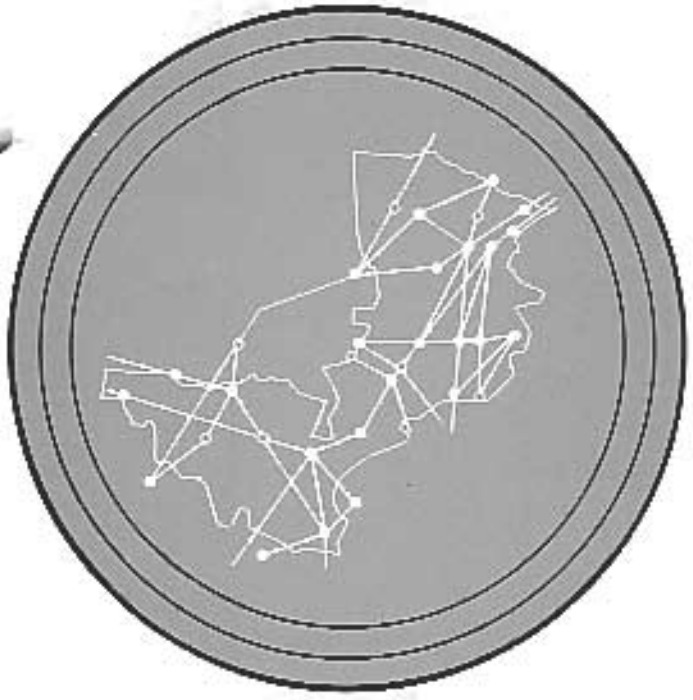

INPUT

EGATS QUARTERLY SUMMER '77

Input

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Editorial Staff:
Editor - M. Lewis
Artwork/Cartoons - M. Germans
J. Creegan
M. Castenmiller

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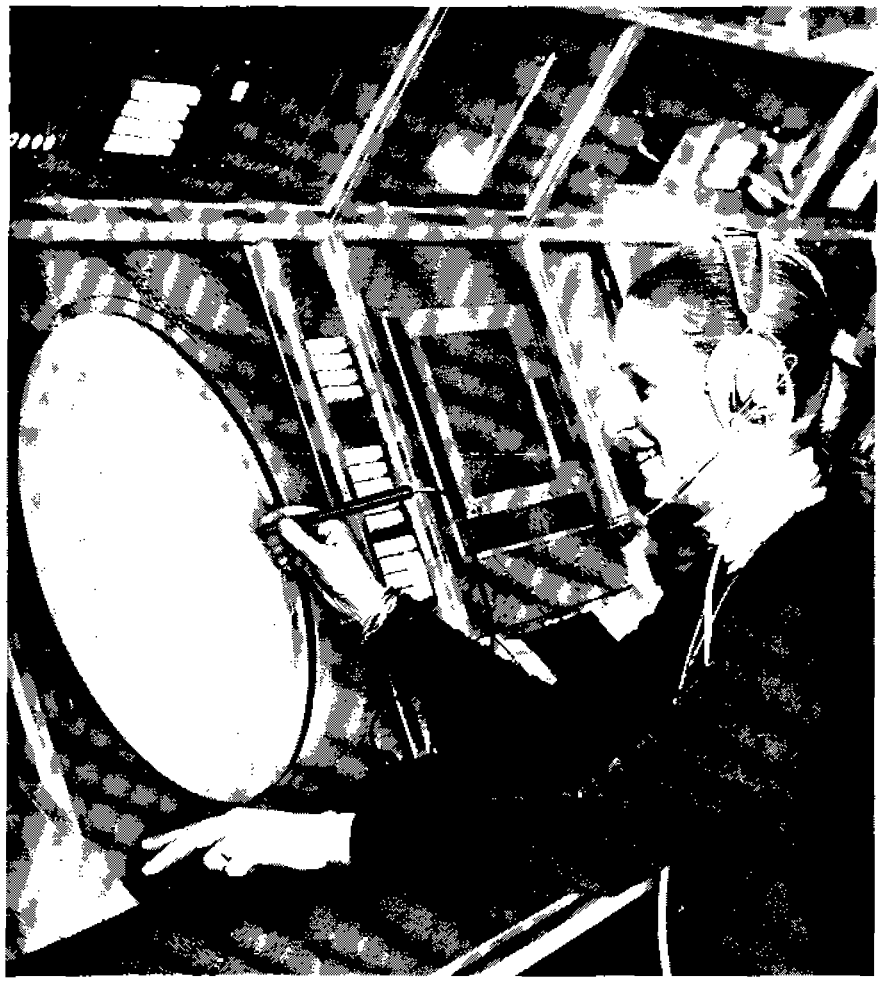
A Member of IFATCA



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HOLLANDSE SIGNAALAPPARATEN

Output

Computers are only Human

Three months after the event, it is still not certain exactly what happened on that black day in Tenerife. It is unlikely, however, that the accident can be attributed to any one factor alone, but more probable that a series of circumstances culminated in a tragic result. The poignant irony of the situation is that both aircraft had been diverted and delayed for safety reasons.

Much of the publicity surrounding this incident was predictably inaccurate, unfounded and certainly distasteful. It seemed that the more sensationalist news media had been awaiting just such a collision; their full force was immediately mobilised to make maximum capital of it at the expense of truth and the feelings of those involved. Great surprise was broadcast because the "black box" flight recorder actually turned out to be yellow; yet many more important details, not the least being the time required for a complete investigation, were either ignored or subjected to guesswork and fantasy.

Such a disaster is obviously an emotive subject, but the instant unsubstantiated assumptions as to its cause, and the various accusations and denials can neither be justified nor be of any help in determining the facts. Almost before the investigating team had arrived, and without access to the relevent information, certain controllers declared on television that Tenerife was a blacklisted, dangerous airport notorious for fog and poor facilities (only to be contradicted within minutes in a different interview with pilot representatives). They also stated that this sort of incident could never occur at better equipped airports.

In this true? Is any ATC system infallible, and if so, what of its human operators and users? Can any controller honestly say that he has never made an error of judgement, never misunderstood the r/t, never been hardpressed or scared by a situation? Can any pilot honestly declare that he has never overshot a cleared level, never misread a clearance, never passed a bad estimate or reported position incorrectly, never deviated from centre-line? It is doubtful. The Law of Averages helps to protect aviation from human error, but as traffic levels increase, the odds become stacked against the system ill-equipped to cope.

The difficulties of the Spanish controllers are becoming better known. Unfortunately, they are by no means alone in their lack of modern facilities; in Greece, for example, conditions are similar, and in Cyprus the situation is incredible. Yet the procedural system that the Spanish are compelled to apply was devised for safety. As long as it is used correctly, no incidents should occur, although delays certainly will. It is only when mistakes are made that the situation can become dangerous.

The various ATC procedures applied throughout the world evolve strictly around the facilities available. An all-radar system works very differently from the non-radar environment. Potentially, therefore, different types of error can also occur.

Modern technology can provide accurate position indication, the possibility of instant and continuous identification, callsign labels, height readout and more. Automatic conflict detection is being explored. Clutter-free satelite pictures may soon be available to those national authorities enlightened enough to utilise their potential. Whatever the level of sophistication, the programming is still formulated by man, and interpreted by man. And the machines are only man's aids, they are not yet running the show! If any way exists to misinterpret the data provided, sometime, somewhere, someone will find it.

Nevertheless, over and above its contribution to ATC efficiency, and improved safe expedition of traffic, what advanced technology also gives is the best possible chance to detect human error in time to take remedial action; radar not only helps move more traffic in a shorter time, it shows the incorrect position and off-route flight; SSR helps not only identification, but to prevent misidentification; mode 'C' speeds level changes whilst reducing the r/t workload, and also shows the mistaken or overshot level . . . and so on.

It may be speculated that with suitable ASMI, Tenerife might have been avoided, although had better equipment been in use in Spain, the two Jumbos might never have been together on the island. If, as it seems, human error was the main cause of the accident, the sad lesson which must be learned from the death of so many is that nobody concerned with aviation safety can afford to believe that they are omnipotent and cannot make mistakes. Complacency and overconfidence are in themselves dangerous. Even computers have been known to go wrong on occasion.

Every controller, worldwide, should be given the best tools to carry out his task in the safest, most efficient manner, with the built-in chance to double-check, in the awareness of human frailties.

M. Lewis

Intercom

Letters to the Editor

Sir,

It is with great amazement that I note the proliferation of logbooks in the operations room. So now the flow controller has one as well (you know, **flow controller,** the one sitting in solitary confinement, the one who has been fumbling in the dark for the last n years but is now being taught the job by people more experienced in such matters). In these austere times, its is reassuring that Eurocontrol can afford so much paper. Are we to assume that planning controllers will soon be getting their own logbooks too (one per sub-sector, of course)? That seems a little unfair on the ATS, sharing only one book between so many. Why not issue everyone with his own personalised journal? We can then get down to really juicy personal comments; the daily sheets can be sent 'upstairs' to be marked out of ten for content, originality and vindictiveness!
Isn't it time to stop this diversification? There should be only one operational logbook, kept on behalf of the team by the supervisor. After all, he is **supposed** to know what is going on, even if some of the entries made under the individual system are not brought to his attention. Or must we believe the rumour that the supervisor is only a figurehead with no actual authority?

M. Maus

Dear Mr. Bartlett,

Many thanks for the copy of your Spring '77 issue of "INPUT". I congratulate you and your editorial staff for this encouraging new start. With great interest I read the majority of the contributions to this issue, some of which I find well conceived. A few items ask for complementary remarks that might be useful for you, the Guild and your INPUT readers:

1. Familiarisation flights for controller staff:

As already indicated in the reply to your subject letter, we have always held the view that familiarisation flights should be regarded as an essential element for maintaining and enhancing the professional proficiency of ATC staff. As a matter of fact, the Deputy Head of the Operations Division has been one of the first promotors for establishing a relevant program within the Agency, and much effort, time and money are reguarly spent by Eurocontrol Headquarters and by the Maastricht U.A.C. for preparing and carrying out our fam.-flight program. Nevertheless - like many other budget items - familiarisation flights are also affected by the various measures of economy imposed upon the Agency. Their severity and duration are, of course, closely linked to the general consideration about the future of Eurocontrol.
It goes without saying that all attempts are being made to use the limited means currently available for fam.-flights as efficiently as possible.

2. "Balcony planning Control" (BPC) position:

The Maastricht U.A.C. attracts numerous visitors and hopefully will continue to do so, well beyond 1983. In order to safeguard an undisturbed environment for controllers and ATS assistants on duty, access to the Operations Room is naturally limited to individual, professionally related visitors (pilots, controllers from other units) or to people politically important/ responsible for the Eurocontrol Organisation.
In order to be able to demonstrate to the majority of our visitors (to whom also belong friends and relations of cur staff) at least a small part of our modern operating system and still the most attractive one for a layman, I have initiated the installation of a „non-standard" SDD.
During more than 4 months, experience has confirmed not only the general usefulness of this arrangement but also the high appreciation by all visitors being able to see one important result of a complex radar- and flightplan-processing system and thus getting a little feel of "Area Control" and its intricacies.

3. Rest- recreation facilities:

It is no secret that the overall rest and recreation facilities have become inadequate with the increasing number of operations staff.
Meanwhile you know that a room allocation scheme for the further use of the temporary building has been established (MAS-A/ 322.7 of April 4th, 1977 refers). Naturally this arrangement cannot meet all requirements but, hopefully, it will somewhat relieve the situation, keeping in mind that we want to accomodate as many requests for extra rooms as possible for all staff activities.
We continue to do our best in finding permanent solutions, however, like other cost-intensive items, they depend upon the budgetary policy of our Member States. Plans for a very limited extension of our main building floor space are in hand and we strive for them to be accepted by the competent bodies and, eventually, approved by the Committee of Management. This project will not lessen our endeavours to arrange for further temporary improvements wherever possible.
In considered it appropriate to quickly let you have my views on some of the points raised in your magazine. As you are aware, many of the items of our common concern, which are on the U.A.C. work programme already since a long

time and in which the Guild is now also taking interest, are affected by various constraints and cannot be processed and implemented quickly. Wherever possible and appropriate I attempted in the past to provide you with a broader background on relevant subjects, INPUT can, undoubtedly, contribute to inform the members of EGATS accordingly and help them to understand why, although desirable, certain projects cannot (or not yet) be realised, and/or which priorities must be observed.
Here I see an excellent opportunuty for discharging one aspect of your self-chosen responsibility and for supplementing rather than replacing our normal chain of communication via the Watch Supervisors, Operations Officers and the Head of the Operations Division or directly with me if justified by the subject matter.

