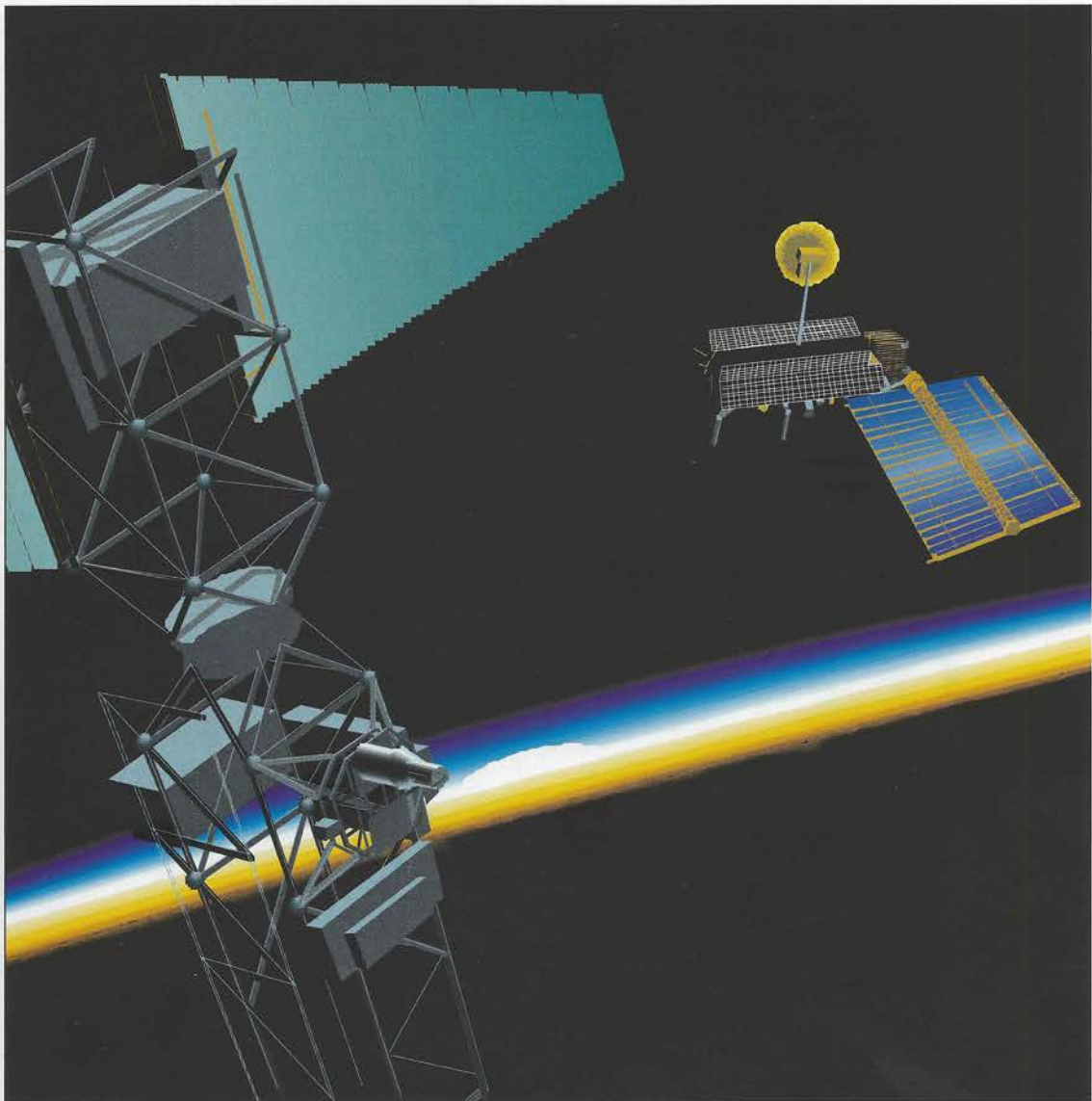


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S W I S S
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WINTER 95/96



SAM PITRODA: A SHORT BIOGRAPHY

Born on November 1942 in Orissa, India, Sam Pitroda is a telecom expert of international repute. With MSc. degrees in both physics (MS University, Baroda) and electronics (Illinois Institute of Technology, Chicago), he worked at various companies in the US and founded Wescom Switching in 1974. Six years later, in a multimillion dollar deal, Wescom Switching was sold to Rockwell International and Sam Pitroda turned his attention to telecom development in India.

After 22 years in the United States, Sam Pitroda returned to his native India, where he helped founding C-DoT (Centre for Development of Telematics). In 1987, he was appointed Advisor to Prime Minister Rajiv Gandhi on national Technology Missions related to water, immunization, literacy,

oilseeds and telecom. Parallel to this function, Sam Pitroda was also responsible for Indian telecommunications development, and is currently Advisor to the Prime Minister on Technology Missions and Chairman of the Governing Council of Centre for Development of Advanced Computing (C-DAC), Vice-Chairman of the World Telecommunications Advisory Council of the International Telecommunication Union (WTAC – of which he was a founding member), and has just been nominated Chairman of WorldTel, a multinational organization run on commercial lines to promote telecommunications in developing countries.

Founder of several companies in the US, Sam Pitroda holds over 50 worldwide patents and has published hundreds of papers.

GREAT EVENTS ARE OUR BUSINESS...

