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Southern African Development Community

Telecommunications Policy, Regulation and Restructuring

Conference Proceedings

Windhoek, Namibia

February 17–19, 1993

Price Waterhouse

in association with

INTRADOS / International Management Group

Office of Government Services
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Price Waterhouse

April 15, 1993

Dear Conference Participant:

Re: SADC Conference on Telecommunications Policy, Regulation and Restructuring

In an effort to maintain the enthusiasm and interest in telecommunications policy, regulation and restructuring kindled in Windhoek, Price Waterhouse and Intrados International Management Group (Intrados/IMG) have compiled this volume which contains the ***Proceedings of the Conference on Telecommunications Policy, Regulation and Restructuring*** which was held in Windhoek, Namibia from February 17 through 19, 1993. The Conference was sponsored by the Southern Africa Development Community (SADC) through its telecommunications arm, the Southern African Transport and Communications Commission (SATCC) with financing from USAID/Zimbabwe.

This volume is divided into three sections. Section I contains summaries of presentations and discussions held after each session and highlights key issues raised during the discussions. Section II contains a list of speakers and speakers profiles and Section III contains the conference presentations organized by day.

Price Waterhouse and Intrados International Management Group (Intrados/IMG) would like to thank you for your participation in the Conference and your valuable contribution to increasing the awareness and understanding of telecommunications privatization and restructuring in the SADC region.

Very truly yours,

Price Waterhouse

Telecommunications Policy, Regulation and Restructuring

Windhoek, Namibia
February 17-19

Proceedings

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6. *Competition and Privatization in the Telecommunications Sector*
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   by: Joseph Tyndall, Chairman, Public Utilities Commission, Guyana
2. *Issues in Regulation: Interconnection, Equal Access, and Frequency Management*
   by: Pantelis Michalopoulos, Esq., International Telecommunications Associate, Steptoe & Johnson
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Telecommunications Policy, Regulation and Restructuring

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I. Summary of Key Discussion Issues

A. Day 1: Wednesday, February 17.

1. *The Role of Telecommunications in Economic Development*

Following the opening of the Conference with remarks from Mr. Mangoela, the Director of the Southern Africa Transport and Communications Commission (SATCC) and the Minister of Communications for Namibia, Mr. Hausitu, Mr. Cornelius Prior from Atlantic Telenetwork discussed applications of telecommunications in support of off-shore banking and other services such as off-shore insurance, data processing and telemarketing. He noted that these applications required an SS7 digital switch, high speed data lines and high service quality and had the potential to generate a number of skilled, well-paying jobs.

Mr. Mariki from the United Nations Industrial Development Organization (UNIDO) discussed the need for promoting local manufacturing in the region to reduce dependence on foreign imports and the use of foreign exchange earnings. He noted that not only was equipment produced abroad inappropriate for African needs, but also that in some cases, this equipment had to be discarded rather than repaired due to the availability of spare parts. Furthermore, the use of tied aid from donor agencies favored suppliers from developing countries and excluded local African manufacturers.

Mr. Reitz from the Namibia Agricultural Union (NAU) focused on the need for expanding the domestic network to improve access to markets and information for farmers in the rural areas. Meat production accounts for nearly 80% of Namibia's exports which requires that producers remain competitive especially now that they have access to European markets through Lomé Convention. The NAU is especially concerned about reducing the isolation of the communal (subsistence) farmers in the country who do not have access to quality service at the present time.

The discussion following these sessions focused primarily on local manufacturing and the need to mobilize government support for the development of a manufacturing base in the region. It was determined that the development of new technologies in Africa would be inappropriate because of the rapid pace of technological change. Rather, the region should focus on research and development and the adaptation of existing equipment to meet rural needs. Suggestions were made to increase cooperation with major suppliers to encourage investment and to establish regional working groups to facilitate the process. The International Telecommunications Union (ITU) and others are working to develop a telecom manufacturing strategy for Africa and support the concept of standardization to promote local manufacturing. These efforts could include encouraging the involvement of SADC engineers in the ITU standardization process. In addition, it was recommended that efforts be made to encourage regional governments and donor agencies to give preference

to local manufacturers. Among the benefits of using local suppliers are their proximity, knowledge of local markets and needs, and lower labor costs. It was further suggested that, to standardize production, SATCC should develop regional specifications for local manufacturing that support CCITT standards.

2. *Structural Changes and Sector Reorganization*

The focus of presentations and discussions during this session was on telecommunications restructuring, privatization and private sector participation. Mr. Bo Ecklöff from Telecom Namibia made a presentation on the restructuring of Telecom Namibia addressing restructuring issues such as the separation of posts and telecommunications in 1992 and the transfer of employees to the new company which is still owned by the Government of Namibia.

In his presentation, Mr. Kayani from the World Bank outlined the problems in the telecommunications sector that have promoted reform. These include low penetration, poor quality, unreliability and the unbalanced territorial distribution of service. He discussed the necessity for defining policy objectives and identifying policy instruments such as the separation of posts and telecommunications, promotion of competition, separation of service provision and regulation and commercialization. He stressed that there were no universal solutions and that experience from other countries should be applied with caution. He also discussed the financing options to achieve restructuring such as divestiture, subscriber financing, issuance of bonds and commercial debt instruments and use of private sector financing entities. He suggested further that the success of privatization depends on political will and also the ability to integrate privatization into the political process.

Mr. Waddell of Price Waterhouse addressed the impact of telecommunications privatization on labor and productivity utilizing examples of Chile, Argentina and Mexican privatizations. In general, productivity gains from privatization were achieved overall and employees benefitted from the privatization, especially in cases where employees received encouragement and assistance in purchasing company stock. In some cases, especially that of Telmex, shares increased significantly in value, resulting in benefits to employees.

Ms. O'Neill of Steptoe and Johnson discussed private sector options for the development of the telecommunications sector, emphasizing that privatization was not the only means of accessing private sector financing. She pointed out that competition could be introduced at different levels of the sector depending on policy objectives. In general, she noted, investors are concerned about transparency and require an environment that is reasonably predictable. She also provided an overview of privatizations in Mexico, Argentina, Chile and Venezuela.

Mr. Odeh from the ITU discussed how privatization is driven by need for new sources of capital. He briefly noted the use of private sector mechanisms such as loans from private institutions, revenue sharing schemes such as Build-Own-Transfer (BOT) and Build-Lease-Transfer (BLT), subscriber loans, financial markets and joint ventures.

A case study of the privatization of the telecommunications entity in Guyana was discussed by the former President of Guyana, Mr. Hoyte. He noted that before privatization, the telecommunications entity in Guyana was unable to service its debt or raise financing for equipment and services. During this period, the country's telephone penetration rate was 1.7% and its call completion rate was 15%. The sale of the company resulted in significant increases in employee salaries and tax revenues to the Government of Guyana. Penetration rates went up to 4% and call completion rates to 50%.

The discussion following this session focused on whether a telecommunications entity and network could achieve the efficiency and growth necessary to be profitable through increased autonomy from the government without ownership changes. This discussion was based on the assumption that the principal need of the sector was access to resources rather than changes in ownership. Concerns were raised in the audience that privatization was being presented as the only option to achieving policy objectives and it was suggested that efforts be made to examine the relevance of competition and privatization to the SADC region where networks are small. It was pointed out that privatization does not necessarily have to be accompanied by competition. In the case of Guyana, the telecommunications entity is still a monopoly because the size of the market does not support open competition. In response to concerns about job loss associated with restructuring, it was noted that in the case of Guyana, the investors agreed with the government that voluntary retirement would be offered. The investors did not fire any of the employees because they were needed to keep the company in operation.

B. Day 2: Thursday, February 18.

1. *Private Sector Participation in Telecommunications*

In addressing private sector participation in telecommunications development, Mr. Kayani opened the session by examining the role of government in sector restructuring. This, he explained, relates to the level of restructuring and the policy objectives to be achieved.

Governments should be involved in setting long-term objectives for the sector and articulating sector policies related to investment and resource mobilization, commercialization, tariffs, manufacturing, private sector participation, competition, privatization and regulation. The government should support telecommunications entity attempts to be more responsive to user needs by:

- granting it greater autonomy;
- ensuring that it has a competent, business-oriented Board of Directors and management team;
- enabling it to award contracts;
- ensuring that subsidies are available to support unprofitable projects and services; paying its bills on a timely basis;
- reviewing tariff levels according to agreed provisions; and
- providing adequate equity and undertaking financing restructuring where necessary.

With regard to regulation, he outlined regulatory functions to include the granting of licenses, the approval of subscriber terminal equipment, the review of interconnection and revenue sharing arrangements and the definition of a mechanism to obtain user views periodically. In addition, Mr. Kayani defined regulatory objectives to ensuring that:

- interests of consumers, governments and operators are served and grievances addressed;
- tariff policies are defined;
- technical and financial performance indicators are monitored;
- the radio frequency spectrum is management effectively; and
- competition is encouraged and supported.

Mr. Prior discussed the factors that investors consider in making investment decisions. Investors take into account the political climate existing in a country and its economic potential, existing telecom infrastructure, financial outlook and legal climate. The most important of these is the political climate, particularly the government's attitude towards private and foreign investment. Other key factors are the existing condition of the telecommunications system and the required amount of investment needed to upgrade it as well as the company's ability to generate foreign exchange. There is also the issue of legal protection afforded investors by the company's laws, the rate of return on investment available under the system of regulation and the freedom to operate the company efficiently and without undue regulatory oversight.

Mr. Jabre from the International Finance Corporation (IFC) discussed the role of the IFC in financing telecommunications development and its involvement in funding cellular network development in Hungary, Zaire and Mexico and other capital projects in Chile and the Philippines. He noted that privatization and liberalization offer a full range of new

financing options from outright privatization to "middle-of-the-road" solutions such as BOOs, BOTs, partial privatizations where governments retain "golden shares" and new franchises.

Mr. Werth of Hughes Communications discussed the use of satellite based systems to expand telecommunications services in rural areas. He noted that these systems allowed for the rapid installation of rural and urban telecommunications facilities. The capability of cell sites to communicate directly with each other through gateways to the public network, demand assignment and voice activation provide cost effective use of satellite resources while modular electronics allow for easy installations and low maintenance.

Discussion following this session focused primarily on the role of government in restructuring as a regulator rather than a service provider and on the need for transition from public to private sector. Moreover, any restructuring of the sector must be accomplished in the context of overall macroeconomic development and not in isolation. The audience wished to learn more about the post-privatization period in countries that had chosen the privatization option. They asked how many companies in the U.S. had collapsed within five years of start-up and how penetration had increased in post-privatization. Concerns were raised as to the effectiveness and reliability of the private sector as a partner in telecommunications development and a question was raised as to whether there had been any alliances with private sector partners or overseas investors that had failed. The case of Chile and the purchase of the CTC by Australian investor Alan Bond was cited as an investment relationship that was short-lived.

2. *Competition in the Telecommunications Sector*

In introducing the topic, Mr. Fernandes of Telecomunicaçoes de Moçambique (TdM) discussed the restructuring efforts underway in Mozambique including the performance contract between TdM and the Government of Mozambique which defines the GOM's obligations, performance indicators, tariffs, financing strategy, quality of service, strategic objectives, human resources policy and annual evaluations. Telecommunications sector policy in Mozambique is structured to allow monopoly in basic services and competition in data transmission, value-added and related services.

Mr. Waddell discussed the forms of competition that are available in facilities, services, benchmark and procurement (BOOs and BOTs). Competition offers such benefits as lower customer rates, increased technological innovation and a greater variety of services. On the other hand, it has an adverse effect on initial privatization, exacerbates current problems in developing countries and service can be disrupted by inadequate investment.

In discussing telecommunications restructuring in Africa, Ms. O'Neill pointed out that investor perceptions were more important that reality and that while it was important to have a uniform approach, primary focus should be on addressing individual country environments. She cited examples of Kenya where the postal and telecommunications

services have been separated but the regulatory and operational functions have not and that of Gambia where the Government-owned company is incorporated under the Companies Act, allowing the Managing Director of GAMTEL "free discretion to act."

This presentation was followed by the presentation of two case studies of restructuring in the region. The first was made by Mrs. Sarah Kachingwe, Permanent Secretary in Zimbabwe's Ministry of Communications, who discussed the restructuring program planned for the sector. This program will include the separation of postal from telecommunications services, the definition of policies for the two new companies, the establishment of a regulatory framework to support competition and the development of principles and procedures to guide the formulation and implementation of appropriate tariff structures and levels.

Mr. Bets of Telkom S.A presented the second case study which discussed the restructuring of the company including the separation of regulatory and operational functions and the establishment of a regulatory body which would issue licenses, enforce service standards, ensure fair competition, maintain a stable environment for telecommunications development in South Africa to attract investors, improve penetration levels and enforce compliance with international standards and service levels. Telkom S.A. is a public company with only one shareholder which is the government; privatization is not an option under current legislation. Among the key issues that the company had to face in restructuring was the continued provision of unprofitable service for purposes of increasing penetration, an unsatisfactory debt-equity ratio, a clear commitment of job security to Telkom staff and a prohibition on the sale of shares in Telkom.

Representing the African National Congress (ANC), Mrs. Shope-Mafolo noted in her presentation that the ANC was concerned that the report prepared for the restructuring of Telkom called for the retrenchment of workers. Given that the ratio of staff per line was indeed unjustifiably high, there were concerns that black and female staff members--whose numbers were already low--would be significantly affected by any job losses associated with restructuring. She stressed the need for more education and training for the black population and the need for an independent Telecommunications Authority to oversee the functioning of the sector, especially the further development of rural services.

The discussions following this session focused on the relationship between telecommunications and security in situations where governments are reluctant to relinquish control of the telecommunications system for fear of security threats. The example of the U.S. was cited where 60% of the radio frequency spectrum is allocated to the U.S. Government. Private sector companies such as AT&T provide services to the U.S. Government. However, employees must have special clearances. Similar approaches are being used in Argentina, Venezuela and Mexico. Governments could consider the construction of another network but public networks could used securely with encryption. A related issue is the guarantee of security in a private network to protect users against

eavesdropping, especially in the case of satellite services where footprints cannot be controlled and signals are easy to steal. Such protection is afforded by encryption.

C. Day 3: Friday, February 19.

1. *Telecommunications Regulation*

Sessions in the first part of the final day focused on the issue of regulation. Mr. Tyndall, who heads the regulatory agency for the telecommunications sector in Guyana, noted that the regulatory body should be established and functional before the sale of the company is made. In establishing a regulatory body, objectives must be clearly established, regulatory arrangements must be tailored to meet the needs of the individual countries and relationships among the parties must be carefully defined. The latter should be defined to ensure that the regulator is independent from outside influences, that the telecommunications entity operates as an autonomous corporate entity maintaining strict business relationships with other sector participants and that the roles played by the respective parties are appropriate to the achievement of policy objectives.

Mr. Michalopoulos from Steptoe and Johnson addressed the issue of interconnection and spectrum allocation. He emphasized the need to keep interconnection policy broad and flexible, with strict access requirements and interconnection charges based on costs. He noted that spectrum allocation could be done on a block allocation basis followed by licensing, a lottery basis in addition to hearings such as the Federal Communications Commission (FCC) or through government auction.

Mr. Van Rensburg discussed the establishment of a regulatory body in South Africa. He addressed the issues of the independence of the regulator and the relationship between the government and the regulator, including whether the government would have veto power over the decisions of the regulatory body. In addition, he discussed the structure of the body, the skills needed, the procedures that would be followed and the goals and guidelines outlined in the sector policy which would govern the functioning of the regulator.

Mr. Waddell discussed tariff setting for regulation and privatization by looking at some of ratemaking mechanisms currently in use such as rate of return (ROR) and price cap and their implications. ROR has the potential to encourage over-investment and inefficiency while price cap encourages cost efficiency. Examples cited included those of Mexico which uses price cap regulation, New Zealand where there is no regulation and Jamaica which uses return on equity (ROE) benchmark.

Mr. Overvest discussed the implementation of Decree 22/92 of the Council of Ministers of the Republic of Mozambique that created the Instituto Nacional das Comunicaçöes de Moçambique (INCM). The objective of this decree was to separate the policy-making, regulatory and operational functions among the Government, the regulatory body (INCM)

and the operator (TdM). The INCM is a public institute which will assist the government in:

- defining telecommunications policy;
- preparing draft regulations and legislation;
- coordinating the implementation of international treaties, conventions and agreements related to telecommunications;
- approving materials and equipment;
- managing the radio frequency spectrum
- issuing licenses to operators and those providing value-added services;
- undertaking necessary studies for the coordination of various civilian telecommunications systems including radio and television broadcasting.

2. *Working Group Reports*

The afternoon session on the final day of the Conference was devoted to the preparation of recommendations for telecommunications development in the areas of financing, competition and private sector participation and regulation. The following are summaries of recommendations from each working group.

Group 1: Financing

Short Term

- Implement objectives identified in the African Telecommunication Development Conference held in Harare in 1990. These included:
  - Splitting Posts and Telecommunications
  - Splitting Regulatory and Operational Functions
  - Allowing Operators to Set Tariffs
  - Establishing Frameworks for Increased Autonomy
  - Combining National and International Services
  - Creating An Enabling Environment
  - Allowing Operators to Retain Foreign Exchange Earnings
  - Increasing Efficiency to Permit Operator to Generate More Internal Funds

Medium Term

- Encourage the use of private sector financing for value-added services and cellular network development. The latter should provide more income for operators;

- Encourage joint procurement to take advantage of bulk discounts;
- Develop a master plan at a regional rather than national level;
- Share resources for services to improve productivity and training to develop human resources;
- Establish a supportive climate for local manufacturing; and
- Study implications of retrenchment and re-training relative to restructuring.

Long Term

- Promote universal accessibility of services. One possible goal could be to have a telephone within one hour's walk;
- Facilitate and encourage public ownership of telecommunications stock; and
- Maintain a healthy debt/equity ratio.

Group 2: Competition and Private Sector Participation

- Develop a business plan for a joint venture for cellular service;
- Separate Postal and Telecommunications Functions;
- Prepare Five-year Finance Plans which include the potential for private investment;
- Develop and distribute information on costs and benefits of private sector participation which would be useful to support private sector involvement at the highest government levels;
- Develop reliable information which would require the development of network management information systems;
- Establish regulatory frameworks; and
- Coordinate cellular network development. SADC member countries are developing networks independently and coordination is necessary to ensure flexibility and interconnection.

Group 3: Regulation

- Establish telecommunications regulatory bodies in each of the countries with strong input from user groups and representatives;
- Once the units are established, hold meetings for the entities on a regional, annual basis to share experiences and "lessons learned;"
- Ensure that regulatory goals include the splitting of operational and regulatory functions;
- Renew or amend existing enabling legislation to establish the following:
  - an independent entity responsible for telecommunications, posts and broadcasting;
  - a sector policy to encourage universal access to service;
  - a defined organization structure for the regulatory entity; and
  - a defined scope of authority.

LIST OF SPEAKERS

Telecommunications Policy, Regulation and Restructuring

Windhoek, Namibia
February 17-19, 1993

Speaker Profiles

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TELECOMMUNICATIONS POLICY, REGULATION AND RESTRUCTURING

February 17-19, 1993
Hotel Safari
Windhoek, Namibia

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SPEAKER PROFILES

SPEAKERS

Bo Eklöf is presently the managing director of Namibia Post and Telecom Holdings Ltd., a position he recently assumed. Prior to joining the company, he was associated for many years with Swedish Telecom (Swedtel)., most recently as chief controller in the industrial sector. He served as project leader for the "Swedish Telecom Campaign for Service" in the 1990's, which was geared towards both the private market and the industrial sector. He was also controller of the market division from 1985 to 1988 and he has held various training and administrative positions with the company.

In Africa, Mr. Eklöf served as leader of a telecommunications project in Mozambique and as financial director at Liberian Telecom.

Mr. Eklöf received his graduate degree in business administration and an undergraduate degree in engineering from the University of Uppsala in Sweden.

SPEAKERS

Rui Jorge Lourenço Fernandes is chairman and managing director of Telecomunicações de Moçambique, E.P. He has seventeen years of experience in the field of telecommunications, namely in the areas of business management, operation and maintenance of systems, network planning, and human resources and training. He obtained his experience at the Mozambique telecommunications company, i.e., Correios, Telégrafos e Telefones de Moçambique (CTT), until 1981 and subsequently at Telecomunicações de Moçambique (TDM).

Previously, Mr. Fernandes was director of operation and maintenance of the national telecommunications network at TDM, including the international communications, and he served as deputy to the director general. He was later promoted to director general, responsible for the organization and management of all telecommunications services within the country.

While working at CTT, he was a telecommunications engineer in the areas of operation and maintenance of systems. He later became deputy director of the national telecommunications network, and in 1980 he was promoted to deputy director general and deputy director of the telecommunications department, with responsibility for the operation and maintenance of the national telecommunications network, including the international communications. He also served as deputy director general for the project of developing a separate telecommunications company, Empresa National de Telecomunicações de Moçambique, E.E.

Mr. Fernandes has authored several papers on organizational and management models as well as the competitiveness of the telecommunications sector.

Mr. Fernandes holds a bachelors degree in electrical engineering from the University of Lourenço Marques.

SPEAKERS

Sarah Letty Kachingwe is the permanent secretary in the Ministry of Information, Posts and Telecommunications in Zimbabwe.

Mrs. Kachingwe received her bachelor of arts degrees in history, English, and social anthropology in London.

SPEAKERS

Rogati A. Kayani is a senior telecommunications engineer at the World Bank, with responsibility for the preparation, appraisal, and supervision of Bank-financed projects in a number of English-speaking countries including Zimbabwe, Uganda, Kenya, Ethiopia, Nigeria, and China.

Prior to joining the Bank, Mr. Kayani was director of research and corporate planning for the Tanzania Posts and Telecommunications Corporation (TPTC). In this capacity, he was in charge of all planning and research activities, including postal, engineering, and corporate planning.

Mr. Kayani began his career with the East African Posts and Telecommunications Corporation, where he held various engineering positions. He served as the head of Radio and Transmission Construction and as the counterpart to the team leader for the East African section of the PANAFTEL network in charge of planning and engineering the links. Mr. Kayani was also in charge of the planning and construction of the East African Backbone microwave network in Tanzania.

Mr. Kayani received his masters degree in telecommunications systems from University of Essex in Colchester, England. He also holds a bachelors degree in electronics and electrical engineering from University of Westminister in London.

SPEAKERS

Geoffrey E. Mariki is a specialist in the telecommunications industry currently working with the United Nations Industrial Development Organization (UNIDO) in Vienna, Austria. Dr. Mariki is a former assistant professor of electrical engineering at Carnegie Mellon University in Pittsburgh, Pennsylvania, U.S.A. He also taught telecommunications at the University of Dar-es-Salaam in Tanzania and the University of Zambia, and he has served as director of industrial development with the National Development Corporation in Tanzania.

Dr. Mariki is a member of the Institute of Electrical and Electronics Engineers in the U.S.A. and an associate of the City and Guilds Institute of London. His research interests have Included Applied Electromagnetic, particularly on guided wave devices. His current interests are in telecommunications technologies including cellular mobile telephone and ISDN.

Dr. Mariki obtained his PH.D in Engineering from the University of California, Los Angeles. He is also a graduate of the Imperial College of Science and Technology, University of London, where he obtained a bachelors degree in engineering. He was awarded a masters in telecommunications systems from the University of Essex, England.

SPEAKERS

Pantelis Michalopoulos is an associate at the Washington, D.C. law firm of Steptoe & Johnson. His practice has been focused on the legal and regulatory infrastructure required for international privatizations and restructuring. He specializes in international telecommunications, energy, and intellectual property.

Mr. Michalopoulos has conducted a comprehensive review of Kenyan commercial laws and has recommended changes to those laws necessary for the privatization and reform program in progress there. Among other things, he has drafted suggested changes to Kenya's laws governing state corporations and antitrust and he has collaborated with top-level Kenyan antitrust and privatization officials towards implementation of the suggested changes and creation of a new antitrust enforcement commission.

In the area of telecommunications, Mr. Michalopoulos has participated in the drafting of the telecommunications regulations for Venezuela, in the context of the telecommunications restructuring and privatization of the telephone company in that country. He has authored, for the same client, a comparative study of the recently reformed telecommunications structures of many countries. He has given advice on spectrum allocation matters under the laws of several countries to a telecommunications client planning innovative uses of the spectrum. He has drafted transactional documents for a country privatizing one of its telecommunications carriers and for a U.S. company providing value-added services.

Mr. Michalopoulos is a member of the New York Bar. He holds a LL.M. from the University of Pennsylvania and is a graduate of the Law School at the National University of Athens.

SPEAKERS

A.F. (Bob) Odeh is senior economist in the Telecommunication Development Bureau of the International Telecommunications Union. His responsibilities are primarily related to economic development, resource mobilization, restructuring, privatization, and policy reform.

During his five years at the ITU, he has worked in many developing countries in Africa. His experience in the telecommunications sector includes reviewing the economic aspects of telecommunication projects and examining policy and regulatory issues.

Prior to joining the ITU, Mr. Odeh served as counsellor (Development Cooperation) at CIDA from 1982 to 1987 in Canada, working on formulating cofinancing plans for multimillion dollar projects in Africa and Asia. From 1978 to 1981, Mr. Odeh was on secondment from the Government of Canada for posting in Kuwait, where he served as senior advisor to the Kuwait Fund for Economic Development.

Mr. Odeh's educational background includes a bachelors in economics from the American University of Beirut, an masters in economic development from the University of Toronto, and a diploma in international cooperation from the University of Ottawa. He is the author of two books on development financing published by the Government of Canada and the International Telecommunication Union as well as numerous articles on development cooperation and resource mobilization that appear in various professional journals and are presented at international conferences.

SPEAKERS

Judith D. O'Neill, a lawyer, specializes in international telecommunications as a partner at one of Washington, D.C.'s largest law firms, Steptoe & Johnson. Ms. O'Neill specializes in cellular, satellite, and cable services and issues relating to deregulation, privatization, and restructuring of state-controlled telecom systems.

Ms. O'Neill works with and advises state-owned and private corporations as well as the InterAmerican Institute of Capital Markets in Venezuela on all attendant legal and regulatory issues involved in the privatization of telephone companies and other state industries. This includes legal issues to be addressed; drafting of new communication laws to implement government policy and allow for smooth integration of new competitors; employee stock-participation or options issues; securities and capital markets issues and other restructuring issues. Ms. O'Neill has acted as a consultant for the World Bank on matters relating to telecom privatization and has advised Latin American and East European telephone companies or government regulators directly on the privatization and competitive telecom markets.

Ms. O'Neill is chairman and founder of the Science and Telecommunications Law Committee of the Inter-American Bar Association. Additionally, Ms. O'Neill is an invited member of the Advisory Board of the Telecommunications Institute of the Americas of the University of Miami; and founder and director of the Pan American Technology Policy Forum, a roundtable discussion group among ministers of communications of the Caribbean and Latin America, telephone companies, and United States and international regulators in the telecommunications industry. She concentrates in Latin America, Eastern Europe, and the Pacific Rim. She is co-chairman of the International Technology Transfer Committee of the International Section of the American Bar Association.

Ms. O'Neill holds a bachelor's degree in romance languages from the American University in Washington, D.C. and the University of Madrid, Spain; a master's degree in quantitative international relations from the School of International Service of the American University in Washington, D.C., and a Juris Doctor, summa cum laude, from the University of Baltimore Law School.

SPEAKERS

Jan Overvest is an advisor at the National Directorate of Posts and Telecommunications in the Ministry of Transportation and Telecommunications in Maputo, Mozambique.

He has worked in Mozambique for nearly twenty years in various managerial, administrative and instructional positions. He has also taught secondary school in Zambia and at the Frelimo Secondary School in Tanzania.

Mr. Overvest received his degree in electrical engineering at Delft University of Technology in Netherlands.

SPEAKERS

Cornelius B. Prior, Jr. is president and co-chief executive officer of Atlantic Tele-Network, Inc., a telecommunications holding company with two principal subsidiaries, the Virgin Islands Telephone Corporation (Vitelco) and the Guyana Telephone & Telegraph Co., Ltd. (GT&T). He is also chairman of the board of Vitelco and secretary of the board of GT&T.

Prior to joining ATN in 1987, Mr. Prior was a managing director of the investment banking firm of Kidder, Peabody & Co. Inc., where he directed the Telecommunications Finance Group.

Mr. Prior began his career at Sullivan & Cromwell as an associate attorney and later became general counsel of the Private Investment Company for Asia before joining Kidder, Peabody in 1971.

Mr. Prior obtained his bachelors degree from Holy Cross College and his law degree from Harvard in 1962. He was a Fulbright Scholar at the Universiity of São Paulo Law School in Brazil.

SPEAKERS

Gys Reitz is communications manager of the Namibia Agricultural Union. In this capacity, he is responsible for the planning and execution of the NAU's internal and external communication program. This includes the Union's official publication, AgriForum, the radio program Landboumicrofoon, media liaison, image building, and the dispensation of agricultural information.

Prior to joining the NAU, Mr. Reitz worked as a reporter and sub-editor at the then South West African Broadcasting Corporation (SWABC).

Mr. Reitz holds a bachelors degree and a Hons.B. in journalism from the University of Stellenbosch in South Africa.

SPEAKERS

Lyndall Shope-Mafole is the coordinator of the Center for the Development of Information and Telecommunications Policy (CDITP) in South Africa. She coinitiated and established the center in 1992.

Ms. Shope-Mafole has also held several positions with the African National Congress. For the ANC Youth League, she served as deputy chairperson and secretary for international affairs and as a member of the task force sent to South Africa. As a member of the Youth Section of the ANC's National Executive Committee, Ms. Shope-Mafole served as a representative in the United States and as a staff member of the ANC's Observer Mission to the United Nations.

Ms. Shope-Mafole received her masters degree in telecommunications engineering at the Higher Institute of Technology in Havana, Cuba.

SPEAKERS

Joseph A. Tyndall is chairman of the Guyana Public Utilities Commission. In this capacity, he is responsible for regulating the activities of the country's telecommunications sector.

Mr. Tyndall's distinguished career in public service spans the past three decades. While living in Washington, D.C., he was minister and special representative for trade and investment at the Embassy of Guyana. He also served as executive director of the Inter-American Development Bank.

Mr. Tyndall has held ministerial posts at the Ministry of Agriculture and the Ministry of Trade in Guyana. Regionally, he has served as the acting secretary general and deputy secretary general for the Caribbean Community (CARICOM), and as director and chief economist for the Trade and Integration Division of the Caribbean Free Trade Area (CARIFTA).

In Guyana, Mr. Tyndall also served as secretary and chief administrative officer at the Central Bank of Guyana; as assistant secretary for the Office of the Premier and Ministry of Economic Planning; and as Labour Officer at the Department of Labour.

Mr. Tyndall received his bachelors degree in philosophy and economics at the University of London, England. He also holds an advanced diploma in public administration from the University of Exeter, England.

SPEAKERS

Eugene van Rensburg is a well known businessman in South Africa. After qualifying as a chartered accountant he joined a large investment house and was given the responsibility for their various retail interests. He served as a board member of several listed companies, with the joint responsibility of developing with the underlying management the strategy and direction of each company. He was involved in several takeovers and the listing of the well known retail group, PEP Stores.

During 1972, Mr. van Rensburg entered the banking world, where he took control of several smaller banks ranging from installment finance to more specialized merchant banking activities. During this period he was member of the Bank Marketing Association of America and extended the international activities and relationships of the banks with which he was involved.

During the latter half of the 1980s, Mr. van Rensburg moved abroad to Atlanta, Georgia to set up an off-shore retail operation on behalf of a major retailing group. He returned after three years and was approached by the Minister of Privatization to join the Policy Unit, which has the responsibility for public enterprises and the privatization of state's assets. He acted as chairman of the Steering Group, which was responsible for the privatization of the steel giant, Iscor, for a total value of R3,7 billion. This public flotation was hailed as a great success. He also handled the privatization of National Sorghum Breweries, which was the largest privatization exercise aimed at empowering the black community.

Mr. van Rensburg currently acts as adviser in the Policy Unit and is handling the privatization of Abakor, but he has also taken responsibility for the corporatization of the S.A. Post Office, the forestry interest of the state, and Telkom, with more than R16 billion in assets. He is also instrumental for the introduction of competition in the telecommunications industry as well as the establishment of an regulatory authority to oversee competition and ensure a level playing field for all the role players.

SPEAKERS

Baljit S. Vohra is director of the Research and Advisory Services Division of the Intrados/International Management Group (IMG). He is an expert on privatization, financial sector development, and training.

At Intrados/International Management Group, Mr. Vohra is responsible for all research and consulting activities on privatization and financial sector development in developing countries that also include central and eastern Europe. He is also responsible for coordinating research and training activities with the United States Agency for International Development/Bureau for Private Enterprise (USAID/PRE). Mr. Vohra oversees the curriculum of IMG's extensive course offerings in privatization and other topics related to financial liberalization. He prepares country risk analysis reports gauging the potential for carrying out trade in developing countries and is co-editor of *SWAPS*, a quarterly newsletter on international financial developments and new financial instruments with a circulation of 1100 readers worldwide. He also lectures on several programs that also include pre- and post-privatization analysis, and effective financial planning and management in a privatized enterprise.

Mr. Vohra is a guest speaker for WORLDNET, an interactive satellite network of the United States Information Service which is beamed all over the developing world. The WORLDNET program offers an opportunity for experts from the U.S. to share their experience with experts from developing countries and exchange ideas on diverse areas of economic development. He is also called upon to speak on executive development programs for some of the Fortune 100 companies such as AT&T. His speaking assignments have also included strategic management in the global market place and cultural aspects of international business negotiations.

Prior to joining Intrados, Mr. Vohra worked with the Center for Privatization on privatization programs underway in developing countries. The Center was engaged in approximately 150 assignments in over 50 countries. He has worked on the privatization process in areas that have included general diagnosis, strategy development and organization planning, to prioritizing, valuing, preparing and marketing the specific enterprises selected for privatization.

Mr. Vohra holds a masters degree in business administration from the School of Business and Public Management at The George Washington University, Washington D.C. as well as a bachelors degree in mechanical engineering from the University of Jabalpur, India.

SPEAKERS

James A. Waddell is a partner in the Office of Government Services at Price Waterhouse in Washington, D.C. He currently serves as executive director of the OGS' International Privatization Group, with responsibility for the management and quality control of international and domestic privatization and infrastructure projects. These have included privatization and infrastructure development assignments conducted in Eastern Europe, Central America, and Russia as well as the states of California and Alaska. He is a specialist in regulatory economics and has directed several tariff studies in the telecommunications and power sectors, both in the U.S. and abroad.

In the telecommunications field, Mr. Waddell has designed marginal cost-based tariff structures for the national telephone companies of Kenya, Zambia, and Jamaica. These projects included incremental cost analyses, financial forecasts of revenue requirements and telephone traffic demand, and the design of time of day tariffs to promote efficient resource allocations.

Mr. Waddell has also conducted a review of the preparation of cost of service studies in a major telephone utility. This entailed developing methods for estimating the incremental costs of supplying telecommunications services and preparing and presenting tutorial on the use of marginal costs and other economic concepts in pricing telephone service. Mr. Waddell also reviewed the effectiveness of the utility's cost of service analyses in the regulatory process and in view of the organization and management of the department.

Mr. Waddell directed a theoretical and empirical study designed to estimate the cost of capital associated with the primary customer classes and product lines of a major telecommunications operating company. He co-authored a paper detailing the results of this study that was presented at he 1988 National Conference in Regulation and Public Utility Economics. Also, for U.S. West, he analyzed the risk-adjusted cost of capital appropriate for evaluating modernization projects and presented testimony in support of the study's findings.

Mr. Waddell received his masters degree in economics (econometrics and industrial organization) from Georgetown University. He also holds a masters in industrial and labor relations (labor law) from Cornell University, as well as an undergraduate degree in economics from the University of Virginia.

SPEAKERS

Andrew M. Werth, president of Hughes Network Systems (HNS) International, was one of the founders of the original Digital Communications Corporation, the predecessor to today's HNS. He is currently responsible for all of the company's international activities, including sales, marketing, and operations.

Previously, Mr. Werth was general manager of the company's largest business center, the Satellite Communications group.

With credentials in the satellite communications field that span 24 years, Mr. Werth continues to be involved in the strategic planning of products for the international marketplace. He has been associated with the development of satellite communications since the 1950s, including nine years at COMSAT Laboratories, where he led the development of early digital systems such as SPADE, SCPC, and advanced modems for INTELSAT applications.

Mr. Werth received his masters and bachelors degrees in electrical engineering from Columbia University. He has written numerous articles on the subject of satellite applications and telecommunications. He is a Fellow of the IEEE.

SPEAKERS

Gertrude J. White, a partner in the Washington, D.C. office of Reed Smith Shaw & McClay, has been with the firm since March 1989. From 1980, until its merger with Reed Smith in 1989, she was with the Washington, D.C. law firm of Pierson, Ball & Dowd.

Ms. White has specialized in telecommunications law with emphasis on common carrier matters. She has represented clients before the Federal Communications Commission, other federal agencies, and state public utility commissions. Since the FCC's cellular rulemaking, in which she represented a major radio common carrier, she has prosecuted more than 30 cellular licensing proceedings and has counselled cellular clients extensively on regulatory and business issues. She has also negotiated numerous cellular-related agreements, including ones for the sale or acquisition of cellular radio facilities, interconnection agreements, resale agreements, and construction and management agreements.

Ms. White has provided advice with respect to tariff interpretation and preparation and has participated in various tariff proceedings. On behalf of the first satellite-based interexchange carrier, Ms. White participated in FCC proceedings establishing competition in the interexchange telecommunications market and deregulating competitive carriers. On behalf of a local exchange carrier, she has negotiated billing and collection and operator services contracts with AT&T. She has advised that carrier regarding its entry into the provision of interstate and international telecommunications services and other competitive communications-related services.

Ms. White received her bachelors degree. in biology from Tufts University and her J.D. from the American University. She is a member of the District of Columbia Bar.

SPEAKERS

Assad Jabre is manager of the Telecommunications Division at the International Finance Corporation (IFC), an affiliate of the World Bank which has the key responsibility for promoting private sector growth in developing countries, Eastern Europe and the former Soviet republics. Over the past few years, the IFC has considerably expanded and diversified its investments and activities in support of private companies in the developing world, while strengthening its own financial position.

Mr. Jabre came to the World Bank Group in 1980. In 1981, he joined the IFC as investment officer in the Department of Investments, Africa. In 1986, he transferred to the Department of Investments, Europe and Middle East where he was promoted to senior investment officer. From 1989 to 1992, he served as special assistant to the executive vice president of the IFC. Before joining the World Bank Group, Mr. Jabre worked for a French banking group in Paris.

Mr. Jabre holds a masters degree in business administration from the Wharton School of the University of Pennsylvania and is a graduate of the Institut d'Etudes Politiques de Paris.

Telecommunications Policy, Regulation and Restructuring

Windhoek, Namibia
February 17-19, 1993

Speaker Presentations

SPEAKER PRESENTATIONS

DAY ONE: FEBRUARY 17, 1993

WEDNESDAY, FEBRUARY 17

Morning

The Role of Telecommunications in Economic Development

9:00 - 9:15 *Opening Remarks*

Speaker: Mr. Percy Mangoaela, Director, SATCC

9:15 - 9:30 Program Overview

Speaker: Mr. Baljit Vohra, Director of Research and Advisory Services, Intrados/International Management Group

9:30 - 10:00 The Role of Telecommunications in Economic Development in the SADC Region

Speaker: H.E.M. Hausitu, Minister of Communications, Namibia

Using Telecommunications to Increase Productivity

10:00 - 10:30 Telecom Applications in the Financial and Investment Services Industries

Speaker: Cornelius B. Prior, Jr., President Atlantic Tele-Network, Inc.

10:30 - 11:00 Opportunities for Telecom Manufacturing

Speaker: Mr. Geoffrey Mariki, Telecommunications Specialist, Informatics Unit, UNIDO

11:00 - 11:30 The Role of Telecommunications in Increasing Access to Agricultural Markets

Speaker: Mr. Gys Reitz, Communications Manager, Namibia Agricultural Union

11:30 - 11:45 BREAK

11:45 - 12:30 **Discussion**

Moderator: Mr. Percy Mangoaela, SATCC

WEDNESDAY, FEBRUARY 17

Afternoon **Structural Changes and Sector Reorganization**

2:00 - 2:15 *Opening Remarks:* Why Restructure?

Speaker: Mr. Bo Ecklöf, Managing Director,
Mr. A.W.G. Ruck, Senior Advisor
Namibia Post and Telecom Holdings Ltd.

2:15 - 2:45 Developing Telecommunications Policy

Speaker: Mr. Rogati Kayani, Senior Telecommunications Engineer, The World Bank

2:45 - 3:30 Legal Issues in Restructuring: Corporate and Regulatory Structures

Speaker: Judith O'Neill, Esq., International Telecommunications Partner, Steptoe & Johnson

3:30 - 3:45 **BREAK**

3:45 - 4:15 Impacts of Restructuring on Labor/Productivity

Speaker: Mr. James Waddell, Partner, International Privatization Group, Price Waterhouse

4:15 - 4:45 Potential for Private Sector Participation in Telecom Development

Speaker: Mr. A.F. Odeh, Senior Economist, International Telecommunications Union

4:45 - 5:30 **Discussion**

Moderator: Mr. Bo Ecklöf, Namibia Post and Telecom Holdings Ltd.

The Role of Telecommunications in Economic Development in the SADC Region

by: *H.E.M. Hausitu, Minister of Communications, Namibia*

THE ROLE OF TELECOMMUNICATIONS IN ECONOMIC DEVELOPMENT OF SOUTH AFRICA

Mr. Chairman,
Distinguished Speakers,
Ladies and Gentlemen

1. INTRODUCTION

I Consider it a great honour and it gives me great pleasure and delight to give opening statement to this important SADC Seminar on Telecommunication Policy, Regulation and Structuring: the first USAID - SADC Communication Seminar. I would also like to express my deepest appreciation to the United States Agency for International Development and the Management of Price Waterhouse for their ingenuity in organising this first and Seminar at this time in this beautiful Capital City of Namibia.

I am also particularly pleased to be with you to-day to focus on "The Role of Telecommunications in Economic Development in Southern Africa" and tell you more about the SATCC programme of action in the development of telecommunications in the SADCC region Comprising Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Tanzania, Zambia and Zimbabwe.

Southern Africa, normally, hits the international headlines as the region of conflict. Wars and politics stand out and impede and continue to threaten the region's development.

But, there is a great deal more to the region than conflict. In particular, there is long term economic potential; the region has almost all the raw materials, agronomic zones and substantial basic infrastructure necessary for rapid development.

The SADCC countries are diverse in many ways, but the region has two things in common:

- commitment of the governments to developing their economies, with an increasing role for the enterprise sector, and higher priority for trade and investment for both regional and foreign enterprises, and

- recognition by the region that its relationship with South Africa is one of a high degree of economic interdependence without seeking a regional confrontation.

The countries are diverse in size, and also politically and economically.

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2. SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

SADC was formed in August 1992 but its predecessor the Southern Africa Development Co-ordination Conference (SADCC) was formed in 1980 with the broad objectives of fostering co-ordinated regional economic development and reducing the dependence of the countries of the region, particularly, on South Africa and Centres outside the region.

Since its formation, SADCC had placed top priority on the rehabilitation and development of the region's transport and communications infrastructure. The organisation has also articulated policies and initiated activities aimed at investment production and trade.

The institutional framework of SADCC is composed of a small Secretariat based in Gaborone, Botswana. Responsibilities for Sectoral Co-ordination of programmes including chairing of commissions are shared among the member states. Mozambique is responsible for Transport and Communication through the Southern Africa Transport and Communications Commission (SATCC) based in Maputo.

In order to achieve the objectives of the new SADC, among other things, SATCC will undertake to:

a) harmonise political and socio-economic policies and plans of Member States;

b) create appropriate institutions and mechanisms for the mobilisation of requisite resources for the implementation of programmes and operations of SADC and its Institutions;

c) develop policies aimed at the progressive elimination of obstacles to the free movement of capital and labour, goods and services, and of the peoples of the Region generally, among Member States;

d) promote the development, transfer and mastery of technology;

e) improve economic management and performance through regional cooperation;

f) secure international understanding, cooperation and support, and mobilise the inflow of public and private resources into the Region;

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2.1 Transport and Communication

This is by far the top priority sector for SADC and the Donors. In December 1992, there were 42 Telecommunication projects at a total of US Dollars 1.139 billion of which 37% was secured. The foreign exchange element of the total cost is US Dollars 1,021 billions.

In the telecommunications field, SATCC is responsible for the coordination of:

- Regional components of the Pan African Telecommunications Network (PANAFTEL).
- Satellite earth stations connectivity within the region.
- International telephone and telex switching centres in the member countries.
- Dedicated telecommunications network to meet special requirements in support of transportation, civil aviation and meteorological projects.
- Operational Co-ordination in tariffs, standardisation and regulatory issues.
- Training and manpower development.
- Assistance in preparation of long term development plans.

Priority is given to the completion of the missing trunk routes in the regional network, rehabilitation of the telecommunication networks in Angola and Tanzania and institutional and manpower development.

3. TELECOMMUNICATIONS SERVICES

Telecommunications quality of service throughout the region varies but, on the average it is below international standards. During the past decade, attention was focussed on the provision of international systems i.e. Gateway exchanges, Earth Stations and intercountry microwave links.

Of the SADC total population of 78.95 millions only about 600,000 have access to the telecommunication network in other words an average density of 0.57 per 100 inhabitants. Only Botswana, Swaziland and Zimbabwe have a telephone density above 1.0 main line per 100 inhabitants.

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Most of the telephone lines are connected to the 27% of the urbanised population (23.24 millions) while the rural areas with a population of 54 millions have a density of 0.03 main lines per 100 inhabitants.

The investment allocated for development of the telecommunications network is very low (less than 4%) in comparison to investment assigned to other sectors in each of the SADC Member States.

SATCC, in order to increase regional co-operation, has given priority to the development of international links and international Switching Exchanges in terms of equipment and investment in the sector. However, access to the national networks remains difficult in most cases due to the poor level of quality of service and the low success rate of incoming calls.

The SADC Countries continue to suffer from the following constraints:

- limited capacity, with only 600,000 lines with a waiting list of more than 400,000 applicants.

- obsolete equipment, only Botswana, Mozambique and to a certain extent Namibia, Lesotho and Malawi use digital technology, the rest function with crossbar, manual or Sxs technology.

- Networks are concentrated in urban areas mostly saturated and poorly maintained with a high fault rate per subscriber and fairly long clearance times.

Emphasis is now, however given to the rehabilitation, extension, and utilisation of the national and local subscriber base.

With the exception of Botswana, Mozambique and to a certain extent Lesotho and Malawi most networks in the region consist of old equipment which often breakdown for lack of spare parts. The local networks are usually badly maintained which result into low availability and poor quality of service.

Usage of Service

It is presently envisaged that a full international telephone subscriber dialling will be realised for intra-SADCC traffic by the end of 1995 when Angola, Namibia and Mozambique are fully interconnected into the regional trunk network.

For the SADCC countries about 60% of telecommunications revenue is generated by business users, about 30% by government users and about 10% by residential users.

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4. ROLE OF TELECOMMUNICATION IN ECONOMIC DEVELOPMENT

Given the above constraints the countries of SADC are among the least developed countries both economically and in their use of telecommunications. There are strong indications that expanded telecommunication investment is essential, not only for growth, but also to remain competitive.

The SADC countries must accelerate their application of telecommunications technology or fall further behind in economic competitiveness.

The gap in telephone penetration between the developed countries and SADC is increasing. The challenge to reduce this gap is Significant Expanding telecommunications services in the region is a mamoth task.

SADC through SATCC is taking steps to assist Member States to achieve the narrowing of this gap by facilitating the procurement of infrastructure investment in order to improve the regional economies in three areas:

- reduce the cost of production;
- increasing revenues, and
- increasing employment through both direct and indirect effects.

Investment in telecommunications presents its own set of conditions. Because of the nature of telecommunications services and the benefits derived from them, measuring the benefits or placing economic values on the benefits is more difficult with telecommunications investments than other infrastructure investments.

Telecommunications is both a cause and consequence of economic development. This creates problems in precisely defining its contribution to the development process. The benefits of expanding telecommunications in a developing country appear in varying levels. These benefits could include: a rural farmer using a telephone call to replace a time consuming trip to the village; a medical provider able to request urgent supplies; a farmer ordering replacement parts for a damaged irrigation water pump; or directing handcrafts products to market by best transport facility.

Since these indirect benefits cannot be quantified, they are not included in normal cost/benefit evaluations, resulting in under investment in telecommunication systems in the SADC countries.

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4.- Impact of Telecommunications Services

Telecommunication is an input to every other industry in the economy. As inputs to production processes, telecommunications has different impact on different sectors of the economy.

Finally, the region must have the human and capital resources as well as other infrastructure investments to obtain greater benefits from telecommunications investment.

Further, installing new equipment that can provide a broader array of services will hence a great impact than the marginal expansion of existing network, providing that conditions for modernisating the other services of the economy are present.

Included in the SATCC programme, is the provision to assist the Administrations of the SADC Member States to increase the facilities provided and utilisation of the network by undertaking engineering studies for the introduction of:

- data communication and services;
- mobile radio telephone and regional standardisation;
- maritime communication;
- rural telecommunication, and
- TV and radio transmission, etc.

5. TELECOMMUNICATION ORGANISATION AND LEGAL FRAMEWORK

However, infrastructure development is not a sufficient condition for economic growth other factors include legal, regulatory, constitutional and commercial conditions for development Restrictive policies concerning private property, taxation, labor relations and foreign trade and currency exchanges can inhibit the effect of infrastructure investment upon economic development.

In the SADCC region, most countries follow the model of a parastatal Post and Telecommunications Corporation, mixing regulatory and operational functions. Most of the countries are exploring the first stage of restructuring exercise separating telecommunications from postal services and regulatory from operational responsibilities. This has actually been accomplished to a certain extent in Lesotho. Botswana has contracted out many aspects of the provision of telecommunications services to the UK based Cable and Wireless. The Mozambique parastatal has entered into a series of commercial joint Ventures with local and foreign partners.

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Botswana has contracted out many aspects of the provision of telecommunications services to the UK based Cable and Wireless. The Mozambique parastatal has entered into a series of commercial joint Ventures with local and foreign partners.

Further, the management structures in the telecommunication sector and the human and material resources used for equipment operation and maintenance rule out any major improvement in performance.

Although interested in policy and structural issues, the Donors have taken a very cautious and gradual approach. The World Bank has also been very cautious and has not played a significant role in helping the SADC countries policy makers to understand the policy and regulatory issues in the national and regional context.

To facilitate Administrations and Governments to initiate and manage the process for change in telecommunication commercialisation, restructuring and deregulation, SATCC with financial assistance from USAID is organising this seminar for SADC regional policy makers to analyse key themes of telecommunication goals, policy and regulation.

6. INVESTMENT IN THE TELECOMMUNICATION SECTOR

Investment in the sector is well below the needs for the development of telecommunications infrastructure. Despite efforts to pursuade the relevant institutions to support development in telecommunications, many other sectors which are considered as essential and strategic receive more attention and priority from governments in the provision of credits and finance from national or international financing agencies, and telecommunications sector receives funding as a last resort.

With only a few exceptions, the parastatals responsible for telecommunications within the SADC countries, have not yet fully attained the operational level which could enable them to develop independence without government assistance in the form of:

- guarantees in obtaining external financing which is needed to support the importation of equipment for their network expansion and maintenance;
- subsidies to cover the costs of rural services and other unprofitable activities, and
- exemption from taxes and duties on imported equipment.

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6.1 Infrastructure Development

However, a wide range of bilateral and multilateral donors are involved in the telecommunications sector in the SADC region, and until recently most of them were primarily engaged in the supply of equipment and services to support the infrastructure development and rehabilitation of the network in the region.

Italy, Japan, Sweden, Norway, France and other countries have played a significant role in the provision of grants and soft loans for the extension, development and rehabilitation of the telecommunication infrastructure in the region.

USAID, through the Trade and Development Programme, has financed the development of a detailed specification document for the provision of IDR equipment in Earth Stations in Lesotho, Swaziland, Zambia and Zimbabwe as part of SADCC Regional Earth Stations Interconnectivity Project.

With the ending of South Africa's destabilisation in the region and with peace coming to Angola and Mozambique, more investment assistance will be required from the SADCC Co-operating Partners to complete missing links and interconnect the Member States to the existing regional trunk network. More particularly, investment will be required to rehabilitate the networks in Angola and Mozambique.

As to self financing of the telecommunications sector, using its own resources, this is only possible in so far as the turn-over generated by the traffic and services provided is enough to accommodate the large investment and operational costs of the network. However, most networks in the region are a bit small and are yet to achieve this threshold.

The conditions for such an option are far from being fulfilled in most of the SADCC countries. However, depending on the availability of funds from Co-operating Partners, SATCC will undertake a study to determine the conditions which will enable, assist and facilitate the entities to achieve this objective.

7. DEVELOPMENT PROSPECTS

The future development of the telecommunication sector in the region will go hand in hand with the projected economic growth, once the region is established and fully integrated with apartheid-free and democratic South Africa. The Southern Africa region has a combined population of about 100 million people. Telecommunications will be a necessary link and fundamental component for integrating and providing conditions for the economic development in the region.

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And hence development of telecommunications sector in the SATCC programme and indeed in the whole of Southern Africa should be one of the major priorities in the Member States Development Plans; therefore the sector is granted special attention in order to have:

- sufficient funds for investment in the infrastructure with favourable financing arrangements and conditions;
- Manpower development and training programme for skilled and professional staff, and
- harmonisation of regulatory and policy issues to strengthen the commercial viability, efficient operation and autonomy of the organisations.

In view of the low penetration of the telecommunication infrastructure in the region an effort is required to upgrade the provision of services and hence the SADC Countries like other developing countries in Africa have set the following objectives as targets for the growth of the network:

2000 : 1,000,000 main lines, density of 1 main line per 100 inhabitants

2005 : 1,800,000 main lines, density of 1.5 main line per 100 inhabitants

This corresponds to a modest increase of about 1.3 million lines between 1990 and the year 2005 and on the basis of USD 1,500 per installed line will require USD 1.95 billions, that is an annual investment of about USD 130 million for the SADC Countries. With South Africa included total investment would require more than USD 10 billions.

In order to support the installation and investment programme an effort should be made for:

- regional industrialisation of equipment;
- training of operating and maintenance staff, and
- development of bilateral, multilateral, regional and international trading and co-operation.

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In order to support the above effort SATCC will assist in facilitating:

- joint use of complementary projects;
- identification of financing for the establishment of the infrastructure, industrialisation, and training;
- service development and promotion to improve quality of service offered by the network through regional operational co-ordination;
- harmonisation of regulatory policies and restructuring.

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Telecommunication Applications in the Financial and Investment Services Industries

by: *Cornelius B. Prior, Jr., President, Atlantic Tele-Network, Inc.*

Telecom Applications in the Financial and

Investment Services Industries

by

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President
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Telecom Applications in the Financial and Investment Services Industries

One of the principal benefits of a modern telecommunications infrastructure is the ability of a country which has such facilities to attract overseas investment in a number of attractive industries. I will attempt here to mention a few of these industries in the world today and conclude by mentioning some of the necessary telecommunications resources needed to attract such businesses.

One of the oldest "off-shore" businesses that depends on good telecommunications is the off-shore banking industry. For many years the Netherlands Antilles and Panama have been able to attract significant foreign investment through a combination of attractive local laws for foreign banking and the provision of reliable telecommunications facilities to enable foreign investors to manage these off-shore operations.

More recently the United States Government has developed a program to encourage exports by permitting American exporters to establish off-shore companies through which their export sales can be channelled. The US Virgin Islands trust territory, for example, is presently a beneficiary of an "industry" which simply records foreign sales as sales of a V.I. direct export sales corporation, whereby the export profit is kept off-shore until

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Another recent phenomenon that is also taking advantage of lower cost off-shore labor is the telemarketing business. In this business lower paid personnel are trained to market products that are of mass appeal in the developed countries. The calls are typically made to the United States in the evening hours by Caribbean employees who speak the language and who are carefully trained in both marketing and order taking.

Another business that is only now getting started off-shore is data formatting, where batches of raw data are sent to a less developed country where local employees format the data on computers and batch it back to the developed country the next day for use in the business. As in the case of telemarketing, the telephone circuits make it possible for persons to be trained in data handling for businesses that are thousands of miles away. This developing business opportunity is very labor intensive and for this reason is also of major interest to many foreign governments at the present time.

Another area where overseas' telecommunications facilities are assisting the development of business in the developing countries is Audiotext. Audiotext is a word used to describe the provision of a great variety of information to telephone users in a "dial-up" configuration. For example, a person can call a number to hear his daily horoscope and that message can come from a trained person in a totally different country, providing the information from an information bank that is sent by data

the profit is actually repatriated in cash. This is purely a record-keeping activity because the salesman in the US and the overseas buyer communicate directly with each other and the transaction is concluded as a Virgin Islands' transaction only for tax purposes. However, this method of booking foreign sales through the V.I. gave rise to a significant off-shore business and significant local taxes to the V.I. government on the gross receipts of the transactions involved.

For some years now Bermuda has been the home of off-shore insurance companies that are frequently just subsidiaries of major corporations that require an off-shore location to highlight the independence of the operation and to reduce taxes on the insurance profits. This business really has no logical connection to Bermuda except the need for an off-shore location and the legal and telecommunications infrastructure to make it work.

More recently the data processing business has blossomed outside the United States using low-cost labor in nearby developing countries. Thus Jamaica and Barbados are presently enjoying significant revenues from doing key-punching and data entry for American Airlines and other major customers. This business does have a real connection to the countries mentioned because of the need for lower wage rates to pay for the skills needed to accomplish this work.

transmission in vast quantities at low cost to make the whole operation economically efficient.

The latest example of a new information service industry is the tourist information business, where '800' numbers are advertised in the USA and Europe and answered overseas in the location where the tourist is seeking information. In these cases the potential tourist obtains the same information as if the call were made locally, but with an accent of the destination and the recording of information at the destination which then enables the location to spend its advertising dollars more efficiently in the future. Again, the principal ingredients of this service business are lower cost employees and the availability of inexpensive and reliable telephone communications.

All of the financial and information service businesses mentioned above require reliable international telephone service. The data processing and telemarketing businesses also demand that the service be provided at low cost; otherwise the advantage of lower wages would be more than off-set by high telephone charges.

Reliable telephone service today virtually requires digital switching capability in the developing country. Fortunately the cost of switching has paralleled the cost of computing in recent years so that digital switching is less expensive than earlier

technologies only ten years ago. The use of "Signalling System 7" will further enhance the ability of off-shore telephone companies to act interchangeably with telephone companies in the developed countries.

The use of satellites and fiber optics has also driven down the cost of international telephone calling. In addition, completion rates have improved significantly over recent years so that long distance companies are increasingly prepared to invest in long distance facilities to expand capacity between developing countries and the industrialised countries.

The data processing business is the most demanding of all these new service businesses from a telecommunications point of view. Yet, even here, it should be possible for developing countries to take advantage of the need for low cost human labor in the data processing business.

In the competition that will arise among developing countries for a share of the financial and information service businesses, quality of telecommunications and the cost of telecommunications will become paramount factors. A developing country that has a sound educational system will be able to produce thousands of new jobs by improving its telecommunications facilities in order to compete successfully with labor pools in the developed countries themselves.

In conclusion, it is fair to say that modern telecommunications technology now creates for developing countries a great opportunity to increase employment and to improve the quality of the jobs to which their people have access, no matter how far the country may be from the developed country that needs the service. The important first step, of course, is to make the investment in telecommunications infrastructure that will link the market with the need to the market with the supply.

C.R.P., Jr.

Opportunities for Telecommunications Manufacturing

by: *Geoffrey Mariki, Telecommunications Specialist, Informatics Unit*
UNIDO

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OPPORTUNITIES FOR TELECOMMUNICATIONS EQUIPMENT MANUFACTURING IN AFRICA[1]

by

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I. INTRODUCTION

Local manufacturing of telecommunications equipment in Africa has received increased attention in recent years. In fact the manufacture of communications (including telecommunications) equipment features prominently in both the Second United Nations Transport and Communications Decade in Africa (UNCTADA-II) as well as the Second United Nations Industrial Development Decade for Africa (IDDA-II). International agencies like UNIDO and the ITU have initiated a number of activities aimed at promoting manufacturing of telecommunications equipment in Africa and other developing countries. For Africa, the motivations behind those activities emanate from the dismal state of telecommunications development in the continent and the appeal of Member States to the international community for greater assistance in this field.

Despite concerted efforts by many African Governments and the financial support from funding institutions, the average telephone density for the entire continent remains under 1 telephone per 100 population. This abysmally low standard does not even reflect the true picture in rural areas where the vast majority of the African population lives. If one considers the rural areas separately, the telephone density falls to around 0.06 per cent. Over 80 per cent of African villages are without a single telephone and compounding the problem is the fact that a large proportion of them are not even connected to the electricity grid. Providing African villages with at least one telephone has become a noble objective for many telecommunications administrations. It is no longer considered realistic to talk of raising telephone densities to approach the world average of 3 telephones per 100 population; access to a telephone within, say, a 5 km distance, is seen as a more attainable target.

While Africa is struggling to provide one telephone per rural village, the world telecommunications industry is booming with double digit annual growth rates registered in several market segments. According to one estimate[2], the industry's global revenues are well in excess of US$700 billion of which about US$450 billion is from services and the rest is from

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[1] The views expressed in this paper are those of the author and are intended to facilitate continuing dialogue on this topic. The opinions expressed do not necessarily reflect the official position of the UNIDO Secretariat or the organization. This paper has not been edited. The paper was presented at the SADC/SATCC Seminar on "Telecommunications Policy, Regulation and Restructuring", Windhoek, Namibia, 17 to 19 February 1993.

[2] Datapro, "Datapro Reports on International Telecommunications", January 1992

equipment sales. Industrialized countries and some developing countries in Asia and the Pacific and Latin America and the Caribbean are advancing rapidly into the era of Integrated Services Digital Networks and Personal Communications Services. While all this is happening, Africa finds itself entangled in a "Catch 22" situation. Africa needs finance to expand and enhance telecommunications networks in order to improve economic conditions but investors want to see an improvement of the economy before they extend funds. The almost total reliance on imported telecommunications equipment aggravates the African dilemma. The little manufacturing where it exists is limited mainly to telephone cables, assembly of telephone sets and production of some mechanical and electrical components. By far the vast majority of African countries import virtually all their requirements for telecommunications equipment. Development of telecommunications in Africa has thus been based not on the actual demand but on availability of foreign exchange. Given the scarcity of foreign exchange experienced by most countries, the telecommunications sector has remained grossly underdeveloped. Developing manufacturing capacities for telecommunications equipment in Africa will contribute immensely to the expansion of services that will attract new investors to exploit the continent's untapped huge natural resources.

This paper discusses the status of equipment supplies in Africa and some of the problems involved in setting up telecommunications manufacturing industries. Proposals are presented on "Elements of an African Strategy for Enhancing Opportunities for Telecommunications Manufacturing". These proposals are intended to contribute to the continuing discussions on this subject rather than provide a prescription for resolving all the constraints faced in setting up telecommunications equipment manufacturing industries in Africa. Trends in private sector participation in telecommunications equipment manufacturing and some past and current activities in support of telecommunications manufacturing are also analyzed.

II. SUPPLY OF TELECOMMUNICATIONS EQUIPMENT IN AFRICA

The almost total dependence of African countries on imported telecommunications equipment is a major contributing factor to the state of underdevelopment of telecommunications services on the continent. Besides being a continuous drain of foreign exchange, heavy reliance on imported telecommunications equipment has had the following negative consequences:

(i) The imported equipment was designed and manufactured to suit conditions in more developed countries and operate in completely different markets and environment. These equipment are not necessarily suitable to the African conditions. After all in terms of global purchases of telecommunications equipment, African purchases account for only just over 1 per cent of the world total. Thus manufacturers in industrialized countries do not generally design and produce equipment specifically for the African market since this represents a very marginal market. It should also be recalled that a handful of multinational corporations dominate the world market and have global operations. In their scale of operations, the African market is seen as very small. Their R&D expenditures are on innovations to suit the major growth markets in North America, Europe and Asia. The latter region is, however, making determined efforts to establish its own manufacturing base to suit prevailing conditions in that part of the world.

(ii) For commercial reasons, suppliers of imported equipment stop manufacturing older systems including spare parts. As a result very often equipment which is otherwise providing adequate service has to be discarded and replaced simply because the necessary spare parts cannot be obtained. Africa, with foreign exchange shortages, can ill afford such wasteful practices and this situation continues to contribute to the deterioration of telecommunications services in many countries.

To ensure viability and long term stability of the telecommunications sector in Africa, it is essential to strike a balance between manufacturing and services. The few manufacturing facilities existing in Africa are found in only a handful of countries. The intra-African trade in telecommunications equipment is very small. The manufacturing facilities operate very much below capacities for various reasons including limited R&D capabilities, manpower shortages, foreign exchange difficulties and lack of equipment standardization which limits the size of the domestic and regional markets. Other factors contributing to the low capacity utilization of these facilities are the external funding policies which favour suppliers from the industrialized countries. It is not unusual for an industrialized country to provide a low interest loan to an African country for development of the telecommunications sector with the condition attached that all necessary equipment be procured from manufacturers from the lending country. Thus local African manufacturers are automatically excluded.

III. ELEMENTS OF AN AFRICAN STRATEGY FOR ENHANCING OPPORTUNITIES FOR TELECOMMUNICATIONS MANUFACTURING

To attain higher levels of self-sufficiency and facilitate faster growth of the telecommunications sector, African Governments may wish to develop appropriate strategies for enhancing opportunities for telecommunications manufacturing that could include the following elements:

(i) National Policy

The role of the Government is crucial in facilitating emergence and sustenance of telecommunications manufacturing operations. Governments should designate telecommunications as being a strategic sector and implement policies to support its development including local manufacturing activities.

(ii) Systematic Use of Existing Local Manufacturers

Existing local manufacturers should be supported so as to revamp their operations and diversify their product range. There is a need to strengthen structural linkages between telecommunications manufacturers and other industrial sectors such as those in metal-working, plastics, ceramics, electrochemicals, electromechanical and wood. Possibilities for extending the range of locally manufactured products should be explored particularly for spare parts, accessories and components. The existing local manufacturing units could also form the basis for launching assembly and production of more advanced products.

(iii) Strengthening Local Know-how in Telecommunications Technologies

Donor/funding agencies should support African countries in their efforts to develop telecommunications equipment manufacturing by

encouraging increased local participation in implementation of telecommunications projects at all stages including:

- feasibility studies;
- preparation of technical specifications and other tender documents;
- contract negotiations;
- manufacture of certain subsystems and items;
- project management;
- installation of equipment and commissioning;
- local repair and maintenance facilities for the life-time of the equipment.

(iv) Support for R&D in Telecommunications Technologies

Equipment designed and developed in industrialized countries does not always meet the African requirements. Due to limited resources it may not be feasible to set-up production facilities for some of these equipment. This dilemma was analyzed in the ITU report on "The Missing Link"[3] which concluded that:

> "The first objective of the R&D establishment in the developing world, should, therefore, be to develop equipment which is not available elsewhere. An example would be equipment capable of providing service at more reasonable cost in remote areas which would be suitable for manufacture either on local or on regional basis. There is also a wide range of devices, tools and aids that are not pure telecommunications equipment but whose development and manufacture locally would reduce construction and operation costs. These establishments could adapt designs from industrialized world to the needs of the countries they serve. In other words, we do not envisage the institutes developing major new telecommunication systems but rather modifying available systems to their own requirements using modules and components available in the world market."

What this means for Africa is that efforts should be made to create R&D institutes whose initial major function will be to adapt imported equipment to suit local requirements. A network of such institutes should be supported so that activities could be coordinated at subregional and regional levels. As large resources are required to create an effective R&D institute, it is advisable that wherever possible, an existing entity like a University engineering faculty or research centre should be developed to carry out the required functions. These institutes should receive financial support from national science and technology commissions, bilateral and

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[3] ITU, "The Missing Link", Report of the Independent Commission for World-wide Telecommunications Development, Geneva, December 1984.

multilateral/international funding agencies, as well as direct grants from network operators. International development agencies like UNIDO and ITU should render technical assistance to the institutes in order to strengthen their capabilities.

(v) Private Sector Participation

The private sector, both local and foreign, should be encouraged to be full players in the provision of telecommunications services as well as equipment manufacturing. Trends in private sector participation in the telecommunications industry including measures designed to increase their participation in the African region are discussed in IV of this paper.

(vi) Strengthening Regional Cooperation

As countries in a subregion like SADC often share common developmental problems, cooperation in various areas are required to support manufacturing. These include:

- standardization of equipment;
- testing and certification including establishment of regional accreditation mechanisms for testing and certification centres;
- preferential procurement from competitive regional manufacturers.

IV. TRENDS IN PRIVATE SECTOR PARTICIPATION IN TELECOMMUNICATIONS MANUFACTURING

In the telecommunications sector, like in most other public utility capital goods sectors, manufacturing operations are intimately linked with service provision. Equipment produced by manufacturers are subjected to type approvals and have to meet standards and specifications set for connection to the public switched network. In a monopolistic environment, the public network operator is the only major market available to the equipment manufacturer. Historically, telecommunication has been viewed as a natural monopoly and State intervention was the order of the day rather than the exception. State intervention through public investment yielded a relatively stable situation where growth was controlled through development plans drawn up by national PTTs. Domestic suppliers, which were often public corporations themselves or national monopolies, were guaranteed preferential treatment in the local telecommunications market.

The situation changed dramatically with the advent of computer to computer communications via the telephone network. This technological breakthrough that began in the early 1970s, opened up new uses of telephone networks that even the most aggressive national monopolies had difficulty in embracing and controlling. Fundamental changes occurred in the telecommunications market where voice telephony, although still accounting for the larger share of traffic, is gradually giving way to the new world of value-added network services (VANS). The traditional telephone has acquired the dismissive title of "POTS" or Plain Old Telephone Service. The action and glamour of the industry are in VANS encompassing an endless array of innovations such as fax machines with memory, electronic mail, on-line databases, electronic interpreters and language translation devices. To cap

it all, digital cellular mobile telephony, despite recent negative publicity appear. set to completely alter the entire concept of the telephone. Fixed links exemplified by POTS are destined to yield to flexible links made possible by new innovations like cellular mobile digital telephony. Furthermore, developments in multimedia technologies will extend immensely the basic services to be offered to customers.

The changes in technology and the marketplace have occurred with such rapidity and magnitude that Governments all over the world began to re-examine their telecommunications policies. Different approaches have been adopted based on the guiding principles of deregulation, competition and privatization. These will not be explored in any depth in this paper. It suffices to point out that:

- there is increasing recognition that in the provision of telecommunications services the customer needs should be given highest priority;

- no matter how potentially rich a country may be, continuing to support outmoded laws and regulations will inevitably set that country at a huge disadvantage; poorer countries will find it immensely easier to attract foreign investors if they ensure them access to telephones and fax machines that work;

- Drip-feed competition, while attractive to regulators, often generates nervous uncertainties that limit growth of the sector.

This is not to imply that immediate full scale competition would solve the problems of telecommunications. The more the operators in a country, the greater the burden of the regulatory body. Nonetheless the private sector has contributed and continues to contribute to the tremendous growth of the telecommunications sector. These new entrants have been more willing to take investment risks and apply new innovations as they continue to come out of research laboratories. They do not have huge investments tied up in older technologies and thus they respond much more quickly to market forces.

It can also be said that the phenomenal growth of the telecommunications industry in recent years could not have been predicted solely by projecting the past performance of the sector in the pre-deregulation, pre-privatization and pre-competition era when growth was determined by investment decisions of national monopolies. The new policies coupled with the dynamism and flexibility of the new private sector entrants, have been instrumental in stimulating market demand in many industrialized countries. As the demand for telecommunications services grew, manufacturing activities intensified. Here too new players have entered the competition to supply products for the expanding market.

In Africa, new entrants in the provision of telecommunications services are only beginning to emerge. No doubt policies which will encourage greater competition in telecommunications services will attract even more private sector investors. It is known that the level of suppressed demand for telecommunications services is very high - certainly much higher than can be deduced from examination of waiting lists kept by national PTTs. There are thousands of would-be customers who would apply for telecommunications services if they felt that they stood a reasonable chance of receiving those services within an acceptable period of waiting. The long waiting periods

discourage many potential customers from even bothering to seek the service. But this latent demand is there, and with increased competition it can be stimulated into real demand. Increasing demand brought about by participation of private investors in the provision of telecommunications services, will encourage potential manufacturers, local and foreign, to invest in production activities in the region. This will be even more so if competing telecommunications network operators are encouraged through appropriate incentives to make their equipment purchases from regional manufacturers.

Attracting private investors in telecommunications services may require implementation of non-recourse financing schemes such as Build-Operate-Transfer (B.O.T.). B.O.T. is a form of concession arrangement which has frequently been used in the past predominantly in the field of oil and gas exploration, extraction and processing. The basic feature of this type of financing is that it calls for interested parties like manufacturers and equipment suppliers, engineering firms, banks and service companies to execute major projects such as electric plants, highways, telecommunications, railways, industrial parks and ports, with the requirement that the entire financing of the project be provided by the selected group. With such an arrangement, the Host country where the project is to be implemented, grants the group of investors a "concession" to operate and manage the constructed facility for a number of years after its completion and to recoup its investment costs as well as make a certain profit out of the proceeds coming from the operation of the facility. Such concession may include various guarantees and assurances that the legal, commercial and other conditions under which the facility will be operating during the concession period (like taxation regime, foreign exchange regime, customs regime, etc.) will remain substantially unaltered during the period of the concession. Once the contracted period has run out and usually when the investors have repaid the loans used for implementation of the project and made the expected profit, the ownership of the facility is then transferred to the Host country.

B.O.T. financing satisfies multiple purposes of all the parties concerned. On the one hand, it enables the Host country to have a certain strategic facility without engaging its own funds, by giving a concession to those who are willing to invest in such an undertaking. On the other hand, it enables the foreign partners to sell equipment, machinery and technology, while giving them, in their role as sponsors and to their lenders, an opportunity to recoup their investment through sale of the products of the facility. A further important feature of B.O.T. financing is the involvement of the foreign partner as managers in the operation of the facility. The risk involvement of the foreign partner as sponsor and as operator of the facility, acts as an important inducement to stimulate higher operating efficiency and higher standards of maintenance of the facility.

In the SADC region, for example, there are some 40 international importers of telecommunications equipment. It is conceivable that some of them could be willing to invest under B.O.T arrangements given the right policies and incentives. Negotiations for .B.O.T. financing of telecommunications projects will however have to be conducted carefully due to the complexity of the contractual structure of this form of investments.

