

CONNECTING THE GLOBE:



A REGULATOR'S GUIDE TO BUILDING A GLOBAL INFORMATION COMMUNITY

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FOREWORD

The communications revolution is now sweeping the globe. Dynamic developments and innovations in communications technology are transforming our daily lives—from the way we do business, to the ways in which our children learn, and our health care is provided.

In 1994, Vice President Al Gore challenged us to build a *Global Information Infrastructure* (GII) that would allow every nation to connect with the "information highway." In some parts of the world, the vision of a Global Information Infrastructure is fast becoming a reality. For those countries, improvements in technology are expanding the potential of individuals, industries, and communities to participate in the global economy in ways unimaginable only a few short years ago. Yet, for many developing countries, the vision of a GI remains a dream deferred. Throughout some parts of Africa, Asia, Eastern Europe and Latin America, many people have yet to make their first telephone call, and many remain unconnected to the global village.

Although it is slowly narrowing, there remains a gap between the information "haves" and the information "have-nots" throughout the world. This gap is reflected in the disparity in the use of communications technology by developed and less developed countries. In order to eliminate this disparity, developed nations must reinforce their commitments to pursue productive partnerships with less developed countries and to provide assistance when necessary.

All of us come from nations with long and rich histories. Speaking personally, I decided to become involved in telecommunications because of my father. From the time my father was a boy, he dreamed of designing buildings. He was fortunate to fulfill his lifelong dream. He became an architect. He designed buildings to bring communities together, especially those in poor African American communities. In fact, much of his work involved rebuilding communities destroyed by race riots during the Civil Rights Movement in the United States during the 1960s. He designed housing projects and community centers, and churches and hospitals. He always believed that one's work should be woven into the fabric of building communities that include people of all nationalities, religions and colors – and that promote values that enrich us as a people.

In a very real sense, we too are architects--designing and building a dynamic international community. We too are fundamentally involved in bringing people together, connecting communities with one another. Together we can continue to draft the blueprint for this grand, global economy where individuals, communities and nations can all participate.

As Chairman of the Federal Communications Commission (FCC) I have sought to ensure that the revolution in technology is broad and inclusive, and that the notable progress



taking place in the telecommunications industry benefits all people, regardless of nationality, race or income. In this effort, I have been guided by four basic principles which I believe have global applicability, and may be particularly significant for developing countries: (a) privatization, liberalization and competition; (b) deregulation as competition develops; (c) universal access to communications services and technology; and (d) opportunity for underserved populations.

- ***Privatization, liberalization and competition throughout the communications marketplace***

In order to build the modern telecommunications infrastructure significant private capital is needed. Privatization, alone, however, is not enough. Monopolies, even if privatized, are far less likely to provide efficient, innovative and inexpensive services to the public. Market liberalization allows competition to flourish by attracting the investments needed to build competing networks.

- ***Deregulation as competition develops***

Although government may no longer best be suited to act as a provider of telecommunications services, it has an important role to play. It should promote open and competitive markets by establishing independent regulatory systems and fostering, where possible, an environment free from unnecessary regulation. As competition develops and matures, governments can spend more time ensuring that markets operate efficiently and less time imposing regulations. Where competition exists, the market, and not government, becomes the most effective regulator.

- ***Universal access to communications services and technology***

Competitive policies can lead to expanded telecommunications access by making services cheaper and requiring competing carriers to serve underserved populations. However, there are clearly some remote and high cost areas where market forces alone will not result in the satisfactory deployment of services. We, too, in the United States are challenged by how best to proceed with universal access in some parts of our country. One of the greatest challenges facing regulators is to develop policies that both will succeed in a globally competitive environment, and will improve telecommunications service to these areas. Developing effective and innovative universal access programs for under-served populations is a challenge for us all—from the United States to Zimbabwe, from Bahrain to Bolivia, and from Kazakhstan to China. In order to provide affordable services to these areas, subsidies are necessary to make up the difference between the



costs of such service and the amount consumers can pay. These universal subsidy schemes are most effective when they are targeted, explicit and competitively neutral.

- ***Opportunity for underserved populations***

Market forces alone may not always provide opportunity to historically disenfranchised or isolated segments of society. Thus, government should provide opportunities for diverse ethnic groups and women to participate in the burgeoning telecommunications marketplace as owners, partners and providers of telecommunications products and services. Such actions can allow the benefits of the Information Revolution to expand exponentially. After all, the benefits of the Information Age should not be the exclusive domain of big business, the affluent or those who live in urban centers.

In the course of my tenure as FCC Chairman, I have had the opportunity to engage in productive and instructive dialogues with my counterparts from Africa, Asia, Europe and Latin America. Remarkably, many of us have recognized that we face similar challenges in promoting, maintaining, and expanding competition in the dynamic telecommunications sector. Policymakers in newly privatized markets who are facing numerous regulatory issues for the first time have expressed interest in examining comparative models as they explore their own solutions.

I believe there is considerable value in establishing an independent regulatory system to oversee the transition from monopoly systems to competitive markets, and I believe the United States has demonstrated a strong commitment to competition and market liberalization. While the U.S. model may not be appropriate for every developing nation, the principles and procedures that American regulators have adopted over time can provide guidance to policymakers in some developing countries.

*Based on this belief and numerous inquiries from our counterparts abroad, I directed the FCC's International Bureau to prepare a summary of some of the basic regulatory issues our agency has dealt with over the years. Thus, we have published, **CONNECTING THE GLOBE: A REGULATOR'S GUIDE TO BUILDING A GLOBAL INFORMATION COMMUNITY.***

The text was produced in the spirit of providing a comparative model for countries at various stages of telecommunications development. The guidebook does not examine every issue in telecommunications, nor is it a substitute for a primer on the ever-dynamic industry. Instead, it is our effort to identify some of the regulatory challenges we all face, and to share aspects of the FCC's experience that might be instructive to regulators in new environments. These nine chapters represent the major issues facing telecommunications



regulators in today's environment, and many of the sections examine the broad principles outlined above.

This was a collaborative project. It involved the participation and cooperation of several bureaus and offices at the FCC. I would like to acknowledge and thank the Chiefs, Directors and staff of the bureaus and offices for their efforts and contributions to this volume, and particularly to the International Bureau for its coordination of this project.

It is my hope that this guidebook, which is also accessible on the FCC Website, will contribute to the existing body of resources currently available. I welcome the opportunity to explore innovative and cooperative methods to address the challenges facing developing countries, and I look forward to continuing the productive dialogue on telecommunications issues facing our global community.



