JPRS L/9899

7 August 1981

West Europe Report

SCIENCE AND TECHNOLOGY

(FOUO 8/81)

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

APPROVED FOR RELEASE: 2007/02/09: CIA-RDP82-00850R000400040011-1

JPRS L/9899

7 August 1981

WEST EUROPE REPORT

SCIENCE AND TECHNOLOGY

(FOUO 3/81)

CONTENTS

NEW PROCESS DEVELOPED FOR SYNTHESIZING ZEOLITE

Milan IL MONDO in Italian 5 Jun 81 p 107

[Article by Riccardo Romani: "The Philosopher's Stone"]

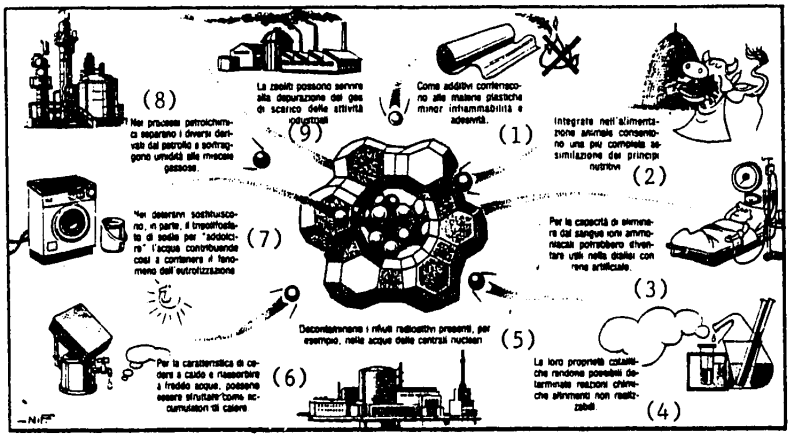
[Text] It is one of the most promising elements in chemistry. Today, zeolite is used to reduce eutrophication of water. But in future....

The development of a new synthesizing process will enable Ausimont (the former Industrial Products Divison of Montedison) to put on the market by next Fall thousands of tons of zeolite A, a sodium aluminosilicate destined to gradually replace the triphosphate necessary for making detergents and known as one of the complex of causes of the phenomenon of eutrophication of waters--that is, abnormal development of algae, which alters the ecological equilibrium of the river, lake or marine environment. The announcement of the successful outcome of the research and experimentation conducted on a preindustrial scale will shortly be made by Montedison and will be of interest to all the firms in the detergents sector, which, with annual production of 700,000 tons of detergents of various types, are involved in an annual business of more than a trillion lire in Italy alone.

The zeolites (from the Greek "zein" and "lithos," stone that boils) are minerals present in nature in volcanic zones and obtainable also by synthesis, using a material that is very abundant in Italy, especially in the deposits of volcanic origin of the center-south. Some hundred variants of them, from the chemical point of view, are known--half of them occurring naturally, albeit with different impurities, and roughly the other half obtained in the laboratory. Their cost varies from a few lire per kilogram (for the naturally occurring ones) to thousands or tens of thousands of lire, depending on the level of sophistication (the synthetic ones).

In any case, the most interesting property of zeolites, common to all of them, lies in their microporous molecular structure. In it, the crystals are disposed inside the mineral in such a way as to leave space for many cavities, connected with one another by a network of microscopic canals with diameter of a few tenths of a nanometer (a nanometer is one-billionth of a meter, and a tenth of a nanometer is, for example, the average dimension of an atom of matter). It is this mixed structure of canals and cavities of always uniform dimensions that gives the zeolites extraordinary possibilities of use. At present, they are used on the industrial scale to facilitate the reaction that leads to the production of styrene.

New Ways of Using Them



Key:

1. As additives, they give plastic materials lower inflammability and adhesiveness.
2. Integrated into animal feed, they permit more complete assimilation of the nutrients.
3. Because of their capacity to eliminate ammoniac ions from the blood, they could become useful in dialysis with artificial kidneys.
4. Their catalytic properties make possible specific chemical reactions that otherwise could not be achieved.
5. They decontaminate the radioactive wastes present in, for example, the waters of nuclear power plants.
6. Because of their characteristic of giving up water in heat and reabsorbing it in cold, they can be used as heat accumulators.
7. In detergents, they partly substitute for trisodium phosphate to "soften" water, thus helping to limit the phenomenon of eutrophication.
8. In petrochemical processes, they separate the various derivatives from petroleum and remove humidity from gaseous mixtures.
9. The zeolites can be used for scrubbing the exhaust gases from industrial activities.

But in Montedison's Milano-Bollate research center, the synthetic zeolites are being subjected to other research also, inasmuch as they seem to open up some entirely new pathways for organic synthesis: among others, the possibility of of making a return to carbon chemistry economically advantageous, facilitating the reaction which, by enriching the molecule of methyl alcohol with two or three carbon atoms will make it possible to produce ethylene directly from coal instead of from oil. Another important property of the zeolites is ion exchange--that is, fixing several metallic ions such as the calcium of water, replacing it with sodium, for example; and it is this that makes it useful in detergents as a substitute for triphosphate. The calcium and magnesium salts contained in water are in fact the compounds that impede the active functioning of soap, and it is trisodium phosphate which, by dissociating the calcium and magnesium and binding them to itself, enables the surface-actives to carry out their function as detergents.

An analogous function can now be performed by sodic zeolite A, which, though costing less than triphosphate, can be present in a double proportion in the detergent mix. This will for the time being entail a gradual substitution, reducing the presence of triphosphate in detergents to about half. Experiments have already been conducted in this direction in Emilia-Romagna, using the new detergent mixes on a large scale with the consent of the local administrations, and achieving considerable reductions of the eutrophication phenomenon. "On the other hand," says Carlo Longiave, in charge of Ausimont's research, "let us not forget that triphosphate, as everyone recognizes, is responsible, roughly, for only about a third of the ecological alteration caused by eutrophication."

In any case, the zeolites, which are inert from the chemical point of view and innocuous to both man and the environment, seem destined to perform also a myriad of other functions useful for the economics of productive processes and for downstream defense against pollutant phenomena (see diagram).

