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West Europe Report

SCIENCE AND TECHNOLOGY

(FOUO 8/82)

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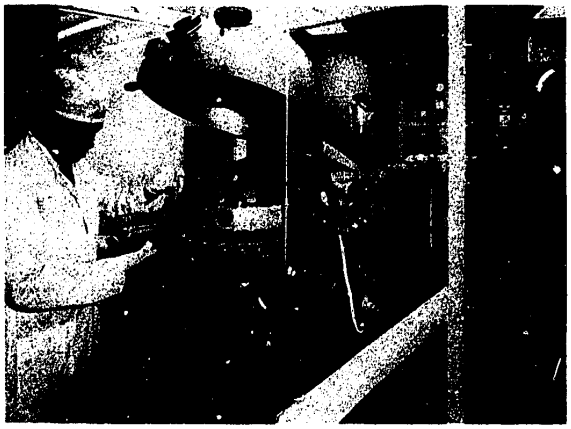
ELECTRONICS

ADVANCED EQUIPMENT FOR PRODUCTION OF SEMICONDUCTORS

Duesseldorf VDI-Z in German No 3, 1982 p V

[Text] Kleockner-Moeller, manufacturer of IC devices in Bonn, has set up a semiconductor pilot line in its research and testing center which will enable them to manufacture special-purpose semiconductors in the future. The pilot line is so designed that almost all manufacturing processes covering the spectrum from bipolar to silicon gate MOS technology can be realized. An important equipment item is the ion implanter. The photo shows the vacuum chamber loaded with thin silicon wafers which will be doped with P and N materials



An investment for the future

9160

CSO: 3102/202

INDUSTRIAL TECHNOLOGY

FRENCH FIRM PRODUCES AUTOMATIC DRILLER-RIVETER

Paris AIR & COSMOS in French 27 Mar 82 pp 19, 21

[Article by Nicole Beauclair: "Aeronautical Hardware and Bolts and Nuts. Automatic Driller-Riveter"]

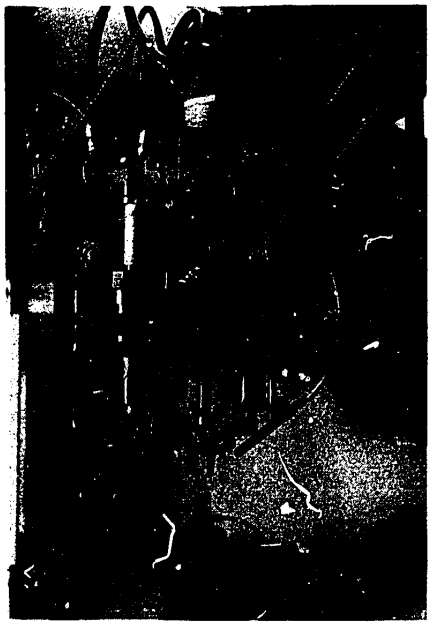
[Text] Until recent years, the aeronautical industry had to rely almost exclusively on the U.S. market for its hardware. This trend is gradually disappearing and French manufacturers are increasingly emerging on the domestic market. However, there remained a gap to be filled in Europe, that of the automatic assembly machine. A French company, Recoules, is picking up the challenge.

Over the years, Recoules & Fils, a company created in 1948, has specialized in the production of cutting tools for the airspace manufacturing industry; during the 1960's, it oriented itself toward the design and production of countersink-bit holders.

