INPUT

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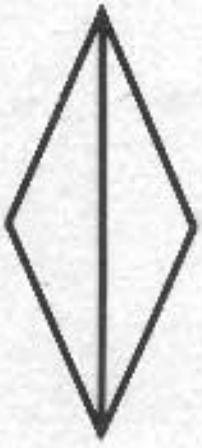


EUROCONTROL
GUILD OF
AIR
- **TRAFFIC**
- **SERVICES**
- **MAASTRICHT LODGE**

LUCHTHAVEN ZUID LIMBURG
POSTBUS 47
5340 BEEK L.
THE NETHERLANDS

I N P U T 4/74 SEPT.

EDITOR C.A. ENRIGHT TEAM D

ASSISTANT MISS M. BREMMERS TEAM C

C O N T E N T S

E D I T O R I A L

We have been working MADAP for almost a year now and after a number of initial problems we seem to have adapted to the system. A system which is Radar orientated.

This has perhaps brought too much reliance on the Executive Controller (EC), who becomes automatically the solve of the Planning Controller's (PC) problems. Because of our restricted area, in terms of airspace, our procedural control was governed by 'deemers'.

In the last two years a number of changes have taken place regarding the re-align ment of airways and the 'deemers' have become obsolete.

The PC is responsible for regulating the flow of traffic through his sector and observing any restrictions imposed by adjacent units.

The basic longitudinal separation should be observed if only to allow the aircraft to exit to the next centre without having to delay en-route.This also frees the EC from having to worry about holding aircraft or delaying tactics, whilst on most occasions the EC can take action between crossing traffic at the same level there are times when his workload is considerably and unnecessarily increased.

Foresight in planning can avoid this. A 5 min. conflict can easily become 1 min. without any revisions being passed. If the PC makes reasonable and practical coordinations by bearing in mind such items as type of aircraft rate of climb, temperature, destination, requested flight levels etc., and informing his EC of the coordinated level well in advance he will relieve his EC of undue strain.

Strips take time to prepare and distribute so try to avoid burdening the EC with aircraft on which he will have no information. Most radar controllers have had reason to curse their planning controllers at some time or other because of unreasonable coordinations or the sudden arrival on the frequency of an aircraft from the lower airspace, and of course it always happens when we are busy.

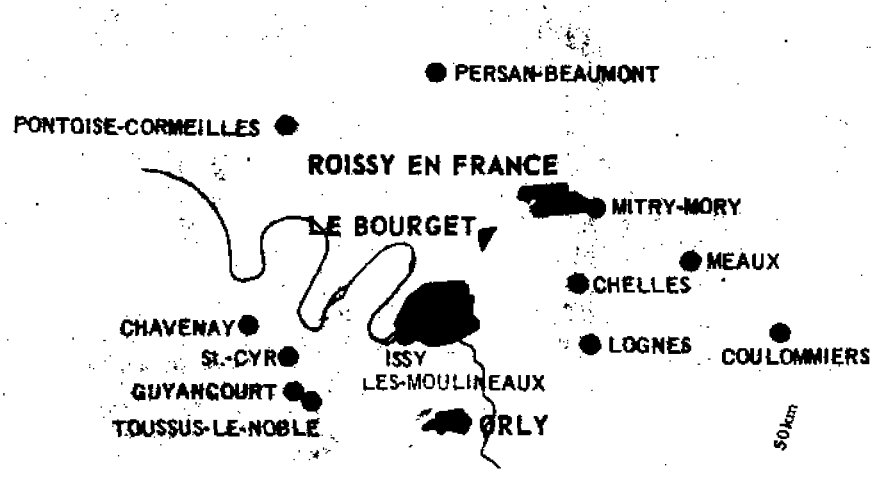
But, we radar controllers are also planning controllers and none of us are immume to the above faults. Foresight in planning will ease the workload of the EC at peak periods and reduce unnecessary R/T.

