sita communications

112 AVENUE CHARLES DE GAULLE - 92522 NEUILLY SUR SEINE (FRANCE)

VOL. 1 - Nº 3 MARCH 1976

Editorial

While going to press with this third issue of "sita communications", we can report on quite a number of positive remarks concerning both the very existence of this publication and its contents. Responses came not only from many airline representatives, but also from our own personnel, in the house and abroad, which shows that we may have picked the proper mixture of items to be of interest to people working in different fields.

This is good news. But it does not mean that we can start to relax. On the contrary, knowing now that there is a community of readers who are looking forward to the next issue, one has to increase the effort, and to follow as much as possible the various suggestions as to subjects to be treated.

One of the letters received proposed a number of projects which are either under way or which are envisaged, and we certainly intend to dedicate some space to all of them, but naturally, not to all of them at the same time.

Mention should also be made of a comment from George Humphreys, Director of International Communications of TWA, and member of the SITA Board of Directors, who wrote the following:

"I suggest that you never let the issue get over 4 pages long. Otherwise it could be relegated to the "read later" pile, which seldom gets read, and its potential benefit would be lost."

The editor, from the point of view of his work load, is delighted to agree.

In this issue, the reader will find a topographical sketch showing the North American continent and the coverage of SITA services in this area. The large number of cities served by SITA New York came as a surprise to the editor himself, and certainly should be of interest to others.

On page 4, we try to tackle a rather complex non-technical issue - the cost sharing scheme. For more than two years, an ad hoc working group, formed of members of the Financial and Technical Committees of SITA, have been studying the implementation of a new cost sharing scheme for type B traffic. In order to understand this new procedure (which at present is being tested out and will require quite a number of adjustments), we thought it would be helpful to elaborate a little on the existing method of cost sharing which has been in use for many years.

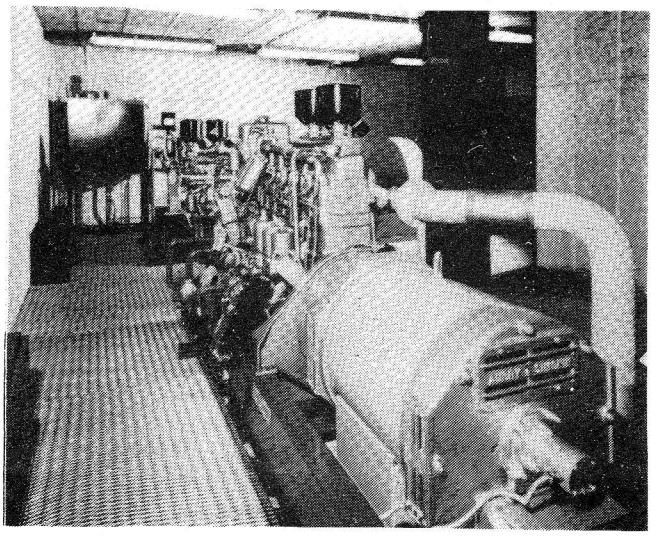
D.K.

Problem areas

Reliability of switching centres

One of the key words in the operation of a telecommunications network is "reliability". It is obvious that any kind of business which depends to a large extent on the remote exchange of information (e.g. air transportation) requires telecommunications facilities which are more reliable than any other component of the business system. Anything may fail - and, as a matter of statistics, does - throughout the large family of man and machine which performs the operations of an air carrier, but telecommunications should not, simply because it serves as a means of control in a given situation: routine or emergency.

Reliability should thus be printed in capital letters, and should not be confused with "availability", as it often is. For a given application, a system which needs to be available only during office hours may nevertheless be required to be 100% reliable although by definition it is not "available" or "accessible" throughout the whole 24 hours. The SITA telecommunications network,



Stand-by power unit in the SITA Paris centre

which covers practically all regions of the world, must be available round the clock, and should be as reliable as possible at any given point in time. The problem lies in the fact that someone has to determine what "as reliable as possible" means. The Network Security Working Group attempted to make such an estimate, and came up with a recommendation that the total monthly down time of a given High Level Switching Centre (HLC) within the SITA network should not exceed one hour or 0.14%.

This figure was based more on empirical considerations than on systems theory. Nor did it define the probability of more than one switching centre being out at the same time. It nevertheless serves as an indication of the behaviour which the network should show.

This being said, one can understand that the designers of the SITA High Level Network made all attempts to protect the switching computers in the High Level Centres against failure by doubling all essential units, and by backing them up with self-supporting power supplies.

Within the framework of these precautions, a High Level Switching Centre should not fail. But unfortunately, it does. Considering the fact that such a centre may connect more than five or six hundred airline offices, both local and remote, one can understand the damage and confusion that result from an outage.

Today, let us concentrate on the problem of electrical power. An HLC of the present size requires about 400 kVA, which is taken from the public power distribution network. Normally, these networks are very reliable, but they can fail under certain circumstances, if only for very short periods of time, or even for longer periods (if one thinks of strikes or of the famous "black-out" in 1965 of the eastern region of the United States).

Computer facilities which are supposed to work on a permanent basis are therefore equipped with back-up power units, which are designed to take over as quickly as possible in case of breakdown of the public utility. However, since these power units are driven by diesel engines, which need about 10 seconds to become fully operational, one needs something in between to bridge the power gap.

Up till now, this has been effected by use of a fly wheel, that is, a heavy rotating mass sitting on the same shaft as the motor/generator, which, by its inertia, keeps rotating the generator long enough and fast enough to bring the diesel up, and to engage the diesel through a clutch so that it takes over the whole unit.

There are other and more modern methods to bridge the energy gap between the failure of the power network and the time the diesel engine requires to take over, which we will not mention here. Instead, we would like to use a recent event to show that such a power back-up system can also fail. This happened in a given country when there was an electricity strike in which the power was not simply cut, but was turned off and on at rather awkward intervals, so that the diesel engine in the SITA HLC of this country had to be fired several times, until, finally, it went on strike as well. In such a case, the power has to be switched off from the computer, and the whole HLC ceases to operate.