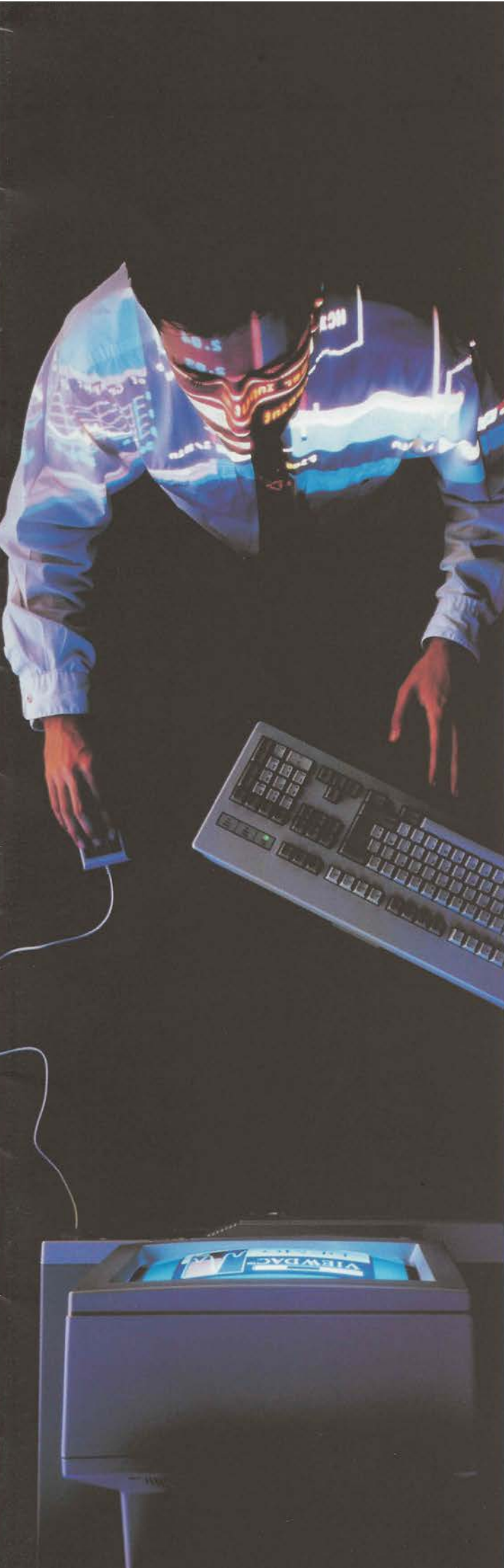
For over a decade, On line Publishing (previously Swiss Quality Publications), has combined a proud tradition of quality (Switzerland's hallmark) with the art of creating outstandingly beautiful publications, dedicated to economic promotion the world over. *The Swiss Economy: A Trilogy*, the first in our series of commemorative books, produced for the 700th anniversary of Switzerland,

enjoyed a resounding success both at home and abroad.

Published for unique events, our books are designed to serve as invaluable reference works for both general public and specialist readership alike. Great effort goes into identifying experts in the field for every new challenge we undertake, to ensure unfailing excellence throughout.

WHO'S WHO IN THE CREATION OF TELECOM?	
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Sam Pitroda	Editorial Director
Danielle Werthmüller	Administration Director
Liliane Mancassola	Commercial Director
Christine Pulvermacher	Editor
Michel Parvis	Production Manager
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PUBLISHER'S NOTE

Today, telecom is widely thought of as the principal technology of the future, that most likely to affect men and women in their work, family life and relationships; that holding the greatest promise for all industries and all trades.

Given the importance of the telecommunications industry, On line Publishing, specialist publishers of luxury commemorative books, have decided, under the editorial direction of Sam Pitroda, expert in the field, to devote a fundamental work to telecom and its impact on mankind.

In language accessible to a wide readership, *Telecom: Impact on Mankind*, will be a comprehensive overview of this all pervasive industry, the forces behind it and the opinions of those who use it. This is no dry history book, but a richly illustrated, vibrant account: a pioneering document incorporating technical data and interviews with daily users, leaders in the field and politicians.

Telecom: Impact on Mankind is designed to be a vehicle for increasing public awareness of the role of information and development, addressing vital issues such as the increasing North-South divide, employment, environmental questions, human rights and child abuse; incorporating telecommunications based solutions proposed by decision makers at the United Nations and individual governments alike. The book will also take a look at the role played by telecommunications in world banking structures, airlines, education, war coverage, the evolution of perestroika, erasing social and cultural barriers, and as the most potent democratization and development tool ever devised.

With its preface by Mr Pekka Tarjanne, Secretary-General of the International Telecommunication Union, I, and all those working on *Telecom: Impact on Mankind*, feel that it will be a vital tool in the struggle to bring some of the world's six billion people (four billion of whom do not have access to even the most rudimentary elements of telecommunications) out of the dark ages and into the 21st century.

Ronald Cicurel



INTRODUCTION, BY SAM PITRODA

The telecom scene has undergone a dramatic change in the last decade. This was to a great degree triggered by the divestiture of American Telephone and Telegraph (AT&T) in the United States of America in 1984, up until then the world's largest corporation with a regulated monopoly. With one million employees, 32 million shareholders and assets of over \$150 billion, AT&T was ranked alongside the 27th largest country in the world, in terms of financial assets.

Today, telecom has become an agent of change affecting social, political, cultural and economic health the world over. No other technology in the last 300 years has had the impact telecom and information technology will have on our social organization, on our institutions, industries, education, entertainment, environment and work. Telecom can realistically be seen as the key to productivity and efficiency in business, government, transport, trade, tourism, banking, manufacturing and management.

The telephone – a necessity

Telecom is no longer simply a question of having a telephone conversation. It is about integrating voice data, graphics and video on information super highways to reengineer existing services, institutions and infrastructures aimed at creating new wealth and new jobs for the competitive global markets of the future. No longer is the telephone some sort of urban, elite, exotic or fancy instrument, but rather as a tool for problem solving. Not only is it a necessity for bureaucrats and businessmen, it is also indispensable to farmers, teachers and health workers in rural areas. It is now well-accepted that without good telecom services, it is difficult to cope with drought, floods and earthquakes, to distribute and administer adequate vaccinations to combat infant mortality, or to fulfil basic human needs related to water, food, health and literacy.

Telecom the world over is increasing openness, accessibility, accountability, connectivity, networking, democratization and decentralization, leading to considerable social transformation. Telecom radiates from the nerve centre of a nation, networking people, projects, ideas and information to provide knowledge essential to the realization of initiatives and actions. With the aid of modern communications, local events become national and national international – in real time, at electronic speeds.

Telecom is second only to death

As a social leveller, telecom and information technology ranks second only to death. It can raze cultural barriers, overwhelm economic inequalities, and even compensate for intellectual disparities. In short, information has the power to put two unequal human beings on an equal footing, making it the most potent

democratic tool ever devised. But information is power, and there are those amongst us with an aversion to sharing it. However, sold as commodities, it is easily available and just as easily accessible. *Beside global information concerns, telecom is the only issue that promises to bring the world together for a common cause, thus giving it high political priority and enormous impact on mankind.*

The main purpose of this unique work is to assemble various elements of this vast, all-pervasive industry and its impact on mankind and package them in such a way that it becomes as gripping for the general public as it is for specialists in the field. It is intended to be a valuable reference document, a living work filled with well-chosen technical data, graphics, easy to understand explanations and superb full-colour photographs covering technology, products, applications and people.

