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West Europe Report

SCIENCE AND TECHNOLOGY

(FOUO 11/82)

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CONTENTS

ELECTRONICS

PHILIPS OPTICAL STORAGE DISC: CONTINUING R&D

Munich COMPUTERWOCHE in German 26 Mar 82 pp 26-27

[Article: "Optical Storage Discs Hold Mountains of Data"]

[Text] German EDP specialists consider the storage media currently on the market to be overtaxed in terms of their capacity--even though they have not been in use all that long. Technicians are, therefore, once again looking for new storage media which can handle an even higher density than, for example, today's magnetic disc systems. Philips Data Systems took a giant step into the "memory future" when some time ago it came out with the first optical disc storage unit with a diode laser. Research and development experts from the laboratories in Siegen report below about their experiences.

It is not secret that people in offices suffer under the growing flood of information and the constant pressure to have to stay up to date in their field of knowledge. Also they are concerned whether the correct decisions are made at the right time if information is not always complete. Integrated information and communications systems shall and can be an important support for this creative potential in our business and administrative offices in the 1980's. Without intending to introduce a new definition--by such communication systems we mean here the totality of all elements and functions which come about through the merging of data and text processing (to date separate communication functions) and the service functions, which are to be understood as office service, as well as classical telecommunications. In this connection--to a very much greater degree than in the past--information storage and management assume increasing importance. The storage media currently on the market are overtaxed.

Thus, the following requirements are placed on the new storage media:
--higher storage capacity than today's magnetic disc systems;
--clearly improved cost-effectiveness ratio as compared with today's mass storage units;
--recording capability of the new medium;
--fast and random access.

Some time ago Philips presented the prototype of the world's first optical disc storage with a diode laser. The extremely compact storage device can record and read out data with a high density. As a storage medium there is a

rotating two-sided plastic disc, 30 cm in diameter, with grooves. The disc stores 10^{10} bits of information which corresponds to the contents of about one-half million typewritten pages of text. Thus, it is far superior to the largest storage units with magnetic discs which are in use today in computer systems.

Research was started in 1972. Since that time work has been in progress at Philips on optical recording methods. The first result was the video long play (VLP) disc which was introduced as a product in the U.S. market in December 1978 and whose market introduction in Europe is imminent.

Some 2.5 Tons of Paper on a Disc

Using this basic technological research as a basis, development work was continued with the goal of utilizing this storage technology in the information processing systems sector, too. The result is the optical storage disc on which 1.25 billion bytes can now be stored per 12 inch unit. This is roughly the equivalent of 500,000 written pages of DIN [German industrial standard] A-4 paper--circa 2.5 tons of paper. It is possible to integrate several of these discs in a so-called megadoc system and to keep them in direct access so that approximately 60 billion characters can be stored in such an exchangeable disc unit. Even smaller versions of the optical storage disc are planned which will then have lower storage capacities.

Overwriting Still on the Drawing Board

The optical storage disc consists of a transparent and unbreakable core to which a thin storage layer has been applied. The information to be stored is burned into this storage layer with a laser beam and can be read as often as desired or else be declared invalid. Overwriting the information--comparable to today's magnetic disc storage--cannot be implemented yet for technological reasons. Efficient data bank systems will, however, make it possible once again to write altered, that is, updated or further developed information at another place on this disc which can be relocated again. In a certain context, today's data processing methods could be realized with it.

The following example makes the accomplishment of the researchers and developer developers at Philips especially clear:

From a gas laser apparatus, which some 10 years ago was 20 meters long, a semiconductor laser was meanwhile developed, the size of a matchbox. That was the real breakthrough for the application of this new technology in connection with future information processing systems.

The theme is "10-Year Plan." Thus, mention is made here of several milestones in the overall scheduling:
--At present five preproduction models are in practical use in various research and application projects.
--In 1982 and 1983 in the FRG five pilot projects will be realized in order to obtain, in the context of user testing of the overall system, additional

ideas for possibilities for improvement in the user interfaces and peripheral equipment. A high level of EDP know-how and the readiness to invest, which is necessary for such technology, must be assumed among the partners for the pilot projects.
--Operational installations of closed communication systems with the optical storage disc as various kinds of information storage systems are planned starting in 1984, including a comprehensive data bank system.

Now some commercial data which should not be omitted in any short report of this type:
--Up to starting the preproduction series far more than DM100 million will have been invested in this research and development project.