Sincerely yours,

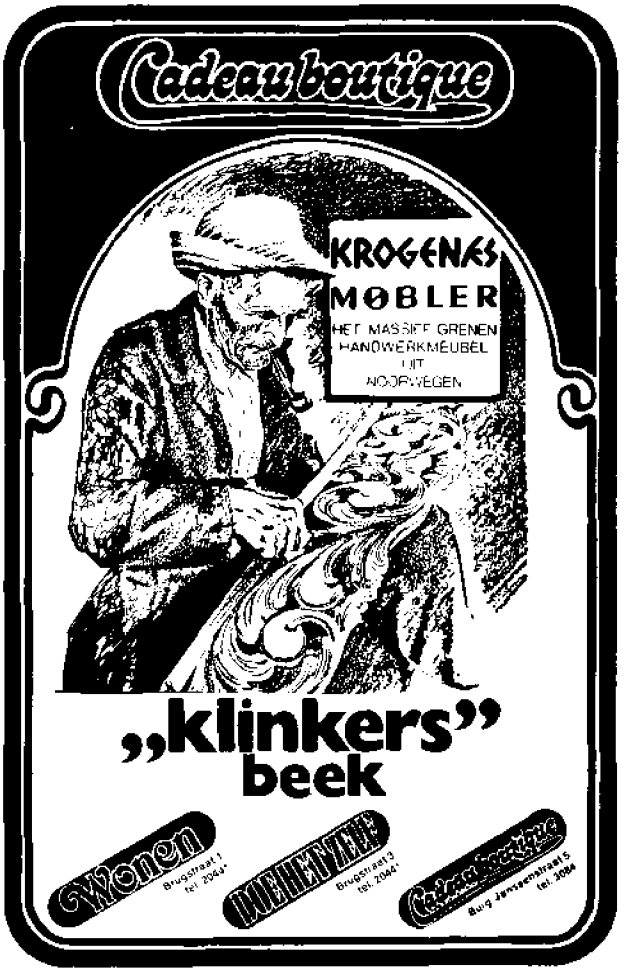
H. von Villiez,

Director Maastricht U.A.C.

Editorial Comment:

Taking the final paragraphs first, it is certainly hoped that INPUT will aid the dissemination of information to EGATS members. It also presents the opportunity to any reader to express his personal viewpoint,although this may be entirely different from that held by the Guild. Therefore, articles published are not necessarily to be considered tied to official Guild policy. Contributions should be addressed to the editor, who is entirely responsible for the production of INPUT.
Familiarisation flights are covered further in 'Internal Affairs', but for whatever reason, it is totally unacceptable that the already minimal continuation training should be further reduced. At the time the BPC article was written, the OEA (radar assistant) did not enjoy the same benefits as visitors to the centre, having been without his own radar screen or TID for three years. During this time, controllers working OEA continually encountered difficulties and frustrations in attempting to perform their functions efficiently, crammed up at the end of the radar suite. Thankfully, and finally, the provision of a new SDD and TID in time for the heavy summer traffic has rectified the situation, and is much appreciated by the Assistant on the east flank. Bearing this in mind, the BPC will now not only help enlighten visitors with restricted access, but help control staff by reducing the disturbance caused by daytime official tours of the ops room during busier periods.
On rest and recreation, it is gratifying to know that steps are being taken to improve conditions. It appears that a communcations breakdown between the parties concerned, aided by comments in "INFO", led to the conclusion that this was not the case. Communications are of primary importance in Air Traffic Control, and perhaps no less important between ATC personnel and management, especially now, when so many influences are eroding morale in Eurocontrol. With luck, there will be no more 'blackouts'.

MJL.



Quote

From one of Maastricht's Celtic controllers:

"Lying at home sick in bed is bad for your health."

European Controllers Cup 1977 Maastricht

Just before midday on Monday 9th May a GAF TA16 touched down at Beek airport and the team from Bremen became the first arrivals for ECC '77. They were duly transported to Valkenburg and for the rest of the day the hotels were kept busy checking in various arriving teams. By 8 o'clock the Hotel Bellevue was packed to capacity for the reunion and Irish and German drinking songs were easily heard above the general hum.

On Tuesday morning we arrived at Sportpark West in Maastricht to be met with a nasty wind, overclouded sky and drizzle. Unfortunately this weather was to prevail for the following three days but did not completely dampen everyone's "spirits".

The first day saw the completion of the eight groups, a total of twenty-four games and the eight group winners went forward to decide places 1-8 on the following two days. These were Copenhagen, Brest, Paris, London, Amsterdam. Cologne, Dusseldorf and Bremen.
In the evening we had a very successful party at the „Kwien" discoteque in Vroenhoven. One of the highlights was the presentation of gifts to Joachim Dickmann and Harold Lehman of Bremen, the original organisers of this tournament ten years ago. However the biggest cheer of the evening was reserved for the cock, which was presented to Georges Mautte from Paris. Over the years the Paris team has traditionally brought a cock with them as mascot. His name was Charlie but, unfortunately, he died last October and a successor was not obtained for this tournament. The Paris team very much appreciated this gesture, at least until the next morning when it was discovered that the future name of their mascot will now be - CHARLOTTE!

After a rigorous first day and late evening, football on Wednesday did not start until midday. Various knock-out games took place with the semi-finals of the tournament being the last two games of the day. The first semi-final between Dusseldorf and Brest proved to be a victory for the defenders and this was decided on penalty kicks - 5-4 to Dusseldorf. The other semi-final paired Paris with Amsterdam and probably produced the most exciting game of the tournament. Plenty of good football, one goal apiece, two sent off, various cautions and the game finally won by Paris 4-2 on penalty kicks.
The morning of the last day, Thursday 12th, proved to be the worst kind of weather we could have expected. Continuous rain and strong winds made the spectating rather miserable, but the players continued in good spirit and didn't let it effect them as they tried to achieve as high a position as possible. This day saw the highest match score of the tournament, an 8-0 win for Dublin against Karlsruhe. This score helped them to third place in the Highest Goals Scored trophy, which was won by Paris. Another cup played for this year was the Fair Play cup which was won by Helsinki.
And so to the final itself, Paris against Dusseldorf, which proved to be a much closer game than most people had expected. At the end of normal time no goals had been scored and extra time was agreed between the teams. Appropriately it was a superb goal which eventually won the tournament, and for Paris once again.
The organising committee would like to thank everyone who helped in this venture and especially those who gave up their free time to do so.

T. Adamson.

EUROPEAN CONTROLLERS CUP 1977
FINAL POSITIONS

1	PARIS
2	DUSSELDORF
3	BREST
4	AMSTERDAM
5	LONDON
6	BREMEN
7	COPENHAGEN
8	COLOGNE
9	MAASTRICHT
10	BRUSSELS
11	PRESTWICK
12	VIENNA
13	GENEVA
14	MILAN
15	DUBLIN
16	KARLSRUHE
17	FRANKFURT
18	MUNICH
19	LIPPE
20	HELSINKI
21	SCHIPHOL
22	STUTTGART
23	MARSEILLE
24	ZURICH

Action...

The second letter from the EGATS Executive Board to airline operators and pilot associations on February 6th 1977.

"Dear Sir,

As a follow-up to our letter of the 29th January 1977 in which we expressed our concern for the future of Eurocontrol's Maastricht Centre, we would like to clarify and elaborate on certain matters, about which there may have been misunderstanding.

I. What is Eurocontrol-Maastricht Control Centre?

Maastricht UAC is an International Upper Area Control centre, located at Beek-Airport in Zuid-Limburg, Netherlands. Here extensive use is made of an advanced system and sophisticated technical equipment in order to assist efficiently our work.
We provide Air Traffic Services to General Air Traffic in the Brussels UIR above Fl 195 as well as in the Hannover UIR above Fl 245.
Since the 1st October 1975 we enjoy the co-location with a German Military Control Centre (MATRAC), who provides through the same system Air Traffic Services to Operational Air Traffic in the Hannover UIR. This service does not include Air Defence flights.
This combination of formerly separate centres has resulted in increased safety and more efficient use of the limited airspace available, e.g. by providing shorter transit routes.

II. Why Flow Control with Spain?

As a result of technical inadequacies and limitations of capacity in the Spanish Air Traffic Control Service, measures were introduced by Spanish Controllers, to regulate the flow of traffic for Spain. These actions were initiated to ensure provision of separation and to maintain air traffic safety. In practice these measures are restrictions, which are imposed on us through official channels e.g. by daily notams.
In this respect, Maastricht-Centre does its utmost to accomodate all the requirements from its adjacent/subjacent centres.

III. International Route Charges (IRC).

Contrary to widespread belief the International Route Charge System is **not** a „Eurocontrol Tax".
The following states, Belgium, Netherlands, Luxembourg, West-Germany, France, Britain, Ireland, Spain, Portugal, Austria and Switzerland, the last four not being member of Eurocontrol, have charged Eurocontrol to operate a central Route Charge Service. This Department collects the charges for all the agreed IFR-flights, both in the lower and upper airspace and distributes the income to the relevant State. The Route Charge - income is **not** part of the operating budget of Eurocontrol.
It is a known policy of the countries concerned to recover eventually all operational costs via the International Route Charge System. Irrespective of the future developments of Eurocontrol-Maastricht, the IRC-system will continue to exist.
Should you require clarification on any aspect of Eurocontrol, we would be happy to oblige. If you are interested in visiting Maastricht UAC, please address your request to the Director

Eurocontrol Maastricht UAC,
Luchthaven Zuid-Limburg,
Postbus 78,
5340,
Netherlands.

With your cooperation and assistance, let us ensure the prolongation of Eurocontrol-Maastricht after 1983."

...and reaction

There has been a steady flow of response supporting the idea of full international cooperation in Air Traffic Control matters. It is highly regrettable that Guild actions initiated in an attempt to preserve one of its most succesful products should have met with violent opposition in certain quarters. It is widely recognised that Europe's ATC problems can only ultimately be solved through the increased commitment of individual nations to work together with others. Aviation safety is a common concern, therefore a common policy is logical.
This is what airline companies and pilot organisations have to say:

British Airline Pilots Association (BALPA)

I am writing in connection with your letter of 20th January, 1977 in which you asked for support for the continuation and expansion of Eurocontrol.
We are naturally interested in this, but the exact nature of the problem is not clear from your letter and we are not sure what specifically might be done to support the future of the organisation.
I would be grateful to know of anything you might feel would be appropriate to the support that you are seeking.

Aviaco

Further to your letter of 20 Jun. 1977, we are pleased to let you know that the Operations

Direction of the Aviaco Company is very grateful for the services rendered by Eurocontrol and for the help received.
We support and encourage you to continue with the European Air Traffic Control Service.

Air Canada

Regarding your bulletin of January 20, 1977, Air Canada Flight Operations procedures and policy endeavours to enhance the highest order of Flight Safety in all our Flight Operations.
To this end, we will always do our utmost to ensure that our flights operate in an ATC environment that provides a level of safe and efficient service.

Trans European Airways

Up to now, as far as T.E.A. is concerned, we have to praise the services rendered by Eurocontrol.
During a period with increasing and still becoming faster Air Traffic, I sincerely do believe that the 7 Member-Countries should make an error in planning to go back to a small-minded nationalism, while they can use a service that actually proves to be perfectly adapted to the circumstances and that works, as I believe, to the total satisfaction of its users.
Indeed, the standard of EUROCONTROL owes an efficiency that shows to be on a higher level than most of the National Control services.
According to this, I will keep on thrusting the EUROCONTROL services and do hope they will continue their activities after 1983.

International Air Carrier Association (IACA)

This is to acknowledge your letter with attachment of 20 January and the follow-up dated 6 February 1977.
I have brought these letters to the attention of the IACA members and can assure you that the situation was discussed in detail. It was the consensus of opinion of the IACA-members that they favored the continuance after 1983 of the Eurocontrol-Maastricht UAC, provided of course, that the services would be rendered at cost and that such costs would be justified by Eurocontrol or the States concerned.

British Airways

A copy of "Towards 2000" was forwarded by British Airways, extracts from which are printed on page 10.

Norwegian Airline Pilots Association (NRF)

Your concern for the future of Eurocontrol's Maastricht Centre.

With reference to your letters, 20-1-77 and 6-2-77 we would like to inform you that the problems pointed out have been discussed internally as well as with our employer, Scandinavian Airlines System.

Both parties express positive wishes for further development of Eurocontrol and will monitor the situation closely.
Political and national viewpoints can never be to advantage to anybody in the field of international air traffic control. We will hope and work for the best.

Danish Airline Pilots Association (DALPA)

With reference to your letters dated 20. Jan. and 6. Feb. 1977 Danish Air Line Pilots Association (DALPA) wants to express not only the full satisfaction of our pilots with the ATC-services provided by Maastricht Centre, but also the fact that DALPA regards the creation of Eurocontrol as a major contributing factor to the improvement of European ATC-service attained during recent years.
Consequently, we are ready to offer our support and efforts in order to ensure the continuation and even expansion of your organisation.
As a pilot union we can express our viewpoints on this matter to the ministry of transport, which we willingly shall do. However, if you are aware of other specific means of action, in which our participation will be of any support to you, then do not hesitate to let us know.