William E. Kennard
Chairman
Federal Communications Commission
Washington DC
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I. Regulatory Challenges and Opportunities

The telecommunications revolution presents both great challenges and opportunities for regulators, particularly those in developing countries. The challenges are many and myriad. They range from the basic issue of structuring a regulatory agency to the complexities of licensing service providers. The opportunities are immediate and profound. As technology has improved and advanced, governments worldwide have changed. Many are still evolving. This combination -- of rapidly growing telecommunications coupled with more open regulatory environments and liberalized markets -- is powerful and promising. As we welcome a new century, we are in a position to have a significant and positive effect on a national, regional, and international basis. Beginning at home, telecommunications regulators can play a pivotal role in ensuring that their country maximizes its resources to build a strong and inclusive telecommunications and information infrastructure. Principled decision-making not only will benefit consumers and industry in the domestic market, but also will enrich the global information community.

ESTABLISHING AND MAINTAINING REGULATORY INDEPENDENCE

Establishing an independent regulatory authority is a crucial factor in the success of any country's effort to introduce competition and to privatize and liberalize the telecommunications sector. Once the decision has been made to establish a pro-competitive, liberalized and privatized regime, it is essential to establish an impartial referee to create the rules and processes by which the industry is to be regulated and service to the public will be provided.

Regulatory agencies have taken many forms. Some countries have regulatory departments within a government ministry. Other countries have regulatory bodies that are separate, yet accountable to a ministry. Still others have regulatory agencies that are separate from, and not accountable to, any government ministries. A few countries have no regulatory bodies and regulate telecommunications providers through the country's antitrust or consumer-protection laws.

An effective regulator should be independent from those it regulates, protected from political pressure, and given the full ability to regulate the market by making policy and enforcement decisions. The regulator should have the authority and jurisdiction to carry out its regulatory and enforcement functions effectively and unambiguously. And the regulator must be adequately funded from reliable and predictable revenue sources.

While there may not be one regulatory framework that suits every country, some models have proven to be more successful than others in fostering liberalized, privatized, and competitive telecommunications markets.



The notion of regulatory independence encompasses at least three concepts:

- ✓ The separation of regulatory and operational functions
- ✓ Freedom from direct political pressure
- ✓ Fair and transparent procedures

A fourth concept applies in the United States, and has been mandated by law:

- ✓ Delegation of broad authority to an expert agency to establish rules and adjudicate disputes, to regulate in the public interest

The defining feature of an independent regulatory body is that the regulator is separate from, and not accountable to, any provider of telecommunications services. To ensure that the regulator is, in fact, impartial, the regulatory body and its staff should not have a direct or indirect financial interest in any of the entities being regulated. Inevitable conflicts of interest arise when a government controls both the regulatory agency and the dominant players in the market.

The second component of independent regulation is the necessity to shield the regulatory agency from political pressure. Doing so ensures the integrity of the policymaking process. It also limits arbitrary changes in rules, and encourages greater confidence on the part of investors. Historically, changes in governments lead to changes in regulatory policy. If the regulator is tied closely to the incumbent government, changes in government can introduce an element of uncertainty which heightens investment risk, and can serve potentially to deter future investment.

The third component of an independent regulator is transparency in decisionmaking. Transparency means that the process of arriving at regulatory policies and specific rulings is open, consistent and predictable. In the United States, for example, the FCC publishes its rules in the Code of Federal Regulations, which is publicly available. The agency announces proposed decisions in public memoranda, and written records of its proceedings are available to the public. A "sunshine agenda" announces the items that will be discussed at upcoming public meetings. Public comment and participation are invited on proposed rules, and our rulemakings rely on the public record. The FCC provides an opportunity for comment on licenses. In some areas, such as technical requirements, the agency relies on voluntary standards-setting organizations composed of industry representatives to develop feasible technical requirements.



Transparency in decisionmaking allows investors, service providers, and the public the opportunity to have knowledge of, and participate in, the formulation of policies and regulations. This process engenders considerable public trust in the integrity of FCC decisions, decreases litigation and enforcement costs, and also provides the agency with valuable public input on challenging issues.

REGULATION AND NATIONAL GOALS

Regulators in newly competitive, liberalized and privatized environments might wish to consider the following general principles as a guide, as they face the many complex and difficult issues ahead:

Encourage Private Investment, Innovation and Infrastructure Buildout

Governments cannot fund the tremendous investment needed to expand network infrastructure. Thus, encouraging and allowing private investment, both domestic and foreign, is critical. Government processes are not always able to keep up with the pace of technical change. Deferring to competitive markets tends to maximize technical and allocative efficiency. By focusing on lifting barriers to entry, and restraint in the imposition of unnecessary regulation, government gives private investors incentives to invest.

Promote Fair Competition

By promoting competition in all sectors, the regulator ensures that innovative and cost-efficient services will be provided by a diversity of entities.

Manage Scarce Resources Efficiently

The regulator should develop spectrum management policies that permit open entry and competition, allow maximum flexibility, encourage technical efficiency and innovation, and facilitate seamless networks.

Promote the Public Interest Where the Market May Not

The regulator has a role to play when market forces alone may not best further the public interest. The regulator should ensure that universal service mechanisms are transparent, efficient, and competitively neutral. Furthermore, it is often up to the regulator to ensure that telecommunications services are available to the disabled community, and that networks serve public health and safety, and do no harm to the physical environment. While encouraging the private sector to take the lead, the regulator must also ensure that networks are reliable and interoperable.



ESSENTIAL FUNCTIONS OF THE REGULATOR

There are several essential functions that the regulator undertakes in the new regulatory environment: licensing; rulemaking; enforcement and adjudication; management of scarce resources; equipment approval; and telecommunications standards.

Licensing

The regulator should seek to ensure that licensees have the capacity to provide reasonably priced quality telecommunications to the largest segment of the population. In carrying out this function, the regulator can choose from several options, including:

- no requirement of any license
- registration or notification of service being provided
- blanket licensing where all entities providing service are covered
- individual licensing after formal application and competitive selection
- individual licensing by auction

In implementing these licensing procedures, the regulator may follow an open-entry policy, permitting anyone to apply, or may impose qualifying conditions, *e.g.*, financial qualifications. Also, many regulators impose operating conditions, such as rules governing the conduct of telecommunications providers, that must be met after being authorized. These conditions are usually placed on classes of licenses, or are general regulations binding upon all service providers, although they may be tailored to specific issues raised in an individual license application.

