



# ITU NEWS

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## TELECOM 99

The last EVENT  
before

# 2000

ISSN 1020-4148

**TELECOMMUNICATION**  
International Union

**N°8/99**

# ITU NEWS

**N°8**

**CONTENTS**

**1999**

**Cover:** Design:  
Nicolas Stäuble (ITU)

**ITU News:** ISSN 1020-4148  
10 issues per year

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**3 TELECOM99:** Ushering in the 21st century (p. 3)  
• Message from the President of ITU-TELECOM (p. 4)  
• TELECOM Exhibitions in photos, from 1971 to 1995 (p. 6)  
• Palexpo expands to accommodate TELECOM 99 + INTERACTIVE 99 (p. 8)

---

**14 INSIDEINFO:** Direction of traffic — Trading telecom minutes (p. 14) • ITU and UNDP talk of closer cooperation (p. 21) • From official sources (p. 22) • Publications (p. 23)

---

**25 YEAR2000:** As the clock ticks to 1 January 2000... are you ready?

---

**31 INFORADIO:** A round-up of regional radiocommunication seminars (p. 31) • Special Committee prepares for WRC-2000 (p. 34)

---

**35 INFODEVELOPMENT:** World Telecommunication Development Report 1999 — Mobile cellular (p. 35)  
• Trends in telecommunication reform — Convergence and regulation 1999 (p. 39)

---

**44 PERSPECTIVES:** Delivering on the GMPCS promise, Nader Modanlo (p. 44) • Worldtelekiosks for remote and rural areas in Africa — A WorldSpace initiative to be launched at TELECOM 99 (p. 46)

---

**47 NEWS**

---

**49 DIARY**

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**Join us at the last event of the century**

**TELECOM 99 + INTERACTIVE 99**



*ITU Management Team. From left to right (in the foreground), Yoshio Utsumi, Secretary-General, and Roberto Blois, Deputy Secretary-General. In the background (from left to right), Hamadoun Touré, Director, Telecommunication Development Bureau (BDT), Houlin Zhao, Director, Telecommunication Standardization Bureau (TSB), and Robert Jones, Director, Radiocommunication Bureau (BR)*

*Photo: A. de Ferron (ITU 990050)*

## Ushering in the 21st century

**I**n a few days, TELECOM 99 + INTERACTIVE 99 will open its doors in Geneva. On the occasion of this last most important event before the turn of the century, the International Telecommunication Union is delighted to welcome exhibitors and visitors from all over the world to celebrate the past, present and future of telecommunications.

As a showcase of telecommunications since its inception in 1971, TELECOM serves, every four years, as a measure of the progress already achieved and a preparation for the future. In this regard, the exhibition we are about to witness offers a unique review of the state-of-the-art technology.

The quality of networks and services provided today have improved dramatically with new techniques for management and with intelligence spread in different parts of what has become a global network. Standards have played and will continue to play a key role for the prompt introduction of new technology in this global network.

As a forum for developing and agreeing these technical standards, regulating the use of the radio-frequency spectrum and promoting telecommunication development, the Union takes specific and often novel measures to respond to the constantly changing landscape of telecommunications. ITU can justifiably boast of having spent the last one hundred and thirty-four years building the global information infrastructure. An infrastructure that has fulfilled largely the dream and aspirations of Alexander Graham Bell, who said in 1878 that: "In the future... a man in one part of the country may communicate with another in a different place."

Indeed, the ability to call any country of the world from any other is particularly laudable. It will be even more laudable when all citizens of the world can enjoy access to telecommunications and information technology. This is the single most important challenge facing the infocommunications industry as we enter the new century.

At TELECOM 95, some of the world's leading specialists and representatives of the converging industries of telecommunications, broadcasting and computing joined ITU in breaking down the barriers towards the global information society. We look forward to yet another dynamic exchange of ideas at TELECOM 99 + INTERACTIVE 99 on the way we will communicate in the future. The bottom line is that we should continually define a framework to allow telecommunications to do what it does best: overcoming distance and connecting people everywhere.

So, TELECOM is not simply a technical show. It is also a way to contribute to development efforts. In this regard, surplus income over expenditure generated by TELECOM events is used as seed money for specific telecommunication development projects, primarily in the developing world.

With the prospects of today's, and even more so, tomorrow's limitless technology, the 21st century should herald a better life for everyone; not just those who can afford it.



**Yoshio Utsumi**  
Secretary-General  
International Telecommunication Union

## Message from the President of ITU-TELECOM

**T**ELECOM 99 + INTERACTIVE 99, the ITU-TELECOM event being held on the eve of the millennium at Palexpo (Geneva), will be the biggest and most influential gathering of telecommunication professionals ever seen. The event, which is taking place from 10 to 17 October, will be the eighth world telecommunication exhibition to be organized by the ITU in Geneva.

Exhibiting over a total ground floor surface of over 66 000 square metres net (63 000 indoors and 3300 outdoors), 1123 exhibitors from 48 countries will offer the 200 000 expected visitors the most influential showcase for all that is new and remarkable in telecommunication products and services. It will provide the launchpad for products of true innovation, the kind of developments that will impact and benefit our lives in the years to come.

Based on projections from the attendance at TELECOM 95, some 100 ministers, 150 directors-general and 3000 media representatives are expected to visit TELECOM 99 + INTERACTIVE 99 in addition to hundreds of chief executive officers and other top-level representatives of the telecommunications world.

At the event this year there will inevitably be a special focus on the changes that have been wrought — and which will continue to be wrought — on society by the combined impact of mobility and the Internet. Four years ago the Internet was on the fringes of the TELECOM event and indeed the entire telecommunications business. Today the Internet and the World Wide Web affect businesses, markets and individuals alike.

Mobile telephony, too, has taken the world by storm in the past four years. At the time of TELECOM 95 there were just 18 million digital cellular subscribers worldwide. Now, in 1999, there are more than 300 million digital cellular subscribers around the world.

In our excitement over this apparently unstoppable growth we should not, however, forget that the vast majority of the world's people do not yet have access to even basic telecommunication services, let alone the World Wide Web. The Forum at TELECOM 99 + INTERACTIVE 99 addresses this issue, and at this year's event we have a broad-ranging and hopefully far-reaching programme lined up. The Forum this year will comprise four summits and eight combined sessions covering issues of interest for all the summits.

Finally, on the weekend of 16 and 17 October 1999 the World TELECOM Internet Days will close the TELECOM 99 + INTERACTIVE 99 event — and lead the way into the new millennium. This event will act as the bridge that leads from the industrial age to the information age, and will be open to the general public as well as to TELECOM's principal audience of exhibitors, Forum delegates, media representatives and trade visitors.

TELECOM 99 + INTERACTIVE 99 promises to be a truly exceptional event. I look forward very much to seeing you there.



**Jean-Patrick Baré**

## TELECOM Exhibitions in photos, from 1971 to 1995



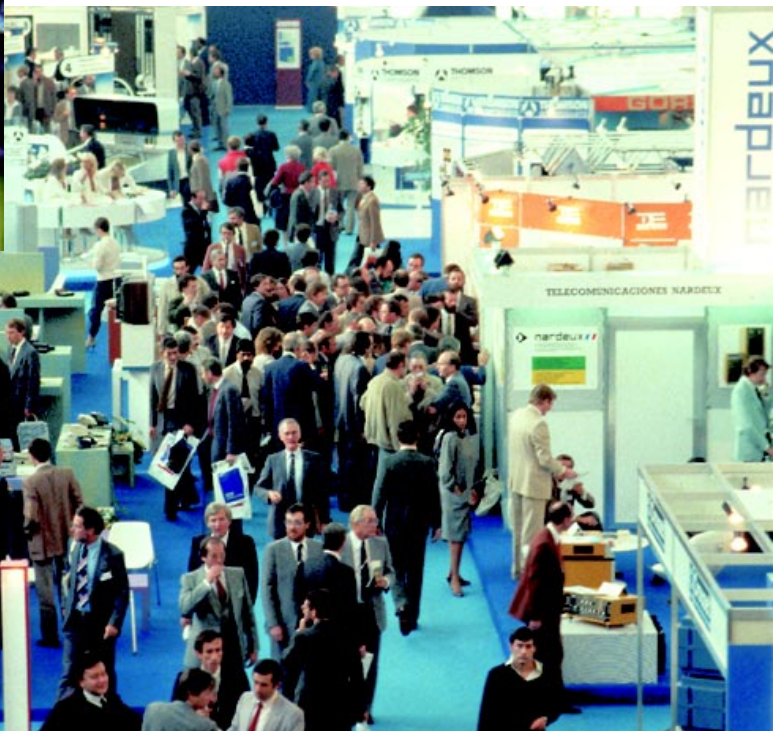
TELECOM 71



TELECOM 75



TELECOM 79



TELECOM 83



TELECOM 87



TELECOM 87



TELECOM 91



TELECOM 91



TELECOM 95

### **Palexpo expands to accommodate TELECOM 99 + INTERACTIVE 99**

**A**llotting space for the eighth World TELECOM Exhibition due to be staged in Geneva from 10 to 17 October 1999, was not easy, given that so many companies made it clear, as early as 1995, that they wanted to show the world their accomplishments and their novelties on the eve of the new millennium. ITU-TELECOM received too many requests for too little space. But during 1998 it was able, with the help of the Swiss authorities, to develop a project to use a whole new area in the gardens in front of the Palexpo Exhibition and Conference Centre.

The project, with its covered walkways, will be an integral part of Palexpo for TELECOM 99 + INTERACTIVE 99. Consisting of a press centre, four press conference rooms, a television studio, a restaurant and an exhibition hall, the area is certain to attract many visitors and of course the world's media.

Fully equipped in terms of network connectivity, air conditioning, etc., it will provide all the amenities

exhibitors and visitors to this global event are used to. For the exhibition itself, the project meant an extra 2500 m<sup>2</sup>, and will enable TELECOM to accommodate part of its long waiting list.

By the end of 1998 it was clear that in total the exhibition would cover 65 000 m<sup>2</sup> of net floor space, not counting additional storeys on multi-level stands.

Also, during 1998 the call for speakers for the Forum at TELECOM 99 + INTERACTIVE 99 was issued, and resulted in more than 1 100 abstracts being submitted to the Forum Programme Committee, which met in February 1999 to shape and define the Forum.

Since October 1998 the world event has enjoyed wide publicity in the business and trade press.

#### **TELECOM surplus funds boost development**

TELECOM events are staged for the benefit of ITU Member States and Sector Members. But as a business-oriented, semi-commercial organization within ITU, TELECOM also generates income. The Plenipotentiary Conferences of Kyoto (1994) and Minneapolis (1998) resolved that a significant part of any surplus income over expenditure derived from the activities of TELECOM should be used for specific telecommunication development projects, primarily in the least developed countries. Some of these projects are highlighted here.

They are managed by the Special ITU-TELECOM Development Programme, which



complements the activities of the Telecommunication Development Sector (ITU-D), over and above the activities which are undertaken by ITU under its ordinary budget.

Projects to be undertaken by this programme are to be carried out in the 1997–2002 time-frame, and can be grouped into the areas of human resource development, infrastructure development, assistance to countries in special need, and application of new technologies.

■ The **human resources development** component of the programme focuses on the establishment of four Centres of Excellence. An amount of CHF 2 million has been allocated by ITU to each Centre of Excellence as seed funding, and the commitment of these ITU funds will form the nucleus on which substantial further contributions will be raised, in cash and in kind.

Two of the centres will be sited in Africa, specifically in Dakar and Nairobi, where existing regional training institutions, the *Ecole supérieure multinationale des télécommunications* (ESMT) and the African Regional Advanced Level Telecommunication Training Institute (AFRALTI), are being transformed into Centres of Excellence.

The other two centres, which are being created in the Americas and Asia-Pacific regions, differ somewhat from the approach taken in Africa, in that a number of existing training and research institutes are being linked into a virtual network of Centres of Excellence.

The primary mandate of these Centres of Excellence will be to train public officials in policy and regulatory issues. They will also be a resource for Chief Executive Officers (CEO) of both established and new operating companies. Here, CEOs will be able to search out the information they need and network with their peers.

The centres will also have a number of other valuable functions, including the provision of training advice and information on the management of the frequency spectrum. Ministers will be able to use the centres to garner information and advice, particularly where large national and continental projects are concerned.

There will also be a continuous assessment at the Centres of Excellence of the regional impact as a

whole — and on specific countries of a given region — of multilateral telecommunication agreements. Moreover, the centres will be places where experts will be available who not only understand the issues involved but who will be able to dispense advice concerning the best ways of financing telecommunications development in both general and individual cases.

Finally, the centres will act as regional focal points where pilot projects can be defined and where demonstrations can be formulated, initiated and discussed. The centres, like the ITU itself, will be a place where, at the regional level, industry and government can come together to form lasting partnerships.

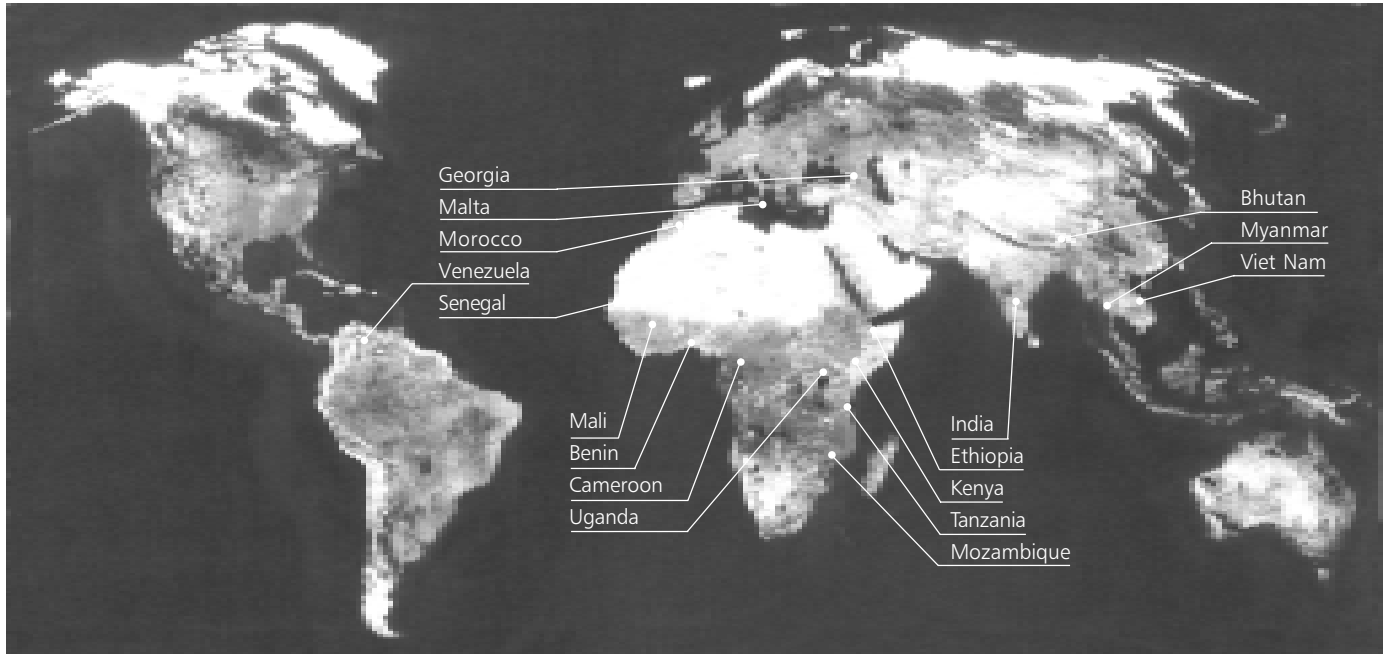
■ The **infrastructure development** component, to which CHF 4 million has been allocated, will enlist the commitment and cooperation of national governments, regional and international organizations and the private sector to modernize the Panaftel network in Africa, and to enhance local and regional manufacturing capabilities in that continent.