South African Airways

I acknowledge with thanks your letter of 6 February 1977 explaining the more singular functions of Maastricht Control Centre of Eurocontrol.
Please be reassured that this company is aware that Eurocontrol commissioned a central body to collect and redistribute the revenue from user charges on behalf of the participating states and that while not aligning ourselves on one side or the other in any possible political or financial controversy on its existence we have always found Maastricht Centre helpful and cooperative.

The Dutch Airline Pilots Association (VNV)

The VNV forwarded copies of two letters which they sent of the Dutch minister of transport, strongly urging action in support of Eurocontrol and in breaking down national barriers. Reproductions of the original Dutch text have been displayed internally on the notice board, and are also available from the E.B.

European Organisation of Airline Pilots Associations (Europilote)

I had already opportunity to shortly discuss the matter you are raising in your letter with Messers. A.P. Bonne and I. Zipp during the IFALPA Annual Conference in Brighton.
Furthermore you might be interested to know the relevant IFALPA Technical Policies, which I quote herewith:

1. "Responsibility for the establishment of Air

Traffic Control and the allocation of airspace should be vested in a single agency within any one area, including, wherever possible, unified control over both civil and military flights. Where, however, this is not possible, joint control centres should be established so that full co-ordination can be effected between the civil and military controllers".

2. "The Air Traffic Service system should be devised so as to provide for the least number of FIRs and related Control Areas consistent with realistic operating conditions". (IFALPA Annex 19, Part II, Attachment to Agenda Item 2, para. 37a).

At our next Council Meeting I shall bring the concerns expressed in your letter to the attention of the EUROPILOTE Member Associations.

Swedish Airline Pilots Association (SPF)

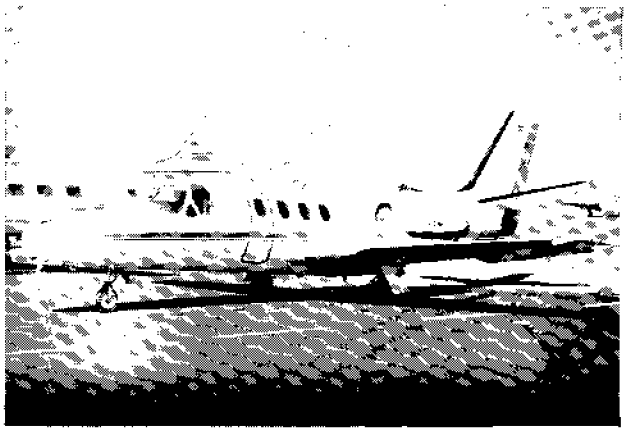
Swedish Air Line Pilots Association hereby expresses its concern regarding the future of Eurocontrol.
We have full confidence in your services and support your efforts to continue your valuable contribution to air safety.

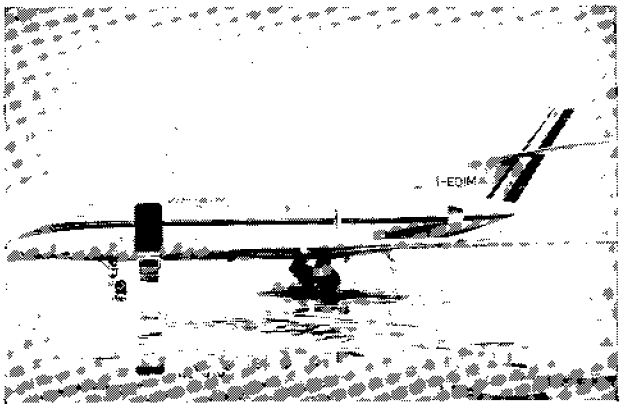
„Say again your type"

Second Generation Biz-Jets.

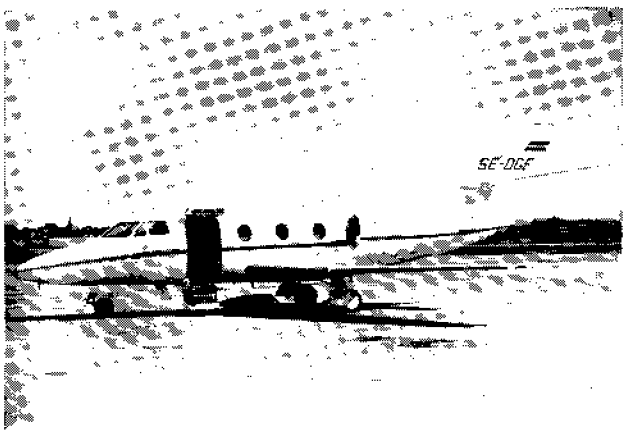
The entry of the business jet into the aviation world came about on September 4, 1957, with the first flight of the Lockheed Jetstar, interestingly enough, only 241 days after it's design was started. Although not exactly a best seller, the Jetstar is still in production twenty years later but modified to meet today's corporate, economic and political requirements.
Most manufacturers have discovered that to go it alone with the design and production of a new transport aircraft is financially impossible but that updated variants of an already established and succesful product can, more often than not, satisfy the customer's needs. It goes without saying, therefore, that future major projects for the civil market will doubtless be joint ventures.
Consequently, aircraft referred to as being "new" are generally up-dates of an existing design whilst the term "new new" is being applied to fresh off the drawing board designs.
The above has also applied in the business aviation sector although there are a couple of "new new" designs coming along in the not too distant future, but more of them later.
Since that first Jetstar flew, back in '57, a sizeable number of biz-jets have appeared on the scene, each fulfilling certain customer requirements. But then, in the latter sixties, more stringent requirements were laid down, this time at national administration level. The biz-jets of the day were still powered by noisy, and thirsty, turbojets, therefore, in order to achieve the noise levels demanded by F.A.R. Part 36 and to meet operator's demands for improved specific fuel consumption, the use of fan jets was considered.

Over the last ten years or so most of the business jet manufacturers have re-engined their aircraft with fan engines and, in some cases, have implemented retrofit schemes.
Let us just take a brief look at some of the engines employed.
Design of the Pratt & Whitney Canada JT15D was initiated in June 1966 and the engine first ran on September 23, 1967. For the flight test phase the JT15 was slung beneath an Avro CF100. The engine was subsequently employed to power the Cessna Citation, Citations 1 & 2 and Aérospatiale's Corvette, producing a take-off thrust of between 9, 8 & 11, 12kN (2200-2500lb).
A much more developed engine is the Rolls-Royce Spey turbofan which, in its various forms, powers the Grumman Gulfstream 2 plus a number of civil transports and military aircraft. Design of the Spey was commenced back in September 1959 and it first ran in December 1960. The variant powering the G2 has a take-off thrust of 50,7kN (11,4001b). The Spey has also been selected as the powerplant for the





forthcoming Gulfstream 3.
The Garrett - Airesearch TFE731 has become the most widely selected turbofan for business jet use. The first engine ran in September 1970 and was later tested in the air aboard a Learjet 25. In August 1972 Dassault took the first production deliveries for use in the Mystére 10. The TFE731 subsequently powered the Jetstar 2, Learjet 35/36, HS125-700, IAI 1124 Westwind, Falcon 50 and the yet to appear Citation 3. The various marks of the TFE731 produce a take-off thrust of between 15,57 & 17,61kN (3500-3959lb).
The General Electric CF700 which powers the Mystère 20 and Rockwell Sabre 75A is, in fact, a derivative of the J85 turbojet which powers the Dutch Air Force NF5A/Bs although lacking, naturally, the reheat capability. Unlike the aforementioned engines the CF700 has an aft-mounted fan. Take-off thrust produced is approximately 18,6kN (4200lb).



Returning to the aircraft, there are two total newcomers to the biz-jet scene, the first of these being a design by William P. Lear of Learjet fame. Initially referred to as the Learstar 600, the world manufacturing and marketing rights were acquired by Canadair who have since renamed the aircraft Challenger 600. .The Challenger is a wide-bodied aircraft and is expected to have a range of some 4000nm. First flight is scheduled for early next year. At the Paris Salon word had it that the Challenger could soon expect a competitor from Gates Learjet! The second aircraft, to be unveiled at this year's Reading Air Show, is the Tony Team Industries Foxjet ST. 600. This 4/5 seat aircraft is expected to cruise at around 300 knots at 39,000 feet for 1400nm. Power source will be two Williams Research WR19-3 turbofan engines developing approximately 2,5kN static thrust. This engine is believed to be the world's smallest fan-jet weighing only 30,4 kg with an overall length of 61 cm and a diameter of 30,5 cm.
First deliveries of the Foxjet, which, incidentally, is comparable in size to the Piper Seneca, are anticipated in about two years time.
Before closing I think it would be extremely unfair not to mention the world's first real biz-jet, the Morane-Saulnier MS760 Paris. This four seat aircraft first flew on July 29, 1954 and, although probably not configured to suit the needs of the present day executive, was certainly the forerunner of the large breed of tailor made corporate jets.
In the next edition of "Input" I shall list the specifications of each of the biz-jets and, hopefully, each will be accompanied by a photograph.
Paul J. Hooper - June 1977

The photos depict aircraft which were designed to accept fan-jets right from the outset.

1. A Cessna Citation photographed at Düsseldorf in August 1976.
2. A Mystère 20 taken at Beek in June 1975.
3. A Mystère 10 at Beek in August 1975.

All photos by Paul J. Hooper

Towards 2000

As a result of comprehensive investigations into ATC, British Airways European Division published a report, "Towards 2000", in March 1975. This report takes a wide ranging look at current systems, developments and political constraints. "Towards 2000" is an internal report, not a British Airways policy statement, and has not been generally released.
The introduction of "Route Charges" obviously effects all airlines. They are justified in expecting efficiency and 'value for money'. British Airways shares the concern that costs and delays should be reduced, and that the ATC system in Western Europe should be improved. "Towards 2000" is extensive in content. Reproduced below are those parts most relevent to the present European Area Control situation, although the Study Group also visited Centres in Chicago and Los Angeles, as well as West Drayton and Maastricht.

CURRENT SYSTEMS

"United Kingdom. The United Kingdom Air Traffic Control Service (NATS) reshaped their organisation at West Drayton in 1971. NATS, the joint responsibility of the CAA and MOD, has created there, one organisation which is responsible for the majority of Civil and Military air traffic in England and Wales and extending almost to the tip of the Cherbourg peninsula in the South. Plessey synthetic radar displays and 9020D Flight Data Processing System, with manually updated flight progress strips, are installed. A contract has been awarded for an evaluation Processed Radar Display system capable of displaying the laballed radar data processed by the 9020D, and this project should be com-

pleted by mid-1978.
Sector control capacity is generally good, but the Daventry sector, squeezed between two areas of intense military activity, suffers from peak hour overloads already, and attempts to reduce sector size are frustrated by handover problems causing more R/T workload for controllers. The London TMA re-organisation of 1974 did ease the situation somewhat, but unless and until this bottleneck can be widened by the acquisition of more controlled airspace, this unsatisfactory situation will continue.
Controller quality is high. Many are ex-aircrew with a good first hand knowledge of aviation either as pilots or navigators. Recruits without this background join as cadets and graduate from the College of Air Traffic Control (Hurn) after a high standard of training. Most controllers we spoke to felt the use of flight progress strips was essential to safe operation, and could not forsee any equipment changes which could help them work any better. Like many British industries, the number of personnel employed to fulfill a task was higher than that used by their American counterparts. Their contact with R & D personnel is negligible, and most we spoke to expressed the thought that research personnel had little idea of what went on at the 'sharp end'. The general controller feeling is that the UK airways system is just about the optimum, with the exception of the Daventry bottleneck. This opinion was not shared by the members of this Study Group.

Eurocontrol.