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CSO: 3102/251

ENERGY

'HAUTE-DEULE' DEEP UNDERGROUND COAL GASIFICATION PROJECT

Paris REVUE DE L'ENERGIE in French Jan-Feb 82 pp 227-234

[Article by Jacques Bieau, director of technical services at the French Coal Company, member of the steering committee of GEGS]

[Excerpts] Since 1978, France has been actively studying the feasibility of a new mining process, which consists of coal gasification at very great depths. For this purpose, four organizations--the BRGM [Bureau of Geological and Mining Exploration], the French Coal Company, the French Gas Company, and the French Petroleum Institute--have formed the GEGS [Underground Gasification Study Group].

Future experiments call for:

a. Pursuing research for a linkage between drillings, and improving these by the process of retro-combustion. This will be the goal of the experiments planned at "Haute-Deule," starting from ground level downward.

b. Testing other methods of linkage, such as electrocarbonization (limited experiments are currently underway in the Loire region).

c. Exploring new ways and means, such as linkage testing by guided drillings, derived from oil drilling techniques.

The "Haute-Deule" Program

I Objective

The objective assigned to the Bruay site has been reached, and in order to enable the GEGS to continue testing in the field, a new site was made available by the French Coal Company and by the Bassin du Nord Pas-de-Calais Coal Mines.

This site, known as "Haute-Deule," because it is located on both sides of the Haute-Deule canal, is located between Lens and Carvin (Pas-de-Calais department).

The objective assigned to this new site means taking a step forward in research since:

a. In order to reach the veins of coal located at depths of over 800 meters, the drilling will originate from the surface, and not from underground levels.

b. The coal veins contain coal with different characteristics from the coal found at Bruay (dry-burning coal instead of rich coal). This will provide some information on the "qualities" of various types of coal in relation to the underground gasification process.

c. The experiments, which will last for about 5 years, should include the development at this site of a gasification demonstration pilot, which would include all the information acquired. It would essentially serve to demonstrate the process in conditions close to those to be found during its future industrial development. The various phases will be the following:

    1. selection of the demonstration field;

    2. creation of shafts and interconnections;

    3. ignition of the coal and enlargement of linkages by retrocombustion;

    4. retrocombustion of the coal.

Concerning the first objective, the selection of the demonstration field, this will include the definition of a precise site reconnaissance methodology for the purposes of an underground gasification operation.

Among the site selection criteria, the criterion concerning the continuity of the vein over a sufficient area may call for the use of geophysical methods. The need to indicate the location of throw faults larger than or equal to the thickness of the vein requires the use of the latest refinements of seismic reflection methods, such as: high resolution seismics and

a vertical seismic profile made from a drilling hole in which a receiver is placed to pick up waves from shots at the surface.

II Scheduled Phases of the Project

The geological studies done by the GEGS using mining documents suggest the possibility, during the first phase, of working from two surface areas, located directly above a series of veins with openings between 1.3 and 3 meters, located at depths between 800 and 1,200 meters.

There are plans to undertake a test program consisting of several phases for these two areas:

a. A reconnaissance and preparation phase for the end of 1981 and the beginning of 1982.

In each of these areas, an initial vertical drilling will go through all the coal veins for reconnaissance purposes. The analyses will be made by means of core samples, diagraphy, and physical measurements.

The diameter of these shafts will be 200 mm; heavy drills will be used for this purpose. These shafts will then be used for the placement of experimental equipment after completion.

b. A limited objective experimental phase during 1982 and 1983.

The placement of the first experimental device will include the following operations:

1. creation of a second drilling, completion of shaft;

2. Conducting of a limited hydraulic fracturing operation, called "minifrac," designed to reveal the orientation of the fracture by a seismic-acoustical study;

3. Possible creation of a third drilling if the direction of the fracture is clearly different from the one found in the first two shafts;

4. Hydraulic fracturing after preparation by water injection;

5. Evaluation of the transmission qualities of the linkage;

6. Beginning of localized combustion by ignition;

7. Conducting of retrocombustion in the air (possibly oxygen-depleted);

8. Start of the retrocombustion phase.

Upon completion of this phase, a survey of the results might be done by mining methods.

c. The pilot phase during 1983 and 1984.

With a time delay after the preceding operations, so that the results may be put to use, a pilot program will be conducted in the same area or in the other area explored, until the oxygen gasification operation, which could begin sometime in 1984. For this purpose, the shafts will be designed to withstand high temperatures and the equipment will include a recovery device to ignite or incinerate the gases produced.