It is difficult to say what the consequences of such a failure might be, since they vary with the size and loading of a centre, and, of course, depend also on the point in time at which the outage occurs. Nevertheless, whatever the consequences, continuous efforts need to be made to avoid these kinds of disturbance. In our example, one could obviously ask the question whether a responsible person would not keep a centre running on diesel power permanently, after the second or third interruption of the public utility during the same day. This example demonstrates clearly that back-up facilities, or stand-by units, however perfectly they may be designed, can produce their real value only if they are used intelligently, which in turn points out that the reliability of systems such as tele-communications centres must include the human factor. It is only during the last few years that people have begun to recognise the role of the human being in an auto-matised environment, although they are still far from being able to define it. Within SITA, much attention is paid to this educational problem, and we shall return to it at a later date.

Projects and development

Agent set connections

The table below shows the number of reservation terminals connected to the satellite processors of the SITA network, and the airlines which use them. The large number of users force us to apply two-letter airline indicators instead of printing the names in full. The total number of terminals

SP	AIRLINE	
AMS	BA BR JL OK QF SA	30
ATH	BA KL LH LZ OK QF SA	33
BCN	BA LH	12
BER	BA LO JL SR	101
BKK	SQ	20
BRU	BA BR EI MA SA	22
CPH	BA JL KL LL MA QF	19
DUS	BA JL QF SA TP	46
FRA	AI BA JL LL LZ MA OK QF RG SA TP UT	47
GVA	AI BA QF RK	18
HKG	KL SQ VG	39
JNB	BA KL SA SN SR UT	45
LON	BA JL LL LZ MA OK RG SA SQ TP	103
MAD	BA LH LZ MA RG SA SR TP VA	61
MIL	BA BR JL	34
MUC	BA OK UT	41
NCE	BA MS SR UT	69
NYC	LO OK SA SR TP VA VG	60
PAR	AI BA BR JL LL LZ OK QF RG SA SR TP	99
PMI	SR	2
ROM	AI BA JL LZ MA OK QF RG RK SA	49
SIN	KL OK SQ	4
STO	BA KL MA QF	17
SYD	KL SQ	30
TLV	AF KL SR	34
THR	IR KL SR	26
TYO	SQ VG	28
VIE	BA LZ MA QF	67
ZRH	BA LZ MZ OK QF SA	24

(1180) will be reached at the beginning of April this year according to implementation planning.

The reader might remember that SITA had connected some 800 agent sets by the end of 1975, which means that during the first three months of this year, more than 300 new terminals became operational as a result of much improved network performance and a growing demand by the users.

This development - as positive as it is - has its consequences for the network. Some of the satellite processors, such as the one in Berlin (which connects not only terminals in its own environment, but also the group of sets in Warsaw belonging to LOT), serve more than 100 units already, and in cases where the High Level Switching Centre is linked to a number of highly loaded satellite processors, it has to handle a huge amount of type A traffic, which may become equivalent to the volume of type B messages.

As far as further development is concerned, the demand for new connections seems to be growing sharply, so that, sooner or later, an extension in the capacity of some of the High Level Switching Centres will be required. We have already reported on the replacement of the present Frankfurt installation, which will become operational early next year and which will thus help to unload some of the other switching centres. Discussions for the extension of Amsterdam and the replacement of the London installation are under way. Also, plans are being developed to increase the capacity of the switching centres in Rome and Madrid.

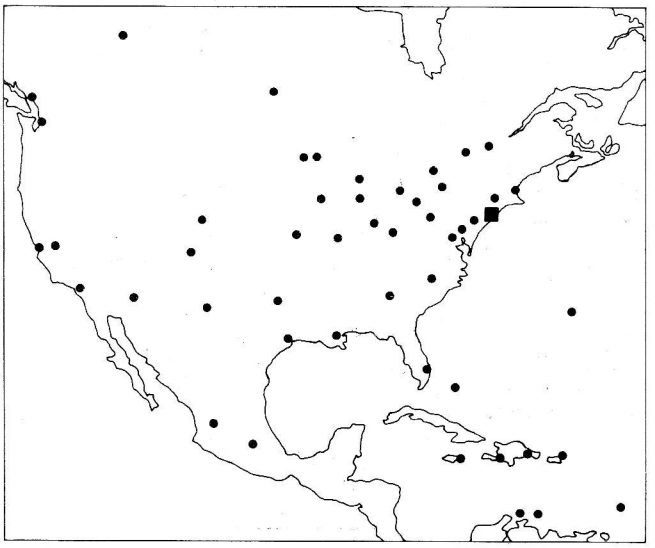
Throughout the organisation

The SITA network in North America & the Caribbean

SITA network charts, as published in regularly updated form by the Operations Department, do not give details of local delivery connections. For reasons of simplicity they show only the shared facilities, such as switching points and their interconnections, which carry the traffic of more than one member airline. While this is perfectly adequate to give an accurate picture of the shared network, it might be misleading in the case of the North American continent and the Caribbean, where one finds only the New York centre and a few connections to locations in the northern part of South America.

Although space does not permit us to present the true network configuration throughout North America, or even to print the names of the locations served via New York, our sketch shows, nevertheless, the coverage for this area, which is realised by a comprehensive system of "party lines" or multi drop circuits.

The various connections to South American cities apart, SITA New York serves teleprinters in more than 650 airline offices in 67 locations. There are 200 offices in New York city and airports, 310 offices in 40 cities throughout the United States, 64 offices in 5 cities throughout Canada, 9 offices in 3 cities in Mexico, 40 offices on 10 islands throughout the Caribbean, and 28 offices on 9 islands in the Pacific Ocean.

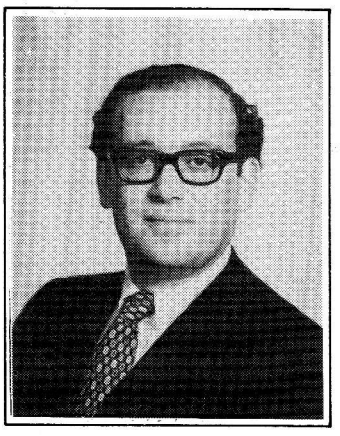


However, the serving of these connections is only one of a number of services undertaken by this centre. SITA New York also serves as a gateway to the network of Aeronautical Radio Incorporated (ARINC) through a bundle of teleprinter circuits connecting the ARINC centre in Cedar Rapids. This inter-network connection is used by more than 150 SITA members. In addition, the New York centre has connections with the Pan American centre in Cedar Rapids, and the TWA centre in Kansas City.

To complete the picture, SITA New York is connected to the reservations processor of Japan Air Lines, and also serves some 60 agent sets belonging to 8 different airlines operating locally. The centre itself is located in Bohemia, Long Island, since 1971, and is equipped with a double configuration of UNIVAC 418 III and two single Raytheon satellite processors. High level links exist with Hong Kong, London, Madrid and Paris.

