Preface

WHO ARE PHILIPS ?

This is a question with an infinitely variable spread of answers.

It can depend on **where** you ask. In Holland, the home base; in Europe, the 'Home Market'; in Africa, the Far East or the United States. Throughout most of the world Philips is a 'household name' with a huge variety of meanings. Lighting, home entertainment, domestic appliances, shavers—these are common currency.

But the answer can also depend upon **whom** you ask. A radiographer will tell you about the sophisticated range of X-ray equipment, an airline pilot will enthuse on Philips airfield electronics and telecommunications engineers from Kuala Lumpur to Kansas City will have yet another highly specialised answer to the question. And all these answers are equally true.

The name Philips is carried like a flag by a very complex, almost organic, partnership of companies that ranges across most of the world and across many facets of human life, domestic and professional.

A LITTLE HISTORY

In the early years of this century, three factors interrelated to lead Philips from purely domestic electrics into the field of communications. The growth of radio, the importance of shipping communications to the maritime Dutch, and the existing expertise of Philips in the still-young techniques of handling glass, vacuum, and electrical components, the basic skills of the new radio industry.

In 1918 a factory, N.S.F., was set up in Hilversum in co-operation with the Dutch government. Over the next decades, this plant under its eventual name, Philips' Telecommunicatie Industrie B.V. (PTI), played an important role in the development of broadcasting (Hilversum is still the centre of the radio and TV industry in Holland), and the evolution of communications equipment in general.

POSTWAR REBUILDING

The war left many ruins and the telephone networks of Europe had been particularly delicate and vulnerable. Philips were called in at this time to help re-establish a working system.

A new field for Philips calling for new techniques and new research. The immediate results were the Philips rotary selector and other new exchange equipment. The long-term effect, a deep involvement with telephone equipment at both public and private exchange level.

TECHNOLOGICAL EXPANSION

In the years that followed, other new areas were explored by Philips.

Point-to-point transmission by microwave answered both the problems of saturated airwaves in Europe and of long distance communication in developing countries—more new techniques, more research. Airfield systems that combined communications, lighting and signalling equipment of a hitherto unknown sophistication, were demanded—and supplied. New disciplines, like weather forecasting on a world scale, called for increasing complex telex installations—they were developed.

This was the era of the growth of the computer and here too Philips were involved, both in computer research and the application of processor control to telephone and telegraphic switching.

Three qualities characterised the company in this period of explosive expansion.

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In the first place, most of this equipment and these systems involved significant capital investment by the customer. A telephone exchange must be built to serve for decades. It must be built to last, both in the physical sense of durability and reliability, and it must also be as far as possible 'future-proof' (it must not too quickly be overtaken and out-dated by advances in technology).
There are only three possible answers to these problems and they are the ones that Philips has always been prepared to give. The first is demonstrable quality and reliability. The second continuous research, to keep abreast, and head of, new techniques. The third factor, of increasing importance in these complex areas, is training. Continuous training programmes for production and maintenance personnel to ensure these high standards of performance and reliability, and comprehensive training of customer personnel in handling the new equipment.

THE CONCEPT OF PARTNERSHIP

Anything that can be described as international has, by definition, many sides, and just as Philips expertise has been offered in the markets of the world, so the group has been continuously prepared to recognize and encourage specialist skills from other countries, other companies.
Over the past twenty years, a number of companies have joined in partnership with Philips. Each had special skills and experience to offer the group. Each benefitted in return from the accumulated technology and continuous large-scale research programmes carried on by the group as a whole.
Examples of this are Pye TMC Ltd. from the United Kingdom who brought to the group highly specialized mobile communications techniques; Tekade/FGF in Germany with advanced telephone technology; and TRT in France with among other things, extensive experience in microwave transmission.
Following this concept, each of these companies retains its own national identity and a degree of autonomy. At the same time each company (and, of course, its customers) benefits from specialist experience, techniques and equipment from anywhere within the group and are able to draw on the massive research facilities and resources that only an international partnership on this scale can support.

TODAY

The Philips group today demonstrates partnership on a world scale, with over 400,000 employees throughout the globe. A vast range of products on the domestic field and in many professional areas. In particular in telecommunications.
Here the list of achievements currently includes advanced processor-controlled public telephone exchanges, and some of the most sophisticated telex switching installations in the world. Complex airfield systems and extensive transmission networks in many countries, and a full range of equipment for both public and private telephone exchanges.
Products and services from the partnership inevitably wear a number of hats. They appear under varying brand names, Pye in the U.K., TRT in France, Philips TMC in Australia are just some of them. But in the professional area they all share two important characteristics. Quality and thought in the hardware that enable it both to last and to resist obsolescence, and a matching quality in the expertise and training of the human element that ensures that the equipment starts ahead of the field and stays there—for longer.

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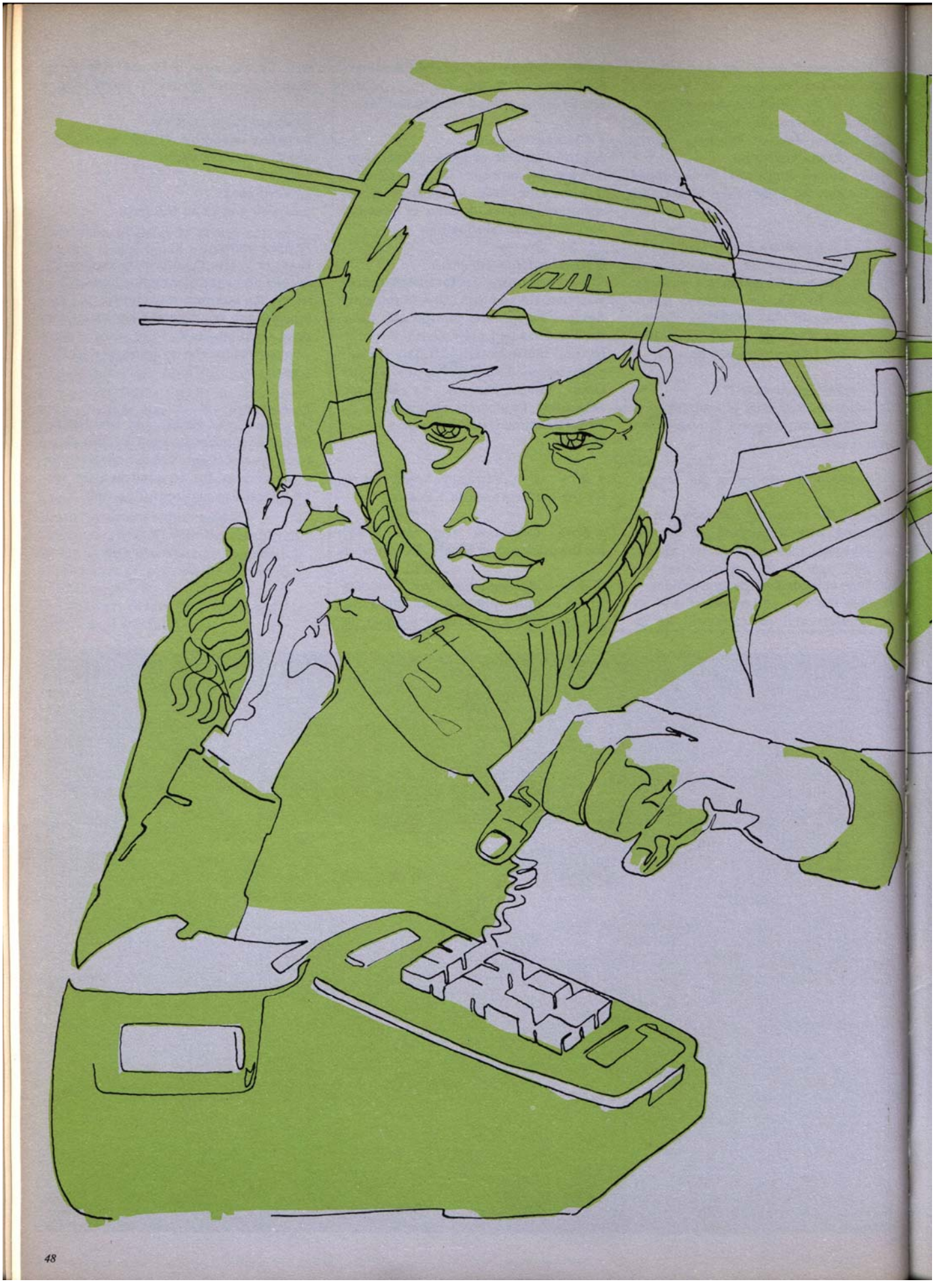
1. The aerial photograph shows the seat of the commercial management and staff of PTI, Hilversum.
The building in the background houses the Order Handling, Installation and Service (OIS) Dept. and Dr. A. F. Philipsschool
2. Modern blocks of PTT's Telecommunications Research Laboratories at Hilversum.
Here advanced work on Telephony and Telegraphy equipment is carried out, including the development of the PRX