11267
CSO: 3102/312

APPROVED FOR RELEASE: 2007/02/09: CIA-RDP82-00850R000400040011-1

CHEMICALS

COMMITTEE ON COMPOSITE MATERIALS TO PROMOTE TECHNOLOGY

Paris AIR & COSMOS in French 27 Jun 81 p 28

[Article by Gerard Collin: "GIMAC: "Mastering the Evolution of Composite Materials' "]

[Text] A rapid succession of announcements--the administration's creation of GIMAC [Interministerial Group for Composite Materials], the SEP[European Propellant Company/ELF-Aquitaine agreement, the ELF-Aquitaine decision to establish a carbon fiber production unit in France, and finally the Hercules/Hexcel agreement providing for establishment of a carbon fiber production unit in Europe--all indicate that the French high-performance composite materials industry is going through a critical period in its history.

In this context, it was considered a good time to interview Christian Langlois Meurinne, president of GIMAC and director of chemical, textile, and related industries at the Ministry of Industry. Jerome Bedier, GIMAC's recording secretary, participated in the interview.

GIMAC was recently created (AIR & COSMOS No 860 p 39). It is composed of six members, which besides the president include the director of the Delagation for Innovation and Technology (DIT), the director of the DGRST [General Delegation for Scientific and Technical Research], the director of mechanical, metallurgical, and electrical industries (DIMME), the director of industrial affairs programs for armament (DPAI), and the director of civil aeronautics programs (DPAC). The members thus include officials from the defense and aeronautic sectors. "The idea for creation of GIMAC for that matter sprang from the needs expressed in the aerospace/defense sector," explains Langlois Meurinne; this gives an indication, as if any were needed, of the determining role this sector plays in matters of high-performance composite materials, and at the same time testifies to an awakening of the collective conscience to the urgent need for certain types of intervention. The idea in creating GIMAC was to respond to the need to ensure better mastery of vital technological advances. "Here we have a fundamental sector," Langlois Meurinne tells us, "which French industry must master on all levels." So already we have a very clear indication of one of the many ideas to which GIMAC is committed: covering the pathways of high-performance composite materials up and down the line. For carbon fibers, this means covering the production of the precursor (unprocessed synthetic fiber), then carbonization of the fiber, impregnation, weaving, and processing into finished prdducts. "France already held some solid trumps, notably its weaving/

impregnating craftsmen and its processing companies, among which the great aerospace companies represent the vanguard. Our country already produces some very satisfactory glass and boron fibers, but it is also necessary for us to establish a greater presence in the production of other fibers and resins." Therefore, the message is clear: France must establish an industry for producing high-performance fibers, with high-strength carbon fibers topping the list. In this context, the ELF-Aquitaine initiative is considered a step in the right direction.

"The starting signal has been given. Everybody can start running," interjects Bedier. In short: the next move is up to industry. And what of the Hexcel/Hercules agreement? Will their plant be located in France? (Cf. AIR & COSMOS No 864 p 81.) "That is not an impossibility," answers Bedier. "But it must be added that, according to our information, this plant would import the precursor; if that is the case, the plant would only partially address our concerns. As we see it, a Hexcel/Hercules plant in France would be of greater interest to us if it were accompanied by an agreement with an important industrial partner in France covering production of the precursor as well. In fact, any number of solutions could be conceived. Other partners could be considered."

On the resin side, the problem seems less complex: the principal resins are found on the French market. "On the other hand, the industry must be in a position to develop new resins, new formulations, and the means for characterization, to address specific needs." (This also appears to be the gist of ELF-Aquitaine's policy in this field; cf. AIR & COSMOS No 860 p 37). All this calls for establishment of a real industrial policy. "Our objective is that this policy be defined in its broad outlines by the end of this year," an ambitious objective, but one which appears to have already evoked action from industrialists. In short, the movement is fully launched.

In this regard, the impetus provided by GIMAC already seems to have produced concrete results. But GIMAC plans to extend its efforts to other levels. First, on the informatinn level: "This is a field which is basically very poorly understood," explains Langlois Meurinne. "In terms of information, a very large task stands before us. It is necessary for us then to coordinate the research, evaluate what exists already, identify the most promising sectors, and give consideration to the means of production offering maximum performance. To a certain degree, the composites campaign takes its inspiration from the earlier campaign to promote electronic components. Wherever we find delays or insufficiency, we must intervene."

With what means? To this question, GIMAC has only one answer: "Wait until the end of the year: the strategy of industrial policy will be to match needs with associated means. Furthermore, our intention is to give industry some precise anchorage points, the first of which will be the 3-liter economy car." In short, GIMAC would like to convey the impression of a movement on the march.

All this should lead to restructuring of an industry in which "there are still many small craftsmen and few industrialists. For the future, it will be necessary to break through three barriers holding back the development of high-performance composites: the price of the components, the extent of our knowledge of the materials and standadization methods, and the costs of final processing."

CHEMICALS

BRIEFS

SEP, CEC STUDY CERAMIC COMPOSITES--The European Propellants Company (SEP) recently concluded a cooperation agreement with the company Carbonisation-Entreprise-Ceramique (CEC), of the Lafarge group, for joint study of processes for manufacturing refractory fibers (alumina, silicon carbide, etc.) for use in the development of ceramic composite materials. The agreement could be extended later to the fabrication of refractory products made of reinforced ceramic composites, which will complement the sintered refractory products developed by Lafarge in conjunction with its affiliate Desmarquet. The principal application for the SEP CEC ceramic composites may turn out to be in diesel engines; CEC, like SEP, has in fact already worked out agreements with the Peugeot company. But other applications are conceivable, notably in aeronautic turboshaft engines. Bear in mind that SEP has already concluded an agreement with the French company ELF-Aquitaine for the production and marketing of carbon fibers and composites utilizing these fibers (AIR & COSMOS No 863). [Text] [Paris AIR & COSMOS in French 27 Jun 81 p 28] [COPYRIGHT: A. & C. 1980] 9828

CSO: 3102/324

TRANSPORTATION

COMMUTER LINERS MAKE DEBUTS AT LE BOURGET

Paris AIR & COSMOS in French 21 Jun 81 pp 53, 55, 120

[Second part of article by Regis Noye]