C.A. Enright

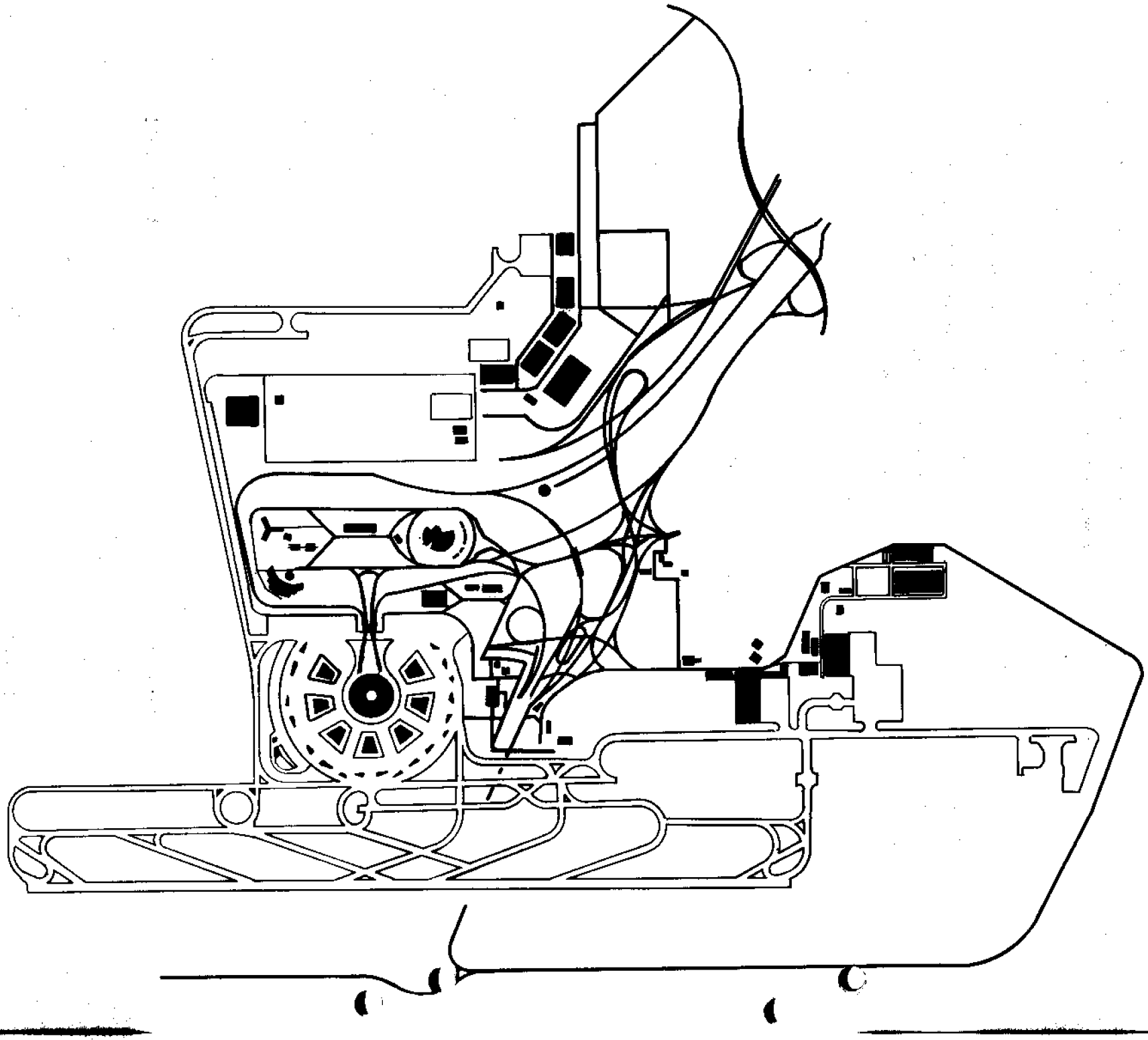
VISIT TO CHARLES DE GAULLE AIRPORT

" Although being periodically in crisis, Air Transport is in a constant state of development and it is necessary for each country to look forward to the future. "

An international centre like Paris doubles its passenger traffic every 5 or 6 years, and its freight every 4 years. Orly-Sud and Orly-West are congested (20 million passengers) and Le Bourget (3 million passengers) will have a new task of business aviation and quiet STOL Airlines.



The French Government decided to build a new Paris Airport which would be one of the most advanced airports in the world. This new conception in airports is situated at Roissy en France, a few km. north of Le Bourget and 22 km. from Paris.
Charles de Gaulle Airport has been operational since 15th March 1974.



On the 18th April 1974 the A.P.C.A. (Association Professionelle de la Circulation Aerienne) invited EGATSM to visit the new airport. During the visit the present construction and future developments of the airport were pointed out to Mr. J.C. Bouton who went as our Guild representative.

Charles de Gaulle Airport has been designed with three main objectives in mind:

-shortening the distance to be covered by passengers between their cars and aircraft

-expediting the flow of passengers

-adapting it for jumbo aircraft

The airport can be considered as a 'machine for taking aircraft', and in that respect it belongs to that new generation of airports like Dallas.

Basically the airport will comprise two main parts: Roissy No 1 and Roissy No 2. All included the airport will have:

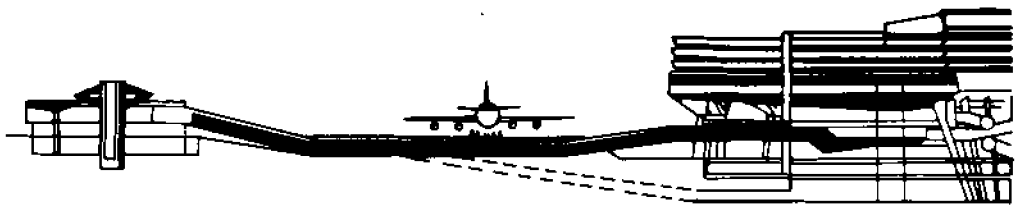
- 4 main runways plus a secondary runway
- 2 or 3 terminals
- huge freight buildings
- an industrial zone
- workshop zones
- technical zones (C.AN.A. and Maintenance)
- C.T.F.E. (Heat - Refrigeration and Electricity plant.)
- telephone exchange (capacity of more than 30.000 lines)

ROISSY No 1

The main building is of cylindrical shape and surrounded by seven satellites. The four top floors are used as car parks, the two lowest floors house commercial installations and luggage sorting facilities, whilst the middle floors comprise Departures, Arrivals, and Transfers.

The passenger enters the terminal with his car, unloads his luggage at the drive-in counters and parks his car on the upper floor car-parks. Then he descends to the Departure floor. By means of a transparent conveyor belt the passenger is taken to the Transfer floor for customs and immigration checks.

After these checks the passenger proceeds to one of the satellites via a tunnel which runs beneath the aprons (using several stretch conveyor belts) and enters the aircraft from a telescopic passenger way so that his whole journey is under cover.



At the present time seven satellites are in use and can handle a maximum of 40 aircraft at the same time.

C.A.N.A. (Airport Air Navigation Centre)

There are two buildings:

- Control Tower (80 m. high)
- a long circular building which groups the instrument navigation control rooms, technical facilities and operational offices together.

The C.A.N.A. has been designed so that when the normal operating stage is reached in 1985 it will be operating over 1000 aircraft per day.

Technical Facilities available to the Controller

For Ground and Approach Control, Thomson T.V.T. primary and secondary radars are used.

Primary radar type TA23	L band
	Range 120 NM
	R.A.M. 15
	Peaks power 2.2 MW
Secondary radar type RS770	mounted on primary
	Range 120 NM
	Peak power 2.5 MW

For the moment the secondary is 'raw' but in the near future response will be labelled. The screens are green (daylight viewing) and fitted with video map.

FREIGHT ZONES (biggest in Europe)

It covers more than 290 hect. and spreads along 3 km. of loading ramps. During the first year of operation it is expected that the freight zone will deal with more than 200.000 tons every year operating 24 Hrs. a day.
The runway in use at the moment (No 1, 27/09) is 3600 m. long and 45 m. wide (+ 7.5 m. safety edge). The runway can be extended to 4200m.