The modernization of the Panaftel network aims to strengthen the capabilities of national telecommunication operators to develop and better manage, operate and maintain African telecommunication networks. The project is expected to attract international expertise in the areas of integrated planning of telecommunications, traffic flows, the gradual digitalization of networks, maintenance and rehabilitation, and tariffs.

■ The amount of CHF 1.5 million has been committed to provide **assistance to countries in special need**, in accordance with resolutions which were adopted by the Plenipotentiary Conferences of Kyoto and Minneapolis.

The most recent project being implemented in this component of the programme provides assistance to the Telecommunication Regulatory Agency of Bosnia-Herzegovina. The project, which is being carried out in partnership with the European Bank for Reconstruction and Development (EBRD), aims to develop a short-term telecommunication development master plan for Bosnia-Herzegovina. *ITU News* has reported extensively on this project in previous issues.

Projects undertaken in this component of the programme will also address the needs of countries from



Projects undertaken in the 1997–2002 programme

the Caribbean and South Pacific regions for emergency standby telecommunication services. The availability of such services can often mean the difference between life and death in the case of tropical storms or hurricanes, and the ITU is committed to their provision wherever possible.

■ In the area of **application of new technologies**, CHF 4 million has been committed as seed funding for pilot projects which demonstrate and extend the benefits of communications technology to the public.

Projects are currently under way in India and Morocco in the area of tele-education and in Morocco and Venezuela in the area of electronic commerce. Community multipurpose telecentres are being implemented in Mali, Uganda, Mozambique, Benin, Tanzania and Viet Nam.

In the field of telemedicine five projects have been implemented in Mozambique, Myanmar, Georgia, Malta and Ukraine. Several others are under way in Cameroon, Ethiopia, Kenya, Senegal, Venezuela and Bhutan.

Other proposals are being assessed for application in developing countries, in fields such as transportation, the environment, tourism, agriculture, efficient government operations and good governance.

## Primary school teacher training in Morocco

In 1998, the preparatory work necessary to implement a pilot interactive teacher training project in Morocco was completed. The project is funded to the tune of more than USD 3.5 million by the Government of Morocco, the World Bank, an ITU-TELECOM surplus contribution and other partners. The project is being implemented by the ITU's Telecommunication Development Bureau (BDT) under a subcontracting arrangement for infrastructure and technical matters, and the United Nations Educational, Scientific and Cultural Organization (UNESCO) for programme issues and content.

The project was to establish 15 learning centres in Morocco to be operational in early 1999. By the end of 1998 a demonstration of very small aperture terminal (VSAT) equipment from *Gilat* (Israel) was already in Morocco and local staff had been recruited. The Moroccan telecommunications authority was approached to provide the satellite segments free of charge.

The pilot project takes advantage of VSAT technology, which allows outward broadcast quality for video, data and audio but also allows for a return

channel for audio and text. VSAT is simplified satellite technology which does not rely on any existing infrastructure — it also has the added advantage of being relatively inexpensive, particularly for the return signal. In distance-learning studies, student feedback is essential. So, simple broadcasting technology is not sufficient, as it does not allow at present for a return channel.

Each remote classroom will therefore be equipped with a class computer as well as simple individual feedback terminals — like a converted remote control unit — for each student.

The project has been established as part of UNESCO's "Education for All" programme. It uses new information technology to combine the potential use of television, telecommunications, and computers, and brings knowledge and learning directly to those who need it most. The project focuses on:

- improving the performance of less qualified teachers;
- enriching teachers' subject knowledge base;
- increasing teacher self-esteem and motivation;
- assessing the use of interactive educational television in developing countries;
- introducing the Internet to learning centres;
- enhancing community recognition of education in development.

A similar project is under way in India, in the states of Gujarat and Madhya Pradesh. Other countries have expressed their interest in this pioneering endeavour.

**Electronic commerce for developing countries (EC-DC)**

The ITU's electronic commerce for developing countries project aims to enable developing and least developed countries to use existing telecommunication infrastructures and services to participate in electronic commerce by providing a low cost gateway to the global market-place for merchants and small businesses. This can be achieved by using a distributed architecture that enables many merchants to share the cost of the electronic commerce infrastructure in their region, thereby increasing the likelihood of sustainability.

Beside the direct economic benefits, EC-DC will stimulate demand for Internet connection infrastruc-

ture, thereby complementing other BDT projects such as telemedicine and distance learning. It focuses on well-defined deliverables and encourages participation of the business and private sectors. It is a concrete example of the thesis ITU has long promoted that telecommunication development fosters economic development.

Many partners from both public and private sectors have expressed interest in participating financially in the implementation of EC-DC in their regions. Implementation of at least four EC-DC centres (the first two being in Morocco and Venezuela) is expected over the next two years.

EC-DC shows business communities in developing and least developed countries the value of the global telecommunications infrastructure which broadens markets by providing access to an international clientele.

For additional information on this project, please visit the website at: <http://www.itu.int/ECDC>.

<b>Growth in the World TELECOM Exhibition since its inception in 1971</b>			
world event	exhibitors	net exhibition space (m <sup>2</sup> )	visitors
TELECOM 71	250	14 000	28 000
TELECOM 75	360	16 600	40 000
TELECOM 79	600	35 000	41 000
TELECOM 83	659	41 000	77 000
TELECOM 87	803	53 600	105 000
TELECOM 91	850	87 260	132 250
TELECOM 95	1066	99 000	154 671

## The TELECOM Board

This Board was created following the recommendations of the High Level Committee (1990–1991), the body that advised the ITU on how to streamline and integrate its activities in today's competitive environment. The Board focuses primarily on providing advice to the ITU Secretary-General concerning technological trends and developments in telecommunications and related fields, both on a global and regional basis.



**Jean-Patrick Baré** has served ITU for more than twenty-three years in various capacities in the human resources management field. From 1990 until 1998, Mr Baré was the Chief of the Personnel and Social Protection Department. In March 1998, he was nominated President of TELECOM and Chairman, TELECOM Board. Since his appointment, Mr Baré presided over the successful AFRICA TELECOM 98, hosted in Johannesburg. This was ITU's twentieth TELECOM event and its fourth in the Africa region.



**Nils Ingvar Lundin** is Managing Director, Corporate Communications and Marketing, at *Investor AB* in Sweden. Before joining this company in 1995 he was head of Corporate Relations and Senior Vice-President of *Ericsson*. He joined Ericsson in 1985 after sixteen years with Swedish Television. Mr Lundin was President of the Swedish Public Relations Association from 1994 to 1996. He holds a Master of Law degree from the University of Lund.



**Osamu Hayama** is Professor of Business Policy at the Graduate School of Integrated Science and Art, University of East Asia (Japan). Before joining the university he served as Managing Director in charge of the Information Technology Research Laboratory and the Research and Consulting Division at Nomura Research Institute, Japan's leading "think-tank". In 1994, he served as a member of the Japanese Delegation to the Kyoto Plenipotentiary Conference of the ITU. In recent years he has been actively committed to telecommunications development activities in the Asia-Pacific region as the Coordinator of the Pacific Economic Cooperation Council (PECC) Telecommunication Forum and also as a Strategic Planning Committee member of the Pacific Telecommunications Council (PTC), among others.



**Andile Ngcaba** is the Director-General of the Department of Communications in South Africa. He holds a Masters Degree of Commerce from the University of the Witwatersrand, as well as management diplomas from the Stanford University Graduate School of Business and the National University of Singapore. He is also a research fellow of the City University School of Social Sciences in London. He is the founder of the Centre for the Development of Information Technology Programmes (CDITP), and serves as Council Member of the Eastern Cape Technikon and as technical adviser to *InfoDev* of the World Bank. He has international standing as member of the International Regulatory Colloquium and as a Board Member of the Telecommunications Development Advisory Group (TDAG) of the ITU. Mr Ngcaba has published a number of papers on both telecommunications and information technology.



**Janice Obuchowski** is President of Freedom Technologies Inc., a telecommunications research and consulting firm. Until 1992, she served as Assistant Secretary of Communications and Information at the United States Department of Commerce and Administrator of the National Telecommunications and Information Administration (NTIA). She was previously Executive Director, International Affairs for NYNEX and Senior Adviser to the Chairman of the Federal Communications Commission (FCC).



**Grégoire Sentilhes**, based in New York, is the Executive Vice-President of Marketing Worldwide of Bertelsmann BOL, the international e-commerce business. BOL was launched in Germany, France, the United Kingdom and the Netherlands in February 1999, and also operates in the United States. Before joining Bertelsmann, Mr Sentilhes was the CEO of *Matra Hachette Multimedia Online*, the online division of the group *Lagardère*, from 1993 to 1996. He is a board member of several Internet start-up companies both in the United States and Europe and has been an online pioneer since 1986 in the e-commerce, content and Internet communities since then. He has co-authored a book, the *Minitel strategy*, which was published in 1988.



**Bruce Willey** has been Vice-President, International Revenue Development for MCI International since 1985. He is responsible for PTT relationships, sales and marketing activities of MCI International in Europe, Asia-Pacific and Canada. His thirty-year career in international telecommunications has included senior posts with TRT and Western Union International. He is a member of the Telecommunications Task Force for the Pacific Economic Cooperation Council (PECC) and serves on the Board of Trustees of the Pacific Telecommunications Council (PTC). He is a member of the Advisory Board of the McLaren School of the University of San Francisco.

**The ITU-TELECOM Management Team**



*From left to right: Lili Rison, Vice-President, ITU-TELECOM and Head, Exhibitions Division, Jean-Patrick Baré, President, ITU-TELECOM, Fernando Lagraña, Vice-President ITU-TELECOM and Head, Forum Division, and Tom Dahl-Hansen, Senior Vice-President ITU-TELECOM, and Head, Business Development and Marketing Division*

## Direction of traffic Trading telecom minutes

**T**his is the title of a new major report which the International Telecommunication Union and TeleGeography, Inc. will launch on the occasion of World TELECOM 99 + INTERACTIVE 99 in October. The 330-page report (1999 edition) looks at the wholesale market for minutes of telecommunications traffic. It examines closely the transition from the traditional revenue-sharing mechanisms of the accounting rate system to newer, cost-orientated mechanisms, principally via domestic interconnect regimes or via the Internet. Country tables show the top 20 incoming and outgoing traffic routes for 1993–1997 for all the major traffic-reporting economies, plus trends in retail and wholesale prices.

“Trading telecom minutes” has at least two meanings in the context of the report.

The first meaning refers to the development of a market for minutes of telecommunications traffic, in terms of capacity, futures and options. It is symbolic of the changing rules of the game in international telecommunications, following the agreement concluded in 1997 by the World Trade Organization (WTO) on basic telecommunications and the emergence of a trading regime.

The second meaning has a much older heritage and refers to trading in the sense of exchanging: “will terminate your minutes if you terminate mine”. It is this principle, of fair exchange, which lies at the heart of international cooperation in telecommunications. The telegraph administrations of Europe in the 19th century quickly appreciated that it was to their mutual advantage to terminate each other’s traffic because they effectively gained the service of call termination free of charge.

Efforts to reform the accounting rate system, by providing mutually agreed guidelines as to what cost-orientated settlement rates should

look like, have moved further in the past twelve months than in the previous twelve years. The report argues that while the benchmarks of the United States Federal Communications Commission (FCC) failed to gain international consensus, the Commission’s action nevertheless gave the international community an additional impetus to tackle the accounting rate problem. The work carried out by the Focus Group on Accounting Rate Reform (see *ITU News*, No. 7/99, page 17) has now put in place a multilateral agreement on an ambitious set of targets which, if implemented, will bring cost-orientation considerably nearer.

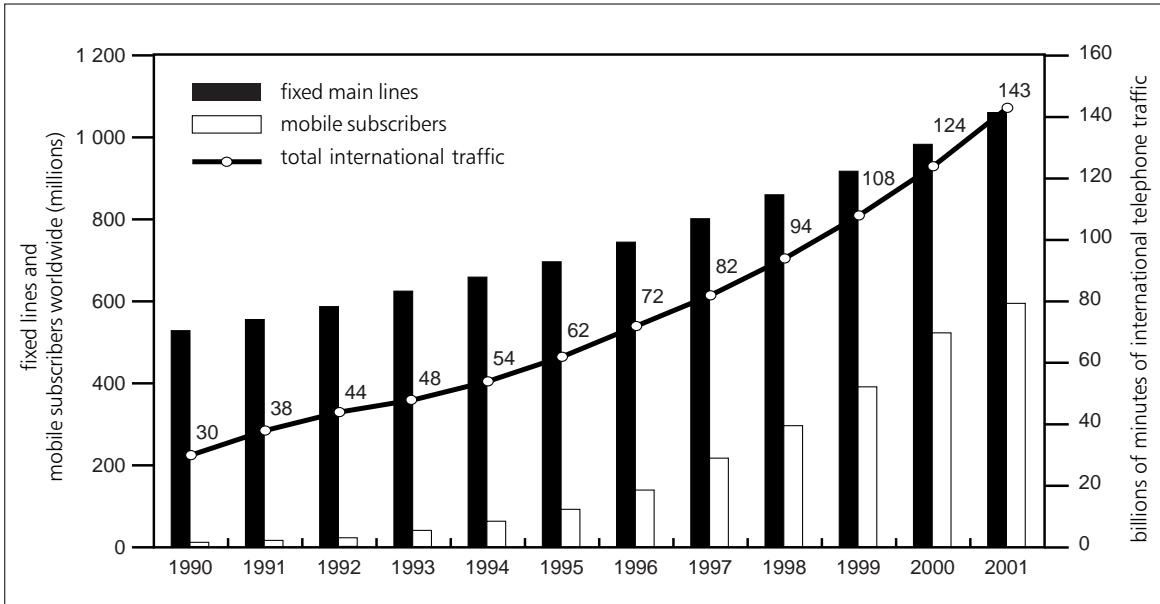
The report concludes that neither meaning of “trading telecom minutes” is likely to be adequate to describe the changes taking place in the international environment, because sooner or later, it will no longer be minutes which are traded, but rather megabytes, or some other capacity-based measure.

The following excerpts from the report are intended to provide an overview of the geopolitical dimension of communication and factors having an impact on the international traffic flow and patterns.

### Traffic trends

In 1997, the volume of international telephone traffic minutes was just under 82 billion minutes worldwide. On the basis of current trends, and taking into account the accelerated growth in the number of main lines and the continuing rapid expansion of the mobile network, one can reasonably expect that the number of minutes of international traffic will surpass 100 billion during 1999 and will reach 143 billion minutes by 2001 (see Figure 1).

At present, nearly three-quarters of international outgoing traffic is generated in just 23



Source: ITU, TeleGeography, Inc.

Figure 1 — International traffic, fixed main lines and mobile subscribers for the period 1990–2001

developed countries\*. The rest of the world accounted for the remaining one quarter of traffic. For incoming traffic, however, the story is somewhat different. The same developed countries account for only 57 per cent of international incoming traffic. It is this gap between the distribution of outgoing and incoming traffic which explains the requirement for an international settlements system and which is the main theme underlying this report.

At the start of 1998, the much-talked about concept of international telecommunications as a competitively traded service finally became a reality, with several major markets permitting competition for the first time. The forerunners were France, Germany, Italy and Switzerland. They were joined by Hongkong-China, Spain and Ireland by year-end 1998. Many other countries

are committed to opening up their markets in the first few years of the next decade, Singapore plans to do so in 2000.

A growing share of international traffic, perhaps as high as 30 per cent, now passes outside the traditional accounting rate system, with domestic interconnection becoming the dominant mode of operation, at least in Europe. In addition, as market liberalization spreads (see Table 1), a growing share of traffic is being resold under international simple resale (ISR) arrangements. A vibrant market has grown up for the trading of minutes of telecommunication traffic and options to deliver traffic.