V. SOME PAST AND CURRENT ACTIVITIES IN SUPPORT OF TELECOMMUNICATIONS MANUFACTURING IN AFRICA

UNIDO's involvement in promoting telecommunications equipment manufacturing in Africa started in 1982 when a programme was initiated in cooperation with PATU aimed at providing technical support to the development of the manufacture of telecommunications equipment in Africa. The "Regional Seminar on the Promotion and Development of Telecommunications Industries in Africa" was held in Algiers, Algeria, from 20 to 28 November 1982. This Seminar was intended to complement efforts already undertaken by PATU and the ITU in the context of the United Nations Transport and Communications Decade in Africa. A follow-up seminar on "Prospects for the Manufacture of Telecommunications Equipment in Africa" was organized in Harare, Zimbabwe, from 6 to 11 January 1986. The conclusions and recommendations of the Harare seminar were unanimously endorsed by the Third PATU Conference of Plenipotentiaries held in Arusha, Tanzania, from 24 February to 6 March 1986. Pursuant to that endorsement, UNIDO initiated and is currently implementing a project on the establishment of a Regional Environmental Testing and Tropicalization Centre for Telecommunications Equipment in Harare, Zimbabwe.

Other activities undertaken by UNIDO include the (i) "Technical Preparatory Meeting on Telecommunications Industries in Africa" held in Sao Paulo, Brazil from 8 to 12 May 1989; (ii) "Conference on National Strategies and International Cooperation for the Development of Telecommunications Industries in Africa", held in Arusha, Tanzania, from 11 to 15 December 1989; and (iii) the "Workshop for African and Arab Country Representatives from the Telecommunications Industry", held in New Delhi, India, from 3 to 12 September 1990.

The latter activity featured bilateral discussions which resulted in some 48 working agreements between African and Arab country representatives and Indian counterparts including 20 signed Memoranda of Understanding. Those agreements envisaged exchange of information, preparation of detailed project proposals for technology transfer and feasibility studies, and supply of components and equipment.

Current activities include the project on "Assessment of Capacities and Capabilities for the Manufacture of Telecommunications Equipment in Africa" which is being jointly promoted by UNIDO and the ITU with the cooperation of regional and subregional intergovernmental organizations in Africa. Another ongoing activity that is intended to promote technology transfer for the manufacture of rural telecommunications equipment in Africa is being promoted. Implementation of this project will include a roving exhibition of rural telecommunications technologies in five SADC/PTA countries. Recognizing the potential for B.O.T. financing in industrial development, UNIDO has also embarked on a project aimed at publishing "Guidelines on Development, Negotiation and Contracting of B.O.T. Contractual Arrangements".

The SADC region has taken a commendable lead in Africa in formulating regional manufacturing strategies for telecommunications equipment. In 1989 SATCC commissioned a strategic feasibility study[4] [5] on the establishment and/or development of local manufacture of telecommunications equipment. This study has lead to the adoption of SADC product specifications[6] and the formation of Regional Working Groups geared to promote cooperation among the national PTT authorities and regional manufacturers.

VI. CONCLUSIONS

Opportunities exist for increased telecommunications equipment manufacturing in the SADC region and Africa in general. Harnessing these opportunities requires formulation and adoption of an appropriate strategy. Elements of the strategy include national policies that recognize the important role of telecommunications in socio-economic development including designating telecommunications as a strategic sector. Other measures include systematic use and strengthening of existing local manufacturing facilities, strengthening local know-how, support for R&D in telecommunications technologies, encouraging private sector participation in services and manufacturing and strengthening regional cooperation.

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[4] SADC/SATCC, "SADCC Telecommunications Manufacturing Strategy", March 1990.

[5] SADC/SATCC, "SADCC Telecommunication Manufacturing - Phase 2", May 1992.

[6] SADC/SATCC, "Telecommunications Products Specification", January 1992.

The Role of Telecommunications in Increasing Access to Agricultural Markets

by: *Gys Reitz, Communications Manager, Namibia Agricultural Union*

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THE ROLE OF TELECOMMUNICATIONS
IN INCREASING ACCESS
TO AGRICULTURAL MARKETS
17 February 1993

Gys Reitz, Communications Manager
Namibia Agricultural Union

Mr Chairman, Ladies and Gentlemen

Today I would like to concentrate on the necessity of telecommunication in the development of agriculture and this implies increased access to agricultural markets. I will thus attempt to explain telecommunications as a vital resource to economic growth.

Namibia's situation in especially the developing areas will be used as example, but I will also refer to the progress which technology may bring to the developed areas.

In a country with a surface area of 0,824 million square kilometres, and a population density of 1,8 people per square kilometre, one cannot but view telecommunications as a lifeline for development and progress.

The fast-changing business world of supply and demand indicates a definite dependency on telecommunications and the news media, especially the electronic news media in Namibia. If one does not adapt or is not a step ahead, one could very easily and quickly lose one's competitive edge and profit may turn to loss.

I am sure you are wondering -- what does the so-called rat race and stiff competition have to do with a Third World country like Namibia?

Firstly : farming equals business -- this is evident everywhere, although Namibia's developing communities are not quite on this level as yet. Secondly : Namibia is part of the world market of agricultural produce, especially concerning meat and karakul pelts.

Let us concentrate on meat, for that industry offers the most opportunities.

Meat production is responsible for 87 per cent of the gross agricultural product. We are a net exporter of red meat. At present Namibia still exports 80% of its meat to South Africa, but two years ago obtained access to the European market through the Lomé Convention. Meanwhile there is also a possibility of exporting mutton to the Middle East, if our price is right.

One thing becomes clear : Namibia must gain a competitive edge. We will have to be capable of marketing affordable products which are in demand. On the one hand production should be geared to this and on the other hand the marketing chain will have to be complete and effective.

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Ladies and Gentlemen, telecommunications is a vital link in the marketing chain of agricultural produce.

The telecommunications infrastructure in the commercial areas of Namibia is excellent, whilst the infrastructure in the so called communal areas (where the subsistence farmers live) leaves much to be desired.

One of the reasons for this inadequacy in the communal areas, was the attitude of the previous political dispensation. The war in the north definitely also took its toll.

Be that as it may. The commercial farmer, by virtue of being organised and in a privileged position, obtained telephones and mail services for himself.

What I'm saying is this: Organised agriculture may play an important role in obtaining essential telecommunication services in the far-flung areas.

The Namibia Agricultural Union has been busy since 1972 to try and organise farmers in the developing areas. We endeavour, in a facilitating role, to found farmers' associations in those areas. Farmers' associations serve as an independent platform from which farmers of a certain area may take up their unique problems with the local authorities or even the state. Furthermore the Namibia Agricultural Union serves as a channel of access to the government and many other key organisations on behalf of its affiliated members.

The NAU has been especially active in the communal areas after Independence and the farmers' associations have started playing an important marketing role on behalf of their communities.

It is when one places the need for telecommunications facilities, mail services, roads, water etc on the agenda of a farmers' association meeting, that one realises the value of being organised.

What is the marketing of livestock like in the developing areas?

Up until Independence, meat production wasn't really stimulated in the traditional areas of Kaokoland, Owambo, Kavango and the Caprivi. Farmers marketed their beef either to the processing factory at Oshakati, or across the border to Angola, or enjoyed it themselves.

The Trans Cordon Fence, a veterinary fence cutting off the north from the central areas, all the way through into Botswana, meant that the northern farmers could not reach the markets of central Namibia or even South Africa. Thus farmers in the north were denied the best markets and prices.

With Independence this changed, and the door to the world opened slightly for the some 120 000 northern farmers, in spite of the Trans Cordon Fence which is still in place.

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One can imagine the situation in the rural areas of a few years ago: A farmer has a herd of cattle he wants to market. He hears though the grape [illegible] that there will be an auction some kilometres from his farm. He decides to market his cattle at the auction and slowly moves them along the road to the auction site. Along the way there is very little grazing or water. After several days he reaches his destination, only to find that there is no auction! It was moved to another date or even cancelled.

What is the current situation?

Meatco, Namibia's own meat corporation, was requested by the Government to urgently pay attention to the marketing circumstances of the subsistence farmers.

The most recent market information as well as quotas is faxed from Meatco's headquarters to the abattoir at Oshakati and the buyers in Oshakati, Rundu (Kavango) and Katima Mulilo (Caprivi).

Meatco's buyers contact the farmers' association telephonically and decide on auction dates and sites. The latest market information is then also shared with the farmers.

The executive committees of the farmers' associations would then either make the arrangements personally amongst their members, or would request the Namibia Broadcasting Corporation to announce the information on, for instance, the Oshiwambo Service. Should the plans change, this can be communicated reasonably quickly.

But imagine if every farmer would have access to telecommunications facilities. He could individually make the adjustments to his marketing programme much more quickly and plan to get his cattle to the auctions on time.

One example of the current technology which is a spoke in the wheel of marketing success, is the manual exchange at Katima Mulilo in the Caprivi. As good as those staff are in their jobs, if the exchange is overburdened, it may take longer than a day to get market information through from Windhoek.

Fortunately Oshakati and Ondangwa, the main centres of Ovambo, got an automatic exchange in 1991, which greatly eased the communication to small towns in the region.

Although Namibia has one of the most modern and extensive telecommunications networks, the arms of the network do not as yet reach large areas of the rural regions. Communication is possible through 81 permanent and some 500 mobile radio stations, but we all know how time-consuming radio communication is.

It is pleasing to take note of the work done by the Namibian Government and Telecom Namibia in this regard. For instance, a Rotel service will be implemented in the Oshakati/Ondangwa area. This project, sponsored by the German Government, apparently entails a point to multi-point radio service, which will enhance telecommunications considerably. Some 21 villages will be serviced in this manner.

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Farm lines are being planned for the Caprivi -- all this is good news for Namibian telecommunication.

Apart from all the good news, one must however be sensitive to the mammoth costs involved in setting up infrastructure of this nature, and the time needed to service the total rural area. A telephone in a rural area costs ten times more than one in town.

On the other hand, 60% of the Namibian population lives in the northern region, with some 120 000 farmers earning their living there.

We must also bear in mind that Telecom Namibia in August last year became an independent corporation. It must generate its own profits and will have to subsidise Namibia Post (the mail service) for the next five years - a difficult task for any fledgling institution.

In the commercial farming areas the telecommunications infrastructure is such that marketing takes place speedily and effectively.

In terms of meat production, a farmer completes a registration form annually according to his marketing needs and the Meat Board allocates him a quota. In order to secure a slaughtering opportunity, the farmer's agent must negotiate telephonically with the Meat Board and notify the farmer of the outcome. All this must happen at a rapid pace, because the farmer would obviously like to market when prices are peaking. The results may then be phoned through to the farmer immediately. Market information is also only a telephone call away.

One wonders what would happen if the latest trend of abolishing marketing boards were to be implemented in Namibia, with the aim of streamlining the free market system within agriculture. Farmers will be even more dependent on speedy market information in order to complete transactions as fast as possible. Telecommunication would be a vital part of life as long distances will have to be covered immediately.

But, even in the commercial areas telecommunications could improve so as to offer quicker access to markets.

Tourism is a new field for farmers. Holiday and hunting farms are becoming more and more popular with overseas tourists, these being people from highly technological countries themselves. They want to communicate directly and efficiently to draw up their tour itineraries. This sort of communication takes place mainly by fax, an amenity not always available in rural areas.

Though the need for faxes is currently limited to only a few commercial areas, I foresee that this need will quickly expand to all commercial farmers. Just think how cost-effective it can be to fax an order for production supplies to town and to merely collect the order later in the week.

Mr Chairman, telecommunication is a must for agriculture, but one is humbled by the costs involved. Telecom would not install services which are not cost-effective. One must understand their viewpoint.

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To compete on world markets, however, one's underlying infrastructure must be of equal standard — a tall order!

I trust that I have sketched the need for effective telecommunications within the marketing chain, and that improved services may offer us greater access to markets, world wide and locally.

Thank you.

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Why Restructure?

by: *Bo Ecklöf, Managing Director*
Namibia Post & Telecom Holdings Ltd.

SADCC-CONFERENCE
Mr Bo Eklöf, Telecom Namibia Ltd

Windhoek 17-19th Feb1993

WHY RESTRUCTURE TELECOMMUNICATION CORPORATIONS ?

During the 1980th's the telecommunication market has gone through a dramatic change, as all of us is well aware of. I will just highlight on four important issues which have had and will have considerable impact on all telecommunication administrations.

Demand of telecommunication services

The structure of telecommunication service providers have been national monopolies. The service provider has decided more or less on his own when and where services should be implemented in the network. Both the business customer and domestic users have had to accept that and line up in the que.

In the 1970th's especially the business customer start to increase the pressure on the local service provider for both better and new services. They also asked for more integrated services especially for international data communication.

Competitors start to show up for especially the data communication services like IBM, Geis etc. Big multinationals also build there own network worldwide.

What happened was that you got a more marketdriven structure of the telecommunication market.

Need of fast decisions and implementation of new services arise in the local national administrations. The organisations were not ready for that not even structured for such a situation. As most of the decisions were taken from a technical point of view and not from the demand of the market.

Technical development

The speed of the technical development increase considerabl. by introducing SPC-technic, digital systems, fibre optics and mobile communication systems not to forget the faximile.

The technical economical lifecycle for telecommunication equipment shortened as well as for services provided. For example the software in a digital exchange has today a maximum lifetime of 5 years and in certain cases its down to 2-3 years.

Plans have to be done on a strategic level and must be open for fast decisions close to the implementation concerning choice of technology and services to be provided.

Deregulation of the national markets

A move has been going on from national monopolies towards regulated competition in providing telecommunication services. Suddenly several of us found that new telecommunication service providers could get concessions through an independent regulatory body. Thus is making it possible to compete with the national old monopoly.

These new service providers very often start to creamskimming the market. Which means that the most profitable market will be attacked. As the services provided in many cases is very similar or the same as already on the market, price competition is used. To meet that, decisions have to be made purely from a commercial point of view. In old structures these decisions very often has been taken by government agencies or in some cases the parliament had to be involved. If the structure is not changed the national administration will have no chance to compete on equal terms.

Supply of capital for investments

Most governments today has constraint in rising necessary funds for investments in new services and plants. Due to both the increasing need of expanding telecommunication sector and other governmental priorities. In a competitive market it is also essential that there is equality for all actors on the market.

New sources for financing investment in telecommunication infrastructure are necessary to find.

Telecommunication administrations must have the same conditions as their competitors to obtain financing and form joint ventures on the financial markets.

Summary

Each one of these four issues can be the reason for restructuring your telecommunication administration. If they occur simultaneously you will have to restructure otherwise you will soon lose profitable marketshares. What one have to do is to form more commercial structure, respond fast to market demands and rise funds for development.

CHAPTER 12

POSTS AND TELECOMMUNICATIONS

INTRODUCTION

1. Posts and Telecommunications were formerly organised under a government department which was responsible for planning, building and running the post and telecommunications system in Namibia. In line with Government policy of commercialisation, the Department was turned into two state corporations in August 1992. This chapter will review the progress made by the Department during the pre-Independence and pre-commercialisation period and survey the areas requiring investment and development during this transitional phase, when the new Corporations change their operations to adapt to the new business climate in which they now have to operate.

SECTORAL PERFORMANCE 1986-1992

Telecommunications

2. After a period of stagnation during the early 1980s, 1986 saw the introduction of the first fully digital electronic exchange in Namibia - the combined trunk and local EWSD digital electronic exchange installed in the Telkom building in Windhoek. The new exchange, commissioned on 21 June 1986, replaced an old two-motion electromechanical exchange and increased the capacity to provide telephone services in Windhoek tenfold. In spite of this, the exchange could not keep pace with demand for services in the greater Windhoek area and by 31 March 1992 there was still a backlog of 2,492 applicants awaiting service. This situation is aggravated by a shortage of distribution cables in the newer suburbs of Windhoek. The expansion of telecommunication services during the period 1986-1992 is shown in Table 12.1. In Wanaheda and Katutura services will be provided in the course of 1992.

3. The expansion of the telephone services in the capital was augmented by Digital Line Units in the suburbs. At the Northern Industrial Area exchange, new units were placed in the existing exchange building and at Khomasdal a new unit was placed in a specially-built insulated container. Supplementary units have since then been installed at both these locations to cope with demand, bringing the total to 8 units.

4. It was, however, not only in the capital that extensions to the automatic switching network were made. Starting in the South, extensions were completed at Lüderitz to provide for the expansion of the CDM mining activities at Elizabeth Bay and the reactivated fishing industry.

5. The Keetmanshoop exchange is a very important station in the telecommunications link to South Africa and provides Namibia's only access to the outside world. The Keetmanshoop trunk exchange was upgraded to cope with greater demand and to provide more terminating circuits for the newly installed microwave system. A local exchange extension will be provided by the end of 1992.

6. The automation of the Rehoboth exchange was one of the major achievements of the 1980s and was the only exchange area to be automated during the decade. The new Rehoboth exchange, which has a subscriber capacity of 3,372, was commissioned in 1989 with a subscriber count of nearly 1,000. Since then the number of subscribers has grown to 1,478.

7. The Rehoboth exchange is linked to the trunk network via a digital microwave system, the first and only system of its type in the country. The new 34Mbit per second system provides sufficient capacity to serve all potential subscribers in the Rehoboth area. In future, all new transmission systems will be digital.

8. At Swakopmund the demand for services continued to increase as the Rössing mine expanded. The old electromechanical exchange had to be augmented with a containerised electronic exchange at Vineta

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which provides for 2,000 subscribers and can in future also be used as a mother exchange to provide automatic switching at Arandis and later at Henties Bay.

9. At Okahandja the trunk exchange was improved to serve the surrounding towns directly without the need to direct calls through Windhoek. This lightened the load of the Windhoek exchange which had to handle an enormous increase in international calls, especially during the period of transition leading up to independence.

Table 12.1: Expansion of telecommunication services 1986-1992.

Type of Service	1986	1987	1988	1989	1990	1991	1992
Automatic telephone lines	28 104	30 617	32 810	34 832	37 185	40 600	44 412
Automatic telephone instruments	49 410	53 009	56 391	60 262	64 739	68 538	72 417
Manual telephone lines	13 466	14 249	13 383	13 937	13 482	13 681	12 527
Farmline services	5 891	6 070	6 135	6 235	6 385	6 359	6 310
Telex services	949	1 012	1 014	795	608	557	484
Data connection	262	299	318	407	408	433	481
Packet network subscribers	Brought into service 18/7/1988			48	59	64	84
Radio line holders	9 648	9 755	10 491	11 289	11985	12 244	12 193

Source: Ministry of Works, Transport and Communications

10. On 1 November 1991 the automation projects at Oshakati, Ondangwa and Oshivelo were brought into service. The new system provided the first automatic services to the previously neglected northern regions. The Oshakati exchange can serve 1,728 subscribers and also provide service to Ongwediva. A digital line unit with a capacity of 808 subscribers serves Ondangwa. Oshivelo is served by a small 20 line digital exchange.

11. The whole switching infrastructure in the North is linked to Tsumeb via an optical fibre transmission system operating at 1.3nm at 140 Mbits per second. This provides ample capacity which will be utilized to carry TV signals for transmission at Oshakati before the end of 1992.

12. The packet network is a service that was introduced to fulfil the needs of those businesses that require constant but cost effective computer interaction between their branches and head offices. By using the packet switched network all users share the same channels on a time share basis.

13. In addition to these automation projects, extensions were also completed at the following manual exchanges and more transmission channels were provided as listed in Table 12.2.

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Table 12.2: Extension of manual exchanges 1986-1992

Town	Exchange	Transmission	Year
Arandis	100 lines	3 channels	1989
Aranos	100 lines		1987
Aroab	100 lines	12 channels	1987
Dordabis	50 lines		1990
Gibeon	100 lines	10 channels	1991
Henties Bay	200 lines		1989
Karibib	140 lines		1988
Katima Mulilo	500 lines	12 channels	1988
Khorixas	100 lines		1991
Klein Aub	100 lines		1986
Koës	100 lines		1989
Noordoewer	100 lines		1992
Okakarara	100 lines		1990
Omaruru	100 lines		1986
Okahao	70 lines		1992
Opuwo	100 lines	3 channels	1987
Oshakati	400 lines	18 channels	1988
Rosh Pinah	100 lines		1986
Rundu	200 lines		1987
Uis	100 lines		1988
Witvlei	20 lines		1988

Source: Ministry of Works, Transport and Communications, Windhoek

14. The provision of services grew steadily over the period with the exception of the telex network. Here enormous inroads were made by the arrival on the market of more convenient facsimile machines which can be bought and installed by the users themselves.

15. As the number of services provided increased, so too did the income generated by them. The point has now been reached where income appears to exceed expenditure by a comfortable margin (see Table 12.3). However, the figures below do not give a complete picture of all the costs involved in providing telecommunication services as a number of services are performed by other Government departments on behalf of the Department of Posts and Telecommunications. These costs cannot be exactly determined but estimates indicate that the Department of Posts and Telecommunications would still show an excess of income over expenditure even if they were included.

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Table 12.3: Revenue and expenditure of the Department of Posts and Telecommunication 1985-1992

Financial year	Operating expenditure	Capital expenditure	Total expenditure	Total revenue
1985 - 1986	47 616 872	18 925 609	66 542 481	53 920 229
1986 - 1987	55 243 329	11 088 803	66 332 132	74 229 838
1987 - 1988	63 230 041	14 135 348	77 365 389	89 391 697
1988 - 1989	65 670 611	11 051 024	77 721 635	109 939 006
1989 - 1990	90 350 545	9 932 082	100 282 627	141 290 049
1990 - 1991	90 422 347	14 622 485	105 044 832	154 999 250
1991 - 1992	104 294 278	17 631 481	121 925 759	167 360 988

Source: Ministry of Works, Transport and Communication, Windhoek

Posts

16. With the commissioning of post offices in Olympia, Windhoek, and Otjinene, the total number of post offices throughout the country has increased to 74. In addition, 15 agency offices are also in operation.

17. During the last 12 months 200 new private post boxes were installed at Oranjemund and 100 at Omaruru while the new post office building at Olympia was equipped with 900 new post boxes.

18. Direct airmail dispatches to Botswana, Zambia and Zimbabwe were introduced during 1991 and these services are now running smoothly.

SECTORAL CONSTRAINTS

19. The most important constraint in the telecommunications field is the lack of suitably qualified personnel. In Namibia this situation is exacerbated by the fact that the teaching of mathematics and science, subjects vital for any career in electronics, has been inadequate.

20. Demand for electronic technicians is very high and special incentives often have to be offered to retain their services. Higher training standards as well as the constant retraining of personnel will be high priorities in order to meet the challenges of a changing communication environment.

21. The expansion of the Technical Training School will receive urgent attention as the present facilities are totally unsatisfactory. To serve the training needs adequately, more classrooms, practical training areas and, above all, lecturers are required. These facilities cannot be provided at the present location and a move to new accommodation is necessary. The appointment of suitable lecturers, possibly as part of an International Telecommunication Union (ITU) initiated aid program, will be investigated during the Plan period.

22. The manually-operated telephone network will be replaced by an electronic-switching network during the Plan period. This is a requirement that cannot be ignored as the old switchboards can no longer be maintained because the required spare parts are becoming harder to obtain. A precise replacement programme will be one of the main issues of the strategic plan for the new Telecom Company.

23. In order to supply the required services, present planning estimates suggest a capital requirement of more than R200 million to expand the network over the next four years. This only makes provision for three existing manual exchanges to be replaced by digital concentrators. However, a much more aggressive replacement strategy will be pursued to maintain rural services. This will not be done at the expense of denying services to areas neglected in the past.

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24. The major expansion of services is now taking place in the North-East of Namibia. The Rundu exchange will be automated in 1994, followed at a later stage by Katima Mulilo, provided adequate financial resources are available. The 500km route along the Trans-Caprivi Highway is sparsely populated and the consequent low demand for services make it financially unattractive.

25. Attention will have to be given to Noordoewer in the South, where there is a major fresh fruit and vegetable producer, and Arandis on the West Coast. On account of its underutilised existing infrastructure, Arandis is to be developed as an export processing zone (EPZ)-type enclave. The telecommunications infrastructure at these and other centres is, however, outdated.

SECTORAL OBJECTIVES

26. Namibia is fortunate in having a relatively high telephone density within its major population centres. The rural areas in the North are, however, very poorly served and telephone penetration is less than 0.3 telephones per 100 people. To improve this situation a major expansion of the telephone system in Ovambo will be undertaken. The existing infrastructure, which has been built up over the past few years, provides a base for the expansion to 23 villages and community centres. A project to supply services to rural radio stations and small decentralised exchanges at the larger growth points is planned for 1992-1994. The following centres will be included in this first phase: Anamulenge, Eenhana, Elim, Endola, Engela, Engolo, Nakayale, Ocibo, Ogongo, Ohangwena, Okahao, Okalongo, Okatope, Ombalantu, Ondobe, Onesi, Ongenga, Ongha, Onunu, Oshigambo, Oshikango, Oshikuku and Tsandi.

27. Greater independence in international communications demands an international gateway exchange. This will be accommodated in existing premises within the Telkom Building in Windhoek which is presently being upgraded. An Intelsat satellite earth station will be constructed just south of Windhoek to link Namibia with Africa and its main trading partners in Europe. Provision could also be made for the Namibian Broadcasting Corporation (NBC) to use the site and station for the transmission of television programmes, including educational material for schools in the more remote rural areas. Feasibility studies have proved the suitability of the site and the project is now awaiting funds.

28. Linking into the Pan African Telecommunications (PANAFTEL) network is another major objective that can be realised by building a microwave link to Botswana along the Trans-Kalahari Highway. Such a system could be better utilised by the addition of spur links to the towns and villages along the route. The first priority, however, is a link to Windhoek International Airport, as the present system cannot be expanded to cope with the increased requirements of an international port of entry. The repeater station to achieve this is now under construction and the exchange equipment is on order.

29. Omitara exchange presently serves a vast area to the north as far as Otjinene. This whole area must be served with a spur from the Botswana line which will provide it with modern telecommunications services. Further along the line, Witvlei and Gobabis must be connected, as well as the communities near the Botswana border. Close collaboration with the Botswana authorities will also make it possible to serve the Otjiva community with this system.

30. The basic north-south transmission network must be extended to serve Okavango in the North and Lüderitz in the South. These two transmission projects will be undertaken during the Plan period. The first phase, the expansion of the microwave system from Tsumeb to Grootfontein, will be completed by the end of 1993. The optic fibre cable route to Rundu will also be initiated during the Plan period. This is a highly labour-intensive project and trenching from Rundu to Grootfontein will be carried out manually by locally-recruited labourers.

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31. The most important task for the immediate future of the Plan period and beyond is to transform the present Department of Posts and Telecommunications of the Ministry of Works, Transport and Communications into a state-owned corporation. In line with general government policy, experience in many different countries points to the possibility of creating a more efficient and responsive posts and telecommunications service, both for the ordinary consumer and for the increasingly sophisticated and demanding business community, through greater commercialisation. Such a move will help free the organisation of civil service rules and allow it greater autonomy in borrowing and allocating funds. Government will, however, continue to own the new corporation. A study to prepare a masterplan for implementation after the incorporation of the Department of Posts and Telecommunications will be started in 1992 and will be carried out by a consultant with experience of other parastatal telecommunications organisations.

32. The sectoral objectives will therefore be implemented within the policy framework of the conversion of the Department of Posts and Telecommunications of the Ministry of Works, Transport and Communication into two state-owned corporations. The new corporations will be legally obliged not to neglect their social obligations of providing services to every community in the country. The change will allow a longer-term financial strategy to be pursued which is not possible under the present budgeting system.

33. An attractive personnel offer for employment in one of the two new companies within the new framework of incorporation was made to all employees of the Department of Posts and Telecommunications. With a few exceptions, employees were keen to accept employment in the new companies with effect from 1 August 1992.

34. The Posts and Telecommunications Companies Establishment Act of July 1992 (Act No.17 of 1992) provides for:

- the incorporation of a postal company (Namibia Posts Ltd.), a telecommunications company (Telecom Namibia Ltd.) and a holding company (Namibia Post and Telecom Holdings Ltd.);
- the transfer of the postal enterprise as defined in the Act to the postal company and of the telecommunications enterprise as defined in the Act to the telecommunications company;
- the conditions of service of persons transferred to or employed by the postal company or the telecommunications company; and
- the control for the Post Office Savings Bank by the postal company and for other matters connected with the transformation.

35. In addition, the Posts and Telecommunication Act of August 1992 (Act No.19 of 1992) provides for:

- the regulation of and exercising of control over the conduct of postal services and telecommunications services; and
- certain powers, duties and functions of Namibia Post Limited and Telecom Namibia Limited and for other matters connected with the transformation.

36. The new corporations will aim at serving the changing needs of both the private consumer and the business community to ensure a steadily growing income. Incorporation will facilitate the financing of expansion plans and permit outdated equipment to be replaced on an ongoing basis. The constant training and retraining of personnel will play an important role in this process. The process of commercialisation demands good communication of the Corporations' strategies to all staff members. Every effort will be made to ensure the participation of each worker in the important task that lies ahead.

New postal infrastructure and services

37. To achieve the goal of bringing the post offices as near as possible to each inhabitant of Namibia, large-scale expansion to the existing facilities will be undertaken during the Plan period.

38. Architects are busy drawing up the plans for new post office buildings at Ombalantu, Onhangwena and Uukwaluudhi in the far north of the country. This project is financed by donor aid from SIDA and will be completed during 1993.

39. As soon as the accommodation problems can be solved, Namibia will establish its own philatelic section in Windhoek.

40. The Post Office Savings Bank, whose main objective is to promote savings among smaller investors and to bring savings facilities to within the reach of everybody, will continue to offer savings bank accounts and savings certificates to its clients.

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Developing Telecommunications Policy

by: *Rogati Kayani, Senior Telecommunications Engineer, The World Bank*

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SOUTHERN AFRICAN DEVELOPMENT COMMUNITY (SADC)
TELECOMMUNICATIONS POLICY, REGULATION AND RESTRUCTURING CONFERENCE

Developing Telecommunications Policy

By Rogati Kayani - World Bank

SYNOPSIS

The paper endeavors to outline the main ingredients of developing a telecommunication policy to achieve sustained growth of the sector. The paper starts with outlining the main generic problems confronting telecommunication sectors in developing countries, with the Southern Africa Development Community countries, for which this conference has been organized, as examples. The paper continues to discuss the main policy instruments that need to be addressed to correct the present unsatisfactory state of telecommunications services in this sub-region. The paper concludes by discussing the organization capacity required in the Government to formulate and implement such policies. The paper has been prepared from the references listed at the end of the paper and internal World Bank documents but the views expressed in this paper are entirely those of the author and may not necessarily reflect those of the World Bank.

INTRODUCTION

As the wind of reforms blows across the developing countries virtually every one of these countries is in the process of undertaking restructuring of one form or another in the management of its telecommunications sector. The urge for reforms has been brought about by the realization by these countries that their telecommunications networks are grossly inadequate to cope with the emerging information age. The pressures that have brought to bear on telecommunication monopolies in industrialized countries - triggering the break up of these monopolies and opening the sector to competition and privatization, are quickly spilling over to the developing world. These reforms have been possible due to the rapid change in technology which has almost rendered obsolete, old economic telecommunications theories on economies of scale. The reforms under consideration/implementation in developing countries range from simple corporatization of entities to full privatization. Over the past three years there has been substantial reforms taking place in this sub-region including split of posts and telecommunications, corporatization (commercialization), opening up of non-basic services to the private sector and competition. To adopt and implement these reforms demand a completely new approach in developing

telecommunications policies. Unlike conventional telecommunications policies, modern policies must be more integrated into the macroeconomic policies, transparent, business oriented and very dynamic. As a result, the formulation of such policies requires a much wider skills mix than before. Thus, a sector that was, until a decade ago, dominated by engineers, is now dominated by lawyers and economists with emphasis shifting from telecommunications per se to externalities. Developing a plausible telecommunications policy has therefor become a more complex task demanding expertise which is not normally available in existing institutions in developing countries.

Strategic Importance of Telecommunications

Studies carried in EEC countries have estimated that by the end of the century, up to 7% of the gross domestic product of the EEC will result from telecommunication and related activities as against about 2% today[1]. Through information technology, more than 60% of the EEC employment will depend, to an important degree, on telecommunications by the year 2000. These estimates are based on the total telecommunications industry which covers manufacturing of telecommunications equipment as well as operating telecommunications networks. Although the developing countries are not major manufacturers of telecommunications equipment, this trend towards the dependance on telecommunications will spill into the developing world creating more and more pressure for them to improve and expand their telecommunications networks. Thus, the developing countries must act now to improve and expand their telecommunication services.

Telecommunications in SADC countries

The telecommunications sector in this sub-region has the same endemic problems as those afflicting other developing countries including: unreliable service, poor quality of service, limited territorial coverage, and a large unsatisfied demand. The SADC countries with a population of about 83 million inhabitants has 517,200 telephone lines which translate to a density of 0.63 telephone lines per 100 inhabitants. Telephone densities in SADC countries is shown in Table 1. Although higher than the Sub-Saharan Africa average of about 0.4, this penetration is completely inadequate for the economies in the region as manifested by a demand which outstrips the existing supply by a factor of more than two. To bring the average level of telephone density of the SADC countries to that existing in Southern Africa (8.49) now, would require US$ 14 billion!! In addition, call completion rates for local and long distanced are low - in the range of 30-40% due to congested and inadequately maintained networks. The problems facing the sector stem from a long period of under-

investment due to lack of financial resources, lack of proper organization and management and lack of appropriate policies for the development of the sector.

Table 1 /a

Telephone Facilities in SADC Countries

Country	Inhabitants	Number of Main Lines	Density/100 Inhabitants
Angola	10,030,000	70,000	0.7
Botswana	1,290,000	26,367	2.04
Lesotho	1,740,000	13,000	0.75
Malawi	8,290,000	27,000	0.33
Mozambique	15,660,000	47,439	0.30
Namibia	1,780,000	53,413	3.00
Swaziland	770,000	13,524	1.76
Tanzania	25,630,000	73,011	0.28
Zambia	8,070,000	65,057	0.81
Zimbabwe	9,370,000	128,423	1.37
Total	82,630,000	517,234	0.52

/a Source: Siemens - 1992 International Statistics

Policy Objectives

In order to address the problems that have plagued the sector for such a long time, there is a need for the governments in the sub-region to formulate new policies and strategies that will ensure efficiency enhancement and adequate growth of the sector to meet the demands of their economies. Although the policy issues and options faced by governments in reforming their

telecommunications sectors are fairly generic, the relative importance of the issues, the package of sectoral solutions chosen, and especially the strategy to implement it are turning out to be highly country specific, depending on the political, economic and social structure of the country[2]. The sector policy objectives would generally ensure that:

- services are equitably provided at a quantity and quality levels which are economically, financially and socially justifiable;
- services are efficiently provided at reasonable price;
- monopoly is limited in some segments of the network and competition is introduced;
- resources available for the sector are maximized through private sector participation.
- technical standards for equipment and services are developed and complied with;
- tariff policies are liberalized over time in appropriate market segments;
- research and development and manufacturing are encouraged in areas where it is economically justified;
- the operators are controlled and interests of consumers are protected through appropriate regulatory mechanisms.

Policy Formulation

One of the main problems with most developing countries especially in sub-Saharan Africa is the lack of an operating policy framework. The development of a plausible policy to improve and expand telecommunications services requires, inter alia, comprehensive understanding of the issues involved and the policy options available to resolve these issues. The formulation process includes clear definition of: problems, issues, objectives and targets to be achieved; policy instruments to be pursued; legal instruments available; monitoring mechanisms for implementing such policies; and implementation timetable. The lack of clear understanding of sector issues and policy options

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available are some of the main reasons for lack of appropriate telecommunications sector policy and strategies in many developing countries.

Experience of Other Countries[3]

Many countries in industrialized and developing countries are either undertaking reforms or they have already completed such reforms. The pace and scope of such reforms has varied considerably among countries. The reform movement got an early start in Latin America; privatization of State telecommunications enterprises has been completed in Chile (1987), Argentina (1990), Mexico (1990) and Venezuela. Restructuring is at various stages of preparation in Bolivia, Columbia, Ecuador, Panama, Peru, Uruguay, Brazil and Nicaragua. Following the collapse of the communist regimes in Central and Eastern Europe and the former Soviet Union, rapid progress is being made in outlining broad sector reform strategies to deal with the huge service and technology gaps relative to the rest of Europe; all governments are developing the details of implementation, and several of them (e.g., Czechoslovakia. Hungary, Poland, Ukraine) are already building state of the art business networks through joint ventures and other new investment and management modalities. Reform has been slower and more limited scope in Asia; corporatization in Malaysia (1987) and partial privatization in (1990), corporatization and liberalization of non-basic services in Indonesia (1990), decentralization of operations in India (1985, partial) and China (1988). Government initiatives to accelerate development outside the main urban centers in the Philippines (from the late 1990) and reorganization from telecommunication departments to State enterprises in Sri Lanka and Fiji (1990); the pace may be picking up, however, with Pakistan preparing for privatization, Thailand embarking in major "Build, Transfer and Operate (BTO)" ventures, and the Indian government exploring options to restructure the state operating entity and possibly opening up parts of the market to new service providers.

In Africa, some of the countries planning and undertaking reforms include Cote d'Ivoire, Ethiopia, Ghana, Kenya, Morocco, Mozambique, Sudan, Tanzania, Zambia and Zimbabwe. Only two countries in Africa have decided to privatize their public owned entities and are in the process of implementing the decision - these are Cote D'Ivoire (1990) and Sudan (1992). It could be argued that, in "relative" terms, the least developed countries have the most to gain from sector reforms; yet Sub-Saharan Africa (SSA) is particularly lagging in the depth of reforms. SSA is particularly lagging in this respect because of various reasons including fear by governments of losing control of the "cash cow" and an outright misconception of the implications of these reforms[4]. There is therefore a need for open discussion on the implication of these reforms. This

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must involve as many parties as possible especially the staff of the operating telecommunications entity. The reforms should be announced to the public well in advance to ensure that prospective investors also informed.

The developing world has also got a lot to learn from restructuring in the industrialized world especially the EEC countries, but it is important to bear in mind the fundamental differences between telecommunications in the EEC countries and developing countries. Whereas the penetration in most of these countries exceed 50 lines per 100 inhabitants with fully developed nationwide infrastructure, many developing countries including this sub-region is still grappling with a penetration of less than 1 per 100 inhabitants, with more than 90% of the telecommunication infrastructure located in cities where less than 30 % of the population reside. Restructuring in countries like the SADC countries should focus on developing basic services to a level that is adequate to meet the requirements of their economies.

Policy Levels

Policy formulation for the telecommunications sector, like other sectors, fall under three hierarchical levels; the national or macro level, the sector or micro level and the entity level. Each one of thee levels has its own important role to play in the policy definition. At macro level, the policy would be defined in general generic form that is applicable to all public owned enterprises. The actual national policy is defined at the micro level by the Ministry responsible for the development of telecommunications. This task is carried out in close collaboration with ministries involved in the formulation of national development programs; normally the Ministries of Economic Planning and Finance. The Ministry of Finance is involved in policy formulation in its capacity as the owner of the telecommunications entity while the Ministry of Planning ensures that the telecommunication policy falls within the framework of the national development programs. When the reforms involve privatization of the public owned entity it is usual for more government ministries to be involved in the policy formulation. The countries carrying out privatization programs have established special bodies to plan and monitor the privatization process. These bodies are normally under the office of the Prime Minister and wield a lot of powers. The telecommunications entity defines the operational policies that are necessary to achieve the sector objectives that have been set up by the Government - at the most efficient manner.

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Macro Framework

For any telecommunications restructuring policy to be successfully implemented it is essential that it forms part of an overall macro economic policy. Such macro economic policy would ensure that bottlenecks in the economic system are removed. For instance, commercialization of services would only be effective if the environments from which inputs are obtained and services are rendered have been liberalized. Successful restructuring of telecommunications required to achieve international competitiveness can only be achieved in the environment of national economic strategies that favor a stable business environment, prudent fiscal and exchange rate policies, effective competition, price and foreign trade liberalization and financial and capital markets. For instance the sector is to reduce the cost of buildings then there must be a liberalized construction industry where the entity can obtain materials and services on a competitive basis. The financial systems must also be in place to enable the entity to raise funds for development. In addition, when the telecommunications sector restructuring policies are part of a macro economic policy framework which is normally approved at the highest levels in government, implementation of the micro policies is greatly facilitated. It becomes much easier for sector ministries to push for reforms because "blanket approval" for these reforms would have already been obtained at macro level. The general approach of many countries in this sub-region, where the Bank is involved in parastatal reforms, is to start with a general parastatal project which addresses generic commercial and legal issues that are potential bottlenecks in the implementation of the reforms.

Policy Instruments

Sector restructuring will by and large revolve around the following policy instruments: separating postal from telecommunication services; commercializing and separating operations from regulation; diversifying supply of services and introducing competition; increasing the participation of private enterprise and capital; and shifting Government responsibility from ownership to policy and regulation.

Separating Regulation from Operational Functions - The process of telecommunications reform will be most effective in an institutional structure that clearly defines separate and distinct roles for policy making, regulation and management. Traditionally, regulatory functions such as frequency management licensing and type-approval has been carried out by the operator. This has been acceptable because the operator had monopoly status and the

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execution of these responsibilities were done purely in the interest of the operator. With the advent of liberalization, competition and privatization, these duties can no longer be carried out by an operator; they have to be carried out by a neutral body whose interest is to develop telecommunications services and having no vested interest in any of the operators. It is also advisable, where feasible, that the policy making body is separated from the regulatory body to encourage the independence of the regulatory process.

The policy making body remains to be the government ministry directly responsible for the communications sector. The main role of government should be to set long term objectives for the sector and articulate sector policies related to: investments and resource mobilization; commercialization; divestiture; tariffs; manufacturing; private sector participation, competition; privatization; and regulation. The policy framework would also define the role of the regulatory body and where it should be administratively placed. The role of operators would also be defined. Other roles are to: coordinate telecommunications operations with other government entities in matters of national importance such as security; and represent the government in international organizations.

The role of the regulatory body will be to:

- regulate the sector to ensure that the interests of the government, the consumers and the operators are served including the establishment of a mechanism for dealing with grievances;
- define the tariff policy and approve basic rates as established under this policy. Beyond the basic rates appropriate formulae should be set for automatic adjustments in accordance with macroeconomic conditions;
- define and monitor technical and financial indicators expected from the operating bodies;
- allocate and administer the radio frequency spectrum;
- grant licenses to install and operate telecommunication services;
- carry out type-approval of subscriber terminal equipment in the public network;
- promote the development of competition and

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- review interconnection and revenue sharing arrangements

- define a mechanism by which the users' views could be periodically obtained.

The role of the operators will be to:

- manage and operate the telecommunication services under their control in completely professional manner, in accordance with international methods and procedures in force in the sector and in accordance with the principles of economy and efficiency;

- plan and provide good quality services on levels determined by the demand in the most technically and economically advantageous manner;

- manage their personnel in accordance with the laws and regulations in force and in accordance with employer - employee agreements in force;

- manage their finances on a commercial basis to ensure adequate profitability to maintain adequate good quality services;

- define and propose revision to the level and structure of tariffs for basic services and define and initiate rates for new services; and

- take part in regional and international conferences, and working groups dealing with technical, administrative and operational matters in the field of telecommunications.

Separation of Posts from Telecommunications Operations - Most of the countries in this sub-region have or are now considering separating postal from telecommunications services. Historically, postal and telecommunications services have been provided through one organization, offering these services through the same organization provided scope economies such as sharing facilities, personnel, management and joint marketing to the public of various services. However, over the past 20 years the trend has been to separate the two services and creating separate postal and telecommunication operating entities and establishing policy making and regulatory agencies that are independent of those operating entities. The principal reason for separation is that substantial differences in postal and telecommunication operations services and markets have evolved over time resulting from the numerous changes in telecommunication technology and economies which have generally eliminated most scope economies of joint provision of those services historically achieved.

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Telecommunication is technically dynamic, rapidly evolving, capital intensive and functions in a highly competitive service market while postal remains relatively static, requires simple, basic physical inputs (e.g., labor and transportation) and functions in a less competitive service market. Because of these differences, efficient postal and telecommunication operations now require different management styles, organizational structures, financing strategies, personnel and personnel training, employee salary structures and career development, facilities, productivity and service performance measures and service marketing activities. There are considerable problems caused by combining postal and telecommunications operations under one management including:

- Employees in each operation are typically covered under the same employment classification scheme and represented by the same labor unions. Thus, pay scale and pay structure is the same for both types of employees although the type of skills and education are considerably different.

- Management of more highly educated, more motivated telecommunication employees performing highly technical tasks typically requires less rigidity and structure, than management of postal employees performing tedious manual activities.

- The highly educated and skilled personnel tend to move to the telecommunications operations and thence, upward to management. Thus upper-level management tends to give most of its attention to telecommunication and scant attention to postal.

- Due to its large capital requirements, highly competitive markets, and top management interests, telecommunications typically receives all the governments limited financial support for development projects. Postal projects are often subordinated to telecommunications projects.

- Because of the large-scale but disparate operations of the telecommunications and postal systems, there are costs associated with simply coordinating the administrative and management functions for both operations.

- There is considerable difficulty in accurately separating the direct and common operational/ management costs associated with the individual postal and telecommunication systems. Thus, cross-subsidy between the services cannot actually be estimated.

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- Government policies regarding the two different operations normally evolve differently. While most countries now expect their telecommunications systems to become commercialized and open to competition, there may still be reasons to shield the postal services from competition.

Despite the problems caused by a combined posts and telecommunications and the potential benefits to creating separate telecommunications and postal operating entities, the decision to actually make the separation may not be easy. First, there may be considerable objection to the postal and telecommunication restructuring from certain interested parties. Second, a separation alone does not make the new operating entities more efficient, it simply places them to be more efficient. The other conditions the government imposes on them and their industrial sectors will dictate the extent to which they actually improve their efficiencies and achieve any other government objectives. Third and finally, there may be substantial financial cost, employee discomfort and customer service disruption incurred during the implementation period. To optimize the social and economic benefits of the separation, the Government must clearly define the overall goals for the postal and telecommunication sectors. Of specific importance in the separation of posts from telecommunications is the financial objectives of these entities. How financially self-sufficient should the telecommunications and postal operating entities be? While the telecommunications entity may be self-sufficient financially, the postal may not and the government might have to extend financial support to the postal sector, at least at the start of the separation.

Commercialization - Many of the countries in this sub-region are going through a commercialization process which is a stage towards non-governmental structures. Commercialization essentially entails operating public owned enterprises autonomously as a business venture free from day to day interference from the owner which is the government. It means a change of the relationship between the government and the telecommunication entity based on:

- establishing clear and attainable objectives compatible with commercial operations;

- providing the entity's management autonomy over its operations and the selection of managers capable of operating independently;

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- establishing clear rules and procedures for government involvement in decision making; and

- holding the management accountable by negotiating targets, monitoring and evaluating results and rewarding them and their staff on the basis of performance.

Many countries are also establishing contracted relationships between the government and the telecommunications entities often called performance contracts under which the government would set up medium-term objectives for the entity,pledge to meet its financial and other obligations in a timely manner and extend autonomy to the entity in exchange of the entity's commitment to achieve agreed performance in the efficiency and reliability of its telecommunications services and in the maintenance of its assets. To achieve these objectives improvements are also undertaken in internal organization and management such as reorganizing the enterprise into cost and profit centers, subcontracting functions that can be undertaken efficiently by other organizations, establishing or improving commercial accounting and management information systems and emphasizing customer service, cost awareness, financial discipline and staff performance.

Limiting Monopoly and Developing Competition[5] In the context of broad economic liberalization, an essential element of telecommunications sector reform is developing competition. A single monopoly operating enterprise, whether state-owned or private, is increasingly unable to meet equally well the larger, varied and rapidly changing demands of all types of users. Competition, or a credible threat of competition is likely to open established operating enterprises to focus on customers, improve service, accelerate network expansion, reduce costs and lower prices. Competition also widens user choices and accelerates the introduction of new services and facilities. Elements of competition can be effectively introduced in the early stages of sector reform and extended by stages to most or all market segments. Modalities can range from competitive award of monopoly or duopoly to regulated entry to unrestricted competition. Competition in the provision and maintenance of customer services equipment, value added services is beneficial in virtually all the countries. Introduction of elements of competition in the long distance networks makes sense as increasing traffic values reduce the importance of economies of scale. In several countries (developed and developing alike), licensing private company networks and regulating their interconnection to the public network and provision of service to third parties

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has been used to build up competition in this market segment. At present, large economies of scale make competition in the provision of wired local services viable only in exceptional situations (e.g. highly developed urban business districts) however, new radio technologies, although still more costly than wired telephones, offer competing alternatives to business and high income residences when conventional telephone lines are very scarce or perform poorly, and when service has to be provided quickly.

In addition to measures to promote competition, there are various other ways to diversify and expand the provision of services and networks. Diversifying supply can attract new sources of capital and management to the telecommunications sector, develop rivalry among service providers regarding performance and price, and generate cost bench-marks to guide pricing of monopoly suppliers. The following are some options: (1) Dividing monopolies by regions; (2) Joint ventures for the provision of specific new services or facilities (e.g., VSAT, packet switched data, cellular); (3) leasing, build-operate-transfer, and related arrangements with other operating companies, equipment manufacturers, and investors for developing parts of the public network; (4) licensing selected specialized networks to meet the needs of major communication-intensive sectors of the economy (e.g., banking, tourism, mining); (5) Franchising independent public telephone companies in unattended areas (e.g., new industrial estates, residential developments); (6) Licensing extensions of the public telephone network (e.g., rural subscriber radio); and (7) Articulating rules for commercial relationships between dedicated and public telecommunications networks.

Increasing Private Sector Participation - Increased private sector participation can attract new sources of capital, management and technology in the telecommunication sector and also contribute to the development of the private sector overall. Besides new entry and privatization of state enterprises, there are many other avenues for private participation in telecommunications. Some options involve an increased role of the private sector in the operation of state enterprise, such as: (1) Existing state enterprises may divest or out-source construction, maintenance, transportation, routine design, billing and collection, directory services, operator assistance, and other functions traditionally undertaken internally; (2) Experienced private operating companies can be retained under management contracts to run the state enterprises; and (3) State enterprises can be reorganized as joint-stock companies, and some shares sold to institutional investors and the public while the state retains a controlling interest. Other options involve alternative forms of private sector financing, such as: (4) Bonds and other commercial debt instruments can be floated in domestic and sometimes foreign markets; (5) Private financial entities can be

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encouraged to invest in profitable new telecommunications ventures; and (6) Subscriber financing schemes can raise a large proportion of the local funds needed for expansion in situations of severe supply shortage.

Privatization - Successful privatization of a state telecommunications enterprise depends on a number of factors falling into place. Privatization must be inserted in the political process. At an early stage, the government must clarify its position regarding tradeoffs among conflicting interests arising from privatization, such as among existing operators, workers, prospective buyers, potential competitors, investment bankers, the treasury, equipment suppliers, large users, and the public at large. Of particular importance is addressing from the start the concerns of organized labor.

Privatization also requires creating a market structure and a regulatory environment that provide the new owners incentives and obligations to invest and perform, and institutional arrangements that free the operators from unwarranted controls yet safeguard users and reconcile commercial interests with broader development objectives. The regulatory framework for privatizing a monopoly must separate out potentially competitive activities, establish the tariff and interconnection regimes, clarify service goals, develop cost containment targets and incentives, and create or strengthen a regulatory capability to oversee implementation. In particular, privatization brings to the fore central issues of pricing policy and regulation. Of particular importance is sorting out what extent, if at all, is it necessary to continue charging prices well above costs for some services (e.g., international) in order to finance expansion of the basic network. A closely related issue is that of the scope and duration of monopoly privileges. Initial practice (i.e., Latin America) has been to give the dominant operator exclusive rights to provide basic telephone services and networks during up to 10 years, largely on grounds that this was needed to enable investors to undertake the large initial investments required to modernize and expand facilities. Current trends, however, are more pro-competitive, including narrower scope of protection (e.g., more liberal licensing of private networks and interconnection to the public network) and shorter duration (e.g., up to five years).

International market considerations are also becoming increasingly important. A large number of sales of telecommunications enterprises are planned in both developed and developing countries. However, only a limited number of experienced operating companies are interested in these opportunities. Timing and preparation will influence the extent to which privatization offerings by developing countries succeed. Commercialization of operations, organizational and financial restructuring of enterprises, renegotiation of labor contracts, and

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improvement of available enterprise information are examples of actions that can make a particular offering more attractive. Some of the most visible and promising privatization, however, have been carried out very quickly (in little over one year), which limits opportunity for preparatory work to be bare essentials.

Proper design and implementation of the complex process of privatization and related sector reforms requires strong and visible high-level political commitment, clear allocation of authority and resources to manage the process, and expert assistance (including foreign) on policy, regulatory, legal and financial matters. Although sectoral solutions are highly country-specific and individual models cannot be readily transplanted, the experience of other countries (including developed countries) in dealing with related issues and options has proven very relevant.

Initial results from privatizing state telecommunications enterprises are generally very encouraging. Governments have successfully sold to consortia led by experienced foreign operating companies capable of providing expert managers, specialized management tools, and continued access to the latest technologies. Good financial performance, reflecting both major tariff adjustments and lower costs, is allowing privatized companies to initially finance accelerated investments largely from internally generated funds. Also, international markets have been increasingly willing to provide large amounts of capital for privatized companies in countries with sound macroeconomic and regulatory frameworks (e.g., Chile, Mexico, Argentina).

Some concerns have been raised, however, about the longer term prospects. Privatization is now being considered in a number of countries perceived by investors as posing higher political risk or offering less attractive markets. In several of these countries, even after sector-specific steps are taken to improve the investment environment, raising post-privatization capital may be a problem. The companies may be unable to attract enough private foreign capital, find themselves cut off from traditional sources of development financing, and lack sufficiently developed domestic capital markets on which to fall back. The importance of foreign operators will increase as privatization reaches the less developed enterprises. Some analysts, however, worry that the incentives and obligations of the operators as set by the government at the time of privatization are not strong enough to secure their permanence for the rather long periods that are needed to turn around some of these companies. Although so far these problems have not materialized, they do raise issues that must be examined in designing the reforms. Experience will show to what extent these

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and other concerns are justified, and how reform strategies might be modified to deal with them.

Tariff Issues

Tariffs should be adequate to cover costs and earn a reasonable rate of return. What is considered to be a reasonable rate of return could vary from one country to another and therefore is a subject of agreement between the government (or the regulator) and the operator. This is particularly important in a monopoly environment where tariffs should be controlled also to ensure that they are not used to cover up inefficiencies. Theoretically, tariffs should not be controlled in a competitive environment where market forces come to play. However, tariffs could be used by the dominant operator to strangle competition and stifle new entrants through under-pricing those services with competition while over-pricing those services which are not subject to competition. The regulator must also ensure that the operators do not form a cartel - thus need for anti-trust laws.

The government could use the tariff vehicle to raise subsidies for developing under-privileged areas by permitting differential tariffs for the dominant operator.

Manufacturing

Besides the obvious issues of volume and profitability of manufacturing, it should be looked at from a macroeconomic point of view in terms of value added and the efficiency of capital. Many of the non-cable telecommunications manufacturing industries in developing countries are mere assembly lines, with most of the components being imported. Labor is the only added value and the merits of this should be carefully analyzed. For long term sustainability of telecommunications manufacturing it is essential to have a sound electronic research and development infrastructure. Without such infrastructure, the equipment being manufactured quickly becomes obsolete.

Procurement policy is another important issue in manufacturing. The government must ensure that telecommunications operators do not buy locally made equipment just because it is made by one of their subsidiaries regardless of cost and quality. To avoid internal subsidies manufacturing should be divested from other operations of the company. One way the government could reduce inefficiencies is to allow foreign competition in equipment manufactured locally. Competition in procurement can be catalytic to innovation and efficiency enhancement for the local manufacturers.

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Addressing emerging issues[6]

In contrast with the subjects discussed above, regarding which a substantial body of knowledge and fairly broad consensus on principles have already developed internationally, other matters are only starting to receive systematic attention. Yet how some of these next-generation issues are dealt with is likely to have considerable impact on telecommunications policy and strategy. The developing countries who are in the process of developing their telecommunication facilities could take advantage of this to formulate policies which are technologically more modern. The challenge is to reduce overall costs while at the same time ensuring the development of an integrated network that is robust, manageable, and consistent with broader development goals. Technological innovations also raise the question whether reform designs based largely on today's dominant technologies, are capable of evolving and accommodating major systematic changes. Some innovations will further lower and eventually remove entry barriers. for example, radio technologies such as new analog and digital cellular telephony, personal communications systems, and satellite mobile services, all now reaching the market, will accelerate the demise of the wired local telephone network as a natural monopoly. Other developments, however, will have precisely the opposite effect. For example, new generations of optical fiber cables are resulting in ever cheaper bandwidth and negligible marginal costs of transmission, reviving natural monopoly arguments in parts of the system where now they no longer apply.

Convergence of Telecommunications and Informatics - Telecommunications is becoming an integral part of a much broader family of information technologies and applications. Distinct economic activities are increasingly being structured as different end applications of a common business, namely the organization and management of telecommunications and information resources. Examples include banking, stock trading, broadcasting, publishing, library and information services, and national statistical services, as well as traditional telecommunications and computing. As the supply of telecommunications facilities grows and diversifies, the focus shifts from the conventional dichotomy of telecommunications networks and users to organizing and managing facilities available from many sources in ways that suit particular business needs. In this context, the boundaries among businesses become blurred, and, in particular, it is no longer clear what is a telecommunications company.

Policy makers are only beginning to look into the implications of these trends for economic development. At least four areas require attention in relation to their effect on telecommunications policy and regulation. First, the structure of

telecommunications supply is likely to influence the pace and direction of informatization of the economy. An initial step is to explore the extent to which it is helpful to organize the telecommunications sector in a manner that allows flexible development of facilities and services by a wide range of suppliers, including users by themselves and for others. This enhances the potential for innovation, but makes it more difficult to establish industry-wide standards needed to develop critical mass and ensure interconnectivity among user groups. Second, the choice of technologies to modernize and expand the main telecommunications network influences the future course of sector development and information technology applications. In particular, generalized networks, such as ISDN, would provide a viable platform for multiple uses which could be especially valuable in developing countries, eventually reducing costs compared to more diversified network structures. However, others believe that ISDN provides solutions that are cost-effective for certain categories of users but not for others, delays the development of facilities-based competition, and overall costs too much. Third, there is the question of what should be the role of dominant telecommunications companies beyond traditional services. In particular, some analysts emphasize the economies that can result from these companies entering the value-added services market, for example by adding intelligence and processing capabilities to their existing networks and making these facilities accessible to users. Others, however, advocate the supply of new services by alternative providers, as part of building up an increasingly competitive environment. And fourth, the development of advanced telecommunications services is likely to have important externalities. The pace of informatization of the economy will be affected by policy decisions as to whether telecommunications companies should merely respond to demand or also play a proactive role, for example building up a critical mass of data terminals among small and medium business users to facilitate the development of information services.

Building Policy making capacity

Formulation and implementation of telecommunications policies requires capacity in the government on all aspects of telecommunications including engineering, legal, economic and financial matters. Such capacity does not exist in many developing counties. Developing such capacity takes a long time and in the present circumstances where these policies are long overdue, the time for building such capacity is not available. Thus, initially governments in developing countries may have to rely on the expertise available outside the government, or even outside the country. Many countries, including industrialized ones, have employed consultants at least during the policy

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formulation stage. The government needs to establish a small specialized group to review and revise policies in coordination with the regulatory body.

Conclusions

Developing a comprehensive and effective policy in such a dynamic sector as telecommunications is a complex task. It requires lucid understanding of all the problems, issues and objectives of the sector and demands a multi-disciplinary approach. Of paramount importance is the need for such a policy to be flexible and transparent to ensure that changes in technical, political, economic and social environment can be easily accommodated. The main stages involved in developing and revising telecommunications policy is summarized in the following chart.

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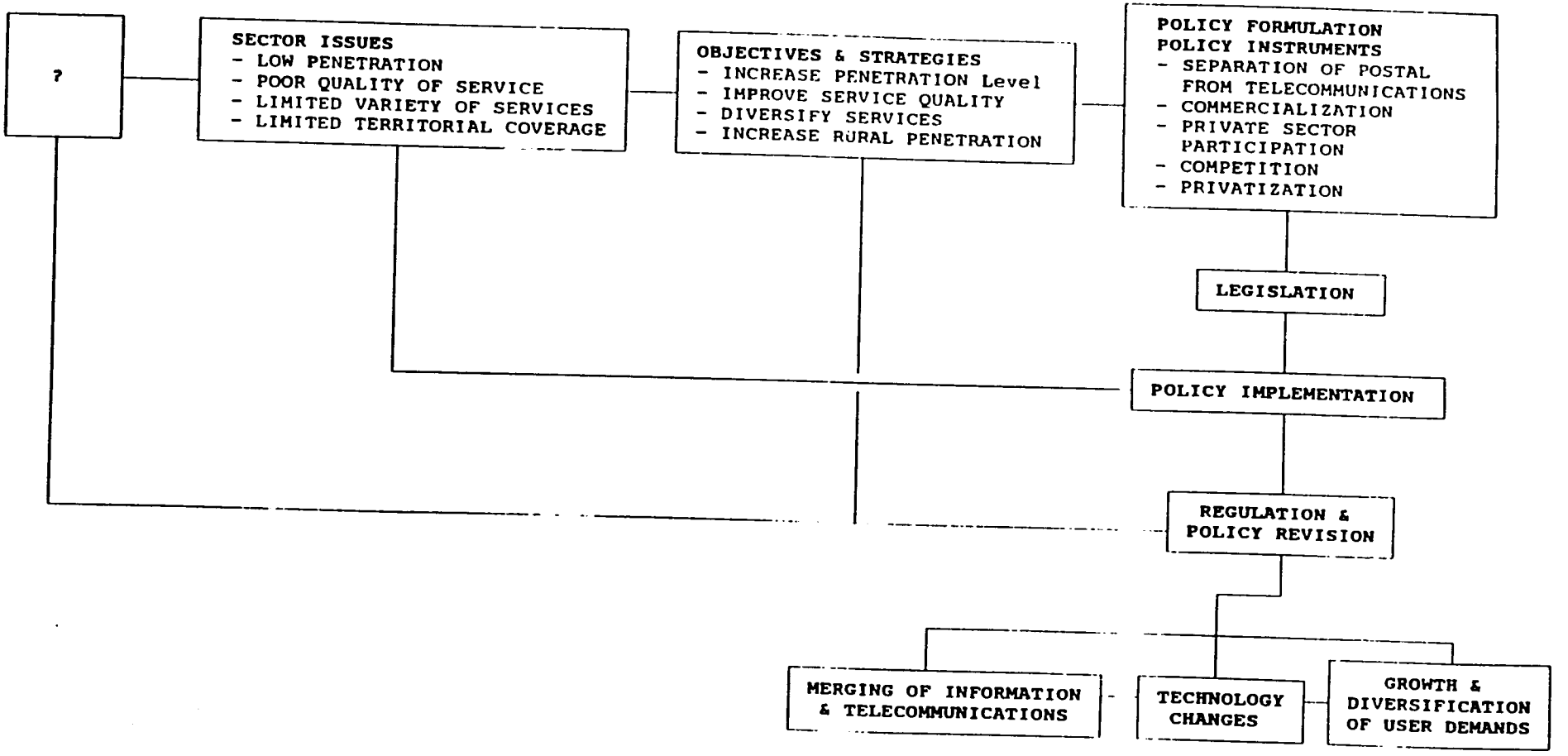
DEVELOPING TELECOMMUNICATIONS POLICY



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Legal Issues in Restructuring: Corporate and Regulatory Structures

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LEGAL/REGULATORY DYNAMICS OF THE CHANGING TELECOMMUNICATIONS ENVIRONMENT

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Judith O'Neill is the International Telecommunications partner of Steptoe & Johnson, one of Washington, D.C.'s largest and most prestigious law firms. She is President of the Telecommunications Section of the InterAmerican Bar Association; Founder and Director of the Pan American Technology Policy Forum; and has participated in varying capacities in government or private sector sides of the telco privatizations and/or sector restructurings in Mexico, Argentina, Chile, New Zealand, Thailand, Poland, Hungary, Czechoslovakia, Venezuela, Australia, and the Dominican Republic. Recently, Ms. O'Neill led a Steptoe & Johnson team selected by The World Bank from an international competition among law firms to prepare the legal/regulatory infrastructure for strategic and non-strategic parastatal reform or privatizations in Kenya.

I. INTRODUCTION

Once a government makes one or a series of decisions as to how it wishes the telecommunications sector of the national economy to function, and what role it wishes it to play in the future of the nation's economic growth, the successful and consistent implementor of those decisions will be the legal/regulatory structure which the nation adopts. There is no longer any question in didactic circles that the telecommunications sector plays both a role as a lucrative sector of the economy in its

own right; as well as the crucial support role in the development and growth of other sectors of the economy. Thus, how the "picture" of the sector (which the government has in mind), is frozen in place or allowed to adjust to changing circumstances over time, is a function of the form and structure of the legal/regulatory system. The cause and effect relationship between the manner of regulation and the behavior of the telecoms sector is a proven phenomenon.

The latter is demonstrated in this summary of the seminar presentation via brief reviews of comparative regulatory schemes and their impact on the behavior of the sector in a sampling of countries. Also, the role of the regulator and its relationship to the political organisms of the State is reviewed in relationship to that cause and effect impact, via the analysis of differing experiences in approaches to regulation, and different national environments.

The second half of Steptoe & Johnson's presentation and of this summary, deals with specialized regulatory issues which are the topic of great discussion at the moment in the world telecoms community due to the impact of liberalization of telecoms regulation and the introduction of competition in many environments. These issues include interconnect and equal access policy; legal aspects of financial issues in restructurings; and management and allocation of the electro-magnetic spectrum. I shall address regulatory policy and comparative regulatory structures today. Later this week Mr. Michalopoulos of our office will discuss interconnection and spectrum issues.

Finally, reference is made to the practical aspects of what foreign investors and operators look for when examining the investment opportunities in emerging-

economy countries desirous of attracting their investment and the related transfer of technology.

II. THE ROLE OF THE REGULATOR AND ITS RELATIONSHIP TO THE STATE

A. Broad Functional Analysis

The process which a government follows to achieve its goals in the telecommunications sector, while necessarily a political and profound decision-making one, should be a structurally organized one. It generally begins with the government's making certain key "macro" decisions as to how it wishes the telecom sector to function. These decisions involve, whether or not competition is to be encouraged. If so, where, as to what services or operators is it to be encouraged. Similarly, the macro decisions will involve the government's choice for finding the capital necessary to build-out a somewhat or very dysfunctional backbone network, and improving and expanding its existing services. Once having been made, these core decisions shape the broad structure of national control of the sector.

That control is memorialized, and made transparent generally by a piece of legislation which embodies the cornerstone policy decisions of the government as to the development and supply of telecommunications services. The legislation, in turn, is implemented via a set of dynamic and sometimes detailed regulations which adapt the changing realities of global and national economics, politics and technology to the cornerstone policies articulated in the telecoms legislation. The regulations form the body of rules which guide, hopefully via a system of carefully drafted incentives, the

behavior of all participants in the telecommunications sector so as to move in the direction desired by the government.

The role of the regulator, wherever in government that function reposes, is to implement, on a dynamic and continuous basis, the decisions of the government for the functioning of the telecommunications sector. That is, if the goal of the government is to provide more, and more varied, improved service to its people at higher quality and lower prices than exist currently in the country; and if the government decides that one vehicle to achieve that goal is to liberalize entry into the telecommunications sector via competition in certain services or under certain circumstances; or to introduce new and needed capital into existing operators for improvement of in-place networks, then the function of the regulator is to implement the regulations in such a fashion so as to tend to make entry easier in defined areas and investment feasible (in a commercial sense) in others.

It is important to keep in mind that government agencies tend to be bureaucratic and bureaucracies tend to slow rather than encourage dynamism. Thus, a federal mindset must be adopted which views the regulator as a "calibrator" of the sector whose function is as much to know when to deregulate (such as when market forces themselves have matured to the point of directing the sector where the government wants it to go); reregulate (such as when technology renders existing regulation obsolete); or regulate anew (such as when new technologies or economic realities introduce new participants whose behavior must be controlled as to each other and the sector to keep the sector balance calibrated).

The role of the State, of course, begins with the broad policy issues. The State has the responsibility to oversee many sectors, not just telecommunications. And the State has the responsibility to accommodate the needs of one sector of the economy to those of another for the overall good of the people. This means that the State's vision is broader and necessarily more politically oriented than the telecom sector regulator's. While different countries seek different solutions to the adaptation of the traditional role of the Minister in a telecoms sector restructuring; one important role of the Minister in almost every system, is that of a bridge between the broader political vision of the State, and the focussed telecoms sector view of the regulator.

Finally, the "independence" of the regulator, while often talked about, is little defined. In general, it refers to a regulator or regulatory body which is charged exclusively with the calibration of the telecoms sector, without in large measure, responsibility for political issues or other sectors. It should be free of political pressures in other areas, and of influences of the needs of other sectors of government or from the private sector. Thus, the ideal, though sometimes not feasible, is a regulator whose budget comes directly from the appropriations body of the government, without filtering through a ministry or other layer of government which has more than one sector or industry with which to be concerned. A variety of structures will suffice, so long as the focus and responsibility of the regulator is and remains the telecoms sector.

B. Comparative Regulatory Structures

In my presentation, I shall review the approach to regulation of several countries, comparing the approach to the later functioning of the telecoms sector, with particular consideration to the goals of the government.

For example, in the United States, the broad policy goals as expressed in the controlling legislation (enacted originally in 1934 and amended) is to encourage universal, high quality, diverse, low cost service for the benefit of the nation's people. The vehicle chosen to do that was a competitive market, initially in select services, and later in all services. The many and continuing regulations promulgated by the regulator pursuant to the core legislation react to changing political, economic and technological environments. Regulations change, as well, in reaction to their own failure. That is, if a regulation does not cause the impact which the government policy requires or the regulator desired, or if changing conditions cause it to cease having the desired impact over time, it is changed. The key policy of U.S. regulation perhaps could be described as the need to control, but not stifle, a sector participant who has the ability to control the behavior of other sector participants, or the service needs and desires of the users. Thus, the U.S. regulates as to market power of a participant; as to facilities ownership of a participant; as to particular services; and as to the criticality of the service to public welfare.

Other countries, such as Japan, have chosen to regulate predominantly as to facilities control, though policies are changing as a result of the impact of the system of regulation on the behavior of the sector participants, which was not consistent with governmental goals. The same situation was evidenced in the U.K., where different

formats of sector structure have been experimented with, to achieve the government's goal for more competitive basic services within the country.

An unusual case is that of New Zealand, where sector-specific regulation is not used. Rather, licenses, contracts and general corporate, antitrust and other commercial law is used to control the behavior of the service providers.

During my presentation, as well, I shall analyze the yet young experiences of Argentina, Mexico, Venezuela and Chile as to the form and structure of regulation.

In Argentina, the experience with an independent regulator following the privatization of its national virtual monopoly telephone company (ENTEL Argentina) was not a successful one. Presently, the regulatory control rests once again with the line ministry, in the case of Argentina, the Secretariat of Communications. During our seminar, I shall review my analysis of why the originally desired regulatory structure did not succeed.

In Mexico, as we shall discuss, the Secretariat was before privatization, and remains the regulator. The change there was the separation of regulatory and operational responsibilities from the Secretariat. I shall analyze the benefits and detriments of that system as well during our seminar.

Chile is the example of the most mature of the "competitive" telecommunications markets in South America and the developing world, having begun its legislative liberalization in 1978; with the ultimate privatization of the two dominant national carriers in 1988. With very little regulation, except as to the dominant carriers (which has been handled via an "Antimonopoly Commission" which is somewhat a

combination of the U.S. Justice Department Antitrust Division and the FCC), the sector has flourished over the past 12 years, though major snags have been encountered. An effort toward organized, focussed regulation is now underway.

The Venezuelan experience is very new, with its privatization completed at the end of 1991. A new regulatory entity has been formed and staffed to date with 40 people. Its functioning is independent of the line ministry functions, and its focus is on sector calibration and the encouragement of competition where the law permits. A rather extensive set of regulations has been prepared for Venezuela in all services.

C. Separation of Regulatory From Operating Functions

While there is not yet a consistent or precise definition of an "independent" regulator, there is universal agreement that for any sector restructuring to be successful, particularly where private investment capital is sought, regulatory functions and operating functions must be separated. That is, in many cases in developing countries where the cornerstone of telecommunications services has been a state-owned monopoly basic services provider, the state have been both the regulator and the operator. The two must be separate for successful expansion and improvement of the sector.

In Mexico, for example, the Secretariat operated as the regulator and the operator of the Morelos Satellite System, a national satellite system owned by the government. It also operated terrestrial microwave links, and, indeed, to some extent competed with the main operator of the country, Telefonos de Mexico (TELMEX), which, while majority government owned also, was a stock corporation. Upon the privatization of TELMEX, the operating function was taken out of the Secretariat, and

transferred to what under Mexican law is a "decentralized" corporation (owned by the government, but not operating within the bureaucracy). The only role now of the Secretariat is that of regulator. Similarly, in Argentina, Chile, Venezuela, the U.S., the U.K., Australia and New Zealand, the functions of regulator and operator are separate and distinct. The Japanese model is somewhat individual as to its relationships among governmental entities. While the regulator, the MPT, does not operate, and indeed has never done so even before the privatization of NTT, the main domestic carrier, the common government bond and the government's interest in both the ministry and the operators is so strong that the lines of demarcation appear to blur on occasion in the view of new market entrants competing with the prior monopoly carriers.

Not only does the separation of regulatory from operating functions allow each to do their respective jobs better, but it affords the regulator the credibility it requires in order to effectively calibrate a sector of often conflicting and competing interests.

COMPARATIVE ANALYSIS OF THE STATUS OF TELECOM RESTRUCTURINGS

COUNTRY	STATUS OF RESTRUCTURING	REGULATORY BODY	REGULATORY HIGHLIGHTS
Chile	Fully private; sector reform began 1978; privatiz. 1988; current examination of "multi carrier" system. Who participates when is under negotiation.	Ministry/Secretariat	Two dominant carriers, CTC and ENTEL, continue litigation on whether each should be allowed in other's market (LEC and IXC, respectively); divestiture case based on Telefónica de España's interest in both companies continues.
Argentina	Privatization complete. 1990	Independent - CNT Directorate disbanded Jan. 1992; Sec. of Comm./Min. Pub. Works & Services leads	Two monopoly basic services 7-10 years exclusivity; Cellular, VAS competitive. Some competition in international satellite services; build-out contract. Problems in 1991-92 on ability of licensed carriers to enter monop. networks. Need for interconnection regulation.

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COUNTRY	STATUS OF RESTRUCTURING	REGULATORY BODY	REGULATORY HIGHLIGHTS
Mexico	Privatization complete 1990	SCT (Ministry)	Basic services 6 year exclusivity; Cellular, VAS, private network competitive. Build-out contract with concession; concessions and permits.
Venezuela	Privatization complete end 1991	Indep. Reg. Entity in place, CONATEL;	Basic services 9 year exclusivity period. Cellular, VAS competition. Public telephony and cellular regs. have been issued.
Australia	Sale of AUSSAT and second carrier license complete, 1991.	Independent - AUSTEL.	Duopoly basic services with 6 year exclusivity. Cellular, VAS competition. Build-out contract obligations. Third cellular license awarded 1992.
U.S.	Always private.	Independent - FCC.	Multi-carrier system. No federal segmentation of markets or restrictions on services as to carrier except AT&T and RBOCs per MFJ. PUC system in each state.