ROISSY No 2

Whereas Roissy No 1 has been constructed more in the vertical plane, Roissy No 2 will be a liner shaped air terminal in the form of 8 connected modular terminals. It is expected to be operational in1978 and have an annual capacity of 40 million passengers.
Roissy will have two sets of parallel runways: two for take-offs and the others for landings. In poor visibility the capacity will be about 150 movements per hour.
By 1990 Charles de Gaulle will be in complete operation with an anticipated pessenger capacity of 50 million and more than 1 million tons of freight per year.

EGATSM wishes to thank Aeroport de Paris and A.P.C.A. for this very interesting visit and hopes that it will be the start of future exchanges between Maastricht and other European Centres.

J.C. BOUTON

TRAFFIC FLOW ORGANISATION IN WESTERN EUROPE

THE MAGNITUDE OF THE PROBLEM

The basis of this article and quotes have been taken from an article of the same title by H. Schmidt from the Eurocontrol Review 3-III May 1974. Facts have been taken which are of particular interest to the controllers at Maastricht UAC.

GENERAL

From the end of the 1960s, serious problems were raised on ATS routes in Western Europe and in particular within the Eurocontrol area, when the orderliness and the expeditiousness in the flow of traffic on these routes were increasingly affected by restrictive measures and circumstances leading to significant traffic delays and congestions.
By June 1972, the delays experienced by a selection of member airlines of the International Air Transport Association (IATA) had accumulated to 6000 hrs. per month. The cost per delay hour thereby ranged from 300 to 4-5000$ for different aircraft types (report by IATA at its 19th Technical Conference, Dublin, Oct. 1972).
To meet these problems in a coordinated manner, the Member States of Eurocontrol charged the Agency in 1971 to undertake a comprehensive study of methods for improving the situation.

The study started with the collection of factual information on the amounts and distribution of the traffic involved in the problem, on the nature and origin of restrictions being applied, the height bands affected by them as well as their frequency and duration.
It became apparent that high traffic demands in certain areas and on certain routes, where they risked exceeding ATC handling capacity, had led to a variety of measures being applied by individual control units or specially created national flow control units to keep the work in their areas within manageable limits.

Compliance with these measures by the adjacent partner units and by farther distant units concerned often showed a "snowball" effect when only small numbers of flights were accepted in a given area or for given destinations. ATC system capacity, lacking in some areas, tended to be under-used in others, a second data collection of this kind performed in the summer of 1972 confirmed these findings with few changes.

Planning of a more orderly flow of Air Traffic, in future undisturbed by foreseeable delaying factors, will necessitate both an adaptation of traffic demands to available air traffic system capacity and, in parallel with this, the possible adaptation of system capacity to forecast demands.
Satisfactory resolution of these tasks and particularly of the former can only be achieved through coherent measures extending over a large geographical area and involving the examination and re-examination of of large quantities of data on intended flight operations against existing or foreseen system conditions.

To find such strategic solutions, the Eurocontrol Agency has, therefore, whilst continuing to keep the evolution of the traffic situation under close review, started an experimental approach to the traffic flow organisation problem.
In performing this approach, the Agency's experience in arithmetical simulation of large varieties of air traffic system conditions will be fully exploited. Airspace modelling studies carried out in contact with interested national and international authorities and with the system users concerned will, in the course of this work, help to determine where and when aircraft operators' intentions would create demands exceeding available capacity.
The results should facilitate any efforts on the part of system users to adjust their flight schedules so as to avoid overdemands on the system.
At the same time, complementary to these periodical exercises, fast time simulation techniques are being applied to compare different possible ways of adjusting ATS system capacity where major bottle-necks have been found to exist.

In deriving the results of the analysis of traffic flow conditions and limitations presented hereunder, three major sources of information have been exploited:

- detailed statistical surveys of General Air Traffic (GAT) performed throughout the Eurocontrol Area,
- extracts of information on traffic flow measures and restrictions made from the daily logs of all ACCs and UACs in the area of Eurocontrol States and in some adjacent States,
- records on flight data available at the Central Route Charges Office (CRCO)

In addition, relevant information in AIP's and NOTAM's was used as well as data made available by operators.

DISTRIBUTION OF TRAFFIC LOADS (1971 GAT survey)

Before reviewing traffic flow measures, it is appropiate to consider the general distribution of traffic concentrations over busy route points within the Eurocontrol Area, as observed during periods of heavy flow in order to highlight those locations which, due to volume and/or composition of traffic, would appear to call for special attention in future traffic flow considerations.

TABLE 1 No of flights in 24 Hrs. FL 200 + Date: Friday 2 July 1971

Posn. in Europe/60	point	No of flights
1	WUR	469
3	LNO	444
19	CTL	296
22	NIK	287
23	DOM	284
24	NTM	277
33	CMB	253
39	GMH	231
44	GAA	220
46	LUX	216
59	WRB	205

These tables show only a selection of reporting points (tabel 60) most relevant to Maastricht.

TABLE 2 Max. No for any 1 Hr.
FL 200 +

No	point	No of flights
1	FFM	27
3	LNO	26
8	NTM	22
29	DOM	14
33	LUX	14
36	CMB	13
40	NIK	12

Table 3 presents (clock)hourly loads (all levels) for the three busiest hours of the day analysed (Friday 2 July 1971) and shows the actual (clock)hours at which these loads occurred.