The aim of this book

The aim of our book is to:

- make the mysteries of the telecom industry accessible, interesting and informative for all;*
- highlight the invisible, but constant impact of telecom on people in their daily lives;*
- demystify telecom technology by connecting the various building blocks making up telecom networks and associated connectivity;*
- outline various viewpoints and future visions;*
- emphasize the hurdles and challenges on the way;*
- raise questions relevant to the future.*

A trilogy, *Telecom: Impact on Mankind* includes interviews with telecom leaders and international personalities, with special focus on their contributions, particular concerns and expectations. This is complemented by articles describing several major manufacturing and service companies, presenting their strategies, perspectives, plans, priorities, problems and hopes.

Part A is divided into seven chapters, beginning in Chapter One by tracing the historical development of language, printing, photography, the telephone, radio and television through to the thriving multi-billion industries they are today.

The second chapter moves on to world telephones, reviewing telephone distribution and statistics. In 1996, in a world of some six billion people, there are some 600 million telephones, of which over 80% are to be found in some 20 advanced countries. This means that over four billion people, mostly in developing countries in Africa, Asia and Latin America, still have no access to basic telecommunications services and no awareness of their necessity. To compound matters, their political, economic and academic leaders and deci-



sion makers appear unconcerned about this revolution. It is therefore of the utmost importance that telecom be given maximum media coverage, that serious efforts be made to increase investment in facilities, and that a suitable network be created in order to fulfil third world needs. Lack of investment in telecom will result in lack of overall development in these countries.

It seems unlikely, given the fact that we live in a private sector driven competitive world, that the North will willingly deliver such a powerful tool into the hands of Third World leaders. However, should the latter countries be alert, and respond to the challenges facing them, such handouts will not be necessary.

Many telephones because one's rich or is one rich because one has many telephones?

Since telephone density is directly proportional to gross national product, countries with high telephone density have constantly improved their production base and standard of living. The key question is therefore whether one has lots of telephones because one is rich, or vice versa? Faced with this dilemma, developing countries are eager to increase the number of telephones in the hope that this may be the road to prosperity. While developing countries are looking for basic telephone services, at the opposite end of the scale, the break-up of AT&T in America unleashed the forces of wireless privatization, deregulation, free market economies, a competitive environment and global networks.

As a result, telecom is changing from a regulated monopoly, providing predominantly run of the mill voice-based telephone services with cross subsidies, to a market driven system focused on return on assets, improved customer satisfaction, reduced pricing and growing value added services. In the process, there will be a multiplicity of organizations with conflicting priorities, complex product offerings and changing rate structures, leading to a certain amount of confusion and concern for connectivity. These developments have triggered many changes in the telecom sector, the implications of which are not yet clear, but which we know will affect all nations and all people.

Chapter Three focuses on development and the impact of telecom on our economic, social, political, cultural, educational, management, financial, marketing and family environments and interactions. The growth of personal computers, databases, mobile phones, e-mail, voice mail and cable television have created new services, not just about connecting people to people, but also about connecting people to machines and machines to other machines.

Overall structures are likely to undergo a change, with development of traditional media frameworks and new models of non-hierarchical, interactive networks creating new possibilities for manufacturing and management

methods. For example, an information effective organization manager might be seen to function like an orchestra conductor with hundreds of players playing different instruments in perfect harmony. Gone are departments, securities, hierarchies and traditional pyramid structures. In their place are egalitarian organizations dedicated to networking talent.

Devoted to technology, our fourth chapter emphasizes the fact that the key to recent telecom developments has been the rapid advances in technologies related to digital, software, fibreoptics, wireless and satellite. We explain these and the related technologies from the viewpoint of how products are conceived, developed, manufactured, installed and maintained, describing as simply as possible the phenomena behind complex global telecom networks capable of connecting any of the 600 million telephones all over the world, future integrated service digital networks (ISDN), asynchronous transfer machines (ATM) and various standards and services, along with insight into investment requirements.

In Chapter Five, we explore a wide range of fascinating telecom applications in business, banks, stock exchanges, airlines, hospitals, factories, the travel industry, libraries, real estate, government, security, railways, advertising, sports, publishing, agriculture, etc., using specific examples from actual operating environments, with comments by leading experts and users.

Addressing the question of future vision, Chapter Six takes a look at global information infrastructures (GII) and related developments. There has been a great deal of discussion at the highest level of governments in the most advanced countries of recent times concerning GII, with a view to incorporating new telecom services such as video on demand, electronic shaping, distance learning, multimedia, telemedicine, electronic transactions, virtual reality, etc. These services require high capacity, high bandwidth access in every home and office.

As boundaries between communication, computers and the entertainment industry are blurring, the need to provide fat fibre pipe-lines – a conduit to deliver new information goods and services to every customer – is becoming a necessity. With these new integrated interactive services, it will be feasible to achieve the unachievable, and think the unthinkable, such as remote surgery, where a doctor in his office in New York will be able to perform surgery on a patient thousands of miles away in Africa.

A whole new concept of time and space

This will give a whole new meaning to the concept of time and space. Cyberspace, in which almost 50 million people in 160 countries are connected by Internet to explore the land of knowledge by exchanging e-mail and sharing

global databases, is already networking interest groups globally, and creating political pressure points.

These new integrated voice, data and video services will demand reengineering of existing jobs in order to include new information reality. *In other words, in the information society of the future, what is now accepted as being the exclusive preserve of a doctor, engineer, lawyer, accountant, manager, teacher, banker etc. will change substantially, with new tools, techniques, databases, automation, networking and interactivity.* With true GII, it will be feasible to create the concept of a global village where people all over the globe can connect instantly at electronic speed to large databases and special networks for banking, trade, commerce, shopping, training and other economic and social activities. This will be followed by a scenario where products and profits will be moved through bits and bytes with nary a thought for national boundaries and customs clearance.

Challenges and roadblocks

Last, but perhaps most important is Chapter Seven, dealing with ten challenges and roadblocks between us and GII becoming a reality. *In a world already divided by information rich against information poor; telecom, intended to bridge the gap between countries of the north and their southern counterparts, is in fact increasing it.* Developing countries of the south need access to basic services, but lack the technology, capital and management skills possessed by the north. While the north is well on the way to GII, the south is badly stuck in an outmoded feudal and hierarchical mindset, hampered by systems bogged down with controls and problems of governance.