Rulemaking

Most countries adopt telecommunication legislation that sets the general terms and conditions under which telecommunications providers must offer service to the public. Formal legislation cannot, however, anticipate all changing conditions that may occur. Therefore, most countries adopt legislation that establishes broad public telecommunications policy and directs the independent regulator to adopt more specific regulations to implement those broad policies. The process by which the regulator adopts such rules and regulations is generally referred to as "rulemaking."

Rulemakings may be instituted by the regulator itself or may result from the filing by a private party of a petition for rulemaking. Once a rulemaking begins, it is critical that the regulator be required to conduct its procedures in a transparent manner. That is, the regulator should make public the reason for initiating the rulemaking, issue a notice setting



forth the proposed rule, allow interested persons to file public comments on the proposal, publish a decision setting forth the text of the final rule, and clearly explain how and why the regulator adopted the particular rule. (See Chapters II and III).

Enforcement and Adjudication

The process by which the regulator ensures that telecommunications providers comply with its rules and regulations is referred to as enforcement or adjudication. To successfully enforce compliance with rules, the regulator must have power to investigate the actions and records of all telecommunications providers, and must have the authority to impose sanctions and penalties for violation of regulations. Sanctions can include fines, civil forfeitures, imposition of new operating conditions, issuance of cease and desist orders, and revocations of authorizations or licenses.

Management of scarce resources

Another important responsibility for the regulator is to ensure that scarce resources, such as radio frequencies, numbers and orbital slots are allocated on a fair and impartial basis. To protect against abuse and influence, the allocator of such resources should not have any connection to any service provider using these resources. The assignment of these resources must be open and transparent, and must allow for public comment.

Equipment approval

Another critical element in telecommunications liberalization is the ability of customers and service providers to attach pieces of terminal equipment to the incumbent's network and to use them in the provision of service to the public. Equipment attachment policies should encourage maximum competition in terminal equipment. Therefore, the responsibility for determining if potential competitors can attach specific equipment on the network must be removed from the incumbent carrier and placed under the regulator's responsibility. The regulator should establish equipment attachment policies that are limited to protecting the technical integrity of the network and preventing harm to network personnel. These rules for attaching equipment to the network should apply to all providers, including the incumbent.

When a telecommunications market becomes liberalized, technical standards become integral to the development of an efficient competitive network. First, it becomes vital that technical interconnection standards become public and freely available. Second, it becomes vital that all interested persons, including competitors, customers and suppliers of telecommunications and information equipment, have an opportunity to participate in the



development of technical standards and an opportunity to comment on proposed standards before they are adopted.

The importance of technical standards to the development of effective competition necessitates that these processes be removed from the hands of the incumbent operator and placed in the hands of an independent, open standards-setting entity, preferably one organized by the private sector.






Telecommunications standards

The regulator must also be concerned with the development of the incumbent network's technical standards. Traditionally, the network operator determined the standards, and during a period of monopoly, many governments did not find a need to make those standards public or allow other persons to comment on the setting of technical standards. The regulator must ensure that embedded standards are not employed as a vehicle for restricting access to the network.

OVERCOMING RESISTANCE

In carrying out these policies and achieving these goals, regulators should expect that the incumbent carrier will fiercely and frequently oppose any decisions that open the market to competition. The incumbent carrier is likely to challenge decisions throughout the regulatory processes, in the courts, and in the marketplace.

The incumbent carrier is also likely to request regulatory relief as competition is introduced in the market. For example, the incumbent might request that the regulator:

-  Permit access to markets that it does not serve;
-  Use greater pricing flexibility;
-  Reduce or remove certain regulatory oversight;
-  Create incentives for network development; and
-  Slow the introduction of competition.

In determining how to respond, the regulator can benefit from taking an inventory of how other regulators have approached these requests from incumbents. (See Chapter V).



The regulator will also face some common demands from new entrants. Potential competitors will want:

- ✓ Clear terms and conditions and fair prices for interconnection;
- ✓ The ability to select network elements and locate its own equipment in the incumbent carrier's switching facilities;
- ✓ Viable resale opportunities;
- ✓ Access to spectrum; and
- ✓ Access to rights of way.

These issues are critical because the regulator's decisions will be the key factors for telecommunications providers and investors in deciding whether to enter or forego opportunities in a given market. All of these issues are explained more fully in subsequent chapters.

Establishing a competitive telecommunications market is a major challenge for regulators. The successful transformation of a market from monopoly to competition requires vision, open and fair procedures, and principled decisionmaking.



II. The U.S. Model

The U.S. system of regulating telecommunications is unique. Several agencies of the federal government, in addition to regulatory agencies of the fifty states, have important roles to play in the determination of regulatory policy. What follows is an overview of the U.S. system.

THE FEDERAL COMMUNICATIONS COMMISSION

The American model for regulating telecommunications is derived from the powers vested in the federal and state governments by the U.S. Constitution. As a means of regulating interstate and foreign commerce in wire and radio communication, the United States Congress passed the Communications Act of 1934 (Communications Act), and created the Federal Communications Commission (FCC).

As an independent regulatory body responsible for regulating interstate and foreign commerce, the FCC has exclusive regulatory power over matters involving use of the radio frequency spectrum. Spectrum is considered to be inherently interstate because radio transmissions are not limited by state boundaries, and it is this interstate character that gives rise to the exclusive jurisdiction of the FCC, as a federal agency, to regulate non-governmental, commercial spectrum. Wire communication, in contrast, has been deemed to be both intrastate and interstate. As such, regulation over wire communications is shared between the FCC, at the federal level, and the various state regulatory agencies.

Pursuant to the Communications Act, the FCC's regulatory responsibilities must be implemented in a way that promotes the public interest. Given this broad mandate, and in order to promote the public interest in telecommunications, the FCC has authority to adopt rules and regulations, to adjudicate disputes, to grant and revoke licenses, and to impose penalties and fines for violations of law.

While the FCC has broad authority to act on telecommunications matters, that authority is not without substantial checks and balances. The President of the United States nominates all five FCC Commissioners for staggered five-year terms, and these nominations are subject to confirmation by the U.S. Senate. No more than three Commissioners can be of the same political party.

The President designates one of the Commissioners to serve as Chairman. The Chairman presides over all Commission meetings. The Chairman coordinates and organizes the work of the Commission and represents the agency in legislative matters and in relations with other government departments and agencies.



The Commissioners hold regular public meetings to decide policies and rules. They also may vote on issues between meetings by "circulation," a procedure whereby a document is submitted simultaneously to each Commissioner for official action.

The Commission is committed to the use of emerging technologies to serve its customers - the American public and regulated industries -- more efficiently.