As the ratio between short range/medium range/long range traffic varies between the different parts of Western Europe, traffic peaks on different routes may occur at quite different times in a day; in other words, peaks resulting from different demands are not distributed homogeneously, either geographically or in time. It will also be seen that:

-the three busiest hours were seldom consecutive

-on some points, the loads on the busiest hours were identical;

-the three busiest hours were all situated between 0700 and 2400Hrs GMT

TABLE 3

No	point	Hourly load during 3 most busy hrs.			clock hours		
		1	2	3	1	2	3
1	SPR	37	33	29	13-1400	17-1800	12-1300
3	LNO	36	33	33	12-1300	14-1500	17-1800
21	NTM	25	23	23	13-1400	12-1300	14-1500
30	GAA	23	16	16	11-1200	14-1500	15-1600
39	GMH	21	16	18	08-0900	13-1400	10-1100
47	WUL	20	17	17	14-1500	09-1000	11-1200

TRAFFIC RESTRICTIONS

Three forms of traffic flow organisation for avoiding unsafe situations and/or saturation were found in use, in varying degrees, during the summer periods:

-Procedural and Organisational Measures

a) reduced longitudinal separation (under radar surveillance)

b) improved civil/military coordination (e.g. use of week-end routes through reserved areas at times of non-activity).

-Limitations in the Choice of Flight Levels

a) levels adapted to distance flown

b) use of specified series of levels on specified routes: flight level allocation systems (FAS).

-Flow Control

Limitation of the number of aircraft accepted along given routes or bound for given aerodromes (measures to be limited to exceptional circumstances where all other possibilities are exhausted).

Some centres adopted the practice of announcing by NOTAM issued at the beginning of the summer schedules, the measures intended for application in the peak months, from early May to early October. Others announced their measures with less advances, and others limited their action to merely notifying the adjacent unit or units concerned by inter-centre telephone.

Most restrictions were subject to short term changes which had all to be known at least to the ATC units and working positions who were to apply them. On a single day in 1971, the number of restrictions applied in Western Europe (upper and lower airspace) was close to one hundred. In 1972, in the same area (except Italy) the figure was 283 in the corresponding period.On this day, 22July 1972, Maastricht's total of all types of restrictions was 43, second only to Paris and Costa who pooled 77. On that day, the number of restrictions and the lengths of delays indicated by airlines was about average for the summer period.

Many measures used by a particular centre were not originated by that centre but merely passed on from an adjacent centre.

For instance, the only traffic flow organisation action originated by Maastricht UAC was the Flight Level Allocation system notified as a "standard" measure.(12 out of the 43 types of restrictions)

When Flow Rates are applied the original acceptance rate gets distorted and drastically reduced. E.g. Rome request aircraft destination Rome at 3 A/C per 20 Min., via Milan, Zürich,Rhein; Brussels then receive "no flights destination Italy".
Clearly some more coherent overall system has to be applied to Western Europe. Frequent modification of restrictions caused much confusion to operators and airline crews.

ANALYSES OF TRAFFIC DEMAND

In the summer of 1973, the General Directorate started exploiting data available at the Eurocontrol Central Route Charges Office for the purposes of the study of the strategic organisation of traffic flow in Western Europe, with the aim of obtaining a global view on the magnitude of the traffic organisation problem and inparticular of the volume of the traffic data to be processed in order to compare future demands with available air traffic systems capacity.
This comparison will be necessary if system users are to be given an opportunity (when establishing flight schedules) to adapt themselves to this capacity or, conversely, for adapting the capacity -within reasonable limits of cost-effectiveness- to the demands stated by users of the system.

Eurocontrol

intends to continue to monitor closely the evolution of the traffic of concern to the Organisation. The information resulting from this activity will be available to interested national and international organisations as well as to users of the air traffic services system.
It is hoped that this and and the experimental work outlined in paras 3 and 4 above will contribute to the organisation in Western Europe of an expeditious, orderly and also more economic flow of air traffic in the forthcoming years.

NEW ATC PROBLEMS WITH THE ENTRY INTO OPERATION OF SST

When jet aircraft entered into operation (1960), mainly B707 Caravelle and Comet, one of the main tasks of ICAO was to define and modify, when necessary, the Recommended Practices and Procedures.
Thus had been created the JORP (Jet Operational Requirements Panel) which had to foresee and develop the necessary requirements. This had been the case, for instance, of fuel endurance, (see Annex 6).
With the entry into operation of the SST in the near future, ICAO had to solve the same sort of problems and created a technical group called: PANEL SST.
To sum up the work of that technical group, let us say that there were two main objectives:

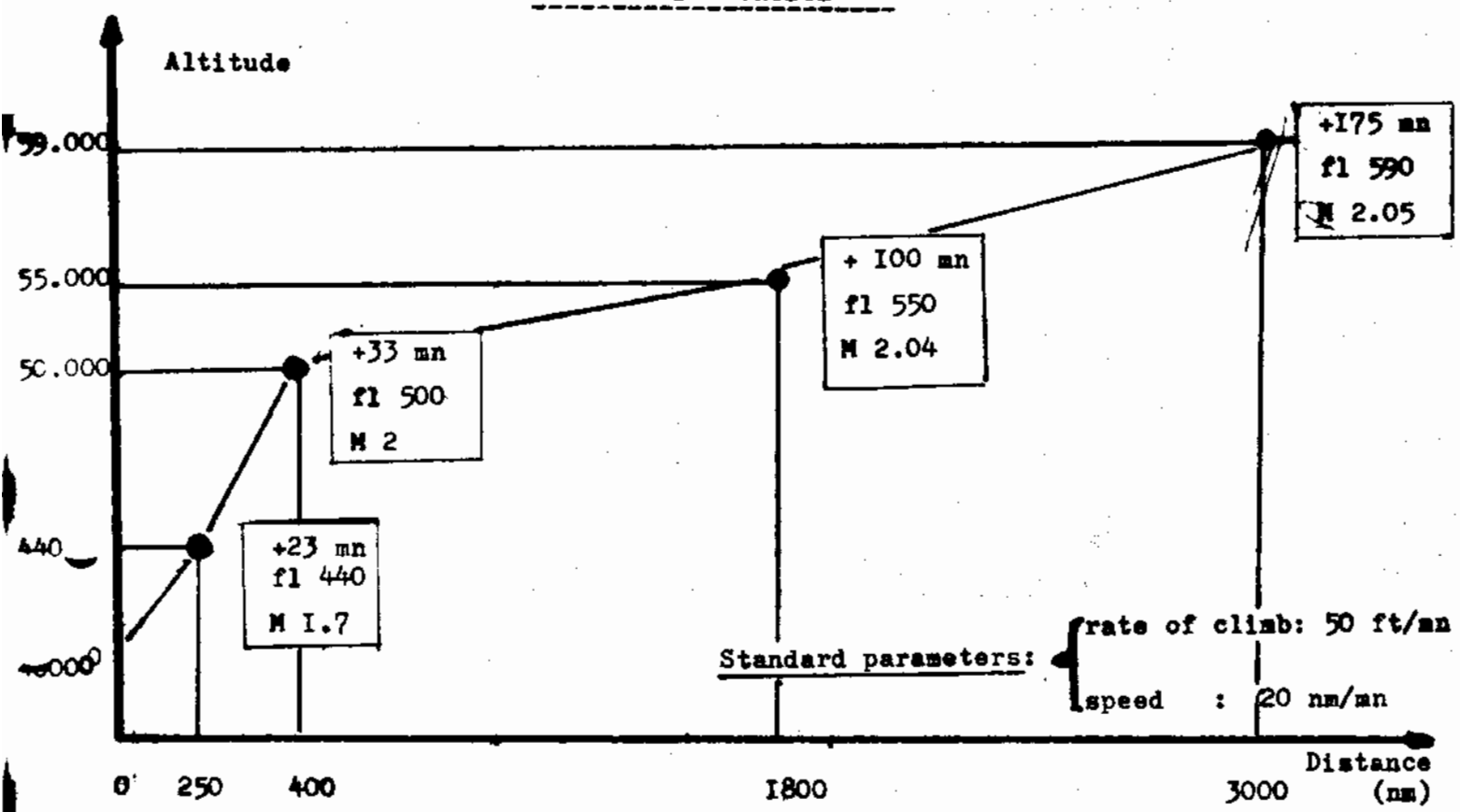
- define the O.R. (Operational Requirements)
- formulate the Amendments from the O.R.

i.e. Air Navigation Commission ——→ ICAO Council ——→ Member States
I will say a few words concerning the modifications of procedures on regional basis.
Mainly the NAT and PAC regions are concerned, especially with route networks and separation without radar coverage. Taking into account that the NAT/SPG (Planification Group) has not yet taken its final decision we can say that the standard separations will most likely be:

- on Subsonic phase	the same separations as for conventional aircraft	
- on Supersonic phase	longitudinal	10 min.
	lateral	60 nm.
	vertical	to be determined later

The Panel SST is working on radar separation problems and the results will be known next year. Radar simulations should bring the necessary information and specify the appropriate separations, (these are being done mainly at Bretigny Experimental Centre and West Drayton).
The main results of all these works have their application in the Amendments.
On Annex 2 (Rules of the Air), two modifications have been proposed:
a) only IFR will be permitted on transsonic and supersonic phases of a flight
b) for the first time in ATC the notion of "climb cruise" has been introduced.

ASCENDING CRUISE



The "climb cruise" is the phase of the flight which follows the supersonic climb. (see diagram no 9).

On Annex II (ATC Services) the notions of acceleration or deceleration in transsonic phases have also been introduced:
"When possible, SST a/c will receive, before take-off, the appropriate clearance concerning the accelerating transsonic phase " and
"Longitudinal separation to apply between SST a/c during their transsonic accelerating phase and supersonic phases should be established by comparing the actual time of the beginning of the transsonic acceleration ".
The accelerating transsonic phase is very critical for the a/c.
This is the moment where the supersonic bang is focalised and this can be done only over non-inhabitable zones. (see diagram)
Also, for fuel and aerodynamic problems, the route of flight should not to be changed, unless for safety reasons, (headings, levelling flights, etc)