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COUNTRY	STATUS OF RESTRUCTURING	REGULATORY BODY	REGULATORY HIGHLIGHTS
Dominican Republic	All private:	Dir. Gen. of Telecom	Dominant carrier is CODETEL, GTE subsidiary; new second carrier TRICOM is licensed for all services; all services are available for competition; competition stymied for lack of regulatory structure. Interconnection regulation needed.
New Zealand	Privatization completed. 1990	Contract and General State Law.	Competition allowed all services. Two main carriers operating.
Puerto Rico	Long distance privatized 1992, domestic still in govt.	Local PUC recently established; fed. level is FCC.	New purchaser of TLD (Telefónica of Spain); radio licenses split off; domestic service under govt control; attempted privatiz. failed in 1991. FCC approved Telefónica purchase Dec. 1992.
U.K.	Privatization 1984. White Paper 1991 (re-evaluating status)	Independent - OFTEL	Duopoly ended 1991. 7 year exclusivity now over. New carrier to be introduced for all services.
Japan	Privatization 1985. Continuing modifi-cations.	Ministry - MPT	No exclusivity. Competition in theory throughout system; Type I and Type II carriers; NTT only univ. service provider; many niche players.

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COUNTRY	STATUS OF RESTRUCTURING	REGULATORY BODY	REGULATORY HIGHLIGHTS
Malaysia	Privatization completed. 1990	Ministry	Stock issuance on capital market and to telco staff. Inadequate regulatory structure.
Thailand	"BTO" restructure underway	Ministry	NYNEX new partner with private company, C.P., for 2 million lines in Bangkok on BTO with state-owned telco. Inadequate regulatory structure.
Uruguay	Privatization underway - 1992	Unknown at present	Announced plan is "mixed capital" corp. 51% State, 49% private. Some exclusivity expected.
Panama	Privatization underway - 1992	Plans to create reg. entity	Announced plan is mixed public/private capital company.
Pakistan	Faux BOT (BLT); full privatization desired - hoped to be completed in 1993	No announced plans	Open to sale of 100% of PTC or less. Government plans not final; likely to be guided by investment banking advisors; no regulatory structure to date.

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III. FINANCING OF TELECOMMUNICATIONS SECTOR RESTRUCTURING

A. Issues Relating to Private Investment

The introduction or encouragement of private investment into the telecommunications sector of a country is not only a popular, but a very logical pursuit, given the capital intensive nature of telecommunications infrastructure enhancement and construction. Given a willingness by the government to review or adapt constitutional or other legislative constraints to the encouragement of private investment, there are a variety of courses a nation could pursue in restructuring its telecommunications sector. These range from the maintenance of government control over the monopoly basic services provider, with competition perhaps introduced via "ancillary" or "non-essential" services, such as value added services, or even cellular services in some countries; to the outright sale of all or a controlling interest in the former monopoly basic services provider with some continuing monopoly period granted in basic services and competition in others; to full commercial sale of the basic services carrier and full competition in all services permitted.

The sale of all or a controlling interest in the basic services provider, generally the former state-owned monopoly, is sometimes called the "top-down" method of sector restructuring. Its advantage naturally is the potential for immediate and much-needed infusion of capital into the reconstruction and expansion of the national basic network. This is in contrast to the state's maintenance of control over the monopoly basic services provider, with perhaps joint ventures with the state invited in certain

discrete service areas, which sometimes is loosely referred to as "bottom up" sector restructuring. Obviously, there are virtually limitless gradations and variations between the extremes of these models; and every country should find its own refinement to the formula to accommodate its particular needs, history, culture, and combination of economic, political and technological attributes.

In the case of the maintenance of state control over a monopoly basic services provider, at least for some period of time during the sector restructuring, the focus should be on the adaptation of the national legal structure to accommodate and, indeed encourage, private investment into competitive services and/or into joint ventures with the state operator for non-competitive services. The investments required will be attractive, naturally, only if the legal infrastructure permits a realistic realization of profit, on the one hand, and a reasonable means to deal with foreign exchange issues on the other. Also pertinent are the laws which permit, or not, private sector investment to begin with from domestic investors, as well as private sector investment from foreign investors. I shall present a series of overheads which review some of the "facilitating" legislative changes which have occurred in the legal systems of the countries of Latin America which are seeking, in competition with each other, and now in competition with the rest of the world including this region, to attract investment to their country.

Another manifestation of the desire of the state to maintain control over a "public utility" such as the telecommunications basic carrier, while also generating the investment capital to expand and improve the network and the quality of service, is the somewhat recently popular format of "Build-Operate-Transfer" or "BOT". As described

in some detail below, the latter is a situation where a private operator is encouraged to invest in the construction of the network, operate it for a period of time which reasonably allows for a return on the operator's investment, and then transfer it to the state. This is a compromise between continued state control without private capital investment, and the state sale of the monopoly operator for full foreign or domestic private investment.

Other alternatives used by countries include the "Build-Operate-Own" ("BOO") option, which is essentially the top-down sale of the monopoly operator; the rather new "Build-Transfer-Operate" ("BTO") being experimented with in Thailand, which puts the asset immediately in the ownership of the state, but with an important portion of the revenue generation enuring to the operator; and the new Pakistani announcement of "Build-Lease-Transfer" ("BLT"), a variation of the BOT model.

To demonstrate how each of these possibilities function as a means of financing telecommunications, or other infrastructure projects, Steptoe & Johnson has organized the core attributes of these options into four basic categories of "deal" construction. Each country will pull bits and pieces of each category to form a package which fits its economic, political and technological needs. The next section describes these categories.

B. Steptoe & Johnson Categorization of Options

1. Public Floatation

In a **public flotation**, much or all of the stock in the new company created by the privatization is advertised and sold to private persons at large, in small lots rather

than in a few large blocks. For example, when British Telecom was turned over to the private sector, over 50% of the State's holding was offered to the public. In Eastern Europe, 40% of Ibusz, the state-owned Hungarian travel and tourism agency, was sold to the public. A significant feature of such offerings in that they do not effect a change in control of the enterprise. The management appointed by the government remains in control.

2. Large Block Sales

In lieu of a widespread offering to individuals, the selling government may place larger blocks of stock with a number of institutions for brokering. This minimizes the direct overhead expense incurred by the government in handling many small sales, while leaving open the possibility that widespread individual ownership will result when the brokers resell the stock.

3. Buy-Out By Management

A buyout of the enterprise by management or employees also involves distribution of stock to a large number of individuals. The privatization of Chile's steel company, for example, included provisions for the purchase of shares by employees via an ESOP, and Poland's privatization law grants preferential prices for stock purchase to employees.

A full LBO, of course, would give control and ownership of the enterprise to former management. But such LBOs seem unlikely to succeed in the middle countries. Shares and assets of the company are pledged to the lender, who is repaid from the company's net cash flow. Obviously, in most cases, the cash flow of inefficient

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state enterprises will be insufficient to service the debt. But foreign investors can expect that such countries will require issuance of minority blocks to employees for some preferential price.

In this context, the outside investor needs to focus on maximizing the price of such a block and limiting the influence of such employees on company policy.

4. Trade Sale

Finally, the government may choose to turn over ownership of the enterprise to a single buyer, in the form of a **trade sale**. Examples of such sales include the transfers of the Chilean telephone services, and of Tungsram, a Hungarian light-bulb manufacturer, where a controlling interest was acquired by General Electric.

A form of this "trade sale" involves the sale of **the firm's assets** rather than the enterprise as a whole. This approach is relatively easy to implement and may be useful in cases where a successful public offering is unworkable -- for example, where the assets are neither corporate nor project-oriented, or where individual assets of the enterprise are worth more than the whole.

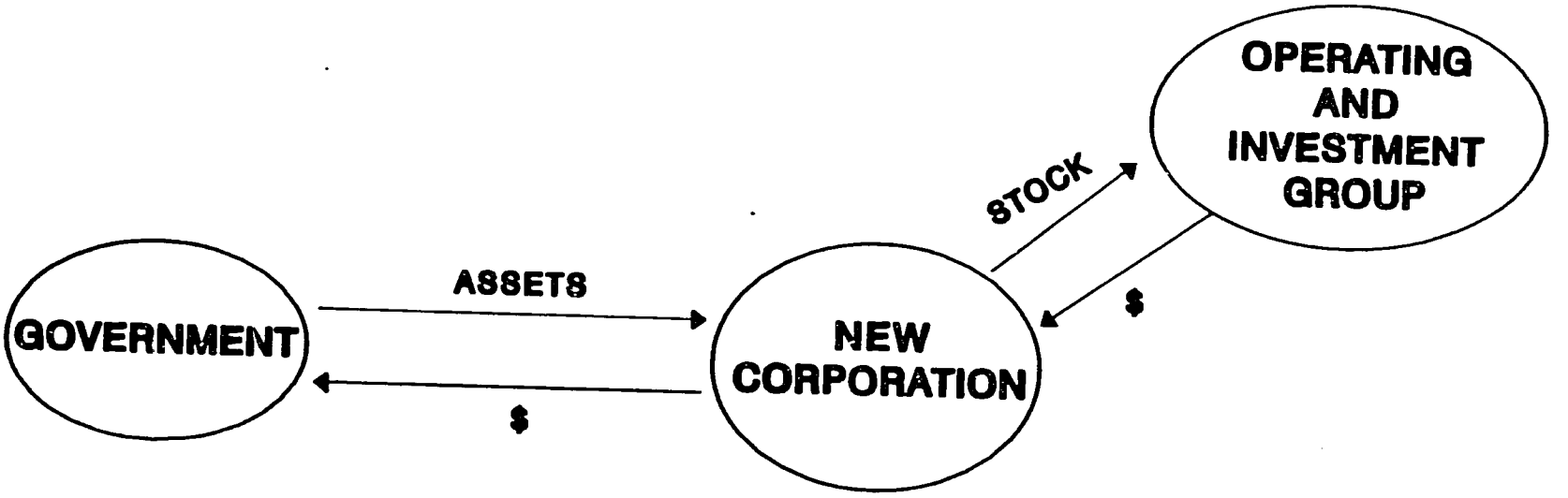
Yet another way to structure a trade sale is for the government to enter into **management contracts** with private firms to perform the services formerly provided by the government. "Contracting out" in this fashion may mean that some state-owned assets can be sold off, since they will no longer be needed if the enterprise's function is handled by existing private parties. Some of these assets, of course, may be sold to the very companies that will then be hired to do the work.

The trade sale approach reduces marketing costs (and hence return on the government's asset) to a minimum. It also brings in experienced and financially strong purchasers to help an enterprise make the transition to a market-driven business. But at the same time, a single purchaser may be in a stronger negotiating position, since it can offer to take the entire enterprise off the state's hands in a single transaction.

Whether the planned arrangements make management an ally or an opponent of the privatization proposal will obviously be politically important in arranging the deal. It has been claimed, for example, that allowing British Telecom's senior managers to form the board of directors of the new company kept them on the side of privatization.

Any of these transfer methods may be used either in whole or in part. In other words, the government may wish to transfer a minority interest in the new company, perhaps as a means of retaining some direct control over its business, once the enterprise has been turned over to its new owners.

SALE OF CONTROL



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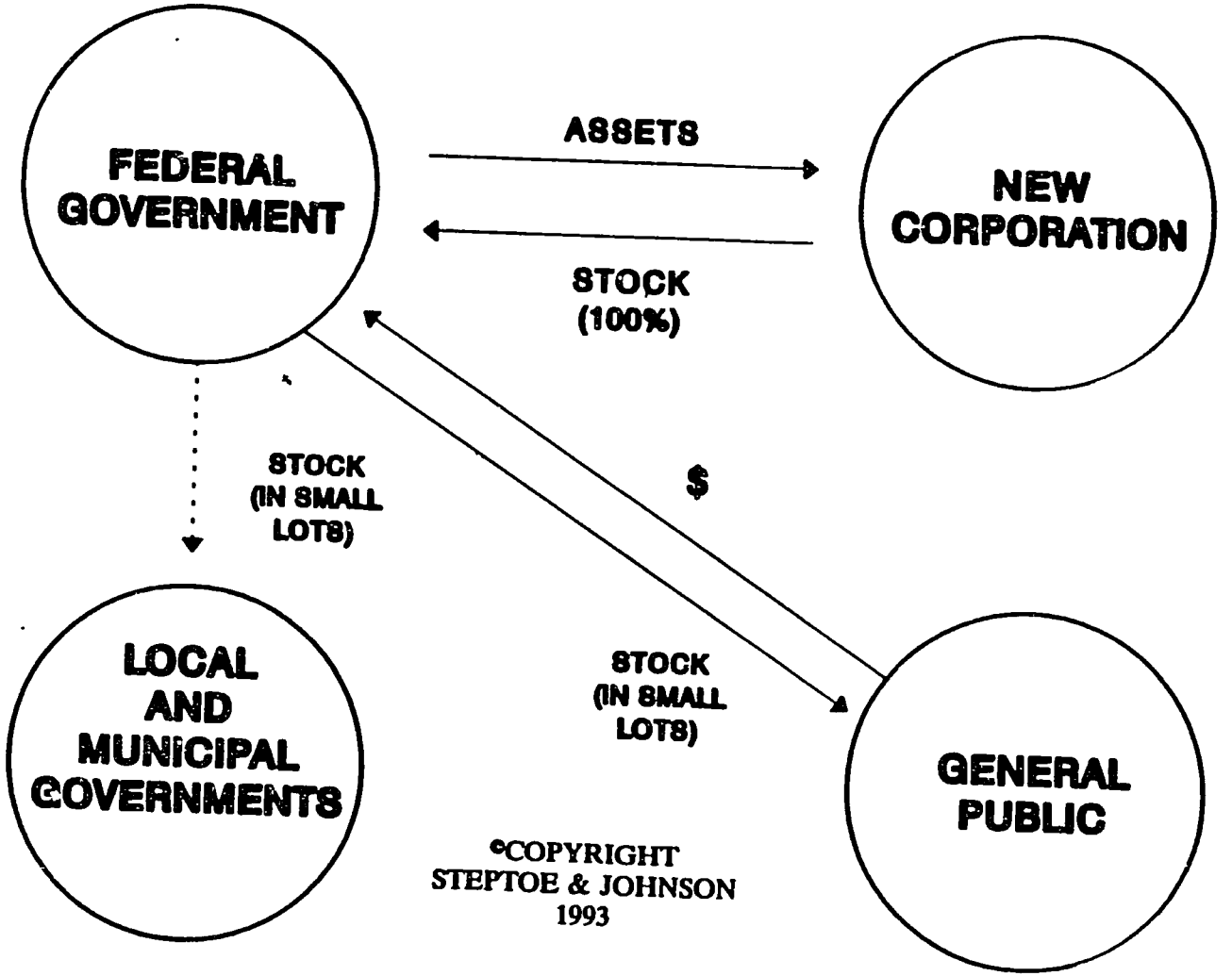
PUBLIC OFFERING



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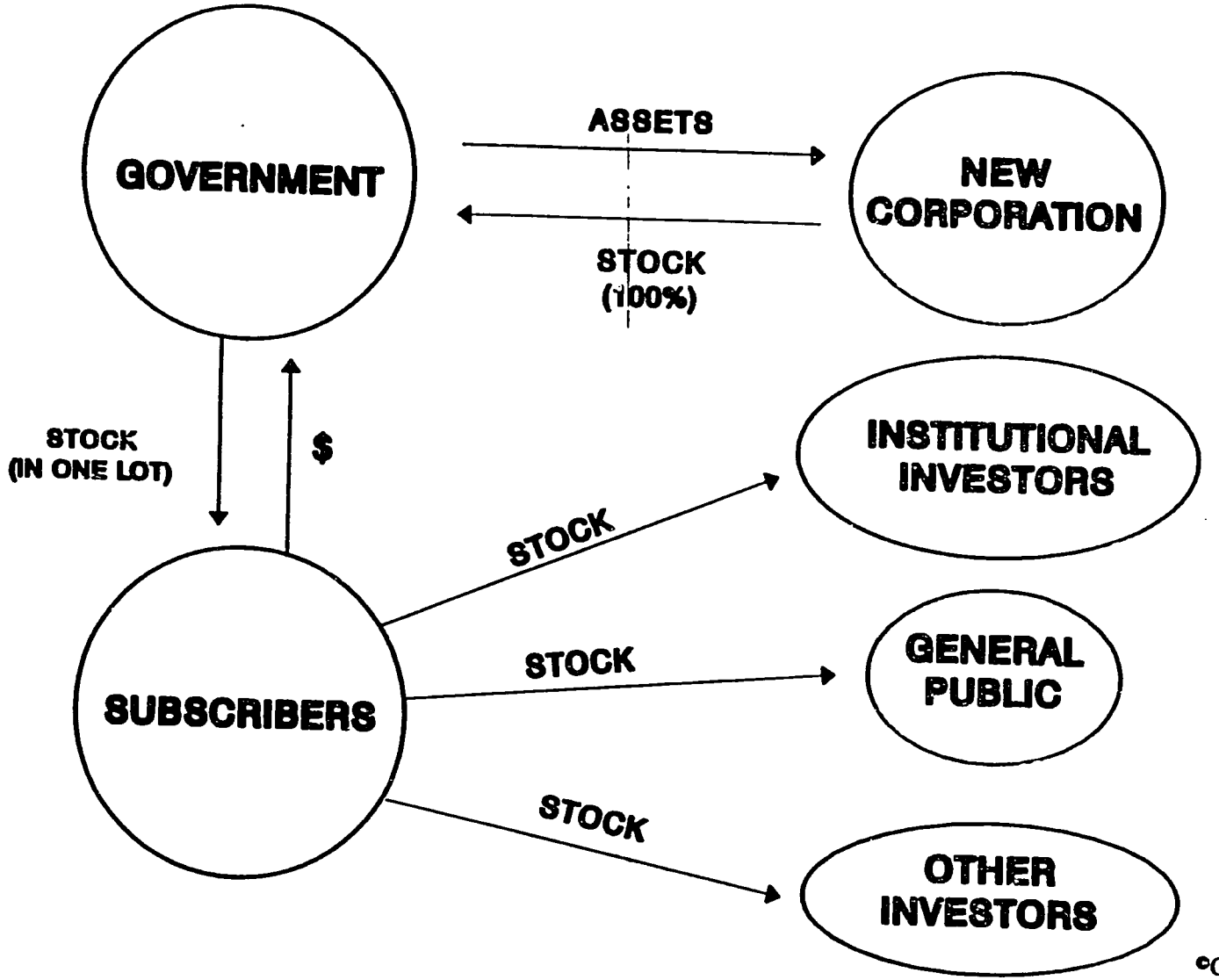
SUBSCRIPTION CONTRACT



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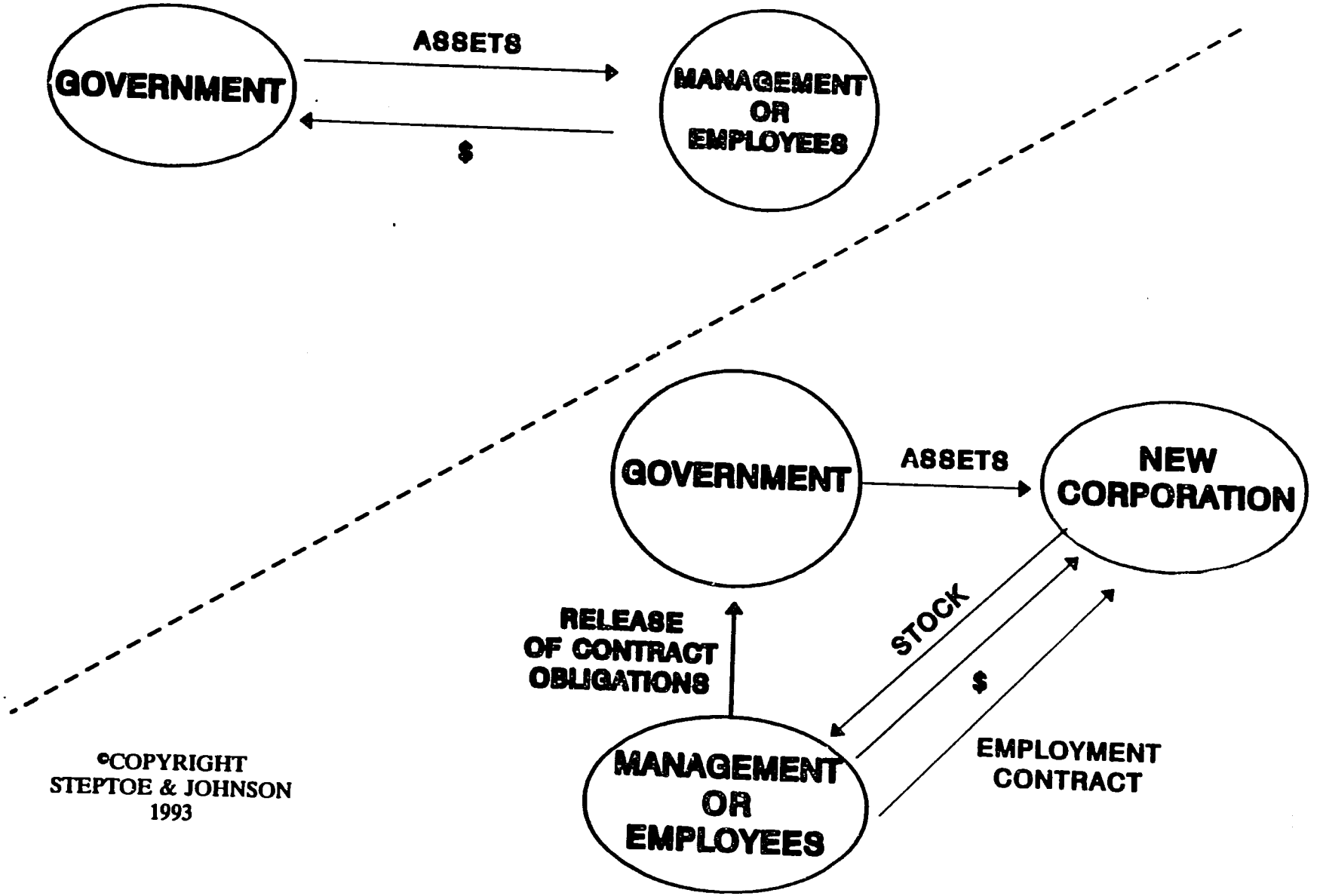
SALE TO MANAGEMENT OR EMPLOYEES



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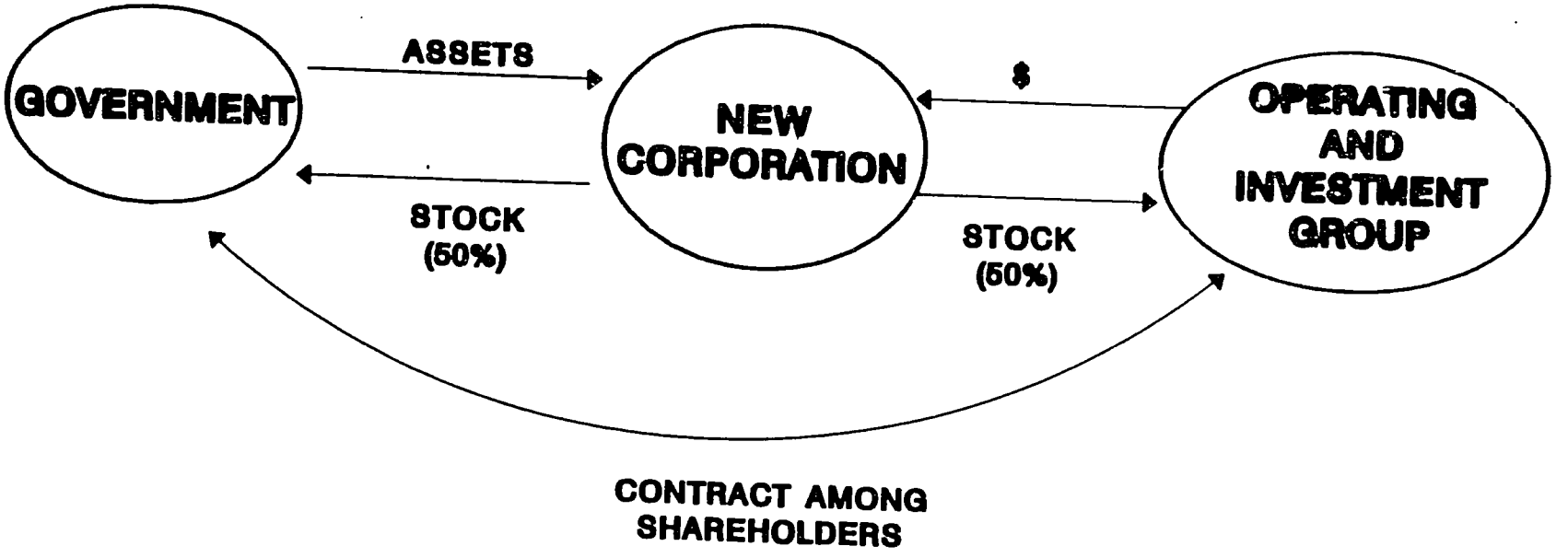
MODELS IN COMBINATION

EXAMPLE OF GOVERNMENT / PRIVATE JOINT VENTURE



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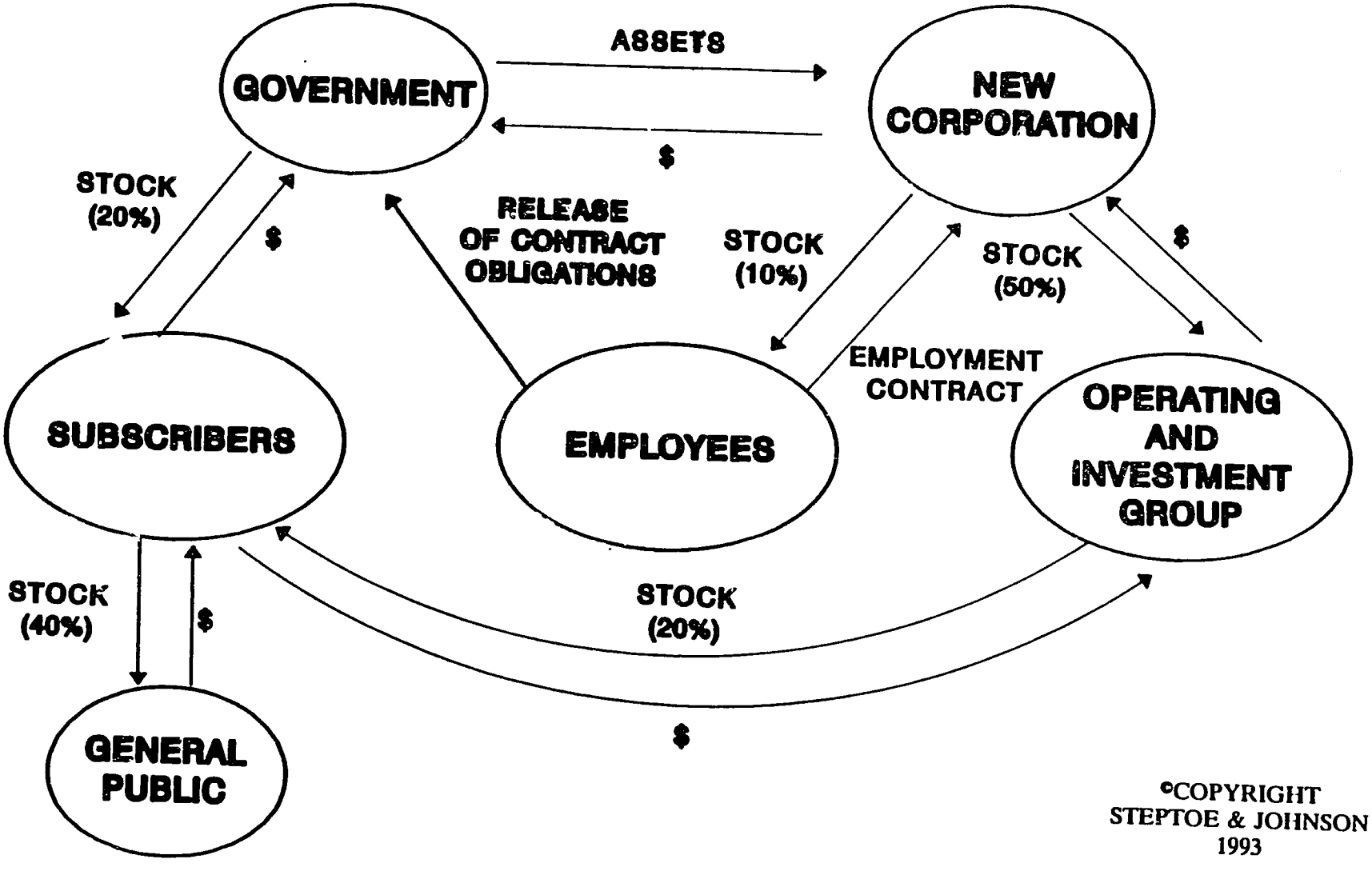
MODELS IN COMBINATION

(MIXED EXAMPLE)



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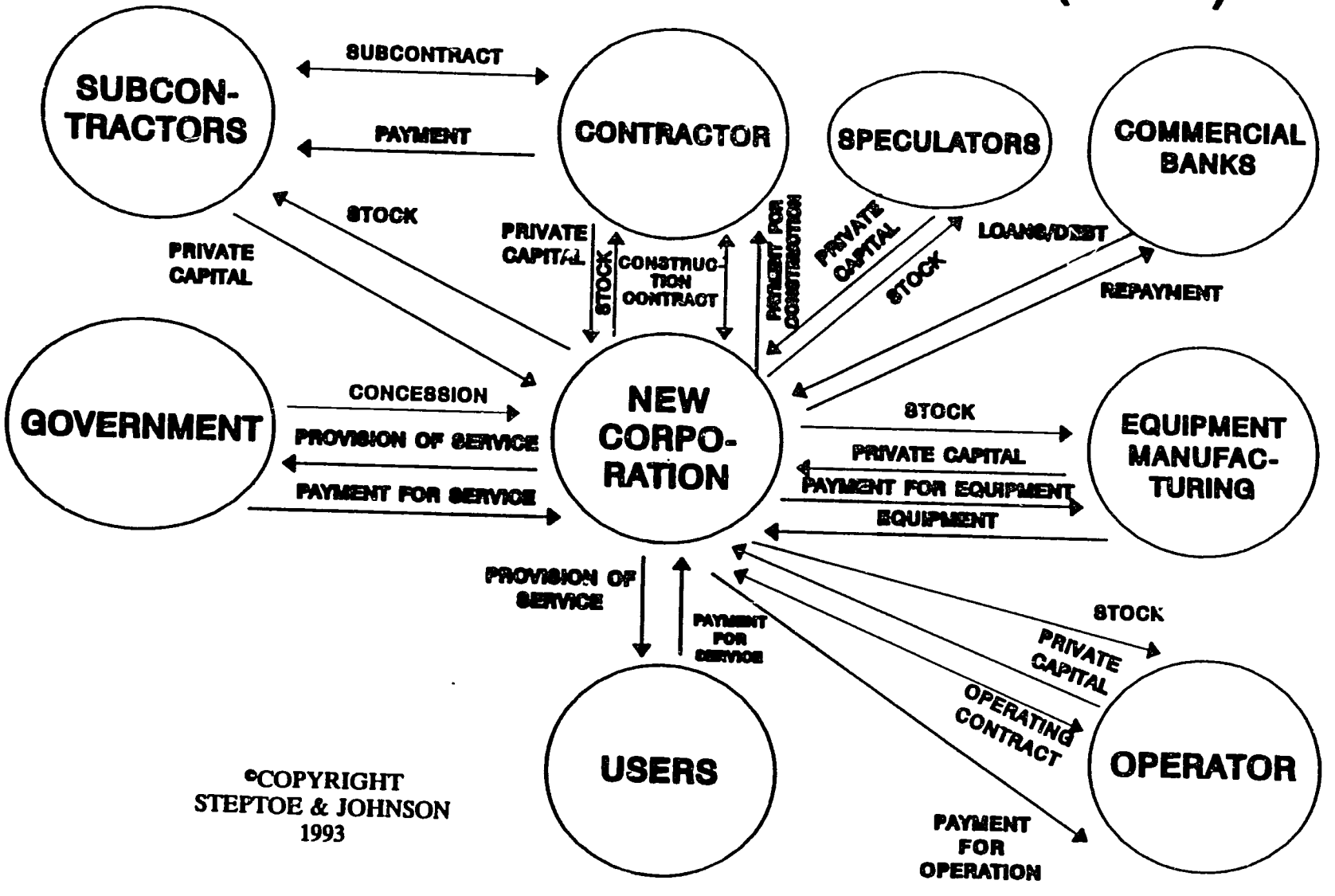
STRUCTURE FOR PRIVATIZATION "BUILD, OPERATE, AND TRANSFER" ("BOT")



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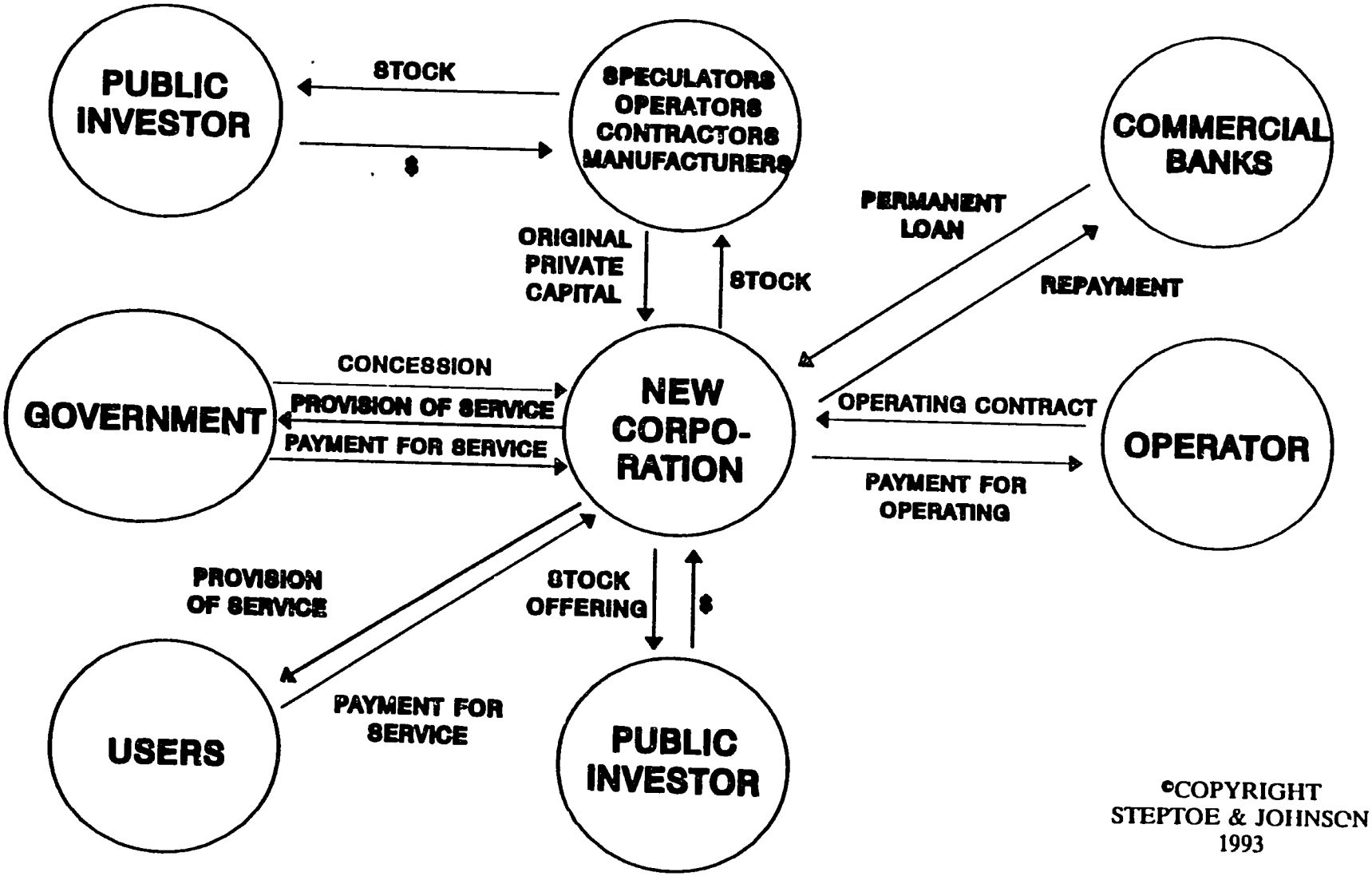
MATURE "BOT" STRUCTURE



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IV. FOREIGN OPERATOR DESIRES IN TELECOM INVESTMENT: THEIR RELATIONSHIP TO GOVERNMENT REALITIES

Not mysteriously, telecommunications restructurings and/or privatizations are business deals and service opportunities from the point of view of the foreign operating companies who participate in them. For the past three years infrastructural privatizations around the world have generated tens of billions of dollars in transactions. It is BIG BUSINESS.

The norms and analysis that apply to the pursuit of international investment opportunities in general, therefore, apply as well to telecommunications privatizations. Similarly, telecommunications, like any other sector of the economy, has its sectoral peculiarities which must be evaluated within the specific set of applicable national attributes and incorporated into the risk/reward formula. In essence, the process and the concepts of how a potential foreign operator analyzes an opportunity are neither esoteric nor unpredictable. Common business sense prevails, together with the desire to be in an environment which allows the foreign operator the realistic opportunity to have a positive impact on service.

What is sometimes less than optimum, and therefore a negative in the risk/reward formula, is the availability of sufficient and accurate information; and the government's inability to control its own process.

From our experience in representing governments as well as private industry in the process of nearly eighteen different privatization or restructuring opportunities in thirteen countries, we see recurrent themes. Whether these items are

classified in sets of "Deal Attributes" as the bankers tend to do, or as a package of revenue-operational-environmental- procedural features as operating companies tend to do, the ultimate information needed to make a sound business decision rarely changes. I have organized this information into three broad categories for the purpose of this paper; two categories of which the government can and should control; and one of which it cannot control, at least at the time of the privatization.

The broad categories of impact on foreign operators I have experienced are:

1. National attributes: the extent to which the history, economic and political status of the country add to or detract from the privatization opportunity.

2. Legal/regulatory environment: the articulation by the government of how it plans to structure or restructure its telecommunications sector; and what it has done or is doing legislatively and through a regulatory effort to accomplish its objectives.

3. Management of the Process: whether there is a perceptible organization and deliberate plan for a transparent process implemented through an organized government team and a small but expert group of outside advisors.

A. National Attributes

As you likely gleaned, the first of the three categories is the least controllable by the government at the time of the privatization. The state of the national economy, stability and convertibility of its currency, perceived and real stability of its political system, demography, history and culture are all salient attributes to a foreign operator/investor. Nevertheless, other than to make available the information at the

time of the privatization and articulate whatever commitments it has made to improvement of any negative elements, the government will have little control over these factors during the investment opportunity analysis period. Nevertheless, whatever can be done to lend certainty should be done.

- **Government Commitment to Privatization**

Another factor in this category is the demonstrated commitment of the government to the privatization. This factor is potentially very important to help propel the pursuit of the opportunity by a foreign operator/investor. This will include, often, governmental "salesmanship" of the concept before and during the process. In Venezuela, for example, industry surveys were conducted before the privatization of CANTV commenced, polling selected user groups and lending an air of openness and demonstration of government sensitivity to the desires of the end users. While many factors contributed, the Venezuelan privatization counts as a success with a 40% share sold for $1.93 billion.

Other manifestations of this phenomenon may occur with the government's manner of dealing with labor issues. There, the government must strike a balance between the desires of the labor market and the economic realities of the investor/foreign operator. In Puerto Rico, for example, the government published a decree at the outset of the privatization of PRTC which announced that telco employees could not be discharged for two years. This presumably will enhance the government's commitment to and popular support of the privatization, but may prove to be an economic problem for the investor. Indeed, in the first privatization attempt the

combination of a legislated purchase price (of $3 billion) and employee mandates caused all interested purchasers to abandon the opportunity. Later a more relaxed environment allowed the successful sale of the long distance company TLD to Telefónica of Spain, which was approved by the FCC in December 1992.

- **Pre-Privatization "Corporatization"**

Finally, as with the sale of any property, the more it is put in order and "cleaned up" before the sale, the more likely it is to sell and the higher the price is likely to be. From the point of view of the investor, therefore, the recent corporate history of the Telco is meaningful.

The ideal opportunity, from a foreign operator's point of view, is in a Telco which has been "corporatized" before its sale. That is, the government has dedicated some period of time to restructuring the telecommunications sector and/or the telephone company, in preparation for the privatization.

In the U.K., the government began the restructuring process with the splitting off of the postal service from British Telecom in 1981 and the establishment of the Office of Telecommunications (OFTEL) as an independent regulator. In 1982, it licensed Mercury as a second carrier. In 1983 it granted a seven-year duopoly to the pair; and in 1984 it privatized BT.

In Chile, a similar though longer process occurred which began with a new telecommunications law in 1978, followed by amendments in later years, and the privatization of the two dominant carriers in 1988.

In Mexico, TELMEX was restructured in 1987 into three regional (North, South and Mexico City) and two service (large user and long distance) divisions designed to monitor costs and revenues and to control cross-subsidies. In November 1990, the Secretary of Transportation and Communications was relieved of its operating responsibilities and given the job of full-time regulator; and on January 1, 1990 Telecomunicaciones de Mexico (Telecomm) began operating the government's satellite and microwave services as a "decentralized" (corporatized) company. In August of 1991 the privatization of TELMEX formally began.

In New Zealand, where not only a privatization (to Bell Atlantic and Ameritech) but a later public stock offering proved successful by any measure, the government spent approximately two years corporatizing the Telecommunications Corporation of New Zealand before its privatization in 1990.

In other countries, for a variety of reasons, this may not be possible. Argentina, Venezuela and Uruguay are cases in point.

Obviously, if it is possible, pre-privatization corporatization is beneficial to the potential purchaser in that it allows a more accurate evaluation of cost, revenue and market projections than may otherwise be possible. This, in turn, is beneficial to the government as it enhances the value of the company and is a clear indicator of government resolve.

B. Legal/Regulatory Structure

This category can and should be managed by the government so as to maximize the investment opportunity for a foreign operator.

Governmental intervention in some form into commercial enterprise is often necessary to control sector growth and protect the interests of the population at large, particularly in a service sector such as telecommunications. However, where there is government intervention, it necessarily will impact upon the structure and profitability of the commercial enterprise. In the micro sense, its impact will be on the day-to-day cost to the company of compliance with whatever regulatory obligations the government imposes. In the macro sense, its impact will be from the type and timing of market entry of any potential competitors which the government permits, as well as from whatever fiscal control the government is inclined to impose on the business; such as tariff controls, investment/performance obligations and partnering/consortia rules.

The government's decisions will be based on commercial and political dynamics. Ideally, with the proper advice, the government will be informed of what decisions are optimum for the commercial success of the privatization. Also, ideally, working with that base of knowledge, the government will accommodate those optimum commercial desires to national goals and needs, and political realities. Whatever the result is, it should be reached in an expeditious, thorough, deliberate manner, based on organized and experienced input, and published as quickly as is feasible. Accurate, reliable (i.e. not likely to change) information which industry can use is crucial.

Having worked on the government and private side of privatizations, I believe that a balance which serves the needs of both is optimum to both; and maximizes the value of the investment opportunity.

In the legal/regulatory analysis, particularly **where any form of a multi-carrier system (including cellular or value added services) is contemplated in the short or long run**, the legal/regulatory bases to be touched are as follows:

1. Constitutional analysis;

2. Drafting and enacting of any legislation necessary to allow for the restructuring;

3. Ideally, the creation of an independent regulatory body, with enabling legislation and a structural/functionary description;

4. Drafting and enactment of the "rules of the game"

   a. A new telecommunications law, if necessary, to assure the completion of the government's objectives and to assure purchasers of the government's seriousness of its purpose;

   b. As much of a base of specific sector regulations as is feasible.

5. A regulatory design oriented toward carriers (rather than services) so as to give potential investors a clear picture of the intended structure of the sector so as to allow reliable financial projections; and so as to give the government the ability to control the speed or slowness with which the sector "opens."

- **Regulatory Infrastructure**

In most countries that are undergoing a sector restructuring, particularly in the developing world, the regulatory scheme is either non-existent, or loosely managed by the dominant or monopoly carrier itself. This creates insecurity for potential foreign operators as certain future market factors cannot be evaluated.

The system of passive regulation was logical and even efficient when the sector, and the law of the country, allowed for only one carrier owned by the government. Also, regulation was not important where fiscal accountability was not a major concern of the telecommunications provider; and where broad social issues were the main responsibility of the government rather than corporate profit or efficiency in the management of the telecommunications system.

With the privatizations in the sector, roles have changed dramatically. Generally, governments have relieved themselves of the responsibility to provide telecom service; and private or "corporatized" government operators have assumed the responsibility of profitability and service improvement; while the government or a specialized agency has stepped into the role of a full-time regulator.

As telecommunications is commercialized and responsibilities change, a need to regulate that change arises. Governments have a public welfare interest in regulating carriers who otherwise have the ability to control their own market place, such as dominant carriers, and potential foreign operators have a need to know in advance what the rules of the game will be in the environment in which their investment is sought.[1/]

[1/] In some regions where the economy has been controlled substantially by the government via a system of government-owned parastatal corporations, broad-based price controls, and the like, a review of the entire legal structure as it impacts entry into and exit from the marketplace may be appropriate. For example, in Kenya, as part of a program to privatize non-strategic parastatal corporations and restructure strategic ones (like the telecoms company) an entire legal review has been done with suggested changes in parts of the commercial legal/regulatory infrastructure to facilitate the achievement of the move toward a market-driven private commercial sector within the framework of the government's goals.

While the regulatory cliché that one should fully regulate monopolies, and not regulate fully competitive services, is often sound, most countries do not find themselves in such clear extremes, particularly in the developing world. Thus, it is in everyone's interest to make and publicize decisions about the kind and amount of regulation appropriate to achieve the government's goals and the potential investor's aspirations.

Having undertaken an in depth review of the albeit brief histories of market reaction to different types of regulatory models around the world, my conclusion is that, in general, a government is better able to encourage healthy economic growth of the telecommunications sector in a developing economy, and an investor is better able to evaluate when and where competition will be imposed, through a scheme which regulates by carrier as well as by service. I say, in general, because there are no absolutes in telecommunications policy, and because there is always some need to address services for specific regulatory régimes, such as cellular services, for example. Nevertheless, in conceiving and drafting the guidelines of a macro regulatory scheme for the sector, a developing economy is more likely to achieve typical government and operator goals of universality of service, increase and improvement in quality of service, variety of offerings, and reasonableness of price, through a scheme where the carrier is the focus of regulation. Similarly, the investor is likely to be better able to predict his future.

Though the histories of telecom privatizations are brief, I have attached a summary review of the impact of different types of regulation on the telecom market in a cross section of countries from the developing and industrialized world.

- **Corporate/Legal Structure**

On the corporate side of the legal issues, investors naturally will be interested in the capital structure established by the government. This will provide critical input to the risks/reward formula such as, how much investment will be required, when, and in what form; what amount of control the investors will have over the operation of the company, and how the balance of the company's stock will be distributed. In this area, there are perhaps as many unique experiences as there are privatizations. Some of these have been or will be discussed as we review the comparative regulatory matrix which I have prepared.

C. Management of the Privatization Process

Recently I moderated a panel on telecom privatizations in Latin America for the Institute of the Americas in San Diego. Following the well-organized speech by a U.S. FCC-oriented lawyer, which proposed a logical, orderly set of steps for a privatization process, the next speaker, one of the last four employees of ENTEL Argentina and a key participant in its privatization, praised the appropriateness of the order and steps articulated by that lawyer. He added, however, that such a process would be possible only if governments, in general, and human beings, in particular, were not involved.

Indeed, to the outside viewer, and particularly to the potential investor pressured by often a multi-billion dollar operating decision, the privatization often appears more like a Chinese fire-drill than a Harvard Business School exercise.

Nevertheless, as much order as is reasonably possible should be a priority of the government to attract and keep foreign operator interest.

- **The Privatization Team**

My experience on the government and the private sector side of eleven different telecommunications privatizations or restructurings has imparted the realization that there is, indeed, a delicate balance in timing of a privatization. While political, labor union, economic and service pressures require a rapid announcement of the privatization decision once it has been made by the government, the announcement attracts a series of private sector inquiries which government often is not prepared to answer. If wrong answers are given, or answers change as the governmental decision-making process matures, potential investors may loose interest.

The dilemma is that the investor wants as much information as possible in as much detail as possible of the privatization attributes, as quickly as possible.

It is not in the investor's interest to provoke ill-contemplated, rapid replies to long-term issues; nor is it in the government's interest to discourage foreign operators by excessive delay or the inability to make the necessary decisions reasonably expeditiously once the decision-making tools are in place.

As to the latter, in most privatizations, the government looks to outside experts to provide the input and experience it needs to make its decisions. Organizing and coordinating the efforts of outside assistants is important to the stability and efficiency of the privatization process. From the investor's point of view, it is best to have one, continuous, source of information as and when information is available from

the government. From the government's point of view, too many assistants, or groups with overlapping responsibilities could generate inefficiencies, or even conflicting conclusions.

In general, the types of outside assistants who have served in a privatization process are: technical consultants; accountants/appraisers; lawyers and bankers. A small and well-organized government team should be in place to work with the assistants and coordinate their activities.

- **Transparency of the Process**

The conduct of the privatization process must be, and must appear to be, free of inappropriate influences, free of corruption, and dedicated exclusively to the articulated objectives of the government. Proper procedures must be established and announced for all activities in the privatization, from the invitation to pre-qualify, to the ultimate selection of an operator, where a new operator is a contemplated element of the privatization.

While all processes vary slightly, they share many attributes in common, and certain norms have come to be expected by investors. These include, by way of example, provision of sufficient data room information and analyses; corporate debt instrument review; analysis of the salient laws of the country; reasonable time tables and articulated requirements for pre-qualification; a regulatory "house in order"; the issuance of a statement of terms and conditions of the sale which define the elements of the risk/reward formula; an offering statement; the requirement of a deadlined bidder proposal; a bidder selection, negotiation and execution of a concession agreement.

Impacts of Restructuring on Labor/Productivity

by: *James Waddell, Partner, International Privatization Group*
Price Waterhouse

Impact of Telecommunications Restructuring on Labor/Productivity

James A. Waddell

Price Waterhouse

Purpose of Presentation

- Restructuring can yield significant productivity gains
- Productivity gains benefit telecommunications providers, customers, and the economy
- Workers are affected by the restructuring and productivity improvements
- Workers' economic welfare can be protected through various means

Benefits of Improved Productivity

- Greater resources available for service expansion (e.g., lines per 100 capita)
- Higher net revenues or enterprise value (e.g., higher ESOP share value)
- Reduced pressure on tariffs (e.g., lower revenue requirement)
- Stronger competitive position in contested markets (e.g., VANS)
- Gains from regulation or contractual requirements (e.g., RPI-X, mandatory selldown)

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Means for Improving Productivity

- New technological solutions and services (e.g., new switches, data services)
- Capital investments (e.g., labor-saving digital exchanges at Telmex)
- Economies of scale and scope (e.g., peak capacity needs, fixed costs)
- New managerial and operational practices (e.g., inventory management)
- New labor training, incentives, work rules, and staffing policies

Price Waterhouse

Areas for Productivity Improvements

	Potential for Unit Cost Reduction			
	Scale and Experience Effects	Changes in the Level of Technology	High-Yield Cost-Cutting Investments	Changes in Operating Practices
I. Transmission Equipment	●	●	●	◒
II. Switching Equipment	◒ *	●	●	●
III. Outside Plant	◒	◒	◒	●
IV. Operation and Support Systems	○	●	●	●
V. Cellular Radio Infrastructure	●	◒	◒	◒

○ Low Potential for Cost Reduction ◒ Medium Potential for Cost Reduction ● High Potential for Cost Reduction

* With consolidation of central offices

Price Waterhouse

Sample Human Resource Improvement Techniques

- MNTL was formed in 1986 to manage telecommunications in Bombay and Delhi
- New training programs were implemented
- Incentive schemes were developed
- Working conditions, transport, and housing were improved
- Productivity improvements were made without staff cutbacks

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Productivity Measures

- Revenue or lines per employee
- Labor costs per unit of output
- Total factor productivity
- Average capital output ratio
- Service quality and availability of new services

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Productivity Impact of Chilean Restructuring

- Compania de Telefonos de Chile (CTC) was privatized in 1987
- Lines per worker is expected to rise from 94 in 1990 to 149 in 1996
- Total factor productivity increased by one third between 1986 and 1990

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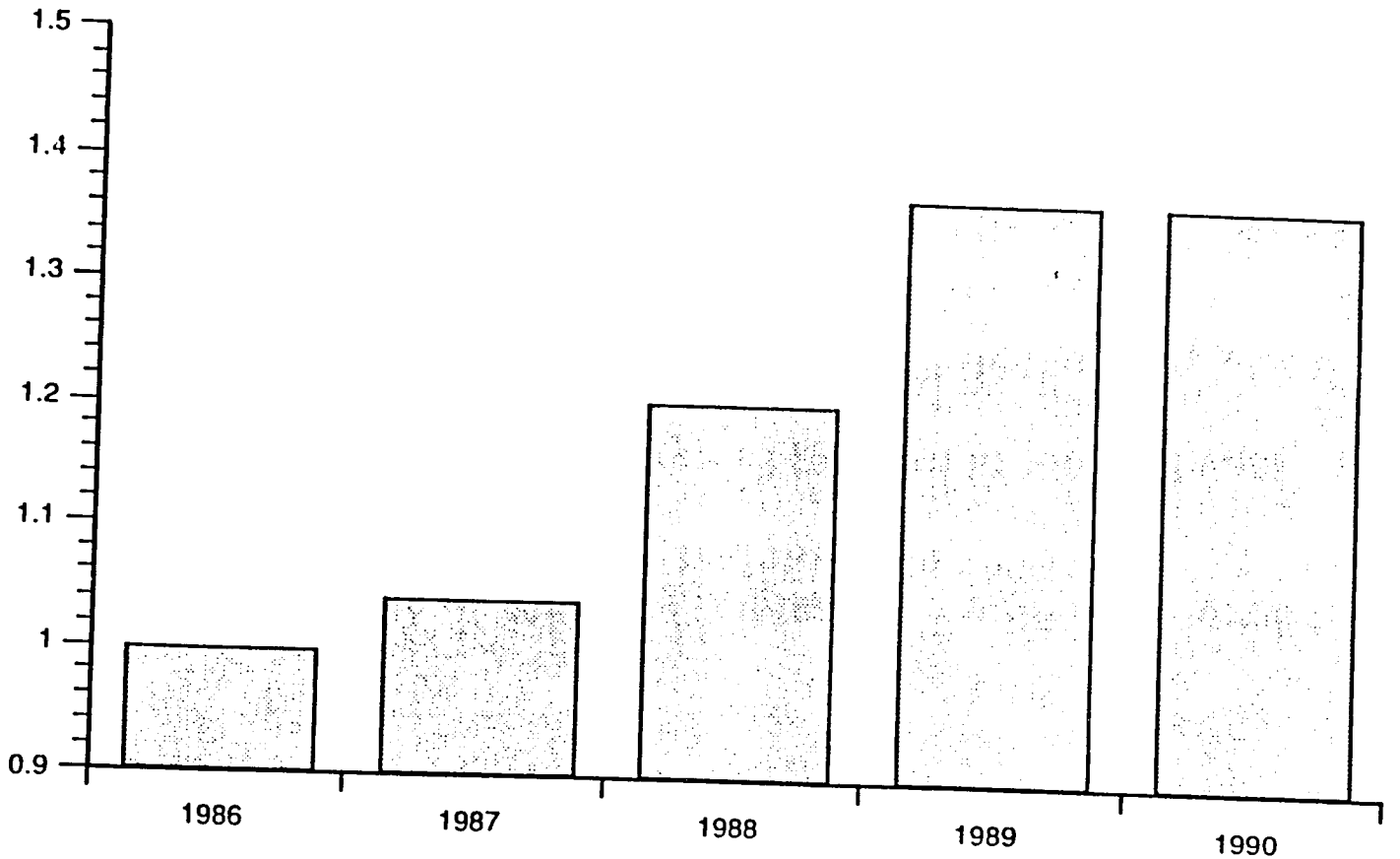
Compania de Telefonos de Chile
Total Factor Productivity



Source: World Bank

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Productivity Impact of Mexican Restructuring

- Telefonos de Mexico (Telmex) was sold in 1990, with the privatization process beginning in 1989
- Labor productivity rose 23 percent in the first year
- Real labor costs per unit of output declined by one third between 1988 and 1991
- Total factor productivity increased by one quarter between 1988 and 1991
- Half of all net gains in economic welfare were from productivity improvements

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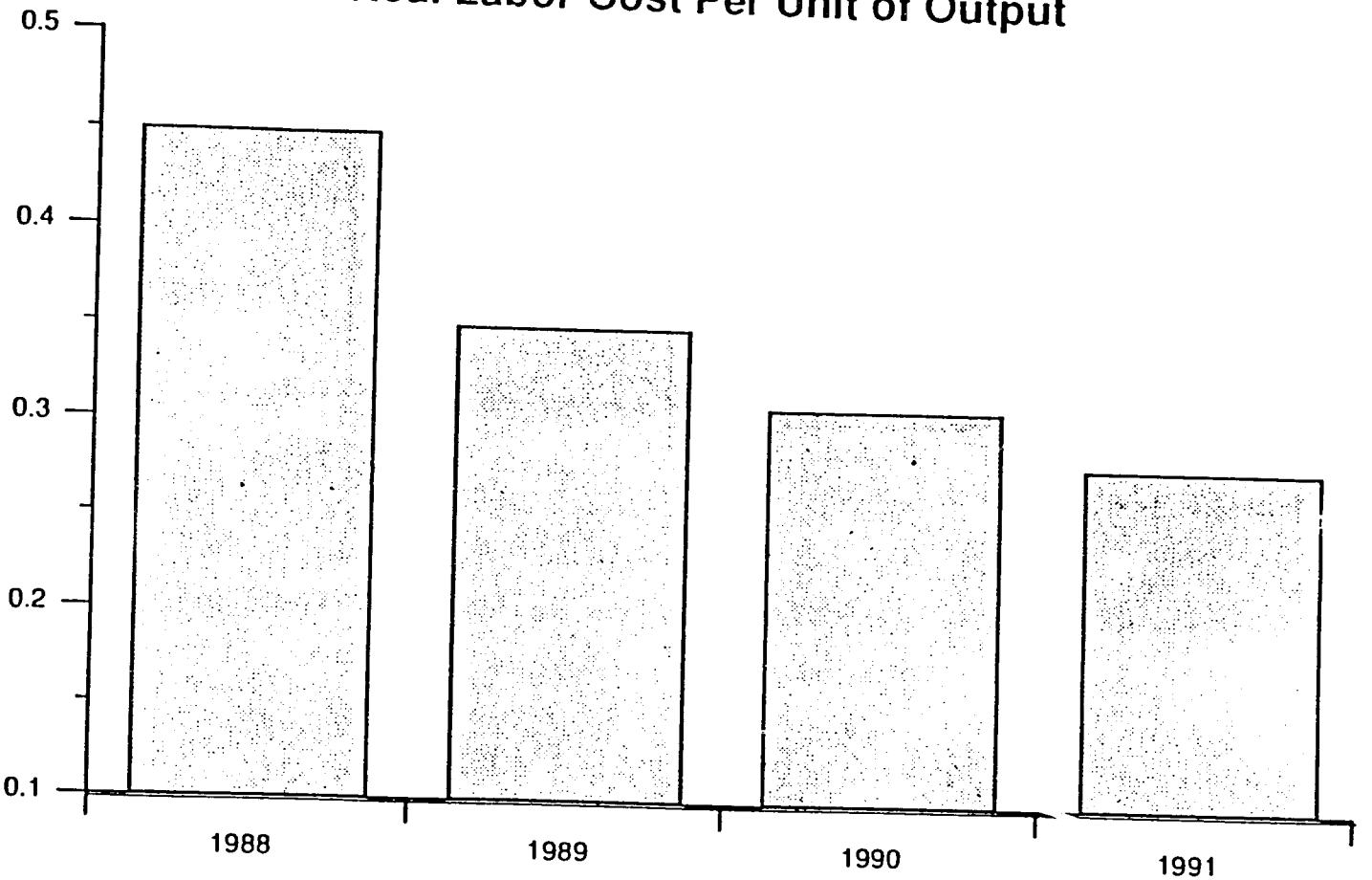
Telefonos de Mexico
Real Labor Cost Per Unit of Output



Source: World Bank

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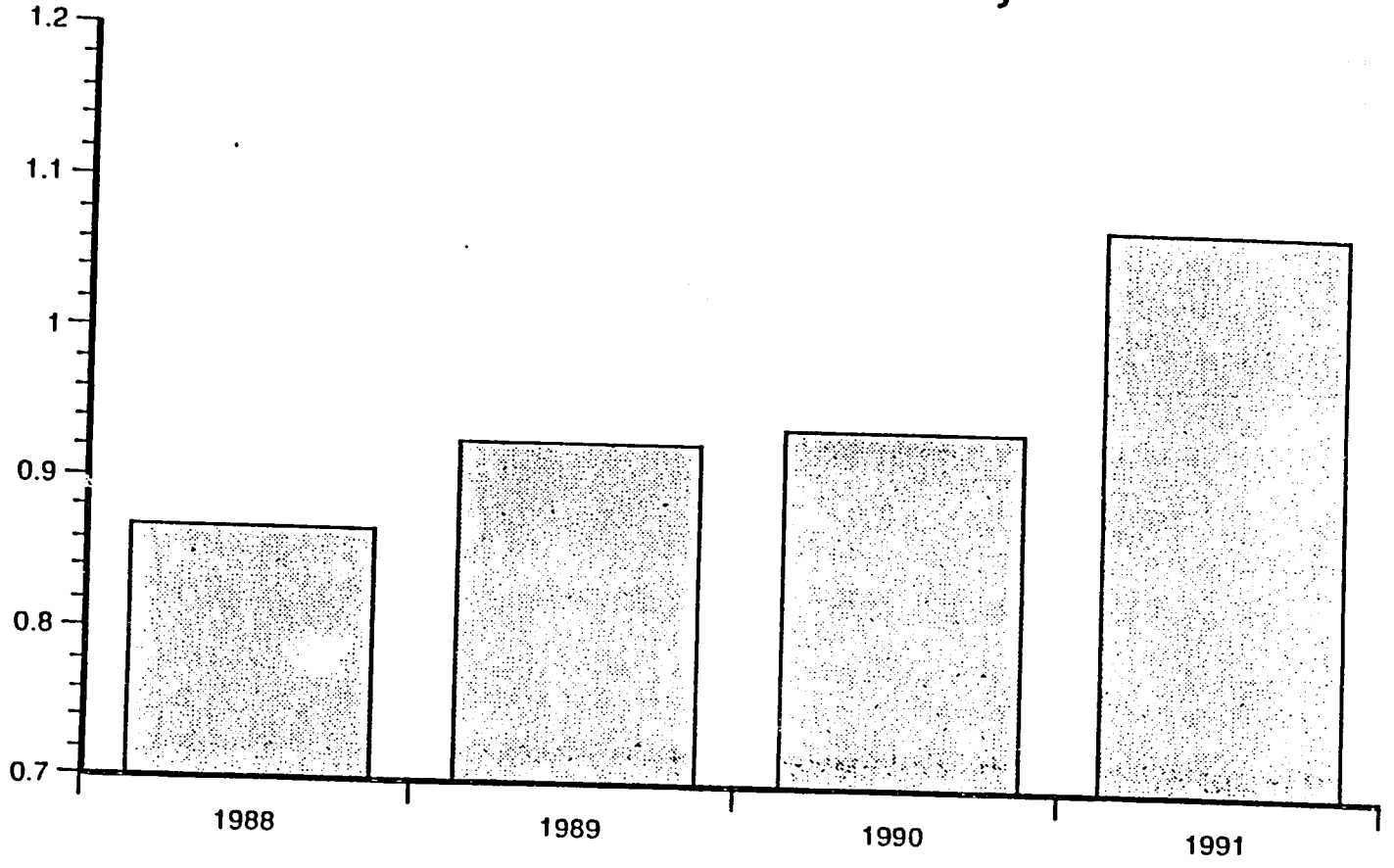
Telefonos de Mexico
Total Factor Productivity



Source: World Bank

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Productivity Impact of UK Restructuring

- British Telecom (BT) was privatized in 1984
- Real unit labor costs declined by one third from 1984 to 1990
- Total factor productivity rose by one fifth between 1984 and 1990
- Three-quarters of all net economic welfare gains were from productivity improvements

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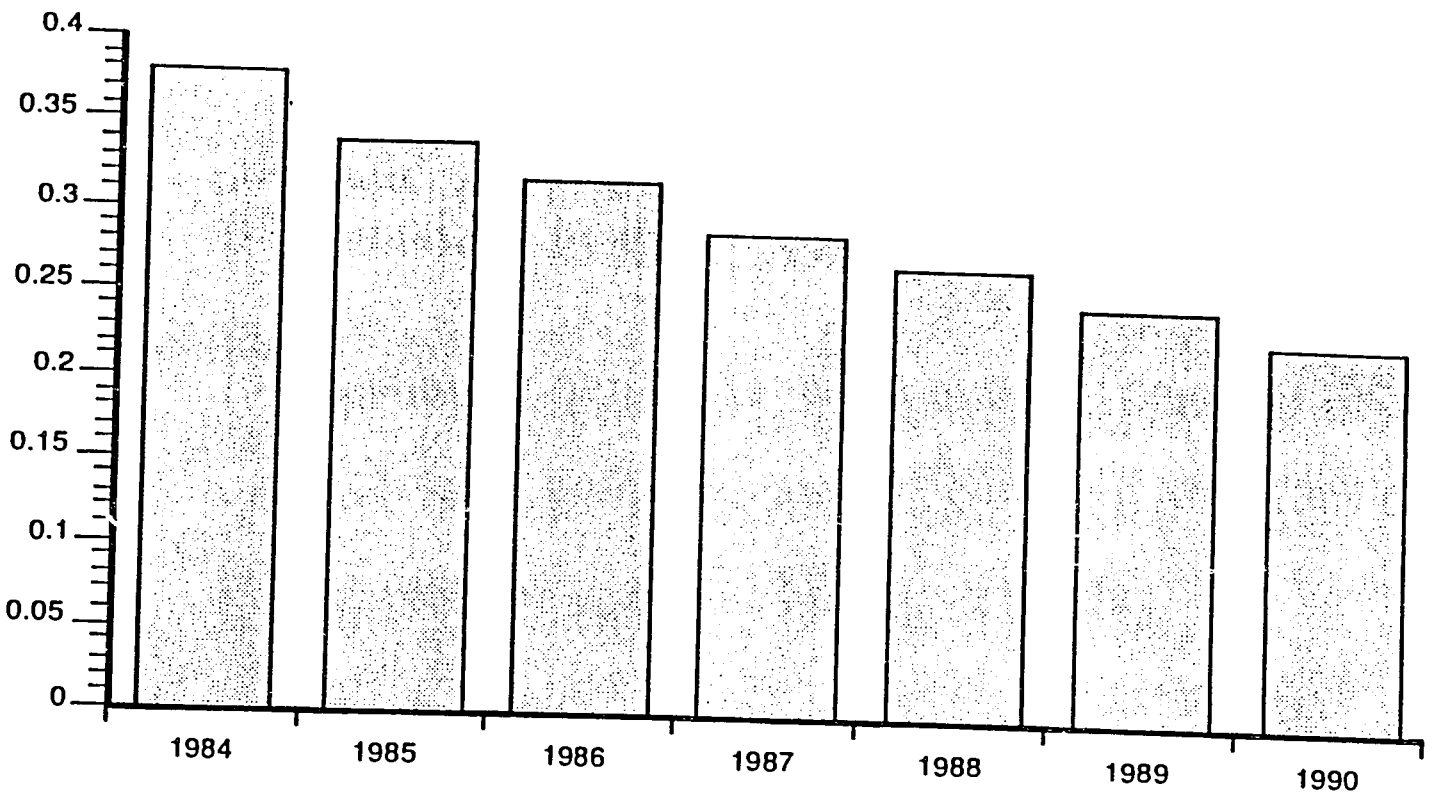
British Telecom
Real Cost of Labor Per Unit of Output



Source: World Bank

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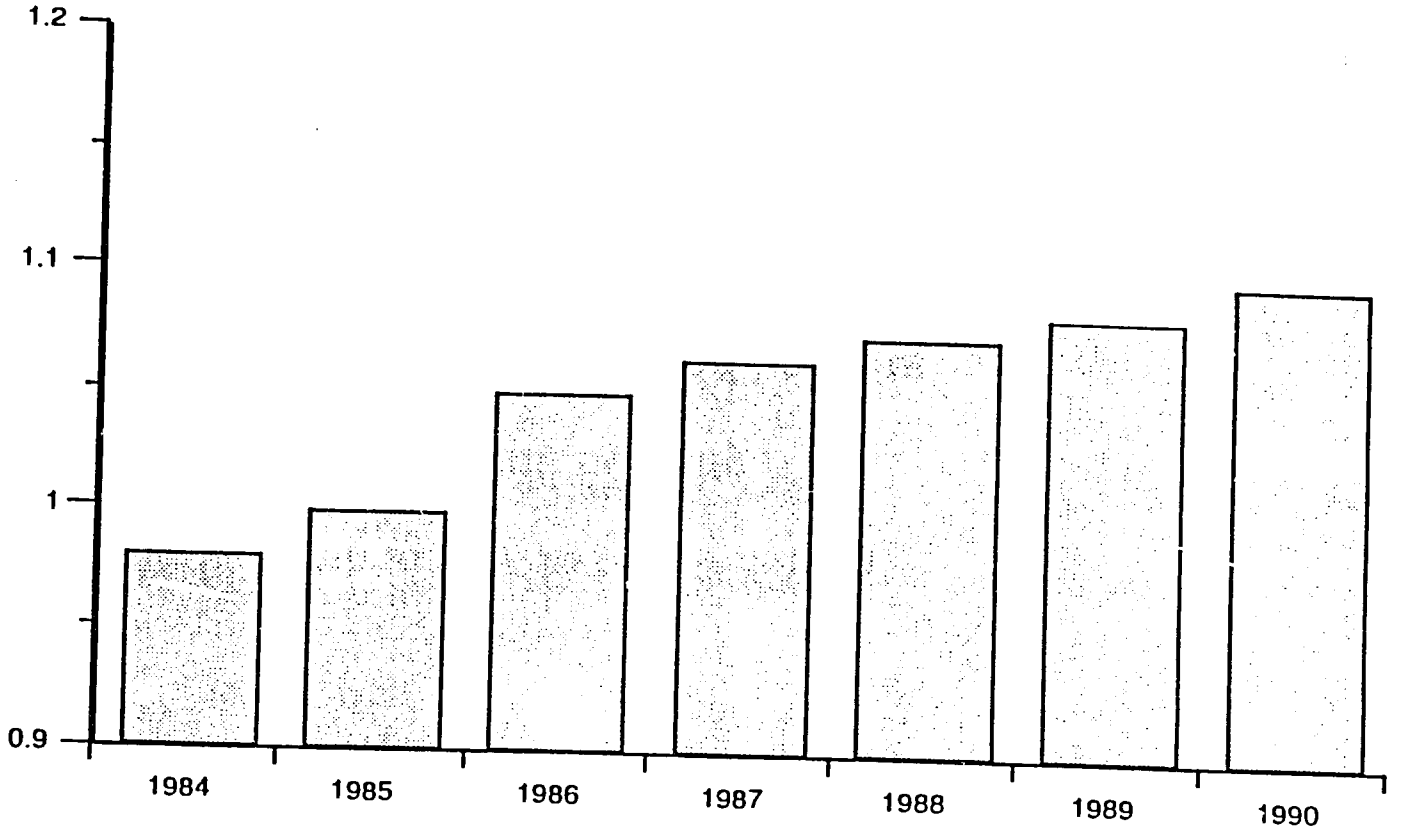
British Telecom
Total Factor Productivity



Source: World Bank

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Possible Labor Concerns Regarding Restructuring

- Immediate job losses in restructuring
- Reduced long-term job security
- Loss of civil service status and benefits
- Impaired pension rights or security

Means for Protecting Labor

- Service expansion
- Retraining programs
- Employee stock ownership
- Severance benefits
- Contractual guarantees of staffing levels and worker rights

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Service Expansion Opportunities

- Developing nations have fewer lines per capita than developed nations
- One quarter to one third of registered demand is often unmet
- After privatization, Chile's CTC doubled its capacity in five years
- New services can be introduced (e.g., data services)

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Employee Stock Ownership

- Free or discounted shares reserved for workers
- Low or no-interest financing provided by the company or the government for employee share purchases
- Shares provide current and future income or capital gains
- Tax incentives may be provided
- Broadens ownership, increases productivity, and mitigates impact of restructuring

Price Waterhouse

Impact of Chilean Telecommunications Restructuring on Workers

- Workers' economic welfare increased in all three cases
- 84 percent of workers purchased 6.4 percent of CTC (funds included severance money)
- CTC agreed to real wage increases with fewer workers per line
- CTC doubled capacity in first five years

Impact of Mexican Telecommunications Restructuring on Workers

- 4.4 percent of Telmex sold to union at 9 percent discount
- By 1992, shares worth four times purchase price
- Additional pay and training in return for staffing reductions and rule changes
- Further staffing reductions through attrition
- One third of the added economic welfare went to workers

Price Waterhouse

Impact of UK Telecommunications Restructuring on Workers

- Workers were given free shares and share discounts (£56 million)
- Total worker gains from share purchases were £150 to £200 million
- Work rule changes were negotiated in exchange for higher pay
- Voluntary staff reductions were achieved through severance payments

Price Waterhouse

Impact of Restructuring on Labor/Productivity

- Substantial productivity gains have been achieved
- Workers' economic welfare has been protected

Price Waterhouse

Potential for Private Sector Participation in Telecom Development

by: *A. F. Odeh, Senior Economist, International Telecommunications Union*

Financing Africa's Telecommunications Investment in the Nineties: Options for Private Sector Participation[1]

A.F. Odeh, Senior Economic Advisor
ITU/BDT

I. Introduction

Telecommunications policy makers in many countries - particularly developing countries undertaking structural adjustment programmes or economies in transition to the market system - are more and more considering the involvement of the private sector in the future development of the telecommunication sector. Government owned telecommunications enterprises or PTTs - in over twenty-five countries around the world - consider that the international debt situation and domestic economic conditions do not seem to encourage continuous reliance on traditional funding sources in the form of long term loans from development financing institutions.

