at about 40 feet.

The USNR was further represented by four F2H-2 Banshees that did two flypasts, the first from the east in finger four, the other from the west at about 100 feet in line astern.

Water Baby: Fresh from a successful engagement at the USN base at Norfolk, Virginia, came the next performer, a Martin P5M-2 Marlin, a platypus-nosed anti-submarine boat of chunky physique. The Marlin landed for a demonstration of its superb water-handling qualities, which are attributable to some degree to its reversible propellers, as well as to hull design.

At this time the show picked up some speed with the arrival of four USAF F-86D's, these flying by in finger four. While one of the D's flew off to we know not where, the remaining three did a 360° somewhere off to the west and returned in echelon left. Then another turn and a high speed pass in line astern cataclysmically cutting in their afterburners while directly over the crowd at about 75 feet. They were gone in a rush of violence, their red-eyed tailpipes winking and blinking as they disappeared to the west in a rapid climb.

With the hasty and noisy departure of the "Dogs" a float-equipped Otter flown by DH Canada's Russ Bannock appeared on the scene, the distinctive bark of its exhaust providing strange contrast with the overwhelming roar of the preceding D's.

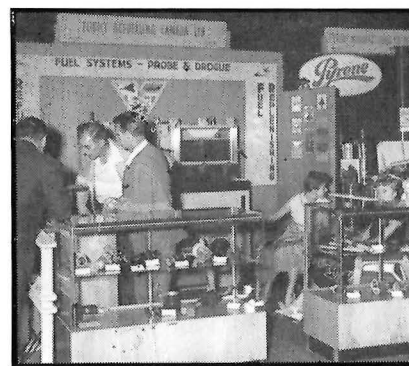
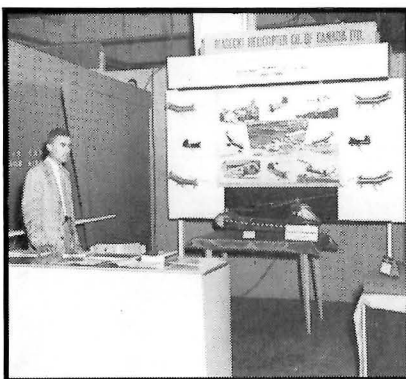
The Otter circled tightly in front of the bleachers then flew by at about 40 mph., rocking violently in demonstration of its low-speed controllability. It circled again and landed, then took off once more, all in commendably short space.

Wet Landing: The presence of a Bristol Sycamore flying in from the east at about 2,000 feet was at this time brought to the audience's attention by the commentator. As the Sycamore reached a point directly in front of the show area, the black form of a parachutist, Glen Masterson, tumbled out. The jumper fell free for about 500 feet, then released his parachute, his descent decelerating rapidly as the orange and white canopy filled with air. As Mr. Masterson entered the chilly waters of Lake Ontario the RCAF rescue launch scurried over to pull him out.

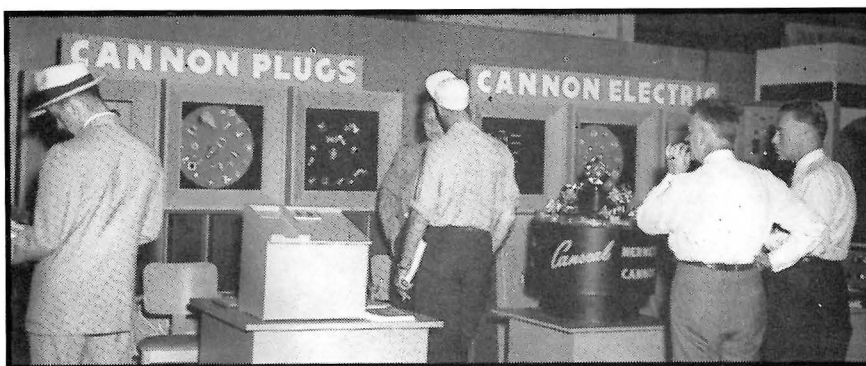
In the meantime the Sycamore had descended and did a high-speed flypast from the east at about 150 feet, turned and did a low-speed run from the opposite direction. Its controllability was impressively demonstrated in a series of maneuvers in front of the crowd, but a feature that was particularly noticeable was the comparatively low noise