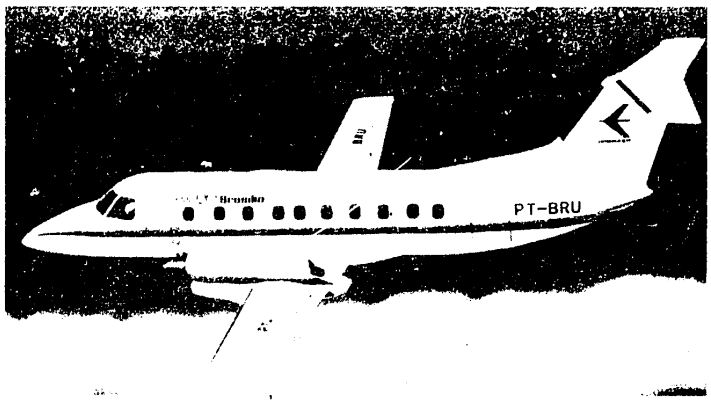
[Text] This week, we continue the overview which we began in our previous issue, of commuter aircraft programs at the Salon, either presenting new planes or announcing orders (numerous) from builders.

Dash 8

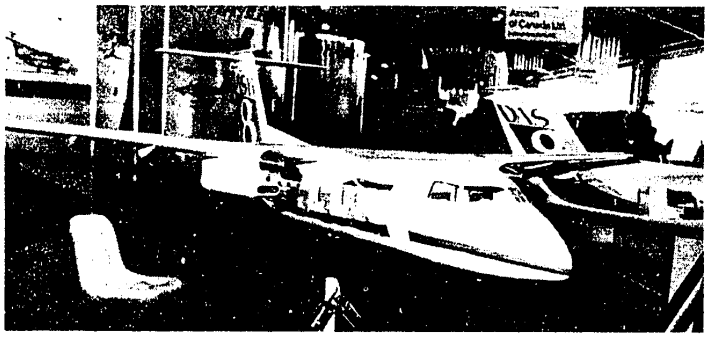
As predicted, De Havilland of Canada announced that it had comfortably exceeded 100 purchase options for its future Dash 8 (36 passengers) with a tally of firm orders and options amounting to 115 on 10 June. Of these, 59 come from the United States, 21 from Canada, and 35 from the rest of the world. The latest price released for the aircraft is 4.7 million Canadian dollars (or less than 4 million U.S. dollars).

The actual development of the aircraft has now been carried out since 1 September 1980, when the program was officially launched. Although wind-tunnel testing is not yet complete, the Canadian manufacturer considers that all the aircraft performance characteristics already released are final. A first scale-study and reliability mock-up, category I, that is, built of wood and composites, will be finished shortly. A second one, category II (metal), should be ready in January 1982. The initial flight of the Dash 8 is still planned for June 1983. Four planes will be built for certification testing purposes. Certification itself, expected in September 1984, will be immediately followed by initial deliveries. Between 40 and 45 planes will be delivered in 1985, but the production rate will reach six units per month at the beginning of 1986, and may increase to eight units depending on demand.

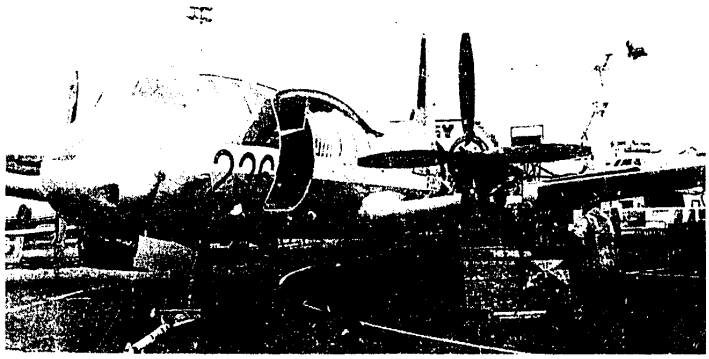
A brief reminder: the Dash 8 will be powered by two PW 120, 1800 takeoff-hp, Pratt and Whitney engines. De Havilland does not necessarily plan to equip the basic version of the plane with navigation CRT screens, but announced at the Salon that it had selected the Sperry DFZ-800 automatic navigation system. The initial order placed with Sperry amounts to 200 units, scheduled for delivery beginning in February 1983, according to the terms of a 20 million dollar contract.



Artist's conception of future EMB 120 "Brasilia" (30 seats)



Scale model of Dash 8, exhibited at the Salon by De Havilland of Canada



Series 2 B of the British Aerospace HS 748 is equipped with two Rolls-Royce Dart 536-2 turboprops

As for the DHC-6 Twin Otter (20 passengers) and the DHC-7 (50 passengers), they are faring brilliantly with 789 and 125 orders and options respectively on record as of 1 June. It should be noted that the 50th DHC-7 was placed in service while the Salon was open, by Austria's Tyrolean Airlines.

CN-235

During a press conference held on 10 June, the companies CASA and Nurtanio of course gave a detailed presentation of the future 34-38 seat CN-235. From a technical standpoint nothing new was added to the presentation in Madrid on 7 May (see AIR & COSMOS No 860); contrary to other projects under development, the builders nevertheless stressed the military utilization capabilities of the plane, created particularly by a standard axial-loading ramp (at the rear) and a landing gear suitable for unimproved fields.

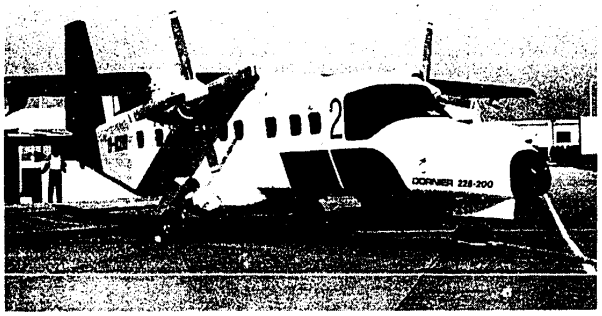
From the business standpoint, the Spanish and Indonesian companies announced 54 firm orders and 18 options, all of them in fact coming from Spain (Iberia and Aviaco, 20 orders) and Indoneisa (Merpati Airways, 14 firm and 14 options). The CN-235 program has now entered its so-called phase II, which includes a study of details, the construction, and the maiden flight of two prototypes planned for October 1983. The third and last phase will be for certification (second half of 1984) and for beginning of assembly line production, with the first deliveries due to take place upon receipt of flight certification. As we already know, the two companies are equal partners, both in terms of investments (estimated at 80 million U.S. dollars) and of task allocation. The two prototypes will be flown simultaneously, one at Getafe (Madrid), the other at Bandung (south of Jakarta), where the two assembly lines will also be installed. It might also be remembered that the CN-235 will be powered by two General Electric CT7-7 turboprops, each of them derated to 1700 hp at takeoff. Stated price: 3.8 million dollars.