The purpose of this paper is to assist telecommunications policy makers in such countries in defining a policy for the development of basic and value added services, by methods that involve the private sector. A brief analysis is made of methods of private sector participation in the telecommunications sector. Examples of financing schemes from various countries are described, but the information publicly available is rarely detailed enough to enable the policy choices made in other countries to be fully understood. The final section contains conclusions.

II. Rationale for Commercialization - the Way Forward

There are at least two major policy concerns that are driving the reform process, according to Robert Bruce, in an unpublished article on the subject.

First, policy makers are seeking access to new sources of capital to develop the national telecommunications infrastructure; thus infrastructure is essential to stimulating economic growth. As stated in the introduction, traditional public sector financing is no longer adequate to generate the huge amounts of investment capital required to construct future telecommunications networks.

Second, according to Bruce - in the same article - commercialization may be seen as a way to break with the pattern and make the telecommunications operator more efficient and able to generate internally significant funds needed for expansion.

By bringing outside investors and new managers into a PTT and by requiring a complete reappraisal of the relationship of the state to the PTT, the reform process, Bruce maintains, can reduce or eliminate the constrictive influence of government

[1]This presentation is based on an original background paper on the subject that was prepared as a mission report to aaa developing country contemplating developing the private sector in its telecommunication investment. The background paper may be available on request from the author.

regulations and practices, obligations to transfer funds out of the PTT to the state treasury to finance other sectors of governmental activity, and management practices that tended to focus on the internal needs of the telecommunications operators rather than on the needs of telecommunications users.

Thus, from an outside investor's point of view, commercialization can present attractive business opportunities. Foreign telecommunications operators and their partners or co-investors, Bruce adds, can secure a strategic position in a dynamic sector of emerging national economies (including those in transition to market systems) at a time when the telecommunications business is becoming increasingly global in scope.

The conclusion to be drawn from the above is that further investment to meet the demand for telephone service and to achieve other policy objectives is urgently needed and should be well rewarded. Both self-financing and private sector financing (both local and foreign) would be facilitated by a sustained effort to privatize the public telecommunications entity's operations.

III. National Approaches to Private Sector Participation

Le us, now, look at the methods in which the private sector could participate in the development of the telecommunications services. By now, a large number of methods of private sector participation have been proposed, with a bewildering variety of names or acronyms (such as B.O.T., B.L.T., B.O.O., B.O.O.T, etc.) but relatively few schemes based on them have yet been implemented in the telecommunications sector. The purpose of this analysis is to identify the key differences between the various schemes and to relate them to examples of particular schemes that have been adopted in various countries.

The options considered may be summarized as follows:

Private sector loans

This includes schemes by which the public telecommunications entity borrows on long term from sources other than the government. Examples would be direct access to financial markets in the country or overseas or raising bond finance from subscribers. In several countries such as Canada, France, Sweden and India, government owned telecommunication operating entities are permitted direct access to private capital markets in order to raise long term loans. The loans may be provided by the banking system or take the form of bonds which individuals can purchase. Loans could also be raised directly from the public telecommunications entity's subscribers in the form of bonds rather than through the capital market. Subscriber loans have been used to finance the development of the telecommunication sector in Brazil, Mexico and (in the past) Japan. The key advantage of this method is that subscribers would not require further specific guarantees; the continuation of telephone service would be sufficient security for the bond. The interest offered could be set by reference to the rate offered on saving

accounts. The purchase of bonds could be made more attractive if they conferred some priority in allocation of a telephone line.

Revenue Sharing

This includes such schemes as Build-Operate-and Transfer (B.O.T.), Build-Lease-and Transfer (B.L.T.), Build-Own-and Operate (B.O.O.) and Build-Own-Operate-and Transfer (B.O.O.T.). All such schemes have the common feature that initial ownership of assets would reside with the private sector, but ultimate ownership would reside with the public telecommunication entity. Revenues generated by the investment would be shared by the private sector in proportion sufficient to repay its investment.

Revenue sharing schemes are variants of turnkey projects, in which the financing of the project is undertaken in part on an equity basis rather than solely though long term loans. The principal characteristic of revenue sharing schemes is that repayment of the private sector investment is linked to a specific revenue stream, usually the revenues generated by the investment itself.

Revenue sharing methods of financing a project are most simply characterized as deferred payment for a turnkey contract. A turnkey project would also entail the provision of a complete network infrastructure in working order. A management contract might extend the supplier's involvement for a year or more. In a normal turnkey arrangement, the contractor would receive about 25 % payment in advance, further payments as work progressed and the balance on handing over the equipment to the public telecommunications entity. Deferred payment would be organized in a manner similar to a hire purchase contract. That is, the telecommunication entity would repay the delivered price plus interest in equal instalments over an extended period.

Joint Ventures

This includes all schemes in which ownership and hence risk is shared between the private sector investor and the public telecommunication entity.

Joint ventures are the normal way in which public telecommunication network operators in developed countries introduce new services or seek to open new markets. A joint venture company is formed by an agreement which specifies what the company will do and the equity participation of the partners. In addition, staff will usually be seconded from the partners to the venture underway. In this context, the merits of a joint venture are the pooling of knowledge and sharing of risks in an activity kept separate from the partners' mainstream businesses. Joint ventures can, therefore, be formed among companies that would otherwise be considered competitors.

Network operators do not usually form joint ventures for purely financial reasons; their standing is usually such that they have no difficulty in funding ventures out of

their own resources or thorough medium term commercial loans. In developing countries, the financial motivation for forming a joint venture is usually of paramount importance to the domestic network operator, although access to commercial experience may also be a significant factor.

Considered as a means of financing investment, a joint venture has the merit that it can be much simpler to devise than a B.O.T. scheme. Because it is agreed at the outset that risks are to be shared in the proportions of the equity interests of the partners, a joint venture agreement does not need to spell out in detail or in legal language the precise allocation of responsibilities for every part of the project, as is the central task when devising a B.O.T. scheme.

Privatization

This includes schemes by which the ownership of all or part of public telecommunication entity changes from the Government to the private sector.

As a preamble, it should be noted that although many countries have announced their intention to privatize the telecommunications sector, to date only seven significant privatizations have actually taken place (in 1984, NTT from 1984 to date, CTC of Chile 1987 to 1990, NZ Telecom, Syarikat Telekom Malaysia and Telemex of Mexico - all in 1990, and ENTel of Argentina in 1991). Each of these privatization has had unique characteristics, which require careful consideration before drawing firm conclusions, but only in the case of is it possible to say that constraints on the capacity of the entity to borrow while owned by the Government led directly to the decision to privatize. In four cases (Chile, New Zealand, Mexico and Argentina), the prime motivation for the privatization was to sell assets to foreign investors in order to reduce the Government's burden of debt. Even with , the receipts from privatization went to the Government and were not invested in the sector.

Privatizations that have involved the sale of all or part of the entity to a foreign network operating company effectively accelerate the commercialization process. Privatization in this form would, therefore, be an alternative to the use of consultants to devise and help implement commercial structures and processes in the telecommunications entity.

Telecommunications Sector Reform

This includes all schemes under which the scope of the public telecommunication entity's monopoly is narrowed. For example by franchising other service providers or permitting users to provide more equipment and services for themselves.

The separation of the telecommunication entity's operations from Government and the restructuring of the organization along commercial lines should have the effect of increasing its profitability. The positive impact of commercialization, aside from any increased investment in the network out of loans or private sector equity that accompanied it, would come about through improved motivation of management and staff, better marketing of services and hence higher revenues rather than reduced

operating costs. The telecommunications entity's ability to finance itself would therefore improve.

Sector reform would also be expected to provide better opportunities for the private sector. by setting limits to the telecommunications entity's monopoly. Private sector opportunities would arise either through licensing other service providers or by allowing users to do more for themselves. These opportunities need not be competitive to the public telecommunication entity's telephone service. No developing country has yet followed the example of the United Kingdom, the USA and Japan by licensing competitive fixed telecommunication networks. Even in developed countries, to reconcile network competition with sector policy goals normally requires relatively sophisticated regulatory arrangements, which take many years to build and refine.

IV. Conclusions

The principal conclusion is that there are many ways to reform the telecommunications sector and innumerable variations on each of them that could attract the private sector. To be able systematically to assess all the options would require a separate paper with a much wider scope than the present one. It would also require that careful considerations be given first to the aims of policy and the priorities of the government. These can be on the basis of the criteria to be used in the evaluation of options, leading to the definition of a coherent strategy.

SPEAKER PRESENTATIONS

DAY TWO: FEBRUARY 18, 1993

THURSDAY, FEBRUARY 18

Morning

Private Sector Participation in Telecommunications

9:00 - 9:15	*Opening Remarks:* Defining the Role of the Government in Sector Restructuring Speaker: Mr. Rogati Kayani, The World Bank
9:15 - 10:00	Private Sector Participation in the Telecom Sector: Factors Affecting Investment Decisions Speaker: Cornelius B. Prior, Jr., President, Atlantic Tele-Network, Inc.
10:00 - 10:45	Financing Private Sector Ventures in Telecommunications Speaker: Mr. Assaad Jabre, Telecommunications Manager, International Finance Corporation
10:45 - 11:30	Expanding Telecom Services: Serving Rural Needs through Cellular Networks and Satellite Systems Speaker: Mr. Andrew Werth, President Hughes Network Systems International
11:30 - 11:45	**BREAK**
11:45 - 12:30	**Discussion** Moderator: Mr. Baljit Vohra, Intrados/IMG

THURSDAY, FEBRUARY 18

Afternoon **Competition in the Telecommunications Sector**

2:00 - 2:15	*Opening Remarks:* The Importance of Competition in Telecom Sector Development Speaker: Mr. Rui Fernandes, Chairman and Managing Director, Telecomunicações de Moçambique
2:15 - 2:45	Competition and Privatization in the Telecommunications Sector Speaker: Mr. James Waddell, Price Waterhouse
2:45 - 3:15	Telecom Restructuring in Africa: Case Studies Speaker: Judith D. O'Neill, Esq., Steptoe & Johnson
3:15 - 3:45	Restructuring Initiatives in Zimbabwe Speaker: Mrs. Sarah L. Kachingwe, Permanent Secretary, Ministry of Information, Posts, and Telecommunications, Zimbabwe
3:45 - 4:15	Restructuring Initiatives in South Africa Speaker: Mr. B.A. Bets, Managing Director, Mobile Communications, Telkom, S.A. Ltd.
4:15 - 4:30	**BREAK**
4:30 - 4:45	Restructuring Telecommunications for a Democratic, Non-Racial, Non-Sexist South Africa Speaker: Mrs. Lyndall Shope-Mafole, Coordinator, Centre for the Development of Information and Telecommunications Policy, South Africa
4:45 - 5:30	**Discussion** Moderator: Mr. Rui Fernandes, Telecomunicações de Moçambique

Defining the Role of the Government in Sector Restructuring

by: *Rogati Kayani, Senior Telecommunications Engineer, The World Bank*

SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

TELECOMMUNICATIONS POLICY, REGULATION AND RESTRUCTURING CONFERENCE

Defining the Role of Government in Restructuring

By Rogati Kayani - World Bank

Introduction

As governments in countries in this sub-region become increasingly aware of the important role telecommunications plays in the overall development of their economies, these governments are now seriously focusing on the development of the sector. These countries are realizing that their competitiveness in the global market largely hinges on their ability to access information rapidly. They are now reviewing the various bottlenecks that have led to the present poor state and under supply of telecommunications facilities and services in their countries. In order to improve the performance of their telecommunications networks and provide adequate facilities to support economic and social activities these governments are considering new ways of managing the sector including commercialization of the state owned monopolies and creation of enabling environments for private sector participation.

With the possible entry of other players in the delivery of telecommunications services whose "bottom line" is to maximize profits from the services they are providing, the old government owned monopolies have had to re-orientate their ways of doing business to match their competitors. As the government's administrative procedures are not suitable to run business ventures, the governments have also to re-orientate their roles in the management of the sector. Their roles have to change from that of direct management to that of strategic policy formulation and monitoring of performance.

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The Reform Process

Reforms of the telecommunications sector is a complex process which can only be successfully designed and implemented with strong political will. The decision to reform must therefore be a political decision. The impact of such reforms cut across the whole political, economic and social systems. The Government is the fulcrum of all sector reforms responsible for defining the reforms, designing and planning for the implementation of the reforms, presenting the reforms to the legislative instruments, implementing the reforms and monitoring the performance of the reformed sector.

Macroeconomic Framework

Adequate telecommunications capability is a key factor in determining a country's competitiveness but its development has to be looked at in the context of other factors that constitute the enabling environment for economic growth[1]. Telecommunications acts as the nervous system for the national economic structure being catalytic to its growth and sustainability of such growth. Although the development of telecommunications can play an important role in development it is important to relate investments in this sector to investments in other sectors. It is the role of the Government to ensure that this balance is maintained through appropriate macroeconomic policies. It is through appropriate macroeconomic policies that the enabling environment is created for telecommunications sector restructuring. Even with appropriate enabling environment, the resource purse for telecommunication financing is limited. There are limits to the domestic financial market and to the ability for the country to borrow from abroad. Since all the sectors have to depend on the same domestic resources and since the ability for individual sectors to borrow abroad is contingent on the ability of the country to repay such loans in foreign currency it is important that macroeconomic policies are in place to balance the distribution of these resources. Thus unless financing is in the form of grant or equity, private or public sector funding for telecommunications will reduce the pool of available resources and

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hence affects all the other sectors. Even with equity participation the amount of dividends that can be repatriated depends on the overall economy and therefore must be balanced in accordance with the overall economy.

Initiating Reforms

Practically all reforms in industrialized countries have been initiated by the government. The need for reforms by and large stems from the Government's realization of the important role played by telecommunication in economic development. Many of these governments are also being pushed by large users of telecommunications services whose demands in terms of quality, quantity and variety of services are not being sufficiently met. Many of the traditional posts and telecommunications entities are organized and managed in a civil service manner, as such they cannot react quickly enough to the demands from their customers. These entities, by virtue of their monopolistic states are prone to inefficiency, are slow to adopt new technologies and generally are not very sensitive to customer demands. The Governments have realized that the sector is just too important to be left in its present structure.

Many governments in developing countries and indeed most governments in this sub-region are aware of the poor state of their telecommunications sector. They are, in addition, under continuous pressure from the business community to restructure the sector -- Most of the business community are advocating outright privatization of the operating entities which they view as arrogant, inefficient and outdated. The governments in this sub-region have been very slow to react to these pressures for a number of reasons:- Firstly, these governments are overwhelmed by more basic problems threatening the very fabric of the survival of their people such as hunger, disease and illiteracy[2]. In such environments, it is not surprising that government efforts are focused towards alleviating these problems and the infrastructure directly associated with them such as roads, railways, and power. governments in these countries are now slowly recognizing the comparative advantage of telecommunications with

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respect to other essential infrastructures such as roads, railways and power. It has been realized that telecommunications is no longer a luxury reserved for the elite few living in urban areas where it is required to sustain the more sophisticated economic and social structure. Secondly, these governments are afraid of losing control of the "cash cow" which has been a source of revenue for a long time. Thirdly many of these governments have over relied on the operating entities to initiate actions to reform their own operations. For obvious reasons reform proposals from these entities have been focussed on internal reorganization rather than the sector as a whole. Fourthly, the governments have misunderstood the implications of these reforms which in some cases have been interpreted as steps towards domination of certain local groups or overseas parties in contradiction with existing political philosophy.

Defining Reforms

In many cases governments do not have the capacity to define the reforms required in the sector and have to rely on the operating entities to define the reforms for them. This is of course unsatisfactory because these entities have neither the capacity nor the interest to propose full scale reforms which are likely to infringe on their operating territory and even throw them out of business. The government has therefore got the responsibility to define the problem and the necessary remedies that are required in the form of sector restructuring. Many countries which have reformed have relied on the expertise of consultants who do not have any stake in the operating entity and who are aware of the issues in the sector on local and international scale.

Enabling Environment

Restructuring of the telecommunications sector requires that the Government provides various forms of incentives to enable commercialized telecommunications entities to operate autonomously and to attract private sector resources. The main objective for private sector participation is to attract private financial and manpower resources which are not available in the operating entity

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or in the country as a whole. The private investor has to weigh his investment in the framework of the total incentive structure which is governed by different laws and regulations in the country. It is not only the telecommunications law that the Government has to revise when reforming the sector. The Government has to review other relevant laws that affect the operations and profitability of the investments. The laws that come into play in the incentive scheme include: commercial code; banking/investment laws; tax laws; contract laws; corporate law; real property law; labor law; courts/arbitration procedures and international agreements.

Owing to the complexities involved in providing sufficient incentives for private sector participation, many governments have established special bodies responsible for privatization of public owned companies. These bodies have the responsibility to study the existing legal regulatory framework with the intention to remove bottlenecks that make it difficult for private capital to flow into the country. The government has also got to ensure that it provides a level playing field for all new entrants and has to see to it that the field remains level during the "game". The government does this through the establishment of a regulatory body which monitors the implementation of agreed policies.

Changing role of Government

The Central issue in the reform process is to de-link the direct role of managing telecommunications operations to that of setting macro and microeconomic policies geared towards providing a stable business environment based on prudent fiscal, monetary, and exchange rate policies. The role of Government and its involvement in the sector will depend on the level of restructuring that is being proposed and the policy objectives to be achieved. The restructuring process would range from separation of posts from telecommunication and commercialization of the resulting entities to the full privatization of the public owned enterprise.

The main role of government should be to set long term objectives for the sector and articulate sector policies related to: investments

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and resource mobilization; commercialization; divestiture; tariffs; manufacturing; private sector participation, competition; privatization; and regulation. The policy framework would also define the role of the regulatory body and where it should be administratively placed. The role of operators would also be defined. Other roles are to: coordinate telecommunications operations with other government entities in matters of national importance such as security; and represent the government in international organizations.

Supervisory Role

In the context of general policy guidelines the government's supervisory role in a government owned commercialized telecommunications entity (TE) would include:

- provision of support to the TE efforts to make its organization more responsive to telecommunications sector needs through granting it the appropriate autonomy;

- ensuring that it appoints a competent, business-minded and independent-minded Board of Directors to run the affairs of the entity. The members of the board should include representatives of commercial and consumer groups. The Government should decentralized power to the Board as a way to depoliticize decision and take the entity's interests into account. The Board's primary responsibility would be to provide strategic guidance to the management and monitoring performance within the overall framework of long term objectives of the Government for the telecommunications sector;

- ensuring that management team of the T.E. is competent, business-minded and action oriented with utmost regard to efficiency in operations/financial matters;

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- delegating all procurement authority to the T.E. T.E. should be able to award all contracts;
- de-linking T.E.'s salary structure from that of the civil services;
- timely provision of subsidies to financially unattractive capital projects required by the Government;
- payment of all of its telecommunication bills to the T.E.;
- reviewing tariff levels proposed by T.E. according to agreed principles;
- provision of adequate equity; and
- undertaking financial restructuring where necessary.

Regulation

The role of setting up a regulatory body is a function of the government, but the "modus operandi" of such a body will vary from one country to another. In some countries like the U.K., the body is an independent body separate from normal government machinery and responsible to the parliament. In other countries, like France, the regulatory body is part of the supervisory ministry. The reason advanced for this is that the implementor of the policy should be as close as possible to the policy maker to facilitate timely coordination between the two bodies. In New Zealand there is nor formal regulatory body. The rules for entry and competition are governed by the commercial law. The major issue in privatization in most developing countries is the lack of properly working regulatory mechanisms.

The functions of a regulatory body would be:

- regulate the sector to ensure that the interests of the government, the consumers and the operators are served including the establishment of a mechanism for dealing with grievances;

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- define the tariff policy and approve basic rates as established under this policy. Beyond the basic rates appropriate formulae should be set for automatic adjustments in accordance with macroeconomic conditions;
- define and monitor technical and financial indicators expected from the operating bodies;
- allocate and administer the radio frequency spectrum;
- grant licenses to install and operate telecommunication services;
- carry out type-approval of subscriber terminal equipment in the public network;
- promote the development of competition and
- review interconnection and revenue sharing arrangements
- define a mechanism by which the users' views could be periodically obtained.

Conclusions

As long as telecommunications remains to be one of the sectors with far reaching externalities, the government will always be involved in its supervision and regulation in one way or another. What is important is that the government should limit its involvement to national policy issues only; leaving the day to day management to the telecommunications entities themselves. This may be difficult to implement when these entities are fully owned by the government. This has been proven over and over again in Sub Saharan Africa where many entities have been corporatized for more than a decade but to-date, are still operating as government departments because the government does not want to let go.

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2. R.A. Kayani - "The Impact of Liberalization and Sector Restructuring on Rural Telecommunications Development" - IEE Conference on Rural Telecommunications Technologies, London 1990.

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Private Sector Participation in the Telecom Sector: Factors Affecting Investment Decisions

by: *Cornelius B. Prior, Jr., President, Atlantic Tele-Network, Inc.*

Private Sector Participation in Telecommunications:

Factors Affecting Investment Decisions

by

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Private Sector Participation in Telecommunications: Factors Affecting Investment Decisions

In considering the factors affecting investment decisions in telecommunications projects, the principal considerations which we will examine today are:

a) Political Climate

b) Economic Potential

c) Existing Telecommunication Infrastructure

d) Financial Outlook

e) Legal Climate

POLITICAL CLIMATE

Perhaps the single most important factor in attracting foreign investment to the telecommunications sector is the political attitude toward private investment in the host country. In many countries the telephone business has been a government business, often part of the Post Office. Today, however, more and more countries are looking to the private market to provide capital to finance this important infrastructure activity.

A foreign investor will be very alert to signs of general political acceptance of the role of the private sector generally in the host country in determining the long-term viability of

telecommunications' investment. The investor knows that he must have day to day freedom to control operations and make employment decisions efficiently; a practice which may be uncomfortable to former political habits of control.

Similarly, a foreign investor will be sensitive to the country's attitude to permitting the free flow of foreign expertise as needed to build a modern telephone company. On the other hand, the telephone company will also be sending local employees abroad from time to time for training and understanding of modern technological advances. An open border for the flow of training and technology is thus an important factor in making the company work efficiently and hence in the investment decision itself.

It is also an important political consideration that a government which commits to a private sector investor in telecommunications appoint a director of the company or high government official with authority to speak for the government on policy matters that arise from day to day. Even though the foreign investor will normally require at lease 51% of the stock of the enterprise, a strong minority partner is an advantage in terms of mobilizing other available resources. In addition, policy questions arise frequently and the foreign investor needs quick and authoritative feed-back from the government partner as to what policies are acceptable.

The importance of a general political consensus in favour of a privately run telephone company is so important that normally a foreign investor will seek assurances that all major political parties, not just the current party in power, support the principles of private operation.

ECONOMIC POTENTIAL

The foreign investor will be very interested in the economic potential of the country as a whole. In the long-run, the success of the telephone company in any country will reflect the wealth and resources of the nation. For example, a country with abundant natural resources, even though presently under-developed, will be more likely to attract foreign investment than a country without such natural resources since the exploitation of those resources will eventually bring wealth to the country and its citizens which will in turn be reflected in their demand for modern telecommunications services.

Similarly, the human resources of any country are very important as well. In Japan, for example, the highly educated population is such a valuable resource that the absence of significant natural resources is unimportant. In developing countries also, the country with a sound investment in education will be a more attractive investment opportunity.

Another sign of economic potential is the country's currency and its convertibility to other hard currencies. If a government finds it necessary to protect its currency, this will be taken as a sign of weakness, however temporary it may be. All in all the per capita Gross National Product will be a very important indication of economic achievement and, to some measure, economic potential as well.

EXISTING TELECOMMUNICATIONS INFRASTRUCTURE

Obviously the condition and capability of the existing telecommunications plant in the country will be a major item of interest to the foreign investor. Are the switches old or new? Is the outside plant well maintained? Are the office buildings and accounting systems in good condition?

In addition to the obvious importance of the existing physical plant, the "moral" condition of the operation is a key investment factor. By this I mean the attitude of the telephone company employees. Are they happy in their work and are they happy with their existing compensation, or are they unhappy and seeking opportunities to obtain additional compensation "off the books". Unfortunately, in many countries today the "moral" condition of the telephone company employees has seriously deteriorated. For one reason or another wages have been low and promotion has not always been by merit only. Accordingly, service backlogs can create enormous problems both from a "moral" point of view and from a service point of view. Similarly,

repair backlogs present the same opportunities for corruption and for creating a public antipathy to the phone company. A company whose employees already recognize a duty to the work ethic and honesty to the public would be an indication of a positive "moral" factor.

Finally, an important factor for investors is the penetration level of telephones per one hundred people of population. This standard measurement, which ranges from about 65% in the modern industrial countries to less than 5% in less developed countries, is some indication of potential growth. Investors will be interested in the growth potential, of course, but recognize that growth requires economic ability to pay as well as the obvious need and demand for additional telephones.

FINANCIAL OUTLOOK

An investor will normally want to begin his financial analysis with a review of the current Balance Sheet of the telephone company and the financial operating results for the past five years. Obviously, a company that has shown profitable operations in recent years will be more attractive than a company that has shown consistent losses. Even more difficult, sometimes, is trying to determine whether the company was profitable or not because of inadequate financial records or the absence of independent audits of those financial results.

Accordingly, reliable financial records are almost as important as the results themselves. It is very difficult for a foreign investor to move into a situation where the local telephone company does not have adequate financial procedures in place to justify additional investment. In such cases the investor will be afraid that his investment will be lost before he can institute the necessary procedures to keep track of the investment results.

The ability of .. phone company to earn foreign exchange is another important financial consideration. In many less developed countries, calls made from abroad by former residents of the country produce a substantial net inflow of foreign exchange which is of major importance if foreign debt has to be incurred and then serviced in order to improve local telephone plant. Accordingly, the ratio of inbound to outbound international calling will be a very significant consideration for the foreign investor.

The tax situation is another important consideration for foreign investors. All other things being equal, a country which gives some tax benefits will probably be more attractive and attract more capital more quickly, if that is the local government's intention. While it is not necessary to provide tax holidays, tax policy is a very important consideration in the negotiation of any telecommunications investment.

Lastly, let me mention the availability of investment insurance as an important investment factor. An investor who can obtain insurance for an investment in an overseas telecommunications venture will clearly be more willing to invest than in a situation where such insurance is not available. In the United States, the government has an agency called "OPIC" which provides US investors with what is called Political Risk Insurance at a cost that is generally less than 2% of the invested amount per annum. Other developed countries have similar programs and the availability of such programs is an important consideration.

LEGAL CLIMATE

A country which has a history of legal protection of human and property rights will definitely have an advantage in terms of attracting foreign investment. The history of foreign investment over the years shows that political climates can change rather suddenly. Accordingly, a country with a tradition of protection of private property, even if that private property is taken by the government for a legitimate purpose, is an important investment consideration.

Equally important is the regulatory framework in a country with respect to the day to day operation of the telephone company and the establishment of fair and adequate rates. The regulatory framework varies significantly from country to country and from state to state in the US, but the principles of regulation will

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be very carefully reviewed by potential foreign investors. Investors will be concerned that the system of regulation provides an adequate return on investment and the freedom to run the business in an efficient manner without undue regulatory oversight. It sounds simple, but where most telephone business decisions in the past were partly political decisions, there must be a clear understanding of the need for independence in the new private enterprize context.

There is no one regulatory framework that is best from an investor viewpoint. The English system of permitting rate increases consistent with the annual cost of living increase is one scheme that seems to work well. Equally useful is the typical state system in the USA, where regulation focuses on a return on investment rather than on the prices for the service.

The legal protection afforded to investors by a country's laws also has to be examined from the availability of the courts to enforce those laws. In other words, a system of protection requires a court system that functions independently of the political process to ensure that the protection is available in fact. Another possibility is to provide for international arbitration in the investment agreement: establishing the foreign investor as an equal partner with the government in the local telecommunications company. International arbitration has worked well historically and has general acceptance with foreign investors.

CONCLUSION

A number of factors affecting investment decisions in the privatization of local telephone companies have been briefly mentioned above. Each situation will require very careful analysis to determine which factors are the most important in any particular situation and factors will also arise that are not even mentioned here at all. The most important thing to remember is the need for a very thorough exercise of due diligence investigating the existing operation, and the need for an even greater effort in fashioning a solution that fits the needs of both the foreign investor and the local government for the life of the franchise.

C.B.P., Jr.

Financing Private Sector Ventures in Telecommunications

by: *Assaad Jabre, Telecommunications Manager*
International Finance Corporation

FINANCING PRIVATE SECTOR VENTURES IN TELECOMMUNICATIONS

Background

1. Telecommunication is a vital service linking developing countries to the emerging global economy, and as such, is critical to the competitiveness and productivity of modern business. But large amounts of capital are needed to expand and modernize the telecommunications infrastructure of developing countries so that they can meet their need for efficient voice, data and image communication services. To mobilize more capital for investment, improve the performance of existing telephone companies and respond to demand for better and expanded telecommunications services, an increasing number of governments are recognizing the need for private participation in the telecommunications sector. They have embarked on major privatization and liberalization programs. Several privatization initiatives, have already taken place. The coming years are expected to witness an acceleration of the privatization process worldwide.

2. At the same time, technological changes have reduced considerably barriers to entry. Telecom projects with moderate capital requirements, in both urban and rural areas, have become commercially viable propositions. As a result, opportunities for private sector participation in the telecommunications sector have increased substantially. They include owning and operating local and long distance telephone companies as well as specialized networks (e.g. satellite business systems, data packet switching and cellular networks) and providing value-added services (electronic mail; data bank access and data processing).

Financing Private Sector Ventures in Telecommunications

3. The availability and mix of financing for telecom projects vary depending on a number of factors including the country macroeconomic and business conditions; the extent of liberalization and privatization of the telecom sector; the development stage of domestic capital markets; and the scope and type of project. But one thing is clear. Privatization and liberalization offer a full range of new financing options. In particular, non-government guaranteed financing is becoming an increasingly feasible alternative where the conditions are right. Potential sources of financing for private sector ventures include local investors and lenders; foreign strategic partners (usually, telecom operators); other foreign equity investors and lenders; as well as export credit agencies, bilateral and multilateral organizations; and, of course, internally generated cash flow which plays an important role in expansion and modernization projects.

4. "Bankable" private telecom projects are generally those with the following main features:

- A reasonably well defined regulatory framework and/or strong contractual arrangements.

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- A clear long-term commitment from the key sponsors.
- Good management.
- Good market prospects and a business plan focused on key customer groups.
- Reasonably proven technology and staged network expansion plan.
- Well defined interfaces with the existing network.
- A risk exposure, which is balanced among operator, investors and lenders (financial structure; completion arrangements).
- Means of access to foreign currency.

The Role of the International Finance Corporation (IFC)

5. IFC is a member of the World Bank Group. Its main objective is to further economic growth in its developing member countries by promoting private sector investment. IFC is playing an increasingly important role in the telecommunications sector of its member countries. It made its first investment in the telecommunications sector in 1969 and has considerably expanded its financing of telecommunications projects in the late 1980s. So far, it has approved total investments of about US$450 million (of which $200 million for the account of participant banks) in cellular, satellite and basic networks. Investments are expected to grow rapidly as opportunities for private sector participation in the telecommunications sector continue to increase.

6. IFC provides three main lines of service to its clients in the telecommunication sector:

- It mobilizes funds (through syndicated loans and underwritings) for basic network operators, which are private or are being privatized;
- It helps structure and finance private sector projects for the provision of specialized and value added services; and
- It provides advisory services to private and joint-venture operators on modernization, expansion and restructuring programs; and to governments and P.T.Ts on privatization.

7. IFC stands ready to help the efforts of its African member countries to develop their telecommunications sector by opening them to private sector participation.

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FINANCING PRIVATE SECTOR VENTURES
IN
TELECOMMUNICATIONS

THE ROLE AND EXPERIENCE OF THE INTERNATIONAL FINANCE CORPORATION (IFC)

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1. WHO IS IFC?

2. WHAT WE HAVE BEEN DOING IN THE TELECOMMUNICATIONS SECTOR.

3. SOME OF THE LESSONS LEARNED.

   -- SOURCES OF FINANCING
   -- WHAT DO INVESTORS AND LENDERS WANT
   -- MAIN FEATURES OF A BANKABLE TELECOMMUNICATIONS PROJECT

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WHO IS IFC?

- A MEMBER OF THE WORLD BANK GROUP.
- ESTABLISHED IN 1956 TO FURTHER ECONOMIC GROWTH IN DEVELOPING MEMBER COUNTRIES BY PROMOTING PRIVATE SECTOR INVESTMENT.
- SHARE CAPITAL PROVIDED BY 151 MEMBER COUNTRIES.
- IFC PROVIDES FINANCING AND ADVISORY SERVICES.

IFC FINANCING

- TO PRIVATE SECTOR AND JOINT-VENTURE COMPANIES.

- LARGE ARRAY OF INSTRUMENTS
  - -- EQUITY (HAS TO BE PROFITABLE)
  - -- LOANS (AT MARKET RATES)
  - -- LOAN SYNDICATIONS
  - -- UNDERWRITINGS
  - -- GUARANTEES

- DO NOT/CANNOT TAKE GOVERNMENT GUARANTEE.

- IN 36 YEARS OF OPERATION, IFC HAS PROVIDED OVER US$ 11 BILLION IN FINANCING FOR NEARLY 1,000 COMPANIES IN 98 DEVELOPING COUNTRIES.

- DURING FY 92, IFC APPROVED A TOTAL OF US$ 1.8 BILLION NET FINANCING IN 167 NEW PROJECTS.

IFC ADVISORY SERVICES

- TO GOVERNMENTS AS WELL AS PRIVATE SECTOR

- WE ADVISE ON

  -- PROJECT PREPARATION
  -- OPERATIONAL AND FINANCIAL RESTRUCTURING
  -- PRIVATIZATION
  -- HOW TO ATTRACT FOREIGN INVESTMENT

IFC IN THE SADC COUNTRIES

- US$500 MILLION OF COMMITMENTS IN MORE THAN 50 PROJECTS, WITH TOTAL CAPITAL COSTS IN EXCESS OF US$2.5 BILLION.

- IFC PRESENT MAINLY IN MINING, FOOD AND AGRIBUSINESS, TOURISM, TEXTILES, GENERAL MANUFACTURING, TRANSPORTATION, BANKING AND FINANCIAL SECTORS.

IFC IN THE TELECOMMUNICATIONS SECTOR

- FIRST INVESTMENT IN 1969.

- SO FAR, TOTAL INVESTMENTS OF ABOUT US$ 400 MILLION (200 MILLION FOR IFC'S OWN ACCOUNT AND THE REST FOR THE ACCOUNT OF PARTICIPANT BANKS).

- INVESTMENTS ARE EXPECTED TO GROW RAPIDLY AS OPPORTUNITIES FOR PRIVATE SECTOR PARTICIPATION IN THE TELECOMMUNICATIONS SECTOR HAVE INCREASED SUBSTANTIALLY.

- TELECOM GROUP SET UP IN 1992.

PRIVATE SECTOR OPPORTUNITIES IN THE TELECOMMUNICATIONS SECTOR

A. WHY?

B. WHERE?

C. WHAT ARE THEY?

WHY HAVE OPPORTUNITIES INCREASED?

1. TELECOMMUNICATIONS IS CRITICAL TO THE COMPETITIVENESS AND PRODUCTIVITY OF MODERN BUSINESS. DEMAND FOR BETTER AND EXPANDED SERVICE IS RISING.

2. LARGE AMOUNTS OF CAPITAL ARE NEEDED TO EXPAND AND MODERNIZE THE TELECOMMUNICATIONS INFRASTRUCTURE OF DEVELOPING COUNTRIES.

3. TO MOBILIZE MORE CAPITAL FOR INVESTMENT, AN INCREASING NUMBER OF GOVERNMENTS ARE PRIVATIZING AND/OR LIBERALIZING THEIR TELECOM SECTOR.

4. AT THE SAME TIME, TECHNOLOGICAL CHANGES HAVE REDUCED CONSIDERABLY BARRIERS TO ENTRY. TELECOM PROJECTS WITH MODERATE CAPITAL REQUIREMENTS, IN BOTH URBAN AND RURAL AREAS, HAVE BECOME COMMERCIALLY VIABLE PROPOSITIONS.

WHAT ARE THESE OPPORTUNITIES

- -- LOCAL AND LONG DISTANCE TELEPHONE COMPANIES
- -- SATELLITE BUSINESS COMMUNICATIONS
- -- CELLULAR NETWORKS
- -- DATA PACKET SWITCHING
- -- VALUE ADDED SERVICES (ELECTRONIC MAIL; DATA BANK ACCESS; DATA PROCESSING)
- -- OTHERS

IFC MAIN LINES OF BUSINESS

IN THE TELECOMMUNICATIONS SECTOR

- MOBILIZING FUNDS (THROUGH SYNDICATED LOANS AND UNDERWRITINGS) FOR BASIC NETWORK OPERATORS, WHICH ARE PRIVATE OR ARE BEING PRIVATIZED

- HELPING STRUCTURE AND FINANCE PRIVATE SECTOR PROJECTS FOR THE PROVISION OF SPECIALIZED AND VALUE ADDED SERVICES.

- PROVIDING ADVISORY SERVICES TO PRIVATE AND JOINT-VENTURE OPERATORS ON MODERNIZATION, EXPANSION AND RESTRUCTURING PROGRAMS; AND TO GOVERNMENTS AND P.T.Ts ON PRIVATIZATION.

WHERE ARE THESE OPPORTUNITIES

- VARY FROM COUNTRY TO COUNTRY.

- SOME GOVERNMENTS HAVE **PRIVATIZED** THEIR EXISTING NETWORKS AND LIMITED THEIR ROLE TO REGULATION (e.g. LATIN AMERICA)

- OTHERS ARE PURSUING **MIDDLE OF THE ROAD SOLUTIONS**
  - -- BUILD, OWN AND TRANSFER ARRANGEMENTS (e.g. THAILAND)
  - -- PARTIAL PRIVATIZATION ("GOLDEN SHARE")
  - -- NEW FRANCHISES

NEW FRANCHISES

- AN INCREASINGLY "POPULAR" SOLUTION IN A LARGE NUMBER OF COUNTRIES WHETHER MAIN TELECOM CARRIERS ARE PRIVATE OR GOVERNMENT-OWNED.

- A FLEXIBLE SOLUTION

  CAN BE LIMITED TO ONE OR MORE GEOGRAPHICAL LOCATION(S); OR TYPE(S) OF SERVICE (e.g. CELLULAR, DATA TRANSMISSION)

- PROMOTE COMPETITION

  TARIFFS
  QUALITY OF SERVICE

- RELATIVELY EASY TO REGULATE

- PROVIDE OPPORTUNITIES FOR GOVERNMENTS TO SHARE IN PROFITS WHILE REDUCING NEED FOR PUBLIC SECTOR FUNDING

- ATTRACT INTEREST OF WIDE RANGE OF INVESTORS (DOMESTIC, FOREIGN)

A FEW EXAMPLES

BASIC NETWORK OPERATORS

1. COMPAÑIA DE TELEFONOS DE CHILE

2. PHILIPPINE LONG DISTANCE TELEPHONE COMPANY

CELLULAR PROJECTS

3. CEDETEL (MEXICO)

4. WESTEL (HUNGARY)

5. TELECEL (ZAIRE)

COMPAÑIA DE TELEFONOS DE CHILE

(CTC)

- IFC ASKED TO HELP FINANCE THE ***US$ 1.3 BILLION INVESTMENT PROGRAM*** OF CTC WHICH WAS PRIVATIZED IN 1988. IT IS OWNED BY TELEFONICA DE ESPAÑA (44%); OTHER FOREIGN INVESTORS (24%); AND LOCAL SHAREHOLDERS (32%).

- THE PROGRAM WAS TO

  -- INSTALL 685,000 NEW TELEPHONE LINES
  -- INCREASE DIGITALIZATION AND AUTOMATIC DIALING SERVICES
  -- INSTALL FIBER OPTIC AND SATELLITE LINKS FOR NATIONAL AND INTERNATIONAL LONG DISTANCE SERVICES, AND
  -- PROVIDE CELLULAR TELEPHONE SERVICE

- IFC PROVIDED CTC WITH US$ 193 MILLION IN LOANS, OF WHICH US$ 113 MILLION WAS FOR THE ACCOUNT OF INTERNATIONAL BANKS.

- IN ADDITION, IFC WAS A CO-LEAD MANAGER OF A PUBLIC ISSUE OF SHARES BY CTC, WHICH ATTRACTED WIDE PARTICIPATION BY FOREIGN INVESTORS (US$ 98 MILLION).

- OTHER FINANCING CAME FROM LOCAL BONDS (ABOUT US$ 300 MILLION); SUPPLIERS' CREDITS (ABOUT US$ 270 MILLION), AND CASH FLOW (US$ 300 MILLION).

PHILIPPINE LONG DISTANCE TELEPHONE COMPANY

(PLDT)

- PLDT IS THE PRINCIPAL VOICE CARRIER OF THE PHILIPPINES. (ABOUT 600,000 LINES; US$ 2,000 MILLION IN ASSETS).

- PLDT'S FINANCING IS QUITE DIVERSIFIED WITH SUBSTANTIAL FUNDING COMING FROM SHAREHOLDERS EQUITY (LOCAL AND FOREIGN); CASHFLOW; SUBSCRIBER INVESTMENT PLAN; CONVERTIBLE BONDS; EXPORT CREDITS; WORLD BANK, ETC.

- IFC HAS HELPED MEET PLDT'S FINANCIAL REQUIREMENTS SINCE 1969, WHEN IT MADE A LOAN WITH AN OPTION TO PURCHASE EQUITY OF US$ 4.5 MILLION.

- IN 1986, IFC PROVIDED A US$ 30 MILLION LOAN TO FINANCE THE COMPANY'S SHARE IN THE TRANSPACIFIC FIBER OPTIC CABLE, AND GRANTED A FURTHER US$ 24 MILLION LOAN FOR AN EXPANSION PROGRAM IN 1987.

- IN 1988, PLDT RETAINED IFC AS AN ADVISER TO PROVIDE GENERAL CORPORATE FINANCIAL ADVICE AND RAISE FINANCING FOR ITS FIFTH EXPANSION PROGRAM, THE MAIN OBJECTIVE OF WHICH WAS TO ADD 130,000 LINES.

- IN 1989, WE FOLLOWED UP WITH A SYNDICATED LOAN OF US$ 70 MILLION FOR PLDT.

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MEXICO: CELULAR DE TELEFONIA
(CEDETEL)

- CEDETEL, A JOINT VENTURE AMONG A MEXICAN AND A U.S./SWEDISH GROUP, WAS AWARDED A LICENSE TO OPERATE A CELLULAR TELEPHONE SERVICE IN NORTHEAST MEXICO, A MAJOR INDUSTRIAL AREA AND GATEWAY FOR MEXICO'S TRADE WITH NORTH AMERICA.

- IFC WORKED WITH CEDETEL TO DESIGN A FINANCIAL PLAN AND MOBILIZE FUNDS FOR ITS ***US$ 70 MILLION INVESTMENT PROGRAM***.

- WE PROVIDED US$ 14.5 MILLION OF IFC'S OWN FUNDS TO THE VENTURE IN THE FORM OF EQUITY AND AN INCOME PARTICIPATING LOAN, AND SYNDICATED AN ADDITIONAL US$ 37 MILLION IN LOANS FROM INTERNATIONAL COMMERCIAL BANKS.

- OTHER SOURCES OF FUNDS INCLUDED OTHER SHAREHOLDERS EQUITY AND CASH FLOW; SUPPLIERS' CREDIT.

HUNGARY: WESTEL

- WESTEL WAS HUNGARY'S FIRST MAJOR PRIVATIZATION INITIATIVE IN THE TELECOMMUNICATIONS SECTOR.

- A JOINT VENTURE BETWEEN U.S. WEST AND THE GOVERNMENT OWNED HUNGARIAN TELECOMMUNICATIONS COMPANY, WESTEL WAS AWARDED A CONCESSION TO PROVIDE NATIONWIDE CELLULAR SERVICES IN THE 450 MHz FREQUENCY BAND.

- WESTEL IS EXPECTED TO ACHIEVE A CAPACITY OF ABOUT 50,000 SUBSCRIBERS BY END-1993 AT AN ESTIMATED ***INVESTMENT COST OF US$ 80 MILLION***.

- IFC WORKED WITH WESTEL'S SHAREHOLDERS AND MANAGEMENT ON STRUCTURING THE PROJECT AND RAISING THE NECESSARY FINANCING.

- IFC PROVIDED A LOAN OF US$ 15 MILLION FOR ITS OWN ACCOUNT ALONG WITH A US$ 10 MILLION LOAN FROM THE EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT.

- OTHER FINANCING TO COME FROM CASH FLOW; SHAREHOLDERS' EQUITY; AND A SUBORDINATED LOAN BY A DOMESTIC INVESTMENT FUND.

ZAIRE TELECOMMUNICATIONS: CELLULAIRES (TELECEL)

- TELECEL IS A JOINT VENTURE AMONG ZAIRIAN, U.S., AND EUROPEAN INVESTORS.

- IT OWNS AND OPERATES A CELLULAR TELEPHONE SYSTEM IN ZAIRE, CURRENTLY THE COUNTRY'S MOST RELIABLE TELECOMMUNICATIONS NETWORK.

- IN 1991, IFC PROVIDED A US$6 MILLION INCOME PARTICIPATING LOAN TO TELECEL TO FINANCE AN EXPANSION PROGRAM TO RELIEVE THE CHRONIC CONGESTION OF THE PUBLIC TELEPHONE NETWORK AND PROVIDE, FOR THE FIRST TIME, INTER-CITY SERVICES WITHIN ZAIRE VIA SATELLITE. TOTAL PROJECT COST IS EXPECTED TO BE ON THE ORDER OF $15 MILLION.

- TELECEL IS EXPECTED TO HAVE ABOUT 7,500 SUBSCRIBERS BY 1995.

SOME OF THE LESSONS LEARNED

1. SOURCES OF FINANCING.

2. WHAT DO INVESTORS AND LENDERS WANT.

3. THE MAIN FEATURES OF A BANKABLE TELECOMMUNICATIONS PROJECT.

SOURCES OF FINANCING

- WILL VARY FROM ONE COUNTRY TO THE OTHER AND FROM ONE PROJECT TO THE OTHER.

- MIX AND AVAILABILITY OF FUNDING DEPENDS ON A NUMBER OF FACTORS, INCLUDING
  - -- COUNTRY MACROECONOMIC AND BUSINESS CONDITIONS
  - -- EXTENT OF LIBERALIZATION AND/OR PRIVATIZATION OF TELECOM SECTOR
  - -- STAGE OF DEVELOPMENT OF DOMESTIC CAPITAL MARKETS
  - -- SCOPE OF PROJECT (e.g. BASIC NETWORK VERSUS CELLULAR PROJECT)
  - -- TYPE OF PROJECT (NEW VERSUS EXPANSION/MODERNIZATION)

- INTERNALLY GENERATED CASH FLOW IS THE MOST IMPORTANT SINGLE SOURCE OF FINANCING FOR THE EXPANSION/MODERNIZATION OF EXISTING BASIC NETWORKS (50% +)

- EXTERNAL SOURCES OF FINANCING FOR TELECOM PROJECTS ARE:
  - -- DOMESTIC
  - -- FOREIGN
  - -- MULTILATERAL

DOMESTIC SOURCES OF FINANCING

- THEY INCLUDE:
  - -- LOCAL SPONSORS (CONTROLLING OR SUBSTANTIAL INTEREST)
  - -- SUBSCRIBERS
  - -- OTHER SHAREHOLDERS
  - -- BONDHOLDERS
  - -- COMMERCIAL BANKS
- LOCAL SPONSORS CAN PLAY A CRITICAL ROLE IN THE SUCCESS OF A TELECOM PROJECT

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FOREIGN SOURCES OF FINANCING

THEY INCLUDE:

- "STRATEGIC PARTNERS"
  (GENERALLY, TELECOM OPERATORS)
- INSTITUTIONAL AND OTHER INVESTORS
  (SHARES AND BONDS)
- EQUIPMENT SUPPLIERS
- EXPORT CREDIT AGENCIES
- COMMERCIAL BANKS
- NATIONAL AID ORGANIZATIONS

STRATEGIC PARTNERS ARE MORE THAN A SOURCE OF FUNDING. THEY ARE ABOVE ALL A SOURCE OF TECHNICAL, MARKETING AND BUSINESS EXPERTISE.

MULTILATERAL FINANCING

- WORLD BANK (WITH GOVERNMENT GUARANTEE)
- IFC (WITHOUT GOVERNMENT GUARANTEE)
- MIGA (INSURANCE TO FOREIGN INVESTORS)
- REGIONAL DEVELOPMENT BANKS
  (e.g. AFRICAN DEVELOPMENT BANK)

WHAT DO INVESTORS AND LENDERS WANT?

- DIFFERENT OBJECTIVES
  - -- CONTROL
  - -- SHARE IN UPSIDE POTENTIAL
  - -- FIXED BUT REASONABLY ASSURED RETURN
  - -- DEBT SERVICE
  - -- OTHER
- DIFFERENT RISK PROFILES:
  - -- OWNER/LENDER
  - -- FOREIGN/DOMESTIC
  - -- BONDHOLDERS/COMMERCIAL BANKS
- BUT SOME COMMON CONCERNS:
  - -- SCOPE AND DURATION OF LICENSE (MARKET)
  - -- STABILITY OF REGULATORY FRAMEWORK AND/OR STRONG CONTRACTUAL ARRANGEMENTS
    - . TARIFFS
    - . INTERCONNECTIONS
    - . TAXES AND REVENUE SHARING
  - -- ACCESS TO FOREIGN CURRENCY

MAIN FEATURES OF A BANKABLE TELECOMMUNICATIONS PROJECT

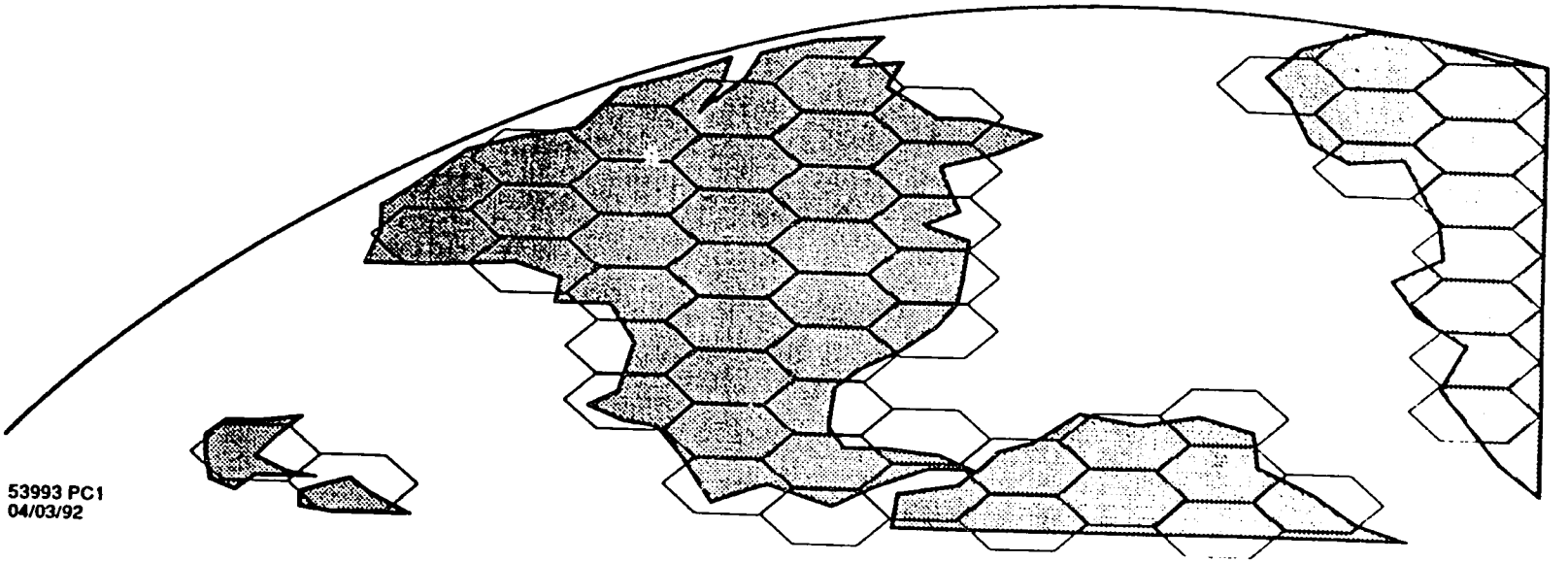
- A REASONABLY WELL DEFINED REGULATORY FRAMEWORK AND/OR STRONG CONTRACTUAL ARRANGEMENTS.
- GOOD MARKET PROSPECTS (EXCLUSIVITY?)
- A CLEAR LONG-TERM COMMITMENT FROM THE KEY SPONSORS.
- GOOD MANAGEMENT.
- REASONABLY PROVEN TECHNOLOGY AND STAGED NETWORK EXPANSION PLAN.
- WELL DEFINED INTERFACES WITH THE EXISTING NETWORK.
- A RISK EXPOSURE, WHICH IS BALANCED AMONG OPERATOR, INVESTORS AND LENDERS (FINANCIAL STRUCTURE; COMPLETION ARRANGEMENTS).
- MEANS OF ACESS TO FOREIGN CURRENCY.

Expanding Telecom Services: Serving Rural Needs through Cellular Networks and Satellite Systems

by: *Andrew Werth, President, Hughes Network Systems International*

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

GMH 2000™ SYSTEM DESCRIPTION



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CTIA'S UPR AND THE GMH 2000™

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

Parameter	Objectives	IS-54 (Full Rate)	GMH 2000
Capacity	10 times the capacity of AMPS	3 times AMPS capacity	10 times AMPS capacity, more than 16 times the traffic capacity
Cost	Significantly reduce fixed costs	Moderate cost reduction	Significantly reduced cost per subscriber
Service Quality	Equal to or better than AMPS; robustness to fading and interference	Achieved through 8-kbps voice coder and TDMA	Voice quality equal to IS-54 full rate. Frequency hopping of E-TDMA™ reduces RF fades
Transition	Dual-mode equipment for interoperability	Achieved through IS-54 dual-mode standard	Smooth migration from AMPS to IS-54 to E-TDMA; multimode channel units for flexibility
Advanced Features	Messaging, encryption, information services	Vendor-dependent	Fully featured system
Cellular Open Network Architecture (C-ONA)	Multivendor support through standards	Only on air interface	Actively promoting E-TDMA within TIA standards committees; GSM A-Interface between MSC and BSC
Technical Risk Minimization	Minimize learning curve, time to market, and technological barriers	TDMA is proven technology; working now	TDMA and DSI are well-proven and widely used technologies

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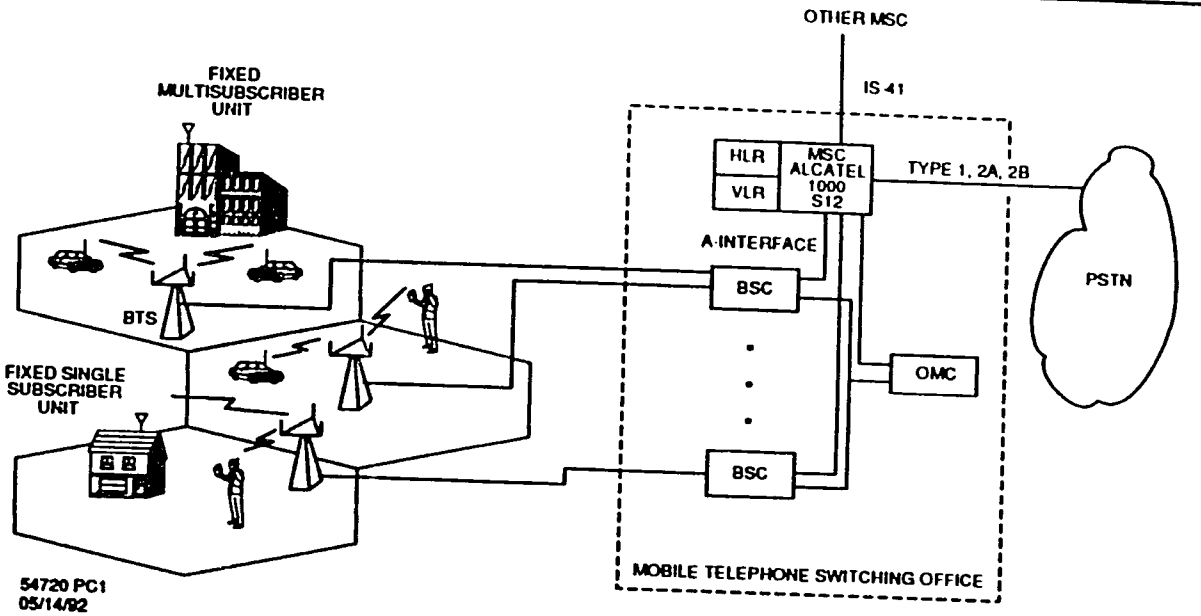
GMH 2000™ WIRELESS TELEPHONY ARCHITECTURE

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



Subsystem

SU:	Subscriber Station (mobile or fixed)
BTS:	Base Transceiver Station
BSC:	Base Station Controller
MSC:	(Mobile) Switching Center
HLR:	Home Location Register
VLR:	Visitor Location Register
OMC:	Operations and Maintenance Center
PSTN:	Public Switched Telephone Network

Interface

IS-553, IS-54, E-TDMA™ to BTS
T1 or E1 to BSC; IS-553, IS-54, or E-TDMA to SU
T1 or E1 to BTS, A-Interface to MSC
A-Interface to BSC; Type 1, 2A, or 2B to PSTN
Integrated with MSC
Integrated with MSC

Type 1, 2A, or 2B

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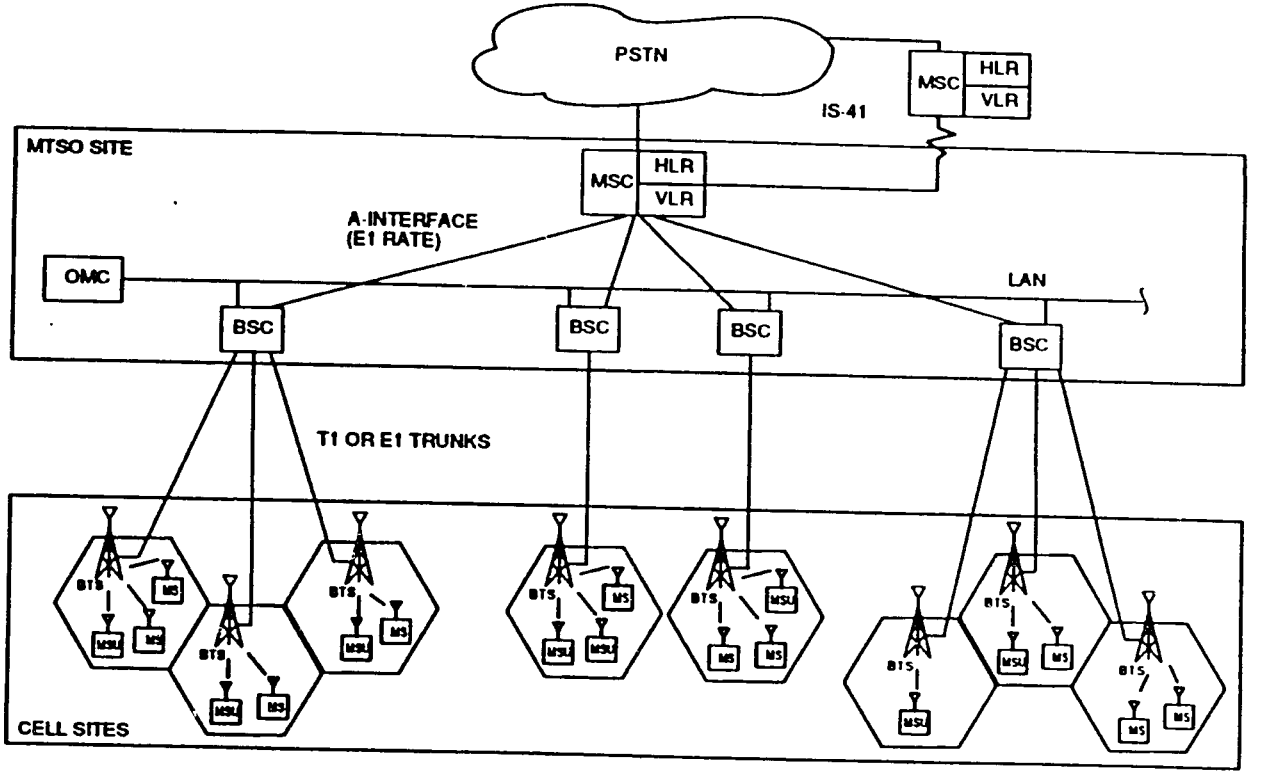
GMH 2000™ SYSTEM HIERARCHY

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



MSC: MOBILE SWITCHING CENTER
HLR: HOME LOCATION REGISTER
VLR: VISITOR LOCATION REGISTER
OMC: OPERATIONS AND MAINTENANCE CENTER
BSC: BASE STATION CONTROLLER
BTS: BASE TRANSCEIVER STATION
MS: MOBILE STATION
MSU: FIXED MULTISUBSCRIBER UNIT
MTSO: MOBILE TELEPHONE SWITCHING OFFICE

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MAJOR CELLULAR STANDARDS SUPPORTED BY GMH 2000™

NETWORK SY
Subsidiary of
Hughes Aircraft Company

- EIA/TIA 553, TIA IS-19, -20 — AMPS
- TIA IS-54, -55, -56 — Dual-mode air interfaces
- TIA IS-41 — Intersystem operation
- Compatible with EDS Personal Communications and GTE/TSI — Authentication systems

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KEY FEATURES OF THE GMH 2000™ RADIO SUBSYSTEM

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Multimode transceiver
- Support for different transmission standards and data
- Remote control and diagnostics
- Frequency agility
- Supports high capacity mode (E-TDMA™)
- Compact size encourages evolution to microcells

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KEY FEATURES OF GMH 2000™ SWITCH

NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

- Based on Alcatel 1000 S12
- Class 4 switch with class 5 functionality
- Smooth expansion
- Distributed architecture for reliability
- Rich functionality
- Composed of a small number of hardware module types

BEST AVAILABLE DOCUMENT

KEY FEATURES OF THE GMH 2000™ OPERATION AND MAINTENANCE SYSTEM

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Centralized operation and reconfiguration of all radios
- Sophisticated fault isolation capabilities
- Intelligent user interface
- Distributed database

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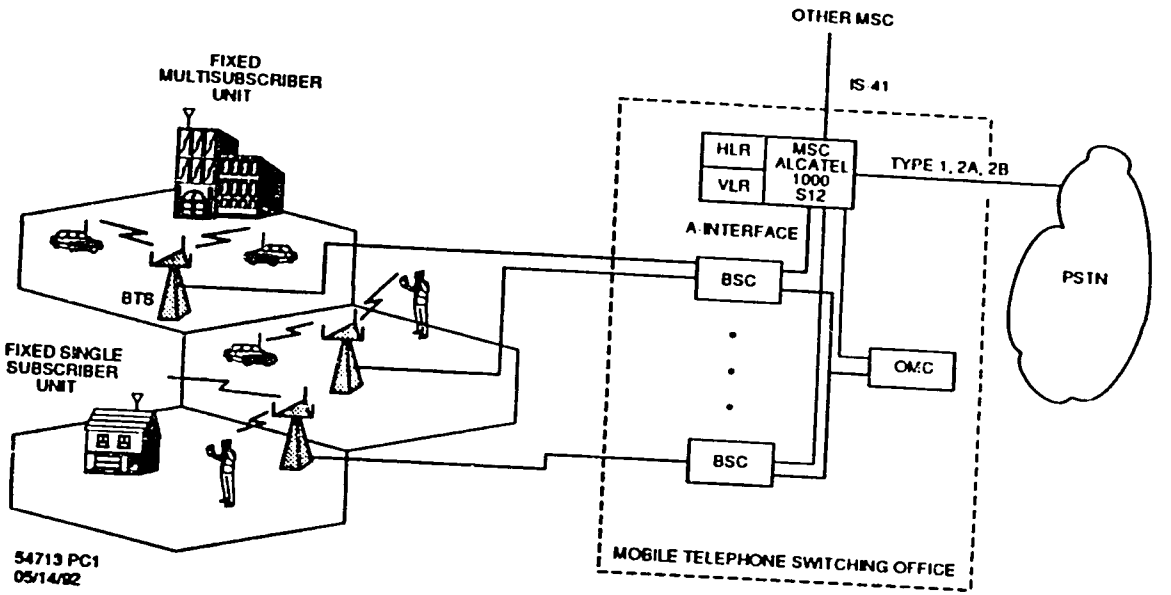
GMH 2000™ BTS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



Subsystem

SU: Subscriber Station
BTS: Base Transceiver Station
BSC: Base Station Controller
MSC: (Mobile) Switching Center
HLR: Home Location Register
VLR: Visitor Location Register
OMC: Operations and Maintenance Center
PSTN: Public Switched Telephone Network

Interface

IS-553, IS-54, E-TDMA™ to BTS
T1 or E1 to BSC; IS-553, IS-54, or E-TDMA to SU
T1 or E1 to BTS, A-Interface to MSC
A-Interface to BSC; Type 1, 2A, or 2B to PSTN
Integrated with MSC
Integrated with MSC

Type 1, 2A, or 2B

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BTS FEATURES

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Supports an omni cell or a single sector of a sectorized cell
- Diversity-receive antennas
- Single channel or multichannel amplifier options
- Autotuning transmit channel combiners
- Common transceiver architecture
  - Software configured for any transmission mode
  - DSP processing based upon transmission mode
  - Building block modules
  - Multichannel capability

Note: Each BTS supports one transmit antenna

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BTS MAINTENANCE FEATURES

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Downloading of all control software and DSP firmware into microprocessors/DSPs to permit maximum flexibility and future growth
- Monitor and control allows centralized control over each channel
  - Power level
  - Frequency assignments
  - Transmission mode
  - Fault isolation
  - In-service/out-of-service/maintenance
  - Status/statistics
- Local monitor and control terminal
- Multiple loopback options for fault isolation
- Automatic redundancy control and alarm reporting for all components

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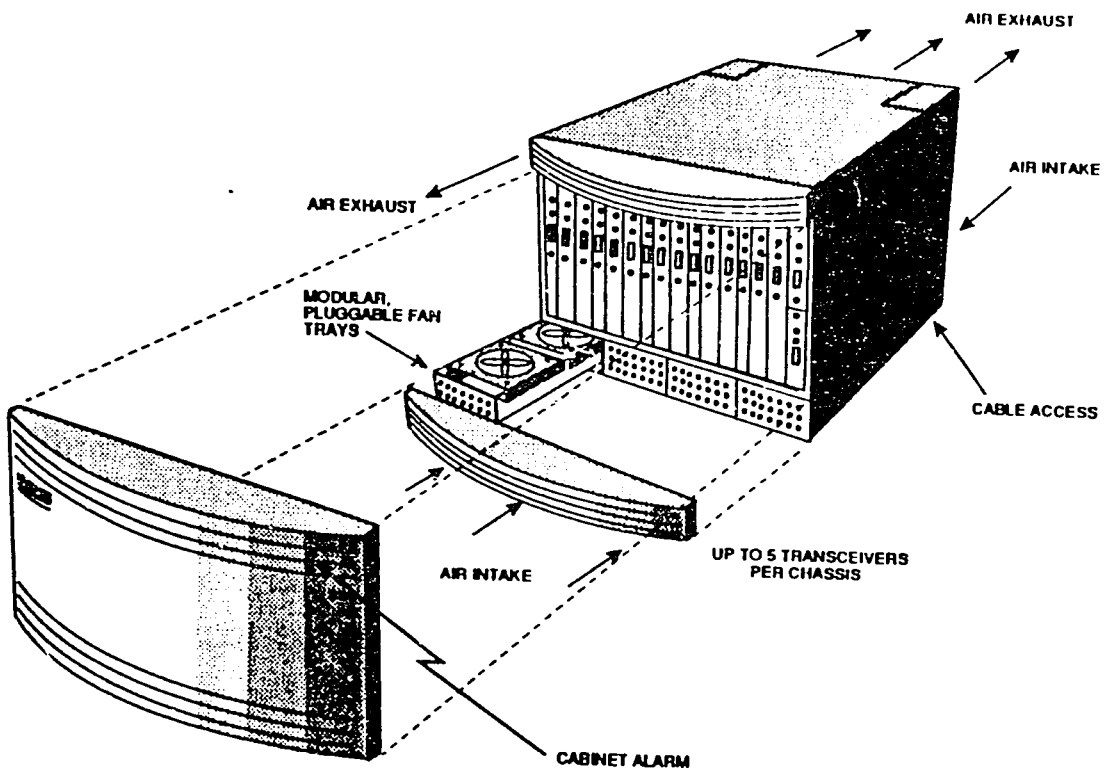
BTS TRANSCEIVER CHASSIS

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company



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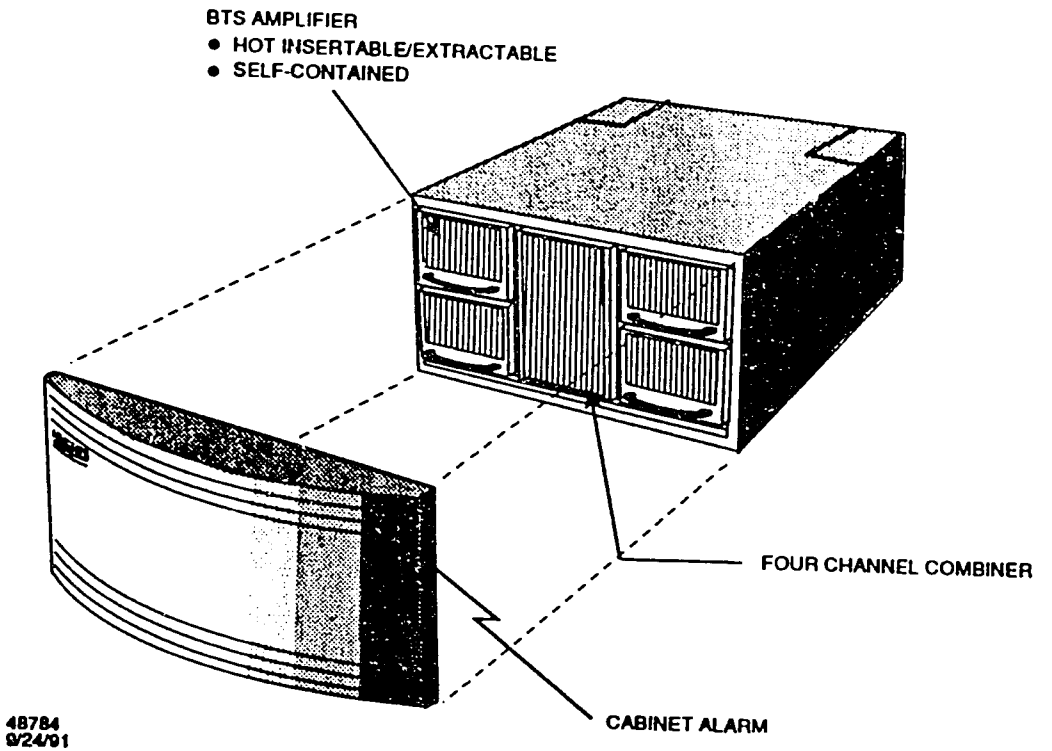
Dimensions: 26" h x 20" d x 22" w

BTS CHASSIS AMPLIFIER/COMBINER



Dimensions: 19" h x 20" d x 22" w

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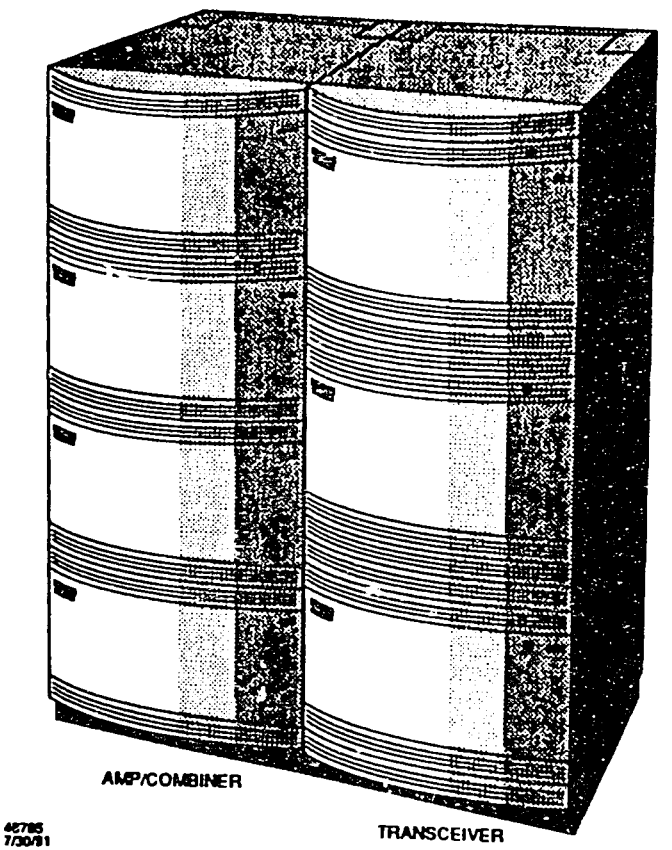
STACKED BTS CONFIGURATION

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



- **Amplifier/combiner:**
  78" h x 20" d x 22" w
- **Transceiver:**
  78" h x 20" d x 22" w

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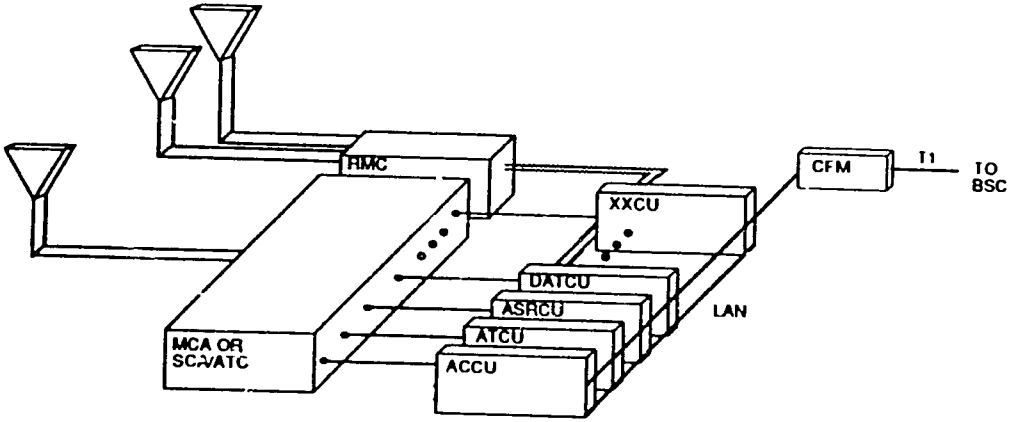
BTS ARCHITECTURE



ACCU (ANALOG CONTROL CHANNEL UNIT)
DATCU (DUAL ANALOG TRAFFIC CHANNEL UNIT)
ASRCU (ANALOG SCANNING RECEIVE CHANNEL UNIT)
DTCU (DIGITAL TRAFFIC CHANNEL UNIT)
CFM (COMMON FUNCTIONS MODULE)
MCA (MULTI-CHANNEL AMPLIFIER)
SCA/ATC (SINGLE CHANNEL AMPLIFIER/AUTO TUNE COMBINER)
RMC (RECEIVER MULTICOUPLER)

- Same transceiver hardware for all functions (AMPS: TC, ACCU, SR; IS-54: FRTC, HRTC, DSI, and DSR)
- DSP functionality, downloaded
- Multiple RF channels per transceiver
- RF all self-tuning
- Only three hardware types per transceiver
- T1 Interface (DS0 per RF channel)

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TRANSCEIVER CONFIGURATION

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

MODULES

MDM	• MODULATOR DOWNCONVERTER MODULE • 2 CHANNELS RF A/D
DEM	• DEMODULATOR • FLOATING POINT DSPs
SPM	• SLOT PROCESSOR MODULE • FIXED POINT DSPs CONTROL PROCESSOR

MAXIMUM LOADING* (RF CHANNELS)

	FM AMPS	FR TDMA	E-TDMA	SR	ACCU
MDM SPM	2	-	-	1	1
MDM MDM SPM	4	-	-	1	1
MDM DEM SPM	2	2	1	1	1

*FOA ONLY. FURTHER LOAD INCREASES POSSIBLE AFTER FIRMWARE OPTIMIZATION.