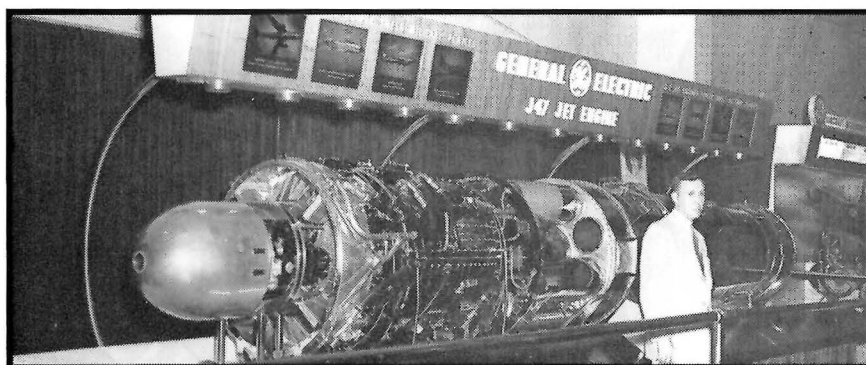
Focal point of the Czechoslovakian Trade Fair exhibit was this Motokov Aero 45, a twin-engined five-place light executive transport. Also included in this display were a two-seat training glider, the Pionyr, and two Walter four cylinder aircooled engines, the Minor 4 and the Mikron III.



Above left, the Piasecki Helicopter Co. of Canada Ltd. featured models of three of its parent company's production helicopters, the H-21, the HUP, and the H-16. At right, Flight Refuelling (Canada) Ltd., demonstrated the operation of its ground refuelling nozzle, with the aid of a transparent tank.

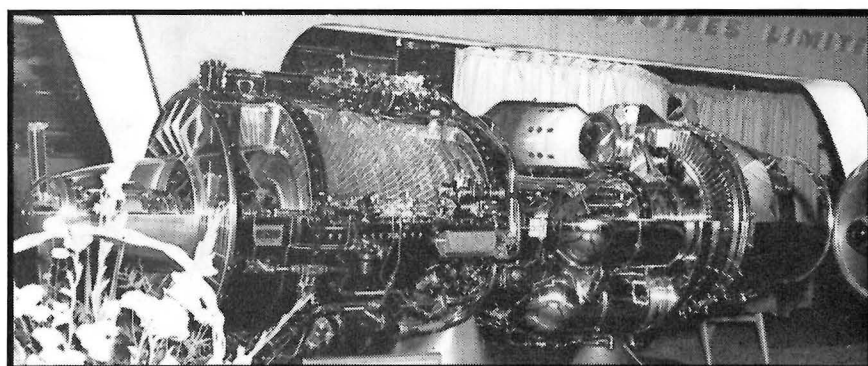
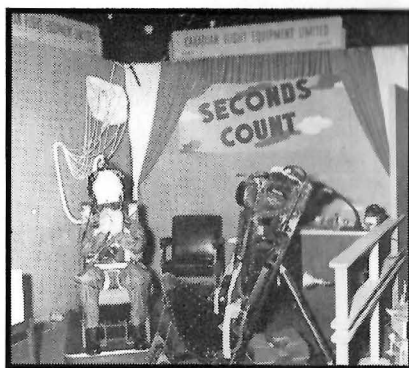


Above, Cannon Electric (Canada) Limited, showed its full line of plugs, quick disconnects, and electrical connectors of all types. Below, the General Electric stand had a colorful full-scale cutaway of a J-47 turbojet. Also shown was a selection of GE's line of aircraft accessory turbine products.

