

equally, with Western building the radars, command and control trailers, and various miscellaneous gear, while Douglas was responsible for the missile airframe, launcher and control equipment. Since Nike is one of the earliest missiles in the Western World to go into service, there is no doubt that this integration of the industry was a resounding success.

This Bell, Western Electric and Douglas type of merger is not a permanent business structure. Instead it is a team assembled to complete a particular project. Our aircraft industry, including the engine and equipment manufacturers, have not, in general, grasped this idea when it comes to proposing a new civil or military airplane. The thinking in the airplane world runs more to the building of permanent business structures by corporate mergers. Canadair Ltd. in Montreal is a part of the General Dynamics Corporation. And A.V. Roe Canada Limited in Toronto is not only a member of the British Hawker Siddeley Group, but has been busily building its own Canadian corporate structure.

Mining to Jets: I was talking to E. G. Mahoney, manager of the Ottawa office of Avro Aircraft Limited. He told me that "the A.V. Roe Canada organization now includes 42 subsidiary companies." These vary all the way from mining coal to designing and producing intricate jet engines and equipment. The aeronautical division of the corporation is headed by Vice President Fred T. Smye. It includes Avro Aircraft, Orenda Engines, Canadian Applied Research, and Canadian Steel Improvement. Only the future will tell whether this type of perma-

nent organization will band together with others to come forward with an integrated design proposal for some new military or civil air system. To date they have shown little tendency to do so. In fact companies that have an aircraft division and an engine division, such as the Bristol Aeroplane organization in the U.K., have been notorious for their lack of integration even when they've been embroiled in the same project. For some reason aircraft divisions tended to work far better with an independent engine manufacturer.

In the U.K. the government has adopted a definite policy of trying to get these aeronautical organizations together. As Minister of Aviation Harold Watkinson said recently, "Both the Minister of Supply and I feel that a policy of merged effort should be encouraged and we shall exert whatever influence we can in this direction in placing future orders." His words were directed at the corporate struggle that had been going on in England as both Bristol and de Havilland tried to land a contract for a new jet transport.

The story began when British European Airways issued a requirement for a 100 passenger, 1700 mile range jet airliner. To keep their fleet modern BEA had previously ordered some Comet 4's as an interim measure. Now they wanted a new jetliner for operations commencing about 1964. When the specification for the new transport was sent out, four British companies, Vickers, Avro, Bristol and de Havilland submitted design proposals. The Government was particularly keen that the project should be financed from company funds. None of the firms felt that they could risk their finances on

this venture. So the project remained dormant.

Tri-Motor: Bristol's had proposed a tri-motor jet, with the engines mounted close to the tail. This was the Bristol 200. The Hawker Siddeley Group looked over the proposal and decided that they would plunge into the contractual pool with Bristol. So it was subsequently announced that a separate company would be formed by the two organizations for the single purpose of designing and building the Bristol 200. Hawker Siddeley, backed by capital and reserves of some \$157 million would own 65% of the new corporation, and Bristol, with capital of \$45 million, would have 35%.

An impressive Board of Directors was lined up with representatives from Bristol's, Hawker Siddeley, and Short and Harland, associate producers of the Bristol Britannia. Sir Arnold Hall, former head of the Royal Aircraft Establishment, would be the managing director, and Dr. A. E. Russell, technical head of Bristol's would be the Chief Engineer. Apparently the company would only materialize when they were assured of an order. Since the de Havilland design was being rumoured as being the BEA choice, the skeleton Bristol-Hawker Siddeley group lost no time in looking into other markets. E. Burns, Ottawa representative for Bristol Canada told me last month that Dr. Russell and a team from the group were going around the U.S. carriers to see what interest they could arouse for the Bristol 200.

De Havillands solved their financial problem by teaming up (67½% interest) with the Hunting Group (22½%), and Fairey Aviation

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The missile industry pioneered in product development by integration of effort, with such successful results as that shown below. Sequence photos record January 10th launching of an Atlas ICBM from Cape Canaveral, Florida.