Air Navigation systems have been installed by all states who are signatories to the Chicago convention and many of the non-signatories who subscribe to most of the laid-down principles. Thus the whole of Europe is covered by ATC facilities.
The quality of these is largely a function of the wealth of the controlling state, but there are a number of small states in Europe over which fly a high proportion of Europe's air traffic. In order to resolve this, and provide a uniform standard of service, in 1963 the organisation of Eurocontrol was conceived in North West Europe, to control all Civil air traffic in the upper airspace (above 20,000 ft) without regard for national boundaries, and to provide an interchange of design and operational expertise.
The larger states, however, (notably the UK and France) considered they already had well developed plans in an advanced state of implementation, and there was also a powerful military lobby to whom the concept of unified control was unacceptable on the grounds of 'security'. They, therefore, opted not to have their upper airspace under Eurocontrol, an unfortunate decision which is having unfavourable repercussions.
Having modified their original plans, Eurocontrol was reshaped to operate from three control centres: Maastricht, to control the upper airspace of Belgium, Holland, Luxembourg and Northern Germany; Karlsruhe to control that over Southern Germany; and Shannon for Eire and the Western Approaches. All were to be manned by Eurocontrol personnel.
Maastricht is in operation and providing service for the intended area, except Holland, the Dutch authorities being unwilling to relinquish control from the Amsterdam ATCC.
Karlsruhe is almost ready for operation, but now the German authorities are following the stand taken by the UK and France. It seems likely that Karlsruhe will become German controlled.
(Editor's Note. Since publication of Towards 2000, Karlsruhe became operational at 0001 GMT on 27-02-77 with German controllers). The Shannon Centre appears to be some way behind the others, and there are suggestions that this is partly the result of the UK NATS pulling one way and Eurocontrol the other.
Both the London ATCC of NATS and Maastricht seem to have demonstrated that it is possible for Military and Civil controllers to work in juxtaposition, either with separate data processing facilities as in West Drayton, or using the same system as in Maastricht, where the German Air Force carry out control of military aircraft over North Germany from a base in Holland.
Another major task effectively carried out by Eurocontrol is the accounting for user charges, where the authority has been extended to cover the nationally controlled lower airspaces.
Manning levels at Maastricht are considerably lower than at other centres visited, mainly because of the high degree of automation in use.
Controller standards are high. Recruitment is from Nationals of subscribing states who are already qualified controllers. (Ab-initios? Ed).
Morale is high and there is notable enthusiasm for the equipment used. Relationships with research personnel are excellent, since many are colocated and contact is frequent with consequent crossfertilisation of ideas.
It was noticeable to the team that other European ATC organisations are antagonistic to the success of Maastricht, mainly because of the fear of supra-National bodies, and partly because of the high salaries paid to Euro-controllers. The inflationary effect of transferring power to Eurocontrol was often mentioned.

POLITICS

Military Influence.

The prime concern of the Royal Air Force must be the defence of the Realm. This requires their ability to distinguish unknown aircraft entering UK airspace as well as controlling the movement of service aircraft within civil air corridors. For this reason, the RAF not only operate their own military operations room, but they also pro-

vide a liason controller to each UK civil airspace control team. This is not necessary in the Eurocontrol system, where the military operate back-to-back with the civil controllers, using a common data base. As far as other European countries are concerned we have not had the opportinuty to investigate their civil/military relationship.
One of the reasons stated for the exclusion of Eurocontrol executive authority by some states is the threat to National Security. We would argue that Security would not be prejudiced if Civil Traffic were controlled by a Eurocontrol team at each centre, with military authorities co-sited and taking data from the common system, but using their own displays.

Research Politics.

The CAA expend £ 2½ million p.a. on ATC research. This sum is split equally between intra and extra mural activities, i.e. Hurn and Malvern. Simultaneously, we know that Eurocontrol is sponsoring its own research programme at Bretigny; and other European countries are engaged in their own parallel research efforts. This seems an unfortunate and motley approach to the problems that should be the common concern of EEC members at least. It is salutory to remember that we, the airlines, are funding this research to an increasing extent as Eurocontrol increases charges towards a full recovery level.
There are three seperate propositions that need to be made regarding the current philosophy of research. The first concerns the style of UK research. It is our impression, supported by evidence gained from people directly involved, that there is an unacceptable gap between operating controllers and those engaged in research at Malvern. This type of problem is frequently observed in situations where analysts have seemingly defined a routine function, only to be confounded by the controllers who, when presented with a solution, declare that the problem solved is not that which concerns them. This attitude is all the more common when the proposed solution is computer based. The fact that the researchers at Malvern and the controllers at West Drayton work for separate Ministers compounds this problem.
Conversely, we were inpressed by the alternative approach employed by Eurocontrol at Maastricht, where the systems division staff work alongside the operations division. There, it is evident that the human relationships formed create responses that encourage both parties to stimulate the best in each other.
Safety and caution are natural associates which, when allied to the fundamental human resistance to change, combine to prolong any process of innovation through continual attenuation. This process appears to us to be evident in the development of ATC procedures. Rightly, caution must be exercised. But we believe development of higher capacity and productivity from the ATC system is something that is dangerously near stagnation in the UK. The existing system is one that when introduced in the mid-60s was highly credible by world standards. But since then, new systems with greater development potential have been introduced. The impetus of the innovators of our existing system has largely been spent, and their mental horizons have difficulty in adjusting to the new possibilities. Their horizons need to be refreshed, and this must be considered an essential task for the NATS organisation. Perhaps, as in many other British institutions, the cause of the trouble lies in the career structure of controllers. For instance, we learned that after about ten years, UK controllers are moved 'elsewhere' or take administrative jobs. This seems inappropriate, for after that amount of time on the job, their knowledge could best be used to improve any system that they know they will be with for a further ten years.
The second proposal concerns the dispersal of research effort already mentioned. It should be the declared intent of all AEA airlines to encourage to the utmost the establishment of one common EEC ATC research centre. Such a unit should be administered through the present Eurocontrol structure, augmented in particular by airline representation. But it should be located cheek-by-jowl with a busy control centre and should have clear objectives which include the augmentation of its developing proposals.
The final proposal concerns the intention of the Chief Scientist of the CAA for the establishment of a multi-disciplined group dedicated to coordinating long term studies in air traffic management, to be located within the CAA. Since the primary objective of this group is the improvement of air traffic management on a European scale, and since practical issues come much to the fore, we suggest that the group should basically be established within Eurocontrol's ambience. Further, that an essential ingredient of the group should be a member seconded from customer airlines.

Eurocontrol Structure.

Eurocontrol is an international agency created in the mid-60s with the effective aim that it should ultimately replace within Europe, after 1980, upper and middle airspace management services of the separate national administrations. The outline intentions centered around centres at Maastricht, Karlsruhe, Shannon, Madrid and Brest, each manned by a mix of European nationals.
Eurocontrol had its policy laid down for it by Ministers who are responsible for their national authorities. It is obvious that, until such time as it is fully augmented, its development must be

related to the development of the European idyll. Meanwhile, its first venture at Maastricht appears to have been almost too successful: its very success must create psychological pressure from neighbouring centres which can only be overcome through their equal provisioning with advanced facilities. An island of automation is not over successful.

The one field where Eurocontrol has been permitted complete freedom is in the area of charging for the service provided within its national area of coverage. This unenviable task has met the ire of most airlines; for until Eurocontrol commenced its accounting responsibilities, charging by national administrations for air navigation services was almost universally unknown. But Eurocontrol is, except for its Maastricht centre, merely acting as a debt collector for the separate administrations that still maintain their operating independence.

Relationships of Member States Within Eurocontrol.

Existing Eurocontrol members are Germany, Belgium, France, UK, Luxembourg, Holland and Ireland. The first step towards international control of upper airspace commenced in 1974 when Maastricht Centre accepted responsibility for the North German upper airspace previously controlled from Hannover.

The next intended steps for augmentation of Eurocontrol principles should be the opening of Karlsruhe and Shannon for control of upper airspace over Southern Germany and over the Republic of Ireland. Unfortunately there are fears amongst senior Eurocontrol staff that, instead of these new centres being operated by Eurocontrol, they will be absorbed by their national administrations. This is activated by a belief that European Unity has lost momentum and politicians have lost the will to revive it. It is our belief that it would be disastrous to allow the relapse of a common federal ATC system into a fragmented national service just because it has all become difficult. We firmly support the federal approach to the extent of suggesting that British Airways should publicly propose the transfer of UK upper and middle airspace control from the CAA NATS service to Eurocontrol. We believe that evolution requires an overall European control organisation able to maintain with far greater ease the safe and smooth flow of traffic within Europe's relatively small airspace: space that is made smaller all the time through steadily increasing numbers of faster aircraft. This would increase the number of adjoining sectors operated by the same organisation and would allow virtually all the oft quoted benefits of North America where one common language and a single controlling authority have encouraged a high capacity system to develop.

Relationship of Non-Member States.

There are two levels of relationship which can usefully be discussed: Eurocontrol vis-a-vis NATO type countries and vis-a-vis Eastern block countries.

In the former case, it is our opinion that there is everything to be gained in the smooth and safer control of aircraft if Eurocontrol, at the least, provides basic standards and advanced equipment to be operated to the common standard which it has developed for its member states. This implies that Eurocontrol would design systems and train the selected staff in their operations, even if such staff were the nationals of the country concerned and worked for that country's national administration. This would satisfy the national insistence for sovereignty and independence whilst dove-tailing into a federal European system.

In the latter case, it is difficult to give a standard solution; but it is obvious that the greater the conformity that can be developed, the more expeditious will be the transfer of aircraft from one system into the other.

CONCLUSIONS

Relationships between Pilot and Controller.

There is a very strong sense amongst those involved that skill in the air is matched by skill on the ground, with a consequent high degree of mutual respect and trust. There is almost universal belief that total automation in either half is quite unacceptable, and that the path of development is to apply technology to make the controller's task easier, to take the routine work off his back so that he can apply his skills to the decision making tasks. This will result in an easing of the workload both in the air and on the ground, and enable more aircraft to be worked safely by each controller.

Airways Structures.

Revision of airway structure over Europe must continue to remove points of congestion which are potential trouble areas, or which require a disproportionate degree of control.

It is not thought that military demands on upper airspace will reduce in the next twenty-five years.

Unless increased automation is introduced into control centres, increases in air traffic will intolerably overload controllers whose numbers will rise. The cost of this increasingly expensive work force will be funded by the user airlines.

Technical Developments - Computer Utilisation.

All ATC centres which we have seen employ very large computers to provide information for the controllers. It would appear that the stringent demands for integrity, multi-processing capability and real time operation came at an early stage in the suppliers' capability to pro-

vide suitable hardware and software. In consequence the whole US NAS depends upon equipment now considered scarcely adequate for the task, as does the UK NATS (who bought the same thing), whereas Eurocontrol recognised the limitations just in time and re-ordered a more modern equipment which has adequate capability. The Americans are overcoming the deficiencies by doubling up their computer banks; the costs of both hardware and software are probably extremely high; and the multiplicity of the equipment brings many potential problems.
Based upon the findings of Eurocontrol, we entertain serious doubts as to whether the West Drayton facility can be expanded to meet all the probable requirements which are even now being proposed, and would expect that the need for a replacement will be apparent very soon. However, we are unconvinced that the very large computer is the best solution, and would expect that a proliferation of smaller machines would provide a more effective solution. However, it is essential that those centres which will comprise the European ATC facility must be totally compatible so that all the required data can pass freely between them. We are dismayed by the present incompatibilities, and the resultant costs of the inefficient means currently used to pass this information between adjacent centre computers.

Recommendations

The team described its objectives as follows: "To see what can be done within the airline and what influence can be exercised by the Board on outside bodies to improve air traffic flow at airports, to improve the use of terminal airspace and to introduce more direct air routings."
Although the terms of reference for the Study Group embrace prognostication of the likely situation in the year 2000, we believe that this will be influenced strongly by our actions in the intervening years, so many of our recommendations are essentially short term.
We, therefore, recommend that British Airways should:

A. Encourage the extension of Eurocontrol authority using compatible control centres, to cover the whole of European airspace.

B. Encourage the progressive revision of the airway layout throughout Europe, to yeild a greater capacity system with a higher inherent safety factor.

C. Encourage closer co-operation between operation and research, and participate in those developments having any interaction with the airline. As an immediate objective, to participate in the development of ADSEL/DABS and implement a fleet fit as soon as benefits can be obtained.

D. Develop scheduling programmes in participation with other airlines to ensure that the available airspace is never knowingly saturated, and to agree with other airlines on effective flow control strategy and implementation. Expect to be able to schedule operations for a maximum continuous runway utilisation of 60 movements per hour.

E. Argue with HMG that a high proportion of the CAA charges is for work of national importance and hence should not be borne by the customer airlines.

F. In recognising Eurocontrol as a collection agency for user charges, take note that these are inflated by gross inefficiences caused by national isolationism and incompatibility of equipment in the various centres.

G. Encourage the introduction of advanced airborne navigation systems provided these are used in conjunction with an air/ground data link to enable the ATC system to operate more aircraft in a given airspace.

H. Examine the feasibility and cost effectiveness of the replacement of ground based telecommunications links throughout Europe by a communications satelite specifically for airline industry purposes, and not restricted to ATC usage.

I. Encourage Air Traffic Control developments which will reduce pilot workload, by reducing the communications requirements.

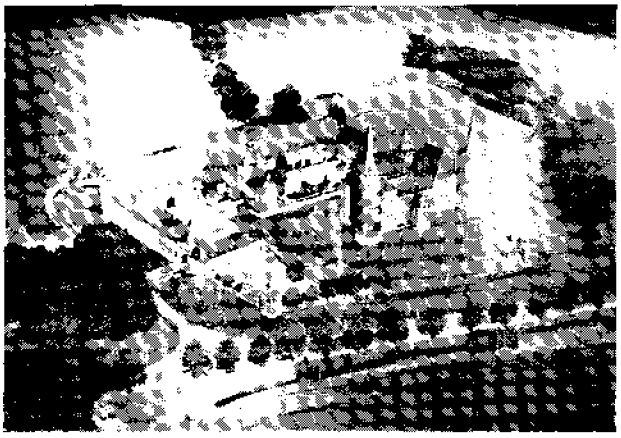
J. Require new aircraft to be so designed that the wake turbulence is reduced such that 3 mile separations are always feasible, and to encourage the development and fitment of modification to effect this on current wide bodied aircraft.