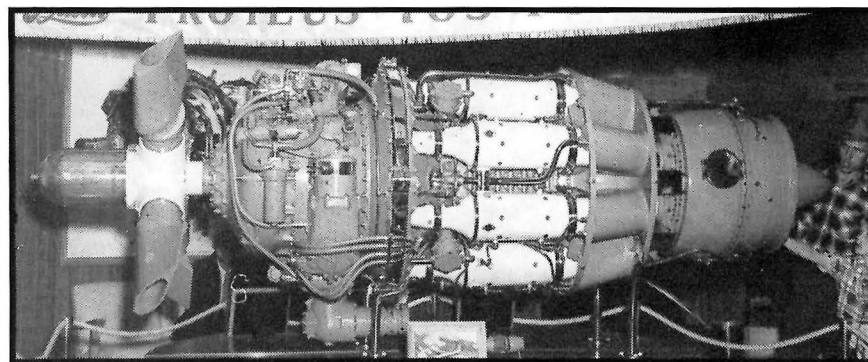




Above, left, Avro Aircraft had on display the CF-100's gun pack, complete with six .50 machine guns and ammunition cans. Avro Aircraft also showed a static test rig representing complete electrical system of the CF-100/4. At right is the Canadian Flight Equipment exhibit featuring the Martin-Baker Mk. CF-2 automatic ejection seat as made in Canada under license by CFE.



Above, Orenda Engines showed a fine cutaway Orenda 11 (two-stage turbine), as well as the earlier Avro Canada Chinook. Below is the Bristol Proteus turboprop which was one of the centres of attraction at the big Bristol of Canada exhibit. Bristol also showed models of Types 171 and 173 helicopters.



Below, left, Aviation Electric displayed a number of aircraft items of its own design and manufacture, as well as the products of some of its principals, particularly Bendix. Right, Bata Engineering exhibited the components of the CF-100 undercarriage system on which it carries out machining operations.



level of this member of the species helicopter.

While the Sycamore was still strutting its stuff, all eyes were attracted by two USNR F9F Cougars which flew by streaming smoke from their wingtips. These same two aircraft had earlier in the day flown the 461 miles from their Chicago base to Malton in 42 minutes. The two Cougars followed their opening pass with a second one, somewhat lower, pulling up and rolling as they climbed away to the east. They returned one at a time, each cutting in its wingtip smoke generators as it passed the crowd, then going into a series of climbing rolls that twisted the streaming smoke like trailing ribbons. More high speed runs and rolls, back and forth in loose formation, and finally climbing away to the west, rolling continuously, frequent distant flashes of reflecting sun denoting that they were still rolling although the aircraft themselves were no longer visible.

At this point on the program, a USAF B-47 was scheduled to put in an appearance, but air show control was unable to establish contact. Some time later it was learned that the B-47 had had to return to base without visiting Toronto. To fill the gap, it was announced that a Bell 47H would perform, but after a long delay it became obvious that the Bell was temporarily not available.

Scene Stealer: Over the loudspeakers now came a somewhat condescending introduction to what turned out to be the pièce de résistance of the air show. On stage flew Ladislav Svab in his Zlin 126 (civil version of the Zlin 26, a standard primary trainer used by the Czechoslovakian Air Force and powered by a Walter Minor 4, a four-cylinder engine of 105 hp).

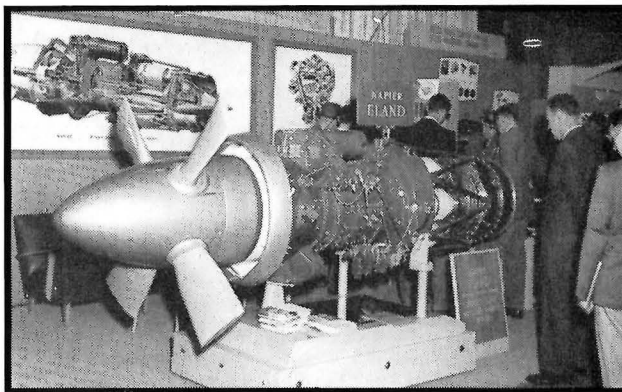
Mr. Svab flew along the waterfront, pulling up into a loop, reversing at the top by climbing over in the second half of an outside loop. His flight path, viewed from the side, took the form of a vertical S. Returning once again, he flew inverted, eventually regaining normal attitude by flying half-way round an outside loop, ending up with a gain in altitude of about 100 feet and flying in the opposite direction, sort of a reversed Immelman.

