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DEMAND PROSPECTS FOR CIVIL TRANSPORT AIRCRAFT

SUMMARY

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Summary and conclusions

The present document has been drawn up for the "Concerted action and consultation between the Member States on industrial policy in the aeronautical sector", subject of the Council resolution of March 4, 1975.

The aerospace manufacturers of the Community, the European air transport companies, the airport authorities in Western Europe have been consulted, and a general agreement on the aims and methods has been expressed individually by the airframe manufacturers.

The aim is to determine on the one hand, the world demand for civil transport aircraft, on the other hand, a series of hypotheses on the various possibilities open to the European aerospace industry looked at from the point of view of a balance sheet for the civil aircraft sector within the Community (balance between expenditures by the European air transport equipment companies and sales by the European aircraft manufacturing industry) for the period 1975-1985.

Section III indicates those sectors of civil aircraft construction in which initiatives could enable the reduction or elimination of the expected overall negative balance, provided that that was the aim required within the framework of the general economic policy of the Community, in which the individual sectorial policies should fit.

Three areas of consideration for future initiatives can be distinguished :

- long haul aircraft, a series of indications (existence of Concorde, the relative decrease of the demand in the USA to the benefit of companies in the "Rest of the World", lead one to thoughts which should be based on more extensive studies on the opportunity to take initiatives in the field of subsonic long haul aircraft.

- "small" short and medium haul aircraft, the maintaining of a European presence in this category appears advisable, if the investments required are in proportion to the relatively limited benefit which can be expected.

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- "medium" short and medium haul aircraft, the range being very large (aircraft between 120 and 290 seats) it is necessary, taking into account at the same time existing programmes and their possible future developments, to examine the various solutions which would enable the European industry to occupy an important place in this aircraft category, in which it has always played a considerable role.

N.B. The following text sets out the results of a study in depth but does not claim to be exhaustive about the methods used.

The complexity of the subject justifies such a presentation, the annexes allowing a better understanding of the main conclusions contained in the note itself.

The forecasts contained in this note and in particular those dealing with traffic development and the capacity required are the results of work done in checking and putting together estimates provided by different sources (manufacturers, official bodies, trade associations, study and research centers).

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SECTION I

Assessment of air transport offers

1. Traffic development

a) Scheduled Traffic (ICAO excluding USSR and China)*

Using the 1973 figures as a base and taking into account the development in 1974, two different hypothetical traffic projections up to 1985 have been calculated (annexes 1 and 2) :

Table 1 (in billion passenger/kms)

1973		1975	1980	1985
519.7	Hypothesis A	555.7	870.4	1192.5
	Hypothesis B	590.6	972.7	1435.6

For the period 1973-1985, the rate of annual increase is 7.1% in hypothesis A and 8.8% in hypothesis B, which means that the rate of growth projected is slightly lower than that indicated by OACI in October 1974 (9% with a spread between 7% and 11%).

For the period 1975-1985, the rates work out as 7.9% in hypothesis A and 9.2% in hypothesis B. (1)

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(1) These figures are therefore close to the figures accepted by US aircraft manufacturers and in particular Boeing, who in May 1974 forecast for the same 1975-1985 period rates of 7.8% to 8.4%.

* See beginning of annexes : Methods and Definitions.

b) Unscheduled traffic (ICAO excluding USSR and China)

Using the 1973 figures as a base and taking into account the development in 1974, two different hypothetical traffic projections up to 1985 have been calculated (Annexe 3) (2)

Table 2 (in billion passenger/kms)

1973		1975	1980	1985
101.6	Hypothesis A	99.5	135.5	188.3
	Hypothesis B	114.5	203.9	327.0

c) Total traffic (Scheduled and unscheduled)

Adding together the totals under a) and b) above gives the following results :

Table 3 (in billion passenger/kms)

1973		1975	1980	1985
621.3	Hypothesis A	655.2	1005.9	1380.8
	Hypothesis B	705.1	1176.6	1762.6

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(2) The rates of growth for the periods 1975-1980 and 1980-1985 are close to those indicated in May 1974 for the same period by Boeing except for the first period in hypothesis A (6.3% as opposed to 10.1% indicated by Boeing).

The rates for development of total traffic during the period 1973-1985 are as follows : (3)

Hypothesis A : 6.8% Hypothesis B : 9%

d) Projection of total traffic sharing

Using the two hypotheses A and B, calculations indicate that there would be a considerable decrease in the traffic of those companies based in the USA in favour of companies in the "Rest of the World", with Europe's share remaining constant. (4)

Table 4

	1973	1985
Europe	31.2	30.7
USA	46.2	38.1
"Rest of the World"	22.6	31.2
	100.0	100.0

Taking scheduled traffic alone, USA based companies would achieve 40.6% of world traffic in 1985.

On the other hand, it is in the area of intercontinental services that an increase would take place.

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(3) The rates given by hypothesis A correspond exactly with the results of a forecast by Boeing in October 1974 (their lower hypotheses) whereas the rates given by hypothesis B imply a traffic growth of more than 10% on the higher hypotheses given in the same forecast.

(4) Member States of the Community plus Austria, Cyprus, Spain, Finland, Greece, Iceland, Norway, Portugal, Sweden, Switzerland, Turkey.

Table 5

	1973	1985
Continental services	61.0	53.3
Intercontinental services	39.0	46.7
	100.0	100.0

It is in the "Rest of the World" that the trend indicated above would be most marked.

2. Available capacity (Total : scheduled and unscheduled services)

Based on the forecasted development of air traffic, it is useful to determine the number of seats/kms offered in terms of load factors varying according to the type of service (whether scheduled or not), the main traffic routes and the year in question.

Annexes 4 and 5 contain the calculations which give rise to the following main conclusions (expressed in billion seat/km offered).

