New Jet Engine Project Takes Off

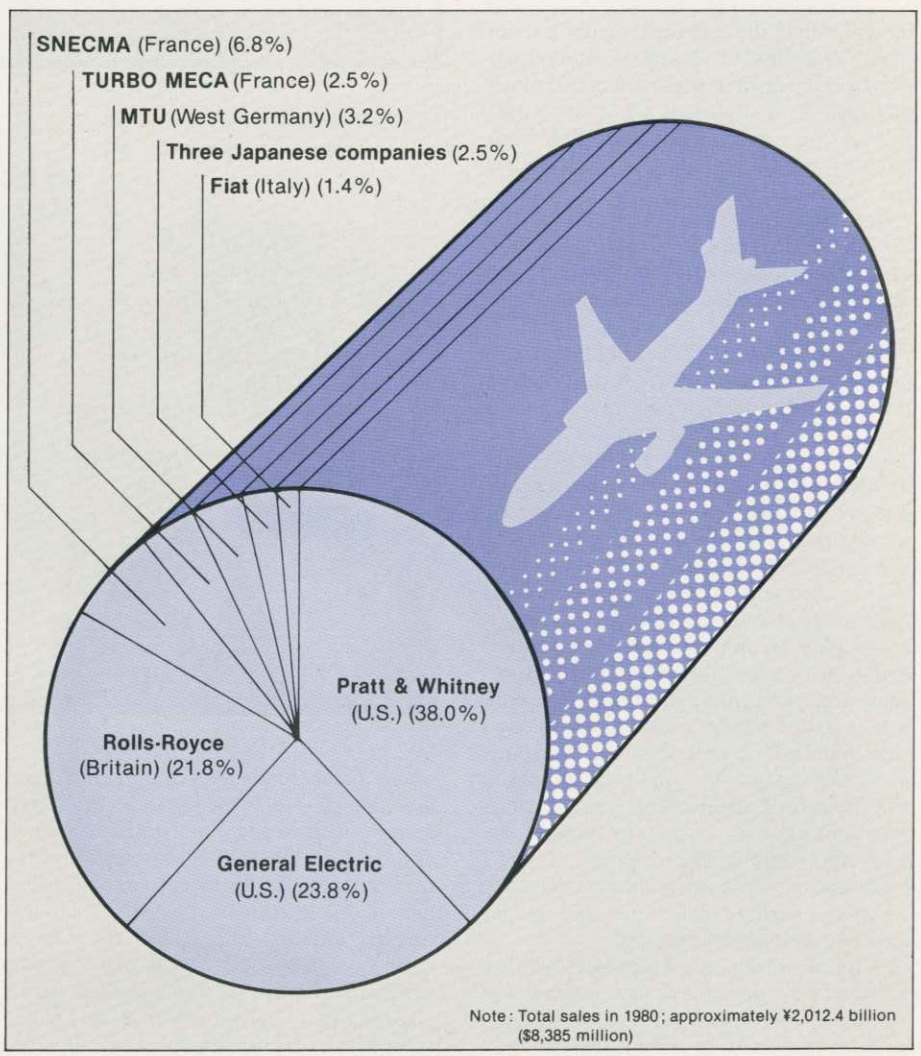
By Takeshi Kojima

An international project to develop a new fuel-efficient, low-noise jet engine has just got underway among seven companies from five countries—Japan, the United States, Britain, West Germany and Italy. The engine will be designed for 150-seat commercial passenger planes, the demand for which is expected to be between 2,000 and 3,000 units from the late 1980s to the 1990s. The project, which entails a total development cost of more than ¥300 billion and involves high risks, received the green light in March 1983, when agreement was reached between two long-standing rivals—P&W (Pratt & Whitney) of the United States and Rolls-Royce of Britain. Also, MTU of West Germany, Fiat of Italy and the Japanese Aero Engines Corporation agreed to take part, the latter being made up of three firms, Ishikawajima-Harima Heavy Industries, Kawasaki Heavy Industries and Mitsubishi Heavy Industries.