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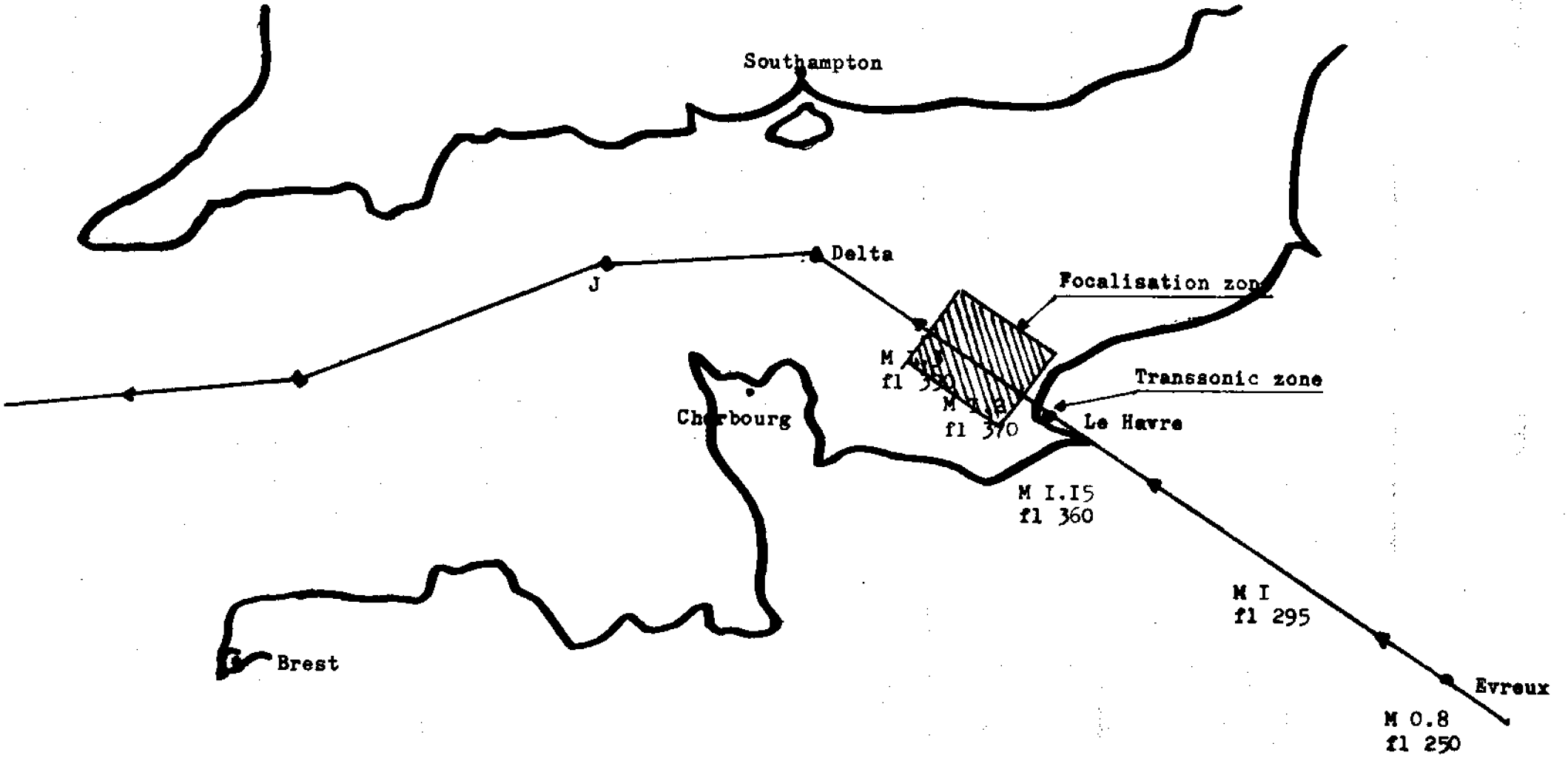
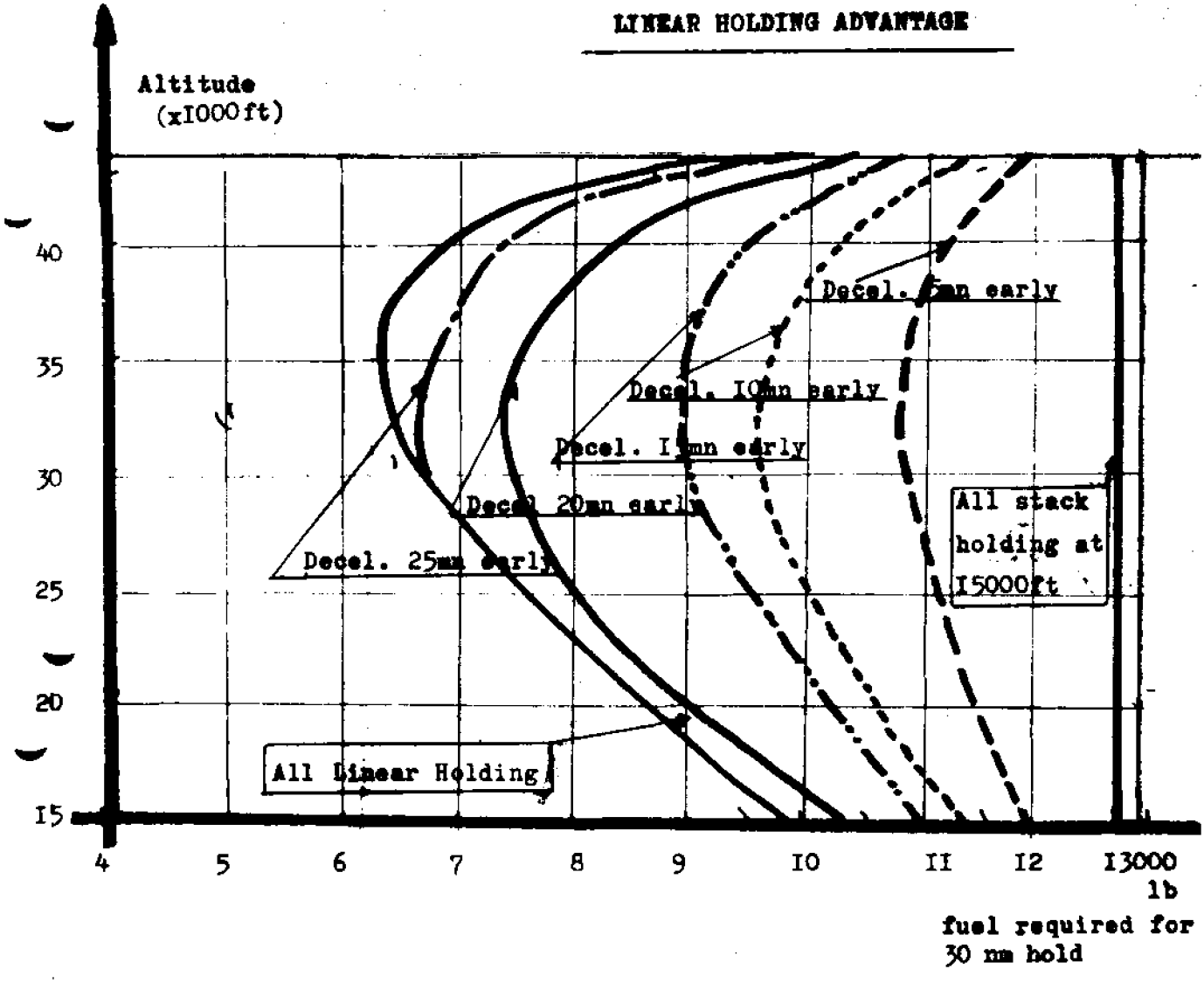
Simulation flight (LFPO-KJFK)