The old game of monopolies, controls, regulations, tenders, centralized organization and multilateral project financing has not delivered telecom developments to developing countries. With a quantum leap in new technologies offering unique cost effective solutions, perhaps now is the time for a new game with new alternatives, private investments and competitive markets in telecom the world over. To narrow this gap in telecom accessibility, what is needed by developing countries is substantial new investment in telecom, even at the cost of other social services momentarily, with appropriate regulatory and organizational frameworks, new technology and modern management skills. Then only will we stand a chance of delivering 75% of the people of the world to the civilization of the information age.

A few key questions

Where will these resources come from? Will market driven economies and profit oriented multinationals have the required commitment, sensitivity and sympathy to solve the prob-

lem? Will the telecom community have the concern, commitment and courage to cope with the consequences of disturbing peace and prosperity? With bold initiative, it is feasible to implement global information infrastructure for all, global information infrastructure which is truly global in reach and resources, capable of meeting the service needs of developing countries as well as new market opportunities for multinationals.

The challenge is not simply for financial resources, but also for the human resource development which is in tune with the information culture of tomorrow. How do we change old mindsets to create new opportunities?

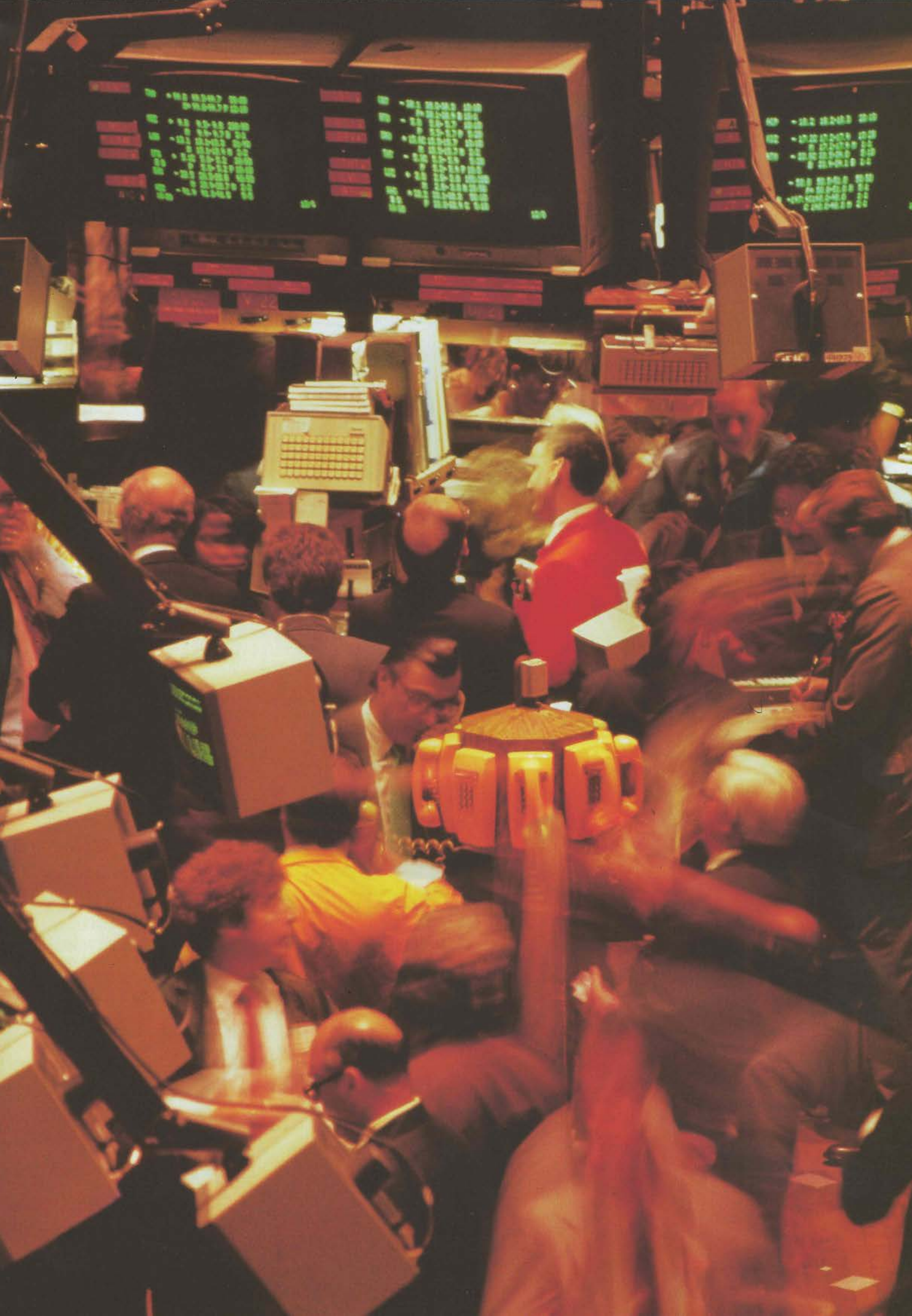
So much information is floating around in electronic files that at times it is difficult to actually find the knowledge required for appropriate action. It is remarkably easy to find oneself drowning in bits and bytes of information overload. Is information for the sake of information what we really want? Does it require organization, structures, filtering and processing to enhance its utility? Can relevant information be found without having to plough through mounds of irrelevant material first?

It is believed (and rightly so) that in the long run, information will create new opportunities and jobs for the masses. However, with information driven automation, just in time inventories, computerized production planning, down sized management and increased productivity and efficiency, millions of those jobs will be eliminated. Are we creating new jobs fast enough? How will this affect our global workforce and unemployment in the short term?

Global connectivity was originally achieved through simple standards and long product cycles. With short product cycles, and complex standards, can we ensure continued connectivity? How will we ensure global integration of services and to whom does this responsibility belong?

Telecom developments in the west preceded developments related to basic needs. As a result, the main focus was on productivity in business. Do we really know how to use telecom and develop new products and services to expedite the process of meeting basic human needs for billions in developing countries. Can we provide literacy for all in the next ten years through improved communication? How can we use telecom to improve health services in Africa?

Telecom will have far reaching implications on human interactions at home as well as at work. How is work culture going to change? It is unfortunate that certain kids have the ability to communicate via computer but have a hard time relating to the kid next door. Will families of the future sit around terminals in the family room? Has telecom, which is supposed to connect people, in fact totally disconnected them? One thing is certain, tele-



com will require new work methods, new work values and new work environments. *Are we prepared for it?*

With a wide range of information on individuals and institutions in all forms and functions, organized, shared and sold, will there be any privacy? With electronic cash and electronic shopping, individuals' names will be tagged with individual behaviour patterns. Is this an acceptable commercial commodity? With all our eggs in the information basket, where will we stand in terms of piracy? Will we run the risk of having our property stolen through remote access?