III Conclusion

With the support of both French and European governments, the GEGS has begun a 125-million franc program covering the 1978-1984 period. This program includes all aspects of the problem, and between now and 1984, a technical feasibility operation for the production of primary gas is to be conducted.

After the first promising results obtained at Bruay, there are still many problems remaining.

At the instigation of the government officials, who asked that we move ahead as rapidly as possible, the GEGS now plans to accelerate the present program beginning in 1982, by moving very quickly into the second operation (the demonstration pilot) at the "Haute-Deule" site.

Furthermore, a supplemental 40-million franc program for 1982 and 1982 has been proposed. Its execution will depend on the provision of major financial support by the government.

After 1984, the development of the process will require an applied research program and at the same time, many pilot

operations on the linkage technique and mastering the combustion process. This phase will last for about 10 years, starting in 1985. It will provide a more precise evaluation of France's coal reserves suitable for underground gasification, based on the criteria for application of this process.

The first large-scale industrial operation might be done between 1995 and 2000. The cost of the gas produced will depend on its quality and on the quantity of coal that can be used through a pair of shafts, for the total cost is highly dependent on the drilling phase of the program. Nonetheless, it seems possible given the present status of economic estimates, and making all due reservations, that we may obtain a gas which can be used as a replacement for natural gas, at a cost under 15 cF/kWh.

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INDUSTRIAL TECHNOLOGY

PLANS TAKE SHAPE FOR REVIVAL OF MACHINE TOOL INDUSTRY

Paris AIR & COSMOS in French 17 Apr 82 pp 29-30

[Article by Nicole Beauclair: "Plan for a French Machine Tool Industry"]

> [Text] More than 4 months have gone by since the government adopted a development plan for the machine tool industry. Talk about it has run at a fast clip and not a week goes by without an announcement of a regrouping of this or that group of companies. What is really the situation? Jean Chauvet, head of the SCFMO [French Machine Tool Builders Association], has kindly provided some clarifications in this regard.

The machine tool industry development program, generally referred to simply as the "Machine-Tool Plan," is based on the outcome of talks between the public authorities and the heads of enterprises. "The plan's objectives are ambitious and realizable only within an economic situation characterized by robust growth," Jean Chauvet disclosed to AIR ET COSMOS, and as everyone knows, the machine tool industry is presently in the throes of a serious crisis from the standpoint of international competitiveness.

Announced at the Council of Ministers of 2 December 1981, the machine-tool industry development plan, we recall, involves three lines of action that were reaffirmed by the minister of industry at the General Assembly of 5 April. The first action is the one addressed in this article. The French machine tool industry must be reorganized, as must also that of components; the action being undertaken is aimed at forming industrial units capable of competing on an international level. These units must be of adequate size and must be headed by dynamic and efficient management teams; concurrently, the French components industry must also be developed, inasmuch as its weakness fosters purchases abroad which in turn lead to increased production costs.

Officially, nothing has been announced as yet regarding the regroupments of enterprises. If we consider only the technological side of the enterprises (we will come to the human side later), regroupment plans are actually in the process of being put together. There is much discussion at this point in terms of a heavy-machine-tool industry "pool" that would consist of two entities: one for milling, with TMI [expansion unknown]-Forest at Capdenac and Line S.A. (Albert

plant), and the other for turning, with Berthiez at Givors (a subsidiary of SNECMA [National Aircraft Engine Study and Manufacturing Company]) and SEMO [Saint-Etienne Machine Tools] (currently one of the Line-PSM [expansion unknown] group). This heavy-machine-tool industry "pool" would have as its overseer the IDI [Industrial Development Institute], which is moreover already a partaker in TMI-Forest through EMS [expansion unknown], of which it is one of the subsidiaries. But these groupings pose financial problems, it being unnecessary to dwell on the problems that have confronted the Line group for more than 1 year now, and the latter despite the financial backing it receives from the state (which does not come under the current funding plan). If now one considers also the SEMO and Berthiez grouping, which lost more than 30 million francs in 1981 on a turnover of 120 million francs, and on the other hand the Line S.A. and TMI-Forest grouping, bearing in mind the well-known disappointments of the latter in its regrouping with Ratier-Figeac and GSP [expansion unknown], it is fairly clear that these plans are still a long way from materializing.