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Table 6

	1980		1985	
	Hypothesis A	Hypothesis B	Hypothesis A	Hypothesis B
I. Mainly continental traffic				
European airlines	232.4	286.1	319.0	419.9
US airlines	557.2	623.8	686.9	792.7
Airlines in the "Rest of the World"	176.4	185.6	225.6	244.0
Sub Total I	966.0	1095.5	1231.5	1456.6
II. Mainly intercontinental traffic				
European airlines	250.1	281.5	306.8	442.3
US airlines	156.4	204.3	213.1	317.7
Airlines in the "Rest of the World"	388.9	450.6	570.9	700.8
Sub Total II	795.4	936.4	1090.8	1460.8
Total I + II	1761.4	2031.9	2322.3	2917.4

Using the averge of hypotheses A and B, the average load factor would be 57.5% in 1980 and 60% in 1985.

If one compares the breakdown of available capacity in 1985 (average of the two hypotheses) with the same breakdown in 1974, the following development is brought to one's notice.

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- Reduction of the share of the total world capacity offered by the US based companies especially to the benefit of companies in the "Rest of the World", the share of the European companies varying slightly.

- The reduction of the share of total world capacity offered by US based companies would be due to the large reduction in the percentage of total world traffic carried by the long haul services of the US companies, this reduction not being entirely compensated for by an increase in the percentage relative to the short and medium haul services of US companies.

- The increase in the share of total world capacity on the part of the companies in the "Rest of the World" would be due to an increase in the percentage of total world long haul traffic carried by companies in the "Rest of the World", an increase not offset by a slight reduction in the percentage relative to short and medium haul traffic carried by these companies.

- For the European companies, the trends are less clear, although if an increase in the share of total world traffic offered by these companies does happen, this would be due to an increase in the percentage of total world capacity relating to short and medium haul European services.

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SECTION II

Analysis of the breakdown of capacity

1. Purpose of this section

The question here is to determine for each of the three geographical areas and for the world (i.e. ICAO excluding USSR and China) for both hypotheses A and B and for 1980 and 1985, the seat/kms to be offered on :

- aircraft in service in March 1974 or on order in October 1974 remaining in service in 1980 and 1985,

- aircraft to be ordered and delivered during the period 1975-1980 on the one hand, and 1980-1985 on the other, the aircraft on option in October 1974 appearing in a special line.

The productivity of aircraft in service and on order has had the following coefficients applied :

- 100% for aircraft in service less than 15 years in 1980 and 1985,

- 60% for aircraft being in service more than 15 years but less than 20 in 1980 and 1985.

2. Long haul aircraft

In annexes 6 and 7 can be found the tables in which the main elements are as follows:

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Table 7

	1975-1980 Airlines in				1980-1985 Airlines in			
SKO x 10^9 to be ordered and to be delivered	Europe	USA	Rest of the World	Total	Europe	USA	Rest of the World	Total
Hypothesis A	11.1	-	138.2	149.3	125.6	75.6	249.5	450.7
Hypothesis B	42.5		199.9	242.4	229.7	180.2	317.7	727.6

The most remarkable element is the overcapacity of the companies in the USA for long haul services up to 1980, even taking the most optimistic traffic development hypothesis. European demand for new long haul aircraft will be comparatively weak up to 1980. On the other hand, this demand will be important during the same period for the "Rest of the World"; it will probably be filled by aircraft types already in service and by transfers of aircraft already in service from one region to another.

To illustrate the demand more clearly, we have converted available seat/kms to be ordered and delivered into "long haul type aircraft". This is purely a question of using an arbitary unit of measurement corresponding to a fictive aircraft having an annual productivity of 541 million available seat/kms (200 seats, 817 km/h, 3,312 hours annual utilisation).

Table 8

	1975-1980 Airlines in				1980-1985 Airlines in			
	Europe	USA	Rest of the World	Total	Europe	USA	Rest of the World	Total
Hypothesis A	20		255	275	232	139	461	832
Hypothesis B	78		369	447	424	333	587	1344

The demand will in fact be filled by a number of aircraft which may be different from the figures given above, for these will vary from 100/400 seats whereas the fictive aircraft above has only 200.

However, it is the market after 1980 which is most worthy of attention given the lengthy timescale between defining a new aircraft on the drawing boards and putting it into service. For the period 1980-1985, demand will reach approximately 850/1350 "fictive" aircraft. These figures are lower than those appearing in earlier studies, but what appears to be more important is the closeness of the estimates in relation to the marked decrease of the percentage of the US carriers in the field of "long haul" world capacity put into service.

According to our estimates, the development of the breakdown of world long haul capacity put into service will be as follows for the two periods below :

Table 9

	1969-1974	1980-1985
European airlines	33	30
US airlines	31	21
Airlines in the "Rest of the World"	36	49
	100	100

3. Short and medium haul aircraft

In annexes 8 and 9 can be found the tables whose principal elements are the following :

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Table 10

SKO to be ordered and to be delivered $(10)^9$	1975-1980 Airlines in Europe	USA	Rest of the World	Total	1980-1985 Airlines in Europe	USA	Rest of the World	Total
Hypothesis A	88.7	128.5	40.8	258.0	120.8	241.3	75.4	437.5
Hypothesis B	142.4	195.1	50.0	387.5	168.0	280.5	84.6	533.1

There will not be overcapacity and the larger part of the demand will emanate from the USA whereas for long haul aircraft, it will emanate from the "Rest of the World".

This demand will represent the following number of fictive short and medium haul aircraft (based on an aircraft of an annual productivity of 335×10^6 SKO : 200 seats, 590 km/h and 2,843 hours annual utilisation).