How to protect one's baby bits and bytes from bandits?

Information being the engine of new wealth creating machinery, how do we protect property? Will everyone really respect intellectual property? How can one envisage protecting ones baby bits and bytes from bandits? What national and international legal system will be available to protect multimillion dollar property in electronic memory machines? What really constitutes intellectual property when everything is the same string of "o's" and "i's" on the digital line?

With MTV, American soap opera and CNN beaming all around the globe, there is concern in many quarters about cultural invasion. Will global telecom bring global culture? Will regional ethnicity become more prominent with improved communication?

On the one hand, American programs are becoming more popular the world over and on the other, Spanish programming is increasing in the US. What implications will all of this have on race, religion and roots?

Telecom for construction

In fact, as we move away from a capital intensive manufacturing society to a knowledge intensive information society, we have more questions than answers. We have more new frontiers to explore, not just in terms of technology, products and services, but also in terms of its impact on human behaviour, human interactions and human civilization.

Europe and North America built their economies with the help of coercion, work force exploitation, child labour and environmental plunder, but the First World has announced to the Third that these and other violations of human and ecological rights are quite unacceptable. In short, this means that the developed countries are forcing human rights and environmental sensitivity on the world's poor, setting all kinds of new conditions and restrictions on economic growth. This is not fair, of course, but it is an excellent policy. However, the First World must understand that it is not likely to achieve this policy goal without the help of telecommunications and other information technologies, for two simple reasons.

First, telecom makes abuses infinitely easier

to monitor. It gives watchdog groups as well as the victims and witnesses of human environmental outrage access to one another. Second, telecom helps to create wealth, and prosperity is everywhere a force for civilized behaviour.

As we take this new road to riches with information bits and bytes, we have many hurdles to overcome. While technology has been used more for purposes of destruction in the 20th century, let us, through telecom, use the 130th anniversary of the International Telecommunications Union in 1995 as the kick off point to reverse this process in the 21st century. Let us use telecom to connect people at both ends of the social scale and at all the four corners of the earth, resulting in a better world for everybody.

Two significant developments in the last five years have created an environment for a new world order. First, the end of the Cold War, and secondly, the momentum of the free market. These two developments have deep roots in telecom and information technologies. Perestroika would not have been possible without modern communication systems. The explosion of freedom and the spread of democracy and free markets would have been deferred or delayed, had it not been for the marvels of mass communication techniques, telephones, fax machines and e-mail, which went beyond being a catalyst.

A new information order

As a result, global information systems are creating a new information order in which there is a great opportunity for equity for all. Telecom could no doubt be a viable instrument to sway developmental activities away from economic disparities to economic distribution. In a sense, the real telecom revolution has hardly begun. One might even go as far as to say that it has yet to begin. Up until now, we have used telecom to augment our existing activities.

In future, telecom will change the very nature of human activities with new information based relationships with individuals, society and environment. Without proper telecom institutions and infrastructure, sustainable development in the context of a free society will be difficult to achieve.

As is usually the case, it may take longer than expected to deliver the fruits of real telecom technology. But when it finally arrives, its impact is going to be far more profound and pervasive even than we outline in this book. Only time will tell...

Sam Pitroda



TELECOM 95

SYNOPSIS OF TELECOM 95

Between 3-11 October 1995, an incredible \$700 million will be devoted to the "Olympics" of the telecommunications sector, *Telecom 95*, to be held at Palexpo, Geneva. Covering 99,000 m² (95,000 indoors and 4,000 outdoors) *Telecom 95* (the seventh event of its kind) will welcome 791 exhibitors from 46 countries. Based on past statistics, 133,000 visitors, including leaders from both the private and public sectors and every professional background (banking, law firms, consultants, investors, scientists, economists and engineers, to name but a few), are expected.

Organized by the ITU, *Telecom* forums are held every four years and have gone from strength to strength, providing a meeting place where innovations are launched, multi-billion dollar deals clinched, and decisions made at the highest level. Around 100 ministers, 150 CEOs and 1,800 media representatives are expected to frequent the halls and fringe activities (which include a Book Fair with the latest publications in the field) of this year's happening.

A synopsis of the major occurrences of this extraordinary event, where the new boundaries for the 21st century market place will be defined, will be included in *Telecom: Impact on Mankind*.

The report will highlight the findings and recommendations of world leaders in telecommunications technology taking part in the two principal summits forming the basis of *Telecom 95*, namely the Strategies Summit and the Technology Summit.

The Strategies Summit will cover issues under the theme: "Breaking Down Barriers towards the Global Information Society", addressing regulatory, legal, economic, financial and policy questions, reflecting the new, convergent nature of the rapidly developing telecommunications environment.

While computers, networking and software are already key components of telecommunications, today, broadcasting and the entertainment and consumer electronics industries are also important players. The Technology Summit is entitled "Convergence of Technologies, Services and Applications", and will be devoted to this rebalancing.

Two and a half thousand visitors are expected to participate in the summits.

Mergers concluded, latest acquisitions, contracts signed, agreements sealed, controversial views aired, understandings reached and innovative ideas advanced: all will be presented in this exclusive summary, destined for a worldwide audience.