Extensive information is available about the Commission through the FCC's "homepage" www.fcc.gov. The Commission uses a fax-on-demand system to allow quick access to forms, press releases and other information (202/418-4830).

The FCC is also subject to congressional oversight of its activities. Congress also decides the size of the agency's annual budget and can restrict the FCC's use of appropriated funds to certain purposes. Federal courts, as part of the judicial branch of government, have jurisdiction over appeals from FCC decisions filed by aggrieved parties. Courts also have jurisdiction to review and overturn congressional actions that are inconsistent with the U.S. Constitution.

THE U.S. DEPARTMENT OF COMMERCE

The U.S. Department of Commerce also has an important function in telecommunications regulation. Primarily through the National Telecommunications and Information Administration (NTIA), the Department of Commerce serves as the President's expert advisor on telecommunications matters and policy. NTIA is charged with reviewing policy options on behalf of the Executive Branch and communicating proposed policy decisions to the Congress. NTIA also manages and administers the portion of the radio frequency spectrum that has been set aside for exclusive use by the United States Government.

THE U.S. DEPARTMENT OF STATE

The U.S. State Department is the Executive Branch's primary representative on foreign policy matters. Through its Economics Bureau Office of International Communications and Information Policy, the State Department represents the United States in international telecommunications forums, including bilateral and multilateral negotiations, and before international organizations. Through the U.S. Agency for International Development (USAID), the United States provides economic development assistance to foreign countries, including assistance intended for telecommunications reform and projects.



THE OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE

The Office of the U.S. Trade Representative (USTR) represents the United States in trade negotiations, coordinates trade policy and administers foreign bilateral and multilateral trade agreements. As telecommunications services and equipment have increased as a percentage of U.S. foreign trade, so has the role of USTR in international telecommunications trade decisions and disputes.

STATE REGULATORY AGENCIES

State governments play an important role in the telecommunications regulatory scheme of the United States, primarily with respect to basic local telephone service. Each of the 50 states, as well as the District of Columbia, Puerto Rico, Guam, and the U.S. Virgin Islands, has a state regulatory agency with jurisdiction and responsibility over intrastate communications. These Public Service Commissions or Public Utility Commissions, as they are frequently termed, typically exercise regulatory power over several regulated utilities in addition to telecommunications, including electricity, water and power, and in some instances, transportation. An evolving marketplace and new deregulatory environment are changing the function and nature of state regulatory agencies, however. In light of competition, state public service commissions are shifting their focus from regulating monopolies to promoting efficiency and expanded services.



III. Components of the Regulatory Process

CHARACTERISTICS

In addition to the Communications Act, the FCC conducts its business pursuant to the Administrative Procedure Act and the Government in the Sunshine Act. Both of these laws apply to federal agencies involved in policymaking. These statutes ensure a high degree of fairness and transparency in the government decisionmaking process.

The Administrative Procedure Act governs the manner in which an agency makes its decisions, requiring public notice of proposed rules and opportunities for any interested member of the public to comment. When the FCC wishes to develop or change a policy, it adopts a Notice of Proposed Rulemaking (NPRM) describing the proposed changes. The NPRM is publicly available, placed on the FCC website, and is summarized in the Federal Register. A deadline is specified for comments and reply comments. (The reply comment period enables commenters to critique the initial presentations of other commenters). FCC proceedings frequently attract participation from opposing commercial interests, so the agency normally has informed critiques of industry positions. Public interest groups also participate in these proceedings. All comments and reply comments are made a part of the public record of the proceeding. In very limited circumstances, the FCC permits parties to its proceedings to submit confidential material. Interested parties may visit FCC commissioners and staff to express views in a proceeding, but they must file an "ex parte" letter in the public record of the proceeding, detailing whom they visited and what they discussed. This creates transparency in the decision-making process so that all interested parties can monitor issues raised in a proceeding.

The FCC and other federal agencies are required to make decisions public and to explain the rationale for their decisions. These decisions are subject to judicial review and can be reversed on various grounds, for example if they are found to be "arbitrary and capricious." FCC decisions are rendered in the form of a Report and Order (R&O). The R&O explains the FCC decision and its rationale. NPRMs and R&Os are generally adopted at open meetings of the Commission.

After the FCC has released an R&O, interested parties who disagree with the decision have 30 days to file a petition for reconsideration, asking the FCC to reconsider all or part of its decision. The FCC seeks comment on such petitions and then renders its decision. The FCC can grant reconsideration petitions in whole or in part, thus modifying the original decision, or deny them. A party still not satisfied with an FCC decision may appeal to the U.S. court system.



Pursuant to the Government in the Sunshine Act, meetings among a quorum of the Commissioners must be open and public. Many FCC decisions are made at open meetings. As noted above, however, some decisions are voted on separately by each Commissioner; these decisions are said to be made "on circulation." In addition, the Commission has delegated some decisionmaking authority to bureaus and offices within the agency.

FCC decisions create a body of precedent, and this provides a substantial degree of predictability when it comes to repeated application of the same statutory provision, rule, or policy. When novel issues are involved, however, there is a lesser degree of predictability.

FCC PROCEEDINGS

In addition to NPRMs and R&Os discussed above, there are a variety of other types of documents that the FCC may adopt. If the FCC is interested in a particular issue but has not formulated a specific rule change proposal, the agency may adopt a Notice of Inquiry (NOI). An NOI simply asks for comments and information about some topic or topics. The comments submitted in response to an NOI may lead the FCC to propose a specific rule change in an NPRM. Alternatively, an NOI may be used to gather information for a report, perhaps to Congress, either at the FCC's own initiative or in response to Congressional direction.

The FCC may also act in response to a request from an interested member of the public. Members of the public that wish the FCC to change its rules or develop new ones may file a "Petition for Rulemaking" requesting that action. The FCC generally puts such petitions out for comment and reply comment before deciding whether to issue an NPRM. A member of the public may also file a "Petition for Declaratory Ruling" with the FCC. This is a request that the FCC clarify the scope or application of an existing rule. In response, the FCC may issue a Declaratory Ruling intended to provide greater certainty to the public.

LICENSING

The FCC is responsible for licensing a variety of communications providers. In the wireline context, the Commission approval process for interstate and international telecommunications carriers is very limited, and is intended to promote competition in these markets. (States license providers of local telephony services). The FCC has provided a blanket grant of authority for domestic interstate carriers that are classified as non-dominant, so no application is necessary. Carriers that provide international services generally receive a presumption in favor of entry and are subject to a 14-day streamlined approval process.