Table 11

	1975-1980 Airlines in Europe	USA	Rest of the World	Total	1980-1985 Airlines in Europe	USA	Rest of the World	Total
Hypothesis A	264	383	121	768	360	720	225	1305
Hypothesis B	425	582	149	1156	501	837	252	1590

We feel that in the numbers of fictive aircraft, demand up to the end of 1980 will be much greater than for long haul aircraft; there is therefore during this period an important market for short and medium haul aircraft. Demand will probably be filled by fewer numbers of aircraft than given in the above figures, since wide-bodied 300-seat aircraft will fill an important part of the market.

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For the period 1980-1985, three essential differences can be noticed in comparison with forecasts for long haul aircraft:

a) Demand will be stronger (rounded average 1450 as opposed to 1100),

b) The spread between the two hypotheses will be less marked, which makes the average figure more meaningful,

c) The sharing of demand between the different geographical areas will be very different compared to long haul aircraft.

If in the field of long haul, we can expect to see a strong shift of the excess capacity demand from the USA towards the Rest of the World, nothing similar is foreseeable, according to our estimates in the field of short and medium haul where the development of the breakdown of capacity put into service will be as follows for the two periods below :

Table 12

	1969-1974	1980-1985
European airlines	20	27
US airlines	58	55
Airlines in the "Rest of the World"	22	18
	100	100

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SECTION III - BALANCE SHEET OF THE AERONAUTICAL SECTOR IN EUROPE

1. This is a question of comparing "consumption" and production in Europe of civil aircraft based on a series of hypotheses relating to :

- sales of European civil aircraft both on the European market and in countries outside Europe,

- import of civil aircraft into Europe.

It is not a question of forecasting sales of European products but of differing balance sheets based on several hypotheses about consumption and production in Europe.

2. Long haul aircraft

Based on estimates of penetration of European products into the markets, which are shown in annexes 10 and 11 (scenarios 1-4 for each one of the hypotheses A and B for available seat/km to be ordered and delivered, see table 7), we reach the following net balances between European consumption and European sales of long haul aircraft :

Table 13 (in million $ 1974)

	1975 - 1980				1980-1985			
Scenarios	1	2	3	4	1	2	3	4
Hypothesis A :	- 305	- 224	+ 339	+ 1949	- 3548	- 2484	- 1672	- 863
Hypothesis B :	- 1198	- 1117	- 554	+ 1056	- 6486	- 4541	- 3191	- 2042

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The balance of the European aeronautical sector for long haul aircraft will shift from -1198/+1949 during the period 1975-1980 to -6486/-863 during the period 1980-1985. The most plausible development being the case of scenario A2, the negative balance would considerably increase from -224 million \$ to -2484 million \$ (factor 11). Such a development could be produced under the following conditions :

- the development of traffic and demand under hypothesis A of sections I and II,
- in the period 1975-1980 : sale of the 16 Concordes under construction,
- in the period 1980-1985 : the European demand for available seat/kms filled by 30% of European aircraft (the equivalent of 45 DC 10-30) without exports.

Under more favourable conditions (scenario A3 : European industry supplying 40% of the European market and 5% of the markets of the US and the Rest of the World) the deficit for the period 1980-1985 would still increase to 1672 million \$ 1974.

3. Short and medium haul aircraft

On the basis of the estimates of the penetration of European products into the markets quoted in annexes 12 and 13, we arrive at the following balance between European consumption and sale of European short and medium haul aircraft :

Table 14

	1975-1980				1980-1985			
Scenarios	1	2	3	4	1	2	3	4
Hypothesis A :	- 2120	- 1472	- 937	- 116	- 2360	- 1226	- 105	+ 863
Hypothesis B :	- 3605	- 2510	- 1699	- 438	- 4028	- 2354	- 811	+ 457

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The balance in the sector of short and medium haul aircraft will shift from -3605/-116 during the period 1975-1980 to -4028/+863 during the period 1980-1985, in other words it will not vary much between the two periods, whereas we have already stated that it will considerably increase with respect ot long haul aircraft.

Dividing the market for short and medium haul aircraft in the following equipment categories (see annexes 12 and 13) :

- "small aircraft" up to 120 seats approximately,

- "medium-sized aircraft" from 120 to 290 seats approximately

- "large aircraft" over 290 seats.

One can estimate for the period 1975-1980 :

- for "small aircraft" a small positive balance,
- for "medium-sized aircraft" a negative balance between 1 and 2 billion $
- for "large aircraft" a negative balance of 0.3 to 0.5 billion $.

For the period 1980-1985, under scenario 2 * the breakdown of the negative balance would be as follows :

Table 15

	Hypothesis A		Hypothesis B	
	Mio $	%	Mio $	%
"small aircraft"	- 13	1.1	- 243	10.3
	- 961	78.4	- 1691	71.8
"large aircraft"	- 252	20.5	- 420	17.9
	- 1226	100.0	- 2354	100.0

The size of the deficit would not increase in relation to the period 1975-1980 and the major part of it would concern the "medium-sized aircraft".

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* corresponding to a complete absence of important new projects launched.

4. <u>The overall balance</u>

The overall balance would ~~switch~~ from -4803/+1833 during the period 1975-1980 to -10.514/0 during the period 1980-1985; in other words, it could increase considerably, reflecting above all the increase in the deficit of the long haul aircraft.