As for the CASA 212, 264 units have been sold up to now; the latest order is from Argentina, and involves a craft ready for delivery in April 1982.

EMB-120

On 6 May, Embraer began its countdown for the first flight of the EMB-120 Brasilia (30 passengers), now scheduled for 29 July 1983; 814 days remained at that time (783 on 6 June)! This means that all the operations in the plane's development program are scheduled to the day.

At the beginning of the month, the Brazilian builder was to have sent the first engine pod to Pratt and Whitney of Canada so that the latter could undertake flight tests on an assembly composed of the pod, the engine (PW 115, 1500 hp) and the propeller, an assembly which will be mounted on a Viscount equipped as a flying test bench. Moreover, a certain number of scale mock-ups for feasibility studies are practically completed, among which those for exact dimensioning of external and internal structures, for studying interior layouts, and for supporting the installation of systems. Since April, Embraer has also carried out impact resistance tests on sections of the pressurized fuselage; these tests are designed to simulate the impact of a propeller blade, turbine blade, or any other object, on the external structure, in order to meet the structural resistance standards of the new American regulation, FAR Part 25.



On 14 June, the Dornier 228-200 prototype had logged 17 hours of flight testing in 13 sessions

The Beechcraft C 99 has been undergoing flight tests in Wichita since 20 June 1980

The builder has announced a new version of the Brasilia, a mixed passenger-cargo version, which will be able to carry 24 or 26 persons plus 900 kg of freight. The latter version will be equipped with a 1.88 m-wide rear cargo door.

On 10 June, 110 units (including options) of the EMB-120 Brasilia had been ordered. Among the customers (there are 19 of them), five are American, eight are Brazilian, two are French (Air Littoral and Brit Air), and two are Finnish. The certification of the aircraft is foreseen for the second half of 1984, to be immediately followed by the first deliveries.

Dornier

As we know, Dornier presented for the first time its models Do 228-100 (15 seats) and -200 (19 seats). We will remember (see AIR & COSMOS No 864) that on 10 June, 64 of these two planes had been ordered, of which paid options, and that the first deliveries will take place in December 1981 and April 1982, respectively. The prices announced at the Salon were DM 3.1 million for the Do 228-100, and 3.5 million for the Do 228-200. The German builder stated that it had not abandoned its LTA project (30-seat plane), but simply set it aside for the time being, in order to concentrate its efforts on models 128 and 228. Three foreign companies including Hindustan Aeronautics Ltd. appeared to have been highly interested in a participation in this program.

HS-748

The recent orders placed by two companies, one American and the other African, with British Aerospace for three 48-passenger HS-748-2B's (plus two options), have brought to 345 the total number of this type of plane (series -2A and -2B) currently sold to 77 users in 48 countries. It should be noted that the companies Air Illinois (United States) and DLT (FRG) have recently declared themselves very satisfied with the modifications made on the older version -2A (primarily involving the wings), which according to these companies, have resulted not only in better performances but also in fuel savings of 7 percent.

Shorts

During the Salon, Shorts announced a 200 version of its 30-seat 300 model, characterized by new engines (two Pratt and Whitney PT6A-45R derated to 1198 hp at takeoff, instead of two PT6A-45A of 1156 hp) and a modernization of some systems. In addition to easier maintenance, this results in a 68 kg increase in payload. Currently, 90 units (including options) of the Shorts 330 have been sold to 27 companies in 12 countries.

Beechcraft

Beechcraft has confirmed the certification of its Commuter C99 model (15 passengers) now announced for July. The first deliveries should be made soon after, from a production rate of two planes per month, a rate which will reach five planes by the end of the year. According to the builder, the number of orders currently received will fully absorb the first year's production. As we know, the C99 is an updated version of the old Beech 99 Airliner, 164 of which were built between 1968 and 1975. Equipped with two Pratt and Whitney PT6A-36 engines of 715 hp, the plane (not pressurized) will have a cruising speed of 459 km/h at 8000 feet (2438 m). In addition, the American company is continuing the development of its pressurized, 19-seat Commuter 1900. Prototype elements are being built in the company's various plants, and final assembly tooling is practically completed. The plane should be flying at the beginning of next year, with first deliveries being scheduled for 1983, following certification to FAA's SFAR 41 standards. It will be equipped with two 1000 hp Pratt and Whitney PT6A-65 engines; its maximum weight will be 6915 kg, its cruising speed 482 km/h, and it will have a range of 1183 km with IFR reserves.

11,023
CSO: 3102/323

TRANSPORTATION

PRIME MINISTER SPEAKS ON AEROSPACE INDUSTRY AT AIR SHOW

Paris AIR & COSMOS in French 20 Jun 81 pp 29, 31, 33, 35

/Text/ The closing luncheon of the 34th Air Show was highlighted by an address by GIFAS /expansion unknown/ President Rene Ravaud and a speech in response by Prime Minister Pierre Mauroy.

In his speech, the prime minister commended the aerospace industry on its vitality and, on behalf of the president of the Republic and the government, thanked foreign guests and representatives from countries for their show of confidence in French technology.

Mr. Mauroy took advantage of the opportunity presented by the Air Show to outline the main features of the aerospace policy his government intends to pursue.