Public Telephony

Introduction

The Philips range of public telephony equipment currently includes several types of automatic exchange switching systems, such as rural, local and trunk switchboards and supervisory desk equipment.

The new PRX electronic switching systems combine extensive experience in telephone exchange design with the latest on-line computer control techniques which set new standards of flexibility and reliability in both local and trunk applications.

The well-proven 'U' range, using Philips high speed precision switches as basic components, consists of the UR systems for large public exchanges, the UV range for Subscriber Trunk Dialling (STD) switching and the UDK or UD systems for rural areas.

The market

This, by the nature of the equipment, is limited to national Post and Telephone authorities and, in some countries, telephone companies.

SPC

Equipment survey

PRX: STORED PROGRAMME CONTROLLED SYSTEMS

The Philips PRX is a Stored Programme Controlled telephone system, designed for applications ranging from terminal exchanges, in both single and multi-office areas, through combined local and trunk exchanges, to main transit exchanges in Public Telephone networks. It offers the full range of advantages associated with stored programme central control.
The system can be initiated economically with quite small traffic volumes and its capacity can be expanded widely without disruption to existing services.

Computer control

The PRX system employs high speed Philips minireed relays as crosspoints in a multi-stage linked network under the control of duplicated computers. These, with characteristics comparable with advanced general-purpose computers, are specially designed for on-line operation. They perform control functions associated with recognition, identification and routing of incoming calls, selection of suitable speech paths through the switching network, issuing instructions to the network, monitoring those instructions, maintaining a complete network status, administrative and technical supervision including call accounting, extraction of traffic statistics, automatic routine testing and display of equipment status.

Advantages

The combination of advanced electronic common control and high reliability switching devices provides a number of significant advantages, and results in lowered operating costs as well as improved service:
Extreme flexibility, both in terms of overall system growth and the adaptability of the exchange to demands for new features and services.
The stored programme principle allows administrations to plan and offer a wide range of services to companies and individuals.
Sharply reduced maintenance. Automatic function checks for both the intelligent system and telephone areas combined with techniques for isolating the faulty

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component and easy exchange of prewired components.
Simplified operation, including system access from a central keyboard which permits:
Connection or disconnection of subscribers and trunkline equipment.

Changes of subscriber, line data and service conditions.
Modification of routing data.
Retrieval of subscriber metering data.
Extraction of extensive traffic data, enabling more efficient network management.
Space and floor load reduction. The use of solid-state electronic components, miniature switching elements, and advanced mounting techniques, reduces the physical dimensions of the system by a factor of **two to four** compared with conventional equipment. This results in substantial cost savings both for new exchanges and for later extensions.
Simplified Installation. Time required for on-site installation of new systems or expansion of existing facilities is significantly reduced by the use of factory prewired cabinets, prefabricated plug-in intercabinet cabling, and special 'x-ray' programmes which check all aspects of a system after installation.

Other advantages
In addition, the PRX system is capable of handling the high switching speeds which are becoming increasingly important for push-button operation, MFC and common channel signalling.
The system is fully compatible with existing electro-mechanical switching equipment, switchboards and other office apparatus, and can be installed in networks using any numbering plan.
Two-wire switching is available for local applications, for transit or trunk exchanges—four-wire. Hybrid solutions for combined two- and four-wire switching are also available.
The PRX can also be equipped with remote line link blocks for connecting remote subscribers. These 'subscribers concentrator facilities' are remotely controlled by medium or high speed data links from the main exchange. Similarly, maintenance or administrative functions for a telephone area can be centralized and controlled from one location, either by individual send-receive teleprinters or by a service computer system.

Housing
The equipment is housed in standard cabinets, 288 cm (113 in) high, 95 cm (38 in) wide, and 40 cm (16 in) deep.
As an example, a 10,000 line unit for an average traffic density can be accommodated within a floor space of 72 square metres (650 sq. ft.).

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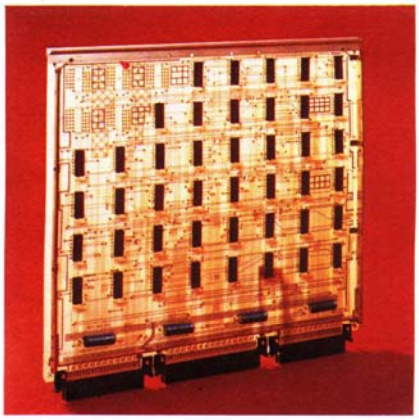