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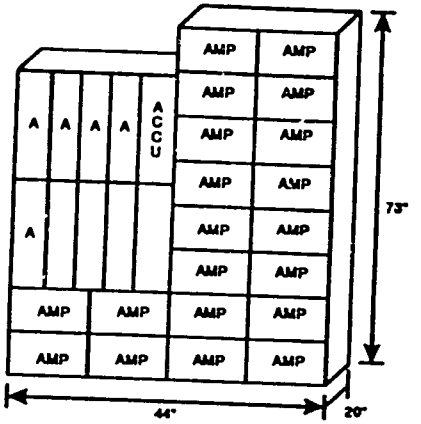
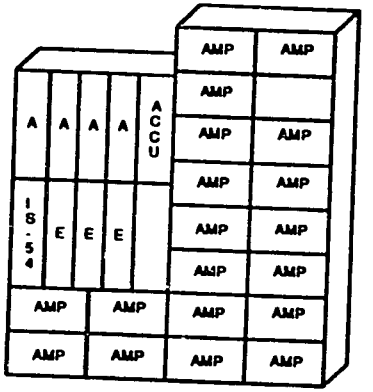
SAMPLE BTS CONFIGURATIONS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



	RF Channel	Capacity (Subs.)	Footprint	Volume
AMPS	19	475		
FR TDMA	0	0		
E-TDMA™	0	0		
Control	1	0		
Total	20	475	6.1 ft²	38.7 ft³



AMPS	13	325		
FR TDMA	2	150		
E-TDMA	3	950		
Control	1	0		
Total	19	1425	6.1 ft²	38.7 ft³

A: AMPS channel unit
E: TDMA or E-TDMA channel unit
ACCU: Analog control channel unit
AMP: RF amplifier

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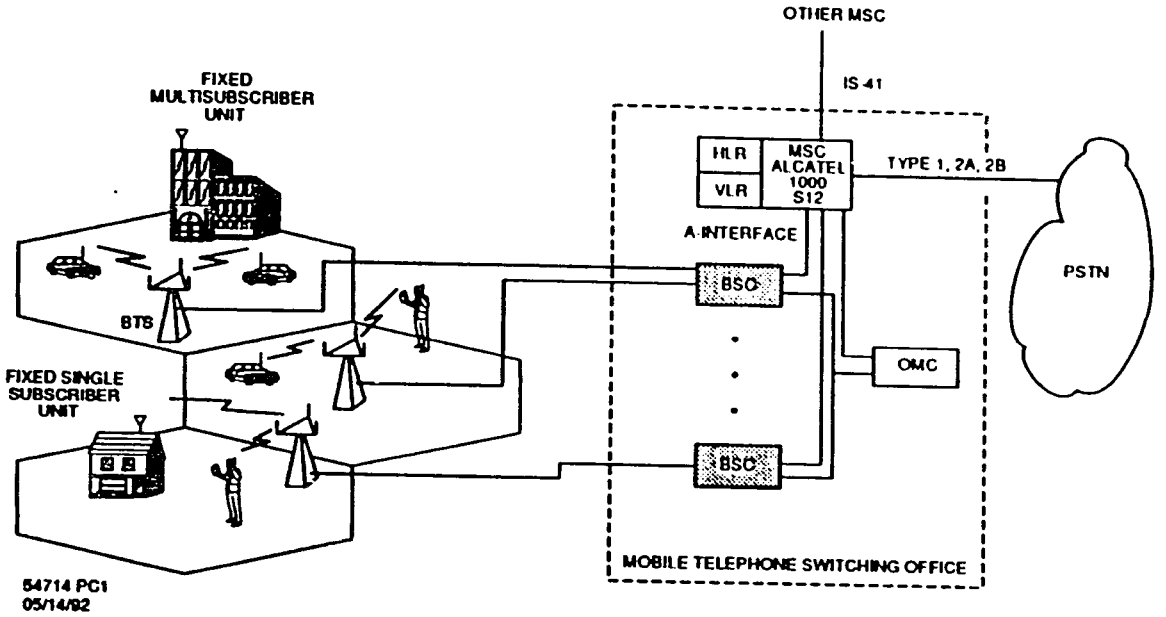
GMH 2000™ BSC

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



Subsystem

SU:	Subscriber Station
BTS:	Base Transceiver Station
BSC:	Base Station Controller
MSC:	(Mobile) Switching Center
HLR:	Home Location Register
VLR:	Visitor Location Register
OMC:	Operations and Maintenance Center
PSTN:	Public Switched Telephone Network

Interface

IS-553, IS-54, E-TDMA™ to BTS
T1 or E1 to BSC; IS-553, IS-54, or E-TDMA to SU
T1 or E1 to BTS, A-Interface to MSC
A-interface to BSC; Type 1, 2A, or 2B to PSTN
Integrated with MSC
Integrated with MSC

Type 1, 2A, or 2B

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BSC FUNCTIONALITY

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Voice coding for digital modes
- Air interface protocols (call control)
- Handoff processing (call quality monitoring)
- Interface to BTS, MSC, and OMC
- Capacity up to 240 active calls
- Isolates the switch from changes in radio modes (e.g., analog, digital, microcell)

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BSC COMPONENTS

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

- Switching Transcoder Module (STM)
  - Call switching
  - Voice coding
- Control processor module
  - Three software builds:
    - Call Control (CCP)
    - Global Resource (GRP)
    - Channel Assignment (CAP)
  - Uses RISC processor

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STM FUNCTIONS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Transcoding
  - Compresses PCM frames into mobile station slots
  - Decompresses mobile station slots to PCM frames
- Switching
  - Under control of CAP, switch any call to any slot
- Voice activity detection evaluated each slot
- Comfort noise generation
- Voice energy level evaluation
  - Redundant deallocation criteria
- Rate adaptation for data

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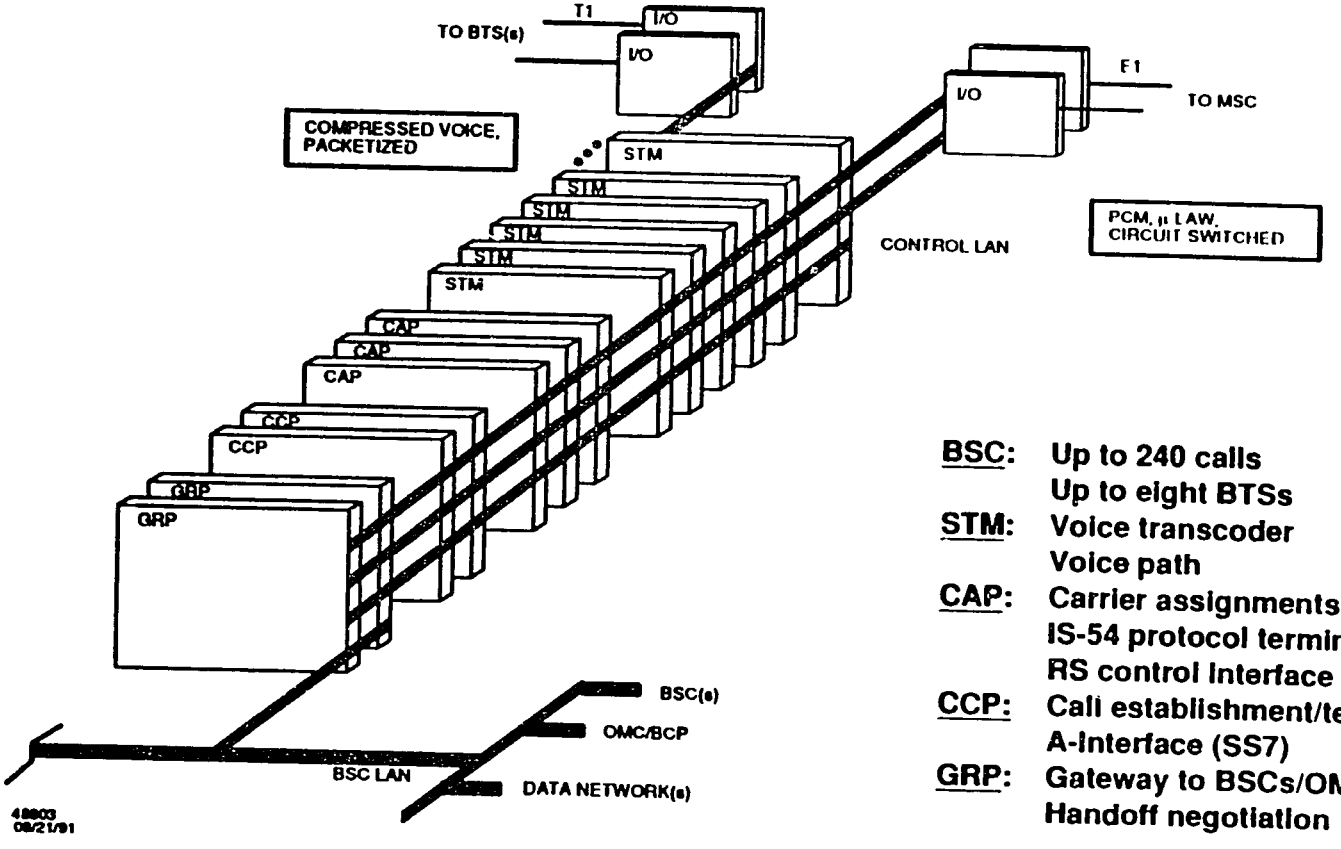
BSC HARDWARE ARCHITECTURE

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



BSC: Up to 240 calls
Up to eight BTSs

STM: Voice transcoder
Voice path

CAP: Carrier assignments
IS-54 protocol termination
RS control interface

CCP: Call establishment/termination
A-interface (SS7)

GRP: Gateway to BSCs/OMC
Handoff negotiation

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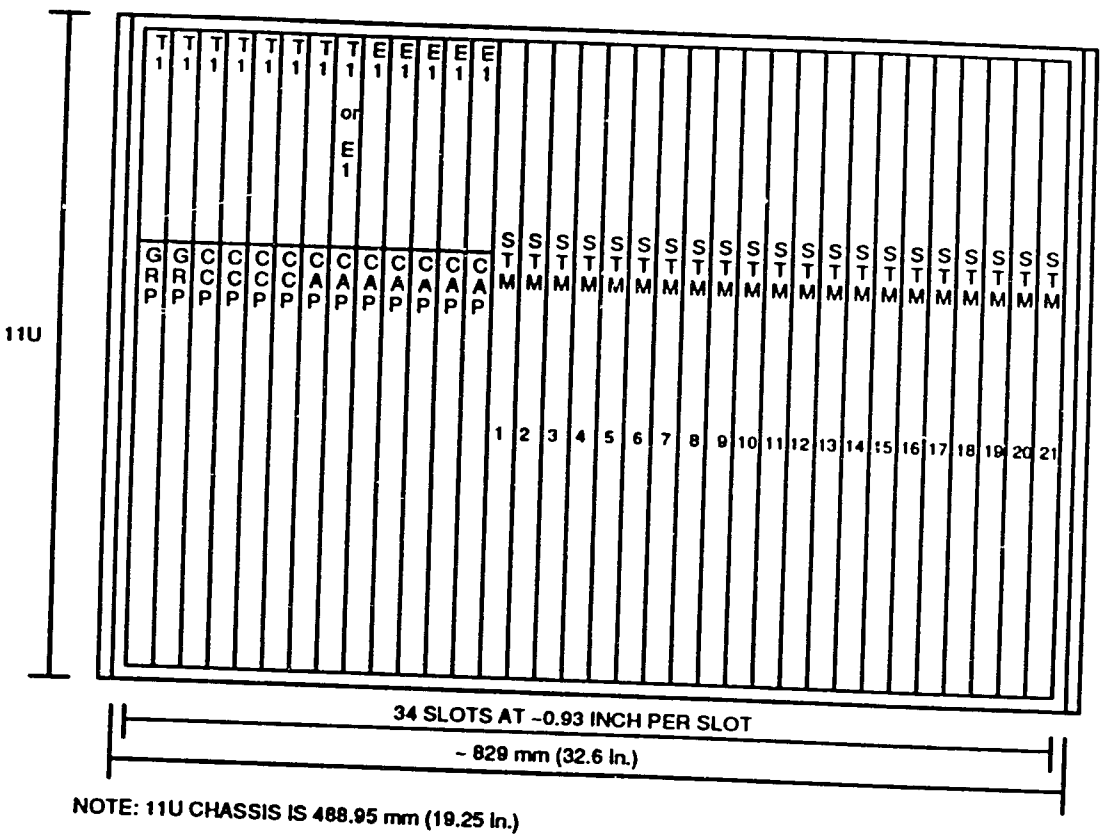
BSS CHASSIS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



NOTE: 11U CHASSIS IS 488.95 mm (19.25 in.)

GRP: Global resources processor
CCP: Call control processor
CAP: Channel assignment processor
STP: Switching transcoder module

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BSC - RACK CONFIGURATION

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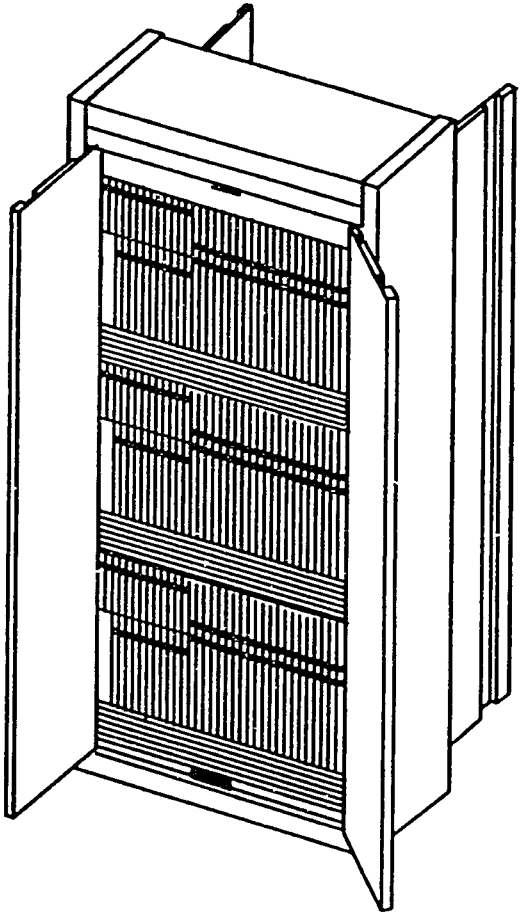
Hughes Aircraft Company



- Three BSCs per rack
- 87 in. x 36 in. x 18 in.

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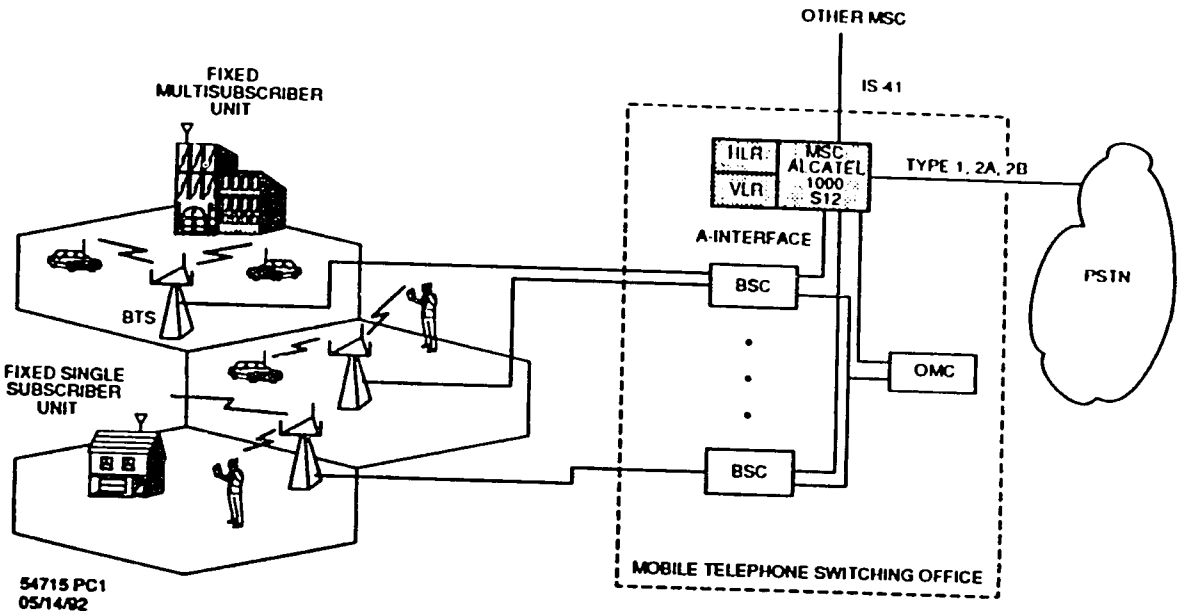
GMH 2000™ MSC

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



Subsystem

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T1 or E1 to BSC; IS-553, IS-54, or E-TDMA to SU
T1 or E1 to BTS, A-Interface to MSC
A-Interface to BSC; Type 1, 2A, or 2B to PSTN
Integrated with MSC
Integrated with MSC

Type 1, 2A, or 2B

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MSC/VLR BASIC CONSIDERATIONS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

The Alcatel Road Map

ALCATEL 1000 S12 IDBN-SWITCH

⇓

ALCATEL SYSTEM 900 MSC/VLR (GSM)

⇓

GMH 2000™ MSC/VLR (AMPS)

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GMH 2000™/MSC: ALCATEL 1000 S12 ADVANTAGES

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- *Superior reliability and system availability:* No total exchange outage in over 10 years' operation in 3,700 exchanges worldwide
- *Superior overload survivability:* Even at the normal engineered level, system overload tolerance approaches 100%. This enhanced survivability ensures uninterrupted service of high capacity cellular installations that will carry more traffic under overload situations than those with smaller groups of channels
- *Adaptability to ISDN and cellular intersystem signaling:* Alcatel 1000 S12 is already proven in delivering ISDN services over the public network, and supports end-to-end digital transmission. In addition, IS-41 (intersystem signaling) will be supported
- *Superior call-processing power:* The open-ended call-processing architecture allows for the incremental addition of processing power matched to the growth of traffic or feature additions

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GMH 2000™/MSC: ALCATEL 1000 S12 ADVANTAGES (Cont.)

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- *Superior operations and maintenance capabilities:* Use of fewer than 40 module types results in lower costs for spares, training, and documentation
- *Economic operation:* Critical processors operate in redundant, hot-standby mode and spares can be connected to the network. In case of failure, a spare will automatically take over, the system will return to normal, and a technician can correct the malfunction during normal business hours (avoiding expensive night or weekend calls)
- *Open network architecture:* A standard open interface (A-Interface) is used for connecting with a radio subsystem, allowing an easy evolution toward a wide range of wireless communications services

PERFORMANCE FIGURES MSC/HLR/VLR

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

Trunks (2 Mbps - 1.5 Mbps interfaces[2])	460 (>1000[1])
SS7 links	256
Equivalent BHCA (EBHCA)[3]	250,000 (>1,000,000[1])
Mobile subscribers (VLR function)	250,000
Home location register	25,000 to 250,000
Visitor location register	25,000 to 250,000
Equipment identity register	100,000 to 500,000[4]
IWF (for one 64-kbps channel each)	1380
MMC-interfaces	20 x V.24
Rack-count (including Magtape)	5-40
Interface protocols	SS7 with BSSAP IS-41 R1 (1, 2A, 2B) R2

Notes:

1. Values for Public Telephone /ISDN switching systems
2. E1 and T1 trunks
3. EBHCA because of additional load (e.g., roaming) compared to wireline exchange BHCA
4. Optional

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BASIC CHARACTERISTICS OF ALCATEL 1000 S12

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

Hardware

- Fully distributed multi-microprocessor control architecture (no common bus)
- Interconnection of processors through switching network (up to 2,000 processors)
- Same switching network used for user channel switching
- Switching network with built-in path search, no map-in memory
- Only two types of processor boards, highly common, with and without peripheral board access
- No limitation in redundancy schemes

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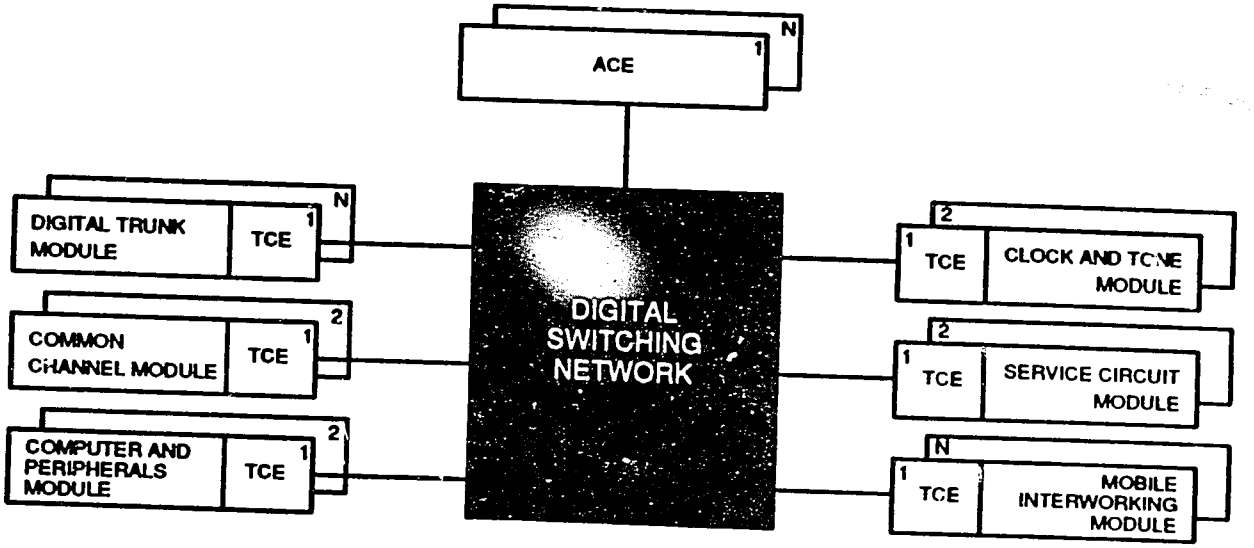
MSC/VLR HARDWARE ARCHITECTURE

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



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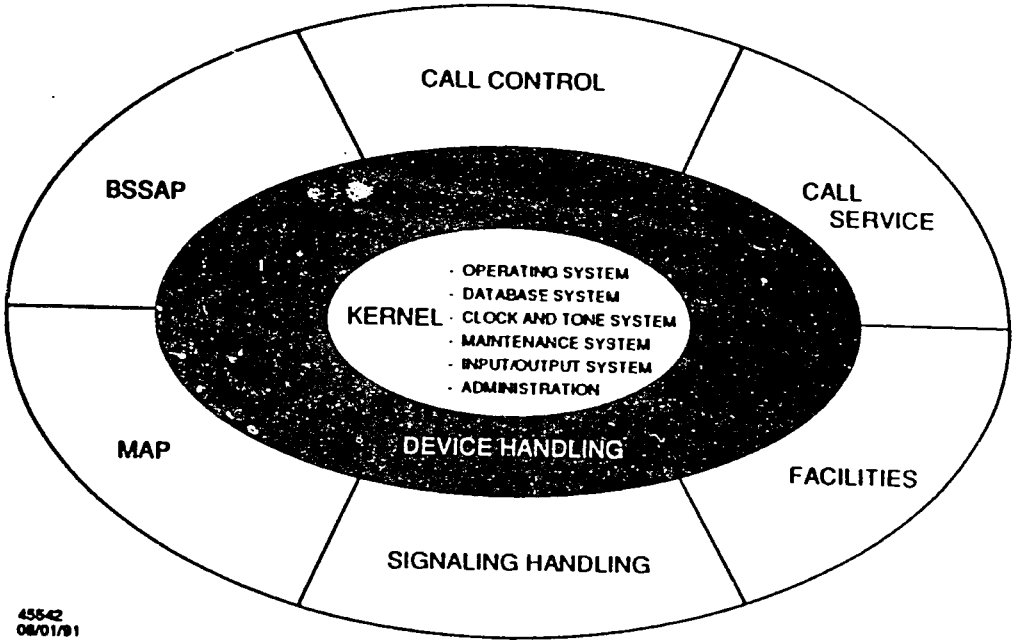
BASIC CHARACTERISTICS OF S12 SOFTWARE

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

Software

- High level programming language (CHILL)
- Virtual machine concept
- Finite Message Machine (FMM)/System Support Machine (SSM) concept
- Communication between modules through messages only
- Layered and structured software model

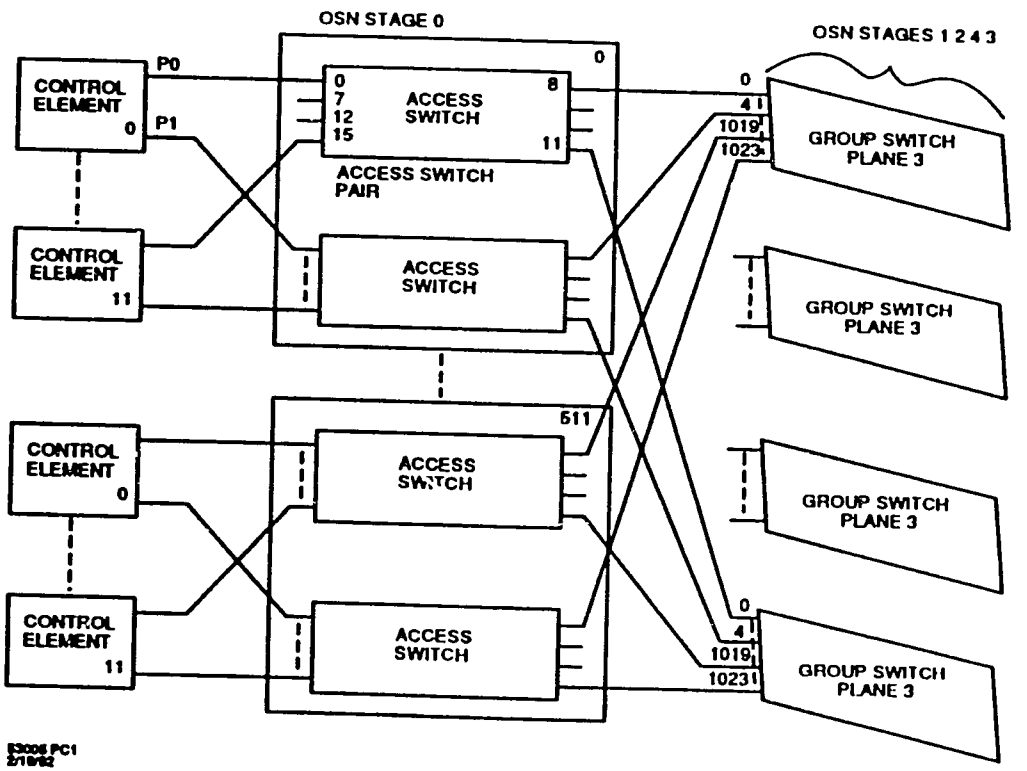


45542
08/01/91

DIGITAL SWITCHING NETWORK STRUCTURE

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

Overall Structure



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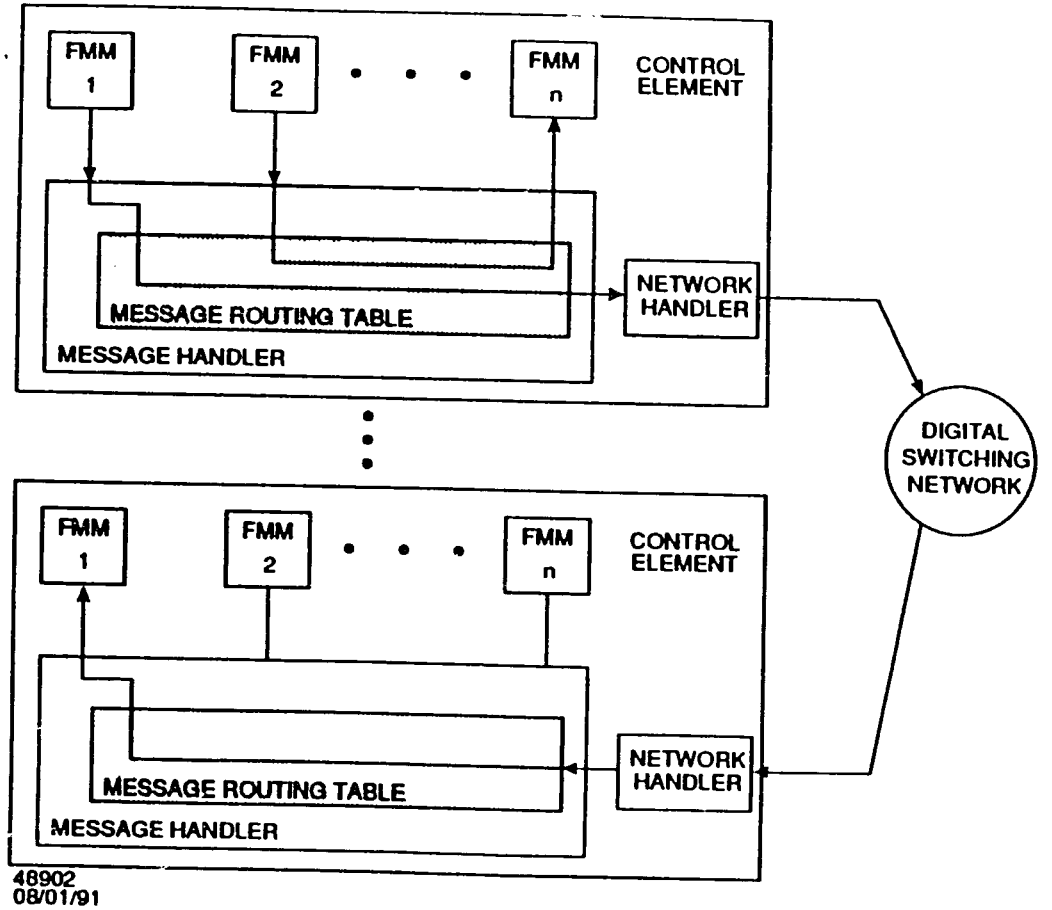
MSC/VLR SOFTWARE - FMM CONCEPT

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



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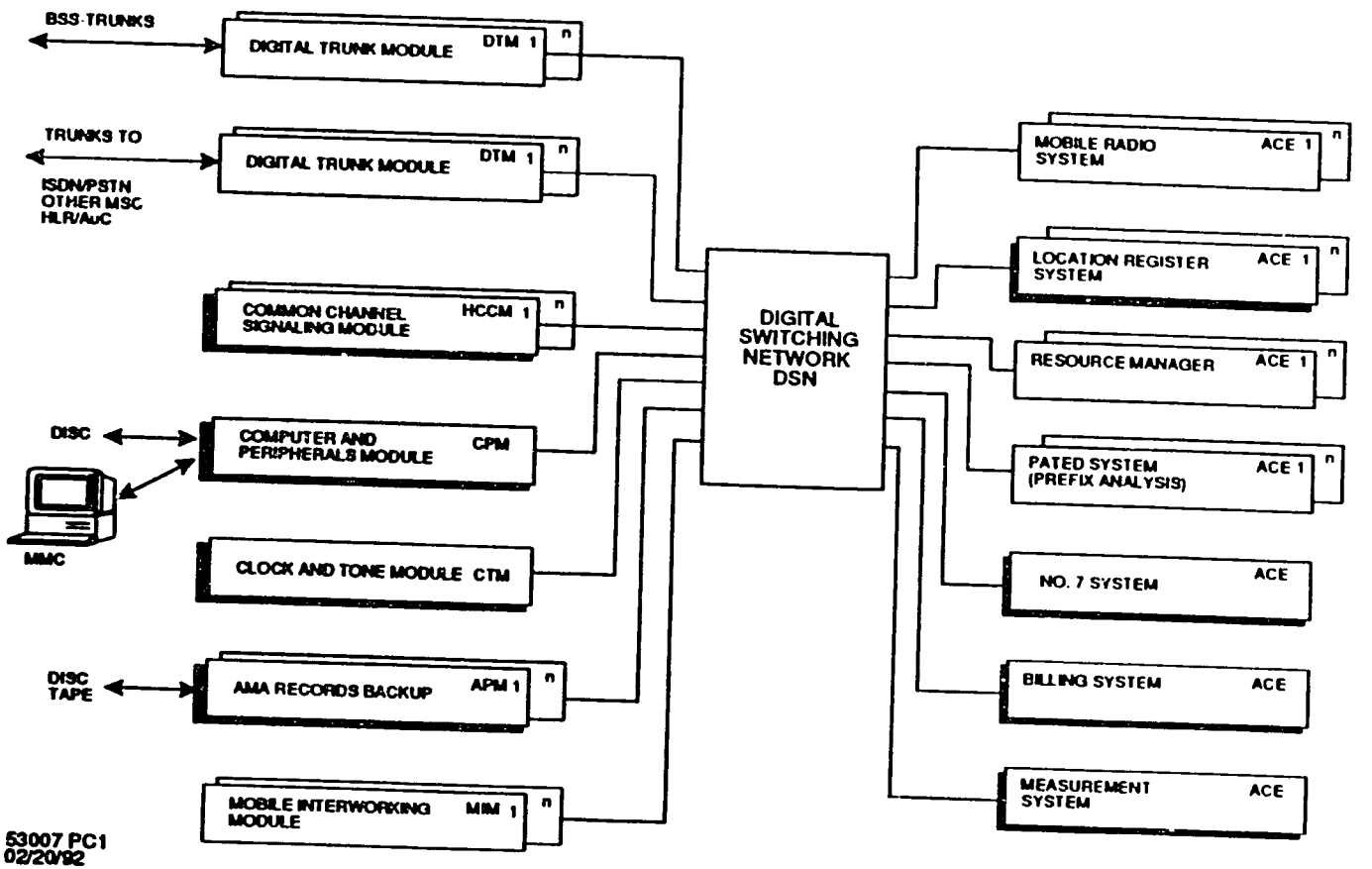
08/01/91

MSC/VLR SOFTWARE FUNCTIONAL BLOCKS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



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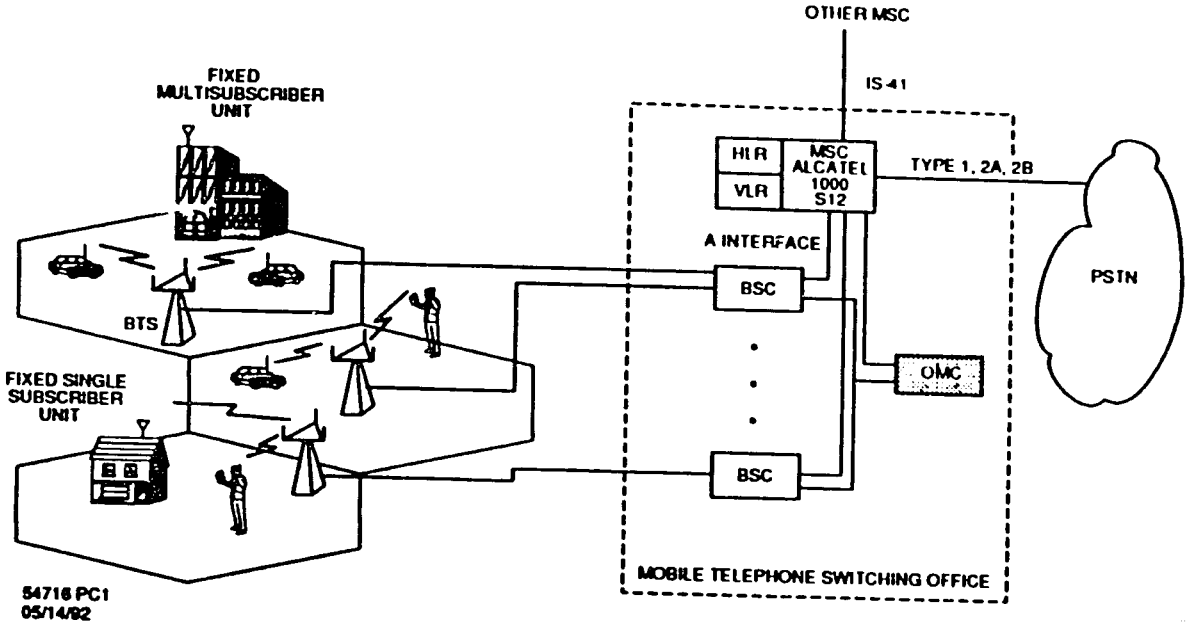
268

GMH 2000™ OMC

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



Subsystem

SU:	Subscriber Station
BTS:	Base Transceiver Station
BSC:	Base Station Controller
MSC:	(Mobile) Switching Center
HLR:	Home Location Register
VLR:	Visitor Location Register
OMC:	Operations and Maintenance Center
PSTN:	Public Switched Telephone Network

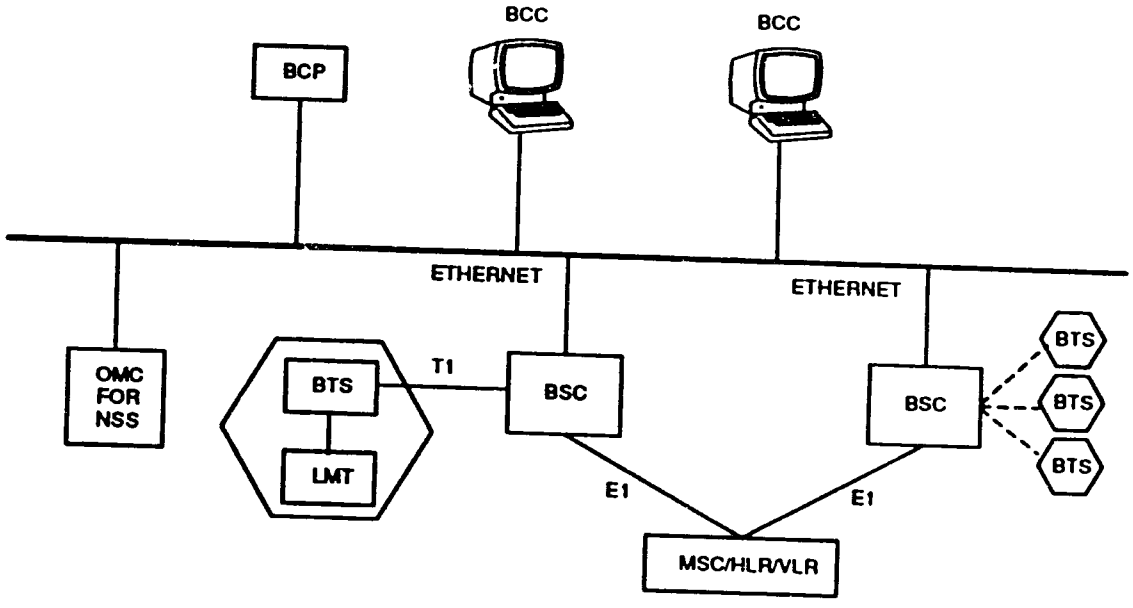
Interface

IS-553, IS-54, E-TDMA™ to BTS
T1 or E1 to BSC; IS-553, IS-54, or E-TDMA to SU
T1 or E1 to BTS, A-Interface to MSC
A-Interface to BSC; Type 1, 2A, or 2B to PSTN
Integrated with MSC
Integrated with MSC

Type 1, 2A, or 2B

BTS OMC ARCHITECTURE

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



BCP: BSS CONTROL PROCESSOR
BCC: BSS CONTROL CONSOLE
LMT: LOCAL MAINTENANCE TERMINAL

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04/03/92

NETWORK OPERATOR INTERFACES

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Local and remote operator access
- Graphical user interface
  - Window and graphics oriented interface for system configuration, monitoring, and control
  - X Window and MOTIF-based
- Command line interface
  - An asynchronous terminal interface
  - Used for remote dial-in or local maintenance
- Access restrictions
  - Name and password
  - Operator type

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LOCAL MAINTENANCE TERMINAL

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

- Installation management software to assist a field technician for a cell site installation
- Capability to load diagnostics software into a transceiver
- Cell site alarms locally displayed
- Capability to log into BCP
- Located at cell site

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LOCAL MAINTENANCE TERMINAL (Cont.)

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

- Located at cell site
- Installation management software for cell site installation
- Capability to load diagnostics software into a transceiver
- Cell site alarms locally displayed
- Capability to log into BCP

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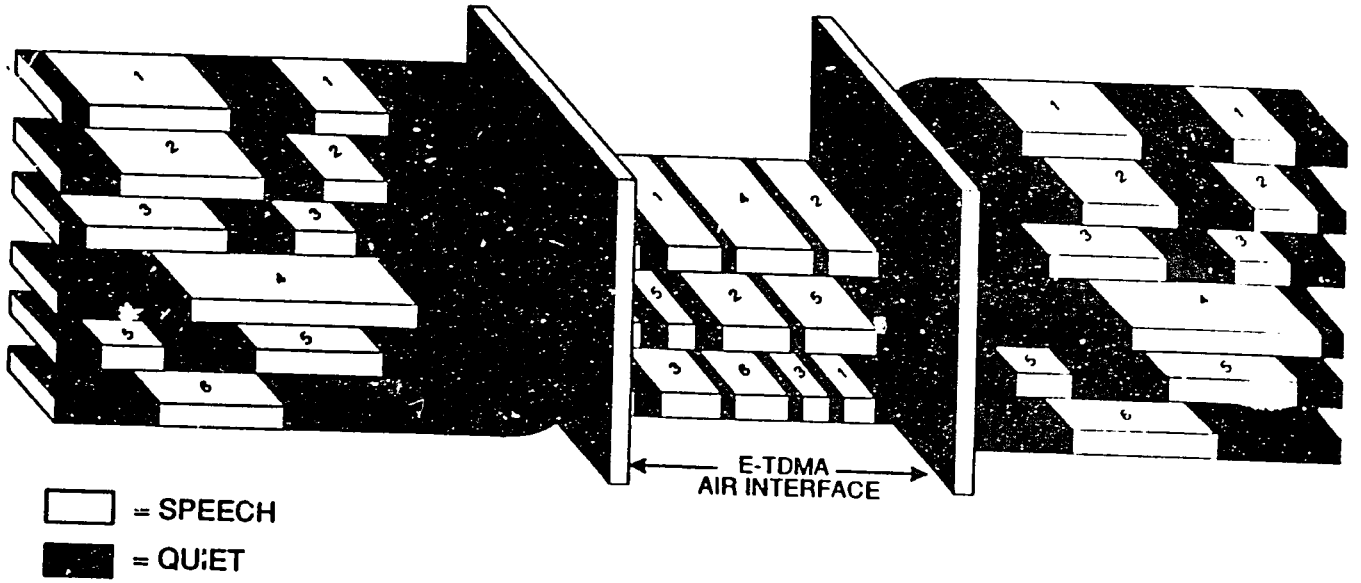
GEOGRAPHIC MAP

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

- Geographic display of cell sites
- Allows "zooming"
- Provides color-coded display of each cell site location according to operator-selected filter (i.e., intruder alarms, environmental alarms, component failures)
- Operator can "click" on site to display graphical representation of site hardware and states. Further selection will open relevant configuration or detailed status BCC screens
- Color-coding based on traffic load and other parameters

E-TDMA™ OVERVIEW

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company



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E-TDMA™ OBJECTIVES

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

- To satisfy the needs of the next-generation mobile cellular systems
- To provide a high-capacity air interface necessary for emerging value-added services
- To provide a leap forward in wireless telephony

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E-TDMA™ CHARACTERISTICS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- E-TDMA adds the following *extensions* to IS-54 TDMA:
  1. Half rate coding (already a part of IS-54 structure)
  2. Digital Speech Interpolation (DSI)
  3. Channel pools

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IS-54 TDMA FRAME FORMATS AND VOICE CODING

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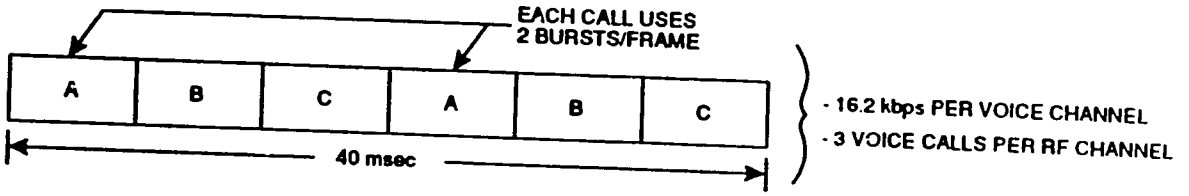
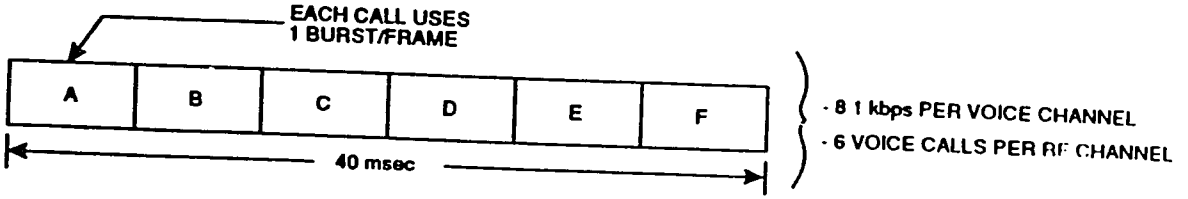
Subsidiary of Hughes Aircraft Company

- 48.6 kbps per channel, $\pi/4$ DQPSK modulation
- 25 frames per second (40 msec per frame)

PRESENT (REV. A)
FULL RATE
(8 kbps SPEECH CODING)
3 CALLS PER CHANNEL



FUTURE (92-93)
HALF RATE
(4.5 kbps SPEECH CODING)
6 CALLS PER CHANNEL



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DIGITAL SPEECH INTERPOLATION (DSI)

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NETWORK SYSTEMS
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To implement DSI in a cellular environment:

- The mobile is assigned an air channel only when voice is being transmitted
- This technique is applied in both directions (forward and reverse)

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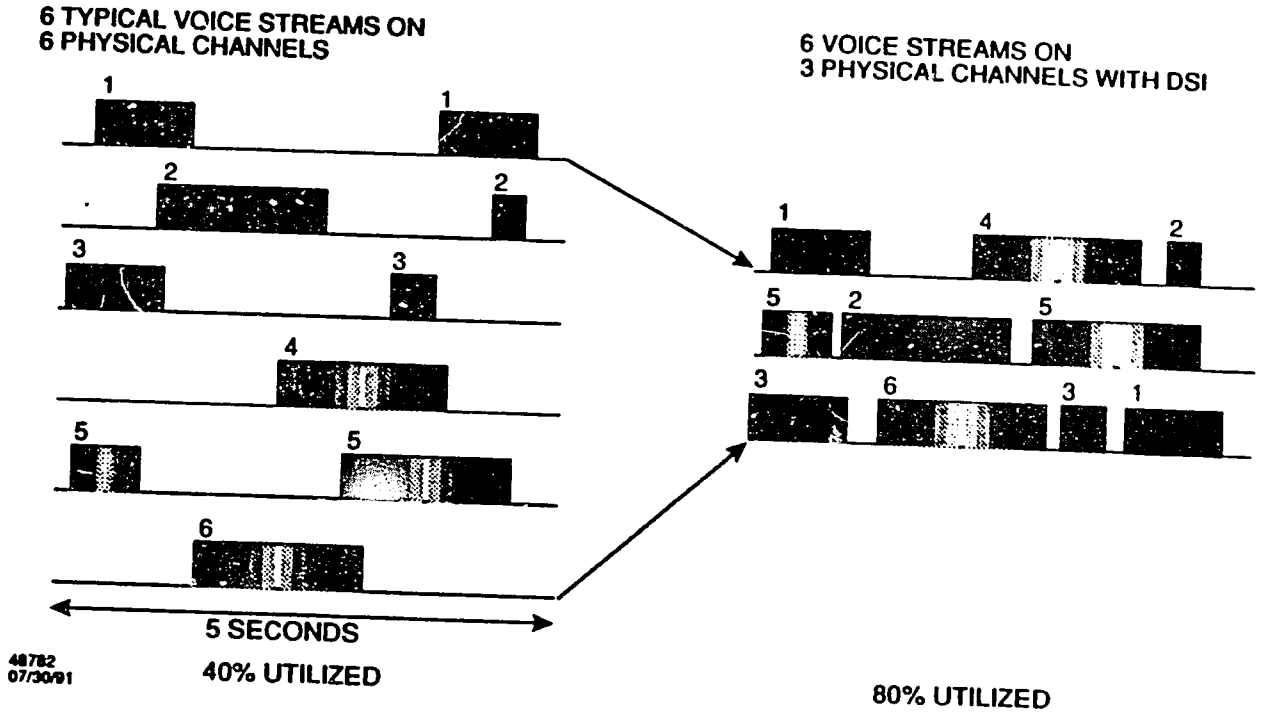
DIGITAL SPEECH INTERPOLATION (DSI) (Cont.)

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



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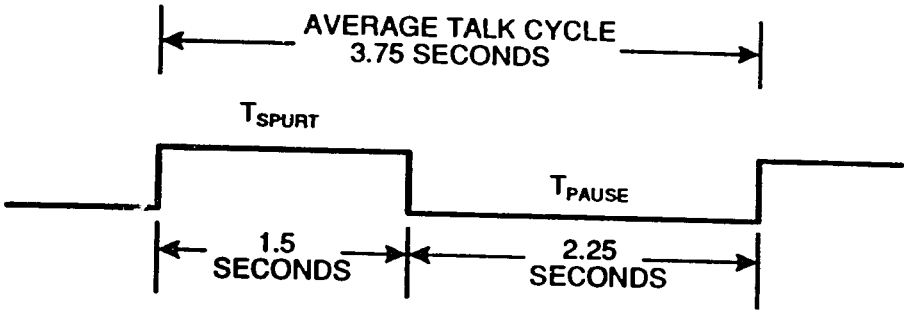
VOICE ACTIVITY

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



$$\frac{1.5}{1.5 + 2.25} = 0.40 \text{ VOICE ACTIVITY FACTOR}$$

41062
7/13/90

- Speech spurt lengths are exponentially distributed (like telephone calls)
- Figure shows average behavior

- Voice activity factor
  - 30-35% in forward direction based on years of practical experience
  - 40% in reverse direction is conservative, based on HNS measurement program in automotive environment

HOW DOES E-TDMA™ WORK?

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

The DSI Pool

- Treat each slot (1-6) of an IS-54 TDMA frame as an independent resource
- Use some for control (FC, RC)
- Use some for voice
- Use others for packet data or special applications

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E-TDMA™ FUNCTIONALITY

HUGHES NETWORK SYSTEMS
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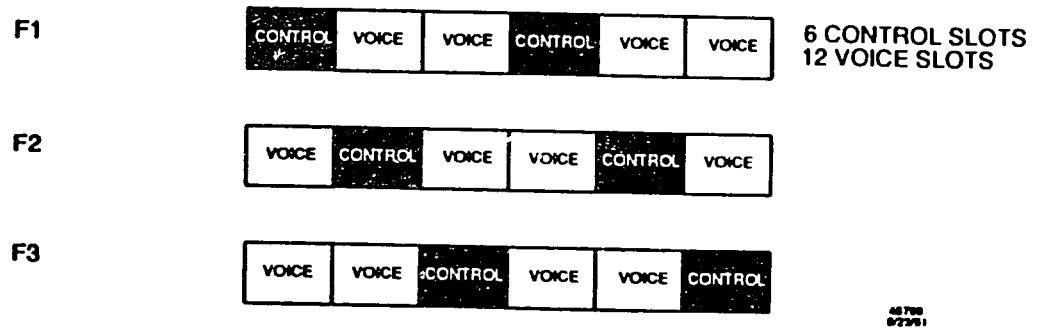
Example - DSI Pool

- **When three RF channels are operating half rate, a DSI pool can be formed**



- **Channels chosen may be widely separated**
- **This pool supports more traffic than just the 18 channels supported in continuous mode half rate**

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DSI POOLS AND CAPACITY

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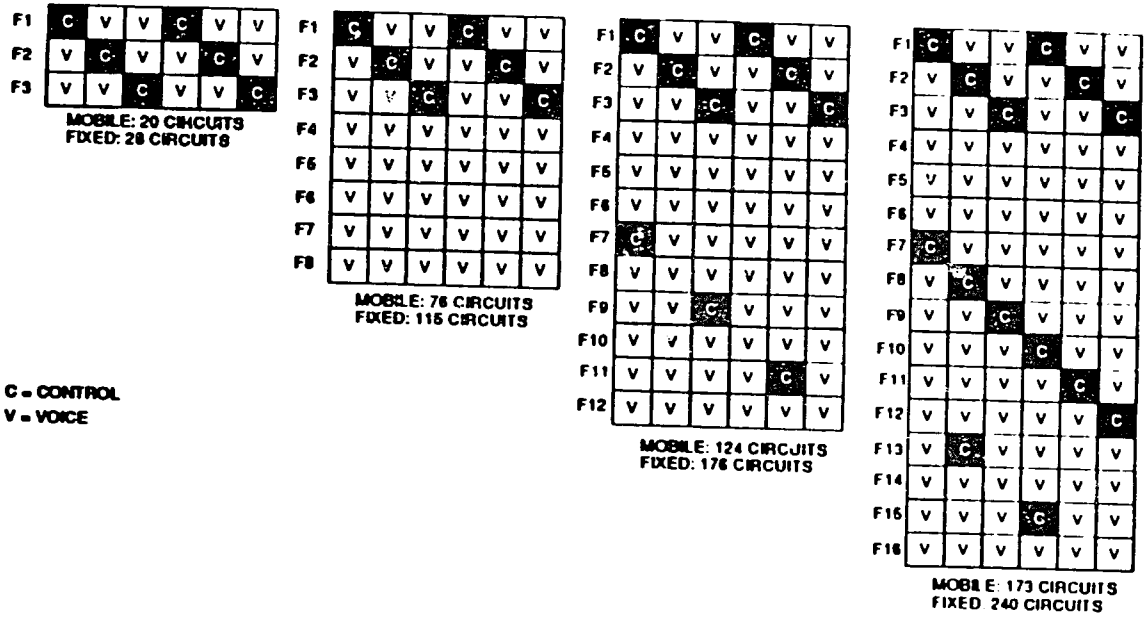
Subsidiary of Hughes Aircraft Company



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04/03/92

- **Additional control slots can be configured for data traffic or other uses**

E-TDMA™ ADVANTAGES

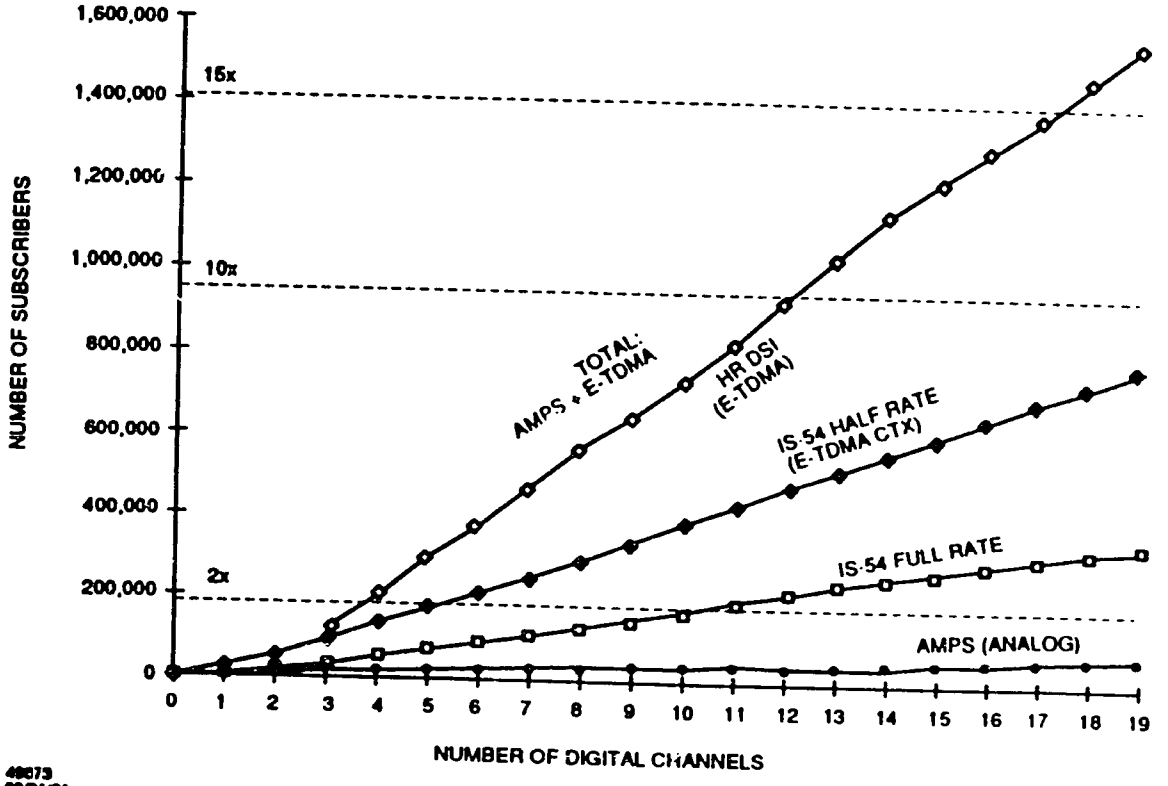
HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

Capacity

- Increased cellular system capacity by a factor of 10 to 15 or more over analog (depending on the number of digital channels converted)
- Achievement of the capacity enhancement over the entire coverage area, independent of geographic distribution of the mobiles, propagation exponent, or shadowing variance
- Early establishment of voice circuits using the DSI capability without wasting system capacity until actual voice begins. This gives further capacity improvement over analog
- Improved utilization of cell sites and cell site equipment (reduced cost)

E-TDMA™ CAPACITY

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



49873
09/21/91

200 SECTORS, .026 ERLANG PER SUBSCRIBER

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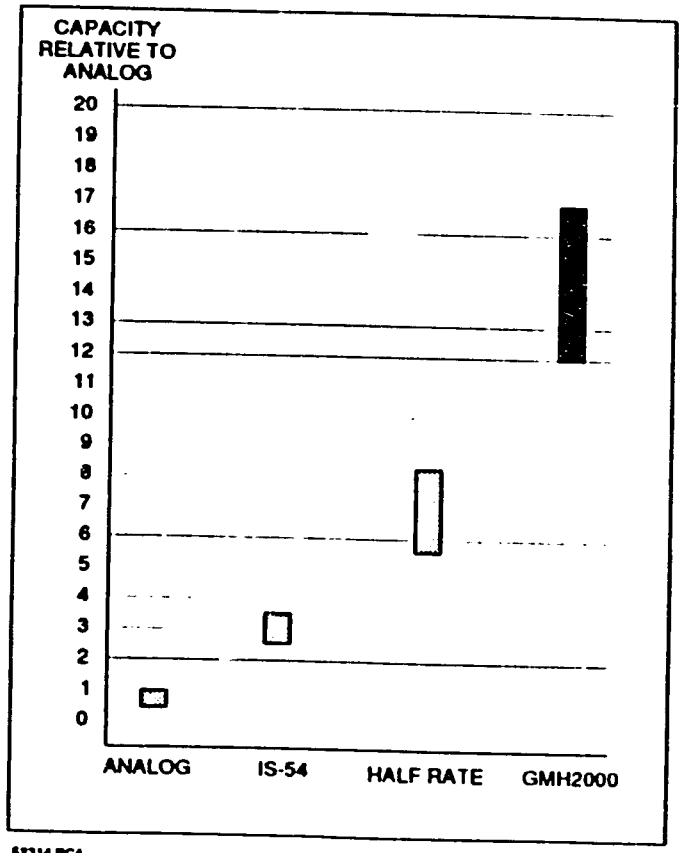
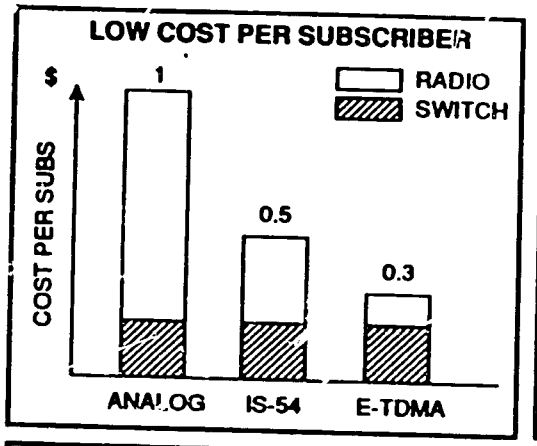
GMH 2000™/E-TDMA™: TIA CAPACITY EVALUATION

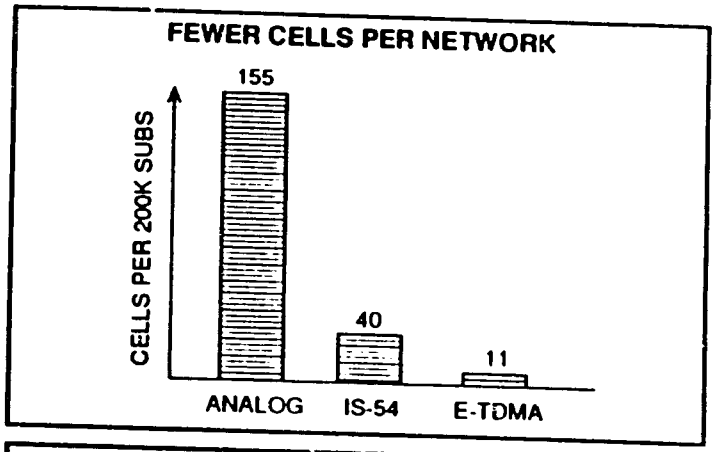
HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

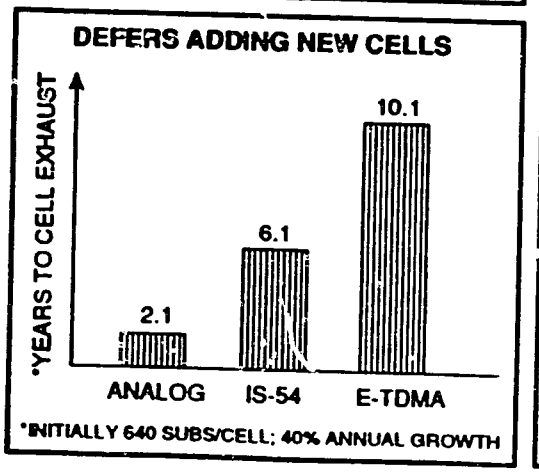


E-TDMA™ ECONOMIC ADVANTAGES

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company







HIGH CAPACITY

	ANALOG	IS-54	E-TDMA
CAPACITY/CHANNEL	1	3.9	15.1
SUBSCRIBERS/SECTOR*	432	1,701	6,541
SUBSCRIBERS/CELL*	1,290	5,103	19,600
CITY WITH 200 CELLS	259,000	1,020,600	3,924,000

*ASSUMING 19 TRUNKS/SECTOR, 0.026 E (SUBS/PBH), GS 01

44318
04/6/92

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E-TDMA™ ADVANTAGES

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

Transmission Quality

- Reduced interference on the reverse channel because:
  - Mobiles operate in DTX mode
  - Speech spurt dynamic assignments lead to geographically averaged rather than worst case interference scenarios
- Significant reduction in speech loss caused by FACCh through scheduling FACCh between or at the end of speech spurts as often as possible
- Implicit frequency hopping giving more resistance to selective fading than IS-54 or other fixed-frequency systems
- These effects more than compensate for the imperceptibie DSI overload event

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NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

DIGITAL CELLULAR DEPLOYMENT IN THE UNITED STATES

73P2084
15 MAY 93

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2nd GENERATION NORTH AMERICAN CELLULAR STANDARDS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

October 1988	CTIA UPR document
June 1989	TDMA selected
February 1990	IS-54 dual mode standard release (3 calls per channel)
August 1991	IS-54B released (Adds privacy and authentication features)
November 1991	CTIA lockdown test started (multivendor field test)

E-TDMA™ ADVANTAGES (Cont.)

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

System

- Soft failures because loss of a transceiver will not cause loss of a call (load sharing)
- Compatibility with IS-54 frame structure and straightforward adaptation to the eventual half rate coding selected for standardization (technology maturity)
- Minimizes backbone requirement (cell-MTSO) if E-TDMA is processed at MTSO
- Use existing frequency plans
- Extra capacity reduces or eliminates the need to split cells or sectorize
- Air interface compatible with data services

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CONCLUSION

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

- GMH 2000™ with E-TDMA™ provides advantages to carrier
  - Improved transmission quality
  - Significantly increased capacity
  - Improved system performance
  - Lower cost

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AMPS-D DUAL MODE MANUFACTURER STATUS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

Systems	Lab Test	"Lockdown" Field Test	Commercial Availability
AT&T	√	√	1Q92
Ericsson	√	√	4Q91
Motorola			1Q92
Northern Telecom	√	√	Not Announced

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AMPS-D DUAL MODE MOBILE UNIT STATUS

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Manufacturer	Lab Test	Field Test
Audiovox		
Ericsson/GE	√	
HNS	√	A E N
Mitsubishi	√	A E N
Motorola	√	A E N
NovaTel	√	A E
Oki	√	A E
Sony	√	A E N

A = AT&T
E = Ericsson
N = Northern Telecom

2-95

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E-TDMA™ STANDARDIZATION PROCESS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

• January 1991	WGU formed "capacity, performance, complexity"
• May 1991	TIA model for TDMA and E-TDMA capacity
• June 1991	Half rate coding workshop
• (November 1992)	Half rate coder selection
• (September 1993)	IS-54 Revision C to include E-TDMA mode

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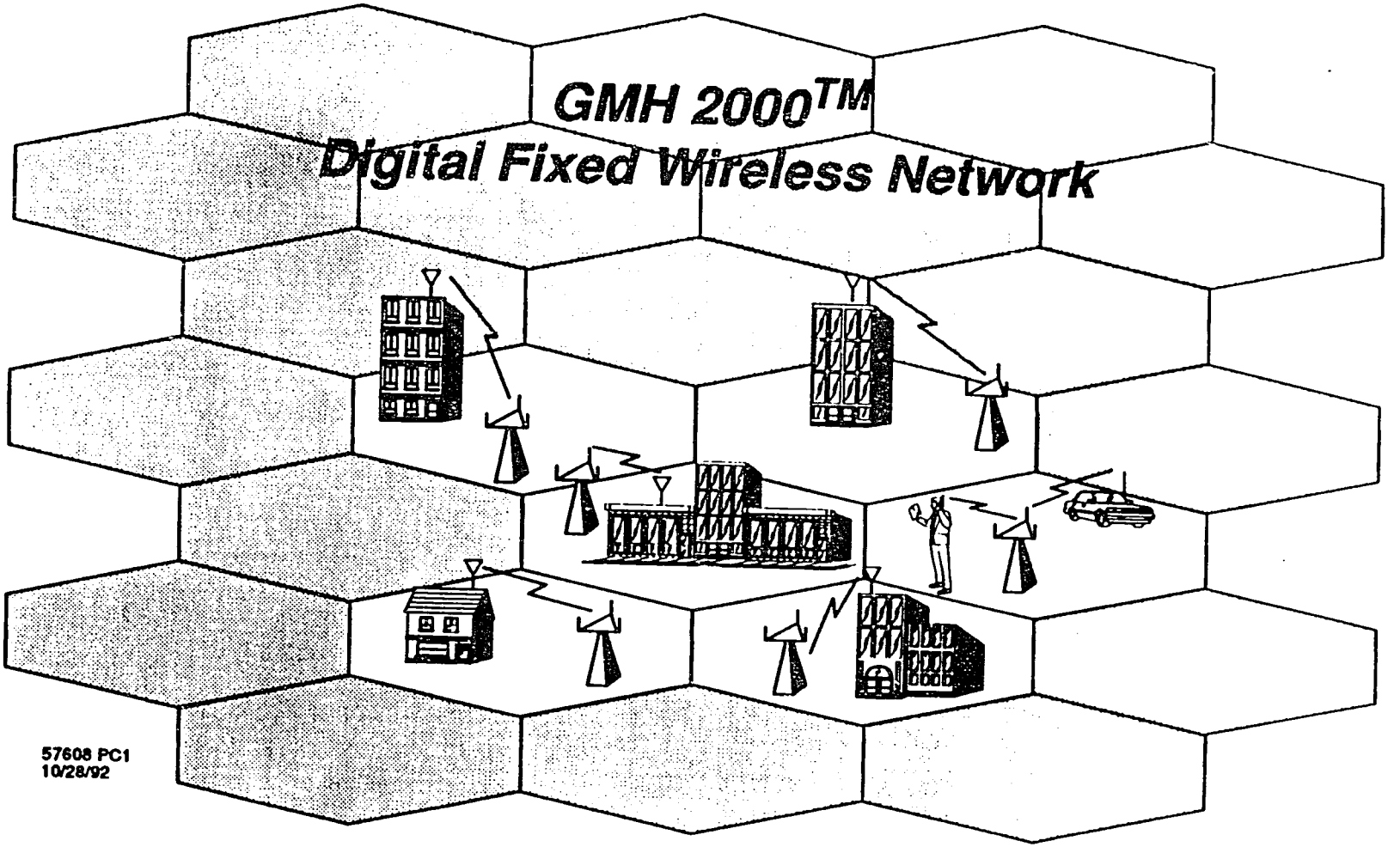

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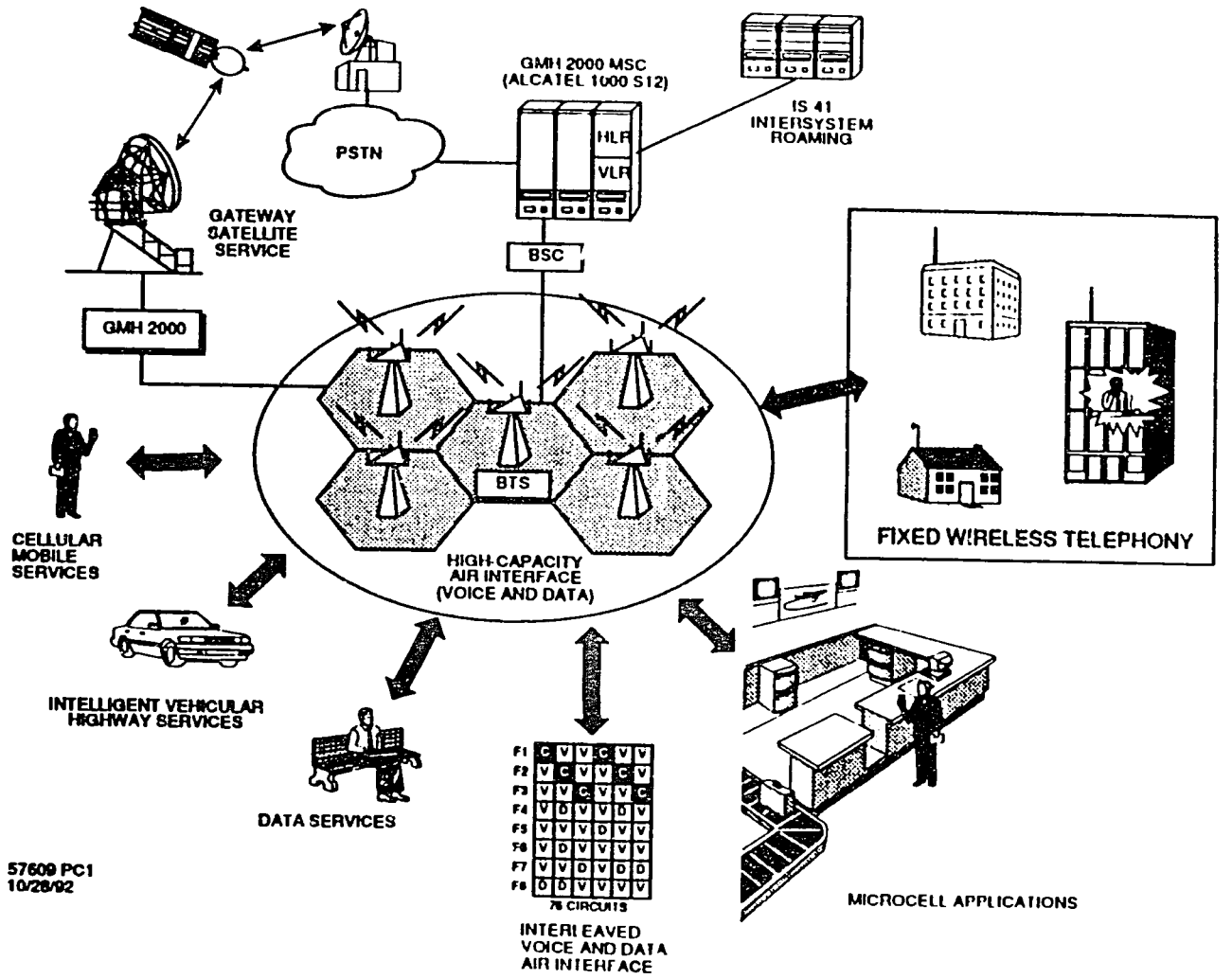
GMH 2000™ WIRELESS VISION

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



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GMH 2000™ HIGHLIGHTS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- High capacity, low cost fully digital telecommunications for mobile and fixed applications
- Dual mode TIA IS-54 standard with E-TDMA™ extensions
- Data services
  - Fax
  - E-mail
  - Database access
- Advanced vehicle services
  - Emergency assistance
  - Fleet management
  - Security
  - Navigation
- Future personal communication services
  - Microcells
  - Wireless PBX
  - Wireless LAN

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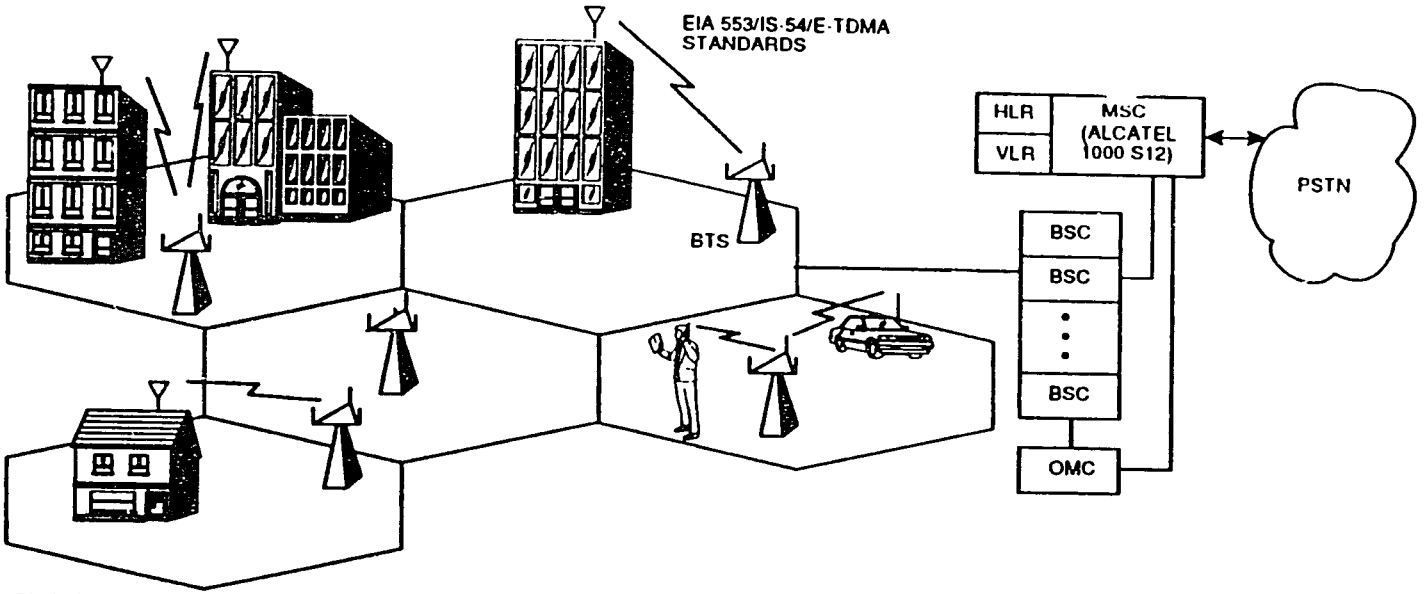
GMH 2000™ ARCHITECTURE

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company



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10/28/92

BTS: Base Transceiver Station
BSC: Base Station Controller
MSC: (Mobile) Switching Center
HLR: Home Location Register
VLR: Visitor Location Register
OMC: Operations and Maintenance Center
PSTN: Public Switched Telephone Network

300

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GMH 2000™ ADVANTAGES

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

Universal Digital Wireless Services

- High quality integrated voice and data, fixed and mobile telephony services
- Extended-TDMA™ air interface
  - EIA 553 analog AMPS, TIA IS-54 plus
    - Digital speech interpolation
    - Half rate voice coding
  - Frequency hopping channel assignment
  - Security
- Alcatel 1000 S12 distributed architecture switch
  - Reliable–no total outage in over 10 years of service
  - 41 million lines in service in over 40 countries
  - ISDN compatible

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GMH 2000™ ADVANTAGES

HUGHES
NETWORK SYSTEMS
Subsidiary of
Hughes Aircraft Company

Flexible, Fully Digital Platform

- **Programmable triple mode channel units: EIA 553, IS-54, E-TDMA™**
- **Modular cabinets for channel units and amplifier/combiners**
- **High capacity E-TDMA cells**
  - **14 times increase in voice channels compared to analog systems**
  - **20 times increase in traffic capacity compared to analog systems**
  - **Additional 100% system capacity gain with R = 4 frequency reuse pattern**

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GMH 2000™ ADVANTAGES (Cont.)