If one examines the breakdown of the negative balances in scenario 2 *, the following trends can be seen :

Table 16

	1975-1980				1980-1985			
	A2		B2		A2		B2	
Long haul	- 224	12.4	- 1117	30.2	- 2484	67.0	- 4541	65.9
Short and medium haul	—	—	—	—	—	—	—	—
"small aircraft"	—	positive balance	—	positive balance	- 13	0.3	- 243	3.5
"medium-sized aircraft"	- 1295	71.4	- 2121	57.3	- 961	25.9	- 1691	24.5
"large aircraft"	- 294	16.2	- 462	12.5	- 252	6.8	- 420	6.1
	- 1813	100.0	- 3700	100.0	- 3710	100.0	- 6895	100.0

We interpret these results as follows :

- <u>for the period 1975-1980</u>, the deficit would be much lower than the one shown for the years 1968-1973, i.e. 4,521 million $ 1974, and the most obvious way of reducing this deficit consists particularly in the improvement of the penetration of European short and medium haul aircraft under construction on the three markets.

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* corresponding to a complet absence of important new projects launched.

- for the period 1980-1985, it seems useful to bear in mind and act on the following projected development :

Table 17

(million $ 1974)	Breakdown of negative balances		
	1968-1973	1975-1980*	1980-1985 (x)
Long haul	2695	670	3512
Short and medium haul	1826	1991	1790
	4521	2661	5302
as percentage			
Long haul	60	25	66
Short and medium haul	40	75	34
	100	100	100

This development reflects the differences between the cycles of re-equipment on the one hand of the long haul fleets (1968-1973 and 1980-1985) and on the other hand of the short and medium haul fleet (1975-1980).

Whereas up till now, based on hypotheses A2 and B2, one is referring to assumptions about the lack of new major initiatives, and it is useful to analyse what the situation would be if new projects were launched (scenarios A4 and B4 for the period 1980-1985).

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(x) average of A2/B2 : calculated from the net balances of the long haul category on the one hand, and short and medium haul on the other : annexes 10, 11, 12 and 13.

Table 18

Period 1980-1985 (million $ 1974)	A4	B4
Long haul	- 863	- 2042
Short and medium haul	—	—
"Small aircraft"	+ 370	+ 283
"Medium-sized aircraft"	+ 745	+ 594
"Large aircraft"	- 252	- 420
	0	- 1585

We note that under the most optimistic scenarios with the lowest rate of increase in demand (scenario A4) the Community may hope to equalise the deficit in long haul aircraft and in large, medium and short haul aircraft, by parallel surpluses in small and medium, ~~short and~~ medium haul aircraft.

This does not mean that no actions in the field of long haul aircraft are called for under scenario A4; a penetration of 40% on the European market, 10% on the US market and 15% on the Rest of the World market will be necessary to reduce the deficit from - 2484 million $ (A2) to - 863 million $.

Action in the field of short and medium haul small aircraft will turn a small deficit of - 13 million $ (A2) into a surplus of + 370 million $.

Action in the field of short and medium haul medium-sized aircraft will turn a relatively large deficit of - 961 million $ (A2) into a relatively large surplus of + 745 million $.

Gains from actions in the various categories would be as follows :

- long haul	1621	million $ 1974	44%
- short/medium haul "small	383	" " "	10%
- short/medium haul "medium"	1706	" " "	46%
	3710		100%

ANNEXES

Methodology and abreviations

- Scheduled traffic : according to ICAO, scheduled service means : "series of flights..... carried out in order to route traffic between two or more points which remain the same throughout the series of flights, either following a published timetable or with sufficient regularity for it to clearly constitute a systematic series of flights.

- ICAO : International Civil Air Transport Organisation.

- SKO : Seat/Km offered (available)

- Methodology for traffic forecasts

  Based on ICAO statistics for 1973, taking into account various information available for 1974 as well as several traffic forecasts for 1973-1975, we have established two series of data relative to traffic expected in 1975 (A and B) and in relation to 9 principal scheduled traffic routes and 7 main non-scheduled traffic routes.

  Having several series of rates of increase predictions for traffic in the various subdivisions, we have chosen two different series of growth rates 1975-1980 and 1980-1985 which have been applied to the figures for 1975 in order to reach traffic hypotheses A and B for 1980 and 1985.

Hypothesis A — Scheduled traffic (million passengers/km)

	1975	75-80 rates	1980	80-85 rates	1985
I. Mainly continental traffic					
1. European airlines					
- domestic services	20,076	8.3	29,910	5.2	38,538
- inter-European services	32,969	10.0	53,096	9.0	81,694
2. US airlines					
- domestic services	205,629	7.8	299,348	5.3	387,538
3. Airlines in the "Rest of the World"					
- domestic services	69,989	7.9	102,361	6.1	137,628
Subtotal I = 1 + 2 + 3	328,663	8.0	484,715	5.8	654,398
rates on 10 years : 6.9					
II. Mainly inter-continental traffic					
4. European airlines					
- North Atlantic services	33,658	5.6	44,198	4.9	56,140
- Other services	46,388	9.4	72,692	4.2	89,294
5. US airlines international					
- North Atlantic services	22,646	5.6	29,737	4.9	37,772
- other services	23,516	11.5	40,526	8.6	61,218
6. Airlines in the "Rest of the World"					
- international services	100,914	14.5	198,599	8.8	302,774
Subtotal II = 4 + 5 + 6	227,122	11.1	385,752	7.2	547,198
rates on 10 years : 9.1					
Total I + II	555,785	9.3	870,467	6.4	192,596
I + II Rates on 10 years 75-85: 7.9					

Rates on 12 years : 1973-1985

	1973	Rates	1985
I + II	519,734	7.1	1,192,596

N.B. For lines 1 to 6, the figures in columns 1980 and 1985 are the results of the application of used rates drawn from the study of existing sources. For the subtotal and total lines, the figures are the results of adding the figures in lines 1 to 6. The rates on the subtotal and total lines are rounded downwards to the nearest 0.1% on the calculations.