(Editor's Note: This is the full list of recommendations at the conclusion of "Towards 2000". Some of them relate to aspects of the report not covered in this issue of INPUT. It is hoped to include these other topics at a later date. MJL)

A quick one

A reliable source of international repute recounted a tale about a certain British controller, renowned for his passion for chips. It appears that some years ago, whilst the controller in question was working in Preston, a Dove at FL 80 started experiencing some problems with icing;
DOVE: Preston, may I, at your convenience, descend to FL 60?
CONTROLLER: Affirmative, descend now to FL 60, report passing conveniences.

Annual buffet-dance



Place: Kasteel Hoensbroek
Date: Friday 21st October
Organisation by EGATS.

Tentatively, a pilot/controller forum will precede this years buffet-dance, on **October 20th. Full** details of both to follow.

Canadian carrier joins IACA

On 1st April 1977, the Director General of the Geneva-based International Air Carrier Association (IACA), Mr. F. Anthony Pfiffner, announced that QUEBECAIR, a Canadian regional carrier operating international charter flights and scheduled domestic services, had been unanimously accepted into the Association as a member effective 1 March 1977.
QUEBECAIR has been in continuous operations since 1946 and its headquarters are in Montreal. Its fleet consists of Boeing 707, Boeing 727, BAC 1-11 and F-27 aircraft. In 1976, QUEBECAIR performed ABC charters to France, Ireland, Belgium, and Malta, as well as ITC charters to the Bahamas, Barbados, Colombia, Cuba, Haiti, Jamaica, Martinique, Mexico, Puerto Rico, Trinidad and Tobago, and the United States. The total number of passengers carried was approximately 800,000 in 1976 on both scheduled and charter services.
Mr Pfiffner noted that QUEBECAIR was the first associate member of IATA to be accepted as a member of IACA.
Other members of IACA are: Aviogenex (Yugoslavia), Capitol International Airways (USA), Cimber Air (Denmark), Euralair (France), Inex Adria (Yugoslavia), Maersk Air (Denmark), Overseas National Airways (USA), SATA (Switzerland), Skyline Sweden AB (Sweden), Spantax (Spain), Sterling Airways (Denmark), TAE (Spain), Transavia Holland (Netherlands), Trans International Airlines (USA) and World Airways (USA).

The very end

Overheard at Beek Airport between Tower and a (Eurocontrol trainee) private pilot:

A/C - Beek, request taxi clearance:

TWR - Clear to enter runway and take off via middle interchange.

A/C - For training purposes, can we take off from the end of the runway?

TWR - Sir, I do not doubt your ability to fly, but I suggest you take the beginning of the runway.

(Names deliberately omitted to protect the guilty)

Bulgaria - land of wine and schweppes

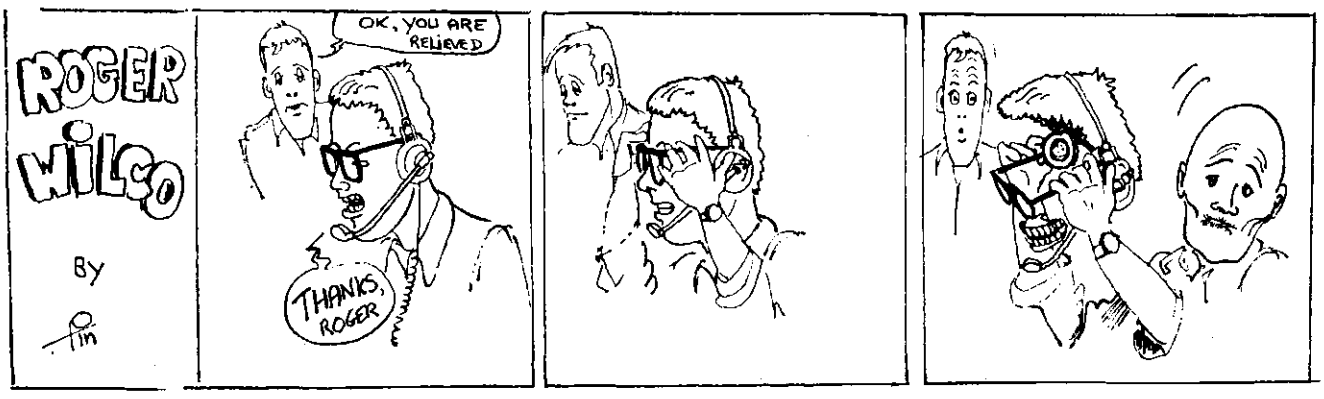
Sofia, surrounded by the snow-covered peaks of the Balkan mountains, is no place for beer-drinkers. Even when visiting Bulgaria for only a few days, the Western fan of this type of liquid is forced to realise that two pints of the only brand available, brewed in the DDR and very expensive, creates an enormous hangover the next day.
The trip to Bulgaria, with a party of 16 people, to meet Leoski Spartak Sofia in a European Cup volleyball match, was a remarkable one. The NLM Friendship departing from Beek incurred 20 minutes delay due to an electrical failiure, reducing our transit time to less than 10 minutes. At Schipol, the transit employee managed to call everybody except the person who was able to hold the DC9 to Vienna, the next point on the journey. The KLM aircraft departed with two team members, who had travelled independently from their home in the Hague, on board. For those left stranded, empty seats were found on a Lufthansa B737 bound for Munich.

The two hours waiting in the transit lounge were filled by a very interesting conversation with Mr. Anton Geesink, ex-World Champion in Judo. From our seats on a Munich-Sofia Lufthansa B727 we had a fantastic and impressive panorama of the Austrian Alps. Arriving at Sofia Airport (also a military airfield: no cameras allowed, probably because of two squadrons of double-deckers used for mountain patrols) we landed immediately after the DC9 from Vienna.
The few days spent in Sofia as official guests left us with mixed impressions. Two officials were delegated to the group to be of service 24 hours a day, but neither of the gentlemen spoke or understood a Western language. The indoctrination speeches at official receptions were, of course, unavoidable, and delivered to us regularly, word-for-word the same on each occasion. Impressive industrial projects were visited, and Sofia itself, a beautiful city with wide streets and magnificent buildings; the basilica (Greek-Orthodox) is an architectural masterpiece.
One everyday aspect is that hotel bookings have to be made at least two and a half months in advance. Another strange fact is that Bulgaria produces and consumes double the amount of "Schweppes" liquids made in Great Britain. At the same time, this was the only Western type product that could be discovered in the shops of the city. Nevertheless, alcoholism is one of Bulgaria's greatest social problems, and heavy drinking is common at a time of day when many Westerners would find a cup of coffee hard to face. Luxury items are very rare and unbelievably expensive (example: a deck of plastic covered playing cards 17,50 Guilders).
Coming to the Bulgarian people, the artificial 'way of life' as ordered by the regime can be observed in the streets - no children playing, they are kept in government controlled 'Kindergartens' 10hrs a day because both parents have to work in order to make a reasonable living.
The only glimpse of children during the time there was of a group being herded along for church services early Sunday morning.
Bulgarians are proud and self-assertive. Marriage is the main event in the life of a Bulgarian citizen. Bride and groom, as well as their respective families, save money for years to meet the gigantic costs of a traditional wedding party for approximately 400 guests. In spite of that, nearly 40% of all marriages end in divorce within five years, and in seperation, the divorcees will still be paying off bills for the reception for quite some time.
Western cosmetics and clothes are appreciated as much as jewellery by Bulgarion women. At 8 o'clock on a Monday morning, there is not a single empty seat to be found in the hairdressing salons, where reservations must be made two to three weeks ahead. A similar period of notice must be given for dining in a restaurant.
Travelling back on Monday was impossible due to fog. No hotel was any longer available, and so an adventurous night was spent out in the country in a few wooden holiday bungalows with open fireplaces, and helped along by a dozen bottles of wine.
An empty Balkan Airways TU134 (no auto-pilot, every course correction was felt like a 90° turn) brought us back from Sofia to Vienna. There we embarked on an Austrian DC9 for Amsterdam, and flying with this company was the most pleasant experience so far on my part. Excellent cabin service, a gourmet dinner, and a very smooth flight with lots of information passed to the passengers makes flying with Austrian Airlines great. Needless to say that the match against one of the strongest Eastern European teams was lost 3-0!

Paul Demelinne

The mind boggles

Quite, recently, a young lady assistant found it necessary to leave the ops room due to natural causes. Her relief was somewhat disturbed, however, by an overflowing cistern pouring water on her head. Although all-in-one ablutions may be a time-saving commodity of the future, it is not yet forseen within Madap planning. As it was a public holiday for non-essential Maastricht staff, our heroine displayed great initiative by asking someone else to report the defective plumbing, via the telephone, to the right person to effect urgent repairs.
"Alright", responded the appropriate authority, "we'll send an electrician immediately."



CARDS at Boscombe down

Since 1972 controllers at Maastricht have been able to work with fully labelled synthetic radar displays. The MADAP system now uses six feeder radar sources and can accomodate more. There are several advantages in the ability to incorporate information from existing radar heads; in certain areas, the introduction of any further SSR or primary heads would create interference and garbling with existing facilities, creating a general degradation of radar pictures.
This is the case in the UK, where a new Ferranti control system is now being introduced.
A number of airfields at UK Ministry of Defence Establishments are currently operating with primary radar only. Because of the need to limit SSR interference the MOD decided not to install new secondary radars but to take SSR data from existing CAA radars. In the case of the Aeroplane and Armament Experimental Establishment at Boscombe Down - the first of the MOD airfields to be so equipped - the sources of SSR data will be Ventnor in the Isle of Wight, Heathrow and Burrington in Devon. Burrington will also supply processed primary radar to supplement the coverage of the three local primary radars at present operating at Boscombe Down. These local primaries will continue in operation, and ATC at Boscombe Down will have the choice of primary radar from any one of its three local equipments plus SSR data from any one of the three remote secondary sites, with processed primary as an additional input when Burrington SSR is selected.

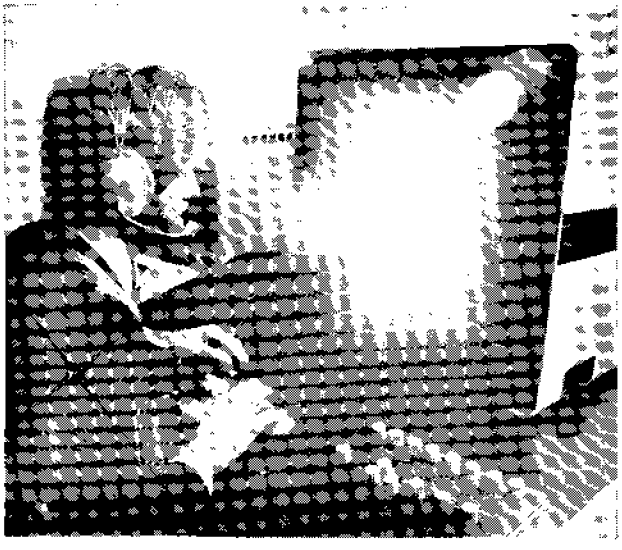
An order has been placed on Ferranti for a Computer Assisted Radar Display System - CARDS - to process and display the incoming data. The system will comprise two complete channels each with its own store, a central backing store on disc, nine sixteen inch (41 cm) displays each having a raw radar and graphics capability, keyboard and rolling balls for all displays, consoles and vice versa. There will be a phased introduction of the system starting in April 1977. Completion, which is being arranged to conform with Boscombe Down's programme, will be completed during the summer of 1977. When fully installed, eight display consoles will be in operation for controllers' use with a ninth console for engineering requirements. This last console will be known as the Maintenance Console, the function of the maintainer being to monitor the standard of technical performance and his display will provide additional information for doing this. The system makes provision for adding a further seven displays later, giving a total system capability of sixteen displays, all of which can be driven from either one of the two Ferranti FM1600D computers.
In a system which uses both raw and synthetic data, the problem is to make available sufficient time to display the full gamut of alphanumeric data, symbols and graphics without stealing time required for the display of raw radar. The latter is painted in a series of traces drawn radially from the centre - or offset centre - of the cathode ray tube (CRT) and which by their apparent rotation build up the characteristic raw radar picture. Graphics and alphanumeric data on the other hand are written cursorily as one writes with a pen. The time to paint the raw radar picture is a fixed percentage of total time, being determined by the range and pulse recurrence frequency (PRF) of the particular radar. The time left is available for the presentation of alphanumeric and graphics.