HUGHES NETWORK SYS.
Subsidiary of Hughes Aircraft Company

Competitive Edge

- Each radio channel is dynamically shared by many subscribers
- Frequencies may be reused for virtually unlimited growth
- Extremely high capacity enables numerous value-added services
- Lower captial investment in infrastructure
- Lower operation and maintenance costs

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GMH 2000™ ADVANTAGES (Cont.)

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

Easy Growth

- Infrastructure accommodates growth <u>without</u> adding new sites
- Each new installation is a simple visit to home or apartment building
- Service in weeks or months instead of years
- No right-of-way issues
- No need to plan routes by guessing where new buildings will go

GMH 2000™ ADVANTAGES (Cont.)

HUGHES NETWORK SYS.
Subsidiary of Hughes Aircraft Company

Low Maintenance Infrastructure

- Impervious to outages caused by human error: line cuts, accidents
- Wireless systems not prone to environmental damage as are wired systems
- Service, repairs are easier because there is minimum reliance on wired subsystems

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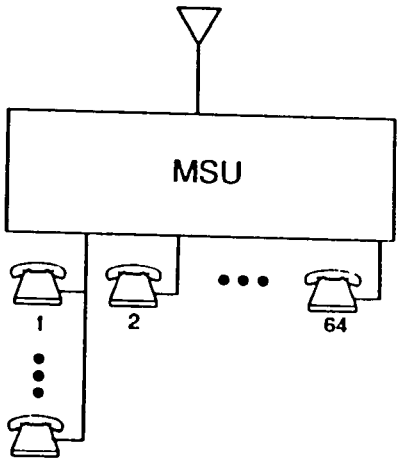
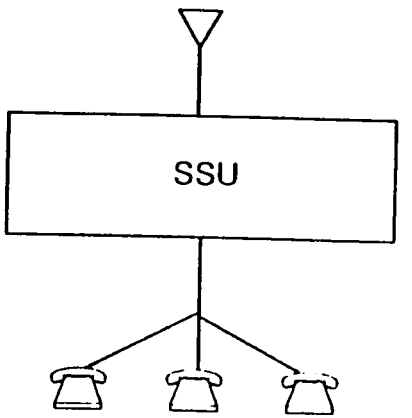
SUBSCRIBER UNITS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- **Multisubscriber unit (MSU):**
  - Provides up to 64 numbers
  - Multiple handsets
  - For apartments, hotels, densely packed housing
  - Subscriber loop can be 10,000 feet long



- **Single subscriber unit (SSU):**
  - Residences
  - Businesses
  - Single phone number
  - Multiple handsets



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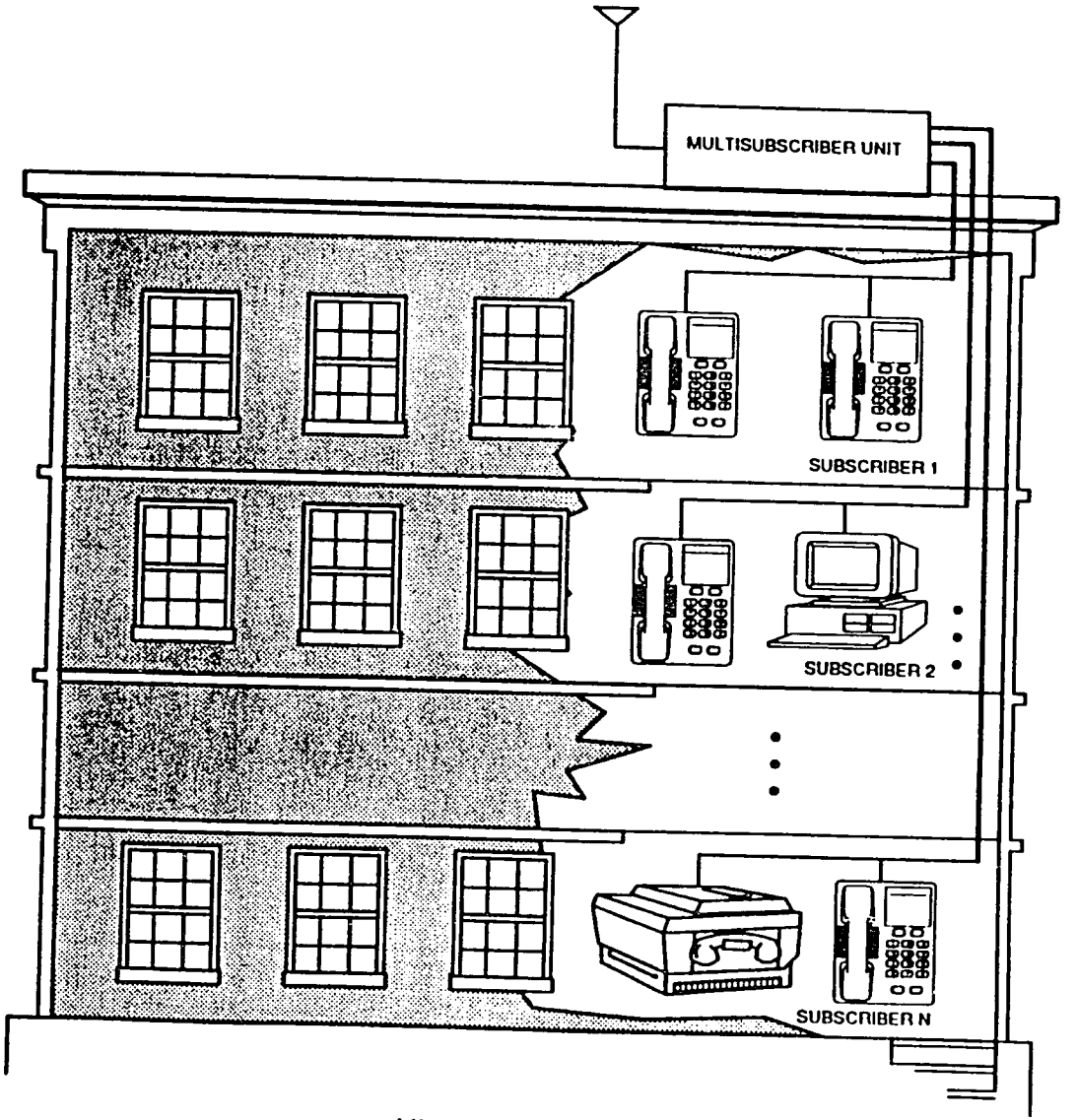
MSU APPLICATION: APARTMENT COMPLEX

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



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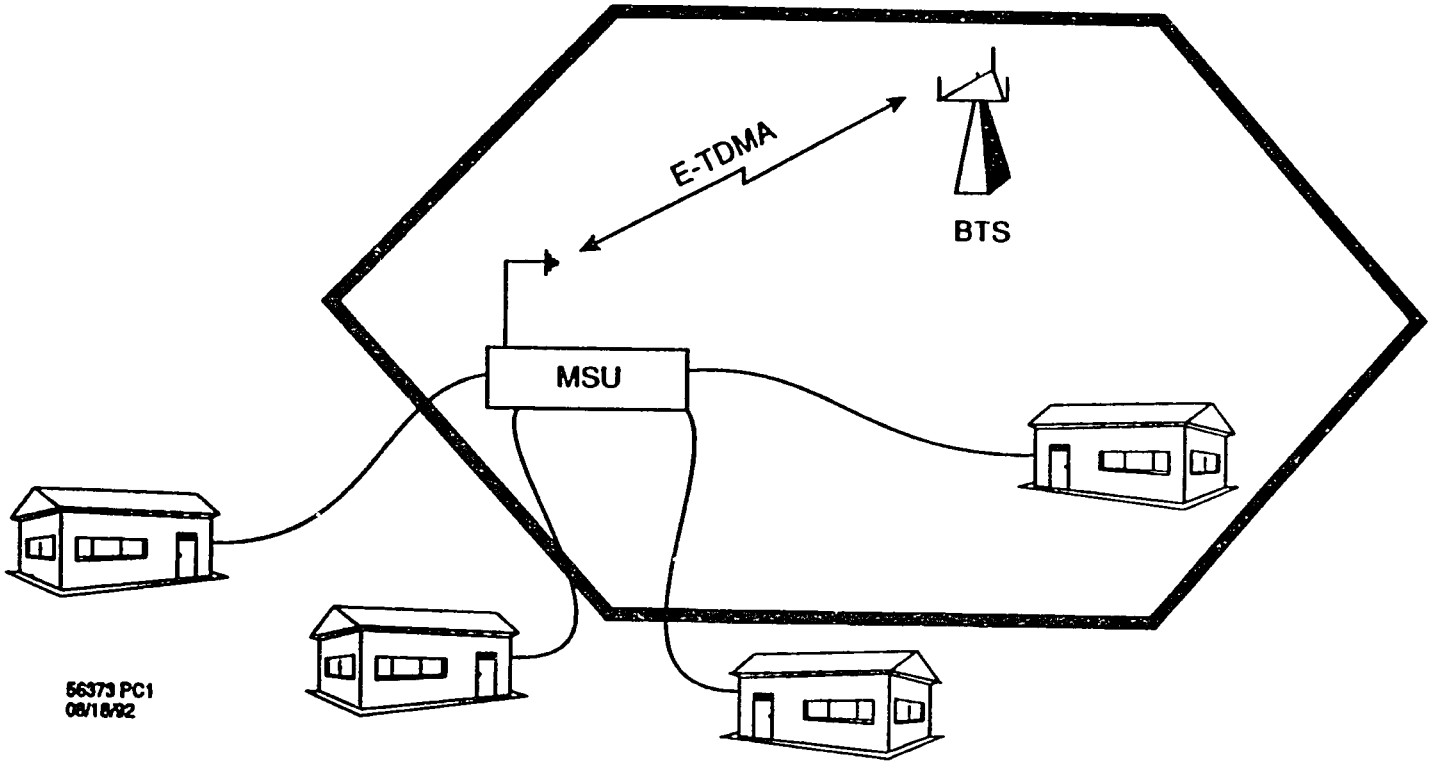
MSU APPLICATION: CAMPUS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



KEY FEATURES OF GMH 2000™ MSU

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Ideal for residential complexes, hotels, businesses, office buildings
- Uses only four types of hardware modules
- Redundancy for common components and load sharing for others
- Uses E-TDMA™ air interface for high capacity and high quality
- Basic unit supports 64 subscribers with conventional in-building wiring
- Multiple low-cost two-wire telephony handsets per subscriber
- Simplified installations

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MSU MAINTENANCE FEATURES

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Continuous monitoring of channel performance
- Download of all control software and DSP firmware for flexibility and growth
- Loopback tests
- Automatic redundancy control and alarm reporting

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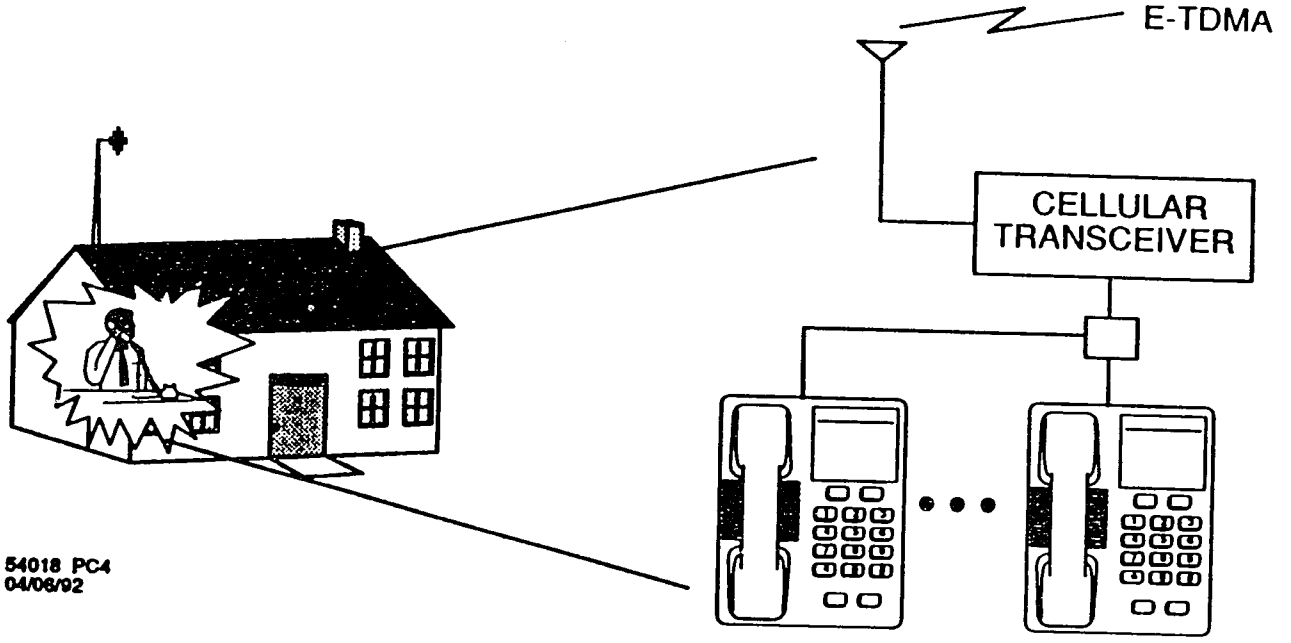
SINGLE SUBSCRIBER UNIT



- One phone number
- Multiple handsets supported
- Ideal for residences, small offices
- "Plug and play" installation

GMH 2000™ APPLICATIONS

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Rural: Long-range communications from a single site
- Urban: Densely packed subscribers employing frequency reuse
- Common objective: Serve maximum number of users with minimum infrastructure

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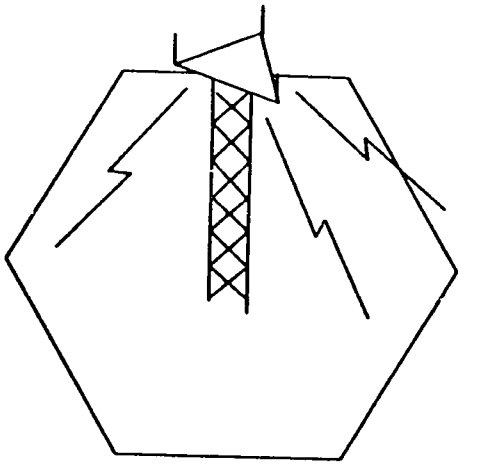
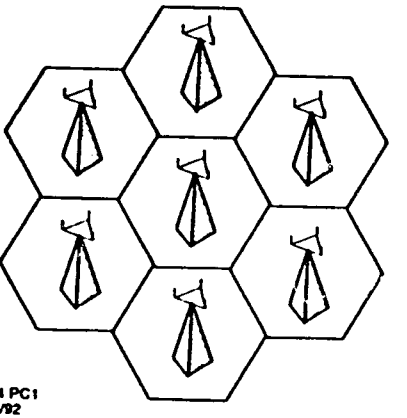
FIXED WIRELESS SYSTEM EXAMPLES

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- **Single cell**
  - One high tower
  - Large capacity
  - No frequency reuse
  - MSU or SSU



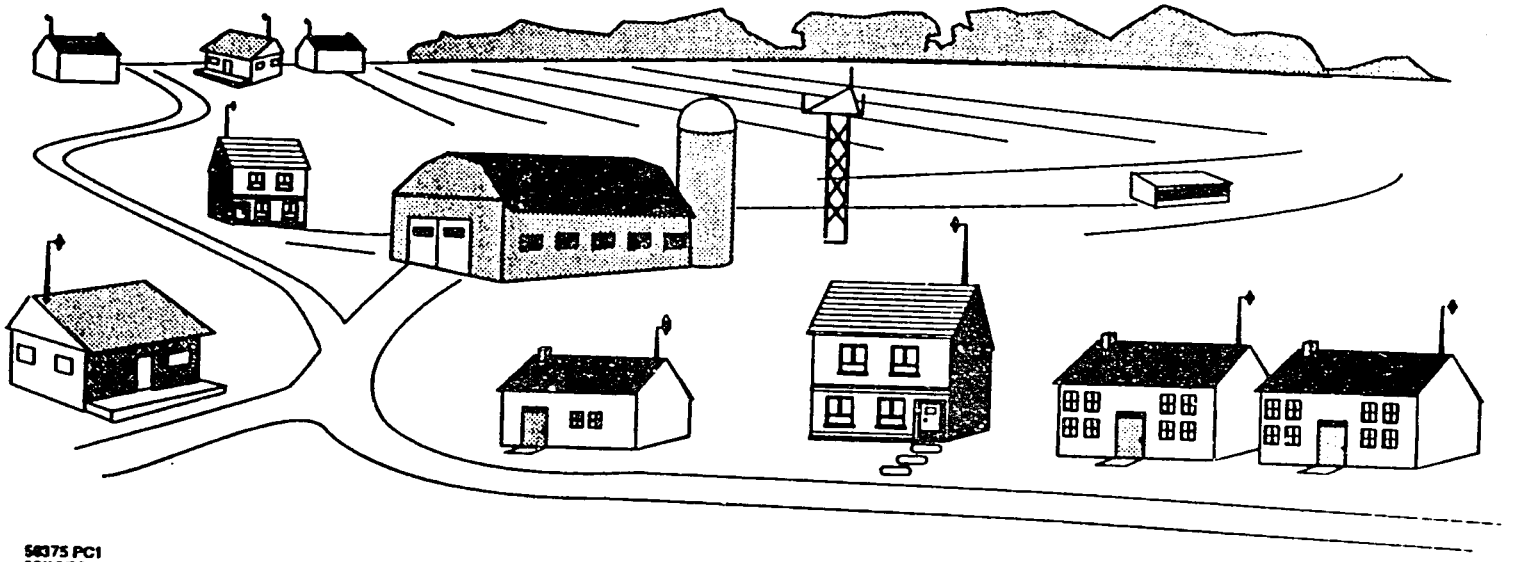
- **Multiple cells**
  - Several low height towers
  - Extremely high capacity
  - Frequency reuse
  - MSU or SSU



56374 PC1
08/18/92

SINGLE CELL FIXED WIRELESS SERVICE

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



58375 PC1
08/18/92

GMH 2000™ PER-SECTOR CAPACITY

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

E-TDMA™ RF Channels	Equivalent Voice Channels	Subscribers at 0.026 erlangs each	Subscribers at 0.052 erlangs each
3	28	661	330
4	45	1,188	594
5	62	1,737	869
6	79	2,300	1,150
7	97	2,907	1,453
8	115	3,522	1,761
9	128	3,969	1,985
10	144	4,523	2,262
11	160	5,081	2,540
12	176	5,639	2,819
13	191	6,119	3,060
14	206	6,600	3,300
15	222	7,113	3,556
16	241	7,721	3,861

Notes:

(1) Grade of service = P.01
(2) Voice activity factor = 0.30
(3) Fixed subscribers

HNS Proprietary

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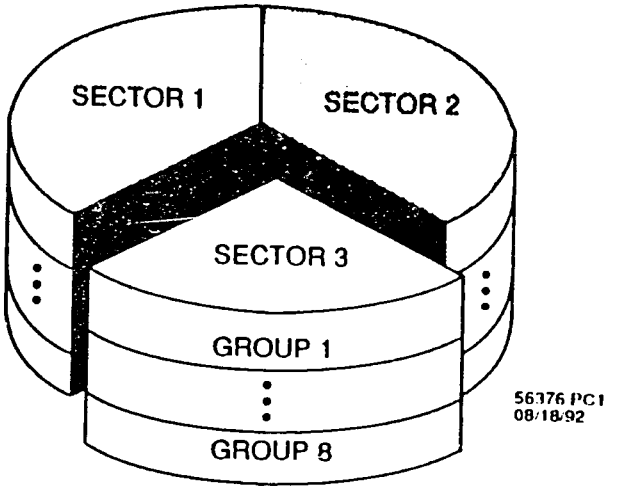
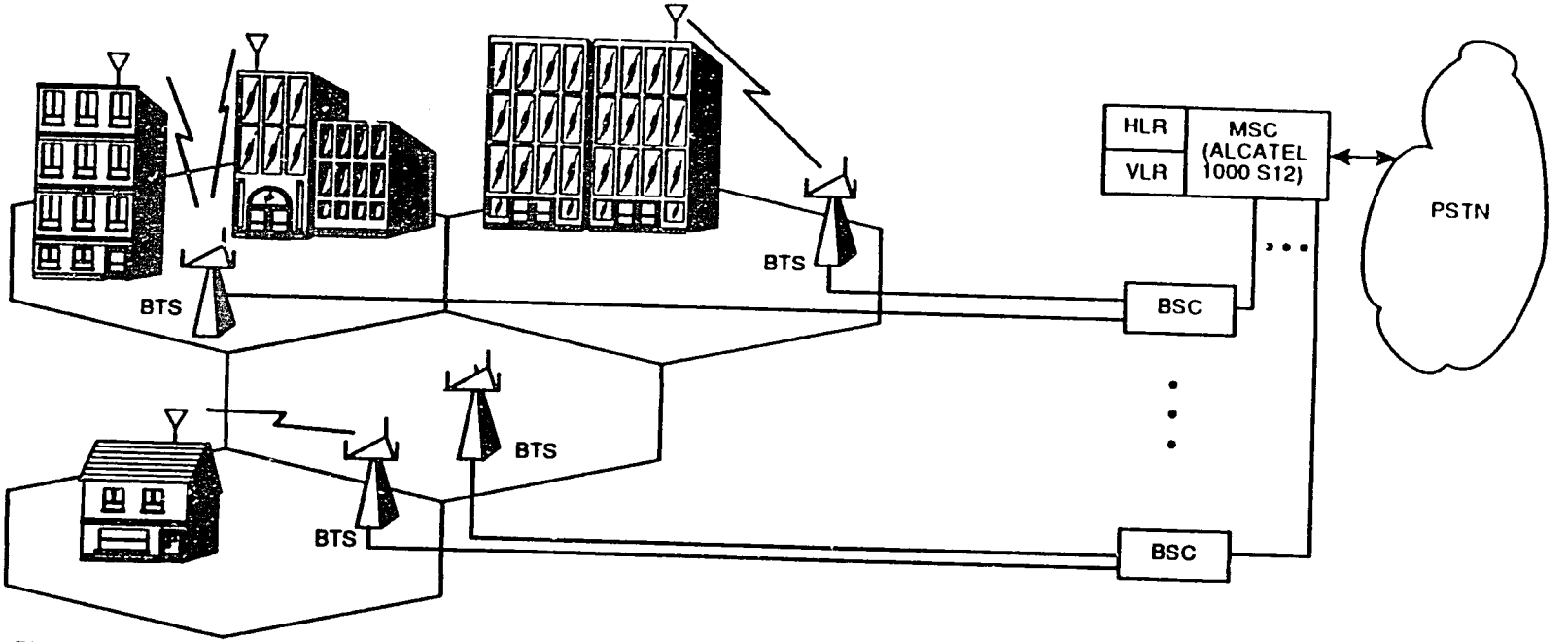
SINGLE CELL FIXED WIRELESS EXAMPLE

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Assume U.S. Cellular "A" band, 395 channels
- 24 groups of 16 use 384 channels
- Divide cell into three sectors with eight groups each
- Each group of 16 channels provides 200 erlangs for a total of 24 x 200 = 4,800 erlangs
- At 0.052 erlangs/subscriber, single tower handles 92,300 subscribers
- Covered area depends on topography but may be hundreds of square kilometers



MULTIPLE CELL SITES WITH FREQUENCY REUSE



56377 PC1
03/18/92

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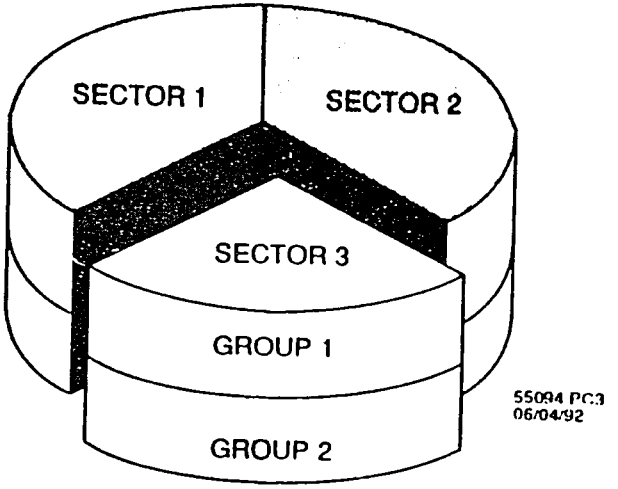
FIXED WIRELESS WITH REUSE EXAMPLE

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

- Assume U.S. Cellular "A" Band, 395 channels
- Cover area with 12 cells, with three sectors per cell, two groups of 16 channels per sector
- 72 groups of 16 use 1,152 channels
- Each group of 16 channels provides 200 erlangs, for a total of 72 x 200 = 14,400 erlangs
- At 0.052 erlangs/subscriber, 12 cell sites support 276,900 subscribers



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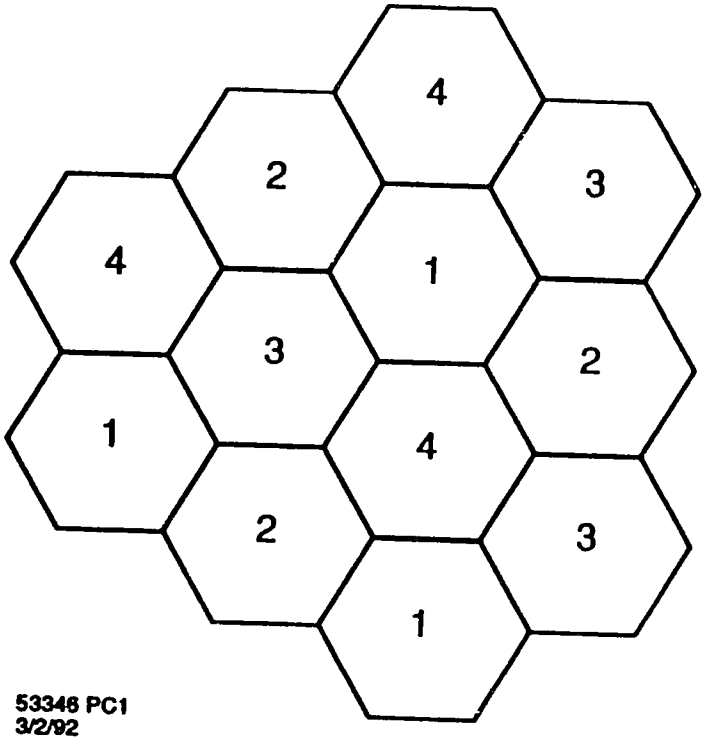
GMH 2000™ 4X REUSE

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company



53346 PC1
3/2/92

Each cell uses 1/4 of frequencies (96 channels)
1,152 channels deployed over this area

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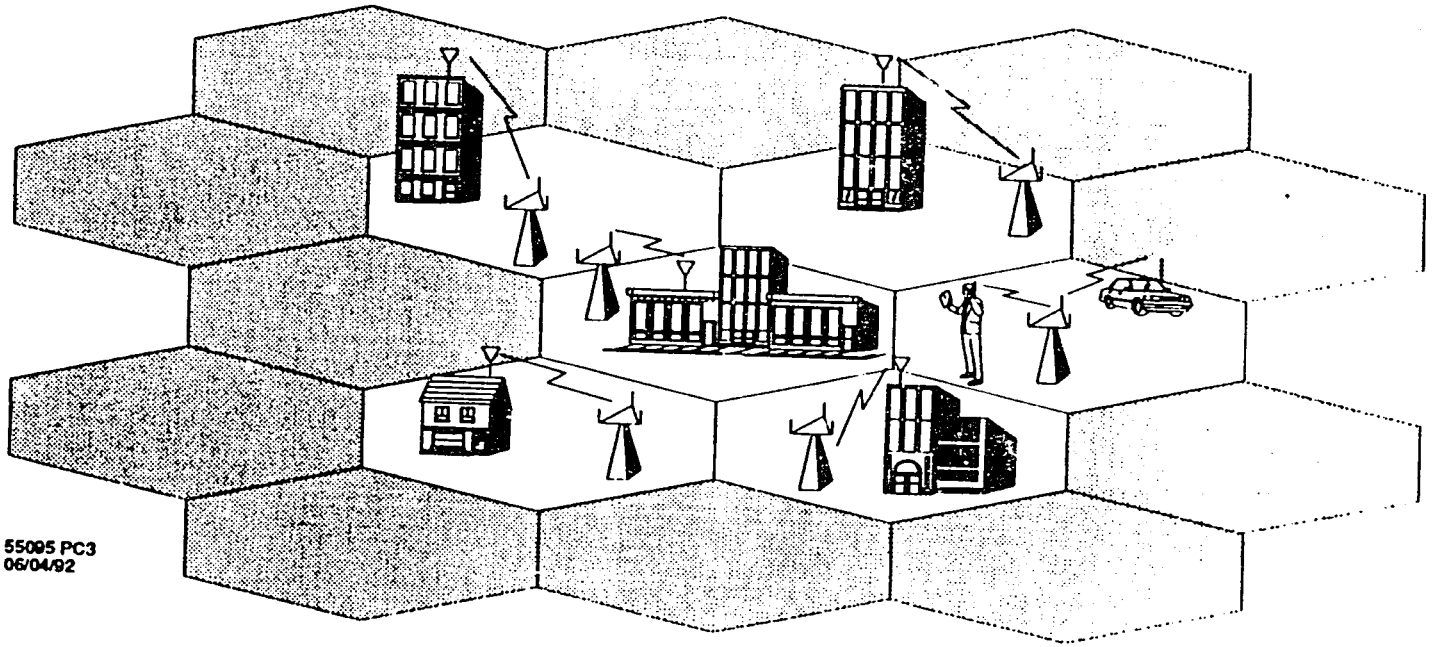
GMH 2000™ FIXED WIRELESS CELLULAR SYSTEM

HUGHES NETWORK SYSTEMS
Subsidiary of Hughes Aircraft Company

* High capacity
* Low cost
* Digital quality
* Flexible, expandable
* Easy to install and maintain



55095 PC3
06/04/92

The Importance of Competition in Telecom Sector Development

by: *Rui Fernandes, Chairman and Managing Director*
Telecomunicaçoes de Moçambique

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COMPETITION IN THE TELECOMMUNICATIONS SECTOR

IMPORTANCE OF COMPETITION

OPENING REMARKS BY
RUI FERNANDES
CHAIRMAN AND MANAGING DIRECTOR
TDM - TELECOMUNICAÇOES DE MOÇAMBIQUE

SADC SEMINAR ON TELECOMMUNICATIONS
POLICY, REGULATION AND STRUCTURING

WINDHOEK, 17TH-19TH FEBRUARY 1993

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COMPETITION IN THE TELECOMMUNICATIONS SECTOR

OPENING REMARKS: IMPORTANCE OF COMPETITION

1. BACKGROUND

The telecommunications sector, in general, in industrial and developing countries, is undergoing substantial changes following options taken by Governments to address basic policy issues regarding the provision of telecommunications services, the development and operations of the countries' telecommunications infrastructure and the private sector participation.

In Mozambique, the primary telecommunications sector objectives fall under two main categories:

a) The development of the telecommunications infrastructure and services, so as to make it accessible to the population at large, both urban and rural.

b) Meeting the rapidly growing and changing diversified needs of the modern sector.

The strategic policies that the Government formulates to achieve these objectives are critical factors in determining the extent of success in reaching these objectives. The basic policies adopted need to take into consideration the specific characteristics of Mozambique's geography and demography, and the levels of social organization and economic and political orientation of the country.

The major policy issues for the telecommunications sector relate to:

- Institutional framework
- Market structure
- Tariffs
- Ownership

2. INSTITUTIONAL FRAMEWORK

In order to make the telecommunications sector play its part in the nation's socio-economic development under the best possible conditions. the Government of Mozambique has decided to reform the bodies constituting the telecommunications sector.

This decision forms part of the wider undertaking of reorganization and stimulation of the economy, a major component of which is the reform of the country's state-owned enterprises.

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The goal of this undergoing process is, in particular, to:

a) Define the responsabilities of the Government for sector policy, strategy definition and regulation, and separate them from the operating responsibilities of the service providers.

b) Strengthen Telecomunicacoes de Mocambique (TDM)'s organization and management, corporate autonomy and accountability, and commercial capability.

c) Increase the telecommunications coverage, and improve and maintain the quality of service.

d) Enhance the sector's capacity to mobilize resources for the benefit of the Government (through taxes and dividends), and, as a result, improve its net contribution to the national state budget.

To achieve all these goals, the Government has approved during 1992 the following laws:

- A telecommunications' basic law.

- A decree establishing a regulatory body, the Instituto Nacional das Comunicacoes de Mocambique (INCM).

- A decree transforming TDM into a public company.

The interface and relationship between the Government and TDM is now to be confined to these three levels:

- Sector policy matters
- Regulatory functions
- Program Contract

The role of the Institute is to be limited specifically to:

a) Formulation and interpretation of sector policy (provision of service, tariffs, liberalization, privatization, external resource allocation and mobilization).

b) Licensing and regulating service providers and radio frequency spectrum users (issuing, monitoring, enforcing regulations and technical standards).

c) Defining perfomance targets and indicators and supervision of the Program Contract (access to services, quality of service, rate of growth and profitability).

d) Handling relations with international and regional telecommunications organizations relating to treaties and policy matters.

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With regard to TDM, as a service provider, it will have:

a) Full financial and administrative autonomy to conduct the operations of the public telecommunications service on a profitable and commercial business accounting basis and the freedom to implement an effective human resources management policy to achieve these objectives.

b) A Board of Directors that will preside over TDM's operations and will be responsible for operating policy guidelines and directives and will be accountable for fulfillment of the Program Contact entered with the Government.

c) Published yearly its statements of accounts audited by an external auditor.

3. MARKET STRUCTURE

The issue of market structure is whether or not more than one service provider is allowed to provide the whole or part of the range of telecommunication services in open competition.

Competition in the provision of terminal equipment such as telephone sets, telex and facsimile machines, mobile radios and PABXs is generally beneficial, subject to properly designed and enforced technical standards, in order to promote diversity of supply and to relieve the main telecommunications service provider of tasks that others can do as well.

Similarly, competition in the provision of data transmission sevices and value-added services, merging telecommunications and informatics, is beneficial in promoting diversity of supply of services.

Where competition is permitted, the established service provider faces competitive pressure to offer improved service and prices to its customers.

To address this issue, the Government of Mozambique has published a new telecommunications basic law, according to which:

- TDM will operate, on a monopoly basis, the basic public telecommunications network, consisting of the fixed system of connections to subscribers, the transmission network and switching, concentrating and processing equipment, to provide the basic services of telephone, telex, fax and also cellular mobile radio to subscribers.

- Data transmission and value-added services and complementary services will be open to competition subject to decisions and regulations to be issued by the Institute.

The infrastructure that covers the basic telecommunications services will be part of the public domain.

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4. TARIFFS

Tariff policy is of basic importance for a telecommunication organization such as TDM, operating along the lines of business enterprise. Tariffs structure and levels largely determine the revenue generating capacity of TDM from its operations.

The basic tariff policy derives from the sector financial policy which calls for TDM's operation to be profitable.

Current basic policy is hence that tariffs, firstly, should be set so that:

a) Gross revenue generated should cover costs.

b) Rate of return on investment should enable self-sustained growth.

c) Revenues should be stable despite the uneven profitability of the different types and categories of services, and changes in the national economy environment, in order to ensure the planned, self-sustained and steady growth of the network and services.

The second consideration is that the basic tariff policy, although targeted to achieve financial objectives, needs to be reconciled with social, economic and political objectives and policies of the Government in other sectors. These relate to issues such as the need for uniformity of tariffs nationwide and the extension of services to rural communities.

Thirdly, the basic telecommunications services are operated as a monopoly nationwide and in a market where supply rarely satisfies demand, there is no market mechanism to press down and to regulate prices. The Government has, therefore, the inevitable regulatory function of ensuring that tariffs reflect costs.

Under the new telecommunications basic law, the Government will fix the tariffs for the services operated as a monopoly. Tariffs for all other services, under competition, will be fixed by the service providers themselves.

5. OWNERSHIP

TDM is wholly owned by the Government of Mozambique. However, existing legislation empowers TDM "to carry out commercial, industrial and financial activities related directly or indirectly to its main activities".

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TDM is cautiously exploring the benefits of private participation in the telecommunications sector. Private participation is being introduced in the form of joint-ventures in a number of value-added and peripheral areas such as: editing and printing of telephone directories, local network construction, supply of terminal equipment, maintenance of vehicles, electronic security engineering, data services, telecommunications consultancy, civil construction, etc.

It eases the financial and management burden on TDM for these services and enables it to devote available limited resources to its principal business operations. The indirect benefits of this policy, apart from the financial dividends to be expected, is the explicit costing of support services and the increased cost consciousness in internal and external resource utilization.

5.1 TDM'S CHALLENGE AND OBJECTIVES

TDM's challenge, therefore, is to provide a wide variety of high quality services at a profit. This challenge is reflected in TDM's recently formulated objectives. We believe that these objectives will be achieved more quickly and also that existing and future investments will be better utilized with the establishment of joint-venture companies with private partners.

In effect, through these joint-venture companies, we are introducing a measure of privatization to the sector and, as a result, TDM will be better placed to deal with any competition which already exists or may emerge in the future.

5.2 INTERNATIONAL PRIVATE PARTNERS

TDM decided, at an early stage, that suitable international partners were essential for the success of the joint-venture companies. Over the years, TDM has dealt with many foreign consultants, service providers and other companies and some problems have been encountered, particularly, with respect to the application of experience from one environment not being directly and readily applicable to a different environment. Therefore, in its choice of international partners for the joint-venture companies, TDM has been particularly careful to ensure that the partners chosen have previously collaborated with and worked successfully in Mozambique.

5.3 OBJECTIVES OF THE JOINT-VENTURE COMPANIES

The objectives of all TDM's joint-venture companies include offering high quality services and being recognised first in Mozambique and later in the Southern Africa region as the best alternative for providing services in various areas.

With the establishment of these companies, a fund of directly applicable region-based experience will be built up and TDM intends to actively market these skills and experience within the region.

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The joint-venture companies are active in a variety of areas, such as:

- LISTAS TELEFONICAS: editing of telephone directories
- TELEDATA: data services
- TELEVISA: local network construction
- TELESERVE: terminal equipment and paging systems
- TELECONSULTORES: telecommunications consultancy
- TELEALARME: electronic security engineering
- SOGITEL: civil construction
- SERVISA: maintenance of vehicles

5.4 LAW FOR FOREIGN INVESTMENTS

The Government has been promoting the establishment of joint-ventures with foreign partners and there is a law regulating direct foreign investments. The objective of the establishment of such companies is to better serve the market by introducing the required know-how and capital.

Incentives to joint-ventures include:

a) Tax exemption.

b) Exemptiom from payment of customs duties.

c) Repatriation of profits by the foreign investor.

d) Possibility of the foreign investor appointing a Managing Director during a 3 to 4 year period.

As can be seen from above, this law is very favourable to the establishment of joint-ventures and TDM has been keen to take every advantage of its utilization.

Maputo, 12th January 1993.

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Competition and Privatization in the Telecommunications Sector

by: *James Waddell, Partner, International Privatization Group*
Price Waterhouse

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Competition and Privatization in Telecommunications Sectors

James A. Waddell

Purpose of Presentation

- Role of Competition in Telecommunications Sector
- Encouraging Competition in Privatized Environment
- Trade-off Between Competition and Investment Incentives
- Experience of Industrialized and Developing Countries

Price Waterhouse

Differences and Similarities Between Restructuring, Privatization, and Competition

Restructuring ≠ Privatization ≠ Competition

but

Restructuring ↔ Privatization ↔ Competition

Restructuring

- Increase Efficiency and Effectiveness
- Improve Technology
- Increase Productivity

Privatization

- Attract New Capital
- External Talent
- Entrepreneurial Management
- Avoid Excessive Govt. Interference

Competition

- Decreased Rates
- New Technologies
- New Services
- Improved Quality

Price Waterhouse

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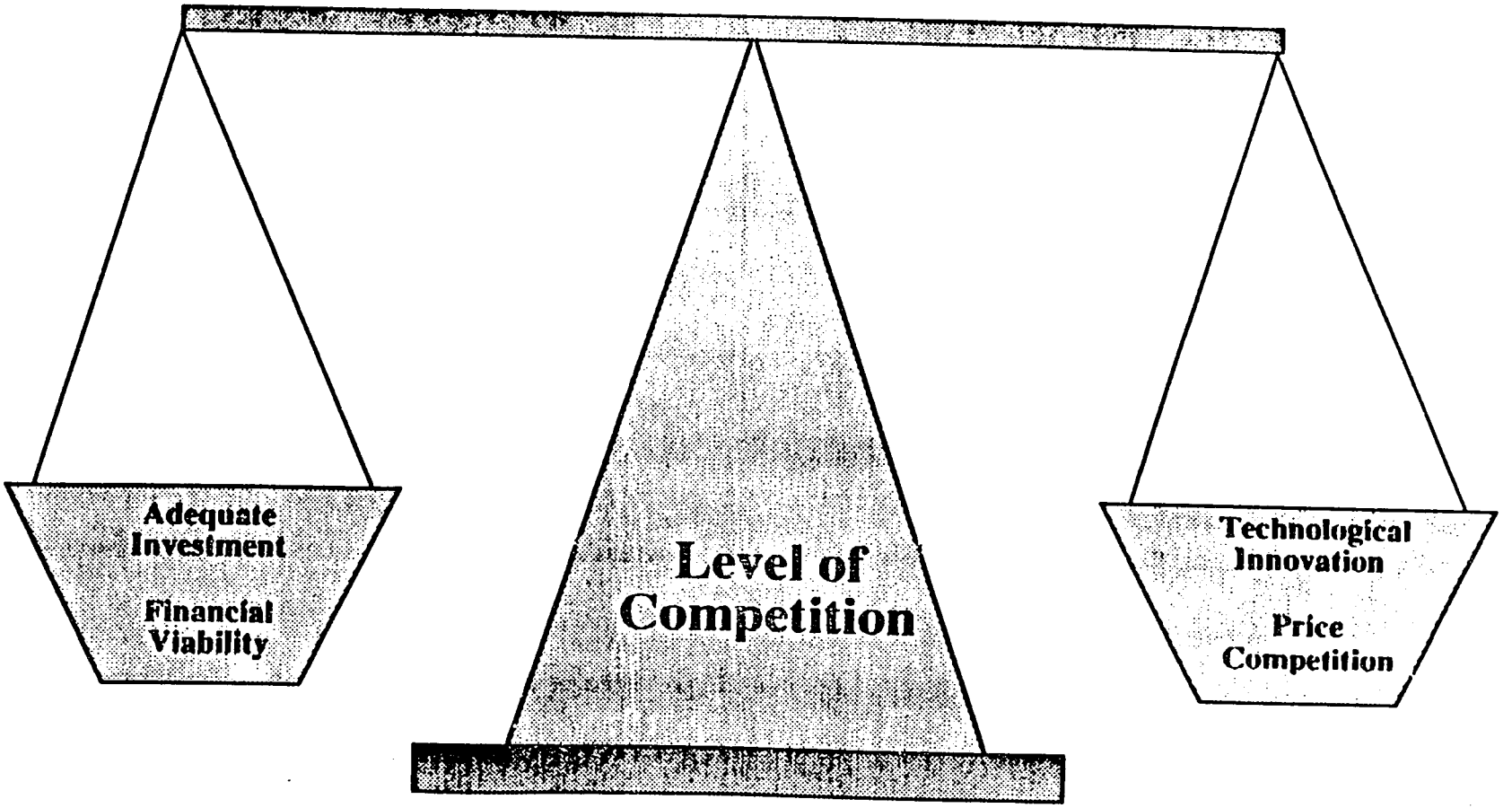
Positive and Negative Roles of Competition In Telecommunications Sectors

Positive Role of Competition	Negative Role of Competition
• Lower Customer Rates	• Adverse Effect on Initial Privatization
• Increased Technological Innovation	• Inadequate Investment Disrupts Service
• Greater Array of Services	• Exacerbates Current Problems in Developing Countries

Price Waterhouse

Optimal Competitive Policy



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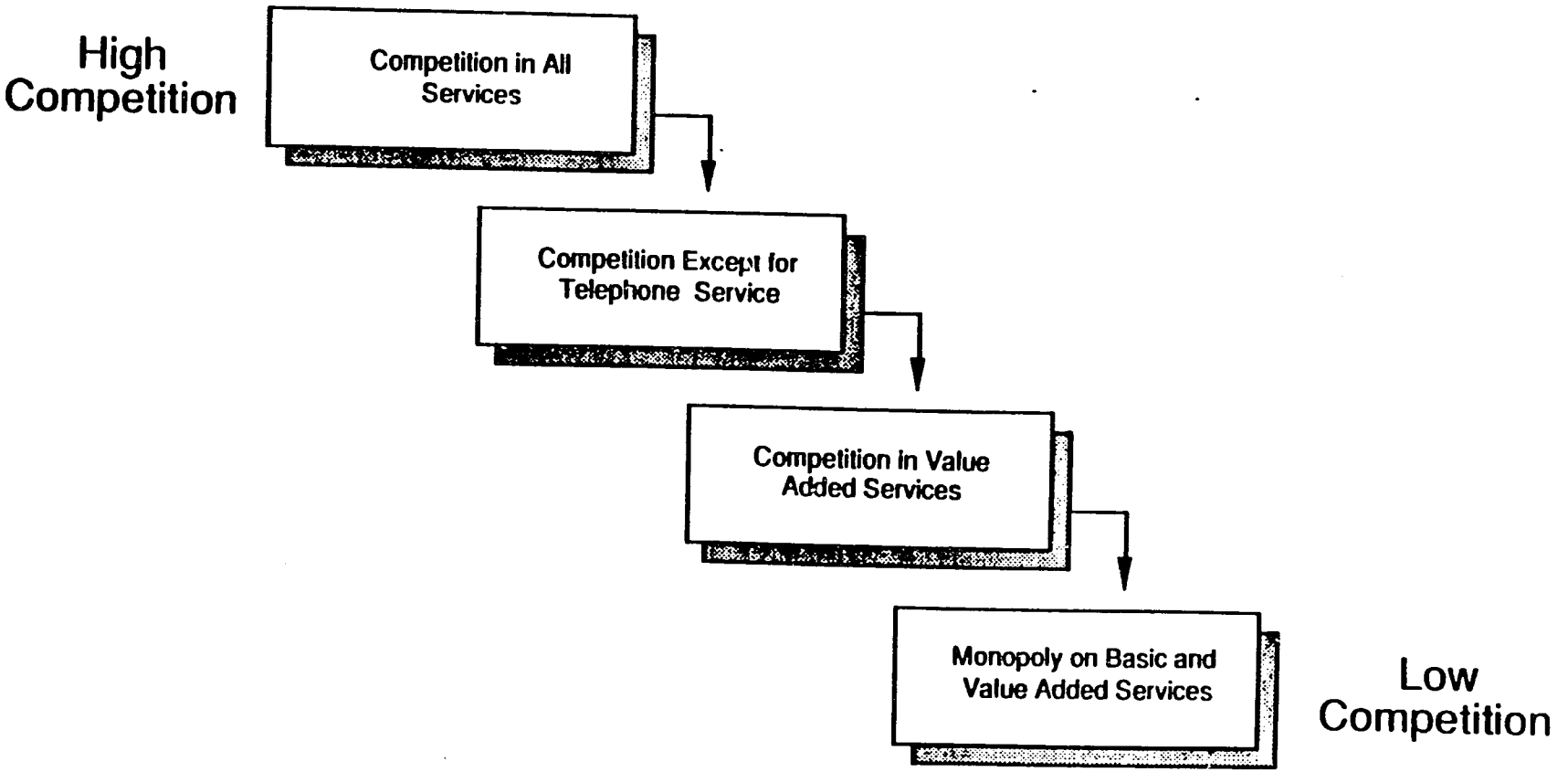
Models of Competition in Telecommunications



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Experience of Industrialized Countries -- United States

Form of Competition	• Divestiture of AT&T (long distance) from RBOCs (local service) • Provisions for new entrants for enhanced services, equipment, long distance
Results of Competition	• Elimination of cross-subsidies between local service and long distance • Lower customer rates for long distance • Higher customer rates for local service • Need for strong regulation at local service level

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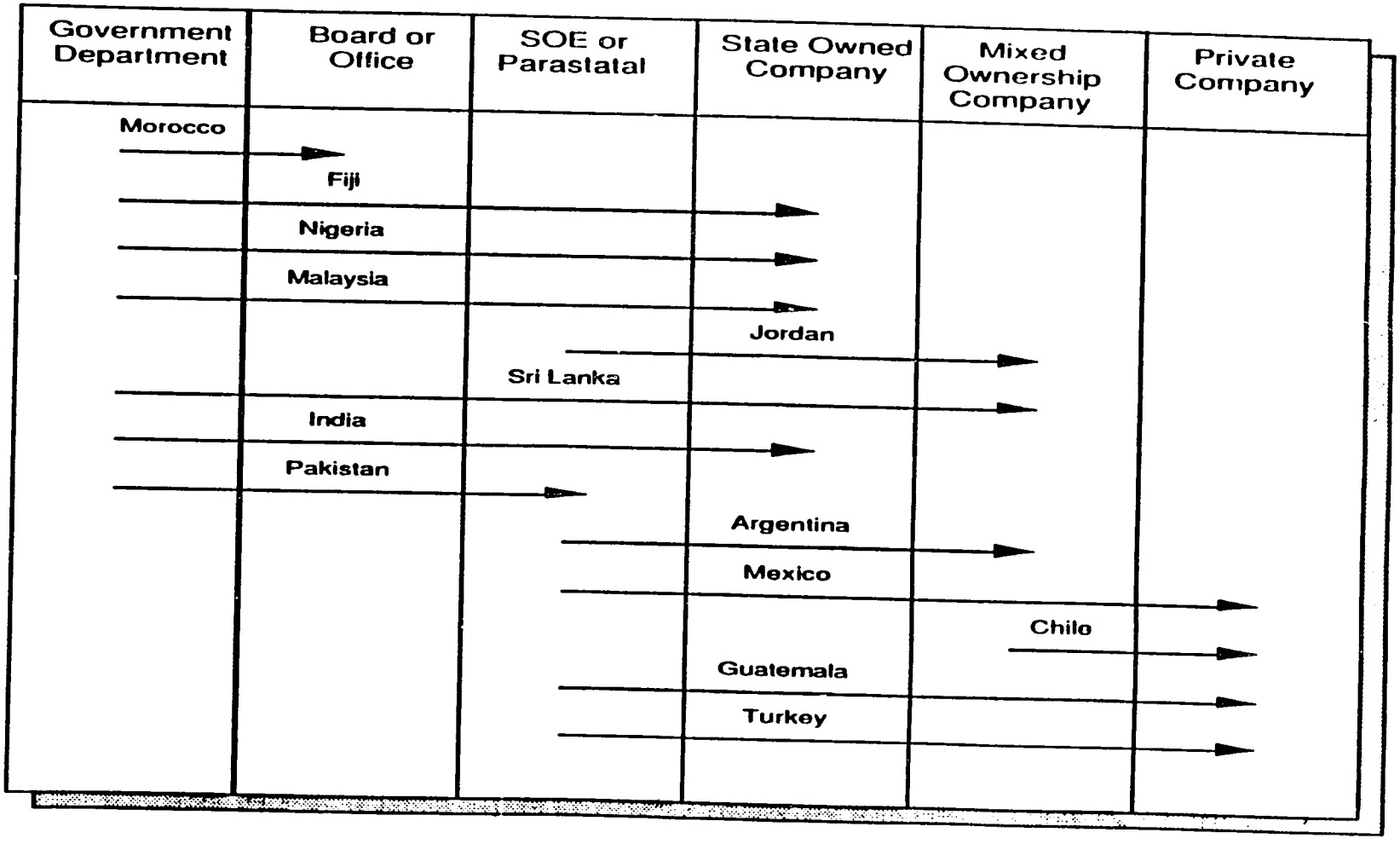
Movements Towards Privatization in Developing Countries



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Limited Role of Competition in Developing Countries Telecoms Sector

- Limited Role Currently to Encourage Investment
  - Examples
- Expanded Role for Competition as Infrastructure Develops
  - Examples

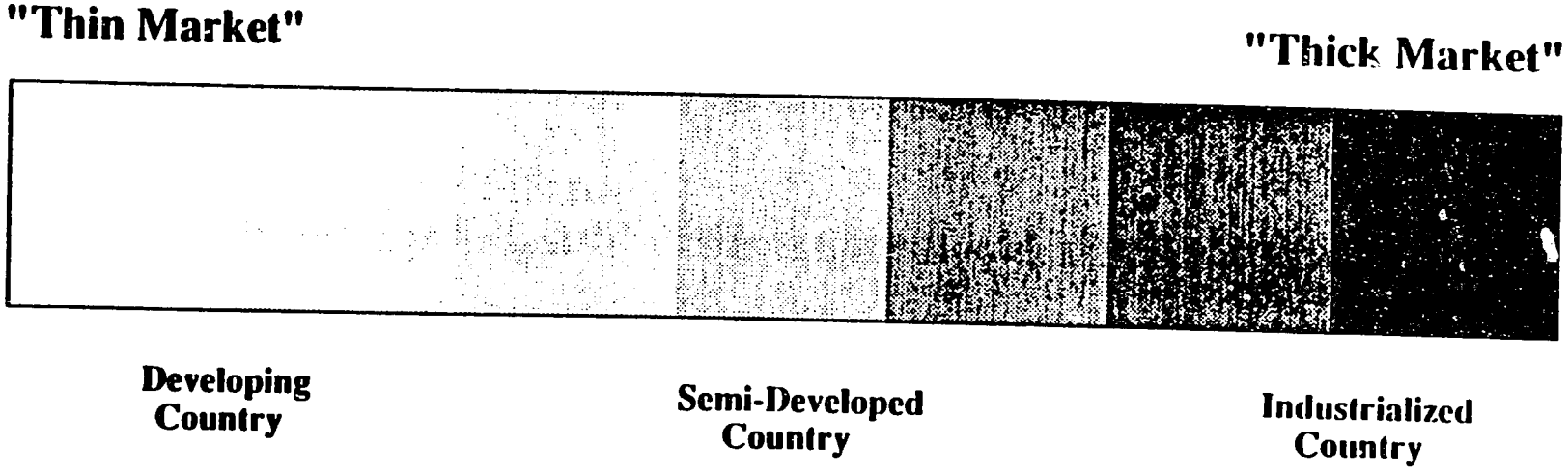
Competition In the Mexican Telecommunication Sector

- TELMEX privatized in 1990
- Monopoly for basic services for six years, after which competition will be allowed in long distance services
- Monopoly on local service until 2026
- Challenge facing TELMEX to upgrade domestic network without enjoying a monopoly in long-distance services.

Competition In the Chilean Telecommunications Sector

- CTC privatized in 1987 - local services
- ENTEL privatized in 1989 - long-distance services
- Increasing competition between CTC and ENTEL - entry into each others' markets
- Additional competition in long-distance services from Telex-Chile
- Competition in cellular services in two major population centers

Sustainability of Competition



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Regulation Under Competition

- Competition Does Not Replace Regulation Totally
- Competition Requires Regulatory Framework to Detect Cross-Subsidization
- Effective Competition Requires "Level Regulatory Playing Field"

Telecommunications Restructuring in Africa: Case Studies

by: *Judith O'Neill, Esq., International Telecommunications Partner*
Steptoe & Johnson

TELECOM RESTRUCTURING IN AFRICA

Restructuring and development of African telecommunications is crucial to national economic development:

- on the national level, it will provide the requisite infrastructure for economic development and will move toward universal service. In terms of network penetration, Africa lags behind much of the developing world, with the average continental penetration rate estimated to be below 0.1 line per 100 inhabitants. Estimates vary and recent, reliable statistics are not readily available. However, ITU 1980 data set the average range at around 0.4 - 0.6 lines per 100 inhabitants. More recent World Bank estimates give an even lower number of Direct Exchange Lines in Sub-Saharan Africa: 0.3 lines. If the ITU average is broken down by country, even lower penetration rates are revealed: Mali and Rwanda (0.06 lines); Nigeria and Burkina Faso (0.07 lines); Zaire, Niger and Central African Republic (0.1 lines). 25 African countries have a network of between 5,000 and 25,000 lines while only five have more than 50,000 lines. Even assuming substantial improvement in the last decade, penetration is still considerably under the regional average of Latin America, for example, at 7 telephones per 100 inhabitants before the wide-spread restructuring and privatization programmes.

- it will prevent the marginalization of rural areas. The discrepancy in penetration between rural and urban areas may be even more striking than the low overall penetration rates; in 1978-80, rural penetration was at 0.006 in Zambia, 0.08 in Angola, 0.04 in Burundi, 0.07 in Cameroon, 0.03 in Senegal, 0.04 in Sudan. The discrepancy becomes even more important considering that those areas are inhabited by the largest percentage of the African population (rural African population for 2000 as projected by ITU: 252 million).
- on the international level, it will permit inter-African communication and the development of a pan-African identity; it will also relieve African countries of some of the network dependence on former colonial powers. Indeed, some African countries have been heavily relying for their international telecommunications on links to former colonial powers (as opposed to inter-African links) or on INTELSAT.

I. THE STRUCTURE OF INTER-AFRICAN COMMUNICATIONS AS A DERIVATIVE OF DOMESTIC POLICIES

To tackle these problems, several studies and international conferences on African communications have been conducted under the auspices of international or inter-African organizations since the early 1960s. Examples of initiatives that have met with varying degrees of success include the African sub-committee of the ITU, which has spearheaded the PANAFTEL network, INTELSAT, UNESCO (which sponsored AFRICOM, the Inter-Governmental Conference of UNESCO on the politics of

communications in Africa in 1980), the Conference of African Ministers of Transport, Communications and Planning (which created the AFROSAT initiative), more recently the initiation of RASCOM (Regional African System of Communications by Satellite), supported among other countries by Nigeria, which is oriented towards a national satellite system integrated within the regional system.

Many of these efforts (particularly the early ones) have had relatively little practical result, partly because some of them have been inspired by conflicting views on the structure of inter-African communications. For example, PANAFTEL was intended to consist mainly of large or medium capacity terrestrial radio connections, combined with coaxial cables. INTELSAT's approach, on the other hand, was naturally conceived to encourage use of INTELSAT satellites but also to allow combinations of terrestrial and satellite communications through the construction of INTELSAT earth stations in 36 African countries.

More importantly, any solutions that may stem from such efforts must necessarily be partial:

On the one hand, it is indeed essential that African countries coordinate their telecommunications policies, that they agree to develop compatible systems and that they establish a strong and unified voice in ITU and WARC regarding international allocation of frequencies and orbital slots. Moreover, the development of inter-African satellite systems independent of the INTELSAT monopoly appears to be a salutary goal, consistent also with recent U.S. developments on satellite law and policy.

On the other hand, however, a solution to the problems outlined above cannot be dictated from above by fiat; rather, the improvement of Africa's low penetration and call completion rates and attainment of the fundamental goal of universal service should be pursued primarily at the national level, by restructuring, liberalization and the invitation of private capital into the domestic telecommunications sector. Such domestic restructurings (which may in the long term relegate decisions on the structure of the domestic sectors to market forces) should eventually drive the decisions on the structure of inter-African communications. Accordingly, the structure of inter-African communications should be examined in the context of planned domestic restructurings.

> Example: Because of the morphological peculiarities of the African terrain and the high cost of cabling large chunks of essentially virgin territory, a satellite system (whether geostationary or Low-Earth-Orbit) may be much cheaper than terrestrial networks. Such a system may be interconnected with the public switched network, but also capable of operating independently of the public network. However, to reach a decision on the rules governing such a system, domestic considerations must also be taken into account. These considerations may include, among others, the need to preserve the value of a country's switched carrier and make it attractive to investors. This may require restrictions on bypassing the switched carrier by satellite or cellular technologies. International satellite service providers may agree to interconnect with the switched system of a country only through gateways jointly established with that country's carrier. Or for certain services, by-pass may be perfectly appropriate. Its appropriateness, however, can only be based on sensible domestic policy.

Thus the African Telecommunications Development Conference of Harare, jointly organized by the ITU, the Organization of African Unity, the Economic

Commission for Africa, the African Development Bank and the Panafrican Telecommunications Union, held in December 1990, soundly determined that important policy and structural issues need to be resolved before expansion of African telecommunications can be successfully undertaken. Several efforts of the U.S. Agency for International Development and the World Bank also have been oriented in the same direction.

II. DOMESTIC RESTRUCTURINGS

Restructuring efforts are now underway in many African countries. They range: from separation of the commercial enterprise from the government; through application of commercial criteria to the operation of the PTT; to privatization and partial opening to competition. Thus in Burkina Faso, upon decision of the Council of Ministers, the law of February 19, 1987 created ONATEL as a public concern with a commercial function, charged with development of the national and international network. In Mali, the law of February 27, 1990 similarly created SOTELMA. In Kenya, the Kenya Posts and Telecommunications Corporation Act of 1977 creates KPTC as the postal and telecommunications monopoly, separate from the Minister. In Gambia, Gambia Telecoms Co. (GAMTEL) was created in 1984 as a company under the 1955 Companies Act, 99% owned by the State and 1% by private shareholders. GAMTEL, a worthwhile study for African telecommunications restructurings in several respects, took over the provision of domestic service (plus service between Gambia and Senegal) from Gambia's Department of Telecommunications and the provision of international service

from Cable & Wireless. In the Côte d'Ivoire, the process of privatizing the state-owned telecommunications operator is underway under the auspices of the World Bank and an asset sale is currently contemplated. Ghana has privatized part of its operations, and consideration is given to allowing competition in certain services.

In mapping out the steps of a telecommunications restructuring, especially in light of African peculiarities, the following considerations are fundamental:

1. **Separation of telecommunications from the post office.** In several African countries (as, for example, in Kenya under the KPTC Act) postal and telecommunications services are provided by the same organization. Owing to the complete dissimilarity between the two operations, their cohabitation is apt to hamper telecom restructuring and may also allow hard-to-detect cross-subsidizing.

2. **Separation of commercial from regulatory functions.** It is important to understand that separation of the commercial enterprise from the government is not enough. The commercial functions must also exclusively reside in the operation and be separated from the regulatory functions belonging to the regulator. Commercial and regulatory functions currently tend to overlap. In Kenya, for example, grant of additional licenses to provide telecommunications services is entrusted to the Managing Director of KPTC, currently the exclusive licensee. This creates an obvious conflict of interest, as the Managing Director will be reluctant to undermine the monopoly of KPTC by licensing another provider. Conversely, the composition of the Board of Directors includes the Permanent Secretary of the Ministry responsible for communications, and the Permanent Secretary of the Treasury. This may compromise the independence of

the operator from the government. Ideally, the operator should be accountable to the government as to a shareholder for its performance *ex post facto*. It should be subject to *a priori* oversight of the Treasury only to the extent of subsidies or other assistance received from the Treasury, and should otherwise enjoy decision-making independence.

In Gambia, on the other hand, the independence of GAMTEL from the government is relatively well safeguarded: although the composition of the Administrative Council includes not only GAMTEL's management, but also representation of the Ministries of Finance and Economy, Public Works and Telecommunications and of the National Office of Investment, the Council is a non-executive body under the terms of the contract-program between GAMTEL and the Government. The Managing Director has been given "free discretion to act."

The statute enabling the telecommunications carrier as a separate entity, or the concession agreement between the government and the carrier, should also clearly require that entity to apply commercial criteria in its decision making. The agreement could also set carefully determined targets for the performance of the new entity, attaching rewards for the management for out-performing these targets and sanctions for failure to attain them. *See, e.g.* the (World Bank-sponsored) contract-program between GAMTEL and the government.

3. **Subsidies.** Under strict commercial criteria for economic viability, a service should be discontinued (or not provided in the first place) when the costs expected to be efficiently incurred in the long term to provide the service exceed the revenues expected to be generated from it. Discontinuation of service, however, would

contravene the fundamental principle of universal service and threaten public welfare. To make universal service possible a subsidy is often necessary. There are various potential sources of subsidies. Some may be permissible, others not, depending on the national policy for provision of telecommunications services. The key issue is that subsidies which exist should be identifiable, conrollable and controlled.

4. **Independent Regulator.** Neither Kenya nor Gambia has instituted a telecommunications regulatory body independent of the Telecommunications Ministry and the government. Such segregation is necessary: among other reasons, the Regulator may be required to adjudicate disputes between the Corporation and the government. Such disputes may arise from the need to determine the amount of subsidy payable from the government to the Corporation to sustain unprofitable services whose continuation of below-cost rates is deemed necessary by the government. The Regulator's powers should, to the extent possible, be confined to *ex post* oversight of the Corporation's conduct. The Regulator should be invested with such safeguards of independence as would make it an impartial judge of disputes to which the government is a party, and its decisions should be reviewable by the courts.

5. **Rate regulation.** A careful balance must be struck in the area of rates: the power to set them in the first instance should squarely be with the Corporation's management (as is the case with GAMTEL, which is progressively instituting a cost-based tariffing system to be completed by 2000). On the other hand, for as long as the Corporation still enjoys a monopoly or market dominance, the Corporation should file its rates with the Regulator in tariffs, and the Regulator should have the power to review

the rates on the basis of an articulated methodology. This distinction between *a priori* setting and *ex post* review of rates is not drawn either in Kenya or in Gambia. Under §§11 and 12 of the KPTC Act, for example, KPTC's Board may approve any "minor alteration" in tariffs, whereas the Minister may approve any "major alteration." The power of the Minister to grant or withhold *a priori* approvals should preferably be removed. KPTC's management shaould be empowered to make all changes in tariffs, minor and major, and the government (or preferably the independent regulator) should be confined to *ex post* oversight.

6. **Universal service.** The statute governing the telecommunications sector should unequivocally establish the fundamental principle of universal service. This is particularly important in Africa, given the discrepancy in penetration between rural and urban areas. The KPTC Act is an example of a law failing to enunciate this principle. Indeed, Section 8(c)(ii) of the Act allows KPTC's Board to

> afford priority to any class of person in the installation of telephone apparatus where the circumstances in the opinion of the Managing Director do not permit the installation of such apparatus in the case of all persons making application therefor.

7. **Rural service.** This all-important issue has been and will be addressed by several erudite speakers. However, Gambia's approach to the institution of rural service is worth briefly examining. In the three-phase program of network modernization and expansion undertaken by GAMTEL, expansion to rural zones was the third and last phase. The following rationale militates in favor of this sequence: development of the telecom infrastructure in the urban zones is necessary for the

operator to avail itself of the high demand for telecommunications by such users as businesses and diplomatic representations in those zones. In this way, the operator will secure the profitable exploitation that will finance further expansion and modernization. However, this sequence should be seen as a realistic choice, not as a "priority" given to urban areas in contravention of the principle of universal service. In Gambia's case, the objective of Phase III, consistent with that principle, was to ensure the same quality of service for rural as for urban zones. Indeed, the infrastructure contemplated for rural zones included an optic fiber cable system for part of the network, and digital networks based on VHF/UHF radio interconnections for another part. Also, to tackle the problem of low penetration in rural areas combined with the low average income of the rural population, Phase III envisaged GAMTEL secondary offices, dispersed geographically so as to give each Gambian in the rural areas easy access to a telephone. As a result of the implementation of Phase III, the number of subscribers was expected to increase from 400 to 2500. Consistent with the principle on subsidies touched upon earlier, the Gambian government acknowledged that the operation of the rural network, while necessary, cannot by its nature be commercially viable for the first two or three years, and undertook to finance it in part. This financing was effected, among other things, by the extension of a temporary tax exemption and by giving GAMTEL the right to withhold the dividends that would be due the government as the 99% shareholder for a certain period of time (until 1993-94).

Restructuring Initiatives in Zimbabwe

by: *Sarah L. Kachingwe, Permanent Secretary, Ministry of Information, Posts, & Telecommunications, Zimbabwe*

CASE STUDY ON RESTRUCTURING INITIATIVE UNDER WAY IN ZIMBABWE POSTS AND TELECOMMUNICATION

1. Preamble

1.1 The Post and Telecommunications Corporation (P.T.C.) was created as a Parastatal organisation by Act of Parliament in July 1970. The sponsoring Government Ministry is the Ministry of Information, Posts and Telecommunications (M.I.P.T.). The P.T.C. is managed by a Board appointed by the Minister of Information, Posts and Telecommunications. The Chief Executive Officer of Posts and Telecommunication Corporation is the Postmaster-General, who is an ex-officio member of the P.T.C. Board.

1.2 During the period 1980 to 1990 the management of P.T.C. and of course the Ministry of Information, Posts and Telecommunications continuously evaluated the performance of the Corporation. Major issues that were found to be constraints in the operation of the Corporation at the end of each fiscal year were shortage of foreign currency, inadequate financing of external loans, protracted tendering and approval process, the persistent shortage of manpower in certain specialities, shortage of operation vehicles and shortages of essential materials. These major constraints resulted in poor performance of the Corporation.

1.3 Annual financial results of the P.T.C. showed that the Postal Sector operations produced deficits and the Telecommunications Sector operations surplus. Therefore this meant that the Telecommunications Sector subsidised the Postal operations on an annual basis. The position is still going on.

2. Reform Program

2.1 The Government of Zimbabwe has as a part of its economic structural adjustment programme (ESAP), launched a programme of reforms in the public enterprise sector with a view to reducing the aggregate financial deficit in the sector. P.T.C. was identified as one of the public enterprises included in the programme.

2.2 Due to the launching of the economic structural adjustment programme by the Zimbabwe Government the World Bank Mission consisting of Senior Telecommunications experts visited Zimbabwe in 1991 to evaluate the performance of the P.T.C. from 1980 to 1990. The performance evaluation exercise on the Corporation was effected with assistance of senior officials of the Ministries of Information, Posts and Telecommunications and Finance and Posts and Telecommunications Corporation. The evaluation was executed to enable sector reforms to be brought about in the Posts and Telecommunications Corporation.

2.3 The World Bank Mission produced an Aide-Memoire at the end of its evaluation.

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The major issues that were identified were the same as thos outlined in paragraph 1.2 and 1.3 above which had alread been pinpointed by the Ministry of Information, Posts an Telecommunications and the P.T.C., namely poor quality o service, large unsatisfied demand weakness in manpower development and training, poor financial performance, lo tariffs, lack of an appropriate sector policy framework goals and strategy to enable rational development of th sector and weaknesses in P.T.C.'s organisation an development. A meeting was held and attended by al interested parties namely senior officials of the Ministr of Finance, Ministry of Information, Posts an Telecommunication (MIPT) and Posts and Telecommunication Corporation (PTC).

All the interested parties at the meeting agreed on th major issues identified and that there was need for reform to be effected in the Postal and Telecommunication Sectors. Government realised also that th Telecommunications Sector is expected to becom increasingly a sector vital to the success of the Economi Structural Adjustment Programme (ESAP). The Governmen therefore decided to review the policy and legal framewor under which the P.T.C. provides services on a monopolisti basis with a view to determine how additional resource could be realised through providing the necessar motivation for efficiency enhancement and mobilizing resources through the private sector.