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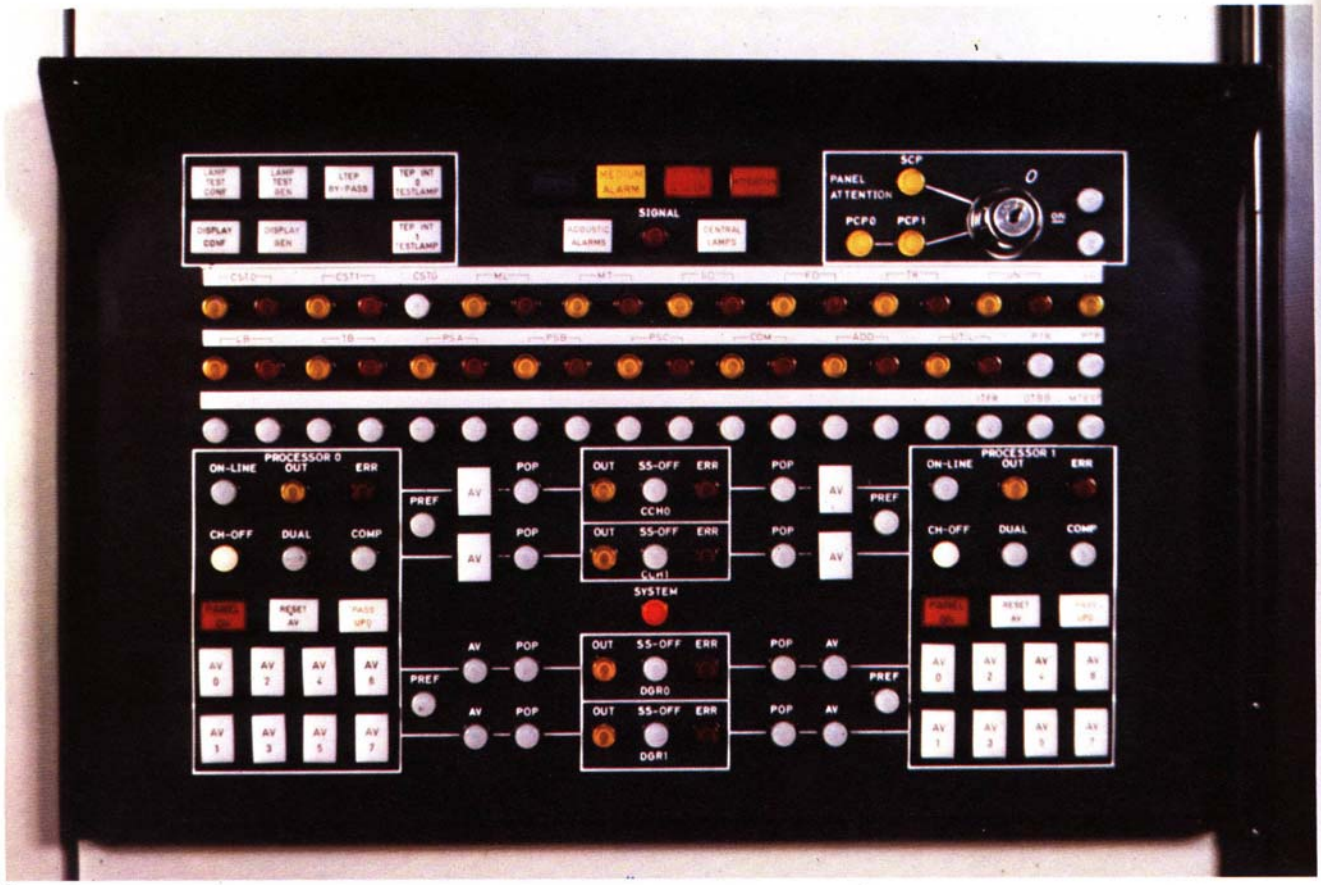
1. The new Processor Reed Exchange
2. PRX printed wiring board with IC circuitry
3. Interior view of PRX processor cabinet



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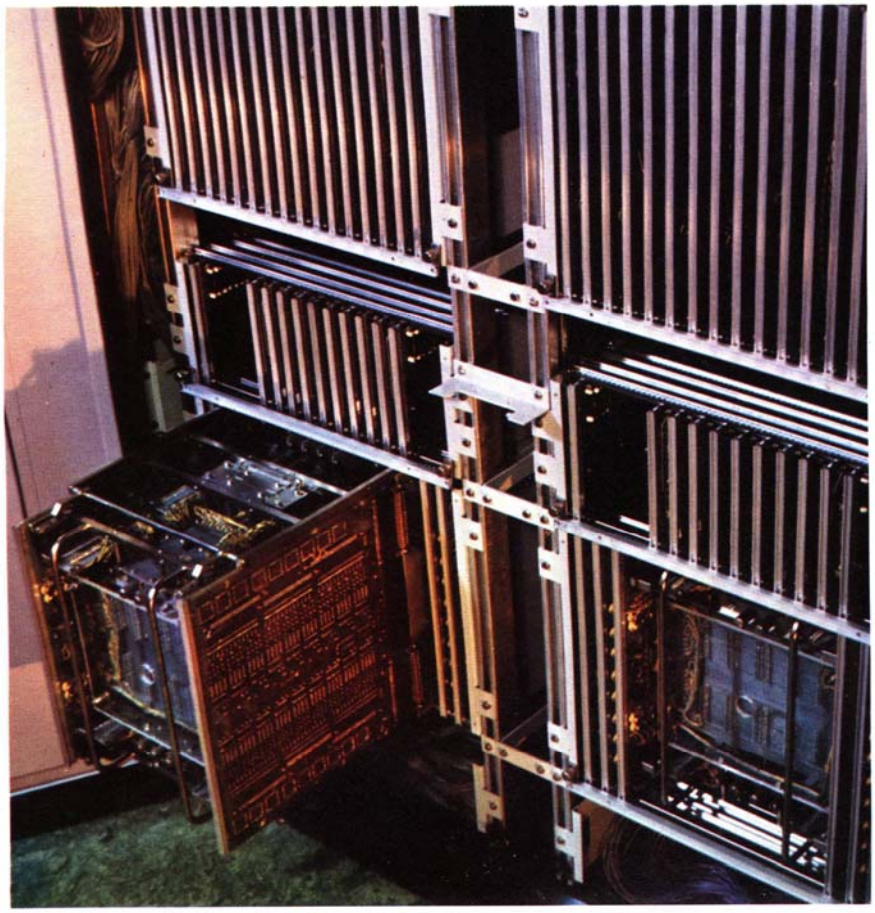

1. PRX configuration control and alarm panel
2. The 16 k core memory stack of the PRX system in extended position
3. Part of the interior of a UDK cabinet
4. UR exchange equipment is housed in dust-proof glass and metalracks
5. The UDK exchange

ELECTRO-MECHANICAL AND SEMI-ELECTRONIC SYSTEMS

In this area, PTI market four systems, the UD, UDK, UR and UV systems, all utilizing a common control principle, with high speed precision switching.

They can be used to handle a high traffic volume in applications ranging from small rural stations to large international switching centres.

Trunk calls in these systems can be handled by pulse and MFC signalling to CCITT specifications, and will fit closed or open numbering schemes.

Tariff determination, routing facilities and different types of signalling simplify integration with any network and ensure compatibility with switching systems of other makes.

The components used in the systems have proved their reliability under all conditions, and maintenance is reduced to a minimum. Experience has shown that even exchanges of up to 20,000 lines can be left without maintenance staff for long periods.