The trading of discounted telecommunication minutes is a sign of an increasing level of price discrimination in the telecommunications sector which is now operating not only at the level of retail minutes but also for wholesale traffic. In other industries, such as airlines, the concept of selling off surplus capacity at discounted rates has long been a familiar practice. It is commonplace to observe that few people travelling on an aeroplane have paid exactly the same price. The price of seats is differentiated in quality according to booking restrictions on the ticket,

\* For the purposes of the analysis here, the developed countries might be broadly defined as the 15 European Union Member States plus Iceland, Norway, Switzerland, Canada, United States, Australia, Japan and New Zealand.

**Table I**  
**Changing market structure**

(Countries permitting competition in international telephony)

1990	1998	1998 (cont'd)
Japan	Australia	Italy
New Zealand	Austria	Japan
United Kingdom	Belgium	Korea (Rep. of)
United States	Brunei Darussalam	Malaysia
	Canada	Mexico
	Chile	Netherlands
<b>1995</b>	Colombia	New Zealand
Australia	Dem. Rep. of the Congo	Norway
Canada (partial)	Denmark	Peru
Chile	Dominican Rep.	Philippines
Colombia	El Salvador	Russia
Denmark	Finland	Somalia
Finland	France	Spain
Japan	Germany	Sweden
Korea (Rep. of)	Ghana	Switzerland
Malaysia	Guatemala	Uganda
New Zealand	Hongkong-China	Ukraine
Philippines	Indonesia	United Kingdom
Sweden	Ireland	United States
United Kingdom	Israel	
United States		

Source: ITU "Telecommunication Regulatory Database", ITU/TeleGeography, Inc. "Direction of Traffic" Database and WTO.

the quality of the seats and the service, and the extent to which the tickets are bundled with other services, for instance as part of a package holiday. However, all passengers on the plane leave and arrive at the same time.

In the telecommunications industry, price differentiation has been slower to develop. After all, PTOs have long prided themselves on achieving a uniform level of quality for call connection and transmission, at a non-discriminatory price.

Today, PTOs face a dilemma. It is widely believed that networks operating under the Internet Protocol (IP) will soon become the public network. Traffic on the public switched telephone network (PSTN) continues to grow, increasing at rates of between 5 and 15 per cent per year on most routes. While hard data is difficult to come by, a useful rule of thumb is that Web-based traffic is doubling in size every 100 days or so. That means that if you begin a service with 100 units of traffic, by the end of one year there will be 1250 units, and by the end of

## At what point will the volume of IP traffic overtake voice traffic?

A few countries now report Internet usage statistics insofar as the Internet connects with the PSTN. An example of this is KPN of the Netherlands, which has reported that in 1998 some 21 per cent of their local traffic was attributable to the Internet, up from 13 per cent in 1997.

The most dramatic statistics are those published by OFTA, the regulator for Hongkong-China. At the start of 1998, dial-up use of Internet was more or less equal with the volume of international calls from the territory (incoming plus outgoing combined). By the spring of 1999, dial-up Internet use was twice as high as international calls. Indeed, the fact that Hongkong's volume of international calls, which had been growing by 16 per cent per year between 1991 and 1997, actually *declined* in 1998, suggests that at least a percentage of the growth in Internet traffic is due to IP telephony which is substituting for calls over the fixed network.

The statistics reported by Deutsche Telekom tell a similar story. During 1998, Deutsche Telekom's calls to *T-Online*, its Internet service provider (ISP), grew by 86 per cent to 7.7 billion minutes overtaking its 4.7 billion minutes of international outgoing traffic. Indeed, Deutsche Telekom's domestic long-distance and international outgoing traffic both declined during that year. If one takes into account calls to other German ISPs as well as Internet traffic generated from leased line users, then Germany's Internet traffic almost certainly exceeds its international traffic (incoming and outgoing) by a comfortable margin, as in Hongkong-China.

The next cross-over point will be when IP traffic overtakes global voice and fax traffic (international plus domestic). The current best guess is that this will happen some time around 2003-2004, though it will happen earlier in some economies. The significance of this date is that once the cross-over is achieved, voice will increasingly become an add-on service, bundled in with data carried over the Internet.

**Table 2**  
**Top 20 developing country public telecommunication operators**  
(Ranked in terms of minutes of outgoing international traffic, 1997)

rank	PTO (economy)	financial year end	minutes of international telecommunication traffic, 1997 (000s)	% change 1996-1997	revenue from international services 1997 (USD m)	% change, 1996-1997	international revenue as % of total telecommunication revenue
1	Hong Kong Telecom International (Hongkong-China)	1 April	1 718.0	-1.2	2 194.9	-2.5	48.5
2	DGT (China)	31 Dec.	1 632.0	13.9	2 107.4	26.3	12.3
3	Telmex (Mexico)	31 Dec.	1 009.0	-5.8	1 446.3	-23.6	18.9
4	MOPTT (Saudi Arabia)	31 Dec.	801.3	37.1	1 174.9	11.7	50.3
5	SingTel (Singapore)	1 April	753.0	21.6	1 377.8	2.6	46.7
6	Chungwa Telecom (Taiwan-China)	30 June	743.1	14.5	797.1	-14.3	15.7
7	Etisalat (United Arab Emirates)	31 Dec.	738.0	25.2	472.9	-9.1	42.0
8	KT (Korea (Rep. of))	31 Dec.	610.0	17.3	1 227.6	8.6	14.4
9	TM (Malaysia)	31 Dec.	589.0	3.2	497.6	-3.5	19.5
10	Türk Telekom (Turkey)	31 Dec.	557.5	17.8	460.9	8.1	12.8
11	TP (Poland)	31 Dec.	529.4	21.1	670.9	6.4	25.2
12	Utel (Ukraine)	31 Dec.	487.0	461.1	172.3	3.5	—
13	EMBRATEL (Brazil)	31 Dec.	477.0	24.6	399.7	9.3	19.9
14	VSNL (India)	1 April	422.0	9.6	1 599.7	9.1	90.8
15	Telkom (South Africa)	1 April	368.8	4.5	652.9	0.6	14.9
16	SPT Telecom (Czech Republic)	31 Dec.	306.1	5.7	240.6	-27.5	19.1
17	Bezeq (Israel)	31 Dec.	300.0	-6.3	428.8	-45.3	16.9
18	Indosat (Indonesia)	31 Dec.	298.1	20.1	443.1	-7.1	88.6
19	Rostelecom (Russia)	31 Dec.	288.5	23.3	279.4	-64.5	17.5
20	HTC (Hungary)	31 Dec.	287.1	7.4	191.4	80.7	14.1
	average/total		12 914.8	14.8	16 836.2	3.7	22.7

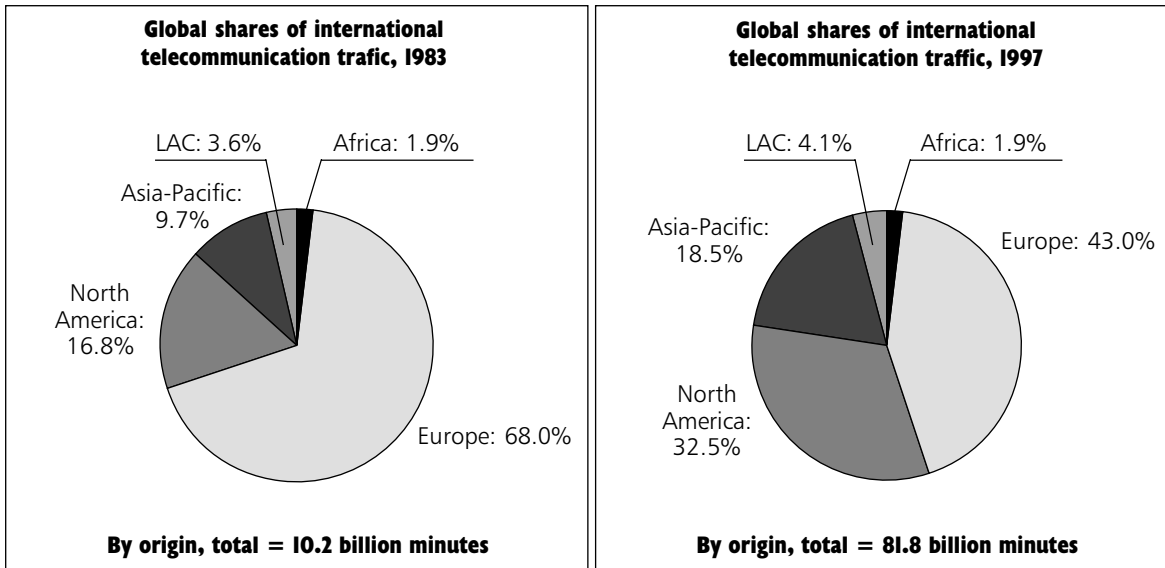
Source: ITU PTO database.

five years there will be more than 30 million units. The problem, therefore, becomes how to scale networks to grow at the same pace as market demand is growing.

### Implications for developing countries

During the period between 1993 and 1998, a total of around USD 40 billion passed from developed countries to the developing world through the workings of the accounting rate system. The United States alone contributed more than 25 billion to this net transfer. Understandably, developing countries are fearful about what will happen to this source of funds as a

result of the changes to the international telecommunications environment described in the report. Many developing countries are vulnerable to sudden changes, particularly small island States and others which derive a large percentage of their total telecommunication revenues from international traffic. The report looks at different scenarios for reform of the accounting rate system, including FCC benchmarks, the "indicative target rates" proposed by the Focus Group on Accounting Rate Reform, termination rates, staged reductions and a move towards sender-keeps-all. Whichever scenario comes to pass, it is likely that the current volume of cross-border financial transfers, particularly from de-



Note: LAC = Latin America and Caribbean.  
 Source: ITU/TeleGeography, Inc. "Direction of Traffic" Database.

Figure 2 — The changing pie (regional shares of global international traffic, by origin, in 1983 and in 1997)

veloped to developing countries, will diminish in size and significance.

Developing countries face a dilemma: do they continue to keep wholesale and retail prices for international traffic high, in order to cross-subsidize access networks, or should they cut prices in order to prevent traffic streams shifting to the Internet? The preliminary 1998 traffic statistics show an appreciable downturn in the rate of growth (falling below 10 per cent for the first time in several decades) and actual decline in outgoing traffic in the case of some economies, such as Hongkong-China (see box). While the downturn in the Asia-Pacific region may be partly a result of the Asian financial crisis, a further explanation is almost certainly due to the loss of accounting rate traffic, especially fax, to the Internet.

Table 2 shows top 20 developing country public telecommunication operators.

### Europe's disappearing market share

The report claims that fifteen years ago, Europe enjoyed a share of more than two-thirds of the global market-place. Now that share has

slipped below 50 per cent (see Figure 2). By contrast, the North American market, which has experienced competition for all of that period, has grown twice as fast as the rest of the world and consequently its share has doubled to almost one-third of total outgoing international traffic. Other developing regions of the world — Asia-Pacific and Latin America and the Caribbean — have also grown their share of the world market at Europe's expense.

### Hard times for international carriers

Will the introduction of competition in Europe reverse the trends towards declining market share? The early signs are that it will, but only at significant cost to the incumbent operators of the region. Several European operators, such as Telefónica and Belgacom, succeeded in growing their international traffic streams at a faster rate than the average for the top 20 operators (see Table 3). But they were only able to do this by cutting prices as they prepared for the introduction of competition. As a result, the overall revenue they derived from international service declined between 1996 and 1997. Over-

**Table 3**

**Top 20 developed country public telecommunication operators**

(Ranked in terms of minutes of outgoing international traffic, 1997)

rank	PTO (economy)	year end	minutes of international telecommunication traffic, 1997 (000s)	% change, 1996–1997	revenue from international services, 1997 (USD m)	% change 1996–1997	international revenue as % of total telecommunication revenue
1	AT&T (United States)	31 Dec.	10 331	8.2	5 786	0.2	11.3
2	MCI WorldCom (United States)	31 Dec.	7 307	17.6	4 743	21.1	17.9
3	Deutsche Telekom (Germany)	31 Dec.	4 813	1.1	3 806	-7.6	9.8
4	France Télécom (France)	31 Dec.	3 100	4.4	2 165	-25.1	8.1
5	Sprint (United States)	31 Dec.	2 759	0.5	1 478	-1.0	9.9
6	BT (United Kingdom)	1 April	2 710	4.5	2 542	-9.9	9.9
7	Telecom Italia (Italy)	31 Dec.	2 209	8.9	1 520	-6.4	8.7
8	Swisscom (Switzerland)	31 Dec.	1 957	6.6	965	-9.9	14.2
9	Telefónica (Spain)	31 Dec.	1 566	31.7	824	-15.2	5.1
10	KPN (Netherlands)	31 Dec.	1 535	0.1	1 072	-17.4	13.5
11	Belgacom (Belgium)	31 Dec.	1 340	14.9	565	-19.1	13.3
12	Teleglobe (Canada)	31 Dec.	1 124	22.9	779	2.4	54.2
13	KDD (Japan)	1 April	1 105	0.2	2 079	-14.5	68.9
14	PTA (Austria)	31 Dec.	996	5.1	492	-11.8	13.2
15	C&W Comms (United Kingdom)	1 April	971	27.3	381	14.8	10.2
16	Telia (Sweden)	31 Dec.	747	5.8	259	-27.0	4.3
17	Pacific Gateway (United States)	—	720	—	173	—	—
18	Telstra (Australia)	30 June	700	-0.3	996	-4.9	8.4
19	Telecom Eireann (Ireland)	1 April	635	9.5	606	8.3	29.5
20	OTE (Greece)	31 Dec.	597	15.2	548	-2.9	16.7
	average/total		47 323	8.6	31 779	-5.1	11.1

Source: ITU PTO database.

all, the level of revenue from international services of the top 20 developed country operators fell by almost 10 per cent in United States dollar terms in the period 1996–1997. Developing country operators also experienced a fall, though not by so much.

### **The Internet as the new public telecommunication network**

The analysis of traffic trends presented in the report suggests that the Internet will not only be the major demand driver for international traffic growth in the next decade (see box), but it will also be a major influence on the future of more traditional traffic streams, principally voice

and fax. Given the economies of scale that Internet traffic will be able to achieve from its volume growth, and the in-built advantages which IP traffic already holds over PSTN traffic in terms of cost effectiveness, it is likely that increasing shares of the voice and fax traffic currently carried on the PSTN will shift to the Internet. The Internet may indeed become the public telecommunication network rather than being simply an adjunct of it. The principal technical difference will be that traffic would be routed rather than switched, but that fact will be irrelevant to the average user who mainly wants lower prices. Ultimately, in a competitive market-place, what the consumer wants, the consumer gets. ■

## **ITU and UNDP talk of closer cooperation**

**T**he International Telecommunication Union and the United Nations Development Programme have long been partners in the provision of technical cooperation to developing countries. Both organizations are now looking to strengthen their partnership to respond to growing challenges.

The need to strengthen this partnership was discussed on 8 September 1999, when UNDP's Director for the European Bureau, Odile Sorgho-Moulinier, and Deputy Director, John Fabre, paid a courtesy visit to ITU Secretary-General, Yoshio Utsumi.

"The time has come to create a new framework for an even closer relationship", said Mr Utsumi, acknowledging the good relationship that has prevailed over the years. "I am confident that UNDP's European Office will serve as an effective focal point as we look for more formal arrangements", he added.

Ms Sorgho-Moulinier, whose last duty station was Senegal, praised the ITU field office for its commitment to the United Nations Development Assistance Framework (UNDAF). UNDAF is a key part of the reforms announced by the United Nations Secretary-General in 1997.