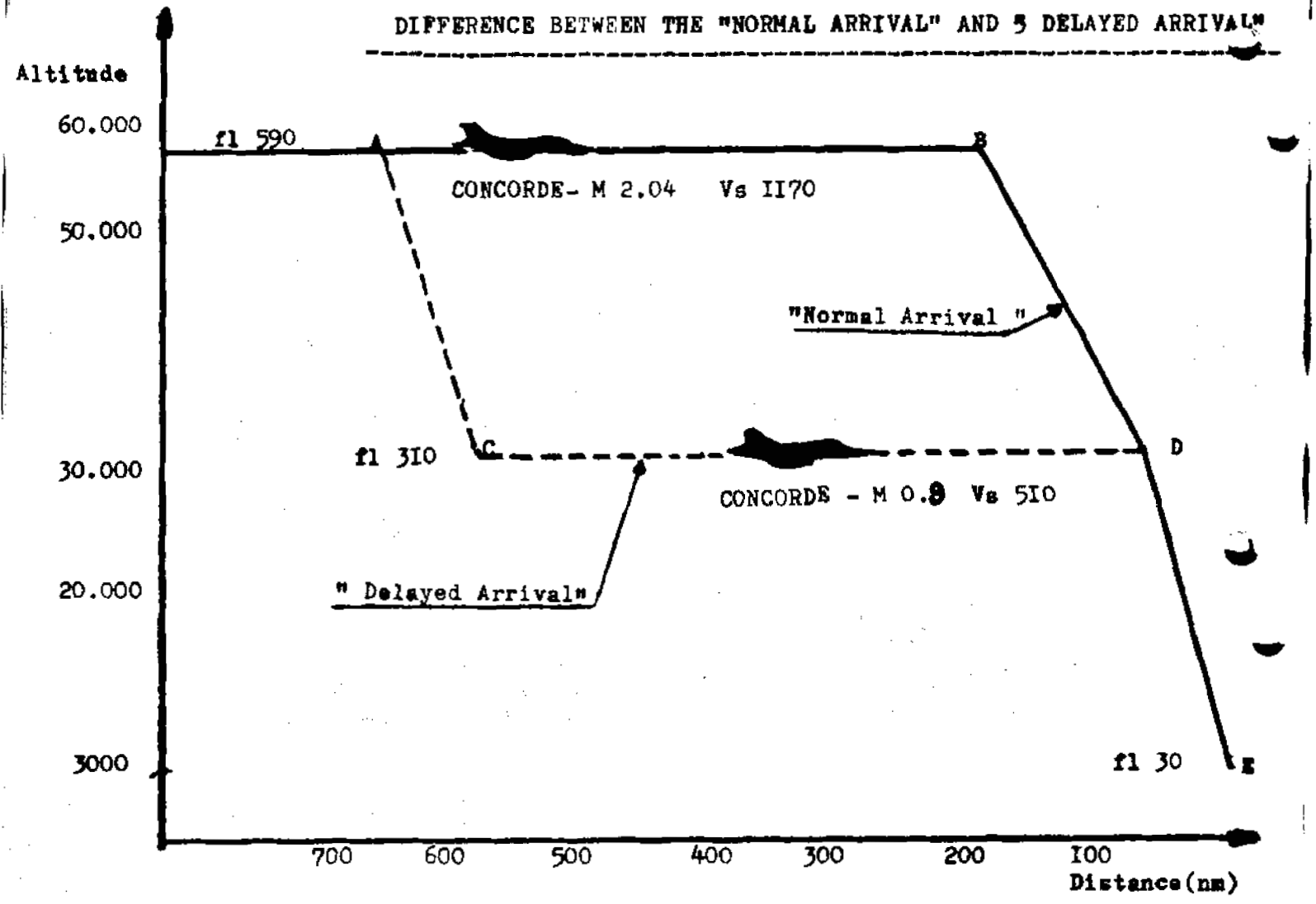
Concerning the arrivals, the notion of Linear Holding has also been introduced. You know that the fuel consumption of a/c on stack holding is very high and for SST a/c this can be very critical.



Instead of losing time over a beacon and waiting its clearance for landing, the a/c, being advised by the controller in advance of his ETA (50 min. more or less), will take the appropriate profile of descent in such a way that it will arrive over the beacon and will receive the immediate clearance for landing.

On the diagram No 4 you will see that, on a normal arrival, with a stack holding of 30 NM foreseen by the controller, the SST a/c will fly from A to B (450 NM) in 25 min.
From B to E (150 NM) the time will be 15 min. Thus, in total 40 min. and the pilot will have to lose 30 min. on holding stack, which means a consumption of 6 tons of fuel.

If the a/c uses the linear holding, the controller will advise the pilot in due time (normally 50 min. in advance) of his ETA over the appropriate beacon.