Hypothesis B — Scheduled traffic (million passengers/km)

	1975	75-80 rates	1980	80-85 rates	1985
I. Mainly continental traffic					
1. European airlines					
- domestic services	21,200	9.1	32,768	5.7	43,233
- inter-European services	35,779	10.3	58,412	9.5	91,953
2. US airlines					
- domestic services	221,211	8.5	332,623	5.8	440,938
3. Airlines in the "Rest of the World"					
- domestic services	71,272	8.6	107,662	6.7	148,895
Subtotal I = 1 + 2 + 3	349,462	8.7	531,465	6.4	725,019
rates on 10 years : 7.5					
II. Mainly inter-continental traffic					
4. European airlines					
Inter-continental services					
- North Atlantic services	35,158	6.1	47,271	10.0	76,130
- other services	48,700	10.0	78,431	10.0	126,313
5. US airlines					
- North Atlantic services	23,531	16.1	31,638	10.0	50,953
- other services	31,130	12.0	54,861	10.0	88,354
6. Airlines in the "Rest of the World"	102,705	17.4	229,050	10.0	368,887
Subtotal II = 4 + 5 + 6	241,224	12.8	441,251	10.0	710,637
Rates on 10 years : 11.4					
Total I + II	590,686	10.4	972,716	8.0	1435,656
I + II : rates on 10 years 1975-1985: 9.2					

Rates on 12 years : 1973-1985	1973	Rates	1985
I + II :	519,734	8.8	1,435,656

Annexe 3

Hypothesis A — Unscheduled traffic (million passengers/km)

	1975	75-80 rates	1980	80-85 rates	1985
I. Mainly continental traffic					
European airlines					
- Inter-European traffic	53,560	5.8	70,921	6.3	96,258
US airlines					
- Domestic traffic	7,655	8.2	11,352	8.1	16,757
II. Mainly inter-continental traffic					
European airlines					
- North Atlantic traffic	6,468	5.2	8,333	6.0	11,151
US airlines					
- North Atlantic traffic	12,320	5.2	15,874	6.0	21,242
European airlines					
- other inter-continental traffic	12,063	8.2	17,889	8.1	26,406
US airlines					
- other inter-continental traffic	3,595	8.2	5,331	8.1	7,869
Airlines in the "Rest of the World"					
- inter-continental traffic	3,943	8.2	5,847	8.1	8,630
Total	99,544	6.3	135,547	6.7	188,313

Annexe 3a

Hypothesis B — Unscheduled traffic (million passengers/km)

	1975	75-80 rates	1980	80-85 rates	1985
I. Mainly continental traffic					
European airlines					
- inter-European traffic	62,171	11.0	104,761	9.2	162,671
US airlines					
- domestic traffic	7,798	16.3	16,591	11.8	28,978
II. Mainly inter-continental traffic					
European airlines					
- North Atlantic traffic	7,700	10.3	12,570	8.8	19,163
US airlines					
- North Atlantic traffic	16,900	10.3	27,590	8.8	42,062
European airlines					
- other inter-continental traffic	12,288	16.3	26,144	11.8	45,664
US airlines					
- other inter-continental traffic	3,662	16.3	7,791	11.8	13,608
Airlines in the "Rest of the World"					
- international traffic	4,017	16.3	8,546	11.8	14,926
Total	114,536	12.2	203,993	9.9	327,072

Hypothesis A — Calculation of the capacity to be offered

(S.K.O. x 10^6)	1980 load factor	1980 S.K.O.	1985 load factor	1985 S.K.O.
I. Mainly continental traffic				
1. European airlines				
- domestic services	55	(54,379)	57	(67,607)
- scheduled international services	55	(96,533)	57	(143,315)
- unscheduled " "	87	(81,516)	89	(108,145)
		(232,428)		(319,067)
2. US airlines				
- scheduled domestic services	55	(544,244)	58	(668,154)
- unscheduled " "	87	(13,047)	89	(18,826)
		557,291)		(686,980)
3. Airlines in the "Rest of the World"				
- scheduled domestic services	58	176,480	61	225,613
I = 1 + 2 + 3		966,199		1,231,660
II. Mainly inter-continental traffic				
4. European airlines				
- scheduled North Atlantic services	56	(78,924)	58	(96,790)
- unscheduled " " "	83.5	(9,979)	84	(13,274)
- other scheduled services	52	(139,786)	54	(165,354)
- other unscheduled "	83.5	(21,423)	84	(31,433)
		(250,112)		(306,851)
5. US airlines				
- scheduled North Atlantic services	56	(53,101)	58	(65,122)
- unscheduled " " "	83.5	(19,010)	84	(25,286)
- other scheduled services	52	(77,931)	54	(113,363)
- other unscheduled "	83.5	(6,384)	84	(9,367)
		(156,426)		(213,138)
6. Airlines in the "Rest of the World"				
- scheduled international services	52	(381,905)	54	(560,676)
- unscheduled " "	83.5	(7,002)	84	(10,273)
		(388,907)		(570,949)
II = 4 + 5 + 6		795,445		1,090,938
Total I + II =		1,761,644		2,322,598

Hypothesis B — Calculation of the capacity to be offered

($S.K.O. \times 10^6$)