*Odile Sorgho-Moulinier and Yoshio Utsumi*

## From official sources

### NEW MEMBERS

#### Development Sector

*National Telephone Cooperative Association (NTCA) (Arlington, VA), Saudi Logistics and Electronics Company Ltd. (SALEC), (Jeddah, Saudi Arabia) and Vodafone AirTouch International Ltd. (Newbury, United Kingdom)* have been admitted to take part in the work of this Sector.

#### Radiocommunication Sector

*New Skies Satellites N.V. (The Hague) and Vodafone AirTouch plc (Newbury, United Kingdom)* have been admitted to take part in the work of this Sector.

#### Standardization Sector

*Fujitsu Europe Telecommunications Research and Development Centre Ltd. (FTRC) (Uxbridge, United Kingdom) and Rostelecom (Moscow)* have been admitted to take part in the work of this Sector.

#### New denominations

*CaribSpace Limited*, which participates in the work of the Development Sector has changed its name. The new denomination is: **WorldSpace Caribbean (Port of Spain)**.

*GSM MoU Association* which participates in the work of the Radiocommunication Sector has changed its name. The new denomination is: **GSM Association (Dublin)**.

*GTE Business Development and Integration*, which participates in the work of the Development, Radiocommunication and Standardization Sectors has changed its name. The new denomination is: **GTE Service Corporation (Irving, TX)**.

*Hong Kong Telecom International Limited (HKTI)*, which participates in the work of the Radiocommunication and Standardization Sectors has changed its name. The new denomination is: **Cable & Wireless HKT International Limited (Hong Kong)**.

*Measat Global Telecommunications Sdn. Bhd.*, which participates in the work of the Radiocommunication and Standardization Sectors has changed its

name. The new denomination is: **Maxis International Sdn. Bhd. (Kuala Lumpur)**.

*o.tel.o communications GmbH & Co.*, which participates in the work of the Standardization Sector has changed its name. The new denomination is: **Mannesmann o.tel.o GmbH (Cologne, Germany)**.

*Sprint Communications*, which participates in the work of the Standardization Sector has changed its name. The new denomination is: **Sprint Corporation (Westwood, KS)**.

*Telecomunicaciones Internacionales de Argentina, Telintar S.A.*, which participates in the work of the Development, Radiocommunication and Standardization Sectors has changed its name. The new denomination is: **Telefónica Larga Distancia de Argentina S.A. (TLDA) (Buenos Aires)**.

### VACANCY NOTICES

Circular letters (via facsimile) which have been sent to all Member States and Sector Members of the Union announce the following vacancies:

- one post of **Head of the Spanish Translation Section, grade P.5**, to be filled in the General Secretariat, Conferences Department, as soon as possible for a period of two years with the possibility of extension (circular letter No. 025 of 4 August 1999; vacancy notice No. 18–1999 ITU; final date for submission of applications: 4 November 1999);

- one post of **Radiocommunication Engineer, grade P.4**, to be filled in the Radiocommunication Bureau, Space Services Department (SSD), as soon as possible for a period of two years with the possibility of extension (circular letter No. 027 of 25 August 1999; vacancy notice No. 19–1999 ITU; final date for submission of applications: 25 October 1999);

- one post of **Technology Information Officer/Administrative Officer, grade P.3**, to be filled in the General Secretariat, as soon as possible for a period of two years with the possibility of extension

**From official sources (continued)**

(circular letter No. 026 of 17 August 1999; vacancy notice No. 20–1999 ITU; final date for submission of applications: 18 October 1999);

- one post of **Administrative Officer, grade P.3**, to be filled in the Telecommunication Development Bureau, Field Operations Department (FOP), as soon as possible for a period of two years with the possibility of extension (circular letter No. 028 of 30 August 1999; vacancy notice No. 21–1999 ITU; final date for submission of applications: 30 November 1999);

- one post of **Head, Terrestrial Services Department, grade D.1**, to be filled in the Radiocommunication Bureau, Terrestrial Services Department (TSD), as soon as possible for a period of two years with the possibility of extension (circular letter No. 029 of 30 August 1999; vacancy notice No. 22–1999 ITU; final date for submission of applications: 1 November 1999);

- one post of **Engineer-Editor (English Language), grade P.4**, to be filled in the Radiocommu-

nication Bureau, Terrestrial Services Department (TSD), as soon as possible for a period of two years with the possibility of extension (circular letter No. 030 of 1 September 1999; vacancy notice No. 23–1999 ITU; final date for submission of applications: 1 November 1999);

- one post of **Head of the Budget Division, grade P.5**, to be filled in the General Secretariat, Finance Department (FI), as soon as possible for a probationary appointment (circular letter No. 031 of 9 September 1999; vacancy notice No. 24–1999 ITU; final date for submission of applications: 9 November 1999).

Detailed applications with ITU personal history form should be submitted to the General Secretariat of the ITU, Place des Nations, CH–1211 Geneva 20 (Switzerland), no later than the final dates mentioned above.

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**ITU Regulatory Colloquium No. 8 (Geneva, Switzerland, 14–16 December 1998)**

Telecommunications Regulatory Issues for Electronic Commerce (Briefing Report No. 8, February 1999) (92-61-08051-0)  
Separate editions in F, E, S, (CHF 50)

**Telecommunication Development Sector**

**Guide for the introduction of a Computerised Subscriber Management System (CSMS) (Geneva, 1998)**

(92-61-07941-5)  
Separate editions in F, E, S (CHF 32)

**ITU–D Study Groups First Study Period (1995–1998) Report on Question 2/2**

Preparation of handbooks for developing countries: new developments in rural telecommunications

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Preparation of handbooks for developing countries: economic, organizational and regulatory aspects of national spectrum management (92-61-08131-2)  
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**Radiocommunication Sector**

**Manual for use by the Maritime Mobile and Maritime Mobile-Satellite Services (Edition 1999)**

(92-61-08031-6)  
Separate editions in F, E, S (CHF 55)

**Handbook on the Technical Specifications of ITU–R Teletext Systems (1999)**

(92-61-06641-0)  
Separate editions in F, E, S (CHF 60)

## Publications *(continued)*

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## Telecommunication Standardization Sector

#### **ITU-T Recommendation G.703 (10/98)**

Physical/electrical characteristics of hierarchical digital interfaces  
Separate editions in F, E, S (CHF 22)

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Enterprise viewpoint for topology management  
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Example of linking options between annexes of ITU-T Recommendation J.112 and annexes of ITU-T Recommendation J.83

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## **As the clock ticks to 1 January 2000... ... are you ready?**

**Gill Govier**

**Manager, Corporate/Engineering Programmes, Inmarsat Ltd  
and Chairman, Information Management Subgroup, ITU Year 2000 Task Force**

### **The Year 2000 Task Force**

**T**he highly prestigious ITU Year 2000 Task Force has achieved remarkable success since its inauguration at a meeting of Study Group 2 of ITU's Telecommunication Standardization Sector (ITU-T) in March 1998. The international team of volunteers led by BT's Ron Balls have ensured that our industry is confident that no major disruption to telecommunications will occur as a result of the Year 2000 issue.

"This has got to be one of the most outstanding achievements in international telecommunications cooperation. We could not have reached our goals without the strong spirit of teamwork and the recognition of the mutual benefit to be gained by pooling of resources, expertise and information", said Mr Balls. It is therefore no surprise to those who know the background and history of the ITU, that the Year 2000 Task Force has achieved high levels of cooperation both across countries and between competing operators in the same country, which is unprecedented outside the telecommunications industry.

"The task force needed a close and active collaboration with ITU-T Study Group 2 and we were most fortunate to have the support of John Tar, Counsellor of the Telecommunication Standardization Bureau (TSB) to help guide us through", added Mr Balls.

The task force has sought to involve as many industry representatives as possible in its work: telecommunication operators, satellite providers and vendors have joined in regular meetings of the task force over the past eighteen months. "Everyone has contributed such a great deal", said Tomas Nylund of *Telia* (Sweden) and Vice-Chairman of the task force. "We needed to disseminate vital information on the nature of the 'Y2K' problem as it relates to telecommunications and

we have relied upon members' hard work and dedication to support the wide variety of work needed to achieve our goals. We can now have confidence that our industry will continue to provide our customers with a seamless service when the clock ticks forward to 1 January 2000."

The task force has worked alongside a number of international Year 2000 Groups representing a variety of industries. This was useful to demonstrate to them the commitment of the telecommunications industry in fighting the so-called "millennium bug" and provide the assurances they need that our services are ready for the date change. In addition, Mr Balls has represented the team at the United States Senate and in the United Nations.

#### **Inter-carrier testing**

Even before the official inception of the task force, the telecommunications community were already preparing for the millennium by looking at the potential for conducting inter-carrier tests. The drive behind the initiative was customers and regulators seeking assurance that their telecommunication suppliers were addressing the "bug" in a diligent manner. Under the leadership of Mick Heduan of BT, supported by Colin Williams of Cable & Wireless, the Inter-Carrier Testing Subgroup was established in February 1998 to work out how best to assess the risks associated with telecommunications business and continuity of services and to test the wide variety of manufacturers' equipment across time zones without interrupting operational service. Mr Heduan was appointed Chairman of the subgroup and Mr Williams as its Vice-Chairman.

"We started the Inter-Carrier Testing Subgroup with about a dozen very eager people representing various European telecommunications and satellite providers", said Mr Heduan. "The group went from strength to strength and very quickly developed a rapport which was to filter throughout the task force. The cooperation, trust and contributions from all members of the subgroup has been unprecedented. Dozens of carriers and operators from all parts of the world have worked as part of a single team to address the Year 2000 challenge."

International gateway testing is part of a multi-layered approach being used by most major telecommunication operators to prepare their networks for the next millennium. Testing the international switches has been for many telecommunication operators the final major element of their Y2K test programmes and is on top of the thousands of extensive tests already conducted by operators and their vendors on domestic networks.

With the successful completion of international gateway switch testing, the participating telecommunication operators are highly confident in their customers' ability to complete international calls before, during and after the Year 2000 transition.

By the beginning of 1999, the enthusiasm to prove that two or more carriers could continue to operate across the millennium transition had grown to such amazing proportions that the subgroup had to split into a number of regional groups.

"I have been so impressed in the way in which our work has proceeded unhindered by the competitive forces that normally shape relationships in today's global communications market. So many international carriers have been supportive and willing to share their experiences", said Mr Williams. Over 100 inter-carrier tests have already been completed without any reported Year 2000 related anomalies.

The first such test, designed jointly by Telia and *Deutsche Telekom*, formed the basis for what became a highly successful series of inter-carrier tests performed since August 1998. The two European companies geared themselves up for time travel into the next century by agreeing to connect their representative switches and international gateways using captive test environments and dedicated circuits in order to pass voice traffic across the 1999–2000 time boundary. At the eleventh hour, *Hong Kong Telecom*

requested to join the party and so the first Year 2000 inter-carrier tests were performed.

Tension grew as the Hong Kong installation rolled forward to the millennium with calls established to both Sweden and Germany, and quickly dispersed as the clock ticked by without interruption to the voice circuits established at the time. The success story continued when the European sites were able to make the transition without failure, a theme which has continued throughout the world between carriers and continents using voice and data services.

## Development

Vishnu Calindi of ITU's Telecommunication Development Bureau (BDT) has been the strength behind the Task Force Development Subgroup, focused on providing first-hand information and support in the appropriate language through regional workshops, expert visits and tailored documentation.

"We are indebted to our regional hosts for providing us with the possibility to reach such a wide target audience. Without their support and generosity our task would have been made very much more difficult", said Mr Calindi.

Participants in the seven regional workshops have come from administrations and operating agencies, major vendors and international and regional satellite organizations and the World Bank. The workshops addressed a range of issues which are essential to a successful Year 2000 compliance programme such as testing, quality assurance, management of supplier relations and contingency planning. The supplier panels featured presentations on the status of compliance of products, the capacity to meet the needs of operators and their own contingency plans.

"The workshops were invaluable in identifying countries that need further assistance as well as the future information needs of developing countries. We were also delighted in the willingness of participants to constitute themselves as Regional Working Parties of the ITU Year 2000 Task Force in order to maintain a flow of information", added Mr Calindi. While enlarging the scope of participation in the task force, this structure facilitates a continuous sharing of experience and creates a continuing forum in which to discuss mutual issues and problems and develop common solutions.

Significant and highly valued in-kind contributions have been received from the Australian Government, BT, Bell South International, Cable & Wireless, Deutsche Telekom, Inmarsat Ltd, the International Telecommunications Satellite Organization (INTELSAT), South Africa's Telkom and Telia. The administrations of South Africa, Morocco, Egypt, Australia, Brazil, Russia, Poland and Jordan provided support and facilities for the organization of workshops.

Following the success of the regional workshops, requests for expert support in launching and managing Year 2000 projects were received from several administrations. "I am most grateful to the numerous experts from companies more advanced in working with the Year 2000 problem who gave generously of their time and expertise by providing specific support to individual countries", said Mr Calindi. At the time of going to press, the task force was preparing a delegation of experts to visit China, India and Pakistan for consultation and discussions with operators and administrations on aspects of Y2K testing and business continuity testing.

## **Contingency planning**

### **The best laid plans of mice and men...**

Following the first phase of awareness-raising workshops, a major element of the work programme of the ITU Year 2000 Task Force has been to focus on technical assistance in the area of business continuity planning. The Business Continuity Subgroup, which is also led by Mr Nylund, has gone from strength to strength following its introduction as the fourth discipline to be added to the Year 2000 Task Force.

The subgroup has been proactive in providing operators with the background and methodology on how to develop contingency and business continuity plans and to demonstrate these through practical workshops designed specifically for this purpose. The group has also provided a useful guide to contingency planning in telecommunications and an international business continuity plan.

### **Early warning**

The newest subgroup to emerge from the task force focuses on the need to ensure information is shared

and quickly disseminated at the transition to the millennium. Gene Talley of GTE, has taken up the gauntlet leading a small team of specialists to work out how best to achieve these goals

## **Information management**

Our role has been to raise awareness and make sure the industry understands the problem, how to tackle it and where to seek assistance.

One of the first activities coordinated by the Information Management Subgroup was to issue a self-assessment questionnaire to all ITU Members with the aim of understanding the readiness and plans of the telecommunication community for meeting the millennium transition.

We were very impressed by the volume and speed of responses from the telecommunication community to the questionnaire. Over 500 responses from 150 countries have been received. We would like to thank all Members for participating, providing open and honest input to a very important survey.

The responses were used in a variety of ways. First of all, to provide information to the public via the newly-formed ITU/Y2K website. George Ganakas of Telstra and Vice-President of the subgroup explained: "We were, and continue to be inundated with requests for information on the readiness of our industry to meet this challenge. The survey responses provide very succinct information and the Internet a medium to reach the world with a single message."

"We were also able to support the efforts of the testing, contingency and development subgroups because the responses highlighted different needs for the task force to address", explains Mr Ganakas.

A key element of the work of the group has been the development of the ITU website by ITU-T's own Al Dayao. "The ability to bring a common message to the whole world is the beauty of this medium. We have been able to share information both within the task force, across the telecommunications community and with all other industries", said Mr Dayao.

The website address is <http://www.itu.int/y2k> and contains information from all the subgroups including events, reports, tools and guidance.

Through active collaboration between a number of experts of the ITU Year 2000 Task Force and BDT, a

comprehensive *Year 2000 Guide* was prepared and widely distributed under the signature of the ITU Secretary-General to all ITU Member States and Sector Members, as well as to other international and regional bodies and standards organizations.

"The Guide has provided telecommunication operators with a high-level overview of the process of dealing with the Year 2000 phenomenon", said Vicki MacLeod, its principal author and member of the Information Management Subgroup. "The Guide supplements the other activities of the Year 2000 Task Force and the technical assistance activities carried out by BDT. It has provided all countries, especially the developing ones, with timely practical advice on

how to prepare their telecommunication infrastructure for the millennium change."