This intertrace time represents only a small percentage of the total time, and the electron beam in the CRT must be capable of moving very quickly to write all the synthetic information. This calls for very fast deflection of the electron beam, a requirement which in earlier displays has been achieved at the expense of heavy power dissipation, large power supply units, and an increase in air conditioning requirements to get rid of the heat. The FRD 1641 displays for Boscombe Down use a CRT with a new electrode assembly having a full scale deflection time to within 95% of final position of only 14 micro seconds (usecs) with an average dissipation of 450 watts. After a major electron beam deflection - i.e. to start the next piece of writing on the opposite side of the tube face - it is possible to start writing alphanumerics within 21 usecs of beginning to move the beam from its previous position. Shorter moves have a shorter shift time, and individual letters take typically 4.62 usecs. The time for writing a complete plaque consisting of seven figures and a symbol, and including both extraction of its position from store and a major position shift prior to starting writing, is 66 usecs. This compares with minimum interscan times for the Boscombe Down local primary radars of:

S232	500 usecs
S264	600 usecs
901D	480 usecs

One of the display drive functions is to check that time remains to complete a writing task before the start of the next scan. If not, it is held until the following interscan period.
The display of raw radar and synthetic data on the same CRT implies two widely different refresh rates. Video, which includes raw radar and (analogue) video maps, is written in time with the rotation of the radar aerial. Several seconds elapse between each sweep, and the controller derives his information from the afterglow of the

phospher as well as from the flashing up of an echo as the beam passes through it. This is not satisfactory as a way of displaying synthetic information due to loss of readability at lower light levels, and it is necessary to renew all synthetic data at a rate adequate to maintain a steady intensity of illumination. The figure must therefore be above that for persistence of vision (including peripheral vision) having regard to the characteristics of the phospher used. In the Boscombe Down system the refresh rate is 16 Hz - i.e. the data is rewritten sixteen times per second.



This does not mean that the computer is required to update the display sixteen times per second. Instead the information for each display is held in a 2K word store included in the display drive unit. This information is updated whenever there is any change, and is re-written by the computer once per antenna revolution.
A difference in intensity is required between video and synthetic data in order to balance picture illumination. This is arranged by writing the synthetics at a lower voltage, effectively hitting the phospher less hard. This in turn reduces the visual level of the afterglow and limits the effect of smear on plaques. Smear can also be reduced by the use of two phosphers when coating the CRT, the traditional long-persistence PPI phospher being supplemented with a sort-persistence phospher which glows brightly at lower beam voltages but decays quickly. An amber filter of appropriate density is used to balance the phospher colours and avoid a bright flash as the raw radar trace passes through patches of weather or ground clutter.
Separate handling is provided for raw radar and synthetic data. The video input comes in over coaxial cables and is taken to the display drive unit without entering either computer channel. Although the rotation information from the local antennas is distributed in digital form (through a duplicated system), bearing reception and distribution does not rely on the operation of the computer or its peripherals, so that in the unlikely event of a double computer failure controllers will still have raw radar.
Synthetic radar data is received at Boscombe Down over a Post Office narrow-band link (telephone wires). This link terminates in a modem which feeds information into two identical computer channels each comprising a data-link terminal, and FM1600D computer with 32K store and a double, S-cubed serial signalling unit, together with a real time clock and paper tape reader.

The selection of the secondary data source is made at LATCC. The input format includes coding identifying the origin of the information, and this is displayed on the controller's minitab. The routing through the modem and data-link terminal to each computer is one way only. Thereafter there is a two way route between each computer and each display. Each controller has the ability to select either computer channel and his selection (by a switch on the display control panel) has the effect of opening up the route from one computer and inhibiting the path from the other. In this way his information always comes from a single computer. The two return routes remain open all the time and every four milliseconds each computer takes in information on each controller's keyboard and rolling ball settings - a process known as polling. This ensures that when the controller changes computer channels, the new computer is fully informed of his requirements.

The design philosophy for this equipment has been that each computer channel should be limited to the reception, processing and storage of data. The display and control of data is a separate function carried out in the operations room. Each display has its own radar control panel, display drive, rolling ball and keyboard. This group of equipment operates as an autonomous unit so that a failure in one display system does not affect any other display. The split between the display and display controls on the one hand and the two computer channels on the other means not only that maximum redundancy is achieved at minimum cost but that the amount of equipment in the operations room is limited and it can be serviced without interference with the overall operation of the system.
Each controller has the choice of five different display presentations lettered A - E on the radar service switch:

A. Raw radar from Cossor 901 plus SSR plaques (correlated in respect of origin) and Minitab. Video map, range rings, remote primary radar (plots and clutter map) are available on further selection.
B. As in 'A' but local radar is Marconi S264.
C. As in 'A' but local radar is Marconi S232.

D. SSR plaques and Minitab. Remote primary radar (plots plus clutter map) on further keyboard selection subject to availability from the remote site selected. Presentation of either the 901 or S264 video map at half PDF with no primary radar.

E. Synthetic data only consisting of SSR plaques and Minitab with remote primary radar (plots and clutter map) on further selection.

The references to 'raw radar' mean that the aircraft is shown as a blip which is painted once each revolution of the radar antenna. Using SSR the position of the aircraft is shown by a symbol associated with a label showing code and flight level. The latter changes automatically to height (using a two figure designation) below the transition level. The symbols in the Boscombe Down System have been chosen to give additional information on level filtering and primary radar cover.

The minitab is a small tabular display of twelve lines (two of which are unused), sixteen characters long. It can be positioned anywhere on the tube face using the rolling ball. The data it displays comprises:

Remote radar source in use
Selected codes
Height filter limits
Selection of 'all codes'
Area filter; in or out
EBRM bearing followed by range
Time in hours, minutes, seconds. QFE setting
Input data. Key selection appears as data is inserted
FAULT warning (flashing) or NO GO for incorrect data entry

The first nine lines are self explanatory but fault warning requires explanation. Display of the word FAULT on the minitab is associated with illumination of a fault warning lamp for either computer channel. Display of the word FAULT without the fault lamp means the fault is in this console. If the lamp is lit, the fault is in the computer channel and the controllers should change channels. The lamp on by itself indicates either a channel is out of commission for servicing, or there has been a catastrophic failure so that a channel change is required. Should the fault occur in the S-cubed link between processor and display, the synthetic content of the display will flash.

In the case of the Maintainer's minitab there is provision for a fault number to be displayed to assist in fault identification. A total of twenty five possible faults have been listed.

The fault notification is part of a comprehensive checking system. To keep it in perspective it should be read against the total system availability which is calculated at .999950.

The controls provided for the controller consist of a set of display and other controls called the Radar Control Panel, a rolling ball and a keyboard group. The radar control panel provides all the normal display control and selection facilities, and all other controls which are keyboard-operated. It also includes an indicator with North, South, East and West lights to indicate the off-screen position of the rolling ball marker. The panel accommodates a total of seventeen controls and seven lights. Except for the computer channel switch (which is for selection only) none of the controls are associated with the computer system, and the panel would continue to operate on a raw radar input even with both computer channels out of action.

In addition to the keys 0 - 9, the controller's keyboard has twenty eight keys in three groups. The first group is concerned with the setting and deletion of height filters, position symbols, the synthetic map and remote primary data. The second is a maintenance group most of which are only operative on the maintainer's or supervisor's consoles. The third is concerned with aspects of rolling ball use. For example, they specify, its function as an interconsole marker (ICM) or electronic bearing and range marker (EBRM).

The interconsole marking facility allows a controller to transmit a symbol (positioned by his rolling ball) to a selected console or to all consoles simultaneously. The EBRM facility allows him to obtain a range and bearing in respect of one position from another, the figures being displayed on the minitab. Additionally, the rolling ball can be used to designate an aircraft on which code and level information is required regardless of filtering. It can also be used to define a geographical area with which a controller is not concerned, so that plaques and processed primary radar are not shown. The area concerned is marked with corner symbols and a warning message appears on the minitab.

As a means of providing the support functions required to maintain the operational system software and to develop new software modules, the specification for the Boscombe Down System includes a single-access, disc-based operating system. The principle items of hardware in this operating system are the disc store itself, with a capacity of 100 megabits; a teletype and a line printer. Although not essential to the operational use of the system, the disc is a useful addition in that it eliminates the need to use paper tape as a backing store, a great advantage in terms of speed of system loading. With this in mind, the system has been designed so that both computer channels have access to the disc store, whereas the rest of the program development system is limited to one of the two computer channels.

The phased installation of CARDS at Boscombe Down will be simplified by the ability to install the new display equipment in existing consoles although these were designed for twelve inch displays. This is made possible by the compact

overall design of the display head which has a frontal area only 19½" x 19½" (49.5 by 49.5 cm) and by the use of the S-cubed link to distribute all synthetic data. S-cubed is the Ferranti Serial Signalling System which was originally designed for use in the Royal Navy. It requires only four twisted pairs for each display - one in and one out for each computer channel - and can handle data at a rate of three megabits per second.
Provision has been made in the design for additional facilities which may be required at Boscombe Down or elsewhere.

a. Code/Callsign conversion can be provided. This would require some additional software and the addition of more core store. If the code/callsign conversion table is held at LATCC, means will be required to access it. Space is available in the racks for the facility.
b. Additional display can be added at a later date. This could be carried out relatively simply because of the limited interconnecting system required. The display facilities can also be expanded to present a fully processed picture.
c. The system is capable of driving separate tabular displays in addition to the minitabs, and is currently doing so on a demonstration basis. This opens up the field to the display of flight plan data.
d. Although not called for in the Boscombe Down System, the CARDS program can provide tracking and can include ground speed readout and coasting facilities.

The CARD System has a number of applications in both civil and military air traffic control, and is seen by both MOD and Ferranti as having a strong export potential. In many of the applications, the ability to take radar information from a source already in existence means a substantial saving in both initial cost and manning.

R.N. Harrison, Ferranti Digital Systems Division.

Press comment

Fear stalks the Ulcer Factory

They call it the Ulcer Factory. And since the horrific crash of two jumbo jets in the Canary Islands, the men in the control tower of Chicago's O'Hare airport have been dipping into the jars of antacid tablets as though they were Smarties.
That disaster was the nightmare of every traffic controller throughout the world. But at O'Hare, where more than 100,000 people pass through the terminal and 1,900 flights take off and land each day, the nightmares become accentuated.
Chicago's international airport is the busiest in the world and the 90 air traffic controllers are modern day cowboys, chivvying and guiding the herds of jumbo jets to safety.
The pressure is such that few can survive it without falling victim to the acute hypertension which is considered a natural hazard of the job.
Most controllers are young men, under 35, and taking a post at O'Hare is roughly equated with proving your masculinity by riding the rapids.
The pilots are mostly mature men who at least glean a little glamour from their seat in the cockpit, but the controllers are expected to be faceless voices, allseeing eyes who can make instant decisions that will determine the fate of thousands of passengers.
Of the 94 controllers working at O'Hare, only two have been there more than ten years. Most don't survive five. A recent survey shows that at least seven men have been carried out of the control tower on stretchers in the past year and two-thirds of the men either have peptic ulcers or the symptoms.
All the rest have succumbed to one or more of the results of living with such high tension which include depression, horrifying dreams, acute anxiety, arthritis, colitis, skin disorders and high blood pressure.
Any controller will tell you that near misses happen nearly every day, but are rarely reported, and it only needs a major disaster, such as the one between the two 747s, to send everyone in the control tower screaming to the psychiatrist.
Because O'Hare is understaffed, no healthy controllers are allowed to leave without a fight and once their nerves are shot they can't get a job at a quieter airport anyway.
So all these young men can look forward to is the certainty that one day they will have to train for a second carrear. In the meantime they may have proved their masculinity, but they will almost certainly have damaged their health.
(Daily Mail)

The 16th annual conference of IFATCA Nicosia 1977

For the Guild the Conference was overshadowed by the fact that, at what was to have been an exploratory meeting in company with the

Guilds or Associations from the Member States of Eurocontrol on the subject of possible assistance by the IFACTA Executive Board in the present crisis situation for Eurocontrol, the Netherlands Guild without prior consultation, accused the Guild of non-professional conduct contrary to the Constitution of IFACTA. The spirit of the exploratory meeting therefore turned sour and the work of the delegation multiplied by Guild delegation meetings, necessary contacts with the other delegations which had been present at the first meeting and with the Executive Board. Throughout all this problem, which tended to take away from the Guild's participation to the full in the Conference business, the whole delegation acted completely professionally throughout and refused to be drawn into a mud slinging campaign. Clearly our case can only be taken up by the Executive Board of IFACTA in consultation with other interested Member Associations. Whereas the majority favoured a meeting under the auspices of the IFACTA Regional Councillor, the Netherlands flatly refused to participate. They were disposed nevertheless to attend a meeting of the MAs concerned outside the aegis of IFACTA. As in the circumstances, the non-participation of the Netherlands would have led the meeting nowhere, the majority accepted the second alternative but not without protests even from those who supported the Netherland initially. The Executive Board gave what for the Guild was an unsatisfactory ruling on the Netherlands accusations, since no facts were produced for the Guild to defend. If such facts were produced to the Board, we maintained that we had the right to know them. We accepted that the IFACTA Board had made a decision, but reserved the right to make our reply after a full Board Meeting at Maastricht. Nevertheless we continued and were insistant on being the first to hold out the hand of friendship to our Dutch colleagues and at least we have maintained grounds for discussion and the possibility to discuss. When the meeting is called in Maastricht we must nevertheless have strong arguments to put our case back under the auspices of the Federation.