2.4 In line with the Government's intention to reform the Public Enterprise sector entitled "A Framework for Economic Refor (1991 - 1995)", the Government has decided to undertak certain actions directed towards institutional changes i the telecommunications and postal sectors to enhance th efficiency of the sectors and to allow privat participation in the delivery of services. These action include:

(a) separation of postal from telecommunication services;

(b) preparation of sector policies for the operation an development of the two sectors on a separate basis;

(c) preparation of new statutes that will ensure that the sectors will operate in a competitive environment on full commercial basis;

(d) establishment of the necessary regulatory framework that will determine the rules for competition and monitor the observation of these rules; and

(e) development of principles and procedures to guide formulation and implementation of appropriate tariff structures and levels.

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2.5 During 1992 the Ministry of Information, Posts and Telecommunication in consultation with the World Bank produced a letter of invitation for consultancy services, a tender specification document to recruit a consultant firm to assist in the implementation of the action plan outlined in paragraph 2.4 above. Seven consultancy firms of international reputation with relevant experience in the restructuring of Posts and Telecommunications sectors particularly in developing countries were approached to offer their services in accordance with the tender specification documents. The identified firms responded and the process of selecting a consultancy firm to execute the studies is in progress.

3. Action by the Government of Zimbabwe

3.1 In line with the structural adjustment programme the Ministry of Information, Posts and Telecommunications recognises the need for the country to have telecommunications and postal policies. Such policies should ensure that the telecommunication and postal sectors operate on commercial basis which takes into account the social responsibility to expand into unserviced remote areas. To achieve this it is necessary for Government to accord the corporation the necessary autonomy under the guide of Regulatory Body.

3.2 Autonomy

P.T.C. should be allowed to take management decision in the context of broadly defined parameters. There will have to be spelt out in a performance contract to be signed between Government and P.T.C. The performance contract would also address the issue of financing the Corporation including decisions relative to the approval of the Capital Budgets and the programmes related thereto.

3.3 Tariffs

There is need for some type of automatic adjustment of tariffs to enable P.T.C. to respond to changes in the demand for goods and services. The study to be carried out by a team of consultants will address this particular issue and make specific recommendation to Government. The tariff system should be restructured and designed in such a manner that it will enable and ensure that P.T.C. operates as close as possible on commercial lines with social developmental responsibility.

3.4 The Regulatory Body

The establishment of a Regulatory Body will be an integral part of a Telecommunication and postal policies. The consultants will also make recommendations on the framework of a regulatory body which will administer the chosen policies including tariff implementation.

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3.5 Degree of Competition

The Ministry of Information, Posts and Telecommunicati recommends commercialisation and not privatisation of Corporation and recognises that there are cert activities which can best be done by the private sector joint ventures between P.T.C. and private sector fi subject to continual reviews.

3.6 Provision of services in rural areas

Telecommunication and postal policies will have to addre particularly the provision of Telecommunications and post development in rural areas. Such policies will ensure th telecommunications and postal development is safeguard against being underfinanced. To achieve these goals, t policies will incorporate provisions for a certa percentage of the G D P per year to ensure rur development.

4. Action by P.T.C

4.1 The P.T.C has already sub-contracted to the private sect some of the maintenance/repairs of vehicles. The P.T. sub-contracts all construction work of all function buildings such as exchanges, Post Offices etc, and maj maintenance works.

4.2 The P.T.C. structure provides for a Deputy Postmaster General (Telephone Planning and Manufacturing) as the tea leader for telecom projects, supported by engineers a project managers.

4.3 The agreed number of consultants will be hired when the World Bank loan has been signed.

4.4 The P.T.C. has on-going training programmes for technica and administrative staff.

4.5 An implementation schedule will be in place before th project is implemented.

Prepared by S.L. Kachingwe
Permanent Secretary for Ministry of Information,
Posts and Telecommunications.
The Government of the Republic of Zimbabwe. HARARE.
7th January 1993.

BEST AVAILABLE DOCUMENT

Restructuring Initiatives in South Africa

by: *B. A. Bets, Managing Director, Mobile Communications*
Telkom, S.A. Ltd.

COMMERCIALISATION OF TELECOMMUNICATION SERVICES IN SOUTH AFRICA WITH SPECIFIC REFERENCE TO THE NATIONAL OPERATOR, TELKOM SA LIMITED

by

Ben Bets
Managing Director
Mobile Communications
Telkom

1.0 INTRODUCTION

1.1 In the first instance I would like to express my appreciation for this opportunity to represent Telkom at this Southern African conference. The fundamental changes that are taking place in our sub-continent are creating new and exciting, as well as difficult, challenges that will require increased co-operation in the Southern African context. We in Telkom SA are committed to these challenges and as indicated by our mission statement are dedicated to play an important role in this regard.

1.2 I would like to address some of the issues related to the commercialisation of telecommunication services in South Africa in the course of my talk this afternoon. After a few introductory remarks on the legal status that existed before the formation of Telkom SA Ltd on 1 October 1991 I will highlight the most important issues that have dictated this major restructuring. I will than address the role and issues that will have to be addressed by the regulatory body, before turning to some of the issues facing the new Telkom company.

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1.3 It was Thomas Jefferson, 3rd President of the United States of America who once said:

> I am not an advocate for frequent changes in laws and constitutions, but laws and institutions must go hand in hand with the progress of the human mind. As that becomes more developed, more enlightened, as new discoveries are made, new truths discovered and manners and opinions change, with the change of circumstances, institutions must advance to keep pace with the times.

The answer why telecommunication services had to be commercialised must therefore be found in the changing environment and in particular in the political, economic, technological and consumer issues impacting on the old Department of Posts and Telecommunications.

2.0 LEGAL FRAMEWORK PRIOR TO COMMERCIALISATION

2.1 It is important to realise that the need for change has not appeared overnight, but apart from a natural resistance to change the transformation of a State department is closely interlinked to the political processes and can therefore only take place once politicians conclude that changes are indeed required. Such changes are therefore often introduced later than circumstances actually dictated. Under such circumstances the commercialised business is expected to adapt virtually overnight which is obviously not possible.

2.2 The legal framework that governed the provision of postal and telecommunication services was introduced during the late sixties when the Department of Post and Telecommunications obtained independence from the South African Treasury and the Commission for Administration. This independence was a necessary evolutionary step to ensure the continued provision of the necessary postal and telecommunication infrastructures. Although the Post Office Act, which governed the provision of these services, did stipulate that the affairs of the Department must be run on business lines, this

objective was never been fully realised mainly due to the lack of the disciplines of a normal business.

2.3 Parliamentary control has its shortcomings in the sense that no business can be properly supervised if its performance is only subjected annually to evaluation and scrutiny. In a private business a Board of Directors normally performs, at monthly intervals, a much more detailed supervisory function. This not only facilitates a more intimate knowledge of the business in question, but also results in increased interaction with the management team to the benefit of the organisation. Direct Parliamentary control on the other hand tends to concentrate more on the regularity of expenditure than the actual effective utilisation of the resources employed by the business. This can not adequately serve the requirements of the dynamic business environment in which a telecommunications operator has to function these days.

2.4 To illustrate that this is not a sudden realisation it is significant to note that as long ago as 1935 the then Postmaster General, Mr HJ Lenton, stated in his annual report that there are many who believe that the Post Office cannot properly function as a business in the restricted atmosphere of a government department. It is further noteworthy that this realisation in South Africa was not only preceded by the restructuring of the traditional PTT's in Europe and on other continents, but also in virtually all our neighbouring countries, i.e. Zimbabwe, Mozambique, Lesotho, Botswana and Swaziland.

3.0 THE NEED FOR RESTRUCTURING

3.1 The rationale behind the separation and transformation of the Department of Posts and Telecommunications into two state-owned companies, i.e. SA Post Office Ltd and Telkom SA Ltd was basically twofold. In the first instance national economic priorities dictate that a more prosperous future for all South Africans be created. As resources are by definition limited, it is in the national interest that all resources are optimally utilised. The State's ownership of large public entities, therefore, dictates optimum functioning of these businesses.

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3.2 Secondly, technological change and the ever-growing critical role communications play in a modern society imply continual change and more sophisticated service needs, which increasingly can be met through alternative means to the traditional administrative provision of services. Competition will therefore constitute a serious threat to a national operator in the years to come. This can already be clearly illustrated by the tremendous growth in, for example, facsimile services with the resultant decline in our telex service.

3.3 It is interesting to note that the number of telex services has declined from approximately 35 000 to 10 600 during the last five years as a direct result of facsimile. Although one can argue that this is an isolated case, it does indicate the sudden decline that can be effected once a more convenient and sophisticated alternative is available. A lesson, no doubt, for the future. It is evident that especially the more profitable services provided by National Operators are being threatened on a global scale. If this trend would have been allowed to continue unabated it would, to the detriment of the provision of basic services, have limited Telkom's ability to continue investing in low income earning services as the sources of cross-subsidization would be drying up. Timely action was therefore required.

3.4 It is also clear that there was and still is a strong feeling that the unnecessary protection of monopolies and limitation of competition is actually not in the best interest of the users of telecommunication services or the economy in general, as there is no real incentive for monopolies to function at optimum effectiveness. In an increasingly competitive environment it is also essential that competition be fair and this requires all parties to be subjected to the same laws and regulations. Considering these factors as well as the inherent differences of the postal and telecommunication businesses a major restructuring was initiated to:

a) separate the operational and regulatory roles previously performed by the Department of Posts and Telecommunications; and at the same time

b) separate the operation of the postal and telecommunication service and to transform these into state-owned public entities under the Companies Act.

3.5 These steps were considered as the only effective and proven way of building better postal and telecommunication businesses, as organisations exposed to more competition and wider user choice have to provide quality service to retain or even increase market share. Job security can in the final analysis only be achieved through satisfied customers and not by entrenching monopolistic services and practices which tend to lead to less than optimum resource usage, both capital and human in nature.

4.0 REGULATORY BODY

4.1 The Department of Posts and Telecommunications was w.e.f. 1 October 1991 divested of its operational role of providing postal and telecommunication services and charged with the task of regulator in the field of telecommunications and radio. This was achieved by transferring the regulatory functions to the "new" department in terms of the Post Office Act. It should, however, only be regarded as a first step as an independent investigation was recently conducted by the consulting firm of Coopers and Lybrandt of London into the regulatory issues and the best way that these could be addressed in future. It is Telkom's view that the regulatory function must be performed in such a way that the best interest of South Africa are served and in view of the many conflicting requirements of the various stakeholders this will indeed be a daunting task.

2.4

4.2 Some of the aspects that a new regulatory body will have to consider are:

a) licensing of all communications operations, including those of Telkom and Transnet, who over the years have developed a large private telecommunication network in terms of legislation that governed the railways and harbours administration;

b) enforcing minimum standards laid down for service providers;

c) adherence to international standards and service levels;

d) fair competition amongst service providers;

e) maintaining a stable environment in the communications industry in South Africa which will attract investment; and

f) ensuring the viability of the provision of communication services to all the segments of the South African population in order that telephone penetration levels can be improved.

4.3 To find appropriate answers to these issues is a difficult task. They do, however, form the basis of discussion all over the world and we can therefore learn from experience elsewhere. In particular the European Economic Committee has been very active in this field and as a number of their members can to some extend also be regarded as developing countries it is worthwhile to note some of their points of view:

a) the role of the regulator and the market participant should be split; and

b) exclusive provision of basic telephony and the network infrastructure can be maintained, but competition should be allowed in all non-voice services and in the terminal market.

4.4 Telecommunications world-wide is characterised by the cross-subsidy of residential by business clients and local by long-distance calls. In many developed countries tariffs are being balanced to eliminate this subsidisation. The socio-economic realities in South Africa as a developing country and the lack of adequate telephone services in the under-developed parts of our country will, however, continue to demand subsidisation in one form or another if the financial viability of the provider of these services is not to be seriously undermined. Deregulation will therefore have to be tackled with the necessary caution and circumspection to prevent pure cream skimming. Investment decisions based purely on economical ground would by definition deny many people access to a telephone, which is by many held as a prerequisite of economic growth. On the other hand a policy of no deregulation would also not be in South Africa's interest, especially the business sector. The views expressed by a spokesman for the Directorate of Telecommunications Policy of the Commission of the European Communities are of interest in this regard:

"Reform is unavoidable and cannot be postponed. Without it, it would be impossible to make the fundamental changes that are necessitated by technology. It is primarily in the areas of terminals and services that should be opened up to more competition, failing which the result would

be serious damage on the macroeconomic level, since opportunities for growth and employment would have been allowed to slip away."

It is clear that a balance between the many conflicting requirements will have to be found to optimally suit local conditions and requirements. In particular the inherent differences in the needs of the first and third world components in our economy dictate that the rules devised in for example Europe can not simply be applied, but at the same time it must be realised that the sophisticated needs of businesses must be met to ensure economic competitiveness. The lobbying power of business and potential competitors are, however, much more powerful than that of the ordinary person in the street and this in itself can easily tilt the scales more in the favour of purely commercial interests which would actually not be in the national interest. What is, however, even at this stage clear is that the regulator will not be able to satisfy all the various interest groups.

5.0 COMPANY STRUCTURE

5.1 In the first instance I would like to stress that although the Telkom is a public company in terms of the Companies Act, the State remains the only shareholder. Privatisation is not possible in terms of present legislation. Commercialisation without ultimate privatisation can, however, lead to a number of problems. In particular a commercialised Telkom will sooner or later have to consider expanding its operation in telecommunication areas not presently or inadequately served. This can easily lead to an outcry from competitors and economists of unfair competition or the expansion of the State's share of the economy. In actual fact the latter sentiment has already raised its ugly head. Without the

ability to grow in new markets and new technologies Telkom would clearly be stifled in its effort to truly commercialise its operations which in turn must inevitably lead to the demotivation of its staff. This is not a far-fetched possibility but something that has already been experienced by for example the Post Office in the United Kingdom. In this regard it is unfortunate that the principles that should be applied to a commercialised business are sometimes neglected once other political pressures are experienced.

5.2 Telkom became a public company on 1 October 1991 and is subject to all the laws generally applicable to other companies in the private sector. The roles of the Board of Directors and the Management Board are important as they define the two-tier structure that was introduced.

5.3 The Board of Directors comprises of non-executive directors, with the exception of the Managing Director, and is appointed by the Government as the only shareholder. The directors are responsible for the strategic direction and policy of Telkom and have to approve the strategic plan, a five year business plan and the operating and capital budgets. In addition they fulfil a vital supervisory role to monitor that the company is managed in accordance with these plans and policies. The Board of Directors is also responsible for the appointment of the members of the Management Board. In Telkom's case the Government has appointed prominent business men to the Board to bring the necessary business acumen to the overall management of the company.

5.4 The Management Board is tasked with the management of Telkom under the supervision and control of the Managing Director and according to the strategies, policies and plans approved by the Board of Directors. They may

therefore act on all issues not reserved for the Board of Directors or the company in general meeting. In terms of the Company's Act and common law the duties of directors are therefore equally applicable to the members of the Management Board as to the directors of the company. As such they legally have an individual and joint responsibility to manage the business in the best interest of Telkom.

5.5 As part of commercialising the business the organisation structure had to be thoroughly revised to move away from the centralised functional structure of the past and to give prominence to marketing as a vital ingredient. In the process the number of management levels were reduced from 8 to 5 and a clear distinction has been made between line and staff functions. The role of staff functions, which in the past dominated decision making in the organisation on functional lines, have been redefined to ensure that their primary function is to support the operational divisions. As such they are responsible for the formulation of overall policies and frameworks, as well as providing advice, counsel, guidance and assistance based on specialised knowledge. They will also appraise performance and alert line management as and when required.

6.0 KEY BUSINESS ISSUES FOR TELKOM

6.1 As part of the essential transformation from Government Department to public company some important duties and limitations were placed on or transferred to Telkom:

a) the continued provision of non-profitable services with the specific aim to increase the telephone penetration in South Africa;

b) a very unsatisfactory debt-equity ratio of nearly three to one;

c) a clear undertaking to Telkom staff that they would not have to fear less job security as a result of commercialisation; and

d) the prohibition on the sale of shares in Telkom.

6.2 This results amongst others in that 83% of Telkom's expenditure can for all practical purposes be regarded as fixed. A cost breakdown illustrates why the cost structure of the company cannot be changed in the short term, unless either staff numbers are significantly reduced or equity is injected in the company in one or other form to reduce the debt burden.

6.3 On the income side the company is largely dependent on the income generated by corporate clients. Approximately 65% of Telkom's income is generated by less than 10% of the clients, which clearly illustrates the cross-subsidization that is part of the tariff structure. It is further interesting to note that 77% of all calls can be regarded as local calls but that these generate only 25% of revenue. This dependence on corporate clients and long distance (including international) calls to sustain the financial viability of Telkom dictates that next to the need to expand and provide basic service to the developing communities and areas, the business sector's needs for more sophisticated and more reliable services will also have to be addressed. The retention of a major market share in these services is vital to enable Telkom to be able to address improved access

to telephone services for all South Africans. Limitations on Telkom to address the more sophisticated markets do therefore make no economic sense unless Government would be in the very unlikely financial situation where it could directly subsidise the provision of such services.

6.4 Telkom has identified a number of key strategies that are vital for future success. These are summarised in the motto "Telkom FOR Clients", where the letters in "FOR" each represent a key strategy vital to Telkom's ability to be truly client focused:

6.4.1 Financial health (F)

6.4.1.1 The greater importance of improved return on investment has to be imposed by the application of sound business principles to ensure continued financial viability of the company. This can only be achieved through adjustments in either price, cost, growth rate or asset utilisation or a combination thereof. It is clear that the use of price increases in excess of inflation to achieve this goal would be highly unpopular and unacceptable. Telkom will therefore have to concentrate to a large extend on the other three parameters.

6.4.1.2 Unfortunately growth is very depressed at present as illustrated by the fact that Telkom's income for 1992/93 is now expected to be some Rm 580 under budget. This means that notwithstanding a growth in the number of services as measured by working exchange connections of nearly 5%, call revenue declined sharply in terms of a decrease in the number of call unit per exchange line. This decline,

although it can be partly attributed to the disastrous inheritance from the old Department of a contract to supply so-called premium rate services (087, clearly illustrates the present depressed economy in our country which in itself is a major stumbling block in our ability to contribute to the creation of building a better future for all South Africans.

6.4.1.3 The large debt burden has necessitated Telkom's Board to decide against further borrowing to finance capital expenditure in the normal line of business. Capital expenditure does therefore have to be self-financed and continues to impede Telkom's ability to address many of the pressing issues as well as preparing itself for a competitive situation.

6.4.2 Get organised for the future (O)

6.4.2.1 One of the problems of having been commercialised only recently is that the company not only has to achieve a major shift in corporate culture and revise virtually all systems dealing with clients and finances to satisfy normal business demands, but at the same time also has to adapt to the major changes that are taking place in our country. You will no doubt realise that this represents an enormous task which ideally should have been phased in over a number of years. As if this is not enough it would further appear that Government is also on the point of introducing competition in the very near future. It all appears somewhat unfair that the present management team is in a way punished for the delaying of essential changes that has been practised in the past, but I can assure you that management is committed to steer Telkom on the road of

future survival, growth and success.

6.4.2.2 One of the key corporate values of Telkom is our commitment to providing quality service through client care and meeting their needs first time. This can not be accomplished without a distinct shift in strategic focus from technology to market issues. Traditionally engineering has been one of Telkom's strengths while marketing has played a relatively minor role, which coincides with the findings of the Witte Commission after their investigation of the German Bundespost:

> "by tradition, administrations involved in the operation of services often attach greater importance to technical matters than to sales or customer-oriented activities."

6.4.2.3 To establish a truly market and client orientation within the organisation is one of the major issues that is being addressed as part of our new business approach through various management actions. One of the first actions was the recognition that the corporate clients have to be looked after properly as one cannot afford to loose their business. Client Managers dedicated to the most important corporate clients was therefore introduced and this is already proving to be successful.

6.4.2.4 Another fundamental building block to achieve this required shift in organisation culture is the commitment to the concept of total quality management. As part of this process training has to play a major role and Telkom has embarked on vigourous training programmes to

achieve a more responsive orientation towards clients amongst its staff.

6.4.3 Relevancy in the South Africa of the future (R)

6.4.3.1 It is fully realised in Telkom that success and effectiveness can only be achieved if the needs of the stakeholders in our company can be sufficiently satisfied. It is also clear that it will be impossible to satisfy all these needs as resources are limited and the present economic climate in the country impacts negatively on Telkom's ability to generate the necessary additional investment funds.

6.4.3.2 In the closed environment of a government department stakeholders are often very narrowly defined. As a company we do, however, realise that there are many more important stakeholders whose needs have to be identified and with whom sound dialogue has to be established. This is not always easy as there is still a fair amount of confusion concerning the independence from the Post Office and the Government in general. Over the last year substantial progress has been made in establishing forums with various political players, consumer organisations and the media to mention a few, but a lot of hard work remains as mutual trust through open and honest communication can not be built overnight. These efforts will in fact have to stepped up to achieve the desired involvement and mutual trust that is required in the interests of all concerned.

6.4.3.3 A number of programmes have been launched to address basic problems. One such programme addresses the basic

telecommunication needs of communities that presently do not have access to a telephone. Telkom has embarked on the provision of community services in these instances and plans to install 10 000 such services by 1997 at a rate of 2000 per annum. This is over and above the normal provision of infrastructure and services in more established urban and country residential areas.

6.4.3.4 Sound application of contemporary technology creates new ways to address difficult and often costly service provision problems. This is for example why Telkom favours the GSM technology for mobile communications. It is not to provide those that can afford a mobile telephone with the best service possible, but rather the inherent capabilities of this new technology to be applied in solving the problem of more easy access to the telephone network. By investing in such a profitable service for mainly the business sector it will not only generate the essential additional funds to address Telkom's social responsibility, but at the same time provide an infrastructure that can be exploited as a result of its inherent design.

6.4.3.5 The GSM system can namely differentiate between cardholder, instrument and base station and does therefore open up totally new service concepts that can be exploited to the benefit of also underdeveloped areas and communities in its service area. It can easily support a system of public telephones to clients who need nothing more than the appropriate card. As the system also caters for short messages it can even support the exchange of messages between clients without them even talking to one another. No analogue system offers this

flexibility and GSM is in the context of South Africa not just a technology for the more affluent part of our population but indeed offers benefits to all.

6.4.3.6 Telkom is convinced that careful selection of modern technology can in fact be to the benefit of a developing country and one therefore guard against the argument that older technologies are more appropriate to the problems of Africa. Although more mature technology might sometimes appear to be less expensive the actual costs over the life expectancy of the system as well as the limitations in application has to be carefully considered.

7.0 CONCLUSION

7.1 In conclusion I would like to emphasise that Telkom is an organisation in transition and will be adapting itself more and more to the needs of our clients and our other stakeholders given a rightful opportunity. There are many past achievements that we can be justifiably proud of especially in field of engineering. Building on these natural strengths it is our aim to successfully transform Telkom into a valued and widely respected organisation - also in the context of Southern Africa.

7.2 In a society where the virtues of the private sector are generally praised and the shortcomings of the public sector are often criticised in a somewhat biassed manner I must emphasise that we have embarked on this sometimes painful road to become a truly successful private sector company. We in Telkom

realise that it means hard work, but we are convinced that we will succeed. goal. Mistakes will no doubt be made, but we will be able to comfort ourselves with the knowledge that even in the utopian world of the private sector mistakes are made and the customer does not always come first.

7.3 The size of our organisation and the fact that in many respects we will continue to supply monopolistic services make it more difficult to satisfy our clients and motivate our personnel. We do, however, fully realise that the best defence to competition, which through further advances in technology will always be a threat, is a satisfied client and we will therefore be continuously striving to achieve this goal.

7.4 As the largest telecommunications operator in Africa Telkom would like to play a more meaningful and influential role in Africa and Southern Africa in particular. We will therefore strife to increased contact with telecommunications operators in neighbouring countries to share our expertise to the benefit of all concerned.

Restructuring Telecommunications for a Democratic, Non-Racial, Non-Sexist South Africa

by: *Lyndall Shope-Mafole, Coordinator, Center for the Development of Information and Telecommunications Policy, South Africa*

RESTRUCTURING TELECOMMUNICATIONS FOR A DEMOCRATIC,NON-RACIAL AND NON-SEXIST SOUTH AFRICA

LYNDALL SHOPE-MAFOLE

AFRICAN NATIONAL CONGRESS

TELECOMMUNICATIONS CONFERENCE

WINDHOEK, NAMIBIA

17-19 FEBRUARY, 1993

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RESTRUCTURING TELECOMMUNICATIONS FOR A DEMOCRATIC, NON-RACIAL AND NON-SEXIST SOUTH AFRICA.

Mr/me Chairperson,
Distinguished guests,
Ladies and Gentlemen,

When marking its 81st anniversary this year,the ANC stated in its January 8th statement that " 1993 should be made the year during which our country effectively enters transition to democratic rule: the year of votes for all - ...".

1993 is a year in which the vast majority of South Africans,black and white,expect fundamental change.It is expected to be the major turning point in our history.

For the ANC,the challenge ahead lies in ascertaining that major steps are taken to ensure that:-

- there is a resumption of multilateral talks in the Convention for a Democratic South Africa - CODESA,
- a climate for free political activity in all parts of our country exists,
- a Transitional Executive Council,an independent Elections Commission and an Independent Media Commission which should facilitate free and fair elections, are in place,
- elections for a Constituent Assembly and an Interim Government of National Unity take place,preferably this year,
- the so-called bantustans are reincorporated to where they rightfully belong - South Africa.

Should all this be successful, Mr/me Chairperson, we will, at last, be moving towards resolving a conflict that has has troubled our country for centuries and one during which tens of thousands of precious lives were and are still being lost.

The ANC is well aware that the election of a democratic government will not in itself bring lasting peace and prosperity to all.For that democracy to have any real meaning,and for it to last,the new government will have to ensure an improvement in the quality of the lives of all South Africans, especially the blacks, women, children , rural and poor sectors of the population.

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A series of measures in this regard will thus need to be taken which will aim at ensuring a sustained economic growth,a more equitable distribution of wealth and income, the elimination of

corruption in the public sector as well as major restructuring of the state and government infrastructures.

Our paper today concerns itself with the enourmous tasks that face our country and especially those of us who are involved in the telecommunications sector.

WHY RESTRUCTURE TELECOMMUNICATIONS?

Like all other sectors,telecommunications in South Africa were severely influenced and affected by apartheid policies.The provision of even the very basic telecommunications services was done in accordance with those policies.This explains why South Africa, which is considered to have the twenty second largest telecommunications network in the world,(1) and, with a telephone penetration of 8%, (2), is in fact two countries.One,white South Africa, with a well developed network and a penetration of 25%, and the other, black South Africa, with a penetration said to be of 2.5% ,ten times less.(3)

Telkom,the South African operator,currently has a staff of 65 000 (4) and the number of telephones in South Africa is estimated to be 3,3 million (5).Of the staff, the number of blacks and women in technical positions of medium to high level is virtually nil.This means that two salient issues arise,

a. The ratio of staff per line is unjustifiably high
b. The number of black and female staff will need to be increased considerably.

The Department of Posts and Telecommunications,in its effort to find the 'best' options for restructuring the telecommunications sector , contracted Coopers & Lybrand, a UK based firm of consultants, to make an analysis of the South African telecommunications environment and make recommendations.

In its report,the firm strongly argues for retrenchments as being the most viable solution to the problems that Telkom faced.We do not of course agree that this is where the solution lies, especially when considering that there is no doubt as to which workers will be most hit by the suggested retrenchments.The systematic introduction of technologies that require a certain minimum standard of education and skills will obviously automatically lead to retrenchments of blacks.

The above mentioned problems become even more complex in view of the fact that the network that is in place today does not even

begin to address the needs of South Africa as a whole.In other words,there is an overwhelming and obvious need for expansion of services to the other 3/4 of the South African population, the majority of which currently does not even appear as 'people in need of telephones'.

EDUCATION AND TRAINING

The alarmingly disproportionate figures on the financing of education in South Africa is well known.

There are three major observations that we find pertinent to make:-

a. There is no way in which the current white population could hope to cope with and satisfy the human resource needs of the new South Africa even if were purely technological.

b. The system of *bantu education* has ensured that there are hardly any black children who have been provided with the basic educational skills that would enable them to enter into science and technology fields.In the few cases where this has happened,extra classes have had to be organised at institutions of higher learning to bridge the educational gap that exists between these students and the their white counterparts.

c. Female students in this field are virtually non-existent.

The amount of training and upgrading of black people at the work place leaves much to be desired.A more effective plan will need to be made and urgently implemented that will facilitate the transformation of this sector into a truly non-racial one.

TELECOMMUNICATIONS AS *A TOOL OF APARTHEID*

Telecommunications in all countries are considered to be of strategic and security importance.In South Africa telecommunications were therefore used very effectively in the implementation and reinforcement of apartheid policies both within South Africa and in the aggression policies against countries in the Southern African region.It has been used used in broadcasting, the police ,security and armed forces etc., and therefore served as an efficient and reliable tool for successive apartheid governments.

Having said that, Mr/me Chairperson, we are convinced that there exists an urgent need to restructure this sector to one that will make the realisation of our ideals of democracy possible.

The question of what exactly needs to be restructured arises and justice can not be done to it in the time we have today,however we could summarise it as follows:-

THE MIND, ATTITUDE AND DISPOSITION,

Apartheid has structured the way South Africans, both black and white, think and behave.Years of propaganda have made white South Africans,with a few exceptions,to believe that they are superior and blacks that they are inferior.There are still many white South Africans who are supporters of apartheid even today and who are prepared to do anything in their power to block,or at least delay,the process of transition to democracy.They see democracy and non-racialism as a threat to the priviledges that they have benefited from for years.This is particularly true in structures that have been government run where a deliberate policy of affirmative action in favour of *the Afrikaner* was implemented.The new government will need to address this problem with the necessary sensitivity.

Successive South African governments have been luring the people of our country into believing that South Africa is not an African country, but a country that happens to be on the African continent.We are familiar with comparisons that are made daily with the rest of Africa in an effort to show that,after all,apartheid has not been that bad.On the other hand comparisons are made with Europe and America of South Africa as a developed country.These are serious misconceptions that will need to be addressed now.

We have dwelt on this issue,to drive the point home sharply that one of the major changes that needs to be attended to in our country is that of thinking, of perception, of attitude etc.This,of course,is applicable not only to telecommunications but to all sectors across the board.

REORGANISING THE INFRASTRUCTURE,

The telecommunications network will need to be restructured in such a way that we maximise the use of already the existing facilities. As you may be aware, there are five sectors in South Africa which have a considerable size of telecommunications infrastructure,these being Telkom, Eskom, Transtel,The South African Broadcasting Corporation (SABC), and the South African Defence Force, (SADF).

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Currently one sector does not know what the other is doing.They fall under different government departments and there is no coordination in the use of those facilities or in strategising for the future.

With the new period of good neighbourliness,there should be no reason why the SADF would still need the mammoth telecommunications infrastructure that it has built for military and security purposes.

A good part of it ought to be rechannelled in its use to provide the much needed services in rural areas and elsewhere.

The objective of restructuring is two fold.For South Africa to be truly democratic it would need a telecommunications policy that is reflective of that ideal both internaly and in relation to its neighbours and the world at large.

Telecommunications should be considered a right which is available and financially accessable to all the citizens as has been the case in the history of the sector in other parts of the world.This means that ways and means should be found to make this right a reality to the majoriy,if not all, South Africans, in the minimum period possible and in the most cost-effectve way.

RESTRUCTURING - WHEN AND HOW?

Developments nationally and internationally compel us to move speedily in reorganising ourselves.It is important,however,that this restructuring is done by a government or institution that has legitimacy in the eyes of all,or at least,the majority.The hastened efforts to restructure and entering into important long term contracts unilaterally will only create problems in future that could have been avoided.

Policy formulation is a process and we firmly believe that it should be a *democratic* process,one that involves all concerned:- suppliers,operators,administrations,users (including representatives of residential users) and workers.This,is the best way to achieve a broad framework that is acceptable to all which could then be passed on to the relevant policy formulating structures.

We cannot look at ourselves in isolation to what is happening in the important sector internationally.

At its Additional Plenipotentiary Conference (APP-92) which took place in Deceber last year,the International Telecommunications

Union, (ITU), adopted a series of measures in order to adapt to the ever changing telecommuncations enviroment.This will clearly have a bearing on our own national and regional policies.It would therefore be logical for those of us,who are preparing for restructuring our own telecommunications,to do so in such a way that would make it easier to complement the international enviroment.

The restructuring of the ITU into the three sectors i.e. Radiocommunications,Standardisation and Development, together with the new method of shortening consultation times by communicating electronically with member countries will have serious repurcurssions for many developing countries.

It will take our country many years to produce the kind of person power that is needed to provide the new administration with timely and well information as will be requested of it.In our planning we would need to look at how best we would meet such demands with the very limited human and financial resources at our disposal.

It is our belief that the solution for us lies in coordinating planning regionally in addition to restructuring ourselves accordinly at a national level.

THE NEED FOR A DEMOCRATIC TELECOMMUNICATIONS POLICY

South Africa needs a comprehensive telecommunications policy as well as an appropriate regulatory structure which is independent and whose task will be to oversee the effective and proper implementation of that policy by all parties in the sector.

In the CODESA discussions the ANC has been party to an agreement on the need for a Independent Telecommunications Authority to oversee the overall functioning of the sector. We look foward to the speedy implementation of this decision as we are convinced that it will contribute positively to building a climate conducive to free and fair elections.

The policy we are envisaging is one that would, pronounce itself clearly on the absence of blacks and women in all the strategic and technical areas of the field.It would need to spell out very clearly as to how telecommunications will be used to improve the quality of life of the thousands of disabled people of our country and region,more so because of the complicity of successive apartheid administrations in the wars to the north of our borders.

There will be a need for a carefull assement of the introduction of new technologies and its impact on financial accessability

of these to the majority of people,the implications for jobs etc. and making sure that our country is able to keep reasonalby in pace with technological developments.

Needless to say,the development of rural areas will occupy one of the priority areas of concern as it is directly linked to the possibilty of investment in those areas as that would reduce the urban/rural imbalance and with it the migration to the cities.

The amount of investment that we will put in research and development and the support to local and regional manufacturers would have,in the long term,very beneficial results.We would need to look at this very closely and given the current highly competitive market,consider the best options.

TELECOMMUNICATIONS AS AN INSTRUMENT FOR DEMOCRACY

In conclusion, Mr/me Chairperson, This paper has attempted to look at some of the major questions that policy-makers in South Africa would need to address, and, urgently so. It has given a broad perspective of the direction in which the ANC would like to see telecommunications policy develop.

We are expected to make choices,political choices,in an enviroment which today is such that the very scope of those choices is limited.Decisions, difficult as they may be,will need to be taken.

It is our well considered view that,for South Africa,the solution to many of the telecommunications issues lies in a strong regional telecommunications policy.In coordinated regional planning.We are convinced that we have no other option,if Africa is to survive the age of telematics.

A democratic, non-racial and non-sexist South Africa should foster the use of telecommunications in the socio-economic development of the people, nation building, education,in inculcating new values of freedom,equality and justice, as well as in the painful but necessary process of forgiveness and reconciliation.

In short, an internal and international telecommunications policy that would contribute towards the creation of a new world order and one that would fill, what Dr.J.Hills termed "*The democracy gap*"(6)

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SPEAKER PRESENTATIONS

DAY THREE: FEBRUARY 19, 1993

FRIDAY, FEBRUARY 19

Morning	**Telecommunications Regulation**
9:00 - 9:15	*Opening Remarks:* The Importance of Defining Relationships in Telecom Sector Regulation Speaker: Mr. Joseph Tyndall, Chairman, Public Utilities Commission, Guyana
9:15 - 9:45	Issues in Regulation: Interconnection, Equal Access, and Frequency Management Speaker: Pantelis Michalopoulos, Esq., International Telecommunications Associate, Steptoe & Johnson
9:45 - 10:15	The Regulatory Process and Considerations in South Africa Speaker: Mr. Eugene van Rensburg, Advisor, Ministry for Economic Coordination and Public Enterprises, South Africa
10:15 - 10:30	**BREAK**
10:30 - 11:00	Regulation and Tariff Design for Privatized Telecommunications Companies Speaker: Mr. James Waddell, Price Waterhouse
11:00 - 11:30	Implementing Regulatory Functions: Mozambique's Institute of Communications Speaker: Mr. Jan Overvest, Advisor, National Directorate of Posts and Telecommunications, Mozambique
11:30 - 12:30	**Discussion** Moderator: Mr. Joseph Tyndall, Public Utilities Commission, Guyana

FRIDAY, FEBRUARY 19

Afternoon **Group Discussions**

2:00 - 4:00 Discussion Groups for Developing Recommendations

Group 1: Restructuring and Financing

Facilitator: Mr. A.F. Odeh, ITU

Group 2: Competition and Private-Sector Participation

Facilitator: Mr. James Waddell, Price Waterhouse

Group 3: Regulation

Facilitators: Judith D. O'Neill, Esq.
Pantelis Michalopoulos, Esq.,
Steptoe & Johnson

4:00 - 5:30 Plenary Session for Recommendations

Chair: Dr. P.T. Shipoh, Permanent Secretary, Ministry of Communications, Namibia

5:30 - 5:45 Future USAID Initiatives for Telecommunications in Africa

Speaker: USAID, Zimbabwe

5:45 - 6:30 **Closing**

The Importance of Defining Relationships in Telecom Sector Regulation

by: *Joseph Tyndall, Chairman, Public Utilities Commission, Guyana*

THE IMPORTANCE OF DEFINING RELATIONSHIPS IN TELECOMMUNICATIONS REGULATION

Joseph A. Tyndall
Chairman, Guyana Public Utilities Commission

INTRODUCTION

The importance of defining relationships in telecommunications regulations can be considered in the context of the objectives of regulation and the implications of regulation for the operation and management of a telecommunications business.

The objective of regulating a telecommunications service or, for that matter, all public utilities operating as a monopoly or under conditions of restricted competition, is to protect consumers from the market power of the utility. In the absence of a competing provider, the utility is in a position to increase its rates, or lower the quality of its service, or to discriminate unjustly in its sales to the public. The purpose of regulation is to protect the consumers from such abuses.

Under regulation, a public utility accepts the obligation to charge rates that are fair and reasonable, for services that are of adequate standards, and not to engage in unjustifiable

discrimination. In return for accepting this obligation, the utility is assured that the rates it is allowed to charge can yield sufficient revenues to cover all its costs - the cost of capital and its operating expenses, with reasonable depreciation allowances - and provide an adequate return to the capital invested by its shareholders. The utility is also assured under regulation that the revenues could allow it to maintain its facilities in good condition and to make a reasonable contribution to the expansion of its service to meet the demands of its consumers.

The regulator's role is to ensure that the utility lives up to its obligations, and, in turn, that its revenue entitlement is fully safeguarded. Provided that the utility is prudently managed, the viability of its operations is virtually assured in terms of meeting the legitimate expectations of its investors.

This entitlement should not be seen as justifying excessive profits. Under regulation, the utility is effectively protected from the risks and uncertainties of a competitive market. Its financial security is underwritten by the consumers in the rates they are committed to pay. In more than a symbolic sense the consumers and the public in general have an ownership share in the operations of the utility. Apart from a guaranteed service in terms of price, quality, and non-discrimination, the consumers have a right to share in the excess profits in the form of investments in service improvements. In this regard, the investing

shareholders benefit equally in terms of an increase in shareholders equity. It is not a case of a zero-sum game.

The regulator acts as an impartial adjudicator between the utility and the public interest, ensuring a convergence of competing rights in accordance with regulatory requirements. But not everthing can be precisely defined in the laws and other documents governing regulation, including the operating licence granted to the utility. Of necessity, much is left to the regulator's discretion. How this discretion is exercised can have far reaching implications for the utility.

The use of the words "of necessity" is in recognition of the nature of regulatory issues and the bases on which they have to be determined. Regulatory issues are generally of a highly technical and complex nature, and the information base for the regulator's decisions are often general and imprecise. Even when the information relates to the past and admits of reasonable statistical and factual accuracy, to the extent that the decisions will affect the future operations of the utility, as most regulatory decisions will, the regulator will have to make a judgement with respect to the likely trends in the utility's operations, the conditions that will affect its prospects, and the impact of the decision on the future operations of the utility. The regulator will have the submissions of the utility and, possibly, information on counter-submissions by other interested

parties, contesting the utility's claims. In the final analysis, the regulator will have to apply discretionary judgement to determine the issue. In the exercising such judgement, the regulator may place some limits on management's discretion in so far as this is necessary to ensure regulatory compliance or conformity with regulatory principles. As the decision of a regulator could have a significant impact on the utility's operations, it is therefore of utmost importance that everthing be done to ensure that the decision is in the best interest of the public.

The success of regulation in terms of regulatory decision making in preserving the rights of the interested parties and safeguarding the public interest will depend upon a number of factors. Among these are the relationships by which the system works, that is, the relationships among its various participants, the utility, its consumers, the regulator, and the appellate authority. The government is also a factor in the process. These relationships in turn require, among other things:

(a) that the objectives of regulations should be clearly established;

(b) that the regulatory arrangements are deliberately tailored to the circumstances of individual countries;

(c) that the relationships among the parties are carefully defined. Also important are the relationships between parties in the regulatory system, and between parties and actors outside the system, in so far as these relationships can affect the achievement of the objectives of the system.

These relationships should be defined to ensure, among other things,

(a) the independence of the regulator from outside influences;

(b) that the role played by the respective parties are appropriate to the achievement of the objectives of regulation;

(c) that the utility operates with a clear identity as an autonomous corporate entity, maintaining a strict business relationship with all other businesses, especially with affiliated interests. Without such a relationship, the regulator will be unable to determine that the utility costs, as well as the rates which reflect these costs, are just and reasonable.

As the structure of the regulatory system will inevitably determine the nature of its relationships, ensuring that these arrangements are tailored to the special circumstances of the country is a precondition for defining the relationships that should prevail for effective regulation. I should therefore like to make some comments on the creation of a regulatory structure.

THE NEED FOR AN INNOVATIVE APPROACH

Although the basic objective of telecommunications regulation is the same for all countries, variations can be found in the arrangements adopted. Even within the United States of America, variations exist among state regulatory authorities. The regulatory arrangements introduced in the United Kingdom in 1983, following the decision to privatise British Telecom, is an excellent example of a structural innovation.

Until some recent changes were made, telephone tariffs in North America were generally based on the rate of return approach. Under this system, the utility is allowed to fix its tariffs at levels that will enable it to earn sufficient revenues to yield a predetermined rate of return on capital employed. The British rejected this approach, largely because of the substantial regulatory expertise required, the adversarial nature of the process and doubts regarding the compatibility of the system with the experience and traditions of the United Kingdom. As an

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alternative, the British developed the price cap system which tied increases in the utility tariffs to increases in the general level of prices.

Under the price cap system, once the initial tariffs are agreed, the utility has the freedom to make automatic adjustments in response to movements in the rate of inflation, subject to regulatory supervision and review. By thus changing the method of setting tariffs, the British were able to put together a regulatory structure quite different from North American models. In so doing, they were able to simplify the procedure for approving tariff increases, eliminate the adversarial character of the process, and minimise the need for judicial review. They were less successful, however, in reducing the amount of expertise required.

North America and the United Kingdom provide two different regulatory models that could inspire developments in developing countries. These models have been shaped by technical imperatives as well as by the political, legal, and socio-economic environment of the particular developed country. Even if developing countries decide to replicate one of these systems, the arrangements adopted will not escape the influences of the new environment. The structures may remain intact, but the relationships that propel the system will most likely be affected. We know this all too well with respect to attempts to transplant political institutions from developed to developing countries.

When a new system or institution is being established, it is important to ensure that the relationship by which the system functions are consistent with the agreed objectives. This is partly a function of the law as well as the rules and procedures guiding the operations. In a country that is lacking in relevant experience, public education has a critical role to play. There is a well-known legal principle that ignorance of the law is no excuse. This is not acceptable for a regulatory system. Ignorance of the laws and procedures governing the system, the rights and obligations defined thereby, and the relationships by which the system should operate could weaken the effectiveness of regulation, and jeopardise the public interest.

Just as the British adopted an innovative approach to the North American systems, developing countries should seek to tailor systems that are most responsive to their special needs and circumstances. How far they can go in this direction will depend, in part, on the objectives to be pursued and on the technical parameters underlying regulation. Developing countries should also be aware that the regulatory system is an important concern to potential investors. Without the confidence of the investment community, it would not be possible to attract their participation in the development and expansion of the telecommunications sector.

FACTORS LIKELY TO INFLUENCE RELATIONSHIPS

Let us now turn to consider some of the factors that are likely to influence relationships in developing countries.

The regulatory arrangements of a developed country reflect a combination of factors - its experience with regulations, its legal, political and socio-economic background, the structural characteristics of the telecom sector and the current policies for development, including deregulation and globalisation. If we try to place developing countries on a time chart reflecting the development of the U.S. telecommunications industry, starting from the year 1882, when the first automatic telephone exchange was established, virtually all developing countries will find themselves in the early decades of this century. The primary concern during that period was with the extension of universal service, providing what is now known as the Plain Old Telephone Service (POTS). Even though many developing countries are now acquiring modern technology in the form of digital systems, optic fibre and cellular wireless telephony, they are doing this, not so much as an enhancement of their national telephone systems, but more in the nature of a short cut to the provision of a universal telephone service - essentially the provision of a plain old voice telephone service.

There are a number of factors that should be considered in shaping regulatory arrangements for a developing country. One of these is

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the fact that the people of the country are hardly likely to have any comparable experience. The utility, on the other hand, will most likely be in a position to draw from the experience and expertise of its investor connection.

To be an effective countervailing force to the utility, the consumers must have adequate expertise at their disposal. In a poor developing country, with an almost chronic shortage of trained personnel, such an involvement may not be possible. Unless some deliberate effort is made to develop the representational capabilities of the consumers, the regulatory process is likely to function like a bird flying with an injured wing.

Another problem likely to be encountered is a passive attitude among consumers in relation to the regulatory process. A likely cause of this attitude is the condition of the service under public ownership. Public dissatisfaction with a state run operation could reach a point where privatisation is embraced as a welcome opportunity for early relief from years of frustration with the old telephone service. In this situation, the public may not be disposed to play a very active role as a countervailing force, considering it more in their interest to stand aside and give the new owners a chance to get on with the job of providing them with a modern and expanded telephone service. This tendency may be reinforced by the public relations activities of the telephone company. In an excess of zeal to promote a good public image, such

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activities could conceivably exceed the limits of what is necessary for this purpose and be cleverly aimed at undermining the countervailing power of the consumers. Moreover, influential voices in the community may regard intervention as a manifestation of government's unwillingness to relinquish control of the telephone company. Regulation may come to be viewed as a curb on the initiatives of the private investor.

Relationships in telecommunications regulation could also be influenced by the level of development of the sector. As previously noted, for most developing countries, the telecommunications sector is very much in the early stages of development, when the dominant concern was with the extension of basic services beyond the small percentage of predominantly urban consumers. The most important concern at this stage is not with questions of price and quality but with the availability of a basic service. Is it not unthinkable that in some aspects, regulation in the U.S.A. during the first three decades of this century will be more relevant to developing countries today than the arrangements now prevailing in the developed countries?

Finally, there are the background circumstances of the developing country, its legal, political, and socio-economic characteristics which will be quite different from the developed countries in which the existing regulatory models have been developed.

The various circumstances just mentioned are illustrative of the factors that will determine the arrangements most appropriate in a particular developing country situation.

SOME IMPORTANT RELATIONSHIPS

We can now review more specifically some important relationships in telecoms regulation.

Relationships within the system

The regulator functions as an independent adjudicator and must be fair and impartial in its procedures and decisions.

The independence of the regulator is an essential condition for the acceptance of regulation. This is of particular concern to investors, but it is also important for winning public confidence. Independence means that in the exercise and discharge of its functions, the regulator should not be subject to the direction or control of any person or authority.

Impartiality and fairness will depend on the independence as well as the competence of the regulator. The latter requires that persons performing regulatory functions should be suitably qualified to assume these responsibilities and that the agency should be well equipped with the human, financial, and material resources necessary for an efficient operation.

Both impartiality and fairness require that the regulation should be conducted in a transparent manner. This will require that the regulator should function by clearly established rules and procedures and should open the processes to public participation and scrutiny.

The regulator is often described as a neutral adjudicator. Neutrality implies that the regulator should at all times refrain from giving assistance to any party. In this connection, the consumers are most likely to be the disadvantaged party. It is beyond argument that the regulator should not give any form of assistance to enable a party to acquire a benefit to which it is not entitled. But what if the assistance will enable a party to secure a right that would have otherwise been denied? Will the regulator be discharging its function as a protector of the consumers against the market power of the utility, if it allows their interests to be defaulted, or the utility to benefit unfairly from the representational failures of the consumers? Should the regulator take decisions solely on the basis of information provided by a single party?

Fairness requires that regulatory decisions are taken on the basis of an adequate presentation of both sides of an issue. One way to deal with gaps in the representation of consumers is for the staff of the regulator to research the issues and present the evidence at the proceedings, with full opportunity given to the utility to

analyse and respond to the presentations.

Another means of protecting the interests of consumers is by providing funding for their representation as with the Consumer Advocates or Peoples' Counsels in the state regulatory systems in the U.S.A. But such funding in a developing country situation may not eliminate the need for the regulator to take initiatives, if necessary, to ensure that the interests of consumers are adequately represented.

I wish to conclude this section by listing a number of factors that will serve to enhance the regulator's independence as well as the transparency, fairness and impartiality of its processes:

1) Rules and procedures should be established and be available to all concerned.

2) The commissioners should be appointed for long enough periods to enable them to get on top of their responsibilities. Additionally, the appointments should be staggered to avoid the possibility of all the commissioners going out of office at the same time.

3) Funding for the agency should be provided on a secure basis to enable the regulator to function efficiently and without interruption or suspension of its work. After

years of experience with legislative appropriations and other means of funding, the regulatory commissions, the state governments of the U.S.A. converted to a system whereby the Commissions are funded by assessments or taxes on the regulated utilities.

For regulation to be effective, the utility must be prepared, at all times, to furnish the regulator with all information required for the purposes of regulation and to cooperate fully with the regulator in all other respects as necessary for effective regulation. It is of vital importance that these obligations be clearly spelt out in the law, with adequate provisions to ensure full compliance.

Consumers are mostly thought of in terms of the protection of their rights. But it is important to recognize that consumers also have obligations. They have an obligation to play an active countervailing role on whivh the system is based, and should not allow themselves to be captured by the utility, thereby undermining the regulatory process.

A constructive relationship between the utility and consumers, particularly with their representatives, would go a far way towards advancing the purposes of regulation. The public utility could contribute to this end by keeping the consumers informed on efforts

to meet their service needs, by promoting dialogue on these issues, and by cooperating with consumers representatives to resolve complaints with respect to its service.

The decisions of the regulator will sometimes be questioned by one or other of the interested parties. Provision for review is therefore an important "extension" of the regulatory process. There is general agreement that appeals from the decisions of regulators should not be allowed on substantive grounds, since the highly technical and complex issues involved in regulatory decisions cannot be satisfactorily dealt with by the processes of the court. It is usual, therefore, for appeals from the regulator's decisions to be confined to matters of law.

Individual oversight and review of the regulator's decision is an important guarantee to the utility and its investors against bias and arbitrariness in the regulator's decisions. The same guarantee holds for other interested parties.

Prolonged delays in the determination of appeals could seriously disrupt the regulatory process, with adverse consequences for consumers as well as the wider public interest. Such delays could also create an atmosphere of uncertainty for the utility's management in which they may be unable to take important operational decisions. It is conceivable that such appeals could even paralyse the regulatory process. It is desirable, therefore,

that steps be taken to ensure that appeals be disposed of by the courts as expeditiously as possible. An example of such action can be found in the states of New York and Maryland, whose laws provide that the Court of Appeal give precedence to regulatory matters over all other civil matters, except electoral matters. Each country will have to find its own solution.

External Relationships

The business relationships between a utility and its affiliates can present major regulatory problems. The responsibility of the regulator to ensure that the utility's tariffs are fair implies that the regulator should also ensure that the underlying costs are reasonable and justified. A utility could enter into arrangements with its affiliates under which goods and services are procured at prices exceeding fair market values. This would lead to a reduction in the utility's liquidity and in higher prices for its consumers. Moreover, physical assets of the utility could be transferred to affiliates at artificially low prices or even without any compensation whatever. Capital transactions between the utility and its affiliates could also be conducted on a non-market basis.

It is of utmost importance to make adequate provision to ensure that all inter-company transactions are conducted on a strictly arms length basis. Affiliates for this purpose should include corporate businesses and individuals with an ownership interest in

the utility. Affiliated interests (corporations and individuals) are sometimes defined in terms of ownerships of at least a certain percentage of the voting securities of the public utility. So important is the issue, that regulatory authorities in the U.S.A. have the authority to examine the books of affiliates with which the utility has business transactions.

With divestment, government moves from an all persuasive role as owner, controller, and regulator of the public utility to one of non-involvement in managing and regulating the business. With the introduction of independent regulation, the role of government in relation to the system is limited to the appointment of the commissioners and to removing them for cause. The grounds for such removal should be clearly specified in law. It is usual, also, for the government to retain the right to grant, amend, and revoke licences or franchises, on the advice and recommendation of the regulator.

The success of regulation could be seriously impaired, if these relationships between government and the regulatory authority are not maintained and the independence of the regulator is cast in doubt. Furthermore, failure to maintain these relationships could jeopardise the inflow of foreign investments to the sector and undermine the development prospects of the country.

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SUMMARY

I have tried to show that the importance of defining relationships in telecoms regulation should be considered in the context of the objectives of regulation and in terms of the implications of regulation for the management and operations of the telecommunications business. Regulation involves the exercise of discretionary judgement by the regulator in balancing the rights of consumers against the utility's entitlement and ensuring that the public interest is not adversely affected. The exercise of such judgement may limit the discretion of the utility's management, as long as it is necessary for ensuring regulatory compliance or conformity with regulatory principles. One of the many factors that will determine the effectiveness of regulation, in terms of preserving the rights of both consumers and the utility, is the appropriateness of the relationships among the participants to the achievements of the objectives of regulation. These relationships are determined in important ways by the structure and character of the regulatory arrangements. Before the appropriate relationships can be defined, it is therefore important that these arrangements be tailored in adequate response to the needs and circumstances of individual countries.

By way of illustration, a number of factors that are likely to determine the structure of the regulatory system in a developing country have been reviewed. These include the lack of any

comparable experience in the developing country, the inability of its consumers to function as a countervailing force to the utility, the level of development of the telecoms sector, and the legal, political, and socio-economic background of the individual country. Finally, some relationships vital to the regulatory process were considered.

An important conclusion from what has been said is that establishing a regulatory system and defining the relationships by which it should function is not a mechanistic task of transcribing from, or adapting, the laws of existing systems. It is an innovative search for the most symbiotic relationship with the new environment.

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Issues in Regulation: Interconnection, Equal Access, and Frequency Management

by: *Pantelis Michalopoulos, Esq., International Telecommunications Associate, Steptoe & Johnson*

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ISSUES IN REGULATION: INTERCONNECTION, EQUAL ACCESS AND SPECTRUM MANAGEMENT

The common source of the rules governing interconnection and spectrum management is scarcity -- the need to determine in the fairest and most efficient way who should have the right to use a scarce or unique resource for value to society to be maximized.

I. INTERCONNECTION

Wireline telecommunications services have an "inherent" monopoly characteristic: the cost of building a cable telecommunications network and the difficulty of securing rights of way are substantial. This creates a barrier to the entry of competitors lacking the cable intrastructure into the market for those services. This in turn creates a "bottleneck" phenomenon: the carrier that owns cable lines directly reaching subscribers exclusively controls access to those subscribers. Even in the U.S., where vigorous competition has been introduced in long-distance service after AT&T's divestiture, local service is still characterized by the bottleneck phenomenon: the "last mile" to the subscribers is largely controlled by monopolistic Local Exchange Companies ("LECs").

For a government that has made the policy decision to open the provision of all or certain telecommunications services to competition, it therefore becomes essential to enunciate an interconnection policy. This policy should generally include the

obligation of the dominant carrier to provide its competitors with interconnection of certain quality, the reciprocal right of competitors to require interconnection, and a methodology for determining the compensation due the dominant carrier for providing interconnection.

A. The Interconnection Requirement

A threshold question is which instrument will incorporate the interconnection obligation of the dominant carrier. There are several alternatives:: rules enunciated by the Regulator; conditions set forth in the dominant carrier's license, granted to it by the Government; provisions in an agreement between the Government (or the Regulator) and the dominant carrier. The U.S. and the U.K. take different approaches. In the U.S. interconnection obligations are unilaterally enunciated by orders of the Federal Communications Commission. In the U.K., the license of British Telecom contains broad conditions, which authorize the Director of Oftel to make a more detailed determination of interconnection policy. The obligations of the dominant carrier and reciprocal rights of the interconnector may be circumscribed, and exceptions to them may be established, if the Government wishes to strike a balance between allowing competition and enhancing the value of the dominant carrier to investors.

The form of the interconnection that the dominant carrier is required to provide may also vary depending on the kind of service that the competitor intends to provide. Thus in the U.S. different interconnection obligations are imposed on LECs depending on whether the competitors seek to provide enhanced services, "special access"

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services (connecting large business users to points of presence of long-distance carriers for non-switched, private service), or switched transport (providing long-distance carriers with access to the local switched network). The U.S. Federal Communications Commission has recently issued an Order mandating expanded interconnection for special access services (as well as a proposed rulemaking purporting to require expanded interconnection for switched transport). The special access Order, now under appeal in the courts, was presented by the FCC as a historic step in the erosion of local service monopolies, and presents special interest as the latest authoritative word on interconnection in the U.S.

The most stringent interconnection obligation imposed on LECs in the U.S. is known as "physical collocation." Under physical collocation, a competitor pays for physical space in the LEC's central office in which to locate the equipment needed to terminate the competitor's transmission facilities. LECs must also allow competitors physical access to the central office for installation, maintenance and repair of the equipment. Physical collocation ensures interconnection on exactly the same conditions as LECs interconnect their own circuits. LECs are exempted from the requirement of physical collocation only in limited cases, for example if there is not physical space available at a LEC central office, and if the prospective interconnector and the LEC agree upon an alternative interconnection arrangement. The potential for waiving the physical collocation requirement by negotiation and agreement is an important feature of the FCC policy: the physical collocation requirement is a flexible one, simply providing the framework for negotiation between the parties and giving the prospective

interconnector negotiating leverage. The relegation of as many aspects of an interconnection arrangement as possible to the agreement of the parties should characterize every sound interconnection policy (provided that default requirements are in place for in case the parties fail to agree.

Even if the parties agree to waive physical collocation (or if space at a LEC central office for physical collocation is exhausted), the FCC's special access order imposes the minimum requirement of "virtual collocation," which is meant to ensure practically the same interconnection terms for competitors than for the LEC's own circuits. Even in virtual collocation situations, the FCC imposes specific conditions: interconnectors may choose the central office transmission equipment dedicated to their use, provided that they reimburse LECs for any additional cost they incur as a result of the choice. LECs are also required to maintain the equipment dedicated to interconnectors with the same care they reserve for comparable LEC equipment.

Physical collocation is required by the FCC only for interconnectors providing basic transmission service. It is deemed unnecessary (and too cumbersome for LECs) in the case of enhanced service providers and the diverse types of equipment needed for the provision of enhanced services. Rather, equal access of enhanced service providers to the LEC network is ensured by the requirement of open network architecture and the price parity rules.

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B. Interconnection Charges

In general, a dominant carrier bearing an interconnection obligation should not be required to provide interconnection for free, but rather should be compensated by the interconnector for the cost of connection, no more and no less. However, an interconnection policy may institute two significant departures from this rule, which pull the amount of compensation in opposite directions.

1. The dominant carrier may have obligations mandated by the public interest and by the principle of universal service, e.g., the obligation to provide certain services below cost or the obligation to subsidize certain services by charging higher-than-cost rates for other services. New competitors, however, do not bear such obligations. Therefore, they may be able to obtain access to the network on the same terms as the dominant carrier without participating in the cost of any subsidy payments, which is shouldered by the dominant carrier alone. Moreover, competitors may undercut the dominant carrier in services that the dominant carrier is required to provide at higher-than-cost rates in order to balance subsidized lower-than-cost rates for other services. Thus, the public interest obligations of the dominant carrier may entail an unfair price advantage for its competitors.

As a result, the question arises whether interconnectors should be asked to bear part of the dominant carrier's public interest obligations through a contribution charge over and above the cost of interconnection. In the special access Order, the FCC decided that generally interconnectors should not be asked to pay a contribution charge.

The FCC showed some preference for alleviating the LECs' public interest obligations instead of imposing such a charge.

2. The second departure from cost-based interconnection charges is in the opposite direction. A government opening its telecommunications sector to competition may decide that, in order for the fldgling competitors to become viable, subsidization by the former monopolist is appropriate. Such subsidization may be effected through lower-than-cost interconnection rates. This approach may be effective in getting new competitors on their feet. On the other hand, it may discourage such competitors from ever building their own infrastructure, since they enjoy a partly free ride on someone else's network. This may ultimately prevent them from establishing themselves as substantial competitors.

II. SPECTRUM MANAGEMENT

"Radio spectrum" is the subset of the electromagnetic spectrum that is usable for the provision of telecommunications services. "Electromagnetic spectrum" is defined as the array of electromagnetic waves arranged by order of their frequency -- i.e., the number of times that their peaks pass through a fixed point in a unit of time (where 1 hertz (Hz) = 1 cycle/second, 1 KHz = 1,000 Hz, 1 MHz = 1,000,000 Hz, 1 GHz = 1,000,000,000 Hz).

The radio spectrum, ranging from 3 KHz to 300 GHz, is a finite and therefore valuable resource. Consequently, its allocation to specific uses and/or users is

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an economic question and the management of the allocation process creates problems of fairness and efficiency, thus legal questions.

A. The Two Stages of Spectrum Management

The primary task of spectrum management is accordingly to allocate spectrum to uses and assign it to users in a way that maximizes the value of spectrum to society and avoids or minimizes harmful interference among users in the transmission and reception of signals among users. In the U.S. as well as internationally, spectrum management typically consists of two components or stages: allocation of spectrum to specific uses (e.g., land mobile services, broadcasting) and licensing individual users of spectrum allocated to a particular use. In particular, the allocation of spectrum is typically effected by the method of "block allocation," whereby a band of frequencies is designated for a specific use or uses on a primary and secondary basis (meaning that the primary use will be given preference over the secondary) or on a co-primary basis (meaning that all uses will be given equal preference). The licensing process then assigns the band designated for a specific use to users on an exclusive, shared or open entry basis. Naturally, the more users are permitted to use the same band, the higher the likelihood of interference among them. It is possible, however, to obtain frequency reuse while preventing interference through recourse to a variety of licensing methods:

(1) **Geographically Limited Licenses.** Thus, a license may assign the exclusive right to use a certain band within a certain area and impose limitations such as

a maximum height of antenna or power of transmitter in order that the signal may not transcend that area.

(2) **Temporally Limited Licenses.** Such a license may assign the exclusive right to use a specified band during a specified part of the day.

Finally, more efficient use of the spectrum (and thus accommodation of more users) is permitted by digital compression technologies, which allow the elimination of unnecessary information from a signal.

B. Spectrum Management Rights

The two-stage method of spectrum management by block allocation and licensing within a block is a relatively simple way of accommodating spectrum users and preventing interference among them. However, it also has the disadvantage of inflexibility, which is particularly serious considering the speed with which new radio telecommunications technologies emerge. Changing the allocation of a block of spectrum from an old to a new use that society values more is a complicated process, and may involve efforts to relocate existing users that have vested interests any expectations in use of the block, negotiations between old and new users, or creation of incentives for old users to relocate or discontinue transmissions voluntarily. These complexities are demonstrated in two well-publicized rulemaking proceedings currently conducted by the FCC -- for "emerging technologies" and "Personal Communication Services." In the meantime (before an allocation is changed) certain blocks of frequency may be under-used and others congested.

Block allocation has recently been criticized on account of this disadvantage. "Spectrum management rights" have been suggested as a more flexible alternative. In their extreme, such rights entitle their holder to use a certain frequency band in any manner it sees fit and to provide any service that is technically possible for this band. Moreover, the holder may institute a private system of managing this band by assigning uses and geographical limits for parts or all of it and sub-licensing other users, provided that any such users do not interfere with the spectrum management rights of other holders. Such broad rights have been recognized, for example, by the New Zealand Radiocommunication Act of 1989 (in conjunction with auctioning, to which I shall return).

C. Licensing Methods

Three primary methods for licensing spectrum users have been supplied or considered: (1) comparative hearings; (2) lottery; and (3) auction.

1. **Comparative hearing.** This method allows the Regulator to gauge the relative merits of several mutually exclusive applications for spectrum use licenses. As a result of the comparison, the Regulator selects the applicant likely to best serve the public interest on the basis of criteria articulated in the regulations. The method may also allow the Regulator to gauge an applicant's financial strength and determine whether it can afford to provide the contemplated service. The revenue generated for the Government from the process consists in the application fees, which are the same for all comparable applications.

Until 1982, the U.S. Federal Communications Commission primarily used licensing by comparative hearings. The process, however, drew criticism on account of the following "disadvantages": comparative hearings take long, their complexity increases with the number of more or less equally qualified applicants, and they entail high administrative and legal costs. Moreover, the choice among more or less equally qualified applicants may turn on formalistic, insignificant criteria. Finally, if the license may subsequently be transferred (either by itself or with the other assets of the licensee), its ultimate holder is not the one adjudged by the Regulator best to serve the public interest. Also, the reveneues generated from the resale of a valuable license inure to the benefit of the first license, not of the Government.

Most of the above "disadvantages" are relevant only in the U.S. and tend to be inapposite for African countries. The disadvantage created by the transferability of licenses can be avoided by imposing restrictions on transfer such as subjecting it to the approval of the Regulator. And while it is true that other licensing methods may generate more revenues for the Government, it is doubtful whether the Government would further the public interest by being in the "business" of licensing.

2. **Lotteries.** In 1982 Congress authorized the FCC to use lotteries for the selection of spectrum licensees. Lotteries may often be conducted in a shorter period of time and may be less costly than comparative hearings. As with comparative hearings, Government revenues are limited to application fees. However, total revenues tend to be higher because lotteries draw more applicants.

On the other hand, lotteries may result in a random windfall for the chosen applicant, who may be minimally qualified to serve the public interest or even provide the licensed service. In practice and in conjunction with the transferrability of the licenses, lotteries have resulted in the creation of "application mills": unqualified applicants enter the lottery merely to sell the license they may win for high prices. This in effect amounts to private auctions of spectrum, with the proceeds inuring not to the Government but to randomly picked individuals.

3. Finally, spectrum could be licensed by auctions organized by the Regulator, with the proceeds inuring to the benefit of the Government and thus eventually of the taxpayer. Auction could be open or sealed. Sealed auctions could be based either on "first-price sealed bid" or on "second-price sealed bid" principles. In "first-price sealed bid," the bidder who submits the highest bid wins and pays a price equal to that bid. In "second-price sealed bid," the bidder who submits the highest bid wins but pays a price equal to the second bid. Because of the uncertainty that often surrounds the value of radio licenses, the "second-price" system avoids the unfairness of the winner's having to pay a price inordinately higher than the other, sealed, bids.

The auctioned rights may range from narrow rights to provide specified services locally through rights to provide certain services nationwide to broad spectrum management rights, and may be fashioned so as to maximize the expectation of profit for the Government.

Licensing by auction is proposed in draft legislation in the United States, and has already been applied in New Zealand and the United Kingdom.

Several types of spectrum licenses were auctioned in New Zealand on a second-price sealed bid basis under the Radiocommunication Act of 1989. Incumbents' licenses were essentially grandfathered (retained and not reauctioned), and other set-asides were provided for public safety licenses or licenses held by New Zealand's indigenous population.

In the United Kingdom, 16 broadcasting franchises, delineated by geographical region as well as by time slot, were auctioned in 1991 by sealed bids under the Broadcast Act of 1990. The law reserved the Regulator (the Independent Television Commission) the right to reject the highest bidder and award the franchise to another bidder if the highest bidder failed to meet certain public interest standards.

Auctions may hold promise of generating higher revenues for a Government than the other licensing methods (although this is not certain). However, Governments should consider auctions with skepticism. The desire to generate as high revenues as possible through auctions may end up being detrimental to the public interest. Thus, the auctioning method may provide incentive for a Government to grant fewer licenses in order to obtain higher prices, or to grant licenses for a previously open block of the spectrum in order to generate revenues. The result may be fewer services and more restrictions for the consuming public.

Many combinations of the three methods mentioned above are conceivable. Thus, if comparative hearings result in the selection of more than one equally qualified applicants, it may be better to choose among them by lottery than by some formalistic insignificant criterion. On the other hand, if the criteria governing

comparative hearings are carefully articulated, perhaps the choice need not be left to chance.

The Regulatory Process and Considerations in South Africa

by: *Eugene van Rensburg, Advisor, Ministry for Economic Coordination and Public Enterprises, South Africa*

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REGULATORY FRAMEWORK AND POLICY FOR TELECOMMUNICATIONS IN SOUTH AFRICA UNDER CONSIDERATION

1. INTRODUCTION

Mr Chairman, Ladies and Gentlemen, you might find the topic of my Paper strange since the commercialisation of Telkom South Africa was already completed the 1st of October 1991 and we could therefore be criticized that we have not set the regulatory structure in place simultaneously or even at an earlier stage. This criticism could be well founded but on the other hand we struggled more than two years to pass the necessary legislation to commercialise the Telecommunications Department and our prime target was to get the commercial discipline into these businesses as soon as possible and not to waste further time to complete the regulatory structure which, as I will explain later on, was and is still a very complex issue. The Bill therefore that allowed for the commercialisation of Telkom SA also transferred the monopoly power, which Telkom enjoyed prior to commercialisation, to the company, Telkom SA Ltd and placed it under the Minister as the Regulator with certain regulatory functions being handled by the Postmaster General as head of a much smaller Department of Post and Telecommunications.

2. STUDY INTO A NEW DISPENSATION FOR TELECOMMUNICATIONS IN S.A

Following the commercialisation of the telecommunications services (the monopoly to render such services with transfers from the

Department of Post and Telecommunications to Telkom SA Ltd, a profit orientated public company on 1 October 1991) the Department of Post and Telecommunications commissioned a study which was done by a team of internationally recognised experts of the Coopers and Lybrandt firm to analyse the policy options for restructuring the country's telecommunications services sector (excluding broadcasting services).

The study was commissioned for the following reasons:

(a) The enormous technological developments in recent years and further developments expected to take place in the near future.

(b) The worldwide tendency to re-regulate the industry and create greater competition.

(c) The need for the expansion of basic services against the background of an increasing depopulation of the rural areas on the one hand and growing urbanisation on the other.

(d) The need to provide the business sector in particular with the variety of quality services which will enable it to compete in all respects, locally as well as internationally.

Some of the matters deliberated and on which decisions must be taken are:

(a) What should the aims, functions and duties of a regulatory body be?

(b) To what extend should competition be allowed in the industry and what factors should be taken into consideration in this regard?

(c) How should the demand for non profit, socio-economic services be met without any consequent disadvantages to the provider of these services?

(d) Which steps should be taken to protect the consumer?

Some of the topics dealt with extensively in the Coopers report were competition and deregulation, the relationship between Telkom and the State, the establishment of the regulatory agency and the independence of such a agency.

This report was published in September 1992 and a closing date for comments was at the end of last year. Numerous comments were received from all interested groups and they are now presently being studied with the view of developing norms and policy guidelines along which the proposed regulatory framework should be structured that will meet South Africa's unique needs and demands.

As previously indicated the monopoly to provide telecommunication services in South Africa was transferred to Telkom SA, a public company. a Monopoly unchecked by Parliament requires one or two mechanisms to restrain i.e. competition or regulation. As competition will best be limited to some niche markets, regulation is necessary for both Telkom and any other future operators.

3. INSTITUTIONAL FRAMEWORK FOR THE REGULATORY BODY

This is an extremely complex issue and it seems that there are no right or wrong and each option has advantages and disadvantages. One's choice will to a large degree be determined by one's views regarding:

- The regulatory goals, and

- The governments responsibilities with regard to the provision of telecommunication services.

The main arguments for establishing an independent regulatory body could be seen as:

- To insulate regulatory activity against short-term political interference, and

- To promote open, participating procedures rather than closed, bureaucratic decisionmaking.

The first of these points is important because international experience demonstrates that insulation from political intervention is an essential ingredient for "regulatory certainties" and this in turn is a key requirement for prospective investors in that sector. The existence of an independent regulatory body operating within a stable regulatory framework is likely to encourage higher levels of investment and more rapid development in those markets which are to be open to competition.

Independence on the other hand could contribute to an open decisionmaking because an independent agency can be required by law to follow certain procedures, to consult formally with interested parties, to reach decisions which are conducive to explicit objectives and to explain the basis of its decisions. The legal basis for such requirements will not be present if the regulatory functions are carried out by a branch of the policy making ministry.

From the above it is very clear that we have to define the roles of the Government, the relevant Minister, Parliament and the Regulator in the legislation as well as the inter relationship and we have to find answers to the following questions which could be raised in this respect i.e.:

- What role if any should the Government play regarding the regulation of the industry, for instance the power to give directions concerning the broad policy to be applied by the Regulator?

- What role should Parliament play?

- Should it merely be responsible for the relevant legislation?

- What role should the Regulator play?

- Should it have the power to prescribe policy?

- Should the Regulator be the final authority or should it merely be an advisory body to the Government/Minister who will ultimately have the final say?

- Who will be the ultimate Regulator?

- Will the Minister or Cabinet have the power or veto over the Commission?. If he does then one of the shareholders of one of the parties will be able to veto the actions of the Commission.

- Should provision be made for an appeal tribunal?

Before I move on I would like to say a final word on <u>independence and accountability</u>. The main argument for retaining the regulatory function within a Government Department is one of accountability. Government Departments are responsible to Ministers who in turn are responsible, through Cabinet and

Parliament to the electorate. There is thus an element of democratic control over regulatory decisions. Given that these decisions may effect billions of rands in investment and impact on the lives of millions of telephone users, the accountability of the argument clearly have some force.

The counter argument is that separation of regulation from political decisionmaking increases certainty in the market. If the Regulator is a Government Department the Minister will come under political pressure to intervene in regulatory decisions and then most of the advantages claimed for "commercialisation" will be lost. An independent Regulator also makes open regulation easier.

I believe that the benefits of <u>independence</u> can be achieved without entirely forgoing <u>accountability</u>. If the Minister is given control of the right to provide telecommunication services (through the power to issue licenses) and he delegates part of his function to the Regulator, he can retain an overall power of policy direction. The terms of appointment of the Regulator should require him (or them) to consult with the Minister on certain decisions. In limited cases the Minister could hear appeals (for example on refusal/revocation of licenses) however, this power should be clearly circumscribed so as not to undermine the Regulators' credibility. Appeals on matters relating to due process would go to the courts in the normal way.

It's against this background that we intend setting up the regulatory body by way of legislation which will incorporate all the sensitive issues and will be the result of widely held consultations with all the different parties and interest groups.