As well as dealing with the constant stream of E-mail messages and telephone queries, the Information Management Subgroup have been proactively providing regular news and articles and speaking at conferences.

Working with my colleagues in the task force has been a very satisfying and rewarding experience. I am proud to have been part of its success. I believe the telecommunications industry should congratulate itself for its achievements in tackling the millennium bug: we are all much richer for having worked together harmoniously towards tackling this common problem. ■

## A round-up of regional radiocommunication seminars

The first half of 1999 was marked by a series of regional seminars organized by the Radiocommunication Bureau (BR).

### ■ Cuba

Havana played host to the first of these seminars (19–23 April), held under the auspices of BR and the Ministry of Communications of Cuba for Region 2 countries.

The seminar served to provide an update on the Radio Regulations adopted by the World Radiocommunication Conference in 1997 (WRC-97), as well as to train participants on how to complete the new notice forms prepared in conformity with the new procedures of the Radio Regulations and how to use the computer tools developed by BR.

Some eight countries from the region took part in this event, which was chaired by Carlos Martínez Albuérne, Director of Spectrum Control in the Ministry of Communications. Hugo Fernández MacBeath (Cuba) gave a lecture on national spectrum management, highlighting the various functions and responsibilities of spectrum managers in that country. Mario Maniewicz from ITU's regional office in Brasilia reviewed the main features of the Valletta Action Plan and how they are being implemented in Region 2.

Michel Giroux, Jacques Fonteyne, Alberto Méndez, Nelson Malaguti de Sousa and Ronald Quin-

tero of BR gave lectures on terrestrial and space services. A full day was dedicated to software demonstrations: the engineering tools, the new paper and electronic formats now in use for notifying radiocommunication data, and the new CD-ROMs produced by BR.

More than 450 pages of documentation were circulated in English and Spanish. Every seminar enables BR to improve on this documentation which is fast becoming a work of reference, particularly as regards the various procedures of the Radio Regulations.

Participants asked numerous questions throughout the seminar, making it a highly interactive event. One conclusion was that the material presented is becoming too large for a five-day event. BR plans to select, through consultations, subjects that are of greater importance to the participants ahead of the seminars in order to limit the content.



*The seminar participants*

A general discussion, just before the closing ceremony, offered participants the opportunity to make comments and suggestions for future seminars. Each participant received a certificate.

## ■ Mali

From 3 to 6 May 1999, a total of 64 participants from 29 countries took part in the Regional Seminar on Broadcasting held in Bamako, organized at the request of the *Union des radiodiffusions et télévisions nationales d'Afrique* (URTNA) and supported by the *Société des télécommunications du Mali* (SOTELMA) and the *Office de radio-télévision du Mali* (ORTM).

The opening ceremony was presided over by Ms Tamboura O. Ascofare, Minister of Communications, in the presence of Abdel Hamid Bouksani, Secretary-General of URTNA. The International Telecommunication Union (ITU) was represented by Michel Giroux of the Radiocommunication Bureau (BR).

This regional seminar, the first to deal exclusively with broadcasting issues, was chaired by Nouhoum Traoré of ORTM. Most participants were representatives from the broadcasting sector or from regulatory

bodies. The participants showed keen interest in the ITU presentations concerning the regional plans for sound and television broadcasting (Geneva Plans of 1975, 1984 and 1989). They participated widely in the work sessions featuring software for assessing the impact of draft amendments to the plans. A large number of questions were raised on matters of concern to many African countries, in particular the granting of licences to private broadcasters, the reorganization of national frequency plans and the setting up of a national regulatory body.

One day was devoted to the new procedure set out in Article S12 of the Radio Regulations concerning high-frequency broadcasting between 5900 and 26 100 kHz. Participants were able to familiarize themselves with the procedure and with the software for capturing requirements, transmitting them in electronic form to BR and performing propagation and compatibility calculations. The participants decided to set up a regional coordination group for high-frequency broadcasting issues, replacing the temporary groups set up in Libreville (April 1998) and Windhoek (June 1998).

Finally, presentations on the RASCOM project and on the Interconference Representative Group were made by Mody Keita and Idrissa Samake, respectively.

## ■ Ukraine

Kyiv, one of the oldest and most beautiful cities of Eastern Europe, with a history going back more than one thousand five hundred years was the venue for the seminar (7–11 June) for the countries of Region 1. This seminar was organized by BR, the Regional Commonwealth in the Field of Communications (the organization which coordinates the telecommunication activities in the



*The seminar participants in front of the Palais des congrès in Bamako*



*The seminar participants*

Commonwealth of Independent States — CIS) and the State Committee of Communications and Informatization of Ukraine. It was the largest of its kind ever held in the region; with more than 200 participants from 17 countries, including 16 private companies.

Presentations were made on the regulatory procedures for terrestrial and space services, world and regional plans, ITU-R activities and the results of WRC-97 and of the last Plenipotentiary Conference (Minneapolis, 1998). Special emphasis was placed on demonstrating the new computer programs developed by BR. For example, the space radiocommunication stations and the terrestrial radiocommunication system (TerRaSys) — the new generation of software for handling terrestrial station data. The BR expects these systems to facilitate considerably the process of submission, notification and registration of frequency assignments for all administrations.

The BR team (Michel Giroux, Gueorgui Korolev, Alexandre Vassiliev and Nikolai Vassiliev) conducted workshops on the use of TIES, the space and high frequency broadcasting software, as well as on how to complete the notice forms.

Participants made a number of valuable comments and suggestions concerning the different aspects of the international frequency management. The BR team was glad to report that it had implemented the proposal expressed during the last BR/CIS Seminar in Kyrgyzstan (1997) to publish the Weekly Circular on TIES.

This seminar was also highly interactive and helped to establish and develop contacts between BR and the specialists directly involved in the national and international spectrum management. The BR will prepare and hold the next radiocommunication seminar in the region, either through an administration or a regional organization. ■

## Special Committee prepares for WRC-2000

**T**he Special Committee on Regulatory/Procedural Matters has become an important instrument in the preparation of World Radiocommunication Conferences (WRC). Shortly after WRC-97, this Special Committee was tasked by the Conference Preparatory Meeting (CPM) to carry out all appropriate regulatory/procedural studies on the relevant agenda items of WRC-2000.

The four Rapporteur Groups which were set up for this purpose have been working through correspondence:

- Group 1 — Appendices S30 and S30A. Rapporteur: François Rancy (France)
- Group 2 — Fixed-satellite service. Rapporteur: Ronald Davidson (United States)
- Group 3 — High-density services in the fixed, mobile, fixed-satellite and mobile-satellite services. Rapporteur: Alan Ashman (Australia)
- Group 4 — Incorporation by reference and HF/MF matters. Rapporteur: Frank Williams (United States).

At its meeting (Geneva, 12–16 July 1999), the Special Committee reviewed the reports of the Rapporteur Groups, as well as other contributions from administrations. It examined also, the regulatory/procedural issues raised at the Minneapolis Plenipotentiary Conference (1998) and which need to be addressed by WRC-2000.

These include: the evaluation of the administrative due diligence procedure for satellite networks adopted by WRC-97, coordination and notification procedures for satellite networks, role of the notifying administration in the case of an administration notifying on behalf of a named group of administrations, and finally the implementation of processing charges for satellite network filings and administrative proce-

dures (see Minneapolis Resolutions 85, 86, 87 and 88, respectively).

The Special Committee adopted several examples of regulatory texts (sometimes with options), which may be used by administrations in their participation in the forthcoming CPM (Geneva, 15–26 November 1999), as well as in WRC-2000.

In many cases, the Special Committee agreed on the possible approach in dealing with the relevant WRC-2000 agenda items. However, some of the discussions at this meeting already indicate several areas where tough negotiations may be expected at WRC-2000. Among them are: the new coordination concepts based on orbital separation, separation of uplink and downlink data in determining the need for coordination, streamlining the provisions relating to coordination between earth stations and terrestrial stations, use of high altitude platform stations (HAPS) in additional frequency bands, delivery of IMT-2000 services by HAPS, methods of updating Appendix S7 of the Radio Regulations, consolidation of the provisions for coordination and notification in the bands governed by Appendices S30 and S30A of the Radio Regulations, scope of the concept of incorporation by reference, the need to include in the Radio Regulations off-axis e.i.r.p. limitations in the fixed-satellite service.

The report of the Special Committee was circulated to Members of ITU's Radiocommunication Sector (ITU-R) in early September 1999, and is available at: <http://www.itu.int/itudoc/itu-r/cpm/docs/1998-99/cpm99-2/002e.html>.

# World Telecommunication Development Report 1999

## Mobile cellular

**T**his new report, which will be launched at TELECOM 99, presents an analysis of trends and developments in the global telecommunication sector, backed by official statistics from the world's leading source of telecommunication information. These statistics monitor the main telecommunication indicators as well as multimedia statistics such as personal computers, Internet hosts and television sets for more than 200 economies worldwide.

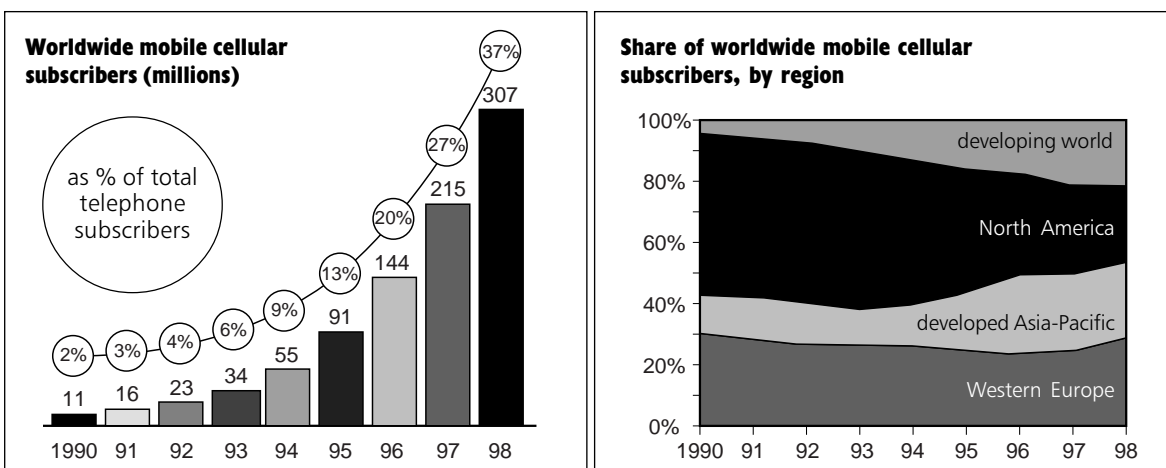
### The global mobile cellular revolution

The global boom in mobile cellular communications has been truly astounding. At the end of 1998 there were more than 300 million subscribers around the world, up from just 11 million in 1990. By the end of this decade there will be more than half a billion mobile users. Mobile cellular already accounts for over one third of all telephone connections. It seems highly likely that the number of mobile cellular subscribers will surpass conventional fixed lines during the first decade of the next millennium. Both devel-

oped and developing countries are sharing in this revolution: in developed countries, users are flocking to mobile cellular as a complement to existing fixed lines; in developing nations, mobile cellular is emerging as a substitute for shortages of fixed lines (see Figure 1 and Box 1).

The mobile cellular boom *has revolutionized* the concept of telephony in a number of ways. First and foremost, with mobile, users no longer call a place but a person. Small, portable handsets have liberated users from the cord that fixed telephones to a geographic location making them reachable anytime, anywhere. Beyond this, compared with fixed telephones, mobile cellular typically offers a greater variety of options in terms of features and tariffs.

Mobile cellular was the first telecommunication market segment where private ownership and competition were introduced in many countries. Start-up mobile cellular companies are almost always backed by foreign, strategic investors. This combination of competitive markets, private ownership and foreign



Note — "Developed Asia-Pacific" in the right chart refers to Australia, Hongkong SAR, Korea (Rep. of), Japan, New Zealand and Taiwan-China.

Source: ITU World Telecommunication Indicators Database.

Figure 1 — The mobile cellular boom (worldwide mobile cellular subscribers, and share by region (1990-1998))

investment has created an appropriate environment for rapid growth. But the market has been driven, as much as anything, by rampant demand. When mobile phones were first introduced in the early 1980s, they were mainly confined to cars, constrained by weight and power requirements. But as mobile phones became lighter, cheaper and more attractive, they have left the car and entered the briefcase, the handbag and the pocket. A modern portable typically weighs a few hundred grams, is brightly coloured, has a small

screen and more features than the average user might use in a lifetime. Mobile phones have as much in common with fashion accessories as plain old telephones. The success of mobile has been a triumph of technology married with *marketing*.

## Regulating mobile

Regulation of mobile cellular services has tended to be minimal. For instance, fewer than half the countries replying to an ITU questionnaire in 1999 stated

### Box I — A tale of two countries

Cambodia, with a population of 10.3 million, is a poor (1996 GNP per capita: USD 300), mainly agriculture-based economy in South-East Asia. Finland, with a population of 5.1 million, is a wealthy (1996 GNP per capita: USD 23 240), industrialized Nordic nation. These two countries could hardly be more different from a cultural, economic or geographic perspective, yet they have one thing in common: they both have more mobile cellular than fixed telephone subscribers.

Mobile cellular came to Cambodia in late 1992. Within a year, mobile subscribers had already surpassed the number of fixed telephones in the country. The main reason was that the fixed network had been extensively damaged during years of civil war. It was logical to exploit the advantages of mobile cellular (e.g., there are no wires to lay which is particularly useful in a country like Cambodia endangered by many land mines) in order to provide rapid access to communication facilities. No less than five companies operate mobile cellular services in Cambodia, and all these are backed by strategic foreign investors, an important consideration in a developing nation like Cambodia. A wireless local loop (WLL) system is also in use for fixed service. The spread of mobile communications has happened so quickly that serious questions are being posed about the viability of expanding the fixed network, despite the fact that Cambodia has one of the lowest teledensities in the world. As a result of mobile growth, Cambodia has surpassed 31 other countries in overall telephone penetration over the past six years. Cambodia illustrates the case that leaping straight to wireless is a viable option for rapidly expanding telecommunication access in developing countries with low levels of fixed infrastructure.

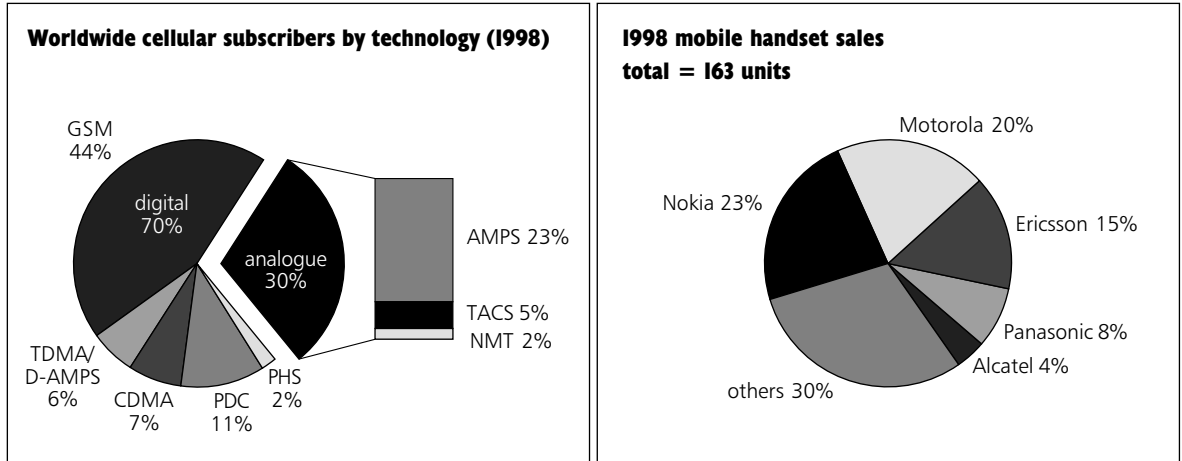
Finland is in some ways a curious place to be the world leader in mobile phone penetration. It is not the richest country in the world (for example both Japan and Switzerland have a GNP per capita twice that of Finland while all of its Nordic neighbours have a higher GNP per capita). Furthermore, Finland does not particularly stand out when the factors that are normally believed to drive rapid mobile phone growth are considered. For example, while there is competition, it was essentially a duopoly until 1998. In contrast, Sweden has had three mobile competitors for some time and the United Kingdom four, yet they both lag behind Finland in mobile phone penetration. Three other factors seemed to have driven the Finnish mobile craze.