Physical design is based on plug-in connection. Systems are housed in steel cabinets with metal doors on both side (UDK) or in cabinet racks with glass doors at the front and metal doors behind (UR and UV).

The UD system is a simplified version of the UDK (see below).

The UDK system is especially designed for terminal exchanges and group centres in rural areas, but can also be used for minor local exchanges in suburban areas (50 subscribers to a maximum of 600 per station).

For capacities of over 600 lines (up to a few thousands) two or more exchanges can be coupled by means of a UDK transit unit. Mobile systems can also be supplied in shelters or trailers.

All the modern features are available including MFC signalling and subscriber identification to enable automatic toll ticketing. Keyset selection is also possible.

Basic system elements include an expandable local automatic exchange type UDK 601 and a transit unit type UDK 001, used to combine exchanges into any desired configuration.

The UR system. This is basically for switching local subscribers. The minimum economical capacity is 1000 lines, and in principle, expansion in line capacity is unlimited. The UR system which now serves more than a million lines throughout the world, has a reputation for high reliability and low maintenance costs.

The UV semi-electronic trunk exchange. This is based on the register-controlled switching principle, and facilitates switching of trunk lines, on a four-wire basis. Capacity both for number of trunks and traffic volume is practically unlimited.

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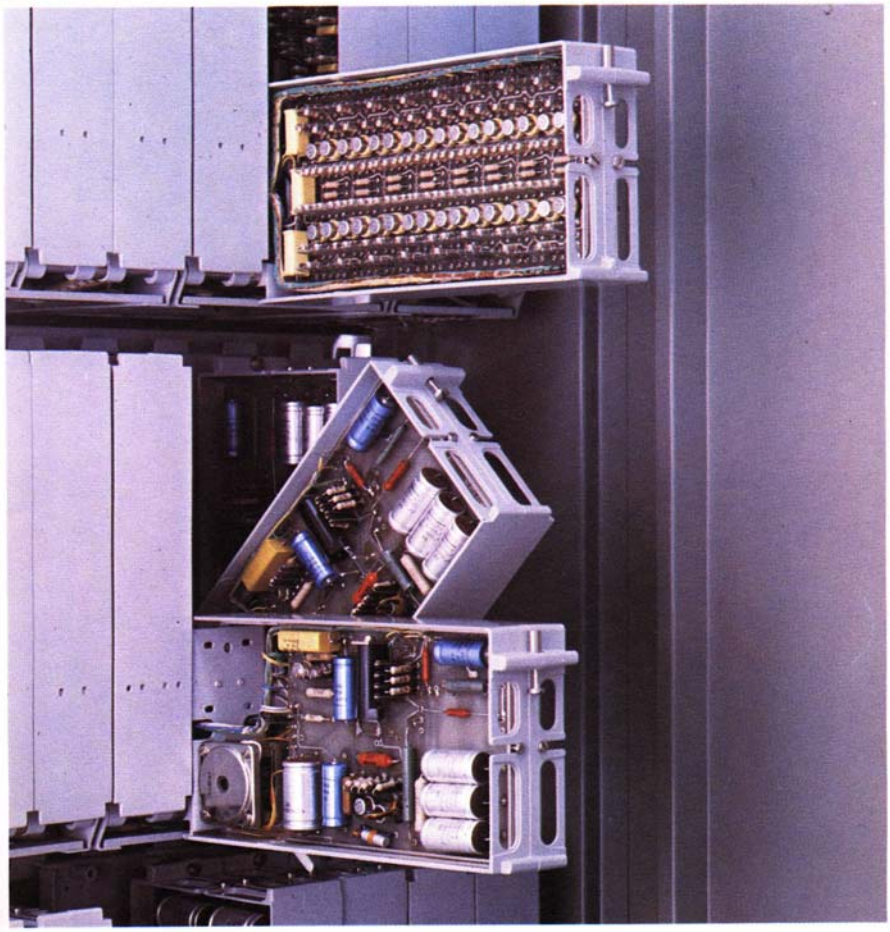

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Some project highlights

Brazil

MODERN TELEPHONY WITH PRX

Brazil is in a period of very rapid expansion, and to keep pace, the infra-structure must be built up at a rate exceeding 20% a year. This is the main problem of the Brazilian 'National Telecommunication System', with currently only 2.5 million telephones for a population of more than 100 million.

Before the end of the century, the system with its projected 30 million telephones, should be able to handle traffic of the magnitude of 250 million calls every day. On November 30th 1973, Philips PRX systems became part of this development. On that day a contract was signed for delivery of the first 5,000-line local exchange, which will be installed in São Paulo, for TELESP, the state telecommunications authority. It will go into service in the second half of 1976.

São Paulo city is today the largest city of the South American continent, with over 8 million inhabitants. The PRX will be installed in Vila Mariana, a city district with its own urgent need for exchange expansion.

The new PRX will expand the Vila Mariana system to 20,000 lines with direct connections to other exchanges and tandem exchanges. Special transit exchanges will carry traffic to and from the region, and connections will be made to a higher transit centre for national and international calls. Adaptations are being developed for all these types of trunking, mostly on an MFC basis, but also with d.c. signalling to the older Strowger systems.

The equipment will be housed on the 6th floor of the new telecommunications building now under construction. In the original design this floor was meant to house 10,000 lines. The compact PRX 5,000-line installation will occupy only 11% of this space.

Philips agreed to the government requirements for local production of the equipment, and the already well established production centres at Recife and São Paulo, are being tooled up to produce PRX equipment and software to meet the needs of this expanding market.

UDK EXCHANGES FOR BRAZIL

During 1972/1973 some large and a number of small orders were received for UDK exchanges for Brazilian telephone authorities totalling over 35,000 lines. Among these were two, for 10,000 lines each, from COTESP* and COTESC* and one for 4500 lines from TELESP*. Initially they will be installed in the standard UD version operating with pulse signalling on the trunk lines and semi-automatic long-distance working. This can be supplemented at any time with register and MFC equipment.

Subscriber identification facilities can also be added making toll ticketing possible. Eventually subscribers can have push-button phones. The UDK 601 system is especially attractive for exchanges in rural areas since it can be built up from a minimum of 50 lines, by 50-line increments, to a full 600, progressing mean-