The FCC also licenses satellite systems. It grants licenses for both space stations and earth stations. Satellite licensing raises unique issues involving spectrum and orbital resources, technical interference and coordination.

The FCC also issues licenses to provide terrestrial wireless (*i.e.*, non-satellite based) telecommunications services. These are generally divided into Commercial Mobile Radio Services (CMRS), such as cellular, paging, Personal Communications Services (PCS) and Specialized Mobile Radio (SMR); and Private Mobile Radio Services (PMRS), private systems used for a variety of purposes including for personal convenience, to promote safety of life and property, to increase commercial productivity, and to advance the science of telecommunications. In addition, the Commission processes requests for antenna tower registrations.

As discussed below in the Spectrum Management chapter (VII), the terrestrial wireless licensing process flows from previous decisions by the FCC as to which services may be provided in which spectrum bands. The FCC has come to rely increasingly on competitive bidding or auctioning to assign licenses. In the past, the FCC relied mainly on comparative hearings, in which the qualifications of competing applicants were examined, to award licenses. Comparative hearings, however, proved tremendously time-consuming and resource-intensive. Competitive bidding is an effective way to ensure that licenses are assigned quickly to the entity that values them most, while recovering the value of spectrum for the public. Furthermore, from a regulatory standpoint, auctions promote transparent decisionmaking by providing a clear basis upon which a license applicant can determine why and how it did or did not obtain a license.

It is important to note, however, that auctions may not be appropriate in all circumstances. For example, when only one party has applied, auctions are not necessary because the license can easily be assigned without consideration of any competing alternatives. In addition, fundamental public policy goals (for example, public safety and national defense) might not be well served by using a competitive bidding mechanism. There may also be cases in which the most efficient and effective use of spectrum is achieved not by granting exclusive licenses to winning bidders, but rather through the shared use of the spectrum, either on a licensed basis -- as is the case with most private services in the United States - - or on an unlicensed basis. In such cases, spectrum fees or other reimbursement methods may be considered to ensure that the public is adequately compensated for use of the resource.

The FCC also licenses both radio and television broadcasting stations, including all U.S. AM and FM radio broadcasting stations and all VHF and UHF television broadcasting stations, which includes the new digital television stations. Broadcasting stations are licensed either as commercial for-profit stations (which means that they are allowed to



include commercial advertising messages) or as non-commercial educational stations (which means that they are not allowed to include commercial advertising messages). Radio and television stations are licensed for an 8-year period, and these licenses are nearly always renewed. In the future when the FCC receives competing applications for a commercial radio or television station to serve the same location using the same frequency, we will use a license auction to select the winning licensee.

The FCC also licenses providers of direct-to-home video satellite services using high-powered geostationary satellites. With regard to cable television service, providers are licensed by municipalities, although the FCC processes applications for cable television relay service (CARS), a microwave-based service that relays signals for local distribution, inter-city relay and remote TV pickup.

ENFORCEMENT

Pursuant to the Communications Act, the FCC is charged with adjudicating complaints against common carriers for the violation of either the Act or the Commission's rules. The FCC receives, processes, and assists in the resolution of tens of thousands of consumer complaints each year. The FCC also adjudicates formal complaints filed against common carriers. These complaints frequently involve disputes between competing carriers or disagreements between carriers and their customers over the terms and conditions of service. The FCC may also take independent (self-initiated) enforcement action. Enforcement actions may result in assessing forfeitures, issuing cease and desist orders, or revoking operating authority for carrier conduct that violates either the Communications Act or the Commission's rules.

THE ORGANIZATION OF THE FCC

The FCC has six operating bureaus, and ten offices that provide support services.

The six operating bureaus reflect broad divisions of FCC responsibility. These are the Cable Services, Common Carrier, Compliance and Information, International, Mass Media, and Wireless Telecommunications Bureaus.

Cable Services Bureau (CSB)

The Cable Services Bureau has responsibility for issues related to the cable television industry and other multi-channel video programming providers. It is also responsible for regulations concerning "must carry," retransmission consent, customer services, technical standards, home wiring, consumer electronics, equipment compatibility, indecency, leased access and program access provisions.



Common Carrier Bureau (CCB)

The Common Carrier Bureau has responsibility for policies concerning telephone companies that provide telecommunications services to the public through the use of wire-based transmission facilities. These companies, called common carriers, provide voice, data, and other transmission services.

Compliance and Information Bureau (CIB)

The Compliance and Information Bureau, through its headquarters staff and various field offices, informs the public about FCC regulations, policies, practices, and procedures; ensures compliance with FCC rules; and uses its technical expertise to solve problems in the communications environment.

International Bureau (IB)

The International Bureau promotes innovative, efficient, reasonably priced, widely available, reliable, timely and high quality international and global communications services. IB develops, recommends and administers policies and programs for the authorization and regulation of international telecommunications facilities and services, and the licensing of domestic and international satellite systems. IB advises and makes recommendations to the Commission, or acts for the Commission under delegated authority, on the development and administration of international telecommunications policies and programs. Additionally, IB develops FCC proposals to World Radiocommunication Conferences (WRCs) and other multilateral and international conferences, meetings and assemblies.

Mass Media Bureau (MMB)

The Mass Media Bureau advises the Commission on policy pertaining to broadcasting – television and radio – as well as Multipoint Distribution Service (MDS) and Instructional Television Fixed Service (ITFS). The Bureau issues licenses, performs policy and rulemaking functions, and administers the enforcement program for all mass media services.

Wireless Telecommunications Bureau (WTB)

The Wireless Telecommunications Bureau oversees the use of radio spectrum to fulfill the communications needs of businesses, local and state governments, public safety service providers, aircraft and ship operators, and individuals. In addition to licensing commercial



providers of wireless services, WTB monitors the more than two and a half million licensees that use private radio for personal convenience, to promote safety of life and property, to increase commercial productivity, and to advance the science of telecommunications.

The FCC has ten operating offices that are responsible for administrative, outreach, and various technical functions of the agency.

Office of Administrative Law Judges

Administrative Law Judges preside over hearings and issue Initial Decisions. The full Commission reviews these decisions.

Office of Communications Business Opportunities (OCBO)

The Office of Communications Business Opportunities is responsible for providing advice to the Commission on issues and policies concerning opportunities for ownership and contracting by small, minority and woman-owned communications businesses. The office also advises the Commission on policies to foster equal employment opportunity in the communications industry for minorities, women, and people with disabilities. The office works with entrepreneurs, industry and public interest organizations and individuals to provide information about policies to promote ownership and employment opportunities in the communications industry.