- The early adoption of cellular technology has given Finland a wealth of mobile experience. Finland introduced the analogue Nordic mobile telephone (NMT) system in 1982 and was the first country to introduce the digital GSM standard a decade later.

- Second, there were historically many cooperatives providing local telephone service at fairly low rates and with a high penetration. This meant that for mobile cellular to be successful, tariffs would have to be competitive with those for fixed lines. Furthermore, unlike most other European countries, the largest operator, *Sonera* (formerly *Telecom Finland*), did not have a monopoly for local telephone service, obliging it to look elsewhere for revenue growth.

- Third, there seems to be a Finnish affinity for adopting new technology. In addition to having the highest mobile phone penetration in the world, Finland also leads in Internet host penetration. Finns have also pioneered the use of mobile technology for other applications, such as short message text and data services, chat rooms and even for connecting vending machines.

What Finland illustrates is that mobile cellular penetration may exceed fixed line penetration even in countries that have already attained a high level of telecommunication development. In the past, a family would have obtained one fixed telephone connection. Today, it is not inconceivable that each member of the family will own their own mobile phone.



Note — Analogue systems include: AMPS (Advanced Mobile Phone System), NMT (Nordic Mobile Telephony), TACS (Total Access Communications System). Digital systems include: CDMA (Code Division Multiple Access), GSM (Global System for Mobile), PDC (Personal Digital Cellular), PHS (Personal Handyphone System), TDMA (Time Division Multiple Access).

Source: ITU adapted from Dataquest, Ericsson, GSM MoU, CDMA Development Group.

Figure 2 — Alphabet soup (distribution of mobile cellular subscribers by technology (1998) and handset sales by supplier (1998))

that their mobile operators had universal service/access obligations or that their mobile tariffs were regulated. The relative lack of cellular regulation is partly due to the belief that fixed networks have been too regulated, stifling innovation and network growth. Since mobile has developed at a time when this belief has become commonly accepted, regulation has been limited. A related factor is that mobile cellular has typically been defined as a value-added service, falling outside the regulatory scope of basic voice telephony.

In developing countries, the lack of regulatory skills and in some cases, the absence of an independent regulator, have narrowed the latitude for encouraging mobile operators to enlarge overall accessibility to communications. This begs the question of whether mobile cellular has grown so fast because of limited regulation or whether it would grow even more rapidly with it.

There is a need for some degree of mobile regulation, if for no other reason than to ensure services can operate without interference. One way this has traditionally been done is by limiting the number of operators. Frequency constraints, coupled with the high level of initial investment required (either because of significant licence fees, network construction expenditures or both) suggest that there are high barriers to entry and that the mobile cellular industry

could never be a textbook example of a perfectly competitive market. As a result, there may be some areas where competition will not work as intended. For instance market distortions could arise, particularly in pricing, unless there is some form of regulatory oversight.

## A mobile future

Mobile has emerged as a mini-industry in its own right with 1998 service revenues of USD 154 billion. At current trends, the value of mobile revenue will overtake total fixed line revenue worldwide (international and domestic) in about the year 2004. Indeed, revenues from fixed line telephone service have been in decline globally since around 1996. Were it not for revenues from mobile, the telecommunications sector would be shrinking rather than growing.

As stated earlier, it is not a question of whether mobile cellular subscribers will overtake fixed telephone lines, but when. In poor countries, mobile is being used to rapidly install badly needed telecommunication infrastructure. In rich countries, the functionality of mobile appeals to users long-tied to their fixed telephones. This explains why the number of new mobile subscribers has surpassed new fixed ones every year since 1996. Last year there were almost twice as many new mobile subscribers as fixed ones. Sometimes, towards the end of the next decade, the

## The death of cellular monopolies in Western Europe

December 1998 was a landmark in the evolution of the mobile cellular industry in Western Europe. Switzerland became the last country in the region to adopt mobile cellular competition when the first new market entrant, *diAx*, commenced commercial service on Christmas Eve 1998. The lack of competition had expressed itself most visibly through high tariffs, with Swiss mobile cellular prices among the steepest in the world. Tariff options were limited with no bundling of free minutes or handset price subsidies. *diAx* introduced the concept of bundling free minutes with its tariffs. With a special promotion (that has proved to be ongoing), *diAx* effectively doubled the number of minutes that could be purchased for the same price. As a result, *diAx*'s tariff for 100 minutes of use is half that of *Swisscom*'s and among the lowest in Europe. Orange entered the market as a third competitor in June 1999; in response both *Swisscom* and *diAx* lowered their prices. *Swisscom*, which had only changed its mobile prices once between 1995 and July 1998, has made three reductions in less than a year (including the introduction of lower rates for mobile-to-mobile calls).

Despite historically high tariffs, Switzerland has achieved a fairly high mobile penetration rate (around a quarter of the population at the end of 1998, ranking it nineteenth in the world) although this is much lower than would be predicted by its relative wealth. With lower tariffs as a result of competition, demand will rise (*diAx* gained 300 000 subscribers in the space of just six months), and the Swiss penetration rate could eventually reach the level of the Nordic countries.

number of mobile telephone subscribers will exceed fixed lines. The crossover point could occur much sooner if mobile prices — which are currently considerably above costs — come down and if the new IMT-2000 global mobile standard — to be introduced commercially in some countries in just a few

years — takes off. The success of mobile is something to ponder. It will have taken the mobile industry a little over two decades to reach one billion subscribers; fixed networks will have taken more than one hundred and twenty years to reach the same number. ■

## Trends in telecommunication reform

### Convergence and regulation 1999

Since the beginning of the 1990s, more than 150 countries have introduced new telecommunications legislation, or modified existing regulations, says a new report to be launched at TELECOM 99. This second edition of *Trends in telecommunication reform*, published by ITU's Telecommunication Development Bureau (BDT), explores the theme of *convergence and regulation*. In particular, the report takes a close look at the impact of digital convergence on the reform of the telecommunications sector, notably on national regulatory re-

gimes. The following is an extract from the executive summary.

#### New laws, new regulators

New legislation has given rise to new, separate telecommunication regulatory agencies around the world. As of August 1999, there were 84 separate regulators, compared with only ten at the start of the 1990s. Nine of these regulatory bodies have been established since the middle of 1998.

Europe has currently the largest number of separate regulators, followed by the Americas and Africa (see Figure 1). Another 15 are expected by the end of 2000.

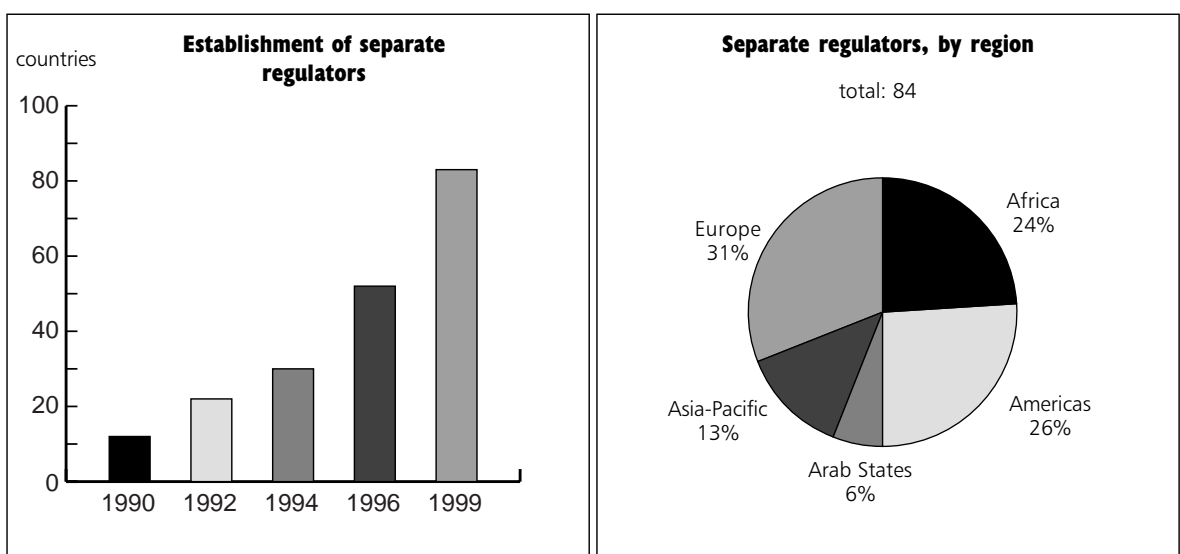
The governing structure of the new separate regulators, despite significant national and regional diversity, seem to point to a new model for telecommunications regulatory bodies. Among the nine regulators created from July 1998 to August 1999, six were established as collegiate bodies (for example, a commission) composed of between five and 11 members. This emerging trend is in clear contrast with the approach mainly adopted prior to July 1998, in which the great majority of new separate regulators (70 per cent) were headed by a single person (for example, a director-general).

The convergence of services and markets necessitates a convergence of laws, and may also necessitate the convergence of institutions or at a minimum, mandate coordination. In Asia, Malaysia and Singapore's regulators have been most progressive, bringing under one entity, all communication and information technology-related functions.

Malaysia's Communications and Multimedia Act may be, for the time being, a unique piece of legislation. But, perhaps also, a representative of the type of legislative reform to take place in other countries in the beginning of the next millennium. Malaysia's Act groups telecommunications, broadcasting and the computing industries into one industry with one regulator. Other countries, such as Namibia and China are establishing single ministries to deal with convergence and a new regulator may come later.

While the increase in regulators and legislative reform is certainly encouraging, new technologies and services are moving faster than the bodies that regulate them. Convergence is not a simple issue for telecommunication regulators.

The challenge is to determine ways to regulate technologies that are continually evolving and more importantly to determine the role of the regulator in a converged sector. The challenge for regulators, as we enter the next millennium, is to develop consistent and relevant regulations which do not inhibit the growth of



Source: ITU World Telecommunication Regulatory Database.

Figure 1 — Booming growth of regulators, 1990–1999

the sector, but rather encourage technological innovation.

## Ownership trends

Since 1997, the percentage of Asian countries that have privatized their operators increased to almost 55 per cent. In Europe, of the 53 European ITU Member States, almost 50 per cent partially privatized their operators by mid-1999.

With more than 20 countries that have privatized their incumbents, the Americas region has the largest number of fully privatized operators. African countries have moved quickly in reducing local and foreign private ownership limitations. As a result, of the 42 African Member States, 14 have privatized their operators and another eight have plans to privatize in the near future. In contrast, in the Arab States, there are presently no fixed-link operators which are 100 per cent privately-owned.

Many countries have increased private sector participation in their telecommunication sectors by allowing new market entrants which are privately-owned. In general, even countries that are reluctant to privatize their operators have been willing to allow new entrants and have even encouraged private sector participation in cellular and other value-added services. As a result, most of the cellular networks around the world are at least partially owned by foreign investors. Recent estimates reveal that more than 100 cellular networks around the world have investments from foreign sources.

Licensing of new entrants has been used also as a way of increasing private investment in the Internet service provider market in most countries around the world.

## Licensing

Perhaps the single most important characteristic of emerging licensing frameworks is the degree of diversity among them. The differences reflect a wide variety of views from one country to the next on the functions and objectives of

licensing. It is clear that there is no perfect approach.

Partly this is due to the fact that each country must build its liberalization programme on the foundation of the particular governmental and industry structure that already exists. Other factors then come into play, including the overall objectives of the licensing process: to control the rate of competitive entry, to minimize or maximize foreign investment, to promote infrastructure investment, to maximize revenue production, to attract advanced services for multinational business, or to minimize adverse economic impact on a national carrier.

The diversity of licensing regimes is an important regulatory issue in the age of globalization. Asymmetrical licensing regimes may impede the growth and implementation of global services, and make more complex the transition to new generation regulatory frameworks that will be required for the age of cybernetworks. Pressure will increase for greater simplicity and harmonization.

In spite of this diversity of licensing regimes across the world, most licences granted today are built around central notions of the public interest. There are three themes underlying individual country licensing regimes: ensuring the availability of public services, promoting the expansion of telecommunications infrastructure, and controlling competitive entry and/or anti-competitive conduct. These themes are not mutually exclusive. All three are usually addressed within a country's licensing scheme.

The report further looks at issues of universal access, interconnection, pricing services on digital networks, and numbering in a digital world.

To order your copy, please contact: "The International Telecommunication Union, Sales and Marketing Service, Place des Nations, CH-1211 Geneva 20 (Switzerland). Fax: +41 22 730 5194. E-mail: [sales@itu.int](mailto:sales@itu.int)". You can also visit the telecommunication regulatory website at: "<http://www.itu.int/treg>".

# Delivering on the GMPCS promise

## Interview with Nader Modanlo Chairman and President of Final Analysis

**F**inal Analysis is an aerospace and telecommunications company formed in 1992 on a commitment to space commercialization through low-cost access. The company provides end-to-end turnkey spacecraft operations and launch services.

### ■ *What can an aerospace company such as Final Analysis offer in the data technology business?*

Final Analysis is in the process of deploying a constellation of global low-Earth orbiting (LEO) satellites to provide digital data services to a wide range of users. Our global FAISAT satellite system will provide consumers, governments and industries (transportation, environmental, utility, oil and gas, agribusiness, automotive and others) with low-cost data information services. These services include: personal messaging (two-way paging and E-mail) and voice mail, file transfers, mobile asset management and tracking, remote monitoring and control, as well as data acquisition.

Let me just explain about some of these services. Our ground terminals will be equipped with global positioning systems (GPS) receivers to provide quick, accurate low-cost positioning information for all sorts of cargo, shipping containers, rail cars, barges and trucks. In addition, the terminals will be equipped with microprocessors for data monitoring and control. With these terminals, one can monitor crop conditions and feed supplies on large farms, climate conditions at weather stations, water quality conditions, consumable supplies in vending machines and copying machines, point-of-sale reports from retail stores and a wide variety of inventory management data.

Our satellite system falls in the category of what ITU calls non-voice non-geostationary systems that

operate below 1 GHz. These systems are also known as "little LEO" systems because of the small size of the satellites and the relatively low cost of system implementation. The term little also helps to distinguish those systems that operate below 1 GHz and are optimized for data, from "big LEO" systems which operate above 1 GHz and are optimized for voice.

We plan to deliver these new digital data information and messaging services at the beginning of the year 2001. A number of studies on our type of applications, as well as financial analysts predict market revenues between USD 2 and 5 billion in just a few years.

### ■ *Final Analysis recently expanded its partnership with General Dynamics. What is the attraction?*

We believe that in order to successfully deploy a constellation of satellites, we must establish a team of strategic partners. This is not because Final Analysis is a small company. We believe that any company, whatever the size, cannot go forward alone. So our partnership with General Dynamics is very significant. In January this year, Final Analysis and General Dynamics announced a partnership valued at USD 20 million. In August, we selected General Dynamics as our partner for overall system engineering and integration, and as prime contractor for the ground segment of the Final Analysis global FAISAT satellite system. General Dynamics has full responsibility for end-to-end performance of the FAISAT system, integrating the space and ground segments and user network. We place great importance on this world-class company to assure that all system parts work together to satisfy the end user. The value of this expanded strategic partnership is 75 million which includes a contract from Final Analysis to General Dynamics and an additional equity investment by General Dynamics in Final Analysis.