With regard still to the milling domain (excluding the "heavy" sector), and in view of the difficulties encountered by Dufour (which became part of the PROFEL [expansion unknown]/PROMAT [expansion unknown] group over 1 year ago), it appears that a solution could be found involving the Nice-based Vernier firm, although the latter (automatically designated a partner) does not seem inclined to merge. As regards machining centers, it would seem logical to associate Hure and Graffenstaden (CIT-ALCATEL [International Telephone Company-Alsatian Company for Atomic, Telecommunications and Electronic Construction] group) to form an entity capable of being prime contractors in the actualization of flexible workshops; H. Ernault Souma could be a part of this entity, but its agreement with Toyoda, which resulted last year in the creation of HES [expansion unknown]-Toyoda in France (fabrication under license of machining centers), is proving a handicap. HES however has a major asset: Its lathe technology, with the new line brought out last year, is tempting, since it lends itself so well to the actualization if not of flexible workshops then of production hubs, thanks to the automation of its lathes from the standpoint of the feeding of parts as well as that of automated tool-changes.

Gambin, still from the milling standpoint (it too joined the Line-PSM group several years ago after having ceased operations for almost 1 year), could also be grouped with ALCERA [expansion unknown]; the regroupment of these two provincially-based companies (the first at Vuiz-en-Sallaz, Haute Savoie, the second at Dole, near Belfort) should not be too ticklish a matter. This is the case also of a possible Ramo-Cazeneuve-Les Innovations Mecaniques regroupment--three companies specializing in lathes, which, although their regroupment has been encouraged by the Ministry of Industry rather than imposed, presents a problem under a different aspect, in that it brings together private partners.

As we seen so far, technological affinities render it easy... to come up with plans; but then there are the financial problems. Each plan must be evaluated from two standpoints: The industrial one (six companies with industrial know-how have been designated by the Ministry of Industry), and the financial one. Each of these evaluations produces findings that lead to reconsideration of

[See caption next page]

Types of N/C Machines	Aeronautical Construction (Number/ Percent)	Total
Drilling machines	41 1.9	2,126 100.0
Drilling and boring machines	56 8.0	703 100.0
Boring machines	69 27.5	253 100.0
Boring and milling machines	24 3.9	614 100.0
Milling machines	361 19.5	1,856 100.0
Multiple-function machining centers	122 11.2	1,090 100.0
Parallel lathes	243 12.2	1,984 100.0
Frontal lathes	17 4.9	338 100.0
Vertical lathes	84 29.7	283 100.0
Grinding machines	26 18.1	146 100.0
Horizontal-spindle turning centers	91 7.0	1,295 100.0
Vertical-spindle turning centers		138 100.0
N/C special-purpose removing machines	15 9.6	155 100.0

[Table continued next page]

[Continuation of table on preceding page]

Types of N/C Machines	Aeronautical Construction (Number/ Percent)	Total
Other C/N removal machines	16 7.2	222 100.0
Robots	8 0.9	847 100.0
Bending presses	6 0.6	952 100.0
Deep drawing presses	32 7.9	403 100.0
Forging presses		54 100.0
Cutting machines	4 0.5	776 100.0
Punching machines	6 0.9	671 100.0
Cutting and punching machines	1 0.3	461 100.0
Other forming machines	25 6.6	376 100.0
Total MOCN [N/C machine tools]	1,247 7.9	15,743 100.0

Partial results of survey conducted by BIPE [Economic Information and Forecasting Bureau] for DIMME [Directorate of Mechanical, Metallurgical and Electrical Industries] and SCFMO. It seems that these results must be modified on the basis of more refined criteria and that the total MOCN's will be no more than 10,500. (SCFMO Document).

certain points in the plan. This explains in part the slowness with which final decisions are being taken. Then, if one adds the human problems inherent in the taking of such decisions, it becomes immediately clear that the heads of enterprises, the Ministry of Industry and the government find themselves confronting an almost insoluble problem: that of regrouping enterprises according to pivotal interests while preserving jobs. It has been definitely established, for example, that a Berthiez-SEMO regrouping would necessitate, if not the laying off of personnel (much dependence would be placed, it seems, upon early retirements), then certainly the moving of personnel from the Givors plant to Saint-Etienne, involving in this case some 150 persons, hence 150 families! Obviously, this gives rise to multiple union controversies.