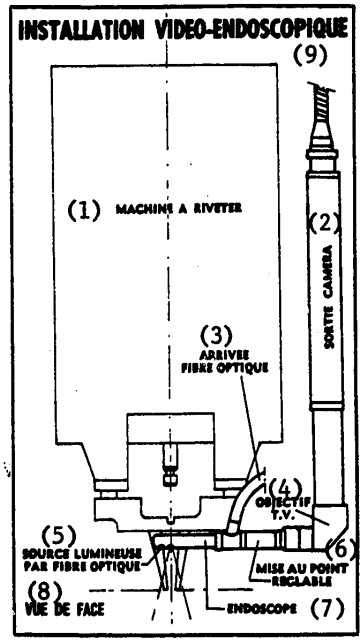
Recoules & Fils was already a supplier to the aeronautical industry when it perceived the necessity to fill the gap which remained with respect to riveters; it started studying the problem in 1978 and a prototype was ready by the end of 1980. This prototype was then tested for three months at Dassault and improvements were made, as is usually required whenever a new machine is placed in service. This approach led to the development of a series of machines based on the same principle (C-shaped frame machines) but having different capabilities.

This series, called Preca, includes three standard machines, one of which has a fixed lower riveting-die holder, while the other two (Preca 500 and 600) have an added-on lower knee-bracket. These various configurations are a function of the panels to be assembled; the opening width of the C-shaped frame of each of the models is respectively of 1,200 mm (Preca 300 S), 400 mm (Preca 500) and 600 mm (Preca 600) for depths of 1,800 mm on the Preca 300 S and 1,550 mm on the Preca 500 and 600.

The machines are designed to drill and rivet at the same work-station. In the standard version, they are equiped with a light spot which ensures that the axis of the drilling unit will coincide with a line previously drawn on the panels to be assembled. However, it is known that aeronautical assemblies



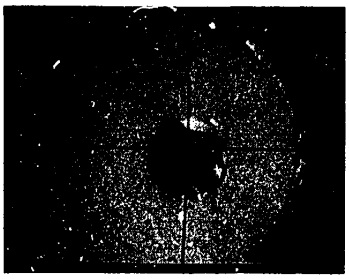
Working head of the Preca 600 with its positioning light-spot



Principle of a machine equipped with an endoscopic system

Key:

1. Riveting machine
2. Camera output
3. Optical fiber input
4. TV objective
5. Optical fiber light-source
6. Adjustable setting
7. Endoscope
8. Front view
9. Video-endoscopic system



Video screen enabling an easy positioning even if the operator is kept at a distance because of panel dimensions

involve bulky panels and that workers sometimes encounter difficulties in positioning the flanges correctly. This is why Recoules & Fils, in collaboration with EFER 3 B, have developed an endoscopic position system which is offered as an option on the machine.

The glass-fiber lighting endoscope has a sight angle of 90° and a field of vision of approximately 35°; it is connected to an elbowed TV objective. This assembly is connected to a camera output with a Newvicon tube; the camera, its control unit and its power supply are French-made (Aaton). The whole thing is connected to a video-screen (Thomson) to enable an easy visualization of the machine/drilling axis positioning to be achieved.

The Preca machines can handle wing panels up to 10 meters in length (or even more), which is still only an average dimension for this type of parts but nevertheless requires five axes to follow the evolved shapes of the panels. The machines, which are provided with digital control only as an option, make it possible to follow such evolved shapes: the machine has two axes, X and Y, and the table moves according to three axes, Z (vertical), Z_1 and Z_2, the latter two being axes of inclination at the ends of the table; a sixth rotation axis can result from a simultaneous motion according to axes Z_1 and Z_2. The machines can be equipped with tables measuring either 8,000 mm x 1,500 mm or 1,200 mm x 2,500 mm.

As far as technical specifications are concerned, and as an example, the Preca 500 is equipped with a hydraulic-motor spindle the speed of which can be adjusted from 500 to 8,000 rpm, with an adjustable speed of 0.02 to 0.4 mm per revolution. The maximum depth of drilling of the Preca 500 is 25 mm with a precision 0.02 mm of the countersink depth in the extreme positive position. It was designed for riveting with titanium or aluminum rivets having a diameter ranging from 2.4 to 6.35 mm and a length of 25 mm, and either a flat or a button head. The compression strength of this machine is 6 tons; the hydraulic unit has a capacity of 250 liters for a power of 7 kW.