4. STRUCTURE OF THE REGULATING BODY

Simultaneously with the publication of the Coopers and Lybrandt report we also had the report of the Viljoen Committee on the broadcasting industry in South and Southern Africa and the question that is now considered is whether there should be one Regulator and/or Minister involved in regulating the whole of the industry or whether provision should be made for different Regulators and/or Ministers. We therefore have to make a decision whether the Regulator body will be in a form of three Commissions coming together under a single Minister or whether it is in the form of one Commission with three separate Departments concentrating on the different issues to be regulated.

There is the view that the issues facing broadcasting are so different to that of telecommunications that they should be kept apart from each other. Control of electro magnetic spectrum lies in between and is the common element and it could therefore be dealt with separately or attached to one of the others. However, the following motivation can be advanced in support of the establishment of one regulatory body, including broadcasting.

(a) The increasing convergence of technology in the sphere of telecommunications makes it sensible and practicable to regulate all facets thereof within one regulatory structure. It is for instance no longer possible to distinguish between a digital signal conveying data, voice telephony, sound broadcasting and television material. Furthermore it often happens that television signals also convey hidden data information. The time is also nearing when the same instrument can be used for voice telephony, data collection, sound broadcasting and television.

(b) The regulation of telecommunications within a single regulatory structure will tend to be more technical and neutral.

(c) Regulation by one body will ensure coordination and cohesion regarding the general direction followed with regard to regulation of the industry.

(d) There is no need for the Regulator to involve himself in matters concerning program content and broadcasting standards other than perhaps prescribing very broad outlines in the licence. Such an approach would be in accordance with the philosophy of upholding freedom of speech. In South Africa's case as far as it may be necessary to regulate desireability of a program, the Publication Act provides a sufficient regulating structure or if not, that Act should be amended to make effective regulation possible.

(e) The electronic media (broadcasting) differ substantially from the printed media. In the case of electronic media one deals with a scarce commodity, namely the frequency spectrum, whilst in the case of the printed media there is theoretically no limitation (other than financial consideration) on the number of persons or organisations entering the market.

The other viewpoint however is that the broadcasting industry is so heavily politicised and that in that context will drag the whole telecommunications industry into the political arena and it would therefore be very difficult to reach consensus on regulatory matters which cover both sectors. That would further delay effective regulation for the telecommunications industry with a negative result of delaying competition and protecting the interests of the consumer.

5. COMPOSITION OF THE REGULATING BODY

It is obviously very important that the Regulator must be trusted by the persons to be regulated.

Ladies and Gentlemen, we all know that the regulatory arena cover a vast number of disciplines varying from technical, legal, financial, consumer and social interests and rarely will we find all the skills vested in one individual. Although Europe has gone the way of individual regulators, they also are experiencing the

difficulties of having too much power vested into the hands of one individual. We all know that the United Stated have gone the other route of appointing a few Commissioners and the FCC thus operates in another fashion. I also believe that the diversity of the society will also have an impact on the composition of the regulatory body and will make it even more difficult to vest all the skills and diversity into one single person. Furthermore, should the decision be to set up one regulatory body for the total industry, cognizance should be taken to accommodate the different technical skills required for each industry although certain regulatory applications will be common ground for example financial, legal etc.

6. PROCEDURES TO BE FOLLOWED

The next question to be considered is the procedures to be followed by the Regulator. This could range from being very informal to that of being very formal. Each option has it advantages and disadvantages. The informal procedure would propably be faster and cheaper but would pose a bigger danger of autocratic decisionmaking than the formal procedure. In the formal procedure the Regulator would act as a tribunal and function very much like a court of law. The procedures will probably be very open, each interested party will have an opportunity to state his case and the proceedings will be open to public scrutiny. This will in turn enhance objective and reasoned decisionmaking but will probably have the disadvantage of being slow and costly.

We promote the idea of "regulation in the sunshine" i.e. the Regulators' decisions must be made transparant and efficient consultation should take place within the industry and all the important roleplayers. Effective regulation cannot take place without dialogue. Notwithstanding the privatisation of the monopoly or utility, the commercial activities of that entity can still be very negatively curtailed by the Regulator and there is a real danger that the privatised business may become more of a political pawn that it was as a nationalized entity.

7. GOALS AND GUIDELINES FOR THE REGULATOR

In fulfilling its goals the Regulator should endeavour to act in a positive encouraging way and not to perceive its role to be that of a mere licensor and then policeman. In this regard some of the goals of the FCC of the USA are instructive:

- "Encourage the development of a competitive, innovative and excellent American communication system.

- Provide effective and adoptive regulations for communications, while eliminating regulations that are unnecessary or inimical to the public interest.

- Promote efficiency and innovation in the allocations, licencing and the use of electro magnetic spectrum.

- Promote the vital interests of the American people in international communications and competitiveness.

- Provide excellent service to the public in the most efficient, uncomplicated, timely and courteous manner possible."

Taking note of the above and resulting from widespread discussions it is clear in my mind that there are four major functions the Regulator should concentrate on which I will describe briefly:

7.1 Promoting consumer interests:

The client must be regarded as "king" and must enjoy the highest priority with the Regulator focusing on protecting the following basic rights of the various clientgroups identified as:

(a) universal service users

the Coopers and Lybrandt report has published statistics of how skewed the telephone penetration in South Africa at present is and the most urgent task will be to provide an affordable universal service for all South Africans. The key right for this group is to enjoy a basic service. The connection charge must therefore be kept low relative to usage costs. This will mean that both connection and usage tariffs may need subsidization In South Africa we

are in a unique position insofar that we have to cover a very wide geographical area and our society show strong elements of first world and third world demands which must be catered for i.e. demands that vary form a very basic telephone service to highly sophisticated requirement for data transmission etc. Not only have the demands placed a great strain on the infrastructure, but faced with the universal service obligations to the community has lead to a strong imbalance in the tariffs for the different services rendered which means the tariffs are not cost related but carry a strong element of cross subsidization.

The Regulators' major objective should, therefore, be to encourage and help develop universal service in a pro active way. The question is; how do we address the huge cost of these services or even meet the ITU objectives of having a telephone within five kilometres of every person? Taking into account our budgetary constrains it is highly unlikely that Government will provide cash for these services and the real solution will have to be found within the industry by observing the following strategies:

- use creative, low cost solutions using appropriate technology to provide the Universal Service (this is not to be confused with "old" technology).

- ensure low acquisition cost for capital equipment. This is best achieved by fostering competition amongst suppliers for all purchases.

- ensure that all operators at any level of the network contribute in some way to provide community services or are levied to provide funds for doing so.

- set appropriate tariffs. A key issue in funding community service is the acceptance of cross-subsidization. In many advanced economies this principle are generally rejected but in the present social political environment in South Africa it is my view that it cannot, indeed <u>should not</u>, be avoided. In this regard several tariff options excist.

  (i) <u>cost based tariffs</u> in which the tariff charged is related to cost. The connecting fees relates to capital cost and usage to the actual cost of operating. While this makes business sense it would be disasterous in South Africa since it would put the service outside the reach of most South Africans and would make long distance (mainly business) calls cheaper.

  (ii) <u>average tariffs.</u> In this option the entire cost of a service, including amortization of the capital equipment is averaged over total usage on a time and distance basis. This has the effect of increasing the cost of long distance calls made for long periods and dropping the connection costs and local, short calls.

(iii) <u>market related.</u> In this option the service is charged at the rate that the market will bear. This system cannot be used were no competitive service is available since it could lead to exploitation. Where competitive services however are available (such as convenience systems eg. cellular) this method is ideal.

(b) <u>convenience users</u>: (for example cellular, some sectors of the payphone market etc.)

the key right to protect is <u>convenience</u> and hence the priority determinant must be <u>availability</u> of service and access. It can be made highly profitable.

(c) <u>business users</u>:

the right is effective modern communication services (both local and long distance) must cover all communication needs including high speed data. It can also be provided profitable.

(d) <u>emergency users</u>:

the right that must be protected is access and availability.

7.2 Regulating Telkom's Monopoly:

The Regulator will have the role of policing the provisions which define the boundary of the monopoly over specific facilities and services which are licenced to Telkom and regulating transactions across that boundary. It will also be the Regulator's role to administer any price control regime which may apply to monopoly services and to monitor the quality of such services.

7.3 Promoting competition:

Competition can be regarded as a form of "regulation" and is the most effective way of protecting customers and encouraging efficiency and innovation. It is therefore no surprise that in the case of utility companies, where there have been statutory monopolies in the past, the promoting and controlling the development of competition have become the specific objectives of the new regulatory regimes. The following areas have generally been tackled:

(i) industry restructuring and restrictions on vertical integration and horizontal concentration of the market and in the case of industries which are vertically and/or geographically integrated, the potential may exist for industry restructuring as a means of facilitating the

development of competition. (We can here refer to the break up of AT&T into the Baby Bells in the USA)

(ii) <u>removing barriers to entry</u>:

in this case the dominant player can create significant barriers for new market entrants and here we specifically refer to cross subsidization where it has the ability of loading cost into the monopoly areas of the business and reducing costs in the competitive areas. The controls that normally are applied is the prohibition on certain activities, requirement to offer access to networks on equitable terms, requirement to publish tariffs on a transparant basis and the prohibition on cross subsidy by the requirement to prepare separate accounts for separate activities.

Mr Chairman, Ladies and Gentlemen, I here would like to refer to a practical case study now under consideration back home. Last year, as a policy decision, the Government decided to introduce competition into the domestic air travel market which was the sole domain of the Government controlled South African Airways. We considered the option of either spliting SAA into two companies or allowing a new entrant into the market. After careful consideration it was decided to reduce the

capacity of SAA and to offer sufficient market share to the new entrant to make it a viable operation. Licenced routes were given to Flitestar (the new entrant) which has captured between 25% or more of the domestic market and a few very small operators has also entered the market. Resulting from this there has been an improvement in the service level and price of airfares has taken a sharp dive. Complaints were lodged with the Competition Board (who acts in a regulatory capacity) that SAA has followed a predatory pricing policy which has lead to the operators showing substantial losses and might force operators out of the market. The Competition Board engaged international consultants to investigate these allegations and the proposals and findings are presently being discussed by the Government and the operators within the industry. Here we are faced with a anomaly that whilst competition has forced down prices, it could force players to leave the industry and we would ultimately be back to square one with only one operator.

That could not be in the long term interest of the consumer. I can assure you there is no simple answer to this very complex situation but illustrates very clearly some of the difficult decisions that the Regulator will be faced with to promote competition in the industry.

7.4 Technical regulations:

The Regulator will have the responsibility for ensuring that network quality and safety are protected and that flexibility and efficiency in the use of resources are promoted.

The Regulator must be the determiner of Standards but must consult the operators before doing so. In this role it must issue standards, give type approvals, issue licences and monitor compliance.

In South Africa where the electronic manufacturing industry has grown out of a protective environment, this goal would have to be treated in a very sensitive manner. We have a tendency to overengineer and thereby increase cost without real benefits. It is imperative that we except lower standards of finish, mechanical design and appearance. None of this need seriously impair the sound of data quality or the reliability of the equipment. The way to achieve this is by selecting a satisfactory model and comparing results against this model rather than through some international written specifications which may be inapropriate and difficult to interpret.

In deciding in the choice of standards the following principles should be followed:

(a) Avoid proprietary standards which tie us to a particular supplier, thus diminishing competition.

(b) Select a standard which is adequate for the purpose rather than the finest engineering standard in the world.

(c) Focus on affordable service to meet the needs of the people of South Africa.

(d) Accept the standards, licences and approvals of selected countries in order to avoid duplication of effort.

Capital is a scarce commodity in South Africa and we will have to set our industry the challenge to find cheaper and more cost effective ways of providing the needs of our communities.

8. CONCLUSION

I believe that the final outcome will be a combination of different elements of regulatory models used around the world but modified to suit our particular requirements not only to stimulate the telecommunications industry in South Africa but also help to develop this industry in Africa.

I therefore want to congratulate you on taking the initiative with this conference and bringing together all the countries in this part of the world to share ideas and experience which only could be to the benefit of the industry as a whole.

THANK YOU

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Regulation and Tariff Design for Privatized Telecommunications Companies

by: *James Waddell, Partner, International Privatization Group*
Price Waterhouse

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Regulation and Tariff Design for Privatized Telecommunications Companies

James A. Waddell

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Purpose of Presentation

- Optimal Regulatory Institutional Design to Encourage Privatization
- Optimal Regulatory Mechanisms to Encourage Privatization
- Tariff-Setting in a Privatized Telecommunications Sector

Overview of Presentation

- Alternative Regulatory Frameworks
  - Rate Base / Rate of Return
  - Price Caps
  - Negotiated Rate of Return
- Elements of Tariff Design
  - Criteria for Sound Tariff Design
  - Marginal / Incremental Costs
  - Rate of Return / Revenue Requirements
- Tariff Design in Newly Privatized Telecom -- Chile (CTC)

Goals of Regulatory Framework

- Promote Financial Stability to Encourage Privatization
- Minimize Excessive Government Intervention
- Minimize Administrative Burden
- Protect Against Monopoly Profits
- Encourage Efficient Provision of Services

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Institutional Relationship Options

- Regulation By Central Government Agency
- Regulation by Separate Administrative Body

Costs and Benefits of Various Regulatory Mechanisms

Option	Characteristics	Advantages	Disadvantages
Strict Rate Base / Rate of Return (ROR) Approach	Detailed analysis of revenue requirements (including rate base, operating expenses, and return requirement), cost of service, and rate design studies. Similar to standard approach used in U.S.	Best protection against abuse of market power. Generates detailed analysis of cost structure and rate design, guarding against cross subsidies.	Relatively costly and time consuming. Provides perverse incentives to artifically increase rate base and operate inefficiently. Least favorable to potential investors.
Rate of Return Benchmark Approach	Agreement between the Government and utility as to maximum / target rate of return.	Less costly and time consuming than strict ROR approach. Guards against excessive profits. Potentially most attractive mechanism for potential investors.	Provides perverse incentives to artifically increase rate base. Provides few incentives for efficient operation. Difficult to detect discriminatory pricing or cross-subsidies in rate design.
Price Cap (RPI-X) Approach	Firm can increase prices over time at a rate not to exceed inflation (the rate of price increase, RPI) minus productivity increases (X). Base rates are reviewed periodocally. Similar to approach used in the U.K. telecom sector.	Less costly and time consuming than strict ROR approach. Attractive to investors because of potential to earn extra profits if operated efficiently. Provides excellent incentives for efficiency.	Extra adjustment clauses create added complexity to formula, increasing administrative costs. Does not provide strong framework for detecting discriminatory pricing or cross-subsidies.

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Criteria for Sound Tariff Design

- Tariff Must Recover Total Revenue Requirements and Achieve Financial Viability
- Tariff Should Promote Efficient Planning for System
- Tariff Should Promote Equity Among Customer Groups

Costs and Benefits of Various Institutional Relationships

Option	Characteristics	Advantages	Disadvantages
Continued Regulation by Government Ministry	Statutory authority for setting rates would remain with the Ministry	• allows maximum government input into the ratemaking process • social goals of the government can be reflected in the rate structure	• potential for excessive political intervention into the ratemaking process • political pressures may create incentives for creation of cross-subsidies in the rate structure and delaying overall rate increases, which may decrease attractiveness to private investors
Establishment of Separate Regulatory Commission	A separate regulatory body would be established to review rates, and potentially operations. This body may regulate other utilities within the country as well.	• less potential for political biases in the ratemaking process than under direct ministry control • regulation at "arms length" from government may make firm more attractive to potential investors • encourages "expert" regulation	• costs of establishing a separate regulatory body are perceived to be relatively high • depending on structure, there may still be potential for excessive political influence in the ratemaking process

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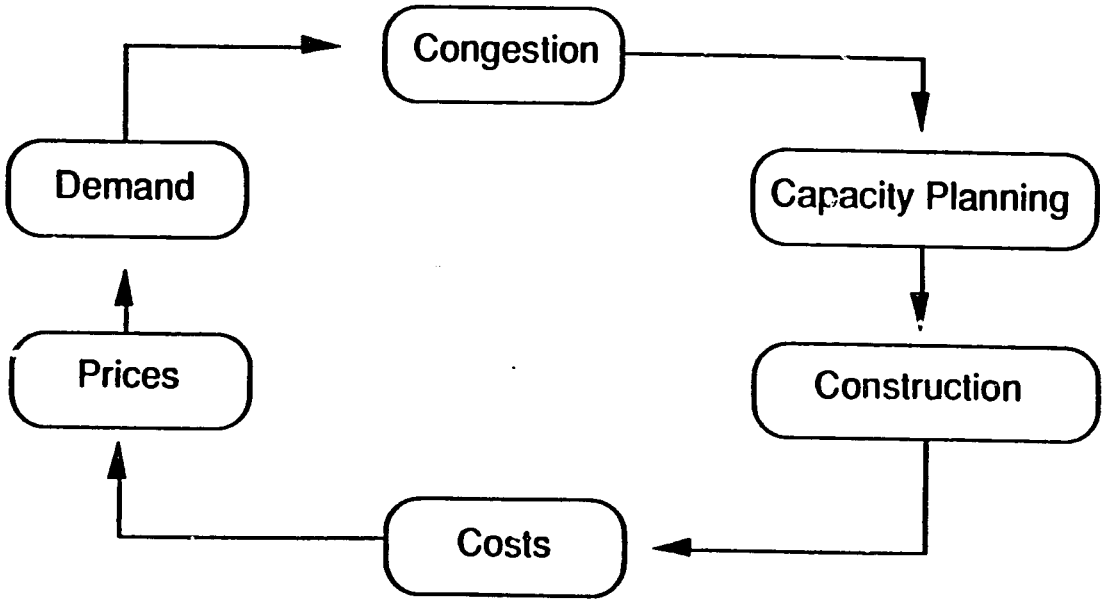
Regulatory Mechanism Options

- Rate Base / Rate of Return Approaches
  - Estimation of Rate Base (Net Assets)
  - Link to Revenue Requirements
- Price Cap Approaches
  - RPI - X Formula
  - Adjustments for Known Cost Changes
- Rate of Return Benchmark Approaches
  - Agreement for Maximum Rate of Return
  - Pricing Flexibility

Marginal / Incremental Cost Approach

- Definition of Marginal Costs
- Short-Run vs. Long Run Perspective
- Advantages of Marginal Costs Over Other Approaches
  - Fully Distributed Approach Arbitrarily Assigns Costs
  - Marginal Costs Send Optimal Pricing Signals
  - Marginal Costs Closely Mirror Investment Planning

Links Between LRMC and Investment Analysis



Costs of Supply Vary Along Several Dimensions:

- Distance Message Travels
- Number of Switches Along Route
- Density of Traffic Along Route
- Time of Day
- Quality of Service

Marginal Costs Should be Calculated for:

- Subscriber Costs
- Exchange Costs
- Transmission Costs
- Operator Time

Revenue Requirements Analysis

- Definition of Revenue Requirements
- Approaches to Estimating Revenue Requirements
  - Debt-Service Coverage Approaches
  - Rate Base / Rate of Return Approaches
- Adjustments from LRMC for Final Tariff
  - Relationship Between Average and Marginal Costs
  - Usually Upward Adjustment to Cover Fixed Costs

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Tariff Design in a Privatized Telecom: Chile (CTC)

- Compania de Telefonos de Chile (CTC) provides local service in Chile
- CTC was public entity from 1974 through 1987, when it was privatized
- Empress Nacional de Telecomunicationes (ENTEL) provides long-distance service, and was also privatized
- CTC derives approximately 25 percent of its revenues from non-regulated services:
  - public telephones
  - cellular telephones
  - equipment sales and private systems

Regulation of CTC in a Privatized Environment

- Prior to 1974, ineffective tariff formulation and weak regulatory institutions diminished CTC's ability to expand and modernized, even though company was privately owned.
- During public ownership (1974 - 1987), tariffs kept up with inflation, but demand gap continued to exist.
- During privatization, Government laid out clear regulatory framework for post-privatization company.
- Regulatory framework still evolving, particularly with regard to competitive entry.

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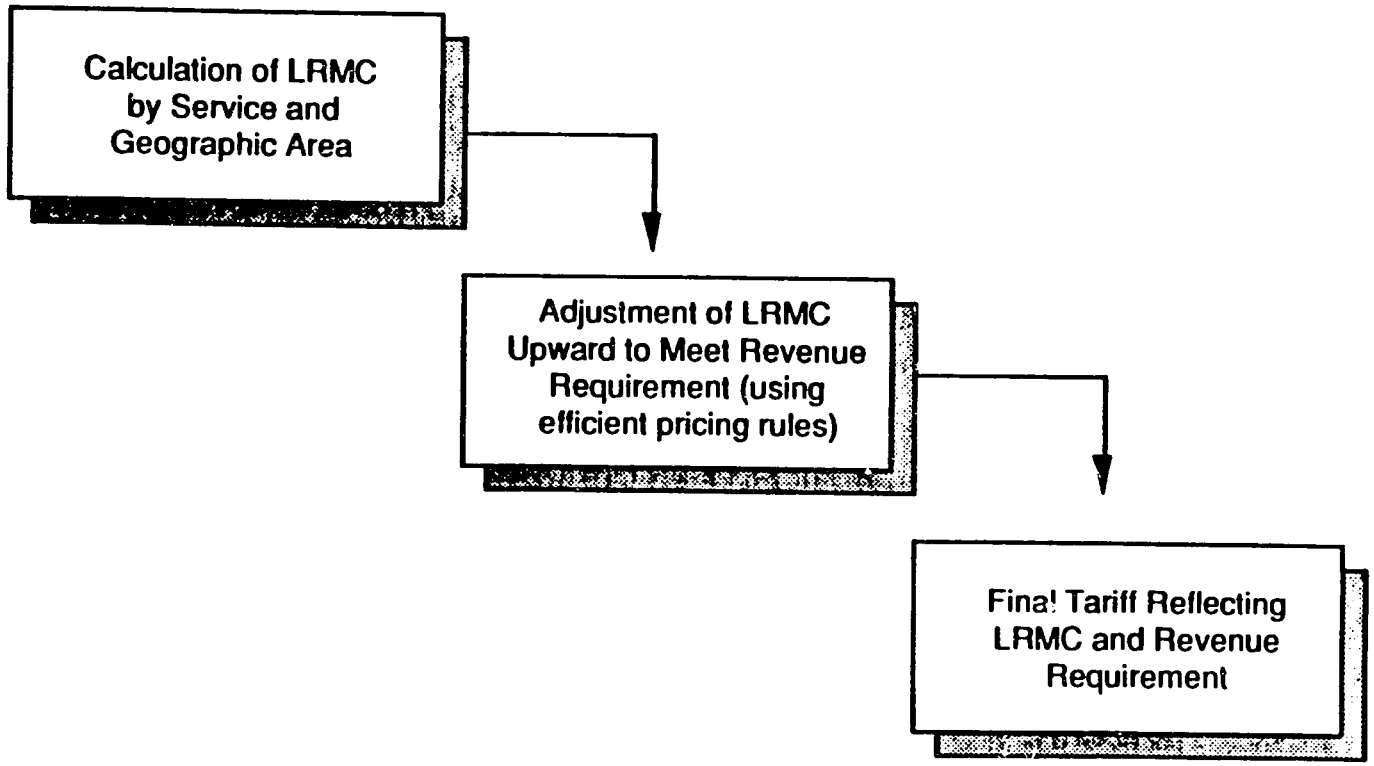
Tariff-Setting for CTC in Privatized Environment



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Lessons From CTC Experience

- Importance of Establishing Clear Regulatory Goals and Procedures Before Privatization
- Importance of Reflecting Marginal Costs of Service in Tariff to Achieve Balanced System Growth and Efficient Provision of Services
- Importance of Adjusting LRMC to Reflect Revenue Requirements and to Provide Adequate Rate of Return to Investors
  - Promotes Financial Stability
  - Ensures Adequate Investment in Capacity

Implementing Regulatory Functions: Mozambique's Institute of Communications

by: *Jan Overvest, Advisor, National Directorate of Posts & Telecommunications, Mozambique*

SADC SEMINAR ON TELECOMUNICATIONS POLICY, REGULATION AND STRUCTURING, FEBRUARY 1993, WINDHOEK, NAMIBIA

CASE STUDY IN IMPLEMENTING REGULATORY FUNCTIONS: MOZAMBIQUE'S NATIONAL INSTITUTE OF COMMUNICATIONS

1. INTRODUCTION

In September 1992 the Council of Ministers of the Republic of Mozambique approved Decree 22/92, that creates the "Instituto Nacional das Comunicações de Moçambique", an institution subordinated to the Ministry of Transport and Communications with the aim to assist the Government in coordinating, supervising and planning the sector concerned with communications for public use, and in managing the radio-electric frequency spectrum.

The implementation of this decree is part of the ongoing restructuring in the communications sector, aiming at bringing about a clear separation between policy-making, regulatory and operational functions and thus implies changes in the relations between Government and the operators of communications for public use.

2. BACKGROUND

Traditionally the postal and telecommunications services have been part of the government structures, without a clear distinction between political, regulatory and operational functions. During the last few years this situation has been changing rapidly worldwide with a generalised tendency to separate the postal from the telecommunications services, to separate the operator's functions from the policymaking and regulatory functions, and, more recently, to separate the regulatory from the policymaking functions.

When Moçambique attained Independence in 1975, it inherited within the colonial government structure the "Direcção dos Serviços dos Correios, Telégrafos e Telefones - CTT". This Directorate ceased to exist when, in line with the above mentioned development, Mozambique separated the postal and telecommunications services from the government structure in 1981, creating two distinct parastatal companies. However, in the absence of a separate regulatory body, some regulatory functions continued to be exercised by the operators.

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Early 1991 it was felt that the creation of a separate Regulatory Body should be prepared and to that end the Ministry of Transport and Communications prepared draft legislation, that was submitted to and approved by the Council of Ministers in September 1992.

3. THE NATIONAL INSTITUTE OF COMMUNICATIONS OF MOZAMBIQUE

3.1. Character

The Instituto Nacional das Comunicações de Moçambique, designated by the abbreviation INCM, is a public institute, subordinated to the Ministry of Transport and Comunications, with legal identity and administrative and financial autonomy. Its aim is to assist the Government in coordinating, supervising and planning the sector concerned with communications for public use, and in managing the radio-electric frequency spectrum.

3.2. Jurisdiction

The jurisdiction of the INCM covers the following:

a) To actively collaborate in the definition of communications policy measures in Mozambique, such as the definition of the sector's legal framework, the administrative and entrepreneurial organisation of the sector, technological and scientific research and development related to communications and coordination with other official departments, public or private bodies and entities, in the actions required to implement communications policy measures.

b) To advise the Government in the exercise of its supervisory functions, including the preparation and submission of the necessary draft legislation and regulations for the operation and protection of communications, the inspection of the quality and pricing of services provided by operators of communications for public use and their observation of the applicable legal and regulatory dispositions and the issuing of opinions on the activity and financial plans of the public companies in the communications sector and on draft Programme Contracts to be signed between the Government and these companies.

c) To coordinate, nationwide, everything to do with the implementation of international treaties, conventions and agreements related to communications, as well as the representation of the Mozambican State in corresponding international bodies, when not otherwise determined.

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d) To approve materials and equipment and, in collaboration with other bodies, to define standards and technical specifications for the materials and equipment used in communications, with the exception of those used in the private networks of the Defence and Security Forces. To proceed in the same manner with regard to radio-communications transmitters and receivers, in accordance with applicable legislation.

e) To manage the radio-electric frequency spectrum, including the planning, within the context of international agreements, of the use of the national radio-electric frequency spectrum, the assignment of frequencies, the licensing of all radio-electrical communications means, the inspection of the use of the spectrum and the coordination of the use of the spectrum with neighbouring countries.

f) To license operators of communications for public use, and those providing value added services.

g) To prepare the necessary studies for coordination between civil communications and those of the Defence and Security Forces, and between the operators of communications for public use and the operators of social communications.

h) To undertake the necessary studies for the coordination of the infrastructures of the various civilian telecommunications systems, including radio and television broadcasting.

In pursuance of its objectives, the INCM is organised into two areas of activity: Postal and Telecommunications.

3.3. Organic system

Organs of the INCM are the Management and the Technical Council and the Institute shall further comprise departments, sections and sub-sections, their number and duties varying in accordance with the development of communications.

The management comprises a director, a deputy director and the department heads and is the organ with full executive powers responsible for the technical, administrative and financial management of the INCM.

The technical council is chaired by the director of the INCM and, in addition to his deputy, includes representatives of some of the Government Ministries and the public companies operating in the communications field.

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The technical council gives opinions on issues such as the coordination between civilian communications and those of the Defence and Security Forces, the coordination of the infrastructures of the various civilian telecommunications systems, including those of radio and television broadcasting, the planning of the use of the national radio-electric frequency spectrum, and the definition of standards.

3.4. Administrative and financial management

Main sources of revenue of the INCM are the following:

a) Fees and other revenue collected within the context of the management of the radio-electric frequency spectrum;
b) Fees and other revenue collected within the context of licensing and inspecting the suppliers of communications services;
c) Fees and other revenue from the approval of material and equipment;
d) Fixed contributions by operators of telecommunication for public use;

The contributions by operators of telecommunications for public use shall be determined annually and in advance, on the basis of the budget proposal submitted by the Management to the Minister of Transports and Communications. The amount proposed for these contributions shall be divided among the operators of telecommunications for public use, in proportion to their overall income in the year immediately preceding that in which the budget proposal is prepared.

INCM expenditure comprises of the charges resulting from its respective operation and the exercise of the functions and responsibilities assigned to it, the costs of the acquisition, maintenance and conservation of the property, equipment or services it has to use and charges for studies and research in the communications field.

3.5. Personnel

The INCM staff will mainly come from two sources: the transfer of some staff from the Ministry of Transport and Communications and the transfer of some staff from the two public companies operating in the telecommunications field.

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3.6. Implementation

The implementation of the Institute is foreseen to be gradual so as to avoid disruption of activities. Thus the transfer of personnel, assets and functions from the Ministry, from the Correios de Moçambique and from the Telecomunicações de Moçambique will take some time as well as the creation of the different departments that are foreseen to exist in the Institute.

4. PERSPECTIVES

4.1. At national level

It is expected that the creation of the Communications Institute will contribute to the clarification of the specific roles of different players in the communications field. It is furthermore expected that only a clear separation of regulatory and operators functions will open up the road for the entrance of new partners, be it private companies that enter into joint-ventures with the Government-owned public companies, be it companies that enter into the market as competitors. The existence of a Regulatory Body as a separate entity will contribute to open up the market and diversify and develop the communications services.

4.2. At regional level

The creation of SATCC was an important step to promote regional cooperation in the field of telecommunications. However, much more has to be done and it is our view that regional coordination and cooperation at government level should be complemented by regional cooperation at the regulatory and the operator's levels. There are important fields to be covered such as the definition of common tariff structures and levels, the management of the radio-electric frequency spectrum, the setting of common regional standards and the approval of equipment and materials.

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Telecommunications Policy, Regulation and Restructuring

Windhoek, Namibia
February 17-19, 1993

Appendices

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TELECOMMUNICATIONS SECTOR –

COUNTRY STATISTICAL PROFILES

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ZAMBIA

Questionnaire - Zambia

1 Size of Network

Estimate the historical, current, and planned size network for the following years:

	1990	1992	1995	2000	2010
Tot. Lines in Service	60,750	68,935	83,270	114,087	214,141
Res. Lines Service	31,646	36,203	43,731	59,915	112,460
Bus. Lines in Service	29,104	32,732	39,539	54,172	101,681
*Gov. Lines in Service	9,296	9,413	9,698	10,193	11,259

* included in Business and Residential lines

2 Urban/Rural Composition of Network

% of network connection in rural areas	20.55
% of network connections in urban areas	79.45
% of switches in rural areas	19.20
% of switches in urban areas	80.80
% of potential subscribers in rural areas	24.59
% of potential subscribers in urban areas	75.41

3 Geographical Composition of Network

List geographical areas used for planning purposes (e.g, north vs. south), the percent of connections from each area, the percent of billing for each areas, approximate population distributions, and approximate Gross Regional Product for each area.

Area	Connections	Billing	Population	Gross Reg. Prod.
Chingola	8.77	7.63	5.74	Not available
Chipata	3.01	2.32	12.46	
Choma	5.03	2.73	10.44	
Kabwe	5.22	2.40	7.65	
Kasama	4.27	1.26	10.59	
Kitwe	13.89	11.81	5.62	
L/stone	3.86	2.93	5.93	
Lusaka Rural	2.12	1.71	5.11	
Mansa	1.93	0.96	7.25	
Mongu	1.45	1.12	6.94	
Ndola	16.70	14.99	4.81	
Solwezi	1.52	0.84	4.90	
Lusaka City	32.22	49.30	12.56	

4 Terminal Type

Please give estimated number of the following terminal types connected to the network:

	No. of Terminals	% of all Terminals
Handsets	104518	
PBX's	no information available	
Modems	"	
Fax Machines	"	
Other (Specify)	"	

5 Telex Services

What is total telex capacity?	4,504
Lines per telex exchange	Lusaka 2,048; Kitwe 2,456
Number of telex exchanges	2

6 Switching Equipment

List the switch technologies used (e.g, analog, digital, cross-bar) and the approximate number of each type of switch.

Technology	No. of Switches
Digital	20
Crossbar	23
Electronic	47
Manual	5

7 Outside Plant

List different transmission media used (e.g., open wire, underground cable, microwave, local radio) and percent of total traffic carried over each medium.

Medium	% of Traffic
Microwave	99.80
Open Wire	0.20

8 Fixed Assets

What is the value of capital work in process?	2,015,000,000 at 3/91
How are assets depreciated?	straight line

9 Traffic

Give numbers and percentages of calls and minutes within each of the following jurisdictions:

	Call Type	Number of Calls
Local	STD calls	505,080,923 units
Toll	Operator Calls	1,395,799 Mins Mostly trunk 95%)
International	International	1,067,372 mins
*Total		

Not able to split into local, toll and international by number or minute

10 International Traffic

Is balance of traffic incoming or outgoing? Outgoing
List top five countries for incoming and outgoing calls and the approximate volume for each.

Incoming	# of Calls	Outgoing	# of Calls
UK	4,904,976	UK	2,987,457
RSA	2,076,140	RSA	2,279,754
USA (AT&T)	1,480,150	Zimbabwe	1,194,526
Zimbabwe	1,416,287	USA	690,857
Botswana	336,108	Germany	570,380

What is the call completion rate for incoming international calls? 60%

11 Demand

How many of the following customer types are on the waiting list for service initiation?

Residential	45,194
Business	12,316

How long is the wait for service?

Residential	21 days if service possible; otherwise 6 mths to 5 yrs
Business	21 days

What is the service initiation charge?

Residential	K 120
Business	K 120

12 Long Term Planning

Is there a long term telecommunications development program? Yes
10-20 years

What are the objectives of the program? Give quantities if specified.

What new service offerings are planned over the next 5 years and the next 10 years?

- cellular telephones
- packet switching network

(not sure)

What levels of profitability and return are planned?
15-25% (government policy)

13 Tariffs

What is the approximate cost of five minute calls beginning at 9:00 AM and terminating in the following jurisdictions:

Local	K 2.83
Toll (within 100 km)	17.00
Toll (100-300 km)	25.50
Toll (300-500km)	51.00

Washington, DC	US$27.50
London	US$27.50
Dar es Salaam	US$14
Lusaka	N/A
Harare	US$14
Gaborone	US$14
Lilongwe	US$14
Johannesburg	US$14
Maputo	US$14
Windhoek	US$14

14 Billing Conditions

How frequently are bills sent to customers?

On monthly basis and fortnightly for IDD - International Direct Dialing but 6 weeks in arrears

What is average payment time within residential, business, and government customers?
2.5 months, 2.5 months, up to 1 year

Approximately what percent of revenues is uncollectible? 15%

15 Please attach financial statements (or annual reports) for the entire entity and just the telecommunications businesses.

MALAWI

Questionnaire - Malawi

1 Size of Network

Estimate the historical, current, and planned size network for the following years:

	1990	1992	1995	2000	2010
Tot. Lines in Service	24,913	28,304	37,673	60,672	157,368
Res. Lines Service	11,571	12,664	16,856	27,146	70,411
Bus. Lines in Service	13,342	15,640	20,817	33,526	86,957
Gov. Lines in Service					

2 Urban/Rural Composition of Network

% of network connection in rural areas	13.08%
% of network connections in urban areas	86.92%
% of switches in rural areas	81.73%
% of switches in urban areas	18.27%
% of potential subscribers in rural areas	70.75%
% of potential subscribers in urban areas	29.25%

3 Geographical Composition of Network

List geographical areas used for planning purposes (e.g. north vs. south), the percent of connections from each area, the percent of billing for each areas, approximate population distributions, and approximate Gross Regional Product for each area.

Area	Connections	Billing	Population	Gross Regional Product

4 Terminal Types

Please give estimated number of the following terminal types connected to the network:

	No. of Terminals	% of all Terminals
Handsets		
PBX's		
Modems		
Fax Machines	507	
Other (Specify)		

5 Telex Services

What is total telex capacity?

Lines per telex exchange	2400
Number of telex exchanges	1

6 Switching Equipment

List the switch technologies used (e.g. analog, digital, cross-bar) and the approximate number of each type of switch.

Technology	No. of Switches
Analog. (SXS)	2
Cross-Bar	16
Digital	58
Manual (Magneto)	28

7 Outside Plant

List different transmission media used (e.g., open wire, underground cable, microwave, local radio) and percent of total traffic carried over each medium.

Medium	% of Traffic

8 Fixed Assets

What is the value of capital work in process?	MK48.5 million
How are assets depreciated?	straight line method

9 Traffic

Give numbers and percentages of calls and minutes within each of the following jurisdictions:

	Number of Calls	No. of Minutes
Local	not available	40,758
Toll	"	91,704.6
International	"	3,396.6
Total	"	135,859.2

10 International Traffic

Is balance of traffic incoming or outgoing? Outgoing

List top five countries for incoming and outgoing calls and the approximate volume for each.

Incoming	# of Calls	Outgoing	# of Calls
RSA	2,132,256	RSA	1,779,475
USA	383,949	UK	1,296,522
UK	162,522	Zimbabwe	648 691
Zambia	35,677	USA	342,909
Zimbabwe		Zambia	155,014

What is the call completion rate for incoming international calls?
33.1%

11 Demand

How many of the following customer types are on the waiting list for service initiation?

Residential	
Business	15,661

How long is the wait for service?

Residential	
Business	

What is the service initiation charge?

Residential	68.00 MK
Business	155.00 MK

12 Long Term Planning

Is there a long term telecommunications development program?

What are the objectives of the program? Give quantities if specified.

What levels of profitability and return are planned

	1989/90	1990/91	1991/92
Gross Profit	MK55.8	MK59.6	MK57.7

13 Tariffs

What is the approximate cost of five minute calls beginning at 9.00 AM and terminating in the following jurisdictions:

Local	0.20MK	Washington, DC	40.00 MK
Toll (within 100 km)	1.25	London	40.00 MK
Toll (100-300 km)	1.67	Dar es Salaam	25.00 MK
Toll (300-500 km)	2.50	Lusaka	25.00 MK
		Harare	25.00 MK
		Gaborone	25.00 MK
		Lilongwe	
		Johannesburg	25.00 MK
		Maputo	25.00 MK
		Windhoek	25.00 MK

14 Billing Conditions

How frequently are bills sent to customers? Monthly

What is average payment time within residential, business, and government customers?

1 month, 1 month, 3 months

Approximately what percent of revenues is uncollectible? 10%

15 Please attach financial statements (or annual reports) for the entire entity and just the telecommunications businesses. (attached)

LESOTHO

Questionnaire - Lesotho

1 Size of Network

Estimate the historical, current, and planned size network for the following years:

	1990	1992	1995	2000	2010
Lines in Service	10,998	11,724	33,630	49,657	106,762
Res. Lines Service	6,383	15,140	19,498	29,672	67,833
Bus. Lines in Service	3,379	3,715	11,607	16,663	34,342
Gov. Lines in Service	1,236	1,182	2,525	3,322	4,547

2 Urban/Rural Composition of Network

% of network connections in rural areas	42
% of network connections in urban areas	63
% of switches in rural areas	58
% of switches in urban areas	42
% of potential subscribers in rural areas	16
% of potential subscribers in urban areas	84

3 Geographical Composition of Network

List geographical areas used for planning purposes (e.g, north vs. south), the percent of connections from each area, the percent of billing for each areas, approximate population distributions, and approximate Gross Regional Product for each area.

Area	Connections (M)	Billing	Population	Gross Reg. Prod.
North	1,088	?	60,700	Not available
Cent.	1,211	?	20,400	"
South	1,242	?	483,000	"
Maseru	8,942	2,247,472	354,000	"
	12,483	3,358,404	918,100	

4 Terminal Types

Please give estimated number of the following terminal types connectec to the network:

	No. of Terminals	% of all Terminals
Handsets Dels	11,234	
PBX's	500	
Modems	-	
Fax Machines	381	
Other (Specify):		
Digital Radio Sys. Dels	125	
Leased lines	52	

5 Telex Services

What is total telex capacity?

Lines per telex exchange	623
Number of telex exchanges	1

6 Switching Equipment

List the switch technologies used (e.g, analog, digital, cross-bar) an the approximate number of each type of switch.

Technology	No. of Switches
AXE-10 Digital	10
Pentex Exchange-Semi Electronic	1
Philips UD (Dutch) Analogue	4
Public Manual Exchanges	22

7 Outside Plant

List different transmission media used (e.g., open wire, underground cable, microwave, local radio) and percent of total traffic carried ov each medium.

Medium	% of Traffic
Microwave	95.12
Underground cable to RSA	4.5
Optic Fibre	0
Open Wire - to RSA	0.38

8 Fixed Assets

What is the value of capital work in process?	M 33,000,000
How are assets depreciated?	Straight Line

9 Traffic

Give numbers and percentages of calls and minutes within each of the following jurisdictions: Annual figures as at December 1991

	No. of Calls	No. of Minutes
Local (Units)	47,267,000	283,602,000
Toll (Units)	60,149,000	360,894,000
International (No)	94,799,800	302,748,100
Total	202,215,800	947,244,100

10 International Traffic

Is balance of traffic incoming or outgoing? Outgoing

List top five countries for incoming and outgoing calls and the approximate volume for each.

Incoming	# of Calls	Outgoing	# of Calls
South Africa	6,686,835	South Africa	8,920,990
USA	305,680	Botswana	63,022
UK	197,614	Swaziland	40,254
Botswana	181,399	UK	29,500
Germany	127,210	USA	21,220

What is the call completion rate for incoming international calls?
50%

11 Demand

How many of the following customer types are on the waiting list for service initiation?

Residential	1,850
Business	795

How long is the wait for service?

Residential	6 weeks min - or 6 months in main towns
Business	

What is the service initiation charge?

Residential	M332
Business	M332

12 Long Term Planning

Is there a long term telecommunications development program? Yes, prepared by UNDP/ITU, not approved at time of visit.

What new service offerings are planned over the next 5 years and the next 10 years? Only information made available were the highlights of the plan attached.

What levels of profitability and return are planned? Not available

13 Tariffs

What is the approximate cost of five minute calls beginning at 9.00 AM and terminating in the following jurisdictions:

Local	MO.20	Washington, DC	M 54
Toll (within 100 km)	MO.36	London	M 45
Toll (100-300 km)	MO.45	Dar es Salaam	M 27
Toll (300-500km)	MO.60	Lusaka	M 18
		Harare	M 13.50
		Gaborone	M 9
		Lilongwe	M 18
		Johannesburg	M 1.80
		Maputo	M 13.50
		Windhoek	M 9

14 Billing Conditions

How frequently are bills sent to customers? Monthly

What is average payment time within residential, business, and government customers?

12 months, 6 months, 12 months

Approximately what percent of revenues are uncollectible?

45%

15 Please attach financial statements (or annual reports) for the entire entity and just the telecommunications businesses.

Attached for year ended 31 March 1991

TANZANIA

Questionnaire - Tanzania

1 Size of Network

Estimate the historical, current, and planned size network for the following years:

	1990	1992	1995	2000	2010
Total in Service	72,774	107,489	160,763	292,748	478,007
Res. Lines Service	26,038	38,537	57,520	104,743	170,949
Bus. Lines in Service	39,074	57,829	86,317	157,183	256,537
Gov. Lines in Service	7,662	11,123	16,926	30,822	50,521

2 Urban/Rural Composition of Network

% of network connection in rural areas 18%
% of network connections in urban areas 82%

% of switches in rural areas 20%
% of switches in urban areas 80%

% of potential subscribers in rural areas 27%
% of potential subscribers in urban areas 73%

3 Geographical Composition of Network

List geographical areas used for planning purposes (e.g, north vs. south), the percent of connections from each area, the percent of billing for each areas, approximate population distributions, and approximate Gross Regional Product for each area.

Area	Connections	Billing	Population	Gross Reg. Prod.
Arusha	6%	7.2%	134,708	Not available
Mwanza	5%	6.0%	223,013	"
Zanzibar	4.5%	4.0%	208,327	"
Dodoma	4%	3.5%	203,833	"
D'Salaam	39%	56.2%	1,360,850	"
Mbeya	2.8%	2.9%	152,844	"
Tanga	12.3%	2.6%	187,155	"
Morogoro	3.7%	2.4%	117,760	"
Moshi	9.2%	2.0%	96,838	"
Shinyanga	2%	1.9%	100,724	"
Tabora	1.5%	1.3%	93,506	"
Others	10%	10.0%	Not available	

4 Terminal Types

Please give estimated number of the following terminal types connected to the network:

	No. of Terminals	% of all Terminals
Handsets	146,589	96.5%
PBX's	1,800	1.2%
Modems	20	0.01%
Fax Machines	1,500	0.99%
Other (Specify)		
Telex Machine	1,928	1.3%

5 Telex Services

What is total telex capacity? 4,785

Lines per telex exchange DSM 1 = 2,143, DSM 2 = 492, Arusha = 150, Dodoma = 2,000

Number of telex exchanges 4

6 Switching Equipment

List the switch technologies used (e.g, analog, digital, cross-bar) and the approximate number of each type of switch.

Technology	No. of Switches
Strowger (SXS) - Analog	6
Cross-Bar (Hitachi) - Analog	26
Manual (Magneto)	139
Digital	12

7 Outside Plant

List different transmission media used (e.g., open wire, underground cable, microwave, local radio) and percent of total traffic carried over each medium.

Medium	% of Traffic
Open wire	Not available
Underground Cable (Normal)	
Underground Cable (Optical Fibre)	
Microware Radio (Analog)	
Microwave Radio (Digital)	
VHF/UHF Radio	

8 Fixed Assets

What is the value of capital work in process?
How are assets depreciated?

9 Traffic

Give numbers and percentages of calls and minutes within each of the following jurisdictions:

	No. of Calls	No. of Minutes
Local		
Toll		
International		
Total		

10 International Traffic

Is balance of traffic incoming or outgoing? Outgoing
List top five countries for incoming and outgoing calls and the approximate volume for each.

Incoming	# of Calls	Outgoing	# of Calls
USA	426,422 (Min)	UK	1,341,512 (Min)
India	222,126	UAE	373,242
Germany	203,270	Canada	289,060
Sweden	127,726	Muscat/Oman	265,854
Zambia	140,786	Italy	249,420

What is the call completion rate for incoming international calls? 17%

11 Demand

How many of the following customer types are on the waiting list for service initiation?

Residential	32,162
Business	75,046

How long is the wait for service?

Residential	2 years
Business	6 months

What is the service initiation charge?

Residential	US$62.50
Business	US$125.00

12 Long Term Planning

Is there a long term telecommunications development program? Yes

What are the objectives of the program? Give quantities if specified

- Extension and up-grading of telecom systems
- Training of staff in the relevant fields of telecommunications
- Installation of new switches & transmission links
- Definition of funding modalities

What new service offerings are planned over the next 5 years and the next 10 years?

- STAFF/1000 DEL'S from 75 (1992) to 43 (1995) & 23 (2000)
- Full digital network by 2005

What levels of profitability and return are planned? Not available

13 Tariffs

What is the approximate cost of five minute calls beginning at 9:00 AM and terminating in the following jurisdictions:

Local (30-150 km)	US$0.19	Washington, D.C.	US$ 30.00
Toll (within 100 km)	US$0.19	London	US$ 30.00
Toll (150-510 km)	US$0.63	Dar es Salaam	-
Toll (OVER-510 km)	US$0.69	Lusaka	US$ 20.00
		Harare	US$ 20.00
		Gaborone	US$ 20.00
		Lilongwe	US$ 20.00
		Johannesburg	US$ 20.00
		Maputo	US$ 20.00
		Windhoek	US$ 20.00

14 Billing Conditions

How frequently are bills sent to customers? Monthly

What is average payment time within residential, business, and government customers? 90 days

Approximately what percent of revenues are uncollectible? 4%

15 Please attach financial statements (or annual reports) for the entire entity and just the telecommunications businesses.

ANGOLA

Questionnaire - Angola

1 Size of Network

Estimate the historical current, and planned size of network for the following years:

	1990	1992	1995	2000	2010
Tot. Lines in Service					
Res. Lines in Service					
Bus. Lines in Service					
Gov. Lines in Service					

3 Urban/Rural Composition of Network

% of network connections in rural areas	0
% of network connections in urban areas	100
% of switches in rural areas	0
% of switches in urban areas	100
% of potential subscribers in rural areas	no information available
% of potential subscribers in urban areas	

Geographical Composition of Network

List geographic areas used for planning purposes (e.g. north vs. south), the percent of connections from each area, the percent of billing for each area, approximate population distributions, and approximate Gross Regional Product for each area.

Area	Connections	Billing	Population	Gross Reg. Prod.

Terminal Types

Please give estimated number of each of the following terminal types connected to the network:

	No. of Terminals	% of all Terminals
Handsets		
PBX's		
Modems		
Fax Machines		
Other (specify)		

5 **Telex Services**

What is total telex capacity?
Lines per telex exchange
Number of telex exchanges

6 **Switching Equipment**

List the switch technologies used (e.g., analog, digital. cross-bar) a
the approximate number of each type of switch.

Technology	**No. of Switches**

7 **Outside Plant**

List different transmission media used (e.g., open wire, underground
cable microwave, local radio) and percent of total traffic carried ove
each medium.

Medium	**% of Traffic**

8 **Fixed Assets**

What is the value of capital work in process?
How are assets depreciated? Straight line

9 **Traffic**

Give numbers and percentages of calls and minutes within each of the
following jurisdictions:

	No. of Calls	**No. of Minutes**
Local		
Toll		
International		
Total		

10 International Traffic

Is balance of traffic incoming or outgoing? Outgoing

List top five countries for incoming and outgoing calls and the approximate volume for each:

Incoming	# of Calls	Outgoing	# of Calls

What is the call completion rate for incoming international calls?

11 Demand

How many of the following customer types are on the waiting list for service initiation?

Residential	no waiting list maintained
Business	

How long is the wait for service?

Residential	1 day to 10 years
Business	

What is the service initiation charge?

Residential	AOK 50,000
Business	AOK 50,000

12 Long Term Planning

Is there a long term telecommunications development program? Yes but prepared in 1985 for 20 years.

What are the objectives of the program? Give quantities if specified.

What new service offerings are planned over the next 5 years and the next 10 years? Cellular phones

What levels of profitability and return are planned?

13 Tariffs

What is the approximate cost of five minute calls beginning at 9:00 AM and terminating in the following jurisdictions:

Local	AOK 100	Washington, DC	AOK 10,500
Toll (within 100 km)	625	London	8,000
Toll (100-300 km)	1,000	Dar es Salaam	10,500
Toll (300-500 km)		Lusaka	10,500
		Harare	10,500
		Gaborone	10,500
		Lilongwe	10,500
		Johannesburg	10,500
		Maputo	6,750
		Windhoek	10,500

14 Billing Conditions

How frequently are bills sent to customers?

Every two months

What is average payment time with residential, business, and governmei customers?

45 days, 45 days, indefinite & variable

Approximately what percent of revenues is uncollectible? 20%

15 Please attach financial statements (or annual reports) for the entire entity and just the telecommunications businesses.

Attached for ENATEL

SOUTH AFRICA

Questionnaire - South Africa

1 Size of Network

Estimate the historical, current and planned size of network for the following years:

(as at 31 March)

Main Services	1990	1992	1995	2000	2010
Tot. in Service	3,080,333	3,479,707	4,491,862	5,389,289	7,174,047
Res. in Service	2,056,490	2,297,036	3,038,575	3,532,307	4,500,343
Bus. in Service	921,090	1,083,334	1,453,287	1,856,982	2,673,704
Gov. in Service	not categorized separately				

2 Urban/Rural Composition of Network

% of network connections in rural areas	27.62
% of network connections in urban areas	72.38
% of switches in rural areas	54
% of switches in urban areas	46 *
% of potential subscribers in rural areas	23
% of potential subscribers in urban areas	77

* Denotes Metropolitan Multi Exchange Areas

1 Geographic Composition of Network

List geographic areas used for planning purposes (eg north vs south), the per cent of connections from each area, the per cent of billing for each area, approximate population distributions, and approximate Gross Regional Product for each area.

Area	Connections	Population
Western Cape	19%	10.5%
Eastern Cape	8%	9.2%
Transvaal	20%	38.6%
OFS	5%	
Northern Cape	2%	9.7%
Natal	17%	16.2%
Witwatersrand	30%	15.8%

4 Terminal Types

Please give estimated number of each of the following terminal types connected to the network:

	No. of Terminals	% of all Terminals	Telkom Mkt Share
Handsets	5,000,000	> 90%	
PBX's	310,000	20%	
Modems	51,000	-	
Fax Machines	0	0%	
Other (specify)			
Key systems	420,000	> 90%	

5 Telex Services

Total telex exchange capacity	51,965
Number of telex exchanges	6

6 Switching Equipment

List the switch technologies used (eg analog, digital, cross-bar) and the approximate number of each type of switch.

Technology	No. of Switches
<u>Digital</u>	
EWSD	213
E10	52
<u>Analog</u>	
TM + MU (Comb.)	22
MU	398
EMD	181
TM	15
<u>Cross point</u>	
CP24	33

Subscribers equipment	
Instruments	2
Switching units	5
Pay phones	5
Foreign services equipment (including switching equipment)	15
Data equipment	
Subscribers equipment	7
Infrastructure equipment	10
Telegraph equipment	
Subscribers equipment	7
Infrastructure equipment	10
Cables	
Overhead	10
Underground	15
Undersea	20
Switching equipment	15

b. Obsolete stock

Obsolete stock is written off in full in the financial year in which it is identified as obsolete.

The value of items identified as slow-moving is reduced, by means of a predetermined percentage, after a period, to reflect their real value to the company.

c. Doubtful debts

Adequate provision must be made for doubtful debts in the financial statements to the extent to which they are considered to be irrecoverable.

All debts which have been handed over for collection or which are in legal dispute must be provided for in full.

d. Profit taking on contracts

Profits may be taken only on completion of the contract concerned. Exceptions to this policy must have the authorization of the Senior General Manager: Finance. The definition of completion must be included in the contract and accepted by the client. All anticipated losses are to be provided for in full irrespective of the stage of completion of the contract.

13 Tariffs

What is the approximate cost of five minute calls beginning at 9:00 AM and terminating in the following jurisdictions?

Local	R0.19 (0-50 km)	Washington, DC	R30.00
Toll (within 100 km)	R1.70 (50-100 km)	London	R30.00
Toll (100-300 km)	R3.02 (100-200 km)	Dar es Salaam	R38.00
	R4.53 (200-400 km)	Lusaka	R13.50
Toll (300-500 km)	R5.67 (400-800 km)	Harare	*
	R6.80 (+800 km)	Gaborone	*
		Lilongwe	R13.50
		Johannesburg	N/A
		Maputo	*
		Windhoek	Same as local calls

* Full rate (for 5 minutes)
0 - 100 km : R4.50
100 - 600 km : R5.50
Above 600 km : R8.00

14 Billing Conditions

How frequently are bills sent to customers? Once per month.

What is average payment time with residential, business and government customers? Bills are payable within 21 days from the date of printing.

Approximately what percent of revenues are uncollectible?
Below 0.5 percent on average.

15 Please attach financial statements (or annual reports) for the entire entity and just the telecommunications businesses.

SPECIFIC ACCOUNTING POLICIES - TELECOMMUNICATIONS OPERATING COMPANY

a. Depreciation

Depreciation is provided on telecommunication plant and other fixed assets on a straight line basis over the estimated effective lives of the relevant assets.

Depreciation is provided as from date of commissioning of the asset and will continue until the asset is disposed of or the book value thereof is written down to R1,00.

The initial computer software used in the telecommunications network is capitalized and computer software purchased thereafter is purchased under operating expenditure and is written off in the year in which it is bought. All other computer software is written off in the year in which it is purchased or developed.

Depreciation periods to be applied are as follows unless there are exceptional circumstances which must be approved by the Senior General Manager, Finance.

Asset Category	Depreciation Periods (years) on Cost for Accounting Purposes
Telecommunications Plant	
Transmission equipment	15
Power plant	15
Motorphone	
Infrastructure equipment	15
Terminal equipment	5
Other Fixed Assets	
Test apparatus	5
Mechanical aids	10
Vehicles	5
Data processing equipment	5
Stores handling equipment	10
Office equipment	10
Buildings	40

7 Outside Plant

List different transmission media used (eg open wire, underground cable, microwave, local radio) and per cent of total traffic carried over each medium.

Medium	% of Traffic
Open wire	3%
U/G Cable	40%
Coaxial Cable	5%
Digital M/W	8%
Analogue M/W	7%
Optic Fibre Cable	36%
Local Radio	1%

8 Fixed Assets

What is the value of capital work in process? R948,0 million

How are assets depreciated? straight line basis

9 Traffic

Give numbers and percentages of calls and minutes within each of the following jurisdictions:

	Distrib. of Calls
Local	77.55%
Toll	22.0%
International	0.5%
Total	100.0%

10 International Traffic

Is balance of traffic incoming or outgoing? Incoming, on average.

List top five countries for incoming and outgoing calls and the approximate volume for each:

Minutes per month - Average for 3 months

Incoming	# of Calls	Outgoing	# of Calls
United Kingdom	1,770,970	United Kingdom	2,211,864
Zimbabwe	1,647,891	Zimbabwe	1,409,066
USA (AT&T)	1,479,419	USA	915,330
Botswana	1,069,775	Botswana	913,060
Germany	896,565	Germany	874,452

What is the call completion rate for incoming international calls? 61

11 Demand

How many of the following customer types are on the waiting list for service initiation?

Residential	90,469
Business	7,832

How long is the wait for service?

Residential	Depending on availability
Business	Infrastructure 4-6 weeks

What is the service initiation charge?

Residential	R195,00
Business	R195,00

12 Long Term Planning

Is there a long term telecommunications development program? Yes

What are the objectives of the program? Give quantities if specified.

- Rationalization of network to a two tier structure
- Replacement of electro-mechanical exchanges by the year 2005
- Replacement of manual exchanges by the year 2000
- Trunk network to be 100% digital by 1995
- Waiters not to exceed 3%

What new service offerings are planned over the next 5 years and the next 10 years?

5 Years: Additional value added voice services
Narrow-bank ISDN
Centrex
Frame relay & Man's

10 Years: Broadband ISDN

What levels of profitability and return are planned?

	1994	1995	1996	1997	1998
(After tax) Net profit margins	(%) 7.6	11.2	13.6	14.9	15.6
(After tax) Return on investment	(%) 3.8	6.4	8.2	9.4	10.0

ZIMBABWE

Questionnaire - Zimbabwe

1 Size of Network

Estimate the historical, current, and planned size network for the following years:

	1990	1992	1995	2000	2010
Tot. Lines in Service	123,665	127,072	323,526	526,476	690,476
Res. Lines in Service	77,111	78,785	258,821	421,181	552,381
Bus. Lines in Service	46,554	48,287	64,705	105,295	138,095
*Gov. Lines in Service					

* included Business Lines.

2 Urban/Rural Composition of Network

% of network connection in rural areas	7
% of network in urban areas	93
% of switches in rural areas	49
% of switches in urban areas	51
% of potential subscribers in rural areas	8
% of potential subscribers in urban areas	92

3 Geographical Composition of Network

List geographical areas used for planning purposes (e.g. north vs. south), the percent of connections from each area, the percent of billing for each area, approximate population distributions, and approximate Gross Regional Product for each area.

Area	Connections	Billing	Population	Gross Reg. Prod.
Mashanaland	54%		4,112,555	
Matabeleland	30%		2,040,026	
Midlands	7%		1,431,774	
Manicaland	5%		1,450,664	
Masvinga	4%		1,356,935	

4 Terminal Types

Please give estimated number of the following terminal types connected to the network:

	No. of Terminals	% of all Terminals
Handsets	156,842	
PBX's	2,397	
Modems	1,246	
Fax Machines	n/a	
Other (specify)		

5 Telex Services

What is total telex capacity?	4,720
Lines per telex exchange	2,982
Number of telex exchanges	1

6 Switching Equipment

List the switch technologies used (e.g., analog, digital, cross-bar) and the approximate number of each type of switch.

Technology	No. of Switches
Digital	4
Analog	105

7 Outside Plant

List different transmission media used (e.g., open wire, underground cable, microwave, local radio) and percent of total traffic carried over each medium.

Medium	% of Traffic	Capacity
Open Wire	7.7%	1,368
Optical Fibre	54.4%	9,660
Microwave Radio	37.9%	6,720
analog		
digital		
Underground		

8 Fixed Assets

What is the value of capital work in process? $51,292,508.53

How are assets depreciated? These are depreciated on the straight line method. This is done during the year following that of purchase.

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9 Traffic

Give numbers and percentages of calls and minutes within each of the following jurisdictions:

	No. of Calls	No. of Minutes
Local		374,345 (units)
Toll		898,572 (units)
International		6,947,680
Total		

10 International Traffic

Is the balance of traffic incoming or outgoing? Incoming.

List top five countries for incoming calls and the approximate volume for each.

Incoming	# of Minutes	Outgoing	# of Minutes
UK & N. Ireland	4,803,528	UK & N. Ireland	5,730,412
USA	3,124,992	USA	1,710,847
Australia	574,985	Australia	530,656
Canada	531,959	Germany	504,809
Italy	474,570	Canada	440,719

What is the call completion rate for international calls? 32.7%

11 Demand

How many of the following customer types are on the waiting list for service initiation?

Residential	70,733
Business	19,444

How long is the wait for service?

Residential	Indefinite
Business	Indefinite

What is the service initiation charge?

Residential	$167.20
Business	$387.20

12 Long Term Planning

Is there a long term telecommunications development program?
Digitalized program.

What are the objectives of the program? Improve the network's quality of service and connectable capacity.

What new service offerings are planned over the next 5 years and the next 10 years?

- Mobile telephone system
- Value added service from digital exchange

What level of profitability and return are planned?

- Recover investment cost over 15 years

13 Tariffs

What is the approximate cost of five minute calls beginning at 9:00 AM and terminating in the following jurisdictions:

Local	16.65 cents/3 minutes
Toll (20-40 km)	$.83/$.90
Toll (40-80 km)	$1.67/$1.80
Toll (80-130 km)	$2.50/$2.70
Toll (130-240 km)	$3.33/$3.60
Toll (240-480 km)	$5.00/$5.40
Toll (480+ km)	$6.66/$7.20

	STD	ORS
Washington, DC	$49.99	$52.45
London	$49.95	$52.45
Dar es Salaam	$49.95	$52.45
Lusaka	$20.00	$21.00
Harare	-	
Gaborone	$20.00	$21.00
Lilongwe	$20.00	$21.00
Johannesburg	$20.00	$21.00
Maputo	$20.00	$21.00
Windhoek	$20.00	$21.00

14 Billing Conditions

How frequently are bills sent to customers?
10th, 20th, 30th of each month

What is average payment time within residential, business, and government customers?
10 days, 10 days, 30 days

Approximately what percent of revenues is uncollectible? 11%

15 Please attach financial statements (or annual reports) for the entire entity and just the telecommunications businesses.

NAMIBIA

Questionnaire - Namibia

1 Size of Network

Estimate the historical, current, and planned size network for the following years:

	1990	1992	1995	2000	2010
Tot. Lines in Service	51,925	59,939			
Res. Lines in Service	28,485	30,651			
Bus. Lines in Service	15,640	18,477			
Gov. Lines in Service					

2 Urban/Rural Composition of Network

% of network connection in rural areas	22%
% of network in urban areas	78%
% of switches in rural areas	-
% of switches in urban areas	100%
% of potential subscribers in rural areas	
% of potential subscribers in urban areas	

3 Geographical Composition of Network

List geographical areas used for planning purposes (e.g., north vs. south), the percent of connections from each area, the percent of billing for each area, approximate population distributions, and approximate Gross Regional Product for each area.

Area	Connections	Billing	Population	Gross Reg. Prod.

4 Terminal Types

Please give estimated number of the following terminal types connected to the network:

	No. of Terminals	% of all Terminals
Handsets		
PBX's	4,378	
Modems		
Fax Machines		
Other (specify)		

5 Telex Services

What is total telex capacity?	1,042
Lines per telex exchange	1,042
Number of telex exchanges	1

6 Switching Equipment

List the switch technologies used (e.g., analog, digital, cross-bar) and the approximate number of each type of switch.

Technology	# of Switches
Digital	5
Analog	
Siemens EMD	11
Plessey MU	3
Plessey 2M	1

EMD/MU = Motor Uniselector Systems 2M = two motion equipment

7 Outside Plant

List different transmission media used (e.g., open wire, underground cable, microwave, local radio) and percent of total traffic carried over each medium.

Medium	% Traffic
Open wire	
Aerial cable	
Underground cable	
Microwave	
HF radio	
VHF radio	

8 Fixed Assets

What is the value of capital work in process?
How are assets depreciated?

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9 Traffic

Give numbers and percentages of calls and minutes within each of the following jurisdictions:

	No. of Calls
Local	
Toll	
International	45,089
Total	6,037,961

10 International Traffic

Is the balance of traffic incoming or outgoing? Outgoing
List top five countries for incoming calls and the approximate volume for each. (Direct dialed calls only)

Incoming	# of Calls Per Day	Call Comp.	Outgoing	# of Calls Per Day	Call Comp.
Germany	1,405	55.1%	Germany	1,360	50.2%
UK	1,029	56.8%	UK	824	55.5%
USA			USA	431	71%
Bostwana	164	48%	Botswana	681	43.8%
			France	198	58.3%

11 Demand

How many of the following customer types are on the waiting list for service initiation?

Residential R&B	3,966
Business	

How long is the wait for service?

Residential	approx. 2 weeks
Business	

What is the service initiation charge?

Residential	R 160 per exchange connection
Business	

12 Long Term Planning

Is there a long term telecommunications development program?

What are the objectives of the program?

What new service offerings are planned over the next 5 years and the next 10 years?

What level of profitability and return are planned?

13 Tariffs

What is the approximate cost of five minute calls beginning at 9:00 AM and terminating in the following jurisdictions:

Local 17c = 1 call/unit (no time limit)

	Rate 1	Rate 3
Toll (within 100 km)	28	64
Toll (100-300 km)	64	42
Toll (300-500 km)	64	59

Washington, DC	R51
London	R51
Dar es Salaam	R51
Lusaka	R20-40
Harare	R11-33
Gaborone	R11-33
Lilongwe	R20-40
Johannesburg*	R5-67 to R1-82
Maputo	R11-33
Windhoek	-

* Rate 1 0700-1800 weekdays
0700-1300 Saturday

Rate 2 Sundays

** Telecom Namibia 100-200 Kms + 200-400 Kms. Rate shown is for 200-400.

*** Telecom Namibia 200-400 Kms + 400-800 Kms. Rate shown is for 400-800.

14 Billing Conditions

How frequently are bills sent to customers? Monthly

What is average payment time within residential, business, and government customers?

Approximately what percent of revenues are uncollectible?

15 Please attach financial statements (or annual reports) for the entire entity and just the telecommunications businesses.

MOZAMBIQUE

Questionnaire - Mozambique

1 Size of Network

Estimate the historical, current, and planned size network for the following years:

	1990	1992	1995	2000	2010
Tot. Lines in Service	83,600	n/a	123,620	173,216	284,768
Res. Lines in Service					
Bus. Lines in Service					
Gov. Lines in Service					

2 Urban/Rural Composition of Network

% of network connection in rural areas --
% of network in urban areas --

% of switches in rural areas --
% of switches in urban areas --

% of potential subscribers in rural areas --
% of potential subscribers in urban areas --

3 Geographical Composition of Network

List geographical areas used for planning purposes (e.g., north vs. south), the percent of connections from each area, the percent of billing for each area, approximate population distributions, and approximate Gross Regional Product for each area.

Area	Connections	Billing	Population	Gross Reg. Prod.

4 Terminal Types

Please give estimated number of the following terminal types connected to the network:

	No. of Terminals	% of all Terminals
Handsets		
PBX's		
Modems		
Fax Machines		
Other (specify)		

5 Telex Services

What is total telex capacity?	2,306
Lines per telex exchange	1,172
Number of telex exchanges	

6 Switching Equipment

List the switch technologies used (e.g., analog, digital, cross-bar) and the approximate number of each type of switch.

Technology	# of Switches	Capacity	Connections
Digital	25	54,794	33,634
Analog	13	23,474	17,170
Manual	120	3,125	2,070
Total		81,393	52,874

7 Outside Plant

List different transmission media used (e.g., open wire, underground cable, microwave, local radio) and percent of total traffic carried over each medium.

Medium	# of systems
HF	12
UHF	6
Troposcutter	5
Microwave (Analog)	3
Microwave (Digital)	11
DOMSAT	3

8 Fixed Assets

What is the value of capital work in process?
How are assets depreciated?

9 Traffic

Give numbers and percentages of calls and minutes within each of the following jurisdictions:

	# of Calls	# of Minutes
Local	354,457,000	
Toll		
International		7,764,000
Total		

10 International Traffic

Is the balance of traffic incoming or outgoing?
List top five countries for incoming calls and the approximate volume for each.

Incoming	# of Calls	Outgoing	# of Calls

Total: 5,855 min

1 Demand

How many of the following customer types are on the waiting list for service initiation?

Residential 32,872 combined
Business

How long is the wait for service?

Residential
Business

What is the service initiation charge?

Residential $106 (both)
Business

Long Term Planning

Is there a long term telecommunications development program?

What are the objectives of the program?

What new service offerings are planned over the next 5 years and the next 10 years?

What level of profitability and return are planned?

13 Tariffs

What is the approximate cost of five minute calls beginning at 9:00 AM and terminating in the following jurisdictions:

Local	Washington, D.C.
Toll (within 100 km)	London
Toll (100-300 km)	Dar es Salaam
Toll (300-500 km)	Lusaka
	Harare
	Gaborone
	Lilongwe
	Johannesburg
	Maputo
	Windhoek

14 Billing Conditions

How frequently are bills sent to customers?

What is average payment time within residential, business, and government customers?

Approximately what percent of revenues are uncollectible?

15 Please attach financial statements (or annual reports) for the entire entity and just the telecommunications businesses.

SWAZILAND

535

Questionnaire - Swaziland

1 Size of Network

Estimate the historical, current, and planned size network for the following years:

	1990	1992	1995	2000	2010
Tot. Lines in Service	12,794	14,738	20,965	31,005	46,507
Res. Lines in Service	6,908	7,811	10,750	15,812	23,719
Bus. Lines in Service	5,886	6,927	10,215	15,193	22,788
Gov. Lines in Service	Included in business lines				

2 Urban/Rural Composition of Network

% of network connection in rural areas	3%
% of network in urban areas	97%
% of switches in rural areas	18%
% of switches in urban areas	82%
% of potential subscribers in rural areas	4%
% of potential subscribers in urban areas	96%

Total waiting list: 11,306

3 Geographical Composition of Network

List geographical areas used for planning purposes (e.g., north vs. south), the percent of connections from each area, the percent of billing for each area, approximate population distributions, and approximate Gross Regional Product for each area.

Area	Connections	%	Billing	Population	Gross Reg. Prod.
Hhohho	7,109	48.74%			
Manzini	5,157	35.40%			
Lubombo	1,353	9.28%			
Shiselweni	967	6.63%			

4 Terminal Types

Please give estimated number of the following terminal types connected to the network:

Terminal Types	No. of Terminals	% of all Terminals
Handsets	25,194	95.52%
PBX's	240	0.91%
Modems	43	0.16%
Fax Machines	750	2.84%
Other (specify) Radio Pagers	150	0.57%
Total	26,377	

5 Telex Services

What is total telex capacity?

Lines per telex exchange	254
Number of telex exchanges	1

6 Switching Equipment

List the switch technologies used (e.g., analog, digital, cross-bar) ar the approximate number of each type of switch.

Technology	Number of Switches
Manual	4
Cross-Bar	16
Digital	1
Strowger (SXS)	1

7 Outside Plant

List different transmission media used (e.g., open wire, underground cable, microwave, local radio) and percent of total traffic carried ove each medium.

Medium	% of Traffic
Open Wire	7.4%
Microwave	92.6%

8 Fixed Assets

What is the value of capital work in process?
How are assets depreciated?

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9 Traffic

Give numbers and percentages of calls and minutes within each of the following jurisdictions:

	No. of Calls	No. of Minutes
Local	-	182,795,439
Toll	N/A	N/A
International	-	11,233,112
Total	-	194,027,551

10 International Traffic

Is the balance of traffic incoming or outgoing? Outgoing
List top five countries for incoming calls and the approximate volume for each.

Incoming	# of Calls/Min.	Outgoing	# of Calls/Min.
RSA	5,732,405.5 min.	RSA	9,433,880 minutes
UK	20,365 calls	UK	57,790 calls
USA	30,368 calls	USA	40,715 calls
Mozambique	843,305 calls	Mozambique	271,878 minutes
Zimbabwe	3,518 calls	Zimbabwe	26,784 calls

What is the call completion rate for incoming international calls? 40%

11 Demand

How many of the following customer types are on the waiting list for service initiation?

Residential	65%	7,069
Business	35%	3,807

How long is the wait for service?

Residential	70
Business	3

*Depends on availability of plant. If available, about one month.

What is the service initiation charge?

Residential
Business

12 Long Term Planning

Is there a long term telecommunications development program?

One is currently being prepared.

What are the objectives of the program?

What new service offerings are planned over the next 5 years and the next 10 years?

All services that come with digital exchanges.

13 Tariffs

What is the approximate cost of five minute calls beginning at 9:00 AM and terminating in the following jurisdictions:

Local	3 mins.	E0.23
Toll,	1.5 min. (within 100 km)	E0.47
Toll,	45 sec. (100-300 km)	E0.93
Toll,	(300-500 km)	N/A

Washington, DC	E48.50
London	E31.25
Dar es Salaam	E30.00
Lusaka	E30.00
Harare	E11.75
Gaborone	E11.75
Lilongwe	E25.50
Johannesburg	E7.00
Maputo	E7.00
Windhoek	E11.75

14 Billing Conditions

How frequently are bills sent to customers? Monthly

What is average payment time within residential, business, and government customers? 169 days

Approximately what percent of revenues are uncollectible? 27%

15 Please attach financial statements (or annual reports) for the entire entity and just the telecommunications businesses.