Be that as it may, the cost to the state of these restructurings has been estimated at 4 billion francs. It would appear, according to Jean Chauvet, that while the Ministry of Industry has decided the extent of the aid it will provide to the enterprises (in the different forms stipulated in the Plan), the Ministry of the Budget and Finance has not yet agreed as to the extent to which it will share in this cost.

The only thing one can urge at this point in time seems to be the following: Let us not repeat the errors of the past, distributing subventions that serve hardly any purpose other than to keep failing enterprises afloat.

Three courses of action must be undertaken forthwith by government authorities: Maintain or increase credit levels (transfer credits), beef up the MECA [Advanced-Design Machines and Equipment] procedure designed to help the PME's [Small- and Medium-size Businesses] acquire MOCN's [N/C machine tools], and lastly accelerate buying by the public authorities, hence by the national educational system which at this time represents 1/20th of the market. In sum, demand first and foremost must be stimulated, since in the present situation it is hardly likely that a "Plan" in and of itself will be crowned with success.

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TRANSPORTATION

INTERVIEW WITH PRESIDENT OF AEROSPATIALE

Paris PARIS MATCH in French 19 Feb 82 p 107

/Interview with Jacques Mitterand, president of Aerospatiale, by Laurence Masurel; date and place not specified/

/Excerpts/ /Question/ How does it affect you to learn that Concorde will no longer fly between Paris and Rio de Janeiro owing to unprofitability?

/Answer/ I am not indifferent. I note that its use is shrinking, but that happily it continues on the north American route and will do so for a long time.

/Question/ At present the financial situation of airlines is hardly bright. But despite that, the Airbus is selling well?

/Answer/ For 18 months almost all airlines have experienced grave difficulties. So they are not thinking of renewing their fleets. We also observe a general compression of orders. Yet in this gloomy context 1981 was a much better year than for others. As of now, 159 aircraft have been delivered to 28 companies, and 346 will be, which brings the figure to 505 planes.

/Question/ Where does the Airbus 320 project stand?

/Answer/ We are negotiating with several airlines, including Air France, to give that program a solid launching base. We know that in 1987-88 all airlines will have to replace the present generation of 150-passenger aircraft, barring severe economic accident. The A 320 will correspond to that type of aircraft. But before making the final decision we want firm commitments from companies: to build such a plane entails an investment of Fr 6 billion.

/Question/ To face such expenditures, do you not think it will some day be necessary to regroup the aeronautical sector, as was done in England or Germany?

/Answer/ Actually, we can ask whether it would not be in the interest of France to conduct a gradual restructuration of the aeronautical sector. For the moment, there is nothing like that in the government's program: the exposed portion of the iceberg makes no mention of it. But is there a hidden face? In my view, that would be in the logic of things. As far as I am concerned, I

would favor a policy of rapprochement, case by case and sector by sector. I am thinking particularly of firms like Dassault, Matra, Thomson, or SEP /expansion unknown/, which is an important affiliate of CGE /expansion unknown/. I think such rapprochements by branches would be useful for a better distribution of research funds, and also for avoiding perpetuation of the domestic fight for foreign markets. It would be a long-term task which should be conducted with a solid dose of pragmatism.

/Question/ On 5 December your tenure as president of Aerospatiale was renewed, although certain trade unions of the group were calling for a "change" of men at the top. The government has not, then, given satisfaction to the trade unions?

/Answer/ I am not the one who decided that I would be kept on. I will not say that there were people happy with me, but that those who wanted me to be replaced did not represent the majority, and that they did not have very clear motivations.

/Question/ Is it an advantage to be the president's brother when one directs an enterprise such as Aerospatiale?

/Answer/ The effects are complex. What I notice is that I am listened to more easily--which does not mean that I am understood! Some people would like to make use of me as their spokesman to the president. I have no trouble resisting. I have never been an intimate in the corridors of power. During my forty four and a half years of professional life I have always been very independent of those in government, and I am not about to be changed now!

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CSO: 3102/181

TRANSPORTATION

GCVERNMENT MAKES FUNDS AVAILABLE FOR NEW FOKKER STRATEGY

Paris AIR ET COSMOS in French 27 Feb 82 p 8

/Text/ Netherlands Economic Affairs Minister Jan Terlouw last week addressed a letter to the permanent economic affairs committee of the Chamber in which he pointed out that Fokker will not have to pay back the 160 million florins provided by the state for study of short/medium range aircraft. That sum is in fact being applied to preliminary studies in which there is an element of risk which cannot be borne by the builder.