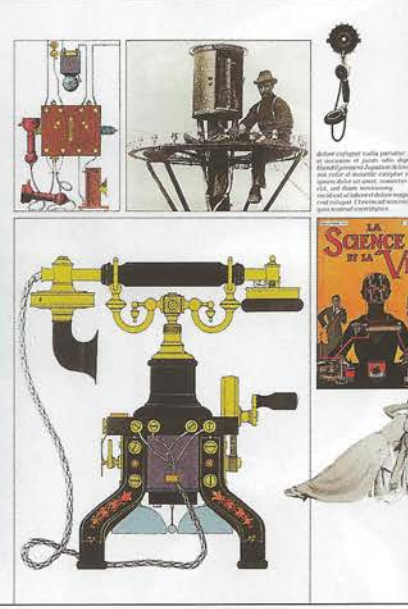
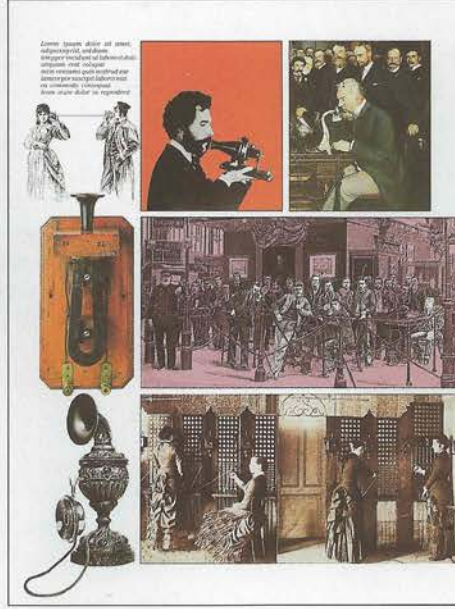
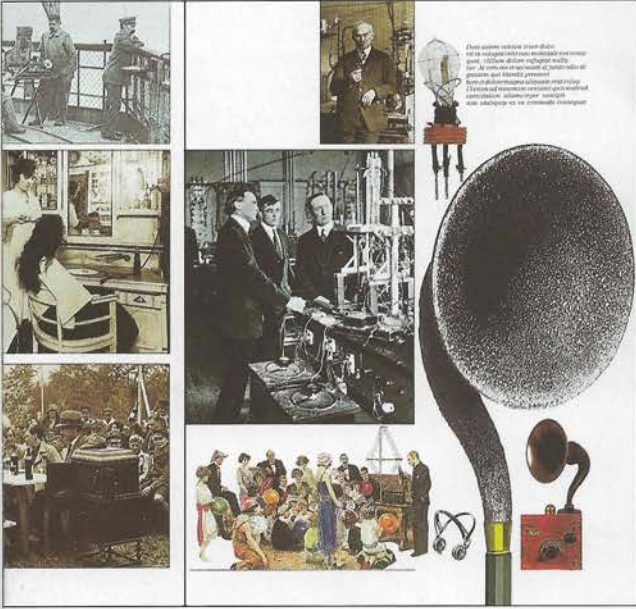
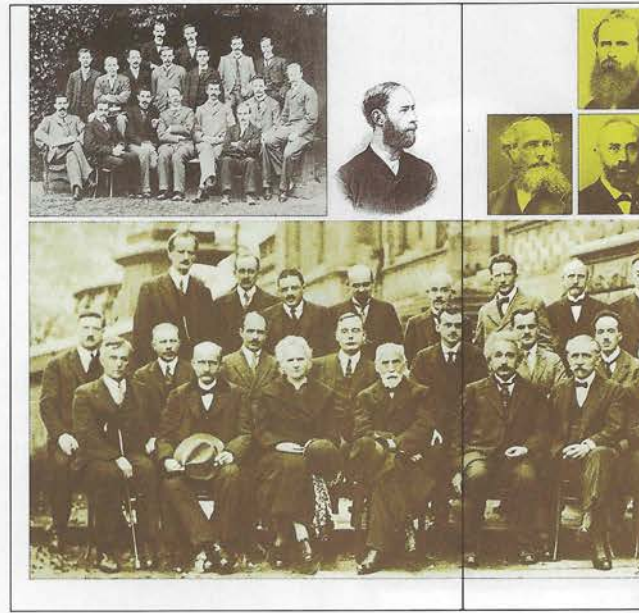
5,000 COPIES TO BE GIVEN AWAY!

Out of the 20,000 copies to be printed, we will have the pleasure of presenting 5,000 copies to the following personalities and institutions on behalf of our sponsors:

- 200 PRESIDENTS AND PRIME MINISTERS FROM ALL OVER THE WORLD
- 150 MINISTERS OF TELECOMMUNICATIONS
- 400 POLITICAL AND ECONOMIC WORLD LEADERS
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Telecom: Impact on Mankind will be an indispensable reference work containing chronologies and statistics to illustrate points made, in an attractive, colourful layout. It is designed to appeal to the man in the street and specialists alike, and will be distributed to a vast audience on five continents. Contact has already been made with a wide range of universities and institutions of higher learning, which will be presenting the book as a graduation gift. No book collection, be it private, public or educational, should be without!

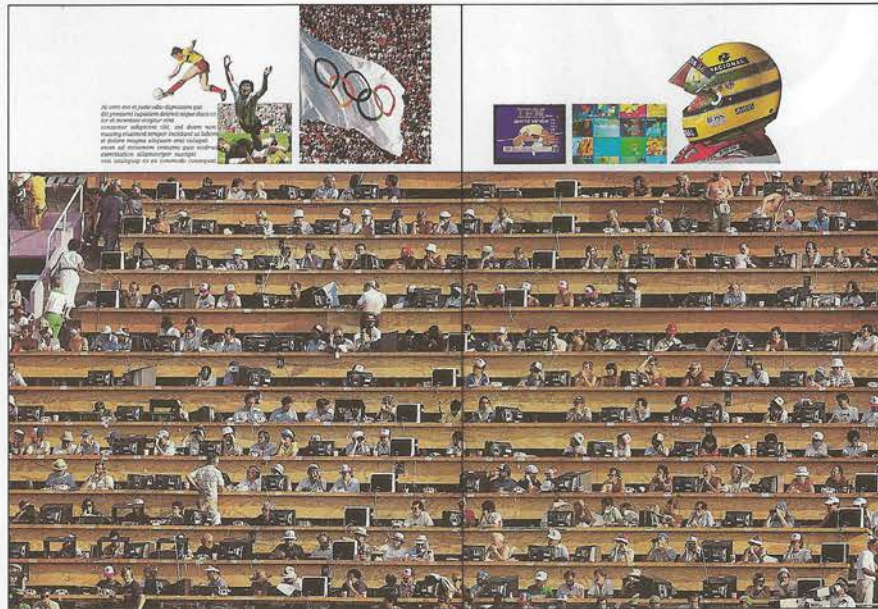
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500 pages
1,200 illustrations, graphics
and diagrams
Full colour throughout
Large format (240 x 320 mm)
Initial run: 20,000 copies
English

A richly illustrated, vibrant
reference work in three parts,
under the editorial direction
of Sam Pitroda, leading expert
in telecommunications.

Publication date: Winter 1995/96.