After recalling the information on exports and employment cited by President Ravaud, he stated: "When we see that figures for the industry have been constantly on the rise, we understand why this industry's future is being given special attention by the government. What better example could there be of the vital importance to our country of companies which are active and highly sophisticated, which export and create jobs and wealth for the country as a whole, and which--when they belong to highly technical sectors--also help spread technological advances throughout the industrial fiber. I would like to make it clear here that the development of industry and the spread of technological advances are on the top of my government's list of priorities. The government will of course back any programs launched by the French aerospace industry, either by itself or as part of an international cooperative arrangement. These programs can be divided into three different but closely interrelated areas."

Military Materiel

"On the military lines, our industry's main objective is to provide the equipment needed to ensure that our country has an independent defense, both in the field of strategic arms essential for our deterrent forces and in the field of weaponry for our conventional forces. Military aircraft currently under construction, such as the Mirage and Alpha Jets, have shown by their success abroad that French industry is capable of producing highly sophisticated and fully competitive equipment. The same is certainly true of the Mirage 2000, whose brilliant capabilities were demonstrated in flight and which, with its avant-garde systems, will be the major military aircraft

program for this decade. This key program will not, however, be the only one, as the line offered by French aircraft companies will continue to be extensive, with the modernized Transall and the Epsilon primary trainer plane."

"As for the airplane to follow the Mirage 2000, France is trying to lay the groundwork for an effective European cooperation plan. It has already taken the following preliminary steps so that the options will be clear and the necessary decisions can be made when the proper time comes: demonstration prototypes of the future M88 engine are being completed at SNECMA /National Aircraft Engine Study and Manufacturing Company/; the main pieces of equipment that will give this plane an extremely efficient system are under extensive research; and finally, important work to coordinate users' specifications is being pursued with our European partners."

"As far as tactical missiles are concerned, the success of our current programs provides evidence, if needed, of the ability of our research offices and encourages us to pursue joint efforts with other European countries or, failing that, to continue on our own. Thanks to all this materiel, our armed forces will have the best possible equipment to carry out whatever missions are entrusted to them. Moreover, it is the president's commitment that the French aerospace industry will keep the position it has gained on the international market." With regard to exports of military equipment, the prime minister emphasized that international commitments in armaments will be respected, just as they are in the field of commerce. In this area, added Mr Mauroy, "I would like to officially put an end to the lies and false rumors circulating on this subject and say categorically that France and French industry are and always will be sure and loyal partners."

Space

"When you review all the major uses of satellites--telephone communications, data transmission, direct television, earth monitoring, management of the earth's resources--the long-term stakes for our country are obviously considerable. If we were to fail to participate in these fields, we would inevitably lag behind those who have already taken a position or who are getting ready to enter these areas, and we would be no more than their subcontractors, at best. The government will therefore attach the utmost importance to developing space programs. This will require action in three main directions."

"First, we should continue working on the main applications satellites (Telecom 1, TDF 1, and SPOT) so that by 1983-84, France can really enter the era of economic and commercial use of these systems. We hope that, thanks to their competitiveness, our satellites can be sold to countries or groups of countries that want space systems. Aerospatiale's recent success on its Arabsat project is very encouraging from this standpoint."

"Secondly, we should naturally be able to assure our complete autonomy in Europe by placing these main satellites into orbit. This means that we will have to develop an Ariane line based on technology already acquired with the first models. This line would include increasingly more sophisticated launchers, perfectly adapted to the size and weight of future satellites, which would make it possible to reduce considerably the price per kilogram of the payload placed in orbit. This will in

turn facilitate the marketing of the Ariane launcher, which has already begun and which must be pursued to maintain our competitiveness and to extend our coverage to all the different markets opening up throughout the world. My best wishes go to the technicians who are preparing for the third Ariane launching at Kourou in the next few days."

"Finally, our policy in the coming years will stress long-term prospects. By 1990 to 2000, new uses for space resources will probably be found: manufacture of weightless materials, biology, domestication of new energy sources. The government will from now on be encouraging serious research on these subjects and on the technologies that will be needed at that time in areas such as the structure of satellites, space robots, or power systems on board. Our country must reflect on the best way to participate in these opportunities, in cooperation with its European partners. To achieve these goals, we will work out a multi-year program based on clear options, and will try to make steady contributions, instead of trying to do everything. Thanks to our ongoing satellite programs, to the development of increasingly more sophisticated launchers, and to the mastery of new technologies, the future of our space industry can be viewed with optimism and confidence, especially as it is part of a well-established European cooperation program."

Civil Aviation

"Civil aviation, the third section of the French aerospace industry I wanted to refer to today, deserves the government's special attention.

Airbus, whose order book shows 469 aircraft (A 300 and A 310) either on order or on option with 40 airlines, is proof that Europe, when it wants to, can unite for a worthy cause. With Airbus Industrie, it becomes the second world supplier of commercial transport planes, accounting for 46 percent of orders for medium-range heavy transport aircraft in the western world in 1980. We must not rest on our laurels though, but plan for the future with confidence and determination: confidence in Airbus' success, as a result of progressive technical improvements to be made to it, of the timely development of new versions, and of efforts to improve our competitive edge; and determination to expand the line of products offered by Airbus Industrie, because to garner a lasting place on a market of this sort, it is essential to have several types of planes to show your customers at the same time."

"The increased cost of energy and the subsequent slackening in the growth of air traffic clearly indicate the direction this expanded line should take today. A number of airlines, including Air France, now want a new plane with low fuel consumption and a passenger capacity of about 150, for delivery in 1986. The A 320 project is responding to this demand."

This is why, in agreement with the associated governments and on behalf of the French government, I note with satisfaction the positive decision made by Airbus Industrie and its partners to place the A 320 on the market, under well-defined technical and commercial conditions."

"This is also why," Mr Mauroy went on to say, "the French government is prepared to contribute its support to the A 320 program, at the request of the industries involved and assuming a positive market response.

In this regard, the government is delighted with the decision made this week by Air France which, after extensive negotiations with Airbus Industrie, was the first to order 50 of these airplanes. In these circumstances, I would urge SNIAS /National Industrial Aerospace Company/ to speed up discussions with its partners on the terms for cooperation on this new airplane. And I would not rule out French participation going beyond its present share in the actual Airbus program, if necessary. Europe will thus once again find itself in an area where its past achievements give it cause for great ambition. The French government attaches great importance to the success and development of Airbus, which is a concrete sign of the political spirit of cooperation among the European partners."