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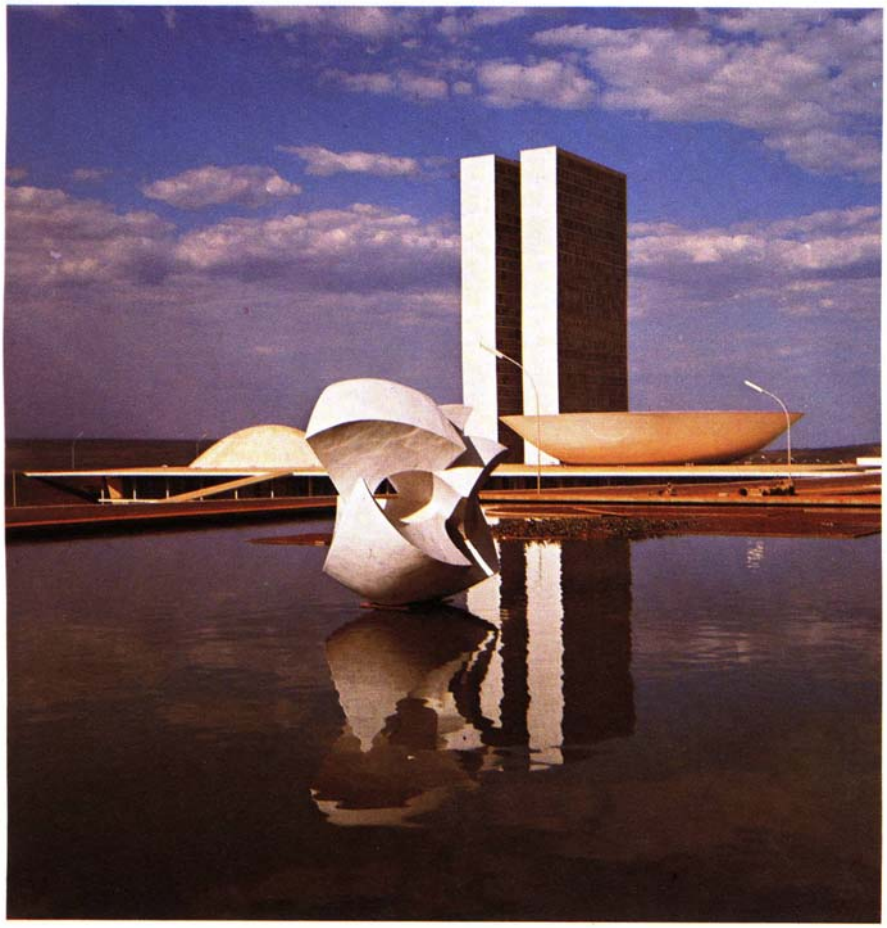

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1. View of the 'Sandwich' building, flanked by the 'Camara dos Deputados' saucer and the dome of the 'Senado Brasilia'
2. Carnival in Rio
3. Rio's colourful beach
4. Map showing UDK exchange sites

while to the more extensive automatic facilities mentioned above. Investment can thus be conveniently spread over a longer period.

A further advantage is in its design for unmanned operation with the signalling of fault alarms to a manned centre. It should also be noted that a number of UDK 601 exchanges can be combined into a larger unit or formed into a group of terminals by the addition of a UDK 001 system.

COTESP*: Companhia de Telecomunicações do Estado de São Paulo
TELESP: S.A. Telecomunicações de São Paulo
COTESC: Companhia de Telecomunicações de Santa Catarina

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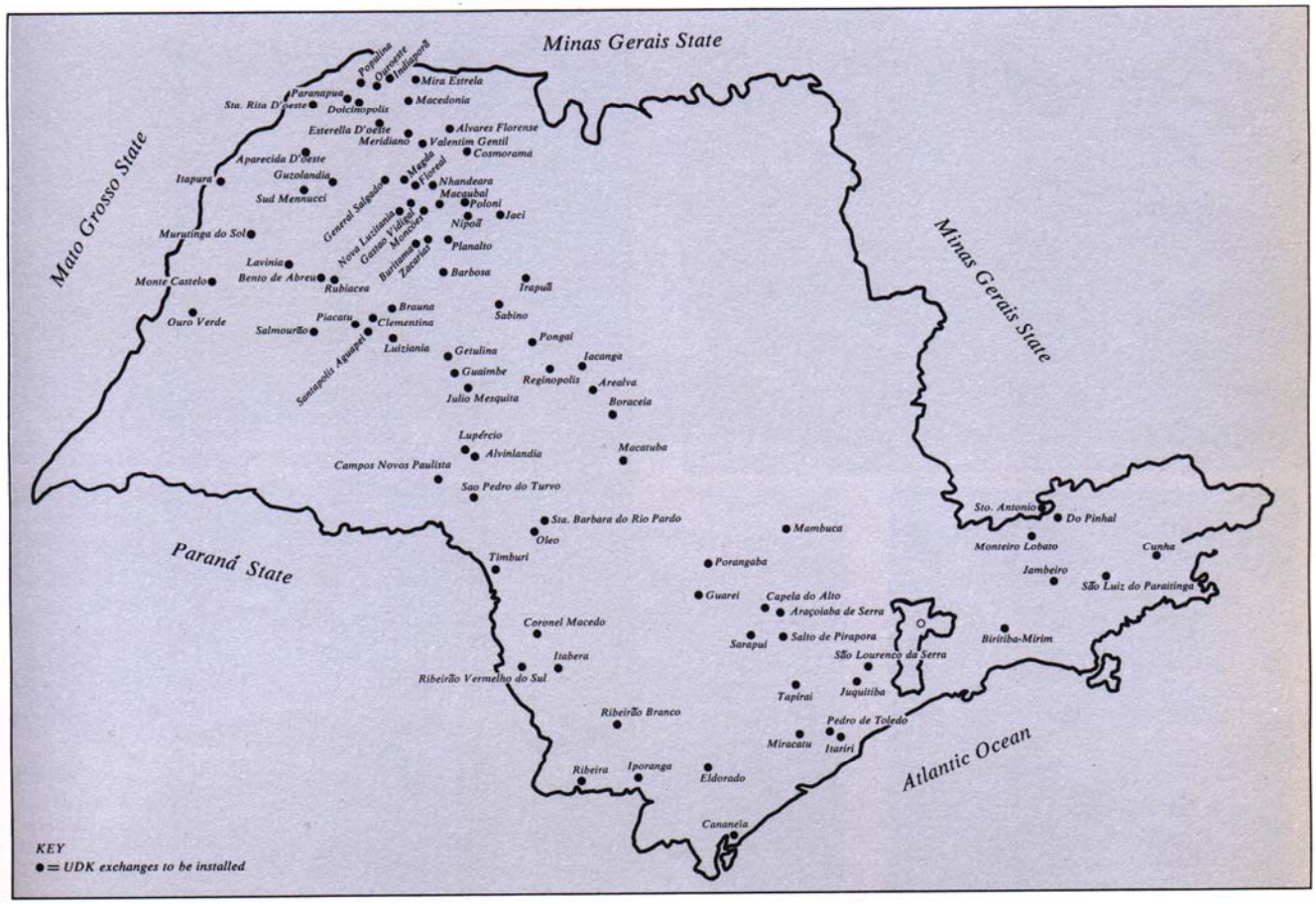

Jersey

JERSEY (CHANNEL ISLANDS)

At the end of 1974 Pye TMC will begin installation of some 5000 lines of PRX equipment for the Jersey Telephone Department. This represents something of a technological leap—from manual and Strowger equipment to Stored Programme Control (SPC), the most advanced telephone switching system in the British Isles.

The telephone network of Jersey currently comprises five exchanges, (Central, North, South, East and West).

The order recently received covers:

a. The addition of 2500 lines to Central. The PRX exchange will be fully incorporated in the network and will eventually replace the existing equipment.

b. The replacement of the manual West exchange with a 2000-line PRX exchange.