The seven companies set up a joint venture, "International Aero Engines AG (IAE)," on December 16, 1983, and aim to obtain a type certificate for the new engine, V2500, in early 1988.

The Japanese companies will develop fans, low-pressure compressors and part of the high-pressure turbine. They will also undertake part of the engine assembly and test operations. The three Japanese firms together will have a 23% share of the total development work, compared with 30% each for P&W and Rolls-Royce, the world's two leading jet engine makers, which will lead the project. Thus the Japanese firms have joined the program on an almost equal footing with these two companies.

Sales Share of the World's Engine Makers



This will be the first time that Japanese jet engine makers have undertaken the development of a jet engine for commercial aircraft. The project, expected to be the last large-scale undertaking of its kind to be launched this century, has an added significance for the Japanese participants, as it is hoped that it will help them catch up with their American and European counterparts. However, the cost burden on the Japanese companies involved is heavy, even though a good part of their share—more than ¥70 billion—is to be financed by the government.

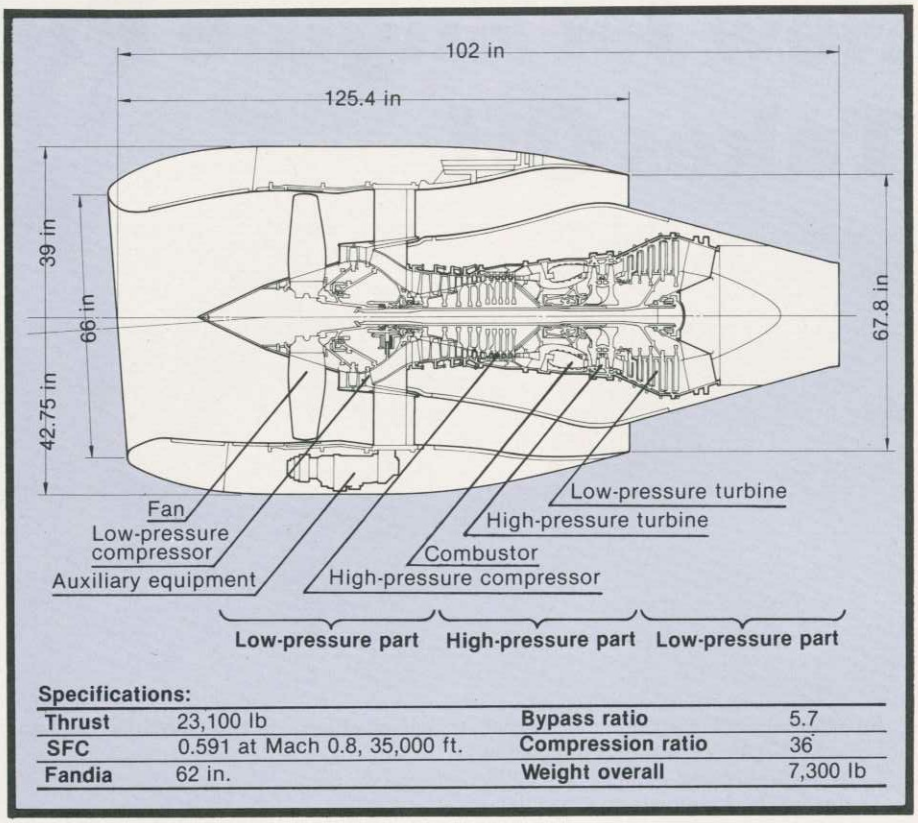
The Japanese firms, moreover, fall behind their Western partners in the field of technology. Consequently, technical guidance from P&W and Rolls-Royce will be necessary in engine assembly and test operation. Mitsubishi will introduce technology for chip clearance control from P&W to develop part of the high-pressure turbine. There is, indeed, a great deal of new technology to be acquired by the Japanese partners. This means that they will have to invest heavily both in engineering talent and new equipment. All this, of course, will require considerably large expenditures.