General managers delegate in New York

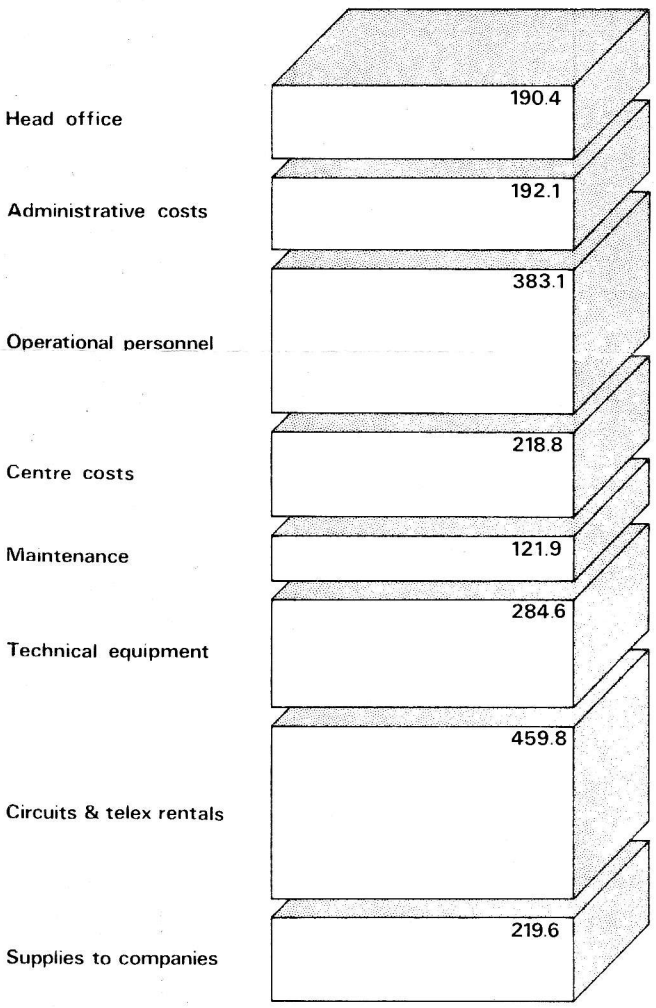
The Administrative Office for New York is located at 500, Fifth Avenue, where one finds Solly Dwek as the General Manager's Delegate, a position he has held since early 1970. Solly Dwek joined SITA in 1960 after having finished his studies in international law with certificates from law schools in Paris and London. During the ten years before being appointed to his present post, he took care of the rather complex field of "contracts and negotiations". Since January, 1975, he has also been responsible for the GABRIEL reservations system.



The monthly topic

Sharing the costs of SITA

Since the founding of SITA in 1949, the total costs of operation have been shared by the users, based on their degree of participation in the various facilities. In the beginning, this was a rather easy task, since the network consisted only of telegraph circuits and teleprinters and other telegraph equipment, and the volume of messages exchanged was comparitively low. As the years passed, more sophisticated switching equipment had to be installed in order to handle the growing traffic volumes, and the redistribution of total costs became more and more difficult. However, the basic idea, that a message should pick up percentages of costs of the facilities it uses in travelling through the network, was maintained, although a number of adjustments were added.



Overall costs (Classified by functions and expressed in millions of Belgian Francs)

For purposes of illustration, the diagram shows the total cost of the SITA operation during 1975 as it is presented by the Finance Department. This cost is 2 070.3 million Belgian Francs, as, being registered in Brussels, SITA usually presents its costs in this currency, although bills are paid in local currency, or, to a large extent, in US Dollars.

The redistribution of costs, as applied up till now, has two disadvantages. Firstly, the cost of a message depends on its "routing", that is, the path it takes from origin to destination through tne network. If for any reason, the routing is changed (for example, in case of a circuit outage), it is not desirable to have the message cost changed. Secondly, the determination of cost per message is only possible after a given period, which does not permit the evaluation of prospective telecommunications costs for the network user.

When SITA established facilities for the transmission of type A traffic, a new cost distribution scheme was introduced, and the Board of Directors proposed studying the possibility of having a similar scheme adopted for type B messages, which would eliminate the two above-mentioned shortcomings. An ad hoc working group was formed, consisting of members of the Technical and Finance Committees, which started to look into the various facets of the matter, and it soon became clear that only a very cautious analysis of traffic data could provide a basis for implementing a new cost sharing scheme.

One of the basic difficulties in developing such a scheme lies in the fact that there are more than 190 users of the network who connect some 10 000 teleprinters. Basically, any originator can send a message to any destination, and the resulting large variety of parameters would jeopardise the distribution scheme if one were to take them into consideration. For type A traffic, the agent sets of a given airline, wherever located, will always call one destination, namely the central reservation system. Therefore, it was relatively easy to implement a cost distribution scheme for type A traffic, based on a monthly connection fee per terminal, and a percentage of transmission costs. To apply a similar system for type B will require, as was said before, a simplification of the various parameters (for example, ignoring completely the variations of origin and destination), and this necessary simplification may penalise certain users in certain areas.

At present, SITA is running a computer program with the traffic data of the last quarter of 1975, and the results will then be compared, per airline and per region, with the existing cost distribution scheme in order to evaluate any discrepancies. It is estimated that the necessary adjustments will take some more months of intensive work and that any new cost participation scheme could not be introduced before the beginning of 1977.

sita communications is published monthly by the Company Secretary, edited by D. Kroneberg. Member Airline Companies will receive one copy only, and are kindly invited to reproduce their own copies for internal distribution.
Printed in France by SITA.

sita communications

112 AVENUE CHARLES DE GAULLE - 92522 NEUILLY SUR SEINE (FRANCE)

VOL. 1 - Nº 4

APRIL 1976

Editorial

In the "old days" (i.e. not even thirty years ago) when computers were conceived and built, not by manufacturers but by mathematicians and electronic engineers at universities, people used, amongst other devices, mercury delay lines for storage purposes. The fact that a given sequence of pulses travels at a lower speed in mercury than it does in the other kinds of circuitry in a computer, means that there is a delay which indeed can serve as temporary storage. This shows that there is no basic difference between the two terms "delay" and "storage", although there is, of course, a difference in the use of the two, if one defines delay as something unavoidable, and storage as something intentional.