The significant part of this partnership is that in an environment where there is concern about new or future satellite systems, winning each other's trust has been a key factor. In this context, our partners are as comfortable with our approach to the market as they are with our system. And this is an important message to the financial and user communities and to the industry at large, that not all systems should be looked at in the same way. With this recent announcement, we hope that other entrepreneurial companies of all sizes around the world can join in our endeavour to implement the new digital data services.

In a world where the majority of countries are developing and a minority are industrialized, in general, there is the impression in the developing world that anything related to space communications should be left to the industrialized nations. I am here to witness that participation in the space-based industry is not exclusive to "giant" multibillion dollar entities. Companies or countries, independent of size, can participate in this industry. In business and in other aspects of life, the key to success is commitment. You can be successful if you are innovative, focused and committed for the long term.

■ **What will little LEOs do for rural communities?**

Our main focus will be the rural and remote areas where the communications gap is huge. Many people read about developing countries and try to understand the situation. I was born in a developing country (Iran) and I am very sensitive to the needs of the developing world. As a player in this emerging industry, I will be promoting low-cost access to new technologies. I am committed to the commercialization of space and the creation of new opportunities for developing countries to gain the benefits of global mobile personal communications by satellite (GMPCS).

Let me give you an example. Two-way personal messaging and voice mail via the Final Analysis FAISAT satellite system can provide rural digital data communications virtually instantly. This system can then deliver new services to health and education centres, as well as to agricultural sites in small villages that may be lacking electricity or telephony.

This means that life-saving information related to health, for example, can be collected, analysed

and disseminated fairly quickly, facilitating medical diagnoses of complex cases from different medical centres. People in areas not otherwise served by telecommunications can also receive early warnings of natural hazards such as hurricanes, earthquakes, volcano eruptions and other environmental and climatic conditions or disasters.

In addition, our FAISAT satellite system's voice mail service could provide a solution for people who may be unable to read or write, as our service would relay recorded speech after it has been digitized into a data transmission.

Clearly, developing countries have significant needs for basic communications and we hope to contribute, through these services, to closing the communications gap and delivering on the promise of GMPCS.

■ **How has the GMPCS process launched by ITU helped the Final Analysis case?**

We have been big supporters of the GMPCS process since the very beginning, when ITU held its first World Telecommunication Policy Forum on this topic in October 1996. The fact that the GMPCS Memorandum of Understanding has now been signed by a number of signatories from government and industry sends an important message that the world is waiting for these new services. My view is that affordability of user terminals and service is the major factor to the receptivity of our new data information services, and I am committed to bringing low cost services to mass markets.

Thanks to the GMPCS-MoU, we will be able to work with national service providers in different countries to deliver digital data services to complement, extend coverage, augment and integrate (not replace!) existing terrestrial and wireless network services around the world. ■



Nader Modanlo

Photo: Jud McCrehin/Space News

### Worldtelekiosks for remote and rural areas in Africa

#### A WorldSpace initiative to be launched at TELECOM 99

More than a year has gone by since AFRICA TELECOM. Under the signature of "African Renaissance", one promise made in Johannesburg has been fulfilled.

At the opening ceremony, WorldSpace Chairman, Noah Samara, announced a major investment, in Africa alone, intended to create a new digital electronic medium to which every African on the continent will gain access.

The first satellite known as *AfriStar* has been launched. The receivers are available on designated markets. In addition, programmes on information and the content on this satellite have been developed mostly by African entrepreneurs for African consumption.

At TELECOM 99, WorldSpace is not spending money on parties or an extravagant exhibition stand. Instead, it is investing in a new concrete project known as "Worldtelekiosks for rural and remote areas in Africa". With the support of ITU's Telecommunication Development Bureau (BDT), WorldSpace is inviting other industries to become partners in this initiative.

What is a telekiosk? You can see it in hall 7 at Palexpo!

A "telekiosk" is a mobile or fixed unit providing basic telecommunications and WorldSpace services to populations in rural and remote areas in Africa. It

offers both content and telecommunication services and responds to the needs of local communities. The project is based on a sustainable business plan.

A "mobile telekiosk" travels to survey and test the markets, train people and find the right services to be provided to local needs.

The "fixed telekiosks" are standard units in design and operations but with "on-demand" features and services to be deployed in chosen locations. They are owned by the community. The fixed telekiosk could become a centre for community development for social and cultural activities. If run by women, it will strengthen the women's role in rural society.

The mobile telekiosk prototype, built by Thomson Broadcast, will be showcased at TELECOM 99.

It is composed of the following:

- Multimedia unit: four working stations with WorldSpace receivers, personal computers, printing and Internet facilities. It offers audio and multimedia content.

- Radio studio: for local radio shows, recordings and re-broadcasting. It has an outdoor area for social and community development activities.

- Public telephony: two Schlumberger "Public phones" and one Inmarsat "Publisat".

- General equipment: power generator, air conditioning, security and fire alarms and various antennas.

The pilot project will be launched in Mali in November 1999, with the *Société des télécommunications du Mali* (SOTELMA) as the telecommunication partner. After Mali, the mobile telekiosk will be introduced in other African countries.



For more information on the project, please contact: "Roxana Dunnette, Senior Business Adviser, WorldSpace, 25, rue Plantamour, CH-1201 Geneva (Switzerland). Tel.: +41 22 738 2545. Fax: +41 22 738 2113. E-mail: rdunnette@worldspace.com".

□ **Marconi establishes new company for ASEAN countries.** Marconi Communications has created a new regional centre based in Singapore to provide a more focused customer service and support for the Association of South East Asian Nations (Brunei Darussalam, Cambodia, Indonesia, Lao P.D.R., Myanmar, Singapore, Thailand and Viet Nam). The new company, known as Marconi Communications Singapore Private Limited, will specialize in three core global Marconi activities: telecommunication products, systems integration and telecommunication services, in addition to the current activities of The General Electric Company of Singapore Pte. Ltd. — *Marconi.*

□ **SingTel and Cisco enter strategic alliance.** Singapore Telecom and Cisco Systems, Inc. have formed a strategic alliance to bring to market cutting-edge telecommunication solutions to customers in Singapore and the Asia-Pacific region. Initial projects which the two partners plan to develop include the building of intelligent infrastructure based on Internet Protocol (IP), virtual private network services, a local frame relay network, digital subscriber line technology, and next-generation multi-service networks that integrate data, voice, and video. Customers of both companies are expected to enjoy the cost benefits and advanced services that multi-service networks provide, as well as end-to-end network efficiency and reliability. — *SingTel/Cisco.*

□ **Italy: Tuscany to enter the millennium with Marconi's TETRA system.** Marconi Communications, in cooperation with the Tuscan Region Authority, is to establish a GBP 3 million trial for innovative mobile data applications in Tuscany. Initial users will be the public services: emergency services, health and transportation.

During the "Giubileo" in the year 2000, an enormous number of pilgrims and tourists are expected in the region, offering an unprecedented opportunity to test new data applications supporting tourism. The pilot system is based on *ELETTA*, Marconi's implementation of the terrestrial trunked radio (TETRA) technology, and will be the first such network in Italy. TETRA is a new type of wireless communication system, ideal for any group of users needing high-performance wireless communications. Already, Marconi is implementing TETRA-based communication sys-

tems for St Petersburg Metro (Russia) and the national electricity generating organization in Croatia.

The company's pilot system in Italy will be installed in the city of Florence and is scheduled to be fully operational within the second half of 1999. The project is funded in part by the Italian Government. — *Marconi.*

□ **Ericsson's Ribbonet system set to bring the "intelligent home" a step closer.** *Ericsson Cables* can inject optical fibre cables into apartments and houses, using its new pistol-like tool known as *Ribbonet*. With this new technology, pre-contacted ribbon fibre is injected in the existing conduit system all the way around the residence, reducing installation costs for the installer. Through this method, it is anticipated that data communication via optical fibre will become common in homes.

This year consumers will spend over  
\$20 billion in on-line commerce.  
What's in it for telecom companies?

## Tracking Telecoms 99

A series of Sponsored Sections in the  
International Herald Tribune

Coinciding with Telecom 99 and Interactive 99 in Geneva, this series will provide a daily focus on the e-commerce revolution.

Section topics: • Telecoms and E-Commerce • Telecoms and Business Solutions • Telecoms and Interactive Learning • Telecoms and Emerging Markets • Telecoms and the Home • Telecoms and Travel • Telecoms and Future

**Oct. 9-17, 1999**

For further information:  
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Fax: (41) 221 730 5939, E-mail: lambert@iht.ch



A joint initiative of  
**Herald Tribune**  
THE WORLD'S DAILY NEWSPAPER

The new technology is set to open up a wealth of possibilities in homes: access to all the world's television and radio programmes in real-time, rapid Internet connection, the capability to control daily electricity consumption, access to games and interactive entertainment. In short, this is the local "home network" to which a television, washing machine, refrigerator, CD player, computer and other appliances can be connected, bringing the world one step closer to an intelligent home. The local home network can also be used for elderly residents and the disabled because it can activate an alarm if anything unusual happens in the home. — *Ericsson*.

□ **Alcatel awarded a contract in Africa.** *Alcatel* has been chosen to develop a submarine cable network that will provide many countries in Africa with high-quality international communications. The company has concluded a USD 265 million contract for the new Atlantic network, known as SAT-3/WASC. With a total length of 14 000 km, the network will comprise an express route between South Africa, Ghana, Côte d'Ivoire, Senegal and Portugal, as well as providing high-speed access to Benin, Nigeria, Cameroon, Gabon and Angola. The contract was signed by the ten countries concerned and a number of operators including BT, Cable and Wireless, Teleglobe (USA) and AT&T.

SAT-3/WASC will use wavelength-division multiplexing (WDM) technology. The backbone express route will initially operate at 20 Gbit/s, with the possibility of upgrading to at least 40 Gbit/s. The network should be completed by early 2001.

Alcatel has also been commissioned to supply an overall integrated network management solution between the SAT-3/WASC and SAFE networks, a project currently being implemented between South Africa, Reunion, Mauritius and Malaysia. Once these projects have been completed, the routes could be used as a backup for part of the SEA-ME-WE 3 network which connects Asia and Africa. — *Alcatel*.

□ **France Télécom launches the "Kit mobicarte K2", a mobile telephone for children.** Since last June, *France Télécom* has been marketing its new *Kit mobicarte K2*, which is specially designed to enable children aged seven years and over to maintain a constant link with their parents and communicate with their friends. The Kit K2 comprises a *Philips Savvy* handset

plus accessories (battery, charger, belt clip) and a mobicarte pack comprising an SIM card with FRF 144 of preloaded call credit. The lightweight handset is available in three colours (yellow, green and black) and has a standby time of 250 hours and talk time of four hours. The Kit K2 is marketed at FRF 890, inclusive of tax.

The *Philips Savvy* handset has many functions which make it both an essential and fun tool: games, alarm, calculator, chronometer, biorhythm monitor, euro converter and a choice of 20 ring tones. It is also possible to block outgoing calls, so parents can specify the numbers (a maximum of ten) that can be accessed. Remote loading of the list of authorized numbers is effected by means of a personal code, either through *Minitel* or simply by completing and returning to the customer service unit the form that comes with the handset. — *France Télécom*.

#### □ **Structural change in Kenya**

The Communications Commission of Kenya (CCK) issued licences to the newly created Postal Corporation of Kenya and Telkom Kenya Ltd. This allowed the two entities officially to commence operations as separate entities with effect from 1 July 1999. Telkom Kenya will continue to participate actively in the activities of ITU in the same capacity and with the same status as that of the former Kenya Posts and Telecommunications Corporation (KPTC), along with the CCK until such time as the entity is fully privatized.

#### □ **Personnel changes in Israel**

Mr Benjamin (Fuad) Ben-Eliezer has been appointed Deputy Prime Minister and Minister of Communications.

#### □ **in Kenya**

Mr Augustine Cheserem and Ms Alice Koech have been appointed Managing Director and Manager, International and Public Relations, Telkom Kenya Ltd., respectively.

#### □ **in Nigeria**

Mr Alhaji Mohammed Arzika has been appointed Minister of Communications.

#### □ **in Sri Lanka**

Mr K. C. Logeswaran has been appointed Chairman, Director-General of Telecommunications, Chief Executive Officer, Telecommunications Regulatory Commission of Sri Lanka. — *ITU Notification No. 1381*.

## ITU Conferences

The calendar for all ITU conferences and meetings can be found on the Web at: <http://www7.itu.int/events-public>

### 1999

- 10–17 October (Geneva)  
TELECOM 99 + INTERACTIVE 99

### 2000

- 10–15 April (Rio de Janeiro)  
AMERICAS TELECOM 2000
- 1–5 May (Istanbul, Turkey)  
Radiocommunication Assembly (RA-2000)
- 8 May–2 June (Istanbul)  
World Radiocommunication Conference (WRC-2000)

### 1999

#### Telecommunication Development Sector

- 25–27 October (Bahrain)  
Subregional workshop on costing and tariffs for Gulf countries
- 26–29 October (Sofia)  
Business-oriented development plans — Subregional seminar
- 1–3 November (Istanbul)  
GMPCS regional workshop on “Licensing and commercial issues” for Eastern Europe, Baltic States and CIS countries
- 1–5 November (Nairobi)  
Workshop on marketing of telecommunication services for English-speaking African countries
- 3–5 November (Kampala)  
Platform for partnership: partnership and rural telecommunication development
- 7–11 November (Damascus)  
Regional seminar on the impact of new technologies and ITU teletraffic planning
- 9–12 November (Morocco)  
Regional seminar for the Arab States on reform and regulation
- 10–12 November (St Petersburg, Russia)  
Regional seminar for CIS on universal access and rural development

- 22–25 November (Tunis)  
Concluding seminar on costing and tariffs for Arab countries
- 22–26 November (Hanoi)  
Subregional meeting for Cambodia, Lao P.D.R. and Viet Nam
- 22–26 November (Chisinau)  
Workshop on the transformation of companies and quality management for CIS
- 22–26 November (San José)  
Strategic management workshop and case study development
- 28–30 November (Dubai)  
GMPCS regional workshop on “Licensing and commercial issues” for the Arab countries

#### Radiocommunication Sector

- 18–27 October (Geneva)  
Joint Working Party 10-11S (Satellite broadcasting)
- 25 October–5 November (Helsinki)  
Task Group 8/1 (International Mobile Telecommunications-2000 (IMT-2000))
- 1–5 November (Geneva)  
Task Group 1/6 (Development of method(s) for the determination of the coordination area around Earth stations)
- 8–10 November (Geneva)  
Working Party 9C (HF systems)
- 8–12 November (Geneva)  
RRB (Radio Regulations Board)
- 9 November (Geneva)  
Working Party 8D (All mobile satellite services and radiodetermination satellite service)
- 10–12 November (Geneva)  
Study Group 8 (Mobile radio-determination amateur and related satellite services)
- 15–26 November (Geneva)  
CPM (Conference Preparatory Meeting)
- 26 November (Geneva)  
CVC (Radiocommunication Study Group Chairmen and Vice-Chairmen Meeting)
- 29 November–3 December (Geneva)  
Inter-conference Representative Group — fifth meeting

- 6–8 December (Geneva)  
Task Group 10/6 (Digital sound broadcasting at frequencies below 30 MHz)
- 15–17 December (Geneva)  
Joint Study Groups 10 and 11 meeting