Office of Engineering and Technology (OET)

The Office of Engineering and Technology is responsible for managing the non-government use of the spectrum. OET makes recommendations to the Commission on how the radio spectrum should be allocated and establishes technical standards.

Office of the General Counsel (OGC)

The General Counsel serves as the chief legal advisor to the Commission and its various bureaus and offices. The General Counsel also represents the Commission before the federal courts of appeals; recommends decisions in adjudicatory matters before the Commission; assists the Commission in its decision-making capacity; performs a variety of legal functions regarding internal administrative matters; and advises the Commission on fostering competition and promoting deregulation in a competitive environment.



Office of the Inspector General (OIG)

The Office of the Inspector General was created by the Inspector General Amendments Act of 1988. The Inspector General conducts and supervises audits and investigations relating to the programs and operations of the agency. The Inspector General recommends policies for activities designed to promote economy, efficiency and effectiveness, as well as to prevent and detect fraud and abuse in agency programs. The Inspector General also provides a means for keeping the Chairman, Commissioners and Congress fully informed about problems and deficiencies at the agency. Incidents of waste, fraud, abuse or mismanagement within the agency are reported to the OIG, in writing or utilizing a toll-free hotline.

Office of Legislative and Intergovernmental Affairs (OLIA)

The Office of Legislative and Intergovernmental Affairs serves as the Commission's principal point of contact with Congress and with other governmental entities.

Office of the Managing Director (OMD)

Under the supervision and direction of the Chairman, the Managing Director serves as the FCC's chief operating and executive official. The Managing Director provides managerial leadership to, and exercises supervision and direction over, the FCC's bureaus and staff offices in management and administrative matters; formulates and administers all management and administrative policy programs and directives for the Commission; assists the Chairman in carrying out administrative responsibilities; advises the Chairman, Commissioners and management on administrative and related matters; administers the FCC's management systems; and directs agency efforts in improving management effectiveness, operational efficiency and employee productivity.

Office of Plans and Policy (OPP)

The Office of Plans and Policy serves as the principal economic and technical policy advisor to the Commission, analyzing agenda items and developing long-term policy. The office also produces working papers on major policy issues.

Office of Public Affairs (OPA)

The Office of Public Affairs is responsible for informing the press and public of the FCC's actions, facilitating public participation in the FCC's decision-making processes, and operating many of the FCC's public reference rooms and library. OPA issues daily news releases, public notices and other informational material; prepares the Annual Report and



other publications; and handles telephone, written, and walk-in requests for information. OPA maintains the FCC's Internet homepage.

Office of Workplace Diversity (OWD)

This office serves as the principal advisor to the Chairman and Commission on all aspects of workforce diversity, affirmative recruitment, equal employment opportunity and civil rights within the Commission. The office develops, coordinates, evaluates, and recommends to the Commission internal policies, practices, and programs designed to foster a diverse workforce and to promote equal opportunity for all employees and applicants for employment.

BUDGET

Each year, Congress appropriates operating funds to the FCC. For Fiscal Year 1999 (October 1, 1998 to September 30, 1999), the FCC was appropriated \$192,000,000. Section 9 of the Communications Act provides the authority for the Commission to assess and collect regulatory fees to recover the costs associated with enforcement activities, policy and rulemaking activities, user information activities, and international activities. The amount of regulatory fees to be collected and applied as an offset to the FCC appropriation in any fiscal year is determined by Congress.

In addition to the funding provided by the direct appropriation and regulatory fees, the Commission has authority under the Communications Act to recover the costs associated with conducting Spectrum Auctions.

Finally, Section 8 of the Act provides that the Commission shall assess and collect application fees. The receipts collected under Section 8 are deposited directly into the U.S. Treasury and are not available to offset operating costs of the Commission.

USEFUL INTERNET LINKS

The FCC web site, www.fcc.gov, has links to the various FCC operating bureaus and offices. Each bureau/office site provides information about recent activities.

Administrative Procedure Act, 5 U.S.C. 551, www.uscode.house.gov
Government in the Sunshine Act, 5 U.S.C. 552b, www.uscode.house.gov



IV. The FCC and the Public Trust

Based on the philosophy that “public service is a public trust,” the Federal Government has adopted policies designed to ensure that every citizen of the United States can have complete confidence in the integrity of government practices and decisions. The following is a synopsis of some of the most critical provisions of these regulations, and illustrates the approach the United States has taken to promote public trust in the government process.

STANDARDS OF ETHICAL CONDUCT

Employees of the FCC, like others working for the U.S. Government, are subject to specific rules governing their official and professional conduct. The Office of Government Ethics (OGE), an independent agency of the U.S. Government, has promulgated standards of ethical conduct for employees of the Executive Branch of the government and independent agencies like the FCC. The *Standards of Ethical Conduct* are designed to instill confidence in the integrity of the federal government and its officers.

These standards regulate such diverse subjects as the acceptance of gifts from sources outside the federal government, the giving and accepting of gifts among co-workers, holding financial interests that might conflict or appear to conflict with the independent exercise of an employee's duties, impartiality in the performance of official duties, misuse of government property, and engaging in outside activities.

The FCC has supplemented the OGE rules with regulations that are applicable to its employees only, and that cover the outside practice of one's profession and the FCC's specific financial disclosure requirements. In addition to these two sets of regulations, FCC and other government employees are also subject to the conflict of interest statutes contained in the United States criminal code. Moreover, attorneys working for the FCC, like other attorneys employed by the federal government, also remain subject to the professional ethics requirements of the state governments where they are admitted to the bar.

Gifts from Outside Sources

Employees of the federal government may not solicit or accept gifts that are given to them because of their official positions in the government or that come from what are termed “prohibited sources.” A “prohibited source” is defined in the standards of conduct as anyone who is doing business with or who is regulated by the FCC, or who has interests that would be substantially affected by the performance of the official duties of the



employees who have been offered the gifts. The term "gift" in the standards of conduct is defined to include almost anything of monetary value.

Several exceptions to this general gift acceptance prohibition are provided for in the standards. Such exceptions include unsolicited items with a minimal market value (\$20 or less), or gifts that are clearly motivated by a family relationship or personal friendship between the giver of the gift and the employee who receives it. In addition, with the prior approval of the Commission's legal officials, employees are permitted to accept invitations to widely-attended events, where it has been determined that their presence is in the interests of the agency because it will further agency programs or operations.