A pioneer of these early days of computer history, who, as a matter of fact, is one of the inventors of the magnetic drum, tells the story of how he came to make this invention. It happened during a discussion with the mercury delay line people when he asked how they would provide for long term storage in their computer. "In this case", they replied, "we make a printout of the data on paper, put it in an envelope, address it to ourselves, and drop it in a letter-box." This statement not only made him smile, but also started him thinking, and when he arrived home he began to glue magnetic tape on a cylinder, thus realising the idea of the drum.

This story is related here to shed some light on the technique employed by the SITA network which we used to call "store and forward" switching. If a message is received in a manually operated centre at a rate of approximately 6 characters per second (which equals 50 Baud), it takes about half a minute until the whole message is punched on paper tape, and only then can the operator tear the tape, read the address, put it in the transmitter to the related outgoing direction (if this is free) and retransmission can start. Thus "relay" means "delay", and great efforts were made to keep the number of relay centres a given message had to pass to a minimum, although, at the same time, the benefits of these efforts were somewhat offset by costs of circuits.

In the automatic part of the SITA network, the above technique is no longer applied. The majority of messages appear in the form of single "blocks" which are relayed through our switching computers in such a short time that one could practically ignore the delays involved.

This leads to the situation of today where some people consider the transmission time of messages of only a few seconds between, say, Bangkok and Paris, as being much too fast. They would wholeheartedly accept a transmission time which is several orders of magnitude longer if this could in turn reduce transmission costs.

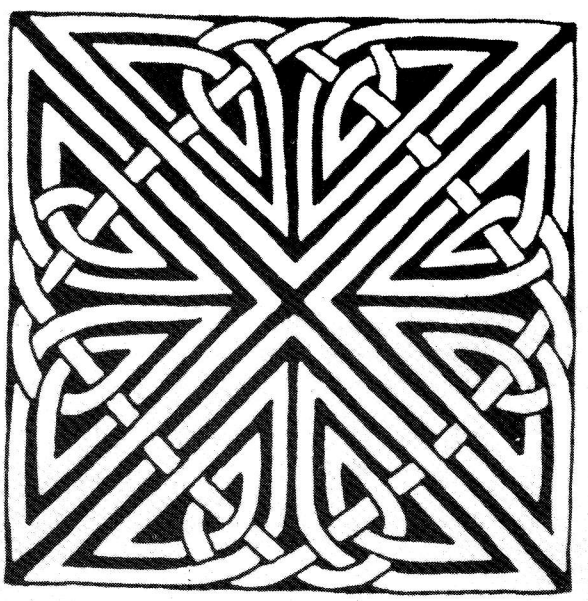
Unfortunately, this is not possible because one would have to build, in the transmission path, artificial delays, which mean storage, and this means additional money. Thus, modern times, at least in our field, have created the paradox that high speed service, even if not wanted, is cheaper than low speed service.

D.K.

Problem areas

What about NERA

About 15 months ago the SITA Operations Department, being forced to keep a closer watch on the various deficiencies throughout the automatic network, established a new data collection system which presented, on a monthly basis, the behaviour of the network and its components. This reporting system was called NERA, which stands for "Network Efficiency and Route Availability", and which tries to list all outages observed within the network, and its components, by giving their durations and, as much as possible, the factors which caused them.



Celtic "Knotwork" (about 6th century) - patterns very close to modern networks

Naturally, such an undertaking produces lots of statistical data printed on endless lists and thus is not a piece of literature one would want to read before going to bed. On the other hand, the NERA reports, which have improved significantly since they were first published, serve very well in describing the network behaviour and the real error sources observed. The reports were systematically forwarded and scrutinised by the Technical Committee, and have become a useful tool for the improvement of the SITA services.

One must understand that NERA is not the last word in the development of a network control system. The ideal system would ultimately need to not only collect data and present it a posteriori as a sort of behaviour pattern, but would also have to include a feed-back for action to be taken in order to repair recurring defects. In this ideal case, the telecommunications network should even be able to perform this task in real time, and thus should be a sort of "self-repairing system" - very much in the way the human body is.

Needless to say, there is not a single telecommunications network of the SITA type in existence which could do this job, and although some highly qualified engineers in SITA Head Office are working on possible solutions, we will have to live for quite a while with existing means in order to understand what is going on with our technical equipment, our circuits, and their probable failings.

NERA will thus continue for a time, and has shown over the past months a real improvement in the network as a whole, this improvement being to a large extent the result of the very existence of NERA itself.

To conclude this short expose, an example should illustrate what the figures and the reports can do. When the NERA report covering the month of January 1976 was published, somebody found that the percentage of circuit interruptions caused by modem outages was one order of magnitude higher in the high level network than it was in the network linking the satellite processors. Internal discussions which followed this observations brought to light the fact that during the period under consideration, SITA introduced a new type of modem on some of the circuits of the high level network to prepare for the increase in speed from 4 800 bps to 9 600 bps. The various installation activities with all the testing and possible disturbances involved indeed generated an accumulated circuit down time within this part of the network which was worse than during the preceding month, although it was undertaken for reasons of modernisation and improvement, and despite the fact that the new type of modems show a better performance than the ones used before. This example demonstrates the controversial (or even slightly schizophrenic) effect that comes from attempts to improve something, which usually starts by disturbing a peaceful environment. At the same time, it indicates how people operating the network are sometimes led to hate the engineers who want to make it a better one.

Panel on the preceding page was reproduced from: George Bain, "Celtic Art - The Methods of Construction", published by William Maclellan, 1975

Throughout the organisation

SITA Management

Managers from left to right: R. Bebie (Operations), M. Thwaites (Contracts), J.C. Lacat (Company Secretary), D. Kroneberg (Special Tasks), G.A. Monniot (General Manager), K.S. Molenaar (Deputy General Manager), M. Heins (Supplies and Services), R. Duport (Site Engineering), C. Deroual (Finance), D. Andorka (Data Services Development), J. Glories (Deputy General Manager), L. Baudet (Personnel), B. Audau (Technical)

It was one of those rare occasions when each member of the SITA general management was in town - and a photographer was at hand. This happened on March 18th when SITA management had invited all regional representatives for an information session. Unfortunately, the weather presented a more than cloudy sky (you can't have everything at the same time), but we are glad to publish one of the pictures taken.

The international character of SITA is reflected even at management level: out of thirteen managers, six hold passports from U.S., Switzerland, U.K., Holland and Germany.