From 1975 to 1982 an estimated 196 million florins were spent on studies for the F 28 Super, F 29, and MDF-100, of which approximately 20 percent was financed directly by Fokker and 80 percent by the state. Of that total, Fokker has spent over 110 million florins provided by the Economic Affairs Ministry through the intermediary of the NIVR /Netherlands Institute for Aeronautics and Astronautics Development/. The balance was spent by the NLR /National Aeronautics and Astronautics Laboratory/, which also receives funds through the NIVR.

A comparable situation has already been experienced by the Netherlands authorities in connection with the VFW 614. For that program, which failed, 25 million florins had to be written off.

For the future, the Netherlands Government remains disposed to make 1.7 billion florins available to Fokker in the form of guarantees and bank loans for execution of a project in anticipation of which Fokker has set up a study group with the mission of defining in the coming weeks a new strategy for the firm. Mr Terlouw declared that prospects will have to be quickly brought out so as to determine under what conditions Fokker will be able to continue working in the 90's on complete aircraft projects.

For the moment, the halting of the MDF 100 program is not causing unemployment problems at Fokker, but only at the NLR. At Fokker the F 27 and F 28 programs continue under more favorable conditions than were initially foreseen. The Netherlands authorities consider that the decision to put an end to cooperation between McDonnell Douglas and Fokker was the correct one from the time when it appeared impossible to arrive at a rapid launching of the MDF 100 project. Fokker will have to resume conversations with Airbus Industries, Boeing, and even McDonnell Douglas.

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CSO: 3102/181

TRANSPORTATION

A 310-300: HEAVIER, LONGER-RANGE AIRBUS PLANNED

Paris AIR ET COSMOS in French 27 Feb 82 p 11

/Article signed R. N./

/Text/ As the first A 310 emerged from the building shed (cf. AIR ET COSMOS no. 895), Airbus Industries made public a number of technical details on future versions of the aircraft, and particularly on the long-range or A 310-300 version.

We recall first of all that the A 310, though directly derived from the A 300 and having the same fuselage cross section, is nevertheless characterized by the following modifications:

A shorter fuselage (46.66 m compared to 53.62 m for the A 300);

A new airfoil with less wing surface (219 m^2 compared to 260 m^2;

New engines to be chosen by option from the same builders: General Electric (CF6-80A1/A3) and Pratt and Whitney (JT9D-7R4D1/E1). We note that Airbus Industries is currently studying a new supplementary option constituted by Rolls-Royce RB211-524B4 engines;

A new forward-facing crew cockpit characterized by digital avionics and instrumentation with cathodic visualization;

A new quieter and more economical Garrett GTCP 331 APU /expansion unknown/.

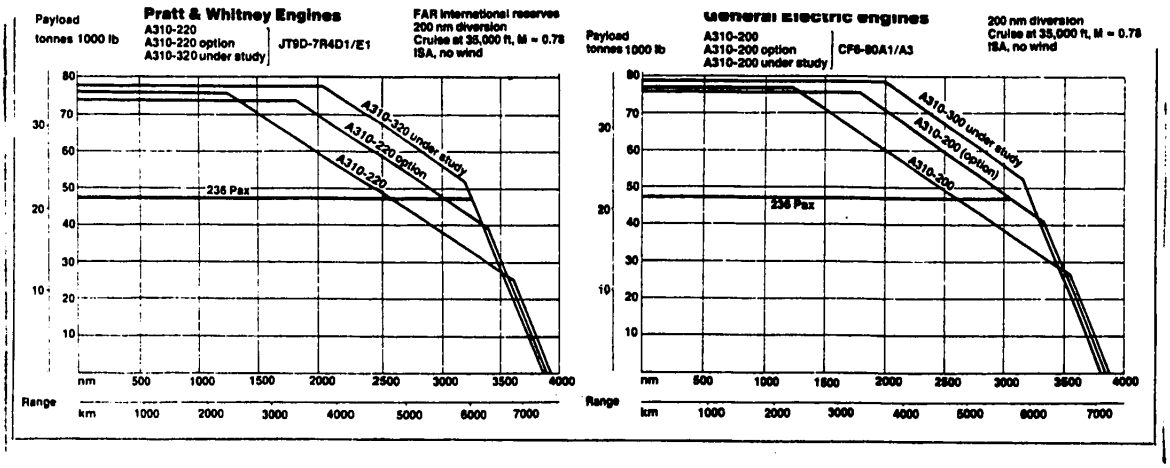
In its present basic version, called the 200, the A 300's "little brother" can transport from 195 to 265 passengers (the typical layout is for 210 seats) up to 5,000 km at a speed of Mach 0.78 at 35,000 ft altitude. Its maximum weight at takeoff is 132 tons, of which 43 tons is fuel. Also proposed at present are a convertible A 310 C version offering a 36.8 ton cargo capacity, and an all cargo A 310 F "Freighter" version, already ordered by Martinair, offering a 210 m^3 volume and a 39.4 ton capacity. These two versions are equipped with a large cargo door 3.6 m wide by 2.6 m high. While keeping to the same lift capacities, but in order to meet specific requirements of certain client companies, Airbus Industries has decided to develop two other versions of the A 310 to be characterized by greater takeoff weight, which would permit greater