Gifts Between Employees

There are also specific restrictions on the giving of gifts to one's supervisors at the FCC and on the acceptance of certain gifts from some government employees who are subordinate to the recipient. Specifically, an employee may not give gifts or solicit contributions for a gift to an official superior, nor accept a gift from an employee paid at a lower rate of pay, unless they are personal friends and not in a superior-subordinate relationship. Exceptions exist that permit the giving or accepting of such gifts on certain infrequent occasions of personal significance to the recipient of the gift. Such occasions could include a marriage, the birth of a child, or retirement.

The purpose of this restriction is, of course, to ensure that personnel actions taken by the Commission are not motivated by (or do not appear to anyone to be motivated by) the giving of gifts to one's official superiors, and that the integrity of the Commission's employee actions is preserved.

Conflicting Financial Interests

In order to ensure the integrity and independence of the FCC's official actions, employees are not permitted to act in any matter in which they have an official stake. Unless they have received advance permission from the FCC's legal officials to do so, employees of the FCC are prohibited from participating in an official capacity in any matter -- whether it is a specific adjudication of an issue between particular parties or a general industry-wide rulemaking -- in which they, or certain other persons whose interests are imputed to them, have a financial interest, if the matter will have a direct and predictable effect on that financial interest. The interests of a spouse, minor child or general business partner, for example, would be imputed to an employee, under the standards of conduct.



Impartiality in Performing Official Duties

In addition to the above restriction, FCC employees may not participate in any adjudicatory-type matter involving specific parties if the matter could affect the financial interests of a member of the employee's household, or if certain persons with whom the employee has a close relationship are parties or represent a party to the matter. This rule is designed to prevent even the appearance of conflict of interest between the employee's personal interests and his or her official responsibilities at the Commission. Under this rule an employee is considered to have a close enough relationship to raise appearance concerns with, for example, his or her spouse's employer, his or her dependent child's employer, or anyone for whom the employee served as an agent, attorney, general partner or employee within the past year.

For example, a new employee who comes to the government from a company or law firm will generally be required not to participate for one year in matters in which his former employer is a party or represents a party. This rule is designed to reassure the public that FCC decisions are not based on outside influences or old loyalties and are free from even the appearance of conflicting interests on the part of FCC employees.

Seeking Other Employment

The standards of conduct also require Commission employees to obtain permission before they participate in an official capacity in any particular matter that could have a direct and predictable effect on the financial interests of any person or company with whom they are seeking employment or with whom they have an arrangement concerning future employment. This rule, like several of those discussed above, is designed to ensure that all parties to a Commission action are perceived to be acting on the merits and not out of self-interest.

Misuse of Position

FCC employees are also specifically prohibited by the standards of conduct from using their public office for their own private gain or for the gain of friends, relatives, or persons with whom they are affiliated in a private capacity. FCC employees have a duty to protect and preserve government property and ensure that it is used only for authorized purposes.

Both the OGE regulations and FCC supplemental rules address the misuse of information not routinely available to the public. Specifically, the FCC rules provide that, absent specific authorization, "nonpublic information shall not be disclosed, directly or indirectly, to any person outside the Commission." The disclosure of such information may subject an employee to disciplinary or other remedial actions.



Miscellaneous Ethics Provisions

In addition to the regulations discussed above, federal employees, including those working at the FCC, are subject to several other sets of rules that govern their activities on and off the job. Some of the more important of these rules are summarized below.

Political Activities

FCC employees, like other employees of the federal government, are subject to restrictions on their involvement in certain political activities. This is to ensure that the public does not perceive that the actions of the Commission's civil servants are aimed at directly promoting the interests of a particular political party and that the activities of individual employees are independent of party interests. The Office of Personnel Management implements the statute and regulations that balance the interests of individual employees as citizens of the United States against the public's need for a government workforce independent of party politics.

Travel Expense Payments by Non-Federal Sources

Under the regulations of the General Services Administration, employees of a federal agency, including the FCC, are authorized to accept certain offers of payment of employee travel expenses from non-Federal sources. Such sources can include individuals and companies, including those regulated by the Commission, under certain narrowly-specified circumstances. This rule is designed to save the government money by permitting individuals and companies to pay for employees to travel to industry meetings, seminars and conferences. Prior to acceptance of any such offer, the agency's legal office must review the circumstances of the offer to determine that no conflict of interest or appearance of conflict would be created by the Commission's acceptance of the offer.

Statutory Gift Acceptance Authority

The general rule in the United States is that government departments and agencies may not receive money except as authorized by Congress, unless there is specific statutory authority to do so. Congress has authorized the FCC to accept certain gifts that may be offered from entities. As with offers of gifts of travel discussed above, the agency's legal office must review such offers to make sure that their acceptance would not create any conflicts or appearance problems.



FCC Supplemental Rules

The FCC has supplemented the Standards of Ethical Conduct discussed above with regulations that apply only to its employees and that reflect some of the specific concerns of the telecommunications industry. For example, Commission employees are required to obtain prior approval from their supervisors and from the Commission's legal officials before they engage in any outside practice of their professions. The Commission also has certain specific financial disclosure requirements in addition to those that apply to all government officials.

CONFLICTS OF INTEREST

In addition to the standards of ethical conduct discussed above, employees of the Commission and the rest of the federal government are subject to various conflict of interest statutes found in the United States Criminal Code. The following are among the more commonly encountered provisions of these statutes.

Bribery Prohibition

The most fundamental aspect of this series of criminal statutes prohibits anyone from offering a government employee money or anything else of value in exchange for performing any official act. Likewise, government employees are prohibited from requesting any payment or gift in exchange for performing or failing to perform any official act. This prohibition is designed to prevent bribery. In addition to this criminal scenario, several companion statutes seek to prevent more subtle actions that also could raise appearance concerns and cast doubt on the integrity of governmental actions.

Representational Limitations

Two statutes prohibit federal employees, other than in their official capacities, from representing anyone before any department or agency of the U.S. Government in any matter in which the United States is a party or has a direct and substantial interest. Although limited exceptions exist, the courts have interpreted both of these statutes quite broadly. It is not necessary that an employee receive compensation for his or her representational activities in order to violate one of these two statutes, as their purpose is merely to ensure that federal employees do not appear to be acting contrary to the interests of the government.



Post-employment Restrictions

Another statute imposes certain restrictions on the activities in which former employees can engage for a period after leaving government service. In particular, representational activities before the government on matters in which the former employees participated or which were under their official responsibilities while in government service are limited by this statute. These restrictions are discussed in detail below.

Financial Conflicts of Interest

Finally, there is a statute which forms the basis for the regulatory prohibition on conflicting financial interests. It prohibits Commission employees from participating in their official capacity in any matter in which they or certain others whose interests are imputed to them have a financial interest if that matter will have a direct and substantial effect on that interest. Under certain circumstances this prohibition can be waived.