First GABRIEL users' meeting

The first meeting of GABRIEL users took place on the 16th, 17th and 18th March in Paris, following the SITA acquisition of the system. Representatives of all twelve current users of the system were present.

The first part of the meeting was devoted to a SITA presentation covering the activities in general, expansion plans of some of the current users, as well as the GABRIEL organisation arrangements within SITA.

This was followed by a general system review, firstly in connection with the integration of GABRIEL into the SITA network, secondly concerning the GABRIEL hardware and operating software, characteristics of the system, current load, expansion capabilities, etc.

This SITA presentation having been completed the users then formed themselves into the GABRIEL Users Group, electing as Chairman Mr. L.R. Fernandes of VARIG. Sub-committees were established, the Procedures Sub-committee being chaired by Mr. J. Paladino (VARIG) and the Communications Sub-committee by Mr. Z. Kozicki (LOT).

The first task of the Users Group, definition of the Terms of Reference, having been accomplished, the meeting continued with a detailed examination of the procedural, functional and technical points brought forward for discussion.

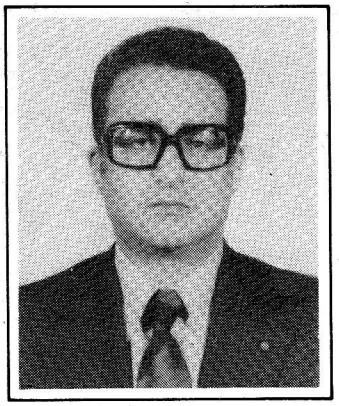
As a conclusion of the successful three-day meeting it can be said that:

- users are satisfied with the functional operation of the GABRIEL system;
- further effort is necessary in order to improve the reliability of the supporting communications network;
- enhancements to existing functions and the addition of new functions will be considered in order to provide improved overall service.

The next GABRIEL Users Group meeting is scheduled to be held in Paris on the 21st September this year.

General managers delegate in Rio de Janeiro

Jóse M. Silva, a former officer in the Portuguese army, and journalist, joined SITA in 1953, and in 1955 became the representative for Portugal. In 1958, he was moved to Rio where he was appointed as representative for the Brazil, La Plata region. Finally, when SITA reorganised the regional management in 1963, he became the General Manager's Delegate for South America.



Budgetary control 1975

The following is an extract from a SITA paper called "Budgetary Control" (January to December 1975), which was distributed to the Financial Committee in March 1976.

The comparison of the 1975 results and forecasts show that the annual budgetary framework was strictly adhered to.

The network operating costs, converted at current rate, are 5.74% below the adopted budget figure (converted at the September 1974 rate); they are 1.6% less with respect to the budget. Basically, this result is due to the difference between the predicted and the actual circuit rental charges. This category of expenses which represents approximately 29% of the network's direct costs was subject to a constant control which has proved its efficiency. Despite careful surveillance, all the other costs, more susceptible to inflation, increased rapdily. However, we were able to keep their level within the limits of the budget.

	Jan to Dec 1975 Compared to Jan to Dec 1974	Jan to Dec 1975 Breakdown P/Area of Total Increase
Europe	+ 3.6	+ 1.95
Eastern Europe	+ 8.3	+ 0.32
Near East	+ 12.5	+ 0.53
Middle East	+ 33.1	+ 1.03
Far East	+ 22.5	+ 2.40
North Africa	+ 6.8	+ 0.18
Africa	+ 7.1	+ 0.42
South America	+ 9.5	+ 0.33
North America	+ 12.2	+ 1.51
Total Network		+ 8.67

Increase expressed in percentage per region for type B traffic during 1975

The analysis of the results, as far as the regions are concerned, reveal that the budget was only exceeded in Africa and South America. Africa has only recently been affected by inflation. The rise in prices, gradual until 1972, accelerated after this date, and grew even worse in 1975. This phenomenon partly explains the increase in the costs of the SITA centres in Africa. In South America, as during the last few years, the budget was exceeded as a result of monetary disturbances.

The volume of traffic handled in 1975 also corresponds to the budgetary estimates. The increase in telegraphic traffic was slightly more rapid than expected. In 1975, 310 000 000 messages were exchanged on the local delivery circuits. The number of telegrams transmitted on the network has increased by 8.7% as shown in the table.

The average direct cost of a telegraph message in 1975 was 5.7% lower than in 1974.

The monthly topic

Relations with PTT's

In the late 40's and early 50's, airlines elected to lease circuits from the PTT Administrations to meet their communications requirements, choosing these in preference to other means outside the PTT Adminstrative sphere, e.g. circuits operated by Civil Aviation Administrations.

The airlines found that networks based on leased circuits were effectively meeting their specific requirements, either on an individual or joint basis (SITA), and hence invested considerably in switching and terminal equipment to make the maximum use of the capacity of such leased circuits and to obtain minimum transit times. (The term "leased circuit network" is used to avoid the term "private network", which is usually used by the Administrations and which gives the impression that such "private networks" are outside PTT control).

Since the creation of SITA, relations with the PTT's and Common Carriers have been more than cordial, and the understanding of each others' problems has grown over the years. Our strict adherence to the regulations stipulated by the Administrations and our policy of supplying the latter with all our traffic information have ensured that their monopoly has not been jeopardised. Moreover, cooperation has been so close that SITA has occasionally supplied equipment, allowing the Administrations in question to not only lease circuits to SITA, but also to open up international circuits for the benefit of the public network.

Over recent years, a tremendous increase in telecommunications requirements was observed and, fortunately, these requirements have run parallel to the creation of new facilities such as coaxial submarine cables and satellite communications.

One would expect that the Administrations might meet such an enormous increase in the utilisation of leased circuits with some relaxation in regulations and tariffs.

However, the contrary has taken place.

Some PTT's, particularly in Europe, are now planning and implementing public data switched networks. A few of these PTT's are of the opinion that message and data traffic transmitted via leased circuit networks should be transferred to these public networks; for, in their view, this would optimize the public networks at tariffs acceptable to all users.

Other administrations go even further, and feel that if circuits are to be leased to certain customers, the administrations ought to be entrusted with the switching of traffic transmitted via such circuits.

Thus, these PTT's are attempting to limit the creation and/or expansion of leased circuit networks by means of restrictive regulations and the application of higher tariffs through the CCITT (International Telegraph and Telephone Consultative Committee) and CEPT (Conférence Européenne des Administrations des Postes et des Télécommunications).