The Preca machines are equipped with a control console which also includes control and safety lights: safety system making it possible to remove the drill-bits without risking to start the machine (air-supply interruption), detection of broken drill bits, automatic shutdown in case of a failure of the compressed air supply, detection of failures or anomalies, etc.

This series of machines designed from existing European equipment offers therefore a considerable advantage as far as machine maintenance is concerned. In addition, these machines, which are primarily intended for drilling and riveting, can in the future be used for other types of attachments, such as the installation of Huck's GP systems to mention only one example.

Therefore, this series of French machines seems promised to a bright future; four are already in service at Dassault (Biarritz and Boulogne plants), at Reims Aviation and at SNIAS [National Industrial Aerospace Company (Aerospatiale)] (Meaulte plant).

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INDUSTRIAL TECHNOLOGY

BRIEFS

FRENCH MACHINE TOOL INDUSTRY--French imports of expensive numerically controlled machine tools will be cut back from today's 60 percent market fraction to about 30 percent by 1984. Minister of Industry Pierre Dreyfus will pursue this goal through government subsidies and contracts to the French machine tool builders; in response, they are expected to increase their international competitive capability through cooperative arrangements. The branch will concentrate specifically on top-grade NC machines whose sales are expected to increase by a factor of 4 to about F4.6 billion by 1985. The most important of the nearly 150 companies will be organized in 3 pools around the 15 branch leaders to bring down the cost of research, development and manufacturing. Consideration is being given to the establishment of a special finance company to assure the required level of financing for the manufacturers of machine tools and industrial robots. The government is coupling its offering to the willingness of the private firms to commit themselves to independent research and development contracts amounting to 5 percent of sales. As compensation, the government will award the industry contracts amounting to F1.2 billion over the next 3 years. With regard to pool formation, it is agreed that the industry leader, Renault Machine Outil, will remain independent. In line with the plan Ernault-Souma, an Empain-Schneider subsidiary, will be pooled with Hure (Suez Group) and Graffenstaden (Citalcatel); they will concentrate on top-of-the-line machines. Another pool concentrating on building special-purpose machines is proposed to be formed around Line-PSM, Tmi-Forest and Berthiez. A third center will be formed around Cazeneuve, Dufour-Profel, Ramo, Innovations Mecanique and others. [Text] [Duesseldorf VDI-Z in German no 3, 1982 p IV] [COPYRIGHT: VDI-Verlag GmbH, Duesseldorf 1982] 9160

CSO: 3102/202

TRANSPORTATION

AIRBUS INDUSTRIE PREDICTS GOOD MARKET FOR AIRLINERS

Paris AIR & COSMOS in French 13 Mar 82 p 9

[Article: "Airbus Industrie: Relatively Optimistic Forecasts for the Airliner Market]

[Text] Airbus Industrie has just published the results of an airliner market survey according to which 8,550 aircraft will be delivered to the 200 principal airlines of the non-communist world before the end of this century, assuming that no radical economic and social changes take place. Of this total, 7,100 aircraft will be short/medium-range aircraft and 1,450 long-range aircraft.

These prospects include the replacement of over 3,500 narrow-fuselage short/medium-range aircraft, of some 700 large-capacity long-range aircraft, and of over 400 large-capacity short/medium-range aircraft. In addition, 70 percent of the B 707 and DC-8 of the previous generation now operated on liaisons of up to 4,500 km will have to be replaced by more economical and less noisy large-capacity aircraft of the A 300/310 class.

Airbus Industrie hopes that the economic conditions which resulted in losses for the airlines and in decreased orders for the manufacturers will gradually disappear during the second half of this year, which would enable the airlines to improve their financial situation and revive the market.

Even if the high growth rates experienced by air transportation during the 1960's are not sustained, traffic can still be expected to increase from 1,000 billion passenger-kilometers in 1980 to 2,500 billion in 1995. With an annual growth rate of 6 percent, traffic in the year 2000 should therefore amount to three times the present traffic.