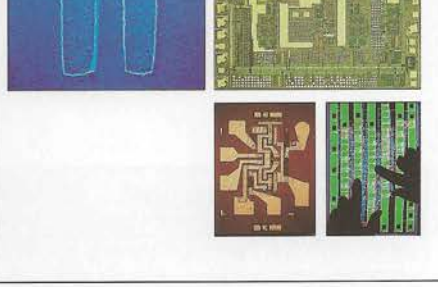




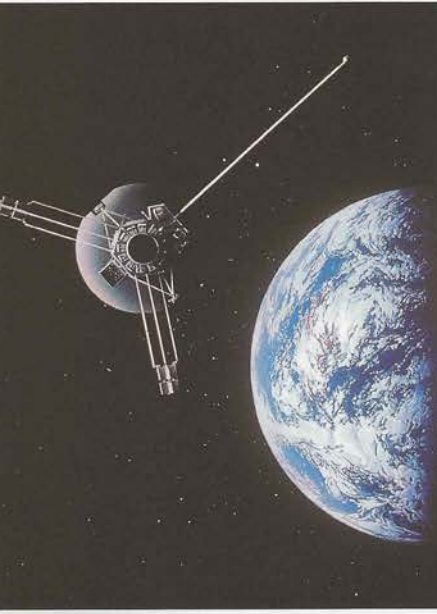
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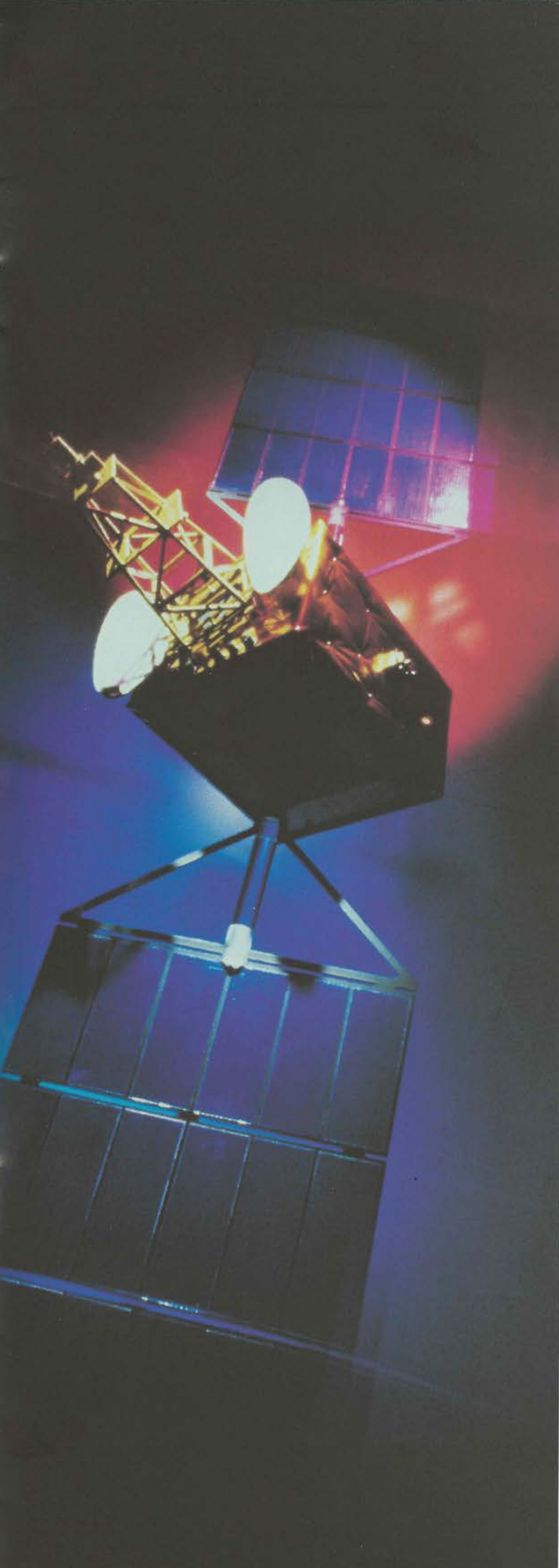


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The list of all those involved in some capacity with the realization of *Telecom: Impact on Mankind* is too long to reproduce here. However we would like to extend our sincere appreciation to all. The preceding names are a small sample of individuals and companies who have already (August 1995) accepted to participate, either in the form of sponsorship or time devoted to providing information for the project.



WORLDTEL UNVEILED!

In 1982, the ITU wisely recognized that the disparity in telecommunications growth between the industrialized and developing worlds would be a growing obstacle to global trade and economic development. As a result, it established the Independent Commission for Worldwide Telecommunications Development which was chaired by Sir Donald Maitland... Extract from McKinsey & Company's feasibility assessment of WorldTel.

On 7 July 1995, WorldTel, a private sector driven funding and development transnational company, was launched to accelerate development in the field of telecommunications.

Currently, four billion people have no access to telecommunications and there has been no significant improvement in most low income countries over the last decade. At the dawn of the information age, this gap is completely unacceptable, both in economic and human terms. Development has been retarded by the need for economic growth in order to generate funds desperately required to improve telecommunications infrastructures. This has in turn been hampered by the poor availability and quality of existing structures, deterring investors from providing the required capital and resulting in an unrelenting vicious circle. In the last ten years, however, the game has changed. Today, due to privatization and liberalization, there is renewed hope of bridging the gap between North and South.

WorldTel began as a proposal put forward by the Maitland Commission (see McKinsey study extract above) to coordinate the development of telecommunications worldwide. Nothing, however, was concretized until 1989, when the Secretary-General of the ITU was authorized to conduct a formal study.

In the wake of the McKinsey & Company report, and due to the current liberalized economic environment and new regulatory regimes, WorldTel has been designed to focus on the lesser developed countries of the world with the aim of closing the communications gap. Using modern technology to provide low-cost services, WorldTel will combine the needs of groups of countries in order to provide economy of scale.

The organization has a new and highly innovative structure, within which client countries, investors and the telecommunications industry will interact in a mutually beneficial commercial undertaking. It is intended to be as streamlined as possible, with extensive use of independent consultants. Business will be done on strictly commercial grounds and returns are expected to be attractive. An added advantage is that, given the developmental nature of WorldTel, the ITU has given its imprimatur, which will greatly facilitate operations.

The main areas of focus are the lesser developed countries, notably in Africa, Asia and Latin America, where there are less than one telephone per 100 inhabitants, or there is a five year wait to have a line. WorldTel will minimize risk for investors by having more than one project on the go at a time, although funds will be kept for the individual projects for which they were originally allocated.