In view of this, we have developed and adopted the following arguments in our approach:

1. Leased circuit networks offer little technical and administrative complexity to the PTT's compared with other services they may offer and operate.

2. It is understood that leasing circuits is for the administrations one of the more attractive services as regards revenue.

3. Public data networks, required to comply with highly diversified user needs, would become very complex and unmanageable.

4. We believe, not that leased circuit networks erode the status of the PTT's, but the contrary in view of the preference of the airlines to leasing circuits from the PTT's instead of using circuits operated by civil aviation administrations.

5. The argument used by the PTT's relating to "creaming off" of traffic from public to leased circuit network is not valid for the following reasons:

   - the availability of leased circuit networks has led airlines to centralise their main functions thus creating a large amount of traffic. Therefore, the major portion of the traffic carried on leased circuits would not exist in the absence of such networks;

   - the revenue derived by the PTT's from leased circuits is substantial and must offset any losses incurred through the transfer of a limited amount of traffic from public to leased circuit network.

6. The PTT's should recognise that the airlines must have the freedom to either select the facilities provided by public networks, or to lease circuits, depending on which would best meet their financial and operational requirements.

7. As well as leasing circuits, airlines will certainly make great use of public data networks to locations between main switching centres and airline offices originating low traffic volumes. It might even be expected that airline traffic via public data switched networks will be considerable. A parallel can be drawn in this respect with the utilisation of leased circuits of the public telex network.

It should be mentioned that a more positive approach to SITA has emerged recently from studies made by the various administrations in the CEPT context. Needless to say, future changes in the PTT tariff policy will be carefully followed and acted on.

sita communications is published monthly by the Company Secretary, edited by D. Kroneberg. Member Airline Companies will receive one copy only, and are kindly invited to reproduce their own copies for internal distribution.
Printed in France by SITA.

sita communications

112 AVENUE CHARLES DE GAULLE - 92522 NEUILLY SUR SEINE (FRANCE)

VOL. 1 - Nº 5

MAY 1976

Editorial

It was certainly more than a gesture of politeness on the part of the Chairman of the Board when he addressed the SITA management on the 7th April. Actually, this event showed to what an extent the Board of Directors feel responsible for the running of the Society, especially during this period of transition before a new General Manager takes up his duties.

The message Norman Stoddart presented to the management in his function as Chairman of the Board covered three main points.

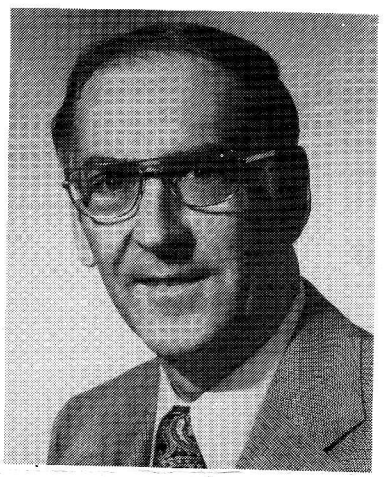
The first of these concerned the choice of the new General Manager of SITA, which was made by the Board of Directors after careful consideration of the various possible candidates.

"An organisation like SITA", said the Chairman, "is so unique and consists of so many facets, that there are only a few individuals who could conduct it - leaving aside the fact that replacing a man like Georges A. Monniot, with his 27 years of experience in this field, is an almost impossible task in any case."

The Board of Directors basically had to consider three alternatives in making its decision: someone from within the company, someone from within the airline community, or someone from the outside world. The final choice, Mr. Stoddart explained, took account of all aspects of the matter, and, in particular, the situation SITA will face during the next few years, a rather demanding period of transition as far as its services are concerned. The Board felt that this period in the company's development would require a General Manager with close connections with the air transportation industry, and it finally selected Mr. Claude Lalanne, at present Deputy General Manager of Air France, who has accepted the position and signed his contract as the new General Manager of SITA.

The second point of Mr. Stoddart's address dealt with the continuity of the SITA organisation. Needless to say, no future General Manager could do the job without the assistance of the present staff - at all levels - and Mr. Lalanne would need the loyalty and the confidence of his colleagues inside the SITA organisation in addition to that already demonstrated by his colleagues on the SITA Board, and to the same extent as that enjoyed by the present General Manager throughout all his years of office.

K.S. Molenaar, Deputy General Manager, replied to the Chairman by stating that the Board of Directors' selection and final choice of a new General Manager were fully appreciated and understood. Furthermore, he felt that he was speaking on behalf of his colleagues when saying that the SITA management would give all possible support to the new General Manager.



Norman L. Stoddart, Director, Telecommunications, Air Canada, and Chairman of the SITA Board of Directors since May, 1975. He has a B.Sc. E.E. degree and after 26 years in airborne telecommunications, he is today responsible for Air Canada's communications data and radio networks.

The third point discussed by the Chairman was that of the future of the Society as such. Speaking for a while more as the Telecommunications Director of a given SITA member airline and less as the present Chairman of the Board, Norman Stoddart emphasised very firmly the growing need of the air transport industry for shared facilities - bearing in mind the severe economic pressures in all parts of the world.

"To my mind", he said, "there exists an enormous challenge in the rapid growth of SITA's services. The problem we are facing here is not one of a declining business, but, instead, of how to master an exploding one."

We felt that the above message from the Chairman of the Board of SITA to its management was sufficiently important to be further communicated to our readers.

D.K.

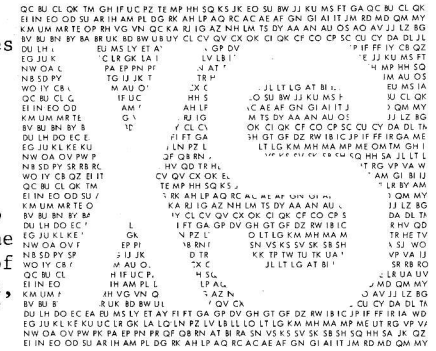
Problem areas

Airlines and alphabets

Amongst all our predecessors, it is the Phoenicians to whom we attribute the establishment of a set of symbols which - when combined to make words - were capable of representing a language in written (stored) form. The two main alphabets based on this ingenious sort of coding - the Greek and the Latin ones - contributed more than any other notation to modern civilisation and are still going strong, but they can

cause problems as we shall see in this article.