### 2000

- 6–14 January (Geneva)  
Task Group 1/5 (Unwanted emissions and the modification of Recommendation ITU-R SM.328.8 concerning out-of-band emissions)
- 17–21 January (Geneva)  
RAG (Radiocommunications Advisory Group)
- 17–21 January (Geneva)  
Working Party 7B (Space radio systems and radio astronomy)
- 17–21 January (Geneva)  
Working Party 7C (Earth exploration satellite systems and meteorological elements)
- 17–21 January (Geneva)  
Working Party 7D (Radio astronomy)
- 2–8 February (Munich, Germany)  
Working Party 3K (Point-to-area propagation)
- 7–9 February (Geneva)  
Working Party 11A (Television systems and data broadcasting)
- 7–9 February (Geneva)  
Task Group 11/5 (Interactive television broadcasting system)
- 7–9 February (Geneva)  
Joint Task Group 10-11 (Multimedia broadcast evolution and common content format)
- 10–11 February (Geneva)  
Study Group 10 (Broadcasting service (sound))
- 10–11 February (Geneva)  
Study Group 11 (Broadcasting service (television))
- 21–29 February (Geneva)  
Working Party 4A (Efficient orbit/spectrum utilization)
- 28 February–10 March (Geneva)  
Working Party 8A (Land mobile service excluding IMT-2000; amateur and amateur-satellite services)

## ITU Conferences *(continued)*

- 5–9 June (Istanbul)  
CPM (Conference Preparatory Meeting)
- 5–9 June (Istanbul)  
CVC (Radiocommunication Study Group Chairmen and Vice-Chairmen Meeting)
- 28 June–11 July (Geneva)  
Working Party 3J (Propagation fundamentals)
- 28 June–11 July (Geneva)  
Working Party 3K (Point-to-area propagation)
- 28 June–11 July (Geneva)  
Working Party 3L (HF propagation)
- 28 June–11 July (Geneva)  
Working Party 3M (Point-to-point and Earth-space propagation)
- 12–13 July (Geneva)  
Study Group 3 (Radiowave propagation)
- 12–18 July (Geneva)  
Working Party 1A (Engineering principles and techniques, including computer-aided analysis for effective spectrum management)
- 12–18 July (Geneva)  
Working Party 1B (Principles and techniques for spectrum planning and sharing)
- 12–18 July (Geneva)  
Working Party 1C (Techniques for spectrum monitoring)
- 12–18 July (Geneva)  
Task Group 1/5 (Unwanted emissions and the modification of Recommendation ITU-R SM.328-8 concerning out-of-band emissions)
- 19–20 July (Geneva)  
Study Group 1 (Spectrum management)
- 4–6 September (Geneva)  
Working Party 10C (Audio-frequency characteristics of sound broadcasting signals)
- 4–8 September (Geneva)  
Working Party 10A (Sound broadcasting at frequencies below 30 MHz and antennas for sound broadcasting)
- 4–8 September (Geneva)  
Working Party 10B (Terrestrial sound broadcasting at frequencies above 30 MHz)
- 4–8 September (Geneva)  
Joint Task Group 10-11 (Multimedia broadcast evolution and common content format)
- 4–8 September (Geneva)  
Joint Working Party 10-11Q (Audio and video quality assessment)
- 4–8 September (Geneva)  
Working Party 11C (Terrestrial television (emission and planning parameters))
- 4–8 September (Geneva)  
Task Group 11/5 (Interactive television broadcasting system)
- 7–15 September (Geneva)  
Joint Working Party 10-11S (Satellite broadcasting)
- 11–15 September (Geneva)  
Working Party 11A (Television systems and data broadcasting)
- 11–15 September (Geneva)  
Working Party 11B (Digital television (source coding))
- 11–15 September (Geneva)  
Joint Working Party 10-11R (Recording for broadcasting)
- 18–20 September (Geneva)  
Study Group 10 (Broadcasting service (sound))
- 18–20 September (Geneva)  
Study Group 11 (Broadcasting service (television))
- 18–26 September (Geneva)  
Working Party 9D (Sharing with other services (except for the fixed-satellite service))
- 19–26 September (Geneva)  
Working Party 9A (Performance and availability, interference objectives and analysis, effects of propagation, and terminology)
- 19–27 September (Geneva)  
Working Party 9B (Radio-frequency channel arrangements, radio system characteristics, interconnection, maintenance and various applications)
- 27–29 September (Geneva)  
Working Party 4SNG (Satellite news gathering (SNG), outside broadcast via satellite)
- 27–29 September (Geneva)  
Working Party 9C (HF systems)
- 27 September–5 October (Geneva)  
Working Party 4A (Efficient orbit/spectrum utilization)
- 27 September–5 October (Geneva)  
Working Party 4-9S (Frequency sharing between the fixed-satellite service and the fixed service)
- 29 September–5 October (Geneva)  
Working Party 4B (Systems, performance, availability and maintenance)
- 6 October (Geneva)  
Study Group 4 (Fixed-satellite service)
- 9–17 October (Geneva)  
Working Party 7A (Time signals and frequency standard emissions)
- 9–17 October (Geneva)  
Working Party 7B (Space radio systems and radio astronomy)
- 9–17 October (Geneva)  
Working Party 7C (Earth exploration satellite systems and meteorological elements)
- 9–17 October (Geneva)  
Working Party 7D (Radio astronomy)
- 9–20 October (Geneva)  
Working Party 8A (Land mobile service excluding IMT-2000, amateur and amateur-satellite services)
- 16–27 October (Geneva)  
Working Party 8D (All mobile satellite services and radiodetermination satellite service)
- 17–27 October (Geneva)  
Working Party 8B (Maritime mobile service including Global Maritime Distress and Safety System (GMDSS); aeronautical mobile service and radiodetermination service)
- 18–19 October (Geneva)  
Study Group 7 (Science services)
- 30–31 October (Geneva)  
Study Group 8 (Mobile radiodetermination amateur and related satellite services)

### 1999

#### Telecommunication Standardization Sector

- 11–12 October (Turin, Italy)  
Working Party 3/13 (Layer 1, access/transport and architectures, ATM layer and OAM)
- 25–29 October (Geneva)  
TSAG (Telecommunication Standardization Advisory Group)

## ITU Conferences *(continued)*

- 29 October (Boulder, CO)  
Working Party 4/13 (Performance)
  - 3–5 November (Rio de Janeiro)  
Regional Tariff Group for Latin America
  - 11–19 November (Geneva)  
Study Group 10 (Languages and general software aspects for telecommunication systems)
  - 22 November–10 December (Geneva)  
Study Group 11 (Signalling requirements and protocols) and its Working Parties
  - 13–17 December (Geneva)  
Study Group 3 (Tariff and accounting principles including related telecommunications economic and policy issues) and its Working Parties
- 2000**
- 24 January–4 February (Geneva)  
Study Group 4 (TMN and network maintenance) and its Working Parties
  - 2–10 February (Geneva)  
Study Group 8 (Characteristics of telematic systems)
  - 7–18 February (Geneva)  
Study Group 16 (Multimedia services and systems) and its Working Parties
  - 21–25 February (Geneva)  
Study Group 5 (Protection against electromagnetic environment effects) and its Working Parties
  - 28 February–10 March (Kyoto, Japan)  
Study Group 13 (General network aspects) and its Working Parties
  - 7–17 March (Geneva)  
Study Group 2 (Network and service operation) and its Working Parties
  - 20–31 March (Geneva)  
Study Group 7 (Data networks and open system communications) and its Working Parties
  - 3–14 April (Geneva)  
Study Group 15 (Transport networks, systems and equipment) and its Working Parties
  - 5–14 April (Geneva)  
Study Group 3 (Tariff and accounting principles including related telecommunications economic and policy issues) and its Working Parties
  - 8–12 May (Geneva)  
Study Group 6 (Outside plant) and its Working Parties
  - 9–19 May (Geneva)  
Study Group 12 (End-to-end transmission performance of networks and terminals) and its Working Parties
  - 15–19 May (Geneva)  
Study Group 9 (Television and sound transmission) and its Working Parties
  - 6–14 June (Geneva)  
TSAG (Telecommunication Standardization Advisory Group)

## Conferences external to the ITU

- 1999**
- 13–15 October (Nis, Yugoslavia)  
TELSIKS '99 — 4th International Conference on telecommunications in modern satellite, cable and broadcasting services  
Tel.: +381 18 529 302  
Fax: +381 18 46180  
E-mail: [telsiks@elfak.ni.ac.yu](mailto:telsiks@elfak.ni.ac.yu)  
[info@telsiks.org.yu](mailto:info@telsiks.org.yu)  
<http://www.telsiks.org.yu>
  - 18–19 October (London)  
ECC '99 — European cable communications  
Tel.: +44 122 578 3466  
Fax: +44 122 578 3206  
E-mail: [simonbond1@compuserve.com](mailto:simonbond1@compuserve.com)
  - 18–20 October (Newport, RI)  
22nd Annual Newport Conference on Fiberoptics Markets  
Tel.: +1 401 849 6771  
Fax: +1 401 847 5866  
E-mail: [info@kmicorp.com](mailto:info@kmicorp.com)  
<http://www.kmicorp.com>
  - 25–26 October (London)  
Next generation telcos  
Tel.: +44 171 252 2222  
Fax: +44 171 252 2272
  - 26 October (Paris)  
14th France Télécom Research Forum — Databases and information systems  
Tel.: +33 1 4529 4949  
Fax: +33 1 4529 6678  
E-mail: [sylvie.fabre@cnet.francetelecom.fr](mailto:sylvie.fabre@cnet.francetelecom.fr)  
<http://www.cnet.fr>
  - 27–29 October (Cartagena de Indias, Colombia)  
XIV National and V Andean Telecommunication Congress and ANDICOM 99  
Tel.: +57 1 620 8307  
Fax: +57 1 214 4121  
E-mail: [afcintel@impsat.net.co](mailto:afcintel@impsat.net.co)  
<http://www.cintel.org.co/congreso.htm>
  - 9–10 November (London)  
Mobile number portability  
Tel.: +44 171 252 2222  
Fax: +44 171 252 2272
  - 9–12 November (Vienna)  
EuroCarriers '99  
Tel.: +44 171 242 2324  
Fax: +44 171 242 2320  
<http://www.aic-uk.com>
  - 9–12 November (Malaga, Spain)  
CWM winter 99 — Carrier wholesale market  
Tel.: +44 143 874 2424  
Fax: +44 143 836 5713  
E-mail: [enquiries@cwexpo.com](mailto:enquiries@cwexpo.com)  
<http://www.cwmexpo.com>
  - 10–11 November (London)  
Satellite communications  
Tel.: +44 171 252 2222  
Fax: +44 171 252 2272
  - 11–12 November (Martlesham Heath, United Kingdom)  
Human factors in telecommunications — Implications for the aged and disabled  
Tel.: +46 46 222 8772  
Fax: +46 46 222 4223

## Conferences external to the ITU *(continued)*

E-mail: Clemens.Weikert@psychology.lu.se  
<http://www.ppsw.rug.nl/cov/hfeseec/hfeseec.htm>

- 15–16 November (Orlando, FL)  
 imtex '99 — 4th International Congress on commercial trunked radio  
 Tel.: +1 202 331 7773  
 Fax: +1 202 331 9062  
 E-mail: [online@imta.org](mailto:online@imta.org)  
<http://www.imta.org>

- 16–17 November (London)  
 Mobile location services  
 Tel.: +44 171 453 5495  
 Fax: +44 171 636 1976  
 E-mail: [cust.serv@ibcuk.co.uk](mailto:cust.serv@ibcuk.co.uk)  
<http://www.ibctelecoms.com/location>

- 17–19 November (Miami Beach, FL)  
 TelecomLatina 99 — Globalization, innovation, convergence  
 Tel.: +1 303 741 2901  
 Fax: +1 720 489 3165  
<http://www.telecomlatina.com>

- 22–24 November (London)  
 Worldwide approvals '99  
 Tel.: +44 171 453 5495  
 Fax: +44 171 636 1976  
 E-mail: [cust.serv@ibcuk.co.uk](mailto:cust.serv@ibcuk.co.uk)  
<http://www.ibctelecoms.com/approvals>

- 23–24 November (London)  
 Service management in IP networks  
 Tel.: +44 171 839 8391  
 Fax: +44 171 839 3777  
 E-mail: [stefan@visibis1.demon.co.uk](mailto:stefan@visibis1.demon.co.uk)

- 23–24 November (New Delhi)  
 TASKnet: towards a South Asian knowledge network  
 Tel.: +91 11 371 1401  
 Fax: +91 11 371 0717  
 E-mail: [tasknet@in.britishcouncil.org](mailto:tasknet@in.britishcouncil.org)  
<http://www.tasknet.nic.in>

- 23–24 November (Amsterdam)  
 Interconnection 99  
 Tel.: +44 171 453 5495  
 Fax: +44 171 636 1976  
 E-mail: [cust.serv@ibcuk.co.uk](mailto:cust.serv@ibcuk.co.uk)  
<http://www.ibctelecoms.com/interconnection99>

- 24–26 November (Berlin)  
 Online Educa Berlin — 5th International Conference on technology supported learning  
 Tel.: +49 30 327 6140  
 Fax: +49 30 324 9833  
 E-mail: [sylke.sedelies@icef.com](mailto:sylke.sedelies@icef.com)  
<http://www.online-educa.com>

- 8–9 December (London)  
 Dark fibre market in Europe  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 8–10 December (New Delhi)  
 BCS India '99/CommsIndia '99 — Convergence India '99  
 Tel.: +91 11 463 8680  
 Fax: +91 11 462 3320  
 E-mail: [exhibind@nda.vsnl.net.in](mailto:exhibind@nda.vsnl.net.in)  
<http://www.exhibitionsindia.com>

- 14–17 December (Bangalore, India)  
 IRSI-99 — International Radar Symposium  
 Tel.: +91 80 524 1959  
 Fax: +91 80 524 2860  
 E-mail: [irsi@lrde.ernet.in](mailto:irsi@lrde.ernet.in)  
<http://www.radarsymp-99-india.com>

### 2000

- 10–11 January (London)  
 Mobile IP  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 10–21 January (Gainesville, FL)  
 Seventh International Training Program on utility regulation and strategy  
 Tel.: +1 352 392 6148  
 Fax: +1 352 392 7796  
 E-mail: [purcecon@dale.cba.ufl.edu](mailto:purcecon@dale.cba.ufl.edu)  
<http://www.cba.ufl.edu/eco/purc>

- 18–20 January (Bordeaux, France)  
 ICIN 2000 — 6th International Conference on intelligence in networks  
 Tel.: +33 5 5615 1158  
 Fax: +33 5 5615 1160  
 E-mail: [icin2000@adera.fr](mailto:icin2000@adera.fr)  
<http://www.adera.fr/icin2000>

- 19–20 January (London)  
 Submarine fibre optic cables Summit 2000  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 26–27 January (London)  
 Value added services through intelligent networks  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 2–3 February (London)  
 IP telephony 2000  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 21–22 February (London)  
 Interconnect billing  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 23–24 February (London)  
 MNS — Managed network services  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 28–29 February (London)  
 IP based VPNs  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 13–14 March (London)  
 Data over mobile  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 20–21 March (London)  
 Valuation and forecasting for telecoms  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 25–28 March (Beirut)  
 ARABCOM 2000 — Congress and exhibition on telecommunication development for the Arab States  
 Tel.: +961 5 450 212  
 Fax: +961 5 455 477  
 E-mail: [ktayar@arabcom.com](mailto:ktayar@arabcom.com)  
<http://www.arabcom.com>

- 27–28 March (London)  
 Speech recognition for mobile  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 29–30 March (London)  
 Cable telephony  
 Tel.: +44 171 252 2222  
 Fax: +44 171 252 2272

- 10–13 July (Guildford, United Kingdom)  
 Eighth International Conference on HF radio systems and techniques  
 Tel.: +44 171 344 5471  
 Fax: +44 171 240 8830  
 E-mail: [hf2000@iee.org.uk](mailto:hf2000@iee.org.uk)  
<http://www.iee.org.uk/Conf/>