Because of the economic expansion of the island, it is envisaged that the Central exchange will grow towards a capacity of 25,000 lines, but by replacing the Strowger equipment with the new PRX, this expansion can be easily contained in the existing building. Additional space here in the centre of the town would have been virtually impossible to obtain. West exchange, however, will be housed in a new building, to be erected beside the manual exchange, permitting expansion to 3 or 4,000 lines.

Commissioning of the Central exchange is planned for the end of 1975, West exchange six months after that.

The hardware adaptation and programmes necessary to enable computer control in a typically Strowger background will be developed mainly in the PRX laboratory of Pye TMC in London. They will be supported by the special PRX laboratory of PTI and by the great experience of the British network gained by Pye TMC in many years of co-operation with the British GPO.

Jersey Telephone Department expect considerable advantages from their decision. Their statement includes the following:

1. The considerable savings in maintenance and administrative costs.

2. The considerable saving in floor space.

3. The ability to provide a fully integrated switching-system in the future.

4. The use of reed inserts in the speech paths.

5. The reduction in installation time.

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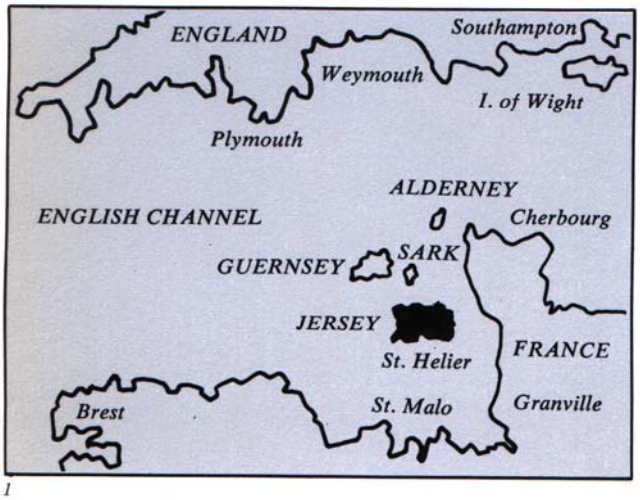

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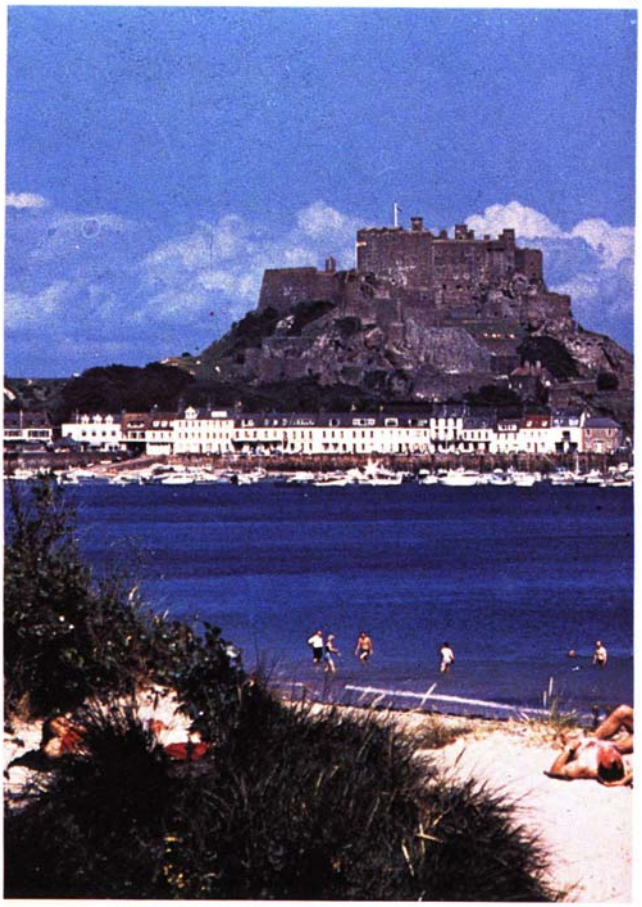

1. Map of the Channel Islands
2. The coat of arms of Jersey
3. The Castle of Mont Orgueil, Jersey

The Caribbean

TELEPHONY IN THE CARIBBEAN

Bonaire

In 1959 Philips started organising telephone exchanges in the Caribbean, beginning with the order for two UD exchanges for Bonaire, in the Lesser Antilles. These were a 250-line exchange in Kralendijk the capital, and a 30-line exchange for Rincon village 17 km away, commissioned in 1962.

These facilities were enlarged in 1965, and a new 100-line exchange was installed in the Antriol district.

An order followed in 1971 for the replacement of the Kralendijk exchange by a 1000-subscriber UR exchange and expansion of the Rincon and Antriol exchanges to 200 lines each.

At the same time these exchanges were connected via a transit exchange to the Government Radio and Telegraph service in Curaçao, giving automatic telephone fraffic between the island and Curaçao and Aruba.

St Martin

Two UD exchanges were ordered for St Martin in 1962. During the following years, these facilities were extended to 300 lines at the capital and 100 at the airport.

In 1972 an order was received to install a national and international exchange in St Martin to cater for inter-island traffic with Saba, St Eustatius, Curaçao, Bonaire and Aruba as well as connecting, on a limited scale, the Leeward and Windward Islands with the USA and Canada, and with Puerto Rico, St Thomas and Antigua. With the commissioning of this equipment in 1974 these islands have been put into easy telephonic contact with the rest of the world.

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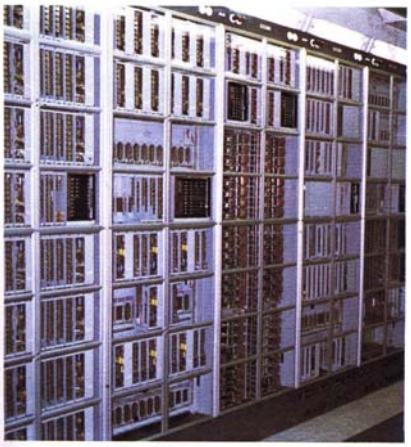

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4. The international UV exchange installed at the Government Telephone Administration at Philipsburg, St. Martin
5. Map of the Caribbean
6. The inner court of the Governor's house, Willemstad, Curaçao
7. Manual operator's positions of UV exchange at Philipsburg
8. Frontstreet, Philipsburg, St. Martin

Peru

PERU CHOOSES PRX

Peru, on the west coast of South America, with an area of 1.3 million sq. km. is the fourth largest country in Latin America, spanning an easy 2000 km from the extreme north, on the equator, to the south. The huge Andes range, running north-south, divides Peru into three zones: the arrid coastal belt (Costa), the mountains themselves (Sierra) and the tropical forest to the east (Selva).

The Costa has a dry, hot climate, Lima hardly ever sees rain. The Sierra is moderate to cold, while the Selva, the catchment area of a number of rivers feeding the great Amazon, has extreme tropical conditions—the whole country presents a challenge to telephone or any other electronic equipment.