The characters of a given alphabet were invented for the composition of words, as mentioned, although ambiguities can arise as far as the meaning of words (or their "semantics") is concerned, which, for example, makes translation from one language to another difficult. But since the general laziness of people has led to the use of characters as abbreviations for words, even more critical difficulties are encountered, especially in the case of those abbreviations used in addressing systems. This is the case which is considered here.



Almost 200 airlines are now SITA members. Those of our readers with good eyes can see that the members' two letter designators are used to form SITA's own one which like those of other non-carriers, starts with an "X"

First, it is not only laziness which leads people to use coded addresses - at least not in telecommunications where each character transmitted costs money. So when people started to abbreviate the names of air carriers, they thought a two letter designator for each airline would do the job, and so far, they seem to have been right. For a limited number of companies the codes in use were even "mnemonic", that is, easy to remember, like AF for Air France, or LH for Lufthansa (provided, in the latter case, one already knows that Lufthansa is the name of a German airline). Other cases are completely arbitrary and require the use of look-up tables.

Nevertheless, as stated already, the system worked well for quite a number of years, and the use of two letter designators spread into services other than telecommunications, appearing on timetables, passenger tickets, baggage tags etc. To change such a coding system would thus obviously be a costly undertaking that no-one really wants to face.

However, it seems that the rapid development of air transportation has led to such an enormous and ever-growing number of carriers that the combination of two characters of the Latin alphabet (which produces some 600 different pairs) will not be eternally sufficient.

Thus, a possible change from two to three letter airline designators has been an item on the agendas of a number of committees for some years, and some people feel that the day will come when the industry will have to move into an enlarged coding system in order to face the demand.

Recently, a task force called "Airline Designator Working Group", which reports to the ATC/IATA Interline Communications Committee as well as to the Joint ATC/IATA Reservations Committee, was reactivated, and met in Washington early in March this year. This group proposed a date sometime around January 1985 as a target date for the conversion from two letter to three letter designators to be completed. For the years to come, measures were suggested, such as cancellation of multiple codes allocated to a single airline as well as the use of identical codes by several airlines in different parts of the world which are operated in restricted areas and do not communicate with each other.

For SITA member airlines there will be no immediate change in the two letter designators used at present, but over the long run SITA will have to follow the resolutions set up by the responsible committees within ICAO and ATC/IATA.

Throughout the organisation

SITA regional management

Some members of SITA Regional management from left to right: K.N. Yousaffi (Karachi), J. Blet (Dakar), J. Sander (Frankfurt), J.M. Silva (Rio de Janeiro), S. Zampetti (Rome), G.A. Monniot (General Manager), H. Gerber (Zurich), B. Leroy (Hong Kong), M. Barbot (Beirut), S. Dwek (New York), J. Boumard (Paris), P. Perrin (ITS, Paris), V. Torres (Madrid)

IBM/SITA users' meeting

A SITA/Airlines meeting took place on Friday, 9th April, grouping those companies with IBM-based reservations systems using the SITA automatic network. All of the ten airlines involved, which are listed hereunder, were represented: British Airways, Aer Lingus, Singapore Airlines, KLM, South African Airways, Transportes Aereos Portugueses, Swissair, Qantas Airways, British Caledonian Airways, and Japan Air Lines.

The object of the meeting was to discuss the experience of the airlines in operating reservations terminals via the SITA network, and in fact the main topics centered around the reliability aspects of the network as it had generally been recognised that the functional improvements effected by SITA over the past few months had resulted in an overall upgrading of the performance.

Discussions on reliability mean talking about hardware, duplication of equipment, creation of redundant configurations, various fall-back possibilities utilising public facilities - all touching upon the basic consideration, which is: increased reliability equals increased costs.

SITA gave detailed outline of the plans under way covering the coming two-year period, which can be summarised as follows:

Duplication of satellite processor sites, which will begin with London, after the first Raytheon RDS 500 in Paris has been thoroughly checked out, and continue with Frankfurt, Johannesburg, Berlin, Hong Kong during 1976, to be followed by Athens, Amsterdam, Cairo, Rome, Madrid, New York and Paris during 1977.

With automatic switchover from the on-line to the standby satellite processor, it is expected that the reliability of these installations will reach the objective set for duplicated systems in the SITA network, that is 99.86%.

Obviously, the already functioning single Raytheon 706/704 systems will be re-used as duplicated installations, the locations for these being selected according to a number of criteria aimed at keeping costs to the minimum.

The airlines represented at the meeting suggested that SITA should improve on the intervention procedures, with enhanced supporting equipment and routines designed to reduce the time taken in locating and repairing faults.

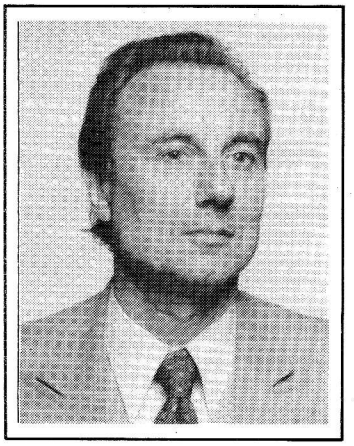
Furthermore, it was emphasised that the airlines need to be informed about the work going on in SITA directed toward improvement and extension of the services being offered and in general kept up-to-date on SITA's planning activities.

In conclusion it can be said that the results of the meeting were constructive for the airlines and for SITA, and it was felt that similar meetings should be organised as and when the need arises for a wide-ranging exchange of views.

It is also proposed that airlines using Univac systems be included in such meetings.

General managers delegate in Hong Kong

Bernard Leroy, who is responsible for the largest geographical region of the SITA network, is to be found in Hong Kong. Before joining SITA in 1956 he served in the Air Force and then in telecommunications for air traffic control, covering Indochina and the South China Sea. He was first stationed in Saigon, and from 1962 onwards in Bangkok. His transfer in 1969 to Hong Kong coincided with the automation of this rapidly growing region of the SITA network. Together with his deputies (Salak Raksanaves in Bangkok, and L. Marias in Bombay), he developed switching centres in Auckland, Bombay, Calcutta, Colombo, Delhi, Kuala Lumpur, Kathmandu, Madras, Rangoon, Seoul, Suva, Sydney and Taipei.



Some highlights from the annual report 1975

The Activity Report from the General Manager for 1975 prepared for the General Assembly lists - amongst other items - the following structural changes effected in the network during 1975.