Markets such as those of the Middle and Far East, which are developing rapidly, will see their rate of growth decrease to a level comparable to that of fully developed markets (North America, Europe). On the other hand, Africa and Latin America should experience accelerated rates of expansion.

Apart from the requirements for large-capacity short/medium-range aircraft such as the A 300, A 300/600 and A 310, Airbus Industrie anticipates a large demand for high-technology fuel-efficient aircraft, such as the A-320, during the second half of the present decade, while the replacement of large-capacity

long-range aircraft of the first generation will start only in the late 1980's or the early 1990's and will then require aircraft such as the A 310-300 and the TA-11/TA-12. The replacement of large-capacity medium-range aircraft during 1990-1995 will open the way to aircraft like the TA-9, an elongated version of the A 300.

Thus, the range of Airbus Industrie's products is developed so that the aircraft which will be in demand are available in due time.

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TRANSPORTATION

VARIOUS GROUPS EXPRESS SUPPORT FOR AIRBUS PROGRAM

Aerospatiale Committee

Paris AIR & COSMOS in French 3 Apr 82 p 11

[Article: "Aerospatiale: A CCE Statement on the A. 320"]

[Text] At its 23 March meeting, the CCE [Central Enterprise Committee] of Aerospatiale studied the problems related to the employment of women by the company, reviewed job training and solidarity agreements, adopted its own budget and noted that the company's results will show a profit before tax for the year 1981. The CCE also took note of the observations of the company's president, Jacques Mitterrand, who expressed his concern about the state of European cooperation which is now at a standstill both for political and budgetary reasons, at a time when certain large projects are tied to European programs. National Defense budgets are insufficient to remedy inadequate workloads. The civilian aviation market is in a decline. The market for helicopters in the United States has lost strength. Certain African markets are vulnerable. Airbus Industries has had to alter its production programs. Its production objective, however, remains set at eight airplanes per month.

Importance of the A. 320 Program

In a statement on the A. 320, the CCE of Aerospatiale underlines that this program is a necessity for its engineering and design department. If the A. 320 were not introduced, the activity of this department would slow down as early as next summer, and manufacturing activities next year. The CCE underlines that the A. 320 and ATR 42 programs complement each other and that the ATR 42 cannot replace the A. 320. Under these conditions, Aerospatiale must show as strong a commitment to the introduction of the A. 320 as it did to that of the ATR 42.

The introduction of the A. 320 would confirm Aerospatiale's supremacy when it comes to designing and manufacturing an entire plane. (The company must not engage into a specialization which could only be detrimental to the consistent development of our industry.) It would also strengthen SNECMA's penetration on the market of civilian turbojets, which started with the CFM 56. The (elected) members of the CCE request that SNECMA be the principal partner in manufacturing the airplane engines. In this respect, considering the

experience SNECMA has already acquired with the CFM 56 programs, its participation should involve an engine which would enable this national enterprise to achieve new progress in mastering the design, engineering and manufacturing of complete engines for civilian use. Beyond the interest shown by Air France and Delta Airlines, the international market for a 140-160 seat airplane is estimated to range from 1,000 to 2,000 planes for the period 1985-2000; therefore, we must be represented on this market. For its part, the French government has stressed its determination to do all it can to introduce the A. 320. It has demonstrated it by allocating some 300 million francs of credits for new airplanes in 1982. To translate the government's determination into facts, the members of the CCE asked the management of Aerospatiale to press and do all it can for the implementation of the A. 320 program. Also, the design and engineering of the new TA 9 and TA 11 must be continued.

In a more general statement, the CCE expressed the wish that the authorities in charge will decide to introduce the A. 320, even if this implies a broadening of European cooperation.