	1980 load factor	1980 S.K.O.	1985 load factor	1985 S.K.O.
I. Mainly continental traffic				
1. European airlines				
- domestic services	55	(59,575)	57	(75,843)
- scheduled international services	55	(106,198)	57	(161,313)
- unscheduled " "	87	(120,412)	89	(182,760)
		(286,185)		(419,916)
2. US airlines				
- scheduled domestic services	55	(604,741)	58	(760,221)
- unscheduled " "	87	(19,069)	89	(32,556)
		(623,810)		(792,777)
3. Airlines in the "Rest of the World"				
- scheduled domestic services	58	185,620	61	244,083
I = 1 + 2 + 3		1,095,615		1,456,776
II. Mainly inter-continental traffic				
4. European airlines				
- scheduled North Atlantic services	56	(84,411)	58	(131,255)
- unscheduled " " "	83.5	(15,053	84	(22,811)
- other scheduled services	52	(150,822)	54	(233,906)
- other unscheduled "	83.5	(31,310)	84	(54,358)
		(281,596)		(442,330)
5. US airlines				
- scheduled North Atlantic services	56	(56,495)	58	(87,848)
- unscheduled " " "	83.5	(33,041)	84	(50,070)
- other scheduled services	52	(105,497)	54	(163,613)
- other unscheduled "	83.5	(9,330)	84	(16,198)
		(204,363)		(317,729)
6. Airlines in the "Rest of the World"				
- scheduled international services	52	(440,463)	54	(683,104)
- unscheduled " "	83.5	(10,234)	84	(17,767)
		(450,697)		(700,871)
II = 4 + 5 + 6		936,656		1,460,930
I + II =		2,032,271		2,917,706

Annexe 6

(see N.B. of annexe 8)

Hypothesis A

S.K.O. x 10^9

Long haul services *

Estimate of the breakdown of available seats/km in 1980 and 1985

	1980				1985			
	Airlines in				Airlines in			
	Europe	USA	Rest of the World	Total	Europe	USA	Rest of the World	Total
1) Aircraft in service or on order in 1974, maintained in service								
- in 1980	239.0	225.1	250.7	714.2				
- in 1985					170.1	137.5	183.2	490.8
2) Reminder of the S.K. to be offered								
- in 1980	250.1	156.4	388.9	795.4				
- in 1985					306.8	213.1	570.9	1090.8
3) S.K. to be ordered and to be delivered								
- in 1975-1980	11.1	—**	138.2	149.3	11.1	—	138.2	149.3
(of which on option in - October 1974)	(14.2)	(33.0)	(13.7)					
- 1980-1985					125.6	75.6	249.5	450.7

* Aircraft taken into account for the calculation of S.K. already available for 1980 and 1985 : B 747, DC 10 30/40, B 707/720, DC 8, CV 880 and 990, Comet, VC 10, Concorde, aircraft with turboprops and piston engines.

** overcapacity : 68.1 S.K.O. x 10^9.

Hypothesis B

S.K.O. x 10^9

Long haul services

Estimate of the breakdown of available seats/km in 1980 and 1985

	1980				1985			
	Airlines in				Airlines in			
	Europe	USA	Rest of the World	Total	Europe	USA	Rest of the World	Total
1) Aircraft in service or on order in 1974, maintained in service								
- in 1980	239.0	225.1	250.7	714.8				
- in 1985					170.1	137.5	183.2	490.8
2) Reminder of the S.K. to be offered								
- in 1980	281.5	204.3	450.6	936.4				
- in 1985					442.3	317.7	700.8	1460.8
3) S.K. to be ordered and to be delivered								
- in 1975-1980	42.5	—	199.9	242.4	42.5	—	199.9	242.4
(of which on option in								
- October 1974	(14.2)	(33.0)	(13.7)					
- in 1980-1985					229.7	180.2	317.7	727.6

Hypothesis A

$S.K.O. \times 10^9$

Short and medium haul services *

Estimate of the breakdown of available seats/km in 1980 and 1985

	1980 Airlines in Europe	1980 USA	1980 Rest of the World	1980 Total	1985 Airlines in Europe	1985 USA	1985 Rest of the World	1985 Total
1) Aircraft in service or on order in 1974, maintained in service								
- in 1980	143.7	428.7	135.6	708.0				
- in 1985					109.5	317.1	109.4	536.0
2) Reminder of the S.K. to be offered								
- in 1980	232.4	557.2	176.4	966.0				
- in 1985					319.0	686.9	225.6	1231.5
3) S.K. to be ordered and to be delivered								
- in 1975-1980	88.7	128.5	40.8	258.0	88.7	128.5	40.8	258.0
(of which on option								
- in Oct. 1974	(19.7)	(30.9)	(7.7)	(58.3)				
- in 1980-1985					120.8	241.3	75.4	437.5

* Short and medium haul aircraft taken into account for the calculation of S.K.O. already available for 1980 and 1985 : a certain number of 747 of US airlines and airlines in the "Rest of the World", DC 10.10, Lockheed 1011, A 300, B 727, B 737, DC 9, Caravelle, Trident, Mercure, BAC 111, F 28, VFW 614, F 27, HS 748 and some other aircraft with turboprops or piston engines.

N.B. The seat /kms available in 1980 on the one hand, in 1985 on the other, on inter-continental long haul aircraft in service or on order in 1974 have been subtracted from the S.K. to be offered in 1980 and 1985 on the mainly inter-continental services so as to obtain the S.K.O. on long haul aircraft to be ordered and delivered during the periods 1975-1980 and 1980-1985. Nevertheless, the productivity of a number of B 747 in service and on order in October 1974 has been applied not the mainly inter-continental services but to the mainly continental services of the US and the "Rest of the World" airlines.

Similarly, the S.K. available in 1980 on the one hand, in 1985 on the other, on short and medium haul aircraft in service or on order in 1974, have been subtracted from the S.K. to be offered in 1980 and 1985 on the mainly continental services so as to obtain the S.K. on short and medium haul aircraft to be ordered and delivered during the periods 1975-1980 and 1980-1985. The calculations have been made on the assumption that there would not be any aircraft transfers from an airline based in one region to an airline based in another.