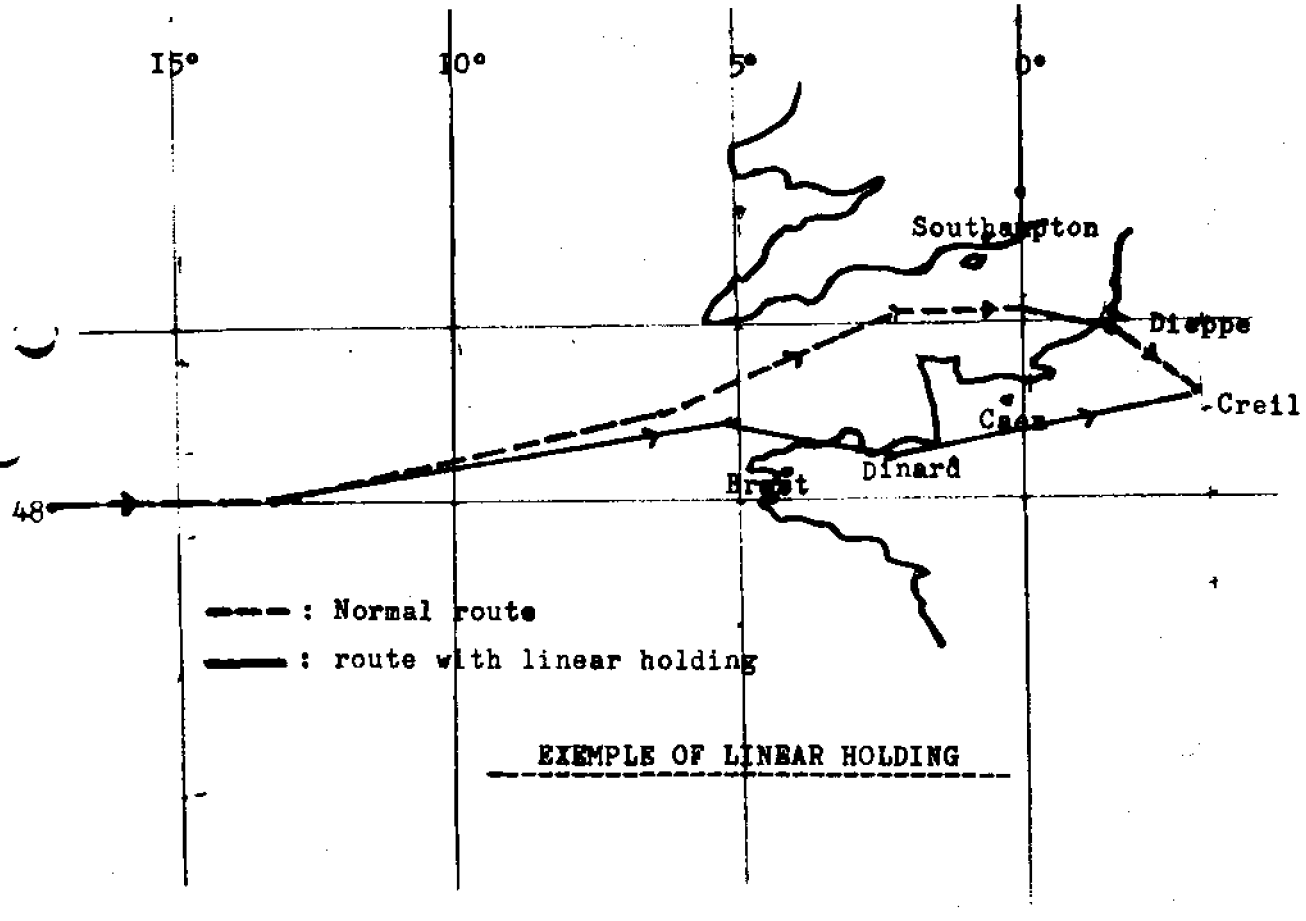


Thus, the SST will fly from A to C (100 NM) in 8 min., then from C to D (440 NM) in 55 min. and from D to E (60 NM) in 9 min., which means in total 72 min.

The a/c will arrive exactly over the beacon in due time and will not spend fuel for the holding. The gain of fuel should be more than 5 tons.

This sort of procedure can also be applied to conventional jet a/c, especially jumbo-jets.

Obviously, this linear holding procedure will be completely achieved if there is full cooperation between the crew and the LAC (Linear Approach Controller) which means that the controller concerned must have a good experience of that procedure. This should include a course of SST instruction and simulation.



EXEMPLE OF LINEAR HOLDING

The entry into operation of the SST has brought many new problems in the ATC 'domain'. The continual increase of traffic, the new experience of controlling SST a/c (including R/T COM. and phraseology, fuel consumption, performances of a/c combined with the flow control procedures) will not facilitate the tasks of the controllers.
This can only be achieved by having a good coordination between the different adjacent centres.

J.C. Bouton

Quote 133.35 controller
' No, I cannot see the traffic you are talking about,
I have a computerised radar.'

EGATSM has the pleasure to inform its members that there is some improvement concerning the seven controllers in France who were dismissed following the dispute last year. Three of them are already reestablished and we hope that the other few will soon be employed as controllers again.

We take the opportunity once more to remind everyone of the trip to London at the end of Sept. This is an excellent chance to observe your colleagues in West Drayton and Heathrow and to have informal discussions.
For others this will be an equally exciting trip to London, to sightsee or to shop - prices are cheaper in England...

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I F A T C A N E W S

The following paragraphs have been taken from the IFATCA Circular, written by Mr. T.H. Harrison, the Executive Secretary. June 74. Eurocontrol is quickly becoming a well known name in International Aviation not only for its Air Traffic Control Centres, but also for the many studies and researches undertaken by the Agency.

" Many were sorry that the application by the Eurocontrol Guild was again deferred but after R. Bartlett's impressive final plenary speech the thought was that perhaps their entry was only ten months away. There is no question that they might overlook making application- it is in their Constitution to become Member of IFATCA. A little thing called determination. "

" Eurocontrol : The second application by Eurocontrol Guild to join the Federation was defeated by a narrow majority at the final Plenary Session of the Tel Aviv Conference.
Their Constitution is now in order and acceptable to the Federation but it would appear that a number of European MAS are apprehensive that Eurocontrol may draw too many members from National Associations into their Guild, thereby depleting the Membership of these Associations.
Mr. R. Bartlett gave a short speech at the end of the fianl Plenary, regretting their exclusion by pointing out that it was their written aim to become members of the Federation and they would thereby be making annual application..... "

" Mr. Gunnar Atterholm has now delivered his history of IFATCA for inclusion in the Eurocontrol Air Traffic Control Synthesis being undertaken by Mr. A. Beroit.
This contribution just made the Eurocontrol deadline and may well be accepted as a standard work. Perhaps S.C.II might look into possibilities here. "

" Eurocontrol have agreed to produce a paper on S.S.T Operations and, to avoid duplication on the subject, other bodies presenting papers on this topic are requested to check their papers with Mr. F.P. Carson (Master of N.W. Lodge GATCO U.K.) who can be reached through Mr. G.H. Trow, Director Operations Eurocontrol. "

- I shall be going to Goch soon for a tour of duty there and so shall relinquish my post as editor of this journal.
During the last year the Guild has put this magazine on its feet and I hope INPUT will continue to expand and to reflect the profession of Air Traffic Control of which we are all members. -

C.A. ENRIGHT