Furthermore, there is a view within the industry that the Japanese firms do not have the ability to undertake marketing, even though their work share is not much different from those of P&W or Rolls-Royce. This view reflects the fact that none of the three Japanese partners has the experience of selling engines to commercial airlines. It appears, therefore, that the Japanese companies can cooperate only in development and production, and only to an extent commensurate with their actual ability.

Yet the Japanese firms are planning to pour a vast amount of money and manpower into this project, because it is their cherished desire to develop the aircraft and aero engine business into a new leader among Japanese industry. The aircraft industry, including the manufacturing of jet engines, is a typical knowledge-intensive industry that makes products of high value added and has extensive technological spinoff effects. Therefore, it is expected to play an important role in Japan's evolution as a technology-oriented nation. However, development, production and marketing of engines and aircraft is a high risk undertaking that requires enormous investment costs. The universal approach to this kind of undertaking is to set up an international joint venture to spread costs and risks among the partners. Japan's basic aim is to boost its aircraft industry by participating such international jet engine development projects.

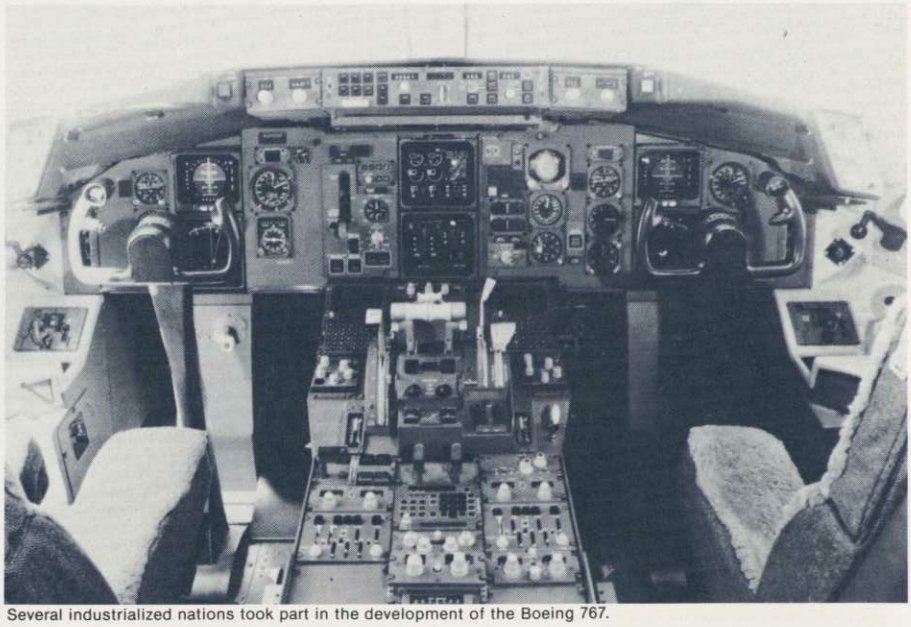
With a multinational project getting underway to develop a new engine, the world's aircraft makers now face the decision of whether to develop a 150-seat passenger plane that will be equipped with the new engine. Negotiations have been proceeding with Boeing, McDonnell Douglas and Airbus Industry in connection with the Japanese development project codenamed YXX (the next generation commercial aircraft). The talks are now in their final stage. If a joint development program with one of these makers materializes, Japan will be undertaking the development of both engine and fuselage. This will give a major boost to the aircraft industry in Japan. ●

Outline and Main Specifications of the New Engine



Specifications:

Thrust	23,100 lb	**Bypass ratio**	5.7
SFC	0.591 at Mach 0.8, 35,000 ft.	**Compression ratio**	36
Fandia	62 in.	**Weight overall**	7,300 lb



Several industrialized nations took part in the development of the Boeing 767.

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