fuel capacity, with a consequent increase in range. Thus the so-called "200 option" will soon appear, which will be actually proposed as such starting with the 17th aircraft, and will be available to be taken up as chosen by the airlines. Its takeoff weight is increased to 138.6 tons, including 43 tons of fuel, and its range could reach 5,900 km with 218 passengers. No structural modification of the aircraft is necessary in view of the excellent optimization of airfoil achieved for the A 310.

With the goal of further increasing the A 310's flexibility, Airbus Industries is also studying a long-range 300 version. If sufficient interest is shown by carriers in this new version, the decision to launch it could be taken during the summer, which would permit first deliveries early in 1986. The A 310-300 this time will have a takeoff weight of 149 tons, including 48 tons of fuel, an increase of 5 tons over the standard version. Its range will be increased to 7,130 km with 218 passengers, which will make the A 310 particularly advantageous on southeast Asian routes.

Here again, the increase in characteristic masses would require no structural modification, for the European builders are this time considering placement of the additional fuel in the horizontal empennage, with a transfer system similar to that adopted for Concorde, which would permit in-flight adjustment of the aircraft's trim toward the stern. In addition to a substantial decrease in wing load, this would also permit reduction of drag at cruising speed, which would result in a 5 to 10 percent decrease in fuel consumption according to Airbus Industries.

Payload-Range Curves of Different A 310 Versions: Left, With Pratt & Whitney Engines; Right, With General Electric Engines:



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CSO: 3102/181

TRANSPORTATION

FRANCO-ITALIAN ATR 42 PROJECT RECEIVES FIRST ORDERS

Paris AIR & COSMOS in French 17 Apr 82 p 13

[Article by J.M.: "Ransome and Command Airways Have Chosen the ATR 42"]

[Text] Two top American commuter airlines have just confirmed the options they already held on the twin-turboprop ATR 42. Acting for the GIE [Economic Interest Group] "Avions de Transport Regional" (formed recently by AEROSPATIALE [(French) National Industrial Aerospace Company] and AERITALIA [expansion unknown]), AEROSPATIALE announced successively on 8 and 12 April:

--A firm order from Ransome Airlines for six ATR 42's. These planes, which it is known will be equipped to transport 46 passengers, will be delivered beginning in November 1985 and operated by this major U. S. east coast carrier on a network that presently serves 11 large cities with 140 flights daily. Ransome Airlines, formed 15 years ago and based in Philadelphia, possesses currently a fleet of six 4-engine turboprop DHC-7's built in Canada by De Havilland Aircraft, and nine twin-turboprop N 262's built by AEROSPATIALE and in operation at Ransome since 1972. In its release, AEROSPATIALE deems that "This first order from Ransome Airlines represents a major success for the ATR 42 over its competitors. The interest being shown in this plane by Ransome opens the way to the development of the ATR family to include larger capacities."

The value of the Ransome order is placed at $30 million.

--A firm order from Command Airways for three ATR 42's to be delivered beginning in 1986, to which are added options on another two planes. Based in Poughkeepsee (New York State), Command Airways currently has six Shorts SD 300's in service on its New York-Boston-White Plains and Albany routes. We note with interest, in passing, that the president of this company, Mr Kingsley Mors, is also president of the newly-formed RAAA [Regional Airlines Association of America]. The ATR 42 has thus found in the United States a backer of some weight[1]...