Aircraft and pilot seemed to be most at home when flying inverted, judging from the amount of the demonstration that was carried out in this position.

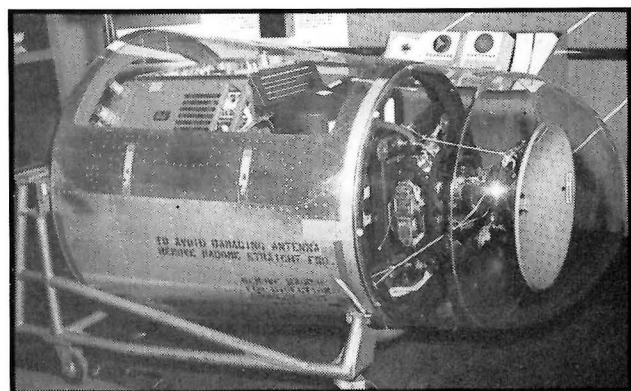
(Continued on page 65)



Effective use of models was made by Fairey of Canada, these including a cutaway Avenger, Fairey Gannett, Sea Fury XI, Gyrodyne, Fairey VTO and a cutaway Lancaster.



The display of D. Napier & Son included a trim show model of the Eland turboprop and, among other Napier products, an interesting model of the Oryx gas generator.



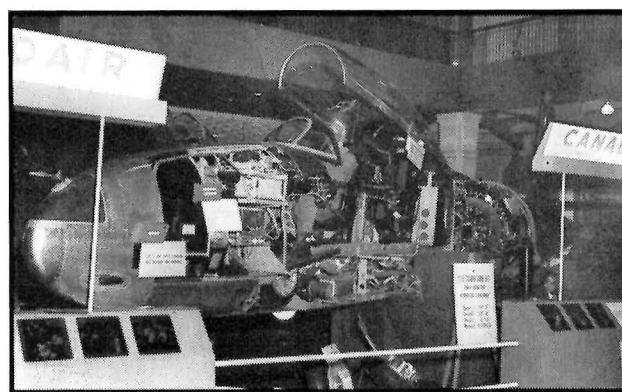
Main item of interest at the Hughes Aircraft display was the cutaway nose section of a CF-100 (above) showing the Avro Aircraft fighter's complete radar fire control system.



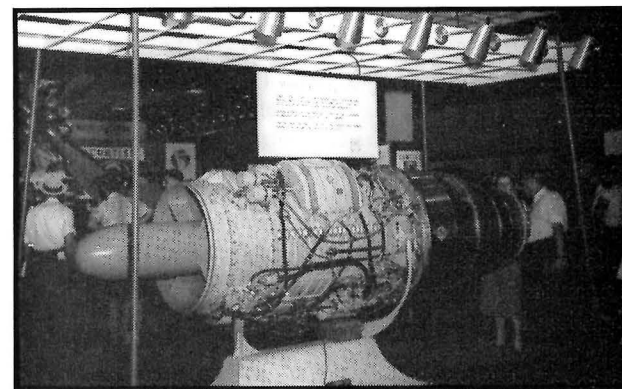
PSC Applied Research (above) displayed items of its own design & manufacture, including Ice Detector & Probe system, armament intervalometer, instrumentation camera.



Above, Fleet showed models of Doman-Fleet LZ-5, Courier lightplane, also radar components. Below, Standard Telephones & Cables showed range of radio equipment.