Hypothesis B

Short and medium haul services

Estimate of the breakdown of available seats/km in 1980 and 1985

	1980 Airlines in				1985 Airlines in			
	Europe	USA	Rest of the World	Total	Europe	USA	Rest of the World	Total
1) Aircraft in service or on order in 1974, maintained in service								
- in 1980	143.7	428.7	135.6	708.0				
- in 1985					109.5	317.1	109.4	536.0
2) Reminder of the S.K. to be offered								
- in 1980	286.1	623.8	185.6	1095.5				
- in 1985					419.9	792.7	244.0	1456.6
3) S.K. to be ordered and to be delivered								
- in 1975-1980	142.4	195.1	50.0	387.5	142.4	195.1	50.0	387.5
(of which on option in								
- in Oct. 1974	(19.7)	(30.9)	(7.7)					
- in 1980-1985					168.0	280.5	84.6	533.1

Balance of the aeronautical sector in Europe

Long haul aircraft 1975-1980

The unit of measure here and in annexe 11 is that of the DC 10-30 (October 1974 productivity and price for the newly equiped aircraft). One has not taken into account any complementary elements such as the delivery of spares and the work done under licence which should intervene for example in a study on the role of the aeronautical construction in the commercial balance sheet. Furthermore, it is only a question of the balance concerning the S.K. to be offered, such as they have been calculated in section II, and which result from the difference between the demand prospects and the S.K. available on aircraft in service and on order in 1974. So, aircraft in service and on order in 1974 do not appear in the balance.

The same estimates of market penetration by the European products have been assumed for both hypotheses A and B of the S.K.C. to be ordered and delivered.

The scenarios are as follows :

1. no new sale of Concorde (14 on order in October 1974)
2. sale of 2 other Concordes : 14 + 2 = 16 Concordes being built.
3. altogether 30 Concordes, that is to say 30 - 14 = 16 new sales.
4. altogether 70 Concordes, that is to say 70 - 14 = 56 new sales.

	European airlines' purchases*				European aircraft industry sales				
(million $ 1974)	A1	A2	A3	A4		A1	A2	A3	A4
in Europe	——	——	——	——		——	——	——	——
import	305	305	305	305	export	——	81	644	2254
	B1	B2	B3	B4		B1	B2	B3	B4
in Europe	——	——	——	——		——	——	——	——
import	1198	1198	1198	1198	export	——	81	644	2254

Balances :	A1 = - 305	B1 = - 1198
	A2 = - 224	B2 = - 1117
	A3 = + 339	B3 = - 554
	A4 = +1949	B4 = + 1056

* calculated on the price of Concorde.

Balance of the aeronautical sector in Europe

Long haul aircraft 1980-1985

(Unit of measure : productivity and price of the DC 10.30)

The scenarios are as follows : penetration of European products in comparison with the market demand as a whole.

1. no production of European long haul aircraft

	European market	USA market	"Rest of the World" market
2.	30%	0%	0%
3.	40%	5%	5%
4.	40%	10%	15%

Hypothesis A

	European airlines' purchases				European aircraft industry sales			
	A1	A2	A3	A4	A1	A2	A3	A4
in Europe	—	1064	1419	1419	—	1064	1419	1419
imports	3548	2484	2129	2129	export —	—	457	1266
Total	3548	3548	3548	3548	—	1064	1876	2685

Balances : A1 = - 3548 A3 = - 1672
A2 = - 2484 A4 = - 863

Hypothesis B

	European airlines' purchases				European aircraft industry sales			
	B1	B2	B3	B4	B1	B2	B3	B4
in Europe	—	1945	2594	2594	—	1945	2594	2594
imports	6486	4541	3892	3892	export —	—	701	1850
Total	6486	6486	6486	6486	—	1945	3295	4444

Balances : B1 = - 6486 B3 = - 3191
B2 = - 4541 B4 = - 2042

1. Balance for "Short and medium haul aircraft" 1975-1980

a) We use the assumption that the breakdown of the S.K. to be ordered and delivered during this period will be the same as that already available for 1980. This assumption of a fixed breakdown of S.K.O. is in favour of aircraft with a small capacity.

We have found the following breakdown of S.K. already available for 1980 in the three following categories of "capacity-range":

"small aircraft" : aircraft with piston engines, turboprops, VFW 614, F 28, DC 9/10-20, BAC 111.200 to 475, Caravelle 1 to 11, B 727.100, Trident 1 and 2. These are aircraft with 100 seats on average.

"medium-sized aircraft" : Caravelle 12, BAC 111.500, B 737, B 727.200, Trident 3, Mercure, S 300.

"large aircraft" : B 747 S.R., Lockheed 1011, DC 10-10.

	Europe	USA	Rest of the World
"small aircraft	23.9	17.3	36.2
"medium-sized aircraft"	64.2	41.3	51.5
"large aircraft"	11.9	41.4	12.3
	100.0	100.0	100.0

The S.K. to be ordered and delivered until the end of 1980 would be divided as follows (see table 10) :

($S.K.O. \times 10^9$)	Hypothesis A			Hypothesis B		
	Europe	USA	Rest of the World	Europe	USA	Rest of the World
"small aircraft"	21.2	22.2	14.8	34.0	33.7	18.1
"medium-sized aircraft"	56.9	53.1	21.0	91.4	80.6	25.7
"large aircraft"	10.6	53.2	5.0	17.0	80.8	6.2
	87.7	128.5	40.8	142.4	195.1	50.0

b) The same estimates of market penetration by European products are used for both hypotheses A and B of the S.K. to be ordered and delivered.