In the area of commercial engines, Mr. Mauroy noted with pleasure the success of the CFM 56, which was selected as the replacement engine for the long-range DC-8's, the tanker planes of the U.S. Air Force and the French Air Force, and for installation in the new version of the short-range Boeing 737. These commercial successes are illustrative of the kind of equitable cooperation that exists between SNECMA and the American company General Electric, and proof of the intrinsic capabilities of this engine unequalled in the world today. In the struggle to realize energy savings in air transportation, the engine industry is on the front line. Engine makers will thus have to adapt to customers' new demands and develop more and more modest engines. "I am convinced," said the prime minister in addressing Mr. Ravaud, "that SNECMA can meet this new challenge with, of course, the government's support."

Helicopters

After referring to the major commercial aircraft and engine programs, Mr. Mauroy went on to congratulate Aerospatiale and Turbomeca on their remarkable performance in the field of helicopters and helicopter engines. "With the Ecureuil, Dauphin and Super Puma, France has become the primary world exporter of helicopters. This provides overwhelming justification for developing commercial production, the demand for which will certainly increase in future. We are paving the way for tomorrow by developing a new turbine engine, the TM 333, to be used primarily in the new generation of light army helicopters. We are also planning for the future by doubling innovation efforts and technological research, where there is a role for the government to play."

The prime minister also cited the advances of the French light aircraft industry and especially the success of the Mystere 10, 20 and 50 executive planes by Dassault-Breguet, which has received orders for nearly 900 planes. Mr. Mauroy urged aircraft equipment companies that have succeeded in selling on foreign markets and equipping many foreign airplanes to persevere along these lines.

"The commercial aviation industry alone, exporting more than 80 percent, should bring substantial net foreign currency earnings into our country in the next 5 years. It employs 35,000 persons today and it will create 10,000 to 15,000 new jobs between now and 1985, if you count the small and medium-sized firms working for it as sub-contractors throughout French industry. The brilliant advances of civil aviation are not the result of a lax export credit policy, as one might be led to believe, but can be attributed instead to the merits of our products, which meet the precise needs of users. I must add in all fairness that those who scream the loudest are not necessarily the most innocent. The government is prepared to continue the ongoing negotiations for export financing of commercial aircraft and is keen on reaching a truly equitable agreement. France in fact intends to continue developing its commercial aviation industry, on the basis of competitive companies and in the context of an open economy."

Air Transportation

"We cannot discuss the prospects of the civil aviation industry without expressing some concern over the conditions that have affected international air transportation during the past few years. If the deterioration in the carriers' financial situation is not halted, it cannot help but have a serious impact on the airlines' ability to renew and develop their fleets and will rapidly have repercussions on the aviation industry. Consequently, the French government is particularly keen on a coherent and reasonable organization for world air transportation. It is opposed to a laisser-faire policy under which companies, and eventually passengers, bear the brunt of the costs. Far from advocating any kind of deregulation, which would lead to conquest of the markets by the most powerful or the least scrupulous, France, together with developing countries and its European partners, would like to contribute to an organization in which everyone would have a fair place and the needed democratization of air transportation would be based on profitable airlines. France, therefore, will not spare any efforts to maintain order on its own market or to promote, in a bilateral and multilateral context, the return to a healthy situation of reasonable, organized and controlled competition."

Mr. Mauroy referred in his conclusion to "the enviable position of the aerospace industry" and pointed out that it could be maintained only by taking the lead and by launching the programs demanded by users. "The government is fully aware of the fact that new equipment will require increased efforts, and it will endeavor to find the most appropriate solutions, with the help of all those concerned. These efforts will have to depend to a great extent on international cooperation, while at the same time naturally preserving our industry's interests. Ariane, Airbus and Alpha Jet are good examples of what can be done along these lines. This cooperation should be pursued systematically by selecting the method best suited to each goal, whether involving programs sponsored by European agencies or bilateral agreements between countries or flexible and efficient industrial groupings."

In concluding, Mr. Mauroy paid tribute to the pioneers, with Mr. Maurice Bellonte leading the group, assured the aerospace industry of the French president's and government's support, and congratulated the organizers of the show on its success.

9805
CSO: 3102/320

TRANSPORTATION

TURBOMECA UNVEILS NEW TM-333 ENGINE AT LE BOURGET

Paris AIR & COSMOS in French 20 Jun 81 p 45

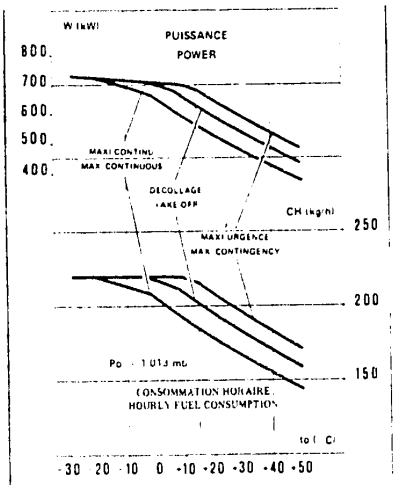
[Article by J.M.]

[Text] At Le Bourget, Turbomeca disclosed the specifications of its new TM-333 turbine engine, whose development began in July 1979; up to now, the Bordes engine manufacturer has been remarkably discreet about this engine with 625 kW (850 hp) takeoff power, intended to become the successor of the Arriel. The display of a stripped TM-333 model has clearly been the turning point for a radical change in the company's information policy.