Above, Canadair featured fullscale cutaways of Sabre and T-33 fuselages. Below, Curtiss-Wright's J-65 turbojet was shown along with a Cyclone Turbo Compound engine.



approach is the only valid method of acquiring knowledge about reality. Eminent men of science are insisting, with what seems a strange enthusiasm, on the fact that science gives us but a partial knowledge of reality, and we are no longer required to regard as illusory everything that science finds itself able to ignore."

So in the aeronautical field, the very important place of science in the scheme of things is slowly coming to be recognized. On the other hand, there is also a slow realization that the aeronautical philosopher, too, has his stand. There is, of course, no final and simple answer to the amount that each must give and take. But as the pendulum gradually regains its central position, each will contribute and each will recognize the other's contribution. Then such air power philosophers as Seversky can no longer complain that there are too many scientists setting up shop as air power strategists, and such eminent scientists as wartime's Vannavar Bush can no longer complain that there are too many air power philosophers who are scientifically irresponsible. When this time arrives we can say with von

Keyserling, "Philosophy is essentially the completion of science in the synthesis of wisdom."

AIR SHOW

(Continued from page 20)

There was a perfect 360° turn, inverted; a perfect 360° turn, starting inverted and doing rolls all the way around the turn; a slow flypast, inverted, with much waggling of the wings to show controllability under these circumstances. Mr. Svab's final pass was also inverted and at such a low altitude that it appeared to us that if he had attempted to roll out he would surely have gone in the water, so he simply slowly climbed away, inverted, to an altitude of about 1,000 feet. We must confess that so long was the time it took him to climb 1,000 in this attitude that we began to think that for some reason he was unable to roll over and planned to land upside down. After this incredible display of flying, nothing would have surprised us less. In tribute to Mr. Svab's skilful exhibition, the crowd several times broke into spontaneous bursts of applause.

Two at a Time: The Bell 47H now put in its appearance, and at the same time a Grumman S2F painted in RCN colors made a high-speed flypast from the east. While the S2F momentarily disappeared, the Bell proceeded to lower itself gingerly until its pontoon-type universal landing gear rested on the top of the breakwater, which is simply a concrete wall, quite narrow at top, and projecting only about one foot above the surface of the water. While in this position, the Bell rocked back and forth several times, then lifted off to do a fast flypast followed by a slow one in the opposite direction, and finally, a backward flypast.

The S2F returned, flying by at about 100 feet with its starboard engine feathered. Its final flypast was made with its MAD tailboom and its "dust-can" extended.

The last solo performance of the day's flying was a flawless display in a CF-100/4 by Avro Test Pilot Glen Lynes, who opened his contribution with two loops that started and ended at about 100 feet. A near-vertical dive built up speed for a flat-out pass at low level, this being repeated from the opposite direction, and a vertical climb-

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out, rolling all the way up. Returning to the waterfront from the west, he did a slow roll at about 100 feet, one-eighthed somewhere off to the east and came back for a high-speed run, again climbing away vertically doing a series of rolls, first to the left and then reversing to the right, eventually reaching a height of some 10,000 feet. Mr. Lynes performance was concluded with an inverted flypast at about 100 feet.

Grand Finale: From the west came a flypast of 16 aircraft, led by four CF-100/4's and including four each of Sabre 5's, T-33's, and Vampires. As these passed before the crowd, three other Sabres appeared in the distance over the lake, flying head-on at the bleachers. When approximately a mile off-shore, the three aircraft pulled up steeply into a sky-high Prince of Wales, this spectacular maneuver signifying the end of the flying display.

Considered on an overall basis, the display was of a very high order of excellence. Getting down to details, it seems to us that an Air Show of the stature of this one could get along very well without Harvards, especially when there are such glaring omissions on the program as the Viscount and the T-34. The Harvard certainly deserves all the honors that can be heaped upon it, but let's face it, the only souls who haven't seen one of these venerable machines do aerobatics by this time are the members of unborn generations.