As far as the Confernee itself is concerned, this was extremely well organised. We were ably represented in Committee B by Jan Van Eck and Tom Van Hal and were many times congratulated on their work and also on the Guild's input through Working Papers which were well received. The only contentious point in Committee B was the question of Universal Language which left our delegation the problem of using differently from ourselves the proxy vote which Costa Rica had sent to the Guild. The details of the Committee B Report will be explained to the technical committee by the participants. The Guild again has charge of the Conflict Detection Studies and Radio Communications Failure Procedures. In the second we will do well to remember that we are attempting to define world wide methods and that many MAs do not have anything like our sophisticated equipment.

Kos Zipp assisted by J. Kuiper ably carried our flag in Committee C. Much of the discussion centred on the forthcoming ILO Conference on aviation. MAs are encouraged to put Controllers on the National Delegations. Eurocontrol is likely only to have observer status at the Conference and I believe we should as a Guild make representations to the Director General to have at least one Guild Member on the official Eurocontrol team. The details of Committee C work will be reported by the participants. I attended some of the discussions in order to present WPs prepared by SC VII. All of our input as a sub-Committee of SC VII was accepted and we have again taken on this task. We also have become responsible for SC V "Recruitment and Training" and as ILO I hope that ALL Guild Members who have gone through the process will give their ideas and support to the Chairman who now has one of the hardest. SCs within IFACTA.

I represented the Guild in Committee A and was assisted by the President who took over when I had to be in Committee C. We supported all the new applications for Membership. We were instrumental with the UK, Yugoslavia, New Zealand and Canada in arriving at a compromise resolution on the question of military controllers. There was clearly a major problem in some countries and not in others and our aim was to allow all to follow a single IFACTA policy. We fought strongly, supported by Cyprus, not to expel Malta without adequate information on their problems. We successfully supported the Board's policy against that of SC III on the principle of retaining the idea of paying Councillors' expenses and expenses of Committee Chairmen and Secretaries. They do an enormous amount of work and often cannot participate in the social side of the Conference.

The principle of the IFACTA Membership card has been established. They will be issued every two years and will be useable for reduced rates in Hotels in a number of countries as well as hire car systems. An updated list will shortly be prepared. The budget was voted and the only increase is in affiliation fees which does not affect us. Our incorporation in Switzerland is complete and two papers amending the Manual on Constitutional Changes and Interpretation presented by SC VII, the second by our sub-Committee were accepted.

We opposed unsuccesfully the Board's proposal to remove all exclusion of Trade Union activity from the IFACTA Constitution. Here we had to use Costa Rica's vote in favour as the Costa Rica Association is a Trade Union. Each time

we had this choice to make we asked for it to be recorded so that the Costa Ricans can see that we tried to put their point of view fairly. Our SC VII sub-Committee paper on relations with the press, presented late as a result of the Teneriffe crash, was accepted. Next year's Conference was confirmed as Copenhagen 23rd-28th April 1978. Turkey was not present so there was no possibility of confirming their offer to host the 1979 Conference. Belgium offered to fill the gap and this was accepted. Two offers were received for 1980 from Surinam and the U.K. No decision was taken. Under IATA 200 we are required to put into effect Lyon Resolution A 51 so the Board of EGATS should contact the National Airlines of all seven countries on the problem of support for reduced rate travel. The problem of the "Ercan FIR" in Northern Cyprus was broached by the Cyprus Association and having acted as devil's advocate for Turkey in order that the two sides of the story should be aired, we supported the strong resolution which took the Cyprus side. Yugoslavia expressed profound thanks for all the help which they had received. They were upset at the thought that the name "Zagreb" might always be attached to the fund. The name will remain until the case is completed but it was felt that subscribers should be consulted. We could see no objection to the name change nor if money is left over for this to be transferred eventually to a permanent aid fund, as Yugoslavia will suggest. Two questionnaires were presented in Committee A and our President offered to complete these. The Guild offered to provide one person for a managerial position in Committee A in Copenhagen.

Jean Daniel Monin announced that he will not stand for re-election next year. We had some discussions with the Danish and Norwegian Associations on Mr. K. Leming of Norway as a possible candidate. They would support the candidature and we approached Mr. Leming, not forgetting Mrs Leming, and they will think the matter over. It is now up to the Board to write to him with copies to Denmark and Norway so that the Guild may propose Mr. Leming to IFACTA.

From an IFACTA point of view after the problems with PATCO and Australia, the Conference was succesful. The Membership reached 50. As last year, the Guild continued its policy of publicising what Eurocontrol does and we received attentive audiences moreso this year from the Corporation Members. Last year we were finding our feet. This year we are recognised as one of the MAs making major input to the Federation. This wins us many friends and our efforts must therefore be kept up in this direction despite all our problems. Even the press tended to seek us out on technical subjects and this was an important sign in view of the fact that the press covering the Conference were very well informed thanks to pre-Conference work by CYATCA. It remains now for our Board to thank CYATCA, Cyprus Airways and Olympic Airways for the help they gave us. As Director I was presented with a souvenir of Nicosia by the Mayor and this was handed over for display at Maastricht.

We now have a number of tasks to do. The sub-Committee of SC VII has already submitted papers to SC VI for processing next year's Conference so it is not too soon to start .

E. Mc Cluskey
IFACTA Liaison Officer.

Emergency! what happens now?

It is possible for a controller to work for years without ever handling an aircraft in an emergency situation. Then, suddenly, he may be called upon to react immediately to a distress call. Although basic guidelines are laid down, the controller faced with an emergency must rely largely on his own initiative and judgement to provide the best assistance.

Generally, there is little, if any, continuation training provided for the controller. New types of aircraft may be introduced without his being aware of their specific limitations, or the workload of the aircrew. Many of the gaps in the controllers knowledge can be filled by regular familiarisation flights. But back on the ground, responding to a distress call, does the controller know what actions are being taken in the cockpit?

To give a better insight, KLM have provided the rapid decompression/emergency descent procedures from the operations manuals of their various fleet aircraft. This issue of Input covers the DC9

DC-9
Cabin Press
Emergency descent procedure

— Oxygen Masks ..... **ON**
Both pilots should immediately put on their oxygen masks in case of decompression at an altitude above 13000 ft.
— Audio Selector Panels ..... SET
BOOM/MASK microphone selector MASK position
Interphone Audio switch ..... ON
Speaker switch ..... ON

PILOT
— Auto Pilot ..... **OFF**
— Power Levers ..... **IDLE**

— Speed Brakes ..... EXTENDED
— Speed Schedule ..... 0,80 M/VMO
Gently push the control column forward and do not exceed 10° nose-down pitch.
Aim at a speed of 0,80 M when flying above approximately 24000 ft.
Maintain this speed until indicated airspeed is just below VMO.
Below approximately 24000 ft, maintain a speed just below VMO. Try to avoid activation of the maximum airspeed warning system.
Average rate of descent will be 6000 ft/min.
Recovery should be initiated in time so that level flight is regained at the desired altitude (flight level)

CO-PILOT

— Outflow Valve ..... MANUAL/LOCKED CLOSED
-15:
Pull the outflow valve lever fully out, rotate it 90° and place the lever manually in full INCR (forward) position.
Lower the lever in the locking detents.
-32/-33:
Place AUTO/MANUAL lever in MANUAL.
Press down and rotate the control wheel until the indicator is in full INCR (forward) position.
Release pressure on the control wheel.
— Pneu X-Feed Valves ..... CLOSED
This restores pressurization in case air supply is lost through a ruptured cross feed duct in the unpressurized tail area.
— Inform ATC
— Check MOCA
The relevant MOCA is published on the company flight plan form.
Make the necessary corrections for non standard temperature (OAT) and pressure (QNH).
Inform the pilot.
— Radio Rack Switch ..... FAN
In this position, airflow through the venturi is restricted.
— No Smoking/Seat Belts ..... ON
The No Smoking sign should be kept ON until oxygen is depleted.
— Oxygen Manual Control Lever MANUAL ON
— Oxygen Manual Door Release Knob ROTATE/HOLD 5 sec if CABIN ALT above 13000 ft
Rotating the spring loaded knob clockwise will result in an oxygen pressure surge for mask presentation (back-up of automatic system).
— Inform Cabin Crew and Passengers via PAS.
As soon as cabin altitude is at/or below 13000 ft, instruct crew and passengers to remove their oxygen masks.
In case flight is continued with a cabin altitude above 13000 ft (MOCA or other reason), remove oxygen mask temporarily and instruct crew and passengers to keep their oxygen masks ON until further instructions are given.
Active flight crew members must use supplementary oxygen when the cabin altitude is above 13000 ft. Also check BOM 3.3.5.

NOTE: If the CABIN PRESS light comes ON during climb-out after take-off, level off and evaluate the situation.
Try to reduce cabin altitude to a normal and acceptable value; if unable to do so, consider to return.

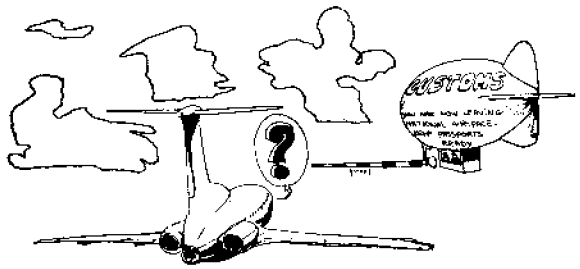
Caution

If structural damage is thought to exist, adapt the procedure accordingly and avoid:
— Abrupt control inputs.
— Use of speed brakes.
— Excessive speed increase.

The J.Y. Prog.

Every weekday lunchtime, BBC Radio 2 broadcasts the "Jimmy Young Show" to an audience of millions. A feature of the programme is studio discussions with different people on a variety of topical, and frequently controversial, subjects. Listeners reactions, which may be telephoned in, are also transmitted.
On 18th April, a Conservative Member of Parliament, Mr Norman Tebbit, appeared on the programme to talk about aviation safety. Amongst other things, he suggested that pilots' organisations should bring pressure on governments to improve ATC services, and that European ATC could be better arranged under the guidance of a multinational authority.
Only brief mention was made of Eurocontrol, the impression being given that it serves only a minor administrative function. The seriousness of the problems faced by the organisation prompted EGATS to issue a statement to the "Jimmy Young Show", and this was broadcast the day following Mr. Tebbit's interview.
"Norman Tebbit yesterday called on Pilots' Associations to lobby their governments to improve European Air Traffic safety standards. He recommended an international organisation allied to the EEC to standardise equipment and procedures.
The Eurocontrol Guild of Air Traffic Services would like to point out that such an organisation, "Eurocontrol", has already been in exis-

tence for 14 years, having been formed by Britain, France, Germany, Eire, Belgium, Holland and Luxembourg in 1963. Its basic objectives were to rationalise and improve the Area control above 20,000 ft. through international cooperation of its member states.
Contrary to Norman Tebbits theory that international technical progress must move at the rate of the slowest nation, Eurocontrol has built two of the most advanced Air Traffic Control centres in the world. Maastricht UAC has centralised civil and military control over Belgium, Luxembourg and northern Germany, and hopefully will also incorporate the Dutch airspace, although this, like Eurocontrol, is facing national opposition.



Pilots' associations and airlines have indicated their full support for the continued development of Eurocontrol. The organisation is, however, threatened by the nationalistic attitudes of some of its own member states.
The professional standards of the Air Traffic Controllers within the Eurocontrol states are extremely high. They may, however, be denied the benefits which can be, and already have been, gained through the efforts of Eurocontrol. It is the Guild's opinion that nationalism will work against the continued improvement of safety standards. It must be overcome; for example, by disregarding national boundaries and reshaping the European airways system, the safety factor can be improved, and delays minimised for the travelling public".

What was that callsign again?

Kenya Airways KQ

With the collapse of East African Airways (a three nation venture involving Kenya, Tanzania and Uganda) the Kenyan government formed Kenya Airways in January 1977. As the VC15s of East African were repossessed by BAC, Kenya Airways leased two B707s from British Midland Airways. However, the airline hopes to have the VC15s back soon.