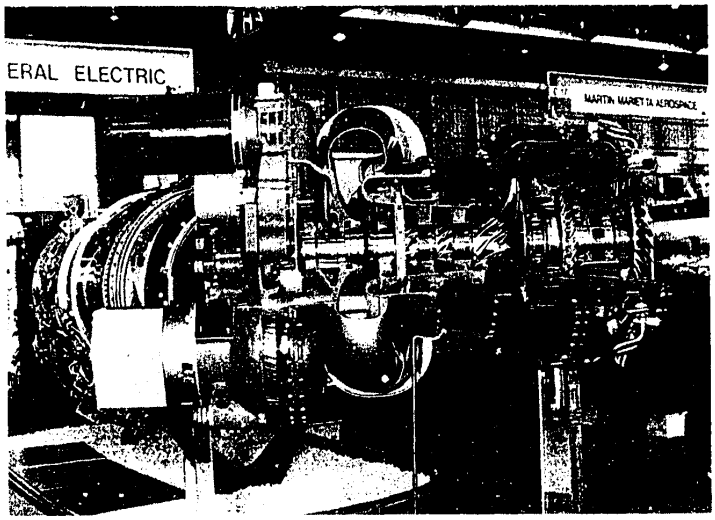
The engineers who developed the TM-333 were assigned five major objectives: reduce operating costs (in other words obtain a high level of reliability and create a robust engine); reduce specific consumption; achieve truly modular maintenance; lower the sales price; and reduce specific weight. The introduction was justified by a significant potential market for twin-turbine helicopters with a total weight of 4-5 tons; whether it concerns the Dauphin SA.365N of Aerospatiale, the BK 117 MBB/Kawasaki, the Augusta A 129, the Bell 222, or the Sikorsky S.76, this market is proving to be very large, and the weight of the craft involved can only become higher than the present 3.5-4.2 tons. Hence the eventual need for a more powerful and of course more updated engine than the Arriel. This is especially true since some of the civilian craft are relatively underpowered and since their builders will inevitably have to seek more powerful engines. Engines derived from current ones (Allison 230-C30, Lycoming LTS-101, Arriel 1C) will serve the purpose up to 700/750 hp. New engines will be needed beyond this point, and Allison, Lycoming, and Rolls-Royce are thinking about it as much as Turbomeca.

Turbomeca had in fact first studied a 750 hp Arriel PA2, and subsequently decided to create an entirely new engine which could truly integrate the progress achieved in many areas (high pressure compressor, high expansion turbines, reverse flow chamber, microprocessor electronic control, reduction gear box, joints, and control of clearances.)

The result is an engine capable of 925 hp (680kW) maximum contingency power (PMD), and 760 hp (560 kW) sustained maximum power (PMC), weighing 136 kg (without nozzle or dynastart), operating at relatively moderate turbine inlet temperatures at start-up (non-cooled turbine), and offering definitely lower consumption than that of Arriel 1C: 236 grams/hp-hour at a PMD of 850 hp, and 243 grams at a PMC of 760 hp; this represents an 8-10 percent gain, which is significant when compared to an already modern engine such as the Arriel.



Civilian application performances.



The TM-333 at Le Bourget: a new generation turboengine. Total length is 943 mm, total height 543 mm, and width (including air intake) 550 mm.

At partial load (350 kW/480 hp) for example, the new engine will consume less than 275 gr/hp/hr, compared to 293 grams for Arriel.

The following architecture has been adopted: from front to back, a two-stage gear reducer (6000 rpm output) with accessory drive, an annular air intake with dynamic recovery spiral; a two-stage steel axial compressor; a titanium centrifugal tapered compressor; a reverse-flow, fixed-injector combustion chamber; a high-pressure turbine with inserted blades and high expansion-ratio (about 3.5); a single-stage free-turbine, also connected to the reducer by a transverse shaft.

This high performance engine has clearly profited from Turbomeca's research on compressors, particularly centrifugal ones, which make it possible to attain rates and performances which were beyond the reach of the previous generation: with one less stage, the compressor of the TM-333 does better than that of Makila.

Control is entirely electronic (with a back-up manual system). This type of control offers various advantages, including the possibility of program modification for piloting practices adapted to the user.

Development of the TM-333 is currently carried out with component testing, which began in March 1980 and will be finished in August. The first complete engine will be bench-tested before the end of the year, and the first test flight is planned for the first half of 1982. Certification is anticipated in 1985.

Finally, it must be noted that Turbomeca is already forecasting its development potential: +12 percent for power and -3.5 percent for specific cruising consumption, simply by raising the turbine inlet temperature. A 500 kg-thrust turbofan, the GTM-333, may also be developed in cooperation with General Electric.

11,023
CSO: 3102/321

TRANSPORTATION

ROLLS-ROYCE, PARTNERS RELEASE DETAILS ON RJ-500 ENGINE

Paris AIR & COSMOS in French 20 Jun 82 p 47

[Article by J. M.: "RJ-500: Rolls-Royce Aims for the 150-Seat Market"]

[Text] Rolls-Royce and its three Japanese partners, IHI (Ishikawajima Harima Heavy Industries), KHI (Kawaski), and MHI (Mitsubishi), released a certain number of specifications at Le Bourget, concerning the future RJ-500, a turbojet in the 9/11-ton thrust category, which was specially conceived for future 150-seat twin-jet aircraft.

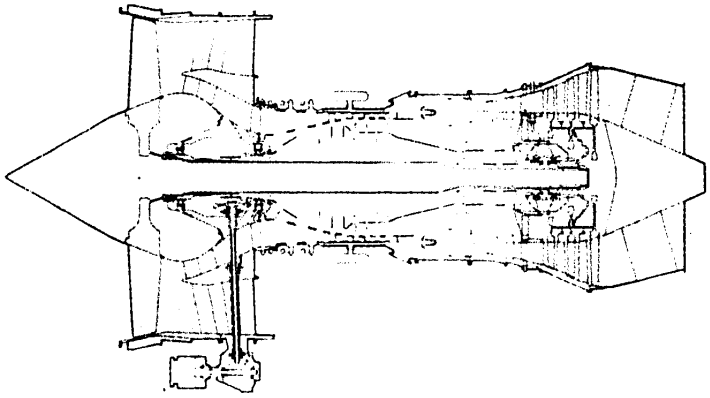
The first engine expected to run, the RJ500-01 will be bench tested at Rolls-Royce in Bristol toward the end of January 1982; the second one will undergo the same testing at IHI in Mizuho (near Tokyo) in mid-March.

The two engines are actually tentative models designed and launched in production over the past two years, on the assumption that 130-seat planes equipped with 9 ton-thrust engines might be developed.