Peru was once the centre of the famous Inca empire which at the time of the Spanish landing under Pizarro in 1532, reached as far as modern Colombia, and deep into Chile and the Argentine. It was characterized by a highly developed culture, tight social organisation and early notions of socialism, unique in non-western cultures.

Of all the Inca arts, that of building was developed to the highest level. This can be seen from the ruins of the citadel at Machu Picchu, and even better in the towering walls of Cuzco which once enclosed the temples of the Sun and the palaces of the Inca rulers. Their courier roads, traversing the mountains, and the terraces and irrigation systems are still clearly recognisable.

Peru today has about 14 million inhabitants, this grows annually by about 3.1%, one of the higher rates in South America. Half of them live in the towns which have experienced fast growth, especially in the last few years. The telephone network, particularly in the interior, is still very much under-developed. The total number of subscribers at present is 242,000 (a density of 1.71 to 100 inhabitants.—World average is 7.1 to 100). About 150,000 of these are in Lima which brings up the local density to 5.3. Low as this might seem for a city with 3 million inhabitants, the table below shows that other towns are even more sparsely endowed.

City/town	Inhabitants ('73)	Subscribers ('73)	Sets/100 ('73)	
PERU (country)	13.600,000	242,000	1.71	
Lima	2.850,000	150,000	5.3	
				PRX capacity
Piura	126,700	2,100	1.65	7,500
Chiclayo	190,000	2,700	1.42	7,500
Trujillo	242,000	3,900	1.61	10,000
Chimbote	159,000	1,500	0.94	5,000
Huacho	37,000	1,100	3	4,000
Ica	92,000	1,500	3.85	5,000
Arequipa	305,000	10,000	3.3	10,000
Iquitos	111,400	1,800	1.63	5,000
Huancayo	143,000	2,100	1.47	5,000

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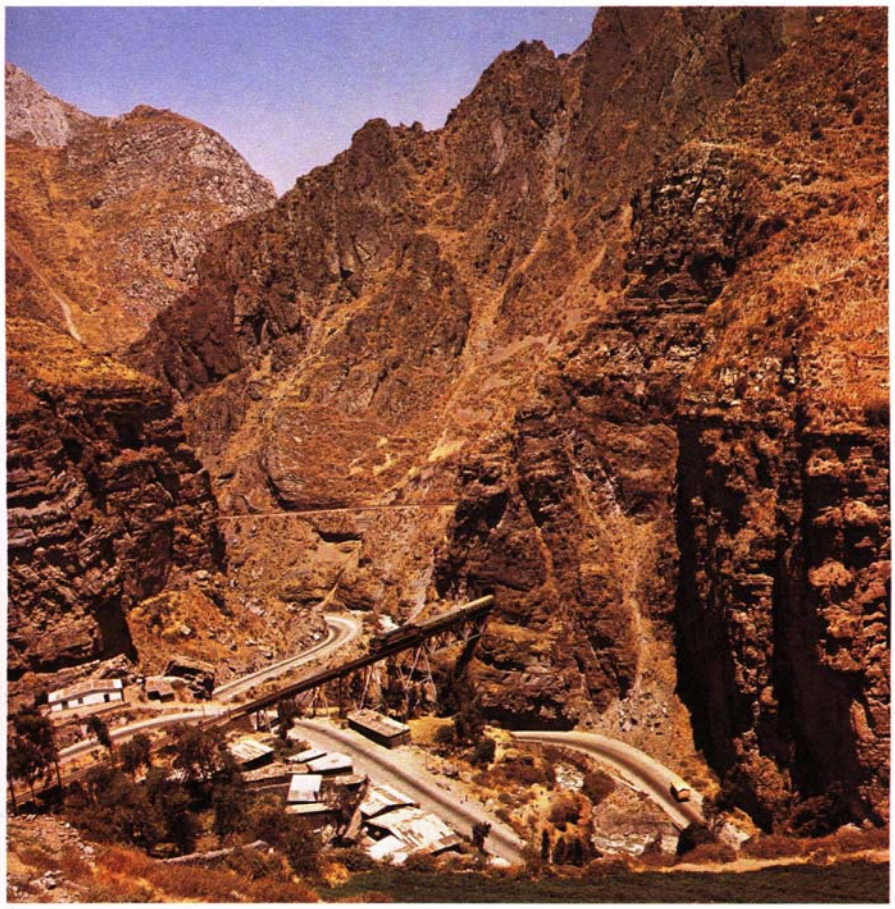

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Until a few years ago the telephone network was largely controlled by three major concessionaires, CPT (ITT) in the city of Lima, STP ((Ericsson) in the south and CNT (Albis) in the north. Recently these companies have been wholly or partially taken over by the Peruvian government, bringing them together into one organization, Entel-Peru. Entel-Peru propose the installation of 59,000 lines in the 9 towns listed above.

The map shows where these exchanges will be installed. Entel will design and reconstruct the buildings, and their staff will do the installation work under the supervision of PTI engineers. System testing will be carried out jointly by PTI and Peruvian engineers specially trained in Holland.

A group of Entel engineers will spend some months in Holland, to familiarize themselves with PRX equipment. They will follow this with practical work with the installation and test teams, who are installing the PRX exchanges for the Dutch P&T Administration. Later the team will form the nucleus of the maintenance and service staff for the PRX network in Peru.

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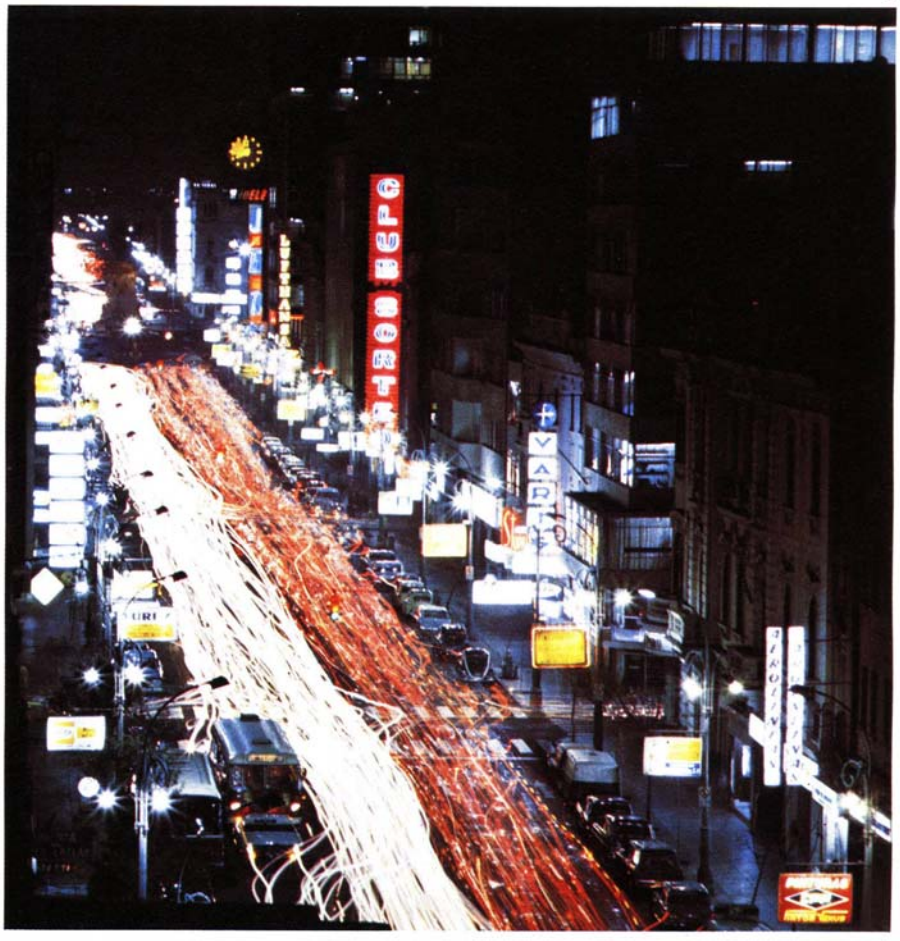