TECHNICAL MEET

(Continued from page 35)

Canadian engineer training as "one-legged." Not enough attention was being paid to the technicians or the practical side, he claimed. The European style was to spend time in the shops, and in this way the embryo engineer got an intimate knowledge of fabrication and production tools. He also got an opportunity to get acquainted with labor in a way that was not possible when he gets older.

Professor G. N. Patterson, head of the University of Toronto's Department of Aeronautical Engineering, took the floor briefly to say that the answer to the engineer shortage was the dollar sign. "Give us the money and we'll turn them out."

Prof. Loudon, in his summation as chairman of the panel, said that it was evident there must be more co-

operation between industry and university at all levels of training.

Annual Dinner: Following the conclusion of the first day's sessions, the Institute held its annual dinner in the Concert Hall of Toronto's Royal York Hotel. The principal speaker was Dr. T. P. Wright, Vice-President for Research at Cornell University, who chose as his topic, "Aircraft Design Possibilities of the Future."

At the conclusion of Dr. Wright's address, the stage was set for the pre-



MISS AWA: As winner of the beauty contest staged at the recent annual convention of the Aviation Writers Association, Miss Mary Harrison of Malton, Ont., will receive a free round-trip to Bermuda when BOAC inaugurates Viscount service from New York this coming autumn. Miss Harrison is employed by Orenda Engines Ltd.

sentation by the Hon. J. A. D. McCurdy of the McCurdy Award, which went this year to Merlin W. MacLeod of TCA.

It was also announced at the dinner that the CAI had decided to commemorate the late Dr. W. R. Turnbull's early work in the field of aeronautics, particularly on variable pitch propellers, with a "W. Rupert Turnbull Memorial Lecture," to be delivered annually at a meeting of the Institute. The lecture will be given alternately by Canadian and suitable foreign speakers.

on paper

A NUMBER of outstanding papers on such phases of aeronautics as manufacturing, aerodynamics, and operations were given

during the final day of the two-day assembly. These papers, copies of which are available from the CAI in Ottawa, were as follows:

Manufacturing: (Chairman, J. W. R. Drummond, Canadian P & W); "The Economic Production of Jet Engines in Canada," by E. K. Brownridge of Orenda Engines; "Economy of Tooling," by R. J. Higman of Canadair; "Titanium Alloys for Aircraft," by H. V. Kinsey of the Department of Mines & Technical Surveys.

Aerodynamics: (Chairman, Dr. D. C. MacPhail, National Aeronautical Establishment); "Aerodynamic Studies in the CARDE Aeroballistic Range," by Dr. G. V. Bull of the Canadian Armament Research & Development Establishment; "An Electrical Analogue for the Calculation of the Wave Drag of Slender Bodies," by P. J. Pocock of the NAE; "A Repeating Parachute," by H. T. Stevinson and Dr. P. Mandl of the NAE; "Lift and Lift Distribution of Wings in Combination with Slender Bodies of Revolution," by Dr. H. J. Luckert of Canadair.

Operations: (Chairman, D. N. Kendall, Photographic Survey Corporation); "The Human Engineering of Aircraft Instruments & Controls," by R. E. Nethercut of Minneapolis-Honeywell; "The Helicopter, Present and Future," read by J. C. Charleson, managing director of United Helicopters and Canadian Helicopters, on behalf of A. Stringer of Okanagan Helicopters, parent company of the other two firms; "Aerial Survey Operations," by J. Fleming of Spartan Air Services.

AIR TRAFFIC CONTROL

(Continued from page 41)

tion for the safe and efficient completion of flight. Before the commencement of flight, or while enroute, information collected by area control centres through their extensive interphone, radio and teletype communications systems and from other flights in their areas, is made available to pilots.

Information such as current or forecast weather conditions, the serviceability of radio navigation facilities or communication facilities, and information regarding the aerodrome conditions are, in this way, readily available to any pilot planning a flight in Canada.