While the detailed design study of the plane continues (the target dates, which remain unchanged, are: initial flights respectively August and October 1984; European and American certification flights in accordance with Part 25 standards during the third quarter of 1985; and deliveries to begin in the fourth quarter, that is--in the case of Ransome--within 43 months), it is interesting to note

that the characteristics of the ATR 42 have changed slightly since the study we published on this plane in October 1981 (see AIR ET COSMOS, No 878, then 881 and 882), with respect to both its weight ratings and performance ratings, and both for the better. The AEROSPATIALE Aircraft Division's Design Bureau in Toulouse, which is carrying prime responsibility for the general architecture of the plane and of its airfoil, has been assigned the dual mission of intensifying its efforts to raise the ATR 42's performance to the maximum and to lower its cost of production to the minimum: In the severe competitive struggle that pits the two European builders against De Havilland Canada, Embraer, and the Saab-Fairchild and CASA [Aeronautical Construction Company]-Nurtanio combines (without forgetting Fokker, which is studying a much-improved F 27), AEROSPATIALE and AERITALIA must absolutely come up with a product that offers the best possible price-performance ratio at a fabrication cost that will ensure profitability within a reasonable time period. The design bureaus of both companies are actively engaged in this mission.[2]

We return to the current characteristics of the ATR 42, bearing in mind that at this stage in its development a project of this nature can be expected to undergo further slight changes.

The cabin measures 13.87 m in length by 2.57 m at its maximum interior width by 1.91 m in height. It is pressurized at 6 psi [pounds per square inch] (420 g/cm^2), providing at an altitude of 13,500 feet a cabin atmospheric pressure equal to that outside the cabin at ground level, and at 25,000 feet a cabin pressure equal to that at 6,500 feet; Passengers will thus experience the same comfort they do in the most modern jets. This cabin will accommodate 42 passengers seated in rows of four (2 + 2) at 32-inch row spacings, or 46 passengers by reducing this spacing to 30 inches, or 49 passengers by reducing slightly the volume (5.8 m^3) of the forward baggage compartment. In all cases, the ATR 42 will have, located aft, a galley facility, a lavatory and a second baggage compartment measuring 2.7 m^3; the latter is in addition to, let us recall, the hand-luggage racks ranged above the seats and having a total volume of 1.6 m^3.

Its weight ratings are summarized in the accompanying table. Two standard versions are currently being offered: the ATR 42-100, capable of taking off at 14,175 kg and of transporting 42 passengers over a distance of 1,300 or four 185-km hops without refueling, and the ATR 42-200 (maximum weight: 15,500 kg), capable of tranporting 49 passengers over a single hop of 1,450 km or five 185-km hops. Maximum takeoff weights have been increased substantially, providing greater flexibility of operation. Incidentally, we point out that the ATR 42-200 will have a range of around 1,550 nautical miles (2,870 km) with a payload reduced to 3,000 kg and 2,200 nautical miles (4,075 km) with a payload of 2,000 kg.

Information will be forthcoming on the characteristics and performance ratings of the stretched ATR 42 (ATR XX), capable of transporting, in one of the versions being considered, 54 passengers at seat-row spacings of 32 inches, and 58 passengers at 30-inch spacings.

Other noteworthy points are:

--The retapering of the fuselage aft, slenderizing it to reduce form drag (its overall length thus totals 22.70 m);

--The definitive choice of the propellers that will equip the two PW 100/2 turbomotors, each of which develops 1,800 shaft hp on takeoff at ISA + 13 degrees C (2,000 hp in "emergency"). These will be 4-bladed, 3.96-m diameter, Hamilton Standard Type 14 SF's.

Weight and Typical Performance Ratings of ATR 42's

Item	ATR 42-100	ATR 42-200
Maximum takeoff weight (kg)	14,715	15,550
Maximum landing weight (kg)	14,715	15,300
Maximum weight less fuel (kg)	14,105	14,465
Operational empty weight (kg)	9,295	9,335
Maximum payload (kg)	4,810	5,130
Maximum fuel (kg)	4,500	4,500
Maximum cruising speed[1] (km/hr)	513	509
Cruising altitude (ft)	25,000	25,000
Cruising altitude on 1 engine[2] (ft)	4,085	3,475
Takeoff runway length[3]:		
at Z = 0 (m)	950	1,070
at 3,000 ft, ISA + 10 (m)	1,150	1,280
Landing runway length [3] (m)	895	950

1) At 20,000 ft, ISA atmosphere.

2) At 97 percent of maximum weight, ISA + 10.

3) At maximum rated weight.

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