It is generally considered that WorldTel will provide new business openings for both institutional and private investors in the telecommunications industry, while giving client countries access to much-needed investment capital. *Telecom: Impact on Mankind* will discuss the working mechanisms of this exceptional opportunity.

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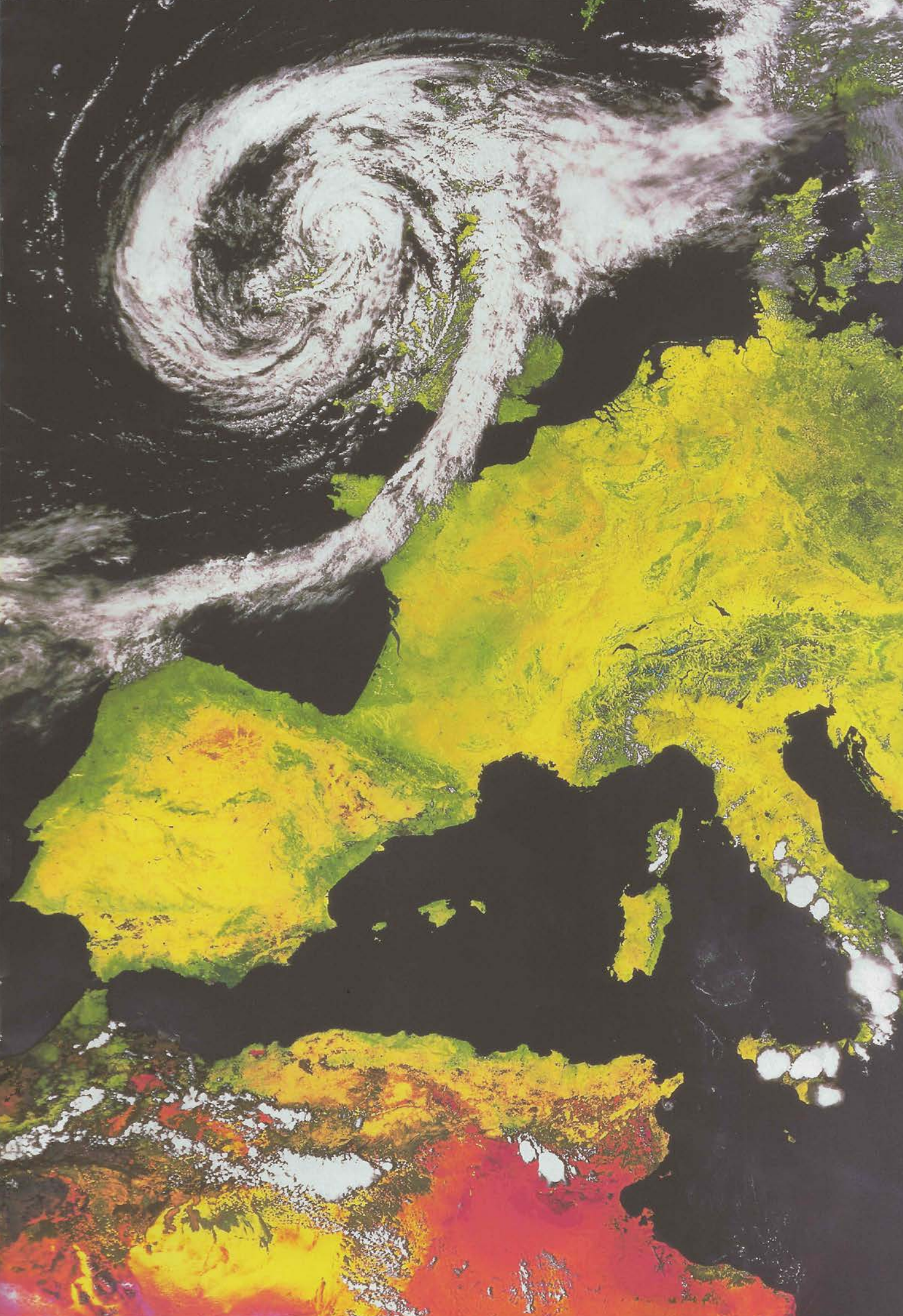
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WHAT DOES TELECOM MEAN TO THESE AUTHORITIES IN THE FIELD?

Comments in the context of the G-7 ministerial conference, organized by the European Commission in Brussels, and the '95 Networked Economy Conference in Paris, both held in late February 1995.

* **Al Gore**, Vice-President of the United States of America: Just as human beings once dreamed of steamships, railroads and super highways, we now dream of the global information infrastructure that can lead to a global information society. But our dream today is not fundamentally about technology. Technology is a means to an end. Our dream is about communication – the most basic human strategy we use to raise our children, to heal, to educate, to empower and to liberate.

Olof Lundberg, Director General, Inmarsat: Telecommunications means the ability to meet and get in touch with people, irrespective of distance or time zone. And today, one can choose the method of communication that best suits one.

Marc Porat, Chairman, General Magic: To me, it means relationships. The need to remain in touch with one's family is just as strong as it was 5,000 years ago. But the actual tools for remaining in touch have changed. Five thousand years ago, camels were used to establish commercial relationships, whereas today, we use computers.

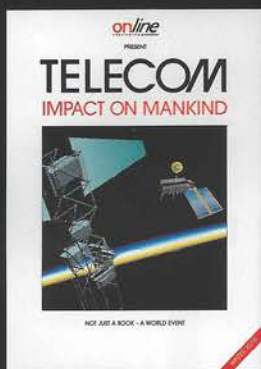
Marcel Roulet, Chairman, France Telecom: Nobody, I believe, underestimates the advantage of the new potential of information technology for the whole of humanity. The challenge consists of enabling the universality of information exchanges in a world where frontiers are falling, while respecting regional or continental cultures. We must act, however, in such a way that the freeing up of market forces does not lead to the law of the jungle and the development of a dual track society.

* **Jacques Santer**, President of the European Commission: In Europe, we must now reflect, and fast, on how we can better organize our education/training programmes so as to be able to profit from unlimited scope and benefits of the Information Society of the future.

Ivan Seidenberg, Chairman and Chief Executive Officer, Nynex: Telecommunications is an old word for a new idea. I think it implies all forms of interpersonal communication.

Brian Thompson, Chairman and Chief Executive Officer, LCI International Inc.: I am a simplist and I think it means connecting somebody at one point to somebody else at another point so that they can communicate. That's all telecommunications is.

* These speeches will be published in the book.



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