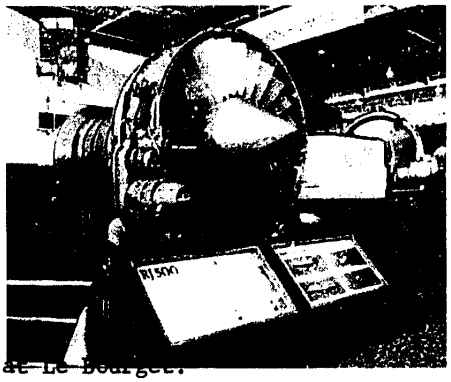
A lot has happened since then: the Fokker project (Super F28) for which the RJ-500 was adapted, has given way to the 150-seat MDF-100, and the other manufacturers (Airbus Industrie and Boeing) are readying 150/160-seat planes which require engines with 25,000 pounds (11.3 tons) of thrust. The definitive version of the RJ500, which is expected to equip planes due for delivery in 1986, will therefore be more powerful than the original RJ500, while the core engine will be similar to the present one. While awaiting the first tests of the RJ500-01, partial tests are being conducted in Bristol (9-stage HP compressor, and HP turbine), as well as in Japan (LP assembly, and later on, fan).

The characteristics of the two RJ500 versions were given at Le Bourget for the RJ500-25, optimized for a 130-seat plane, and for the RJ500-35, more powerful and of course, designed for the 150-seat twin-jet planes. Their characteristics are:

RJ500-25: static thrust at sea level, at ISA +15 ^{o}C, 9525 kg; cruising thrust at 30,000 ft/Mach 0.8, 2518 kg; specific consumption, 0.627 kg/kgp-h; bypass ratio, 21; maximum diameter, 1.55 m; basic engine weight, 892 kg. The RJ500-25 will have a simple fan, a 10-stage HP compressor, a first turbine (HP) with two stages, and an LP turbine with three stages; the annular combustion chamber operates with atomizers. Total length of the RJ-500-25: 2.64 m.

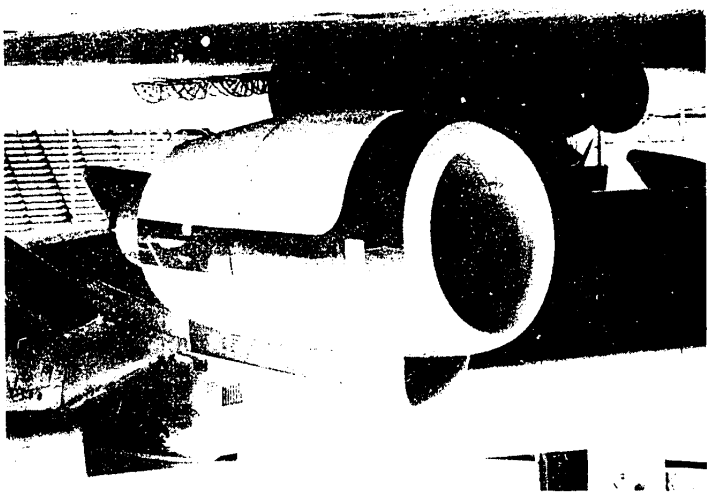


Task allocation between Rolls-Royce (core engine and accessory gear box), and the Japanese partners (LP assembly).

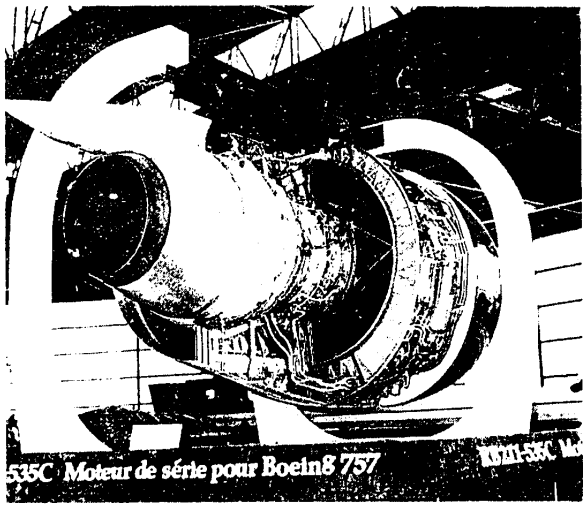


RJ-500 model displayed at Le Bourget.

RJ500-35: larger fan inlet diameter, 1.178 m, or +14.7 percent, and a low pressure four-stage turbine; total length is 2.77 m, and basic engine weight 1078 kg. The announced performance is now: static thrust 11,340 kg (+19 percent); mass-flow 382.4 kg/s (compared to 296.2, or +29 percent); bypass ratio, 5.98; overall pressure ratio, 22.4. Cruising thrust reaches 2945 kg (+17 percent) for a specific consumption of 601 gr/hp-h.



Preproduction RB.211-535C exhibited at Le Bourget.



RB.211-535C pod mounted on a B.747 flying test bench at Boeing. From 9 May to 28 May, this engine has just undergone 65 hours of tests at Glasgow, Montana, up to Mach 0.86 and 42,000 feet.

These two versions thus show fairly significant differences, and chances are good that the RJ500-35 will be the only version to be developed, given market demand. It should also be noted that Rolls-Royce is stressing the RJ500's low manufacturing cost, achieved thanks to careful study and a reduction in the number of parts.

11,023
CSO: 3102/322

TRANSPORTATION

BRIEFS

BUBBLE-MEMORY CASSETTES--Sagem [General Electricity and Mechanics Application Company] announces bubble-memory cassettes with a capacity of 16 Mbits in a volume of 0.25 liter, capable of being used for: storage of cartographic data, such as relief maps for navigation by altitude correlation or the "image radar" type synthetic maps for mavigation by correlation of images or for projection on a cartographic display composited with a warplane; in-flight recording of tests or accidents; and preloading of the "day mission: of a warplane into the plane's computer system. Parallel to the development and evolution of the present technology, Sagem and LETI [Electronics and Data Processing Technology Laboratory, Grenoble] are pursuing the study of other technologies which by 1984 should permit production of chips with a capacity of 4 Mbits (AIR & COSMOS No 854 p 25). [Text] [Paris AIR & COSMOS In French 27 Jun 81 p 32] 9828

CSO: 3102/324

END