By the end of 1975, the SITA network consisted of 276 shared circuits (60 of them operated at medium speed) which linked more than 176 switching points. These switching points include 9 high level centres, 32 satellite processors and 2 medium level centres which became operational in Bangkok (July 1975) and Manila (August 1975). 3 satellite processors were taken into service during the period under consideration: Sydney in June, Beirut in July and Teheran in August. Also in 1975, a second satellite processor was added to the on-site installations in New York (March 1975) and London (August 1975). These two additional machines, however, are not for duplication in the sense discussed in the January issue of "sita communications", but were required to enlarge the connection capacity in order to serve an increasing demand for terminal connection.

The use of time division multiplexing (TDM) equipment became more widespread in 1975. Units of this equipment were installed in Bangkok airport (July 1975), Curacao (August 1975), Bogota (October 1975), Bombay (October 1975) and Las Palmas (December 1975).

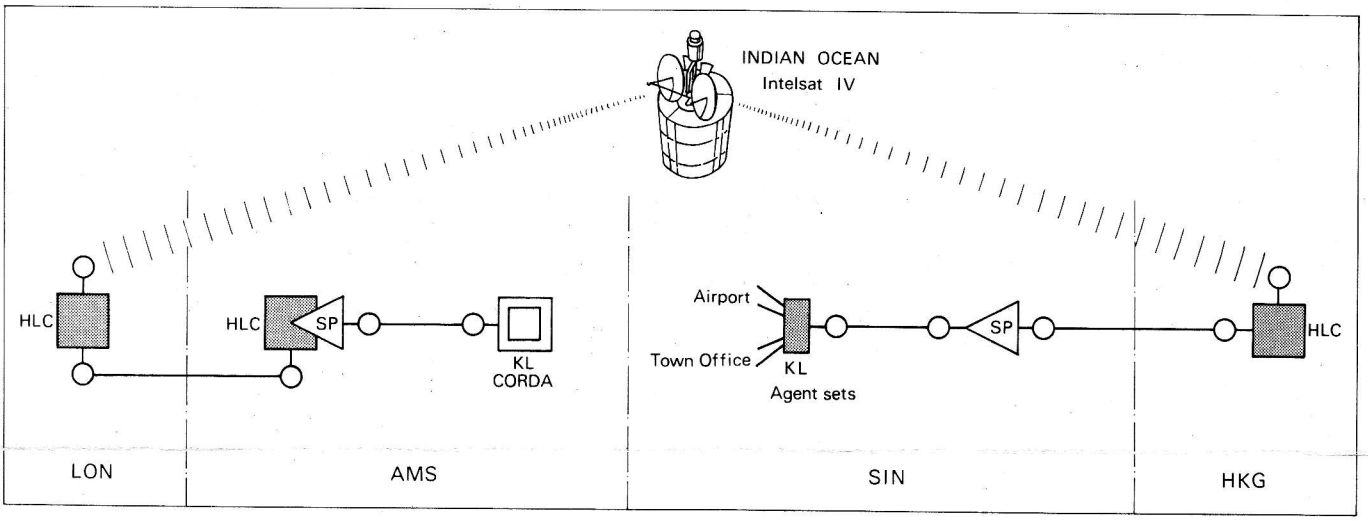
Summarising all teleprinter stations, agent sets and printing devices, the SITA network served, by the end of 1975, a total of almost 10 000 terminals, and connected 14 reservations processors which are used by 23 different airlines.

The monthly topic Transmission means used by SITA

1. Consideration of a given path

Network maps such as the ones produced for the SITA telecommunications network must by definition exclude details, and normally concentrate on the presentation of the configuration of nodes and their point-to-point connections. However, even a "simple" connection such as the link between London and Paris involves not only two different Administrations, but may use quite a number of different cable systems, amplifier stations and other intermediate subsystems which are usually not even known to the user of such a facility but which play their role if one considers overall operations.

In order to further illustrate the complexity of a worldwide facility such as the SITA telecommunications services, let us consider - in this article, the first of a series - in what way and through what means the pieces of information transported over the network travel. For this purpose we have chosen the example of communications between agent sets operated by KLM, located in Singapore, which are to be linked to the "CORDA" reservation system of KLM in Amsterdam.



Transmission path for type A traffic between Singapore and Amsterdam. Modems are marked by circles

Thus, there is a group of agent sets (made by Raytheon) installed in the offices of KLM and which need a connection between Singapore and Amsterdam. The potential traffic to be generated by this little family of sets (four at present) does not justify a direct connection between the two cities and therefore calls for use of the SITA network.

Let us analyse the path the enquiry messages issued by these agent sets in Singapore have to take in order to reach their destination and receive their response from Amsterdam. Each set in the Singapore offices is first connected to a control unit which coordinates the output and feeds the total flow of information through a modem into a local circuit, which is linked to a SITA satellite processor (made by Raytheon) in Singapore. Although this satellite processor is a shared facility and therefore has other things to do, it is programmed in such a way that it serves each of these sets (by "polling", that is, interrogating them at short time intervals) practically all the time, adds some information about the particular agent set's identity and thus forms a block which it transmits to the SITA high level centre connected to it - in this case Hong Kong.

One special feature of the SITA network merits attention here: the addressing procedure for type A traffic. In our example agent sets belonging to the KLM family by definition communicate with one fixed address only, that of their parent reservation processor in Amsterdam. This fact enables SITA to set up the address and thus the necessary routing instructions.

The Hong Kong computer would then forward the enquiry message we are tracing to London since there is not a direct connection between Hong Kong and Amsterdam. While being transmitted from Hong Kong to London, our message will first have to pass a modem and will then enter a radio circuit forming part of a circuit bundle which links Hong Kong to London via a telecommunications satellite.

At the London end, this circuit terminates (of course passing a modem) in the SITA switching computer in London (made by Philips) where it is recognised and hence routed to SITA Amsterdam. While crossing another couple of modems, as well as terrestrial and maritime cable systems, it would finally arrive at the SITA Amsterdam switching centre, which would forward it through the on-site satellite processor to the reservation system of KLM where it would be processed. And then, the whole way back.

The fact of the matter is that the system works. How it works and what malfunctions can occur in such a complex system will be discussed in more detail in the series to follow.

sita communications is published monthly by the Company Secretary, edited by D. Kroneberg. Member Airline Companies will receive one copy only, and are kindly invited to reproduce their own copies for internal distribution.
Printed in France by SITA.