2. "Small aircraft" 1975-1980

The following percentages have been used for the scenarios relating to European aircraft penetrating the markets for this category of materials :

	Europe	USA	Rest of the World
Scenarios 1	30	3	30
2	77	4.5	44
3	77	5	55
4	77	10	68

The calculations have been made on the productivity and price of the BAC 111-475. The balance would be as follows (million $ 1974) :

	Hypothesis A	Hypothesis B
Scenarios 1	- 376	- 793
2	+ 117	+ 73
3	+ 196	+ 170
4	+ 333	+ 354

3. "Medium-sized aircraft" 1975-1980

The following percentages have been used for the scenarios relating to European aircraft penetrating the markets for this category of materials:

	Europe	USA	Rest of the World
Scenarios 1	20	—	5
2	26	—	11
3	40	10	15
4	70	15	21

The calculations have been made with the productivity and price of the A 300. The balance would be as follows (million $1974)

	Hypothesis A	Hypothesis B
Scenarios 1	- 1450	- 2350
2	- 1295	- 2121
3	- 839	- 1407
4	- 155	- 330

4. "Large aircraft"

Since no project bigger than the A 300 exists in Europe and with an effective range of the DC 10.10 or Tristar, all aircraft in this category should be imported (calculation on the productivity and price of the Tristar). The figures would be 294 million $ 1974 in hypothesis A and 462 million $ 1974 in hypothesis B.

5. All short and medium haul aircraft together (1975-1980)

	Hypothesis A				Hypothesis B			
	A1	A2	A3	A4	B1	B2	B3	B4
"small aircraft"	- 376	+ 117	+ 196	+ 333	- 793	+ 73	+ 170	+ 354
"medium-sized aircraft"	- 1450	- 1295	- 839	- 155	- 2350	-2121	- 1407	- 330
"large aircraft"	- 294	- 294	- 294	- 294	- 462	- 462	- 462	- 462
Total	- 2120	- 1472	- 937	- 116	- 3605	-2510	- 1699	- 438

1. Balance for "short and medium haul aircraft - 1980-1985

We consider the same subdivisions in the aircraft categories in Annexe 12, and based on previous studies, we assume the following breakdown of demand (percentage)

	Europe	USA	Rest of the World
"small aircraft"	29	4	22
"medium-sized aircraft"	62	60	43
"large aircraft"	9	36	35

The S.K.O. to be ordered and delivered during the period 1980-1985 (S.K.O. x 10^9) would be divided as follows (see table 10)

	Hypothesis A			Hypothesis B		
	Europe	USA	Rest of the World	Europe	USA	Rest of the World
"small aircraft	29.8	9.6	16.6	48.7	11.2	18.6
"medium-sized aircraft"	63.7	144.4	32.4	104.2	168.3	36.4
"large aircraft"	9.3	86.9	26.4	15.1	101.0	29.6
	120.8	241.3	75.4	168.0	280.5	84.6

2."Small aircraft" 1980-1985

The following percentages have been used for the scenarios relating to European aircraft penetrating the markets for this category of materials:

	Europe	USA	Rest of the World
Scenarios 1	30	3	30
2	67	5	55
3	75	10	55
4	80	30	68

The balance would be as follows (million $ 1974)

	Hypothesis A	Hypothesis B
Scenarios 1	- 711	- 1285
2	- 13	- 243
3	+ 117	- 40
4	+ 370	+ 283

3. "Medium-sized aircraft 1980-1985

The following percentages have been used for the scenarios relating to European aircraft penetrating the markets for this category of materials :

	Europe	USA	Rest of the World
Scenarios 1	30	—	5
2	43	—	21
3	62	10	33
4	74	15	55

The balance would be as follows (million $ 1974)

	Hypothesis A	Hypothesis B
Scenarios 1	- 1397	- 2323
2	- 961	- 1691
3	+ 30	- 351
4	+ 745	+ 594

4. "Large aircraft"

It is not totally excluded that a new European project might be launched before 1985 in the category of aircraft larger than the A 300 and with a range comparable to the DC 10.10 or Tristar. However, we take the same hypothesis as for 1975-80, according to which such an aircraft would not be launched in Europe and all aircraft in this category would have to be imported for a value of 252 million $ 1974 in hypothesis A and for a value of 420 million $ 1974 in hypothesis B.

5. All short and medium haul aircraft together (million $ 1974)

	Hypothesis A				Hypothesis B			
	A1	A2	A3	A4	B1	B2	B3	B4
"small aircraft	- 711	- 13	+ 117	+ 370	- 1285	- 243	- 40	+ 283
"medium-sized aircraft"	- 1397	- 961	+ 30	+ 745	- 2323	- 1691	- 351	+ 594
"large aircraft"	- 252	- 252	- 252	- 252	- 420	- 420	- 420	- 420
Total	- 2360	-1226	- 105	+ 863	- 4028	- 2354	- 811	+ 457

Overall balance (million $ 1974)

Hypothesis A

	1975-1980				1980-1985			
	A1	A2	A3	A4	A1	A2	A3	A4
Long haul	- 305	- 224	+ 339	+ 1949	- 3548	- 2484	- 1672	- 863
Short and medium haul	- 2120	- 1472	- 937	- 116	- 2360	- 1226	- 105	+ 863
Total	- 2425	- 1696	- 598	+ 1833	- 5908	- 3710	- 1777	0

Hypothesis B

	1975-1980				1980-1985			
	B1	B2	B3	B4	B1	B2	B3	B4
Long haul	- 1198	- 1117	- 554	+ 1056	- 6486	- 4541	- 3191	-2042
Short and medium haul	- 3605	- 2510	-1699	- 438	- 4028	- 2354	- 811	+ 457
Total	- 4803	- 3627	-2253	+ 618	-10514	- 6895	- 4002	-1585

Breakdown of negative balances based on scenarios A2 and B2

	1975-1980		1980-1985	
	A2	B2	A2	B2
Long haul	12.4	30.2	67.0	65.9
Short and medium haul "small aircraft"	positive balance	positive balance	0.3	3.5
Medium-sized aircraft	71.4	57.3	25.9	24.5
Large aircraft	16.2	12.5	6.8	6.1
	100.0	100.0	100.0	100.0