The ATR 42 Is Introduced at the Right Moment

The CCE noted that the ATR 42 program has effectively started and stated that it comes at the right time since the work resulting from the subcontracting agreement with Dassault-Breguet may revert to the latter company, in which case the workloads of Aerospatiale facilities and subsidiaries affected by these measures would have to be adjusted.

The CCE called on the authorities to introduce the PAH-2. Also, decisions should be made as soon as possible concerning the HADES, SATCP, SX and M-5 programs, in order to provide work for the design and engineering departments and manufacturing facilities of the divisons involved.

The CCE is pleased by the financial effort made with respect to investments and equipment modernization, which should enable the company to assert itself on the international market although its profitability should be enhanced by new programs; it should also make it possible to improve the working conditions of the company's personnel.

Metalworkers

Paris AIR & COSMOS in French 3 Apr 82 p 11

[Article: "FEM: For an Extension of the Airbus Family"]

[Text] Fearing that the situation of the European aerospace industry may become a cause for concern during the coming years unless firm commitments are made soon, the European Federation of Metalworkers in the Community (FEM), on the occasion of its executive committee meeting in Brussels, has taken a stand in favor of the progressive development of the Airbus family. Among other things, this implies that:

- the industry will determine precisely under which market conditions the introduction of new airplanes would be justified;

- the governments of the countries involved, while respecting the GATT agreements, will make the necessary financial commitments to help introduce new planes. More than ever, the Airbus group deserves the support of the European states;

- the industry will increase its participation in venture capitals;

- the cooperation structure can be extended to other countries and manufacturers, especially to solve financing problems;

- the workloads will guarantee medium and very long term employment stability.

The FEM believes that "no single European country possesses today the financial capability to launch competitive programs. Only if countries cooperate will it be possible to put together the financing and production means required by large aeronautical and space programs. As a counterpart, these investments should create a large number of jobs and bring about technological developments, not only in the aerospace sector proper, but also in the primary sectors, and should therefore benefit national and regional economies."

"The European metalworkers' unions believe that it is essential to strengthen cooperation within the civilian aerospace industry in order to improve job stability--which is much more precarious in military aerospace manufacturing, still the dominant sector of the industry. In fact, orders from the military are subject to considerable variations and military export contracts are often uncertain and often politically and morally condemnable."

The FEM calls on the European Communities Commission to contribute to the success of the Airbus-family development. It asks its affiliates to support the FEM's position with their respective national authorities.

FRG Government

Paris AIR & COSMOS in French 3 Apr 82 pp 11, 64

[Article: "FRG: Increased Financial Support for the Airbus"]

[Text] Following a proposal by the Secretary of State for Economy in charge of the aerospace sector coordination, Martin Gruener, the cabinet restated its support to the Airbus program last week, at a meeting chaired by Chancellor Helmut Schmidt.

The maximum amount of the federal guarantee was increased from DM 2.85 to DM 4.1 billion, which should enable MBB to purchase the equipment it needs to share in the manufacturing of 8 airplanes per month, and cover the production of 860 airplanes in 8 years.

In addition, the amount of repayable loans for the development of the Airbus-family airplanes has been set at DM 165 million until 1985; this should make it possible to finance the German participation in the development of the A. 300-600.

Assistance in marketing, which takes the form of advantageous interest rates for 48 airplanes, has been set at DM 288 million. It could total DM 2,044 millions by 1986. Marketing assistance is limited to an average of DM 6 million per airplane until 1985; it should not exceed DM 4 million after 1985. For an additional 520 airplanes, the amount of marketing assistance should no exceed DM 2.4 billion by the year 2004.

Generally speaking, the German government has reaffirmed its support to the expansion of the Airbus program. Mr Martin Gruener argued that, now that the design and engineering studies for airplanes like the Alpha Jet and the Tornado have been completed, new projects must be introduced to maintain the workload of the design and engineering departments, and he asked the manufacturers to increase their investments in the preparation of future projects.

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