

also, we were informed, but was similar to what would be available to purchasing operators. In this particular airplane, the seat cushions were upholstered in a gold-flecked rust material, while the seat backs were covered in dark green fabric which matched the floor carpeting. The side-walls and overhead were covered with a light gray plastic having a simulated weave.

Also definitely non-standard equipment was the pair of blonde stewardesses brought along by Sud Aviation to minister to the wants of the Caravelle's passengers. Eleven am is no time of the day to look down and see on a tray before you a glass of golden bubbly champagne; to hear a husky voice with a hint of Montmartre in it whisper "M'sieu?"; to look up and be impaled, floundering, on twin shafts from a pair of blue eyes that were indubitably fashioned in the depths of the Mediterranean. All this is too much for one mere man at such an hour; so disconcerting in fact that it is difficult to remember that the Caravelle:

- Has a strikingly rapid take-off and steep climb-out (T/O weight in this case was 83,000 lbs.), and reached 10,000 ft. in 6 mins.; 20,000 ft. in 16 mins.; 29,000 ft. (cruising altitude) in 33 mins. At all-up weight it can take off in 5,500 ft.

- Is powered by two Rolls-Royce RA-26 Avons of 10,000 lbs. th. each, to be replaced in production Caravelle's by RA-29's rated at 11,700 lbs. th.

- Is the quietest airliner, or powered airplane of any kind, in which we have ever flown.

- Flew the 345 miles between New York and Montreal, ramp to ramp, in 52 mins., at an average speed of 400 mph. Tail wind component was 22 mph and the highest cruising speed attained was 467 mph. Advertised speed range is 475-515 mph and cruising altitude between 20,000 and 40,000 feet.

Comment should also be made on the ability of the Caravelle to descend rapidly without excessive air speed. Spoiler type air brakes make possible high rates of descent in safety; during flight trials, rates of descent as high as 12,000 fpm were recorded. Normal operational rate is 4,000-6,000 fpm.

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Boosting Brainpower at Avro

To accommodate its accelerated research and development program in supersonic aircraft and allied fields, Avro Aircraft has installed and recently put into operation a powerful new electronic computer at its Malton, Ont., plant.

It is the IBM 704 electronic data processing machine. Described as being the latest and most powerful digital computer now available to industry for scientific applications, the 704 is said to be equivalent in calculating and problem solving power to "3,000 tireless, perfectly organized and trained engineers."

Avro is using the 704 to solve mathematical problems on its supersonic fighter, the Avro Arrow, resulting from analytical work in aerodynamics, structural analysis, structural load, vibration and flutter, weight control, flight control and aircraft guidance, fire control, etc.

At the heart is a high speed magnetic core storage unit consisting of 4096 locations, each of which can accommodate up to slightly more than a ten-decimal digit number, or combinations of numbers, letters and words. The information stored in any one of these locations can be located and put into use in 12 one-millionths of a second.

From the central control desk, the machine is directed, for example, to multiply the figure stored in one place by the figure stored in another. The work is done in a section called the arithmetic unit. The answer comes in one of three ways:

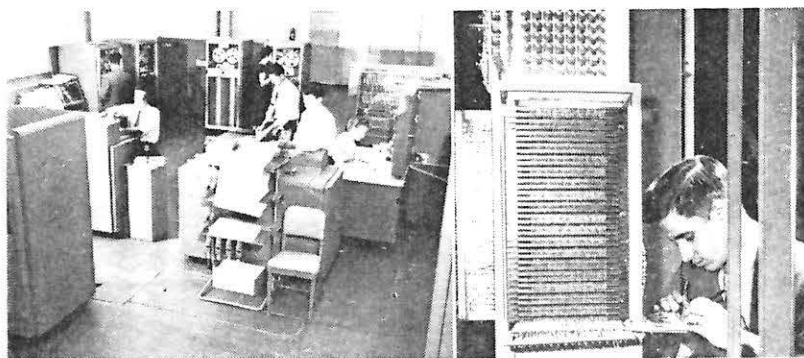
punched cards, magnetic tape or in printed form.

The 704 can execute 70% of its internal operations at the rate of 41,700 per sec. and can make about 10,000 arithmetical operations per sec. while automatically keeping track of the decimal point. In one second it can perform 40,000 additions or subtractions or 5,000 multiplications or divisions of ten-digit numbers.

Commenting on the 704, J. C. Floyd, Avro's vice president, engineering, notes that . . . "the speed and capacity of this computer makes it possible to free engineers and key technicians from a mass of repetitive work so they can spend more time on creative design problems.

"For example," Mr. Floyd says, "in just 22 seconds the 704 can solve 30 simultaneous equations involving 54,000 multiplications and the same number of additions. Using a desk-type computer, an engineer working at top speed and never making a mistake would have to keep going 24 hours a day for 13 days to do the same job.

"Many of the results we can now get through the 704 we could not have attempted to obtain a few years ago. Thousands of mathematicians would have been required. In confirming through mathematics the theories and calculations of our engineering staff, the 704 considerably reduces the number of 'unknowns' before a project ever takes to the air."



Above L, general view of computer; console on right, printer unit in foreground, tape units in rear. R, magnetic core storage unit being checked. Below L, the staff of 30 required to run the computer. Right: on right is console where computation progress is monitored. The mass of wiring on left is the central processing unit which controls all operations.