Surinam Airways PY

Though the history of SLM dates back to the early 50s, the airline's first scheduled intercontinental service, Paramaribo - Amsterdam, was introduced with a leased KLM DC8 when the Surinam government designated SLM as the National carrier, and this being after Surinam's independence in November 1975.

Transair DK & TB

On April 1st, aircraft wearing the callsign DK started calling themselves "Scanair" instead of "Sunjet", and an apparently new sallsign, "Transwed" (TB) also appeared. More sceptical controllers, noting the date, suspected an elaborate practical joke. Continued use of these callsigns proved them wrong.
For the reasons behind the change, Transair were contacted; Captain Rolf Johnsson of Transair's Flight Operations Department provided this explanation:

"Transair Sweden AB (TSA) is a rather old charter company. It was founded in Stockholm in 1951, and for its first two years the activities consisted of carrying newspapers from Stockholm to southern Sweden. However, shortly after the foundation, the company started flying tourists to the Mediterranean tourist resorts. First with Douglas DC3s, then later on with Curtiss C46s which were followed by Douglas DC6s and DC7s.
In November 1967, TSA took delivery of its first Boeing 727-100. Up to then the company had been operating under callsign TB- "TRANSWED" When turning to a pure jet-airline in 1968, it was decided to change callsign to "SUNJET".
In October 1968, TSA started a close co-operation with Scanair, and the callsign "SUNJET" from that time was used for all SCANAIR flights.
In 1976, the Scandinavian CAA's decided that all charter flights should be flown under callsigns clearly indicating the operator. As the callsign "SUNJET" was the covering name for all SCANAIR flights operated by SAS, TSA or Linjeflyg it was no longer useable. So it was decided that from 1st of April 1977, all flights operated by TSA should be flown under its old callsign TB-"TRANSWED". The relationship to Scanair has not been changed.
Scanair is a sister-company to SAS owned by the three Scandinavian National Airlines (DDL for Norway, DNL for Denmark and ABA for Sweden). TSA is a daughter-company fully owned by SAS. TSA does not hold any own sales-organisation, all its capacity is sold by Scanair.
So when you hear a TRANSWED aircraft, it is a Scanair production operated by a TSA B-727 with the same old nice guys in the cockpit".

Time out

It's all rather confusing, really. It was acceptable when, during the winter, Great Britain, as usual, was out of step with the rest of Mainland Europe. Then, for two weeks this year, GB actually came into line with everyone else. But now, in true EEC tradition, there is a division between the nations. France decided to go its own way last year, and is persuing the same policy in 1977, this time joined by the Benelux states, although they call it something different. Many people are not particularly concerned, or even aware of any problem, but for ATC and aircrew, difficulties do arise.

It may not yet be clear to those of you without wristwatches showing the hours, minutes, seconds, date, day, month and year - a computer analyst's nightmare - that I am referring to the time. At the beginning of April, Europe found itself plunged into GMT, CET, French Energy Saving Time, Benelux Energy Saving Time and good old BST, which used to be called British Summer Time (BST) but now rejoices in the name of BST (British Standard Time).

For those who exchange (non-ICAO) pleasantries on the Maastricht r/t, all Hell breaks loose around lunchtime. As the east/west transit time over Belgium is only about 25 minutes, traffic leaves morning for afternoon at the Brussels UIR Boundary where it remains with Maastricht UAC, only to return to morning on transfer to the adjacent centre. This can lead to serious chronological disorientation for those involved. For aircraft flying via France/Belgium/Netherlands there is now no trouble, but there are further complications for flights on UR15 between Belgium and Germany. From noon to 1p.m. in Maastricht it is still a.m. in Germany. Should there not be some official guidelines laid down for the Hannover sectors? Must the Ruhr controller say "good afternoon" because he is sitting in Holland, or ought it to be "good morning" which is appropriate to the area he is controlling? Or should we standardise by saying "good day" or even "good Greenwich morning" etc.?

As with any situation, there are advantages and disadvantages. Our colleagues who live over the border in Germany are unfortunate in that they must get up an hour before anyone else. On the other hand, they do have the consolation of arriving home about half an hour before they left Maastricht.

The whole problem was summarised at the beginning of summer in an air/ground exchange over the Amsterdam area:

EHAM: "PHDTT, unknown traffic at 2 o'clock, range ten".

PTT: "Is that 2 o'clock local or GMT?"

MJL

Belgium's flying rescue service

Throughout Belgium they are known as the "Saving Angels". In airforce jargon they are called simply "the Heli-Flight". "They' are 40th Squadron. based at Koksijde, operating SAR helicopters.

The unit was set up in 1961 as a flight, with three Sikorsky HSS-1 machines. Its primary task was that of locating (aided by C-130s) and recovering military aircrew involved in accidents over Belgium itself, and particularly over Belgian territorial waters. Five Sikorsky S-58 short range transports were later added as the flight expanded to a full squadron. It has recently been re-equipped with the more versatile Westland Sea-King, crew conversion training having taken place at RNAS Culdrose, Cornwall.

Within the international search and rescue organisation the Belgian Air Force is responsible in the event of air and sea accidents over Belgium, Luxembourg and the North Sea as far as 2° East. Headquarters, the Rescue Coordination Centre, is sited at Brussels National Airport. Direct lines connect it to all stations which might receive emergency messages, namely, civil and military air traffic control units. The RCC has two subordinate units, rescue sub-centres, at Luxembourg Airport and that at Koksijde airbase. International contact is maintained to provide or receive assistance when required.

Over land the task is relatively easy due to high population density. However, over the North Sea

this is not the case, and this is when the RCC can call upon the special SAR helicopters from Koksijde. Also on a 24hr basis, a duty ship is maintained in a state of readiness; three shallow-water minesweepers are used here.
Outside its basic rôle, 40th Sqn. performs a variety of peacetime functions which has earned it an international reputation. Over water, it has been involved in the evacuation of sick personnel from ships, transporting holidaymakers involved in boating accidents to safety and searching for others missing at sea, and even locating and following oil slicks. It has been no less active over land, carrying out errands of mercy such as the transport of vital organs (e.g. kidneys) to where they are urgently needed, or the transfer of patients between hospitals-certain of the helicopters were fitted out as VIP transports for this purpose. The aircraft are also used as a means of logistic transport on foreign soil, and for parachuting. The squadron has assisted at road accidents, although this task is now being taken over more by police helicopters, and has a proud record of service in all sorts of disasters.

There are no specially designated helicopter pilots in the Belgian Air Force. Those who fly them are pilots who have completed the cycle from Marchetti to Starfighter or Mirage, and have then undergone two years further flying training on helicopters. The fighter pilot who is chosen to re-enforce the Heli-Flight receives six months basic training and theoretical instruction before acting as second pilot on operational missions for a year. After a further six month period of operational training, he qualifies as first pilot.

On station, if there are no operational missions to be flown, the pilot spends the day still training, particulary in the use of the cargo sling. This entails picking up and settling down loads within a small area. It goes without saying that a high level of skill and dexterity is required. In performing these tasks, the pilot is aided by a crew-member who leans out of the helicopter to follow the manoevre and passes instructions back to the cockpit.
Meanwhile, a standby crew is waiting, yet hoping not to be needed, for any call for assistance. It takes fifteen minutes of preparation to be able to render help wherever required.
Attached to 40th Sqn. is a team of divers, one of whom is on board each helicopter during each mission. He is in charge of the actual rescue, and is responsible for the wide range of equipment carried on board to meet any eventuality - carry basket, blankets, diving equipment, special rubber clothing for cold-water (-12° C) conditions, first-aid box, dinghies, and survival pack containing oxygen bottles, vitamins, fishing hooks, fluorescent and anti-shark powder, fresh water, etc. A, technician helps in the rescue operation by coordinating between diver and pilot.
Fitness is a basic necessity. Descending a rescue rope and attaching it to sometimes unwilling persons at sea requires a lot of physical effort. For this reason, the divers must be in excellent condition, and most rescuers are enthusiastic and accomplished sportsmen.
One old hand was asked what he considered had been his most difficult job;
'A call came in from the lightship 'Westhinder' for us to remove the cook who had broken his leg. There was a force 8 gale blowing at the time. Eventually the helicopter managed to get into position above the ship, as stationary as possible - every small movement causes the man on the rope to swing. I began the descent and was lashed against the side of the ship, but finally reached the deck, only to discover that the cook weighed about 100 kilos. I protected him from bumps with my body while winching up, and at last we got him on board and back land".
The professionalism of the "Saving Angels" has saved many potential victims, and the reputation of 40th Squadron is well earned.

Internal affairs

Familiarisation Flights

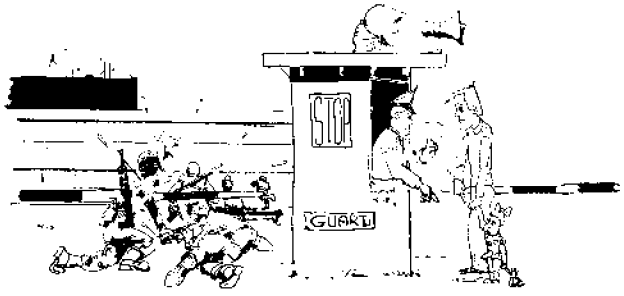
Once again, control personnel have had to bear the brunt of adverse political decisions regarding Eurocontrol. The enforced budgetary cutbacks have led to a 50% reduction in the annual air-experience flight allocation. As it was, controllers were lucky to get one flight every two years. ATS assistants, who perform a vital but thankless enough task, have never been entitled to such flights, and their prospects of getting them are hardly improved by these latest measures. Despite their efforts, Maastricht management seem powerless to influence events.
Through the auspices of EGATS Travel, it is possible, by personal arangement, to make free cockpit flights with certain helpful airlines. The journey to the appropriate airport must, however, be made at the applicant's own expense, and in his own time, with no official aid whatever.

The attitude of IFACTA towards flight experience for Air Traffic Controllers is quite specific;
"The Federation recommends to all authorities responsible for operation of Air Traffic Services:
a) To provide for familiarisation flights in the cockpits of aircraft for Air Traffic Controllers, with combined facilities to visit adjacent and distant Air Traffic Control Units.
b) (1) To encourage Air Traffic Controllers with flying experience to maintain their proficiency

by offering special facilities, and
(2) to encourage Air Traffic Controllers **without** flying experience to gain such experience by providing facilities for pilot training to the level of the Private Pilot Licence, and
c) To exploit the use of link-trainers for the familiarisation of Air Traffic Controllers with specific in-flight problems.
Note:
Familiarisation flights (also known as „Duty Flights" or route experience flights" are granted by national air carriers on government request in accordance wit IATA Traffic Resolution No. 200g. It is strongly recommended that at least two such flights annually be granted to individual Air Traffic Controllers, and that one of these flights be a long-distance one (Paris 1962)"
Most of these recommendations are unilaterally respected on a national basis within the Member States of Eurocontrol. Why, then, should controllers representing their own countries in a multinational environment, be fobbed off with inferior opportunities to update their professional awareness? There can be no excuse, whatever political squabbles may be in progress, for depriving controllers of the chance to improve their professional knowledge.

Security.

An Area Control Centre is potentially a prime choice as a target for a terrorist attack. The total disruption that would be caused by knocking out such an installation is immeasurable. Perhaps, therefore, the public obscurity which is enjoyed by most ACCs is the best form of protection. In Maastricht's case, the security measures taken ensure the complete safety of its personnel. Controllers coming in for night duties know only too well the difficulties of beating the code system for gaining entry via the front door.
For our further protection there is the well-illuminated perimeter fence, 3% of which is visible to the guardroom. Those who play football (badly) may have climed over the fence to get the ball back, but terrorists are famous for their fear of heights. Provided that would-be saboteurs are able to read the Verboden Toegang (Entry Prohibited) notice on the slip road, which does seem to escape the attention of most Sunday drivers, and have forgotten their wire-cutters/shovels/bazookas/glass-cutters/identity cards/wellington boots, we are perfectly safe.
One alert guard recently stopped a controller after he had driven into the Centre grounds to use the petrol pump. The miscreant was informed that he had endangered us all by daring to smuggle his three year old daughter past the main gate in the back of his car. She was, of course, trespassing. No prior approval had been made via the appropriate channels, and the relevent official document to render her harmless had not been issued. Any further serious breach of security regulations would be reported!
The exemplary vigilance displayed in ensuring the complete exclusion of controllers' wives and family from Maastricht's grounds, thereby elliminating the terrible threat they pose, means that we can all sleep easily, if not comfortably, at nights.
Hopefully, no terrorist will have the intelligence to disguise himself as a cleaner . . .



Eurocontrol guild of air traffic services

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Welcome to:

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E. v/d Heuvel, J. Haine

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D. Weiss, M. Biester, C. Holland, W. Rotter, H. Horn, C. Löllmann, P. Kruse, L. Heinz, B. Ulmitz, H. Peter.