1. Flaring flowers in the skirts of folk dancers
2. A perfect network of roads, built by the Incas, and still a symbol of the conquest of nature
3. Lima at night—a real capital

Greece

PUBLIC TELEPHONY ACTIVITY IN GREECE

As long ago as 1958 Philips began to explore the Greek market, with imported equipment. The larger rural areas at that time were already equipped with Siemens and Standard/Lorenz exchanges, so Philips began by introducing the UD type of exchange serving rural areas with a maximum of 200 subscribers. The satisfaction with which the Greek Telecommunications Authority (OTE) received a relatively small consignment, encouraged Philips to set up a modest assembly plant to cope with the demand in this area.

By 1966, 300 exchanges of this type, all locally assembled, were in operation throughout the Greek network.

By this time however, with expansion in rural areas, a problem arose. With heavy telephone traffic towards the capital, transit facilities in many directions were demanded.

This was answered by the introduction of the UR type, which not only met the transit demands, but also those of heavy traffic and future planned growth in the Greek network. The local assembly operation had in the meantime expanded into a multi-site plant.

With the background experience of over 70,000 lines of UD equipment, they were fully prepared to manufacture the UR equipment. So, in 1969 the OTE gave Philips a first order for UR equipment.

This introduction of UR equipment to Greece marked the second important step. Their ability to handle large volumes of traffic and expand up to 10,000 lines enabled Philips to move from the rural areas to the larger urban ones, and to compete, on equal terms, with Siemens and ITT.

By 1972, a total of more than 220,000 UD/UR exchanges were in operation.

At the beginning of 1973, a further contract for 135,000 lines brought the Philips share of the market to over 20%. By 1976 the market share will have grown to 25 or 30%.

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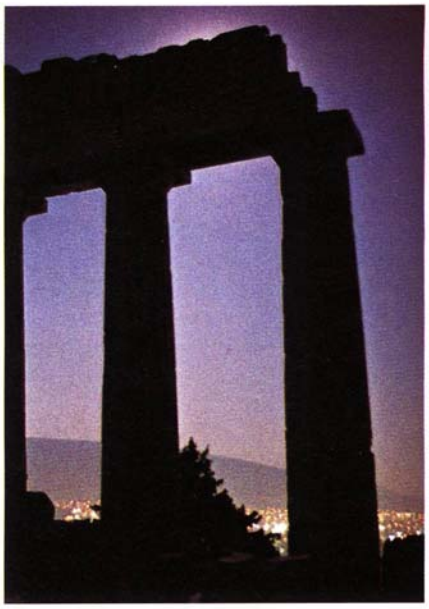
Map of Greece showing some of the places in which Philips Public Telephone Exchanges of the UR Type are in operation



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1. Philips public telephone exchanges, UR type, in Greece
2. Where else but the Acropolis?
3. Part of the telecommunications factory of Philips S.A. Industrielle AVEIP in Athens
4. Held remote by nature, and by custom, the Athos peninsula

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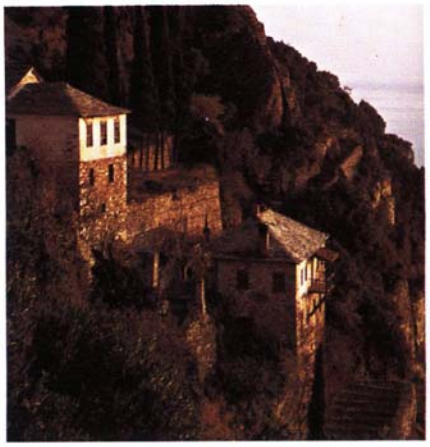

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5. A typical landscape near Delphi
6. Map of Greece showing the locations of Philips rural telephone exchanges, UD type
7. Moonrise over the Lycabethos monastery, Athens

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The Netherlands

PRX IN THE NETHERLANDS

Wormerveer lies some 12 miles from Amsterdam in the Zaan district, recently renamed Zaanstad. Since summer 1974 this district has enjoyed what may be described, without exaggeration, as a new era in telephony. It is the first in Holland equipped with the new Philips PRX public telephone system, a subscriber orientated service on the SPC principle.

The Zaan district is perhaps the oldest industrial area in Western Europe. It began in 1592 when Cornelis Cornelisz of Uitgeest obtained a patent for his invention, a wind driven sawmill. This first 'industry' was joined by many others using the wind power of the flat open polders. In time many hundreds of windmills were turning here, grinding corn, paint and colours, crushing oil, fulling cloth, beating hemp and processing many products such as cocoa, spices, mustard and snuff. Later wind power was replaced by steam, and steam by electricity, but the pattern of local industry remained and today Wormerveer is a modern industrial area, densely populated and still developing.

A modern community needs modern communications, and the introduction of the SPC system by the Dutch PTT has shaped the future of elephone techniques in this area for decades to come.

The new PRX at Zaandam–Wormerveer is intended partly to replace existing electro-mechanical equipment and partly to enlarge the capacity. The room for the equipment measures 12 × 22½ m. and was originally planned for about 15,000 subscriber's numbers of conventional equipment, but with the introduction of PRX it can now accommodate 35 to 40,000. The first stage of the installation covers over 6000 subscribers and also provides for touch-tone dialling for some 2000 subscribers.

A teleprinter keyboard allows communication between the operators and the common control circuitry, and another has been installed at the maintenance centre as a first step towards remote management.

The specification for this installation was drawn up in collaboration with the Dutch Post and Telephones Authority, who have announced that 75 SPC centres will be in operation by 1976 and 200 by 1980, with some 2000 connecting lines per unit.

1. The PRX at Wormerveer
2. Long shot of the Wormerveer equipment room. This site was originally planned for a conventional electro-mechanical system. The saving of floor-space is obvious
3, 4, 5 and 7. The new push-button phones will become a familiar sight in many facets of daily life
6 and 9. For more than four centuries an industrial district with industrious people—a fitting place for the PRX
8. The PRX is future-proof...

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