POST-EMPLOYMENT LIMITATIONS

Overview and Purpose of Post Employment Restrictions

After they leave federal service, former employees are generally free to work for any employer -- even one that represents clients before the federal government. Congress has passed laws that impose restrictions on the types of activities that former federal employees may engage in, prohibiting those activities that are most likely to give the appearance of a person's making unfair use of prior government employment and affiliations.

These post-employment restrictions, which are found in the United States Criminal Code, are not intended to discourage the movement of skilled professionals in government to and from positions in industry, research institutions, law and accounting firms, or universities. Such a flow of skills and exchange of communication between government and private activities is essential to the success of government programs, especially in the rapidly evolving area of telecommunications. Only certain acts which are detrimental to the public confidence in the government are prohibited.

Permanent Bar

When a former government employee who has been involved with certain matters decides to act as the representative for another person on that matter, such "switching sides" undermines confidence in the fairness of government proceedings and creates the impression that personal influence, gained by government affiliation, is decisive. Thus, a



former employee may never represent anyone in a particular matter involving specific parties in which the United States is a party or has a substantial interest if the former employee participated personally and substantially in that same matter while in federal service. A "particular matter involving specific parties" does not include general industry-wide rulemakings, but would encompass adjudicatory-type matters involving defined parties, and those rulemakings that are aimed at a particular entity or limited class.

Two Year Restriction

For two years from his or her departure from federal service, a former employee may not represent anyone before the United States government if this same matter was under the former employee's official responsibility during his or her final year of federal service. This ban covers supervisors who may not themselves have been involved in the matter but whose subordinates were. Again, this prohibition is limited to "particular matter involving specific parties" which is usually an adjudicatory-type matter, and does not include general industry-wide rulemakings.

One Year Restriction for Highly Paid Senior Officials

A more restrictive -- although temporary -- rule governs certain highly paid officials. For one year from their departure from federal service, these former high-ranking senior officials may not come before the Commission to represent anyone on any matter. This ban applies even if the former senior official was not personally involved in the matter and even if it was not under this former official's official responsibility while in government service. The purpose of this prohibition is to limit any real or apparent ability of former officials to receive favorable treatment because of their former government position.

FINANCIAL DISCLOSURE

All FCC employees are subject to restrictions that focus on financial interests. Depending on the employee's salary and duties and responsibilities, FCC employees may also be required to file an annual report disclosing certain financial interests. Certain high-level federal officials are required to publicly disclose their personal financial interests for the purpose of ensuring confidence in the integrity of the federal government by demonstrating that they are able to carry out their duties without compromising the public trust. There is also a confidential (non-public) financial disclosure system for less senior federal employees in certain designated positions to assist the Commission in its own internal conflict of interest review. These reports require information about the official's interests, outside positions, liabilities, and gifts accepted. The financial interests of spouses and minor children must also be disclosed.



The purpose of public and confidential financial disclosure is to prevent conflicts of interest and to identify potential conflicts, by providing for the systematic review of the financial interests of both current and prospective federal employees. These reports assist agencies in administering their ethics programs and providing counseling to employees. Financial disclosure reports are not net-worth statements but seek only information deemed relevant to the administration and application of conflict of interest laws and regulations, both criminal and civil.

Prohibition on Financial Interests in Significantly Regulated Entities

In addition to possible financial disclosure reporting requirements, the Communications Act prohibits Commission employees from holding a financial interest in any entity which is significantly regulated by the FCC. The United States Criminal Code also prohibits federal employees from participating in a particular matter, such as a rulemaking or licensing proceeding, that could affect their own financial interests or the interests of someone with whom they have a specified relationship (*i.e.*, a spouse, minor child or general partner, or any organization or entity in which the employee serves as an officer, director, trustee, general partner or employee). The financial disclosure forms are used by FCC ethics officials to determine whether the filer has prohibited financial holdings that may create a conflict of interest.



V. Competition in Telecommunications Services

Experience has demonstrated that free and open competition benefits individual consumers and societies as a whole by ensuring lower prices, new and better products and services, and expanded consumer choice. The benefits of competition are readily seen in today's telecommunications sector. Dynamic technological change is resulting in new services and systems that provide innovative solutions to communications needs across the globe. As a result, telecommunications is becoming increasingly important to the efficiency and effectiveness of private and public sector institutions. In this environment of rapid change, a competitive marketplace will tap the potential of the telecommunications sector to serve the economic and social well-being of all citizens.

BENEFITS OF COMPETITION

Free and open competition benefits individual consumers and the global community by ensuring lower prices, new and better products and services, and greater consumer choice than occurs under monopoly conditions. In an open market, producers compete to win customers by lowering prices, developing new services that best meet the needs of customers. A competitive market promotes innovation by rewarding producers that invent, develop, and introduce new and innovative products and production processes. By doing so, the wealth of the society as a whole is increased. In a competitive environment, businesses that fail to understand and react to consumer needs face the loss of customers and declining profits.

A policy framework to establish, foster, and regulate competition is critical to the delivery of benefits expected and demanded by consumers.

In other words, competition rewards entrepreneurship, responsiveness, and enthusiasm; it punishes sluggishness and indifference. Because of the increasing importance of the telecommunications sector to the overall economy, countries can ill afford the sluggishness and indifference that so often characterize the provision of products and services under monopoly conditions. As developments in technology continue to produce efficient and exciting communications services, societies may be significantly disadvantaged if they forego the rewards of entrepreneurship and responsiveness associated with open, competitive telecommunications markets.



POLICY GOALS TO ACHIEVE COMPETITIVE MARKETS

In order to achieve the benefits of competition described above, governments and regulators must establish an appropriate policy framework to govern the telecommunications sector.

First, governments should remove legal barriers that protect existing monopoly providers from competition by new entrants.

Second, policymakers should take affirmative steps to promote competition in sectors of the market that were previously closed to competition. Examples of these steps include adopting policies that encourage multiple methods and modes of market entry.

Third, policymakers should consider introducing competitive safeguards to protect against the exercise of market power by incumbent carriers during the transition to competition. The most fundamental of these competitive safeguards involves regulation of the terms and conditions governing interconnection with the existing monopoly provider's network.

In the United States, although important steps were made to promote competition in the telecommunications sector prior to passage of the Telecommunications Act of 1996, the law firmly established the intent to provide for a pro-competitive, deregulatory national policy framework designed to accelerate private sector deployment of advanced telecommunications and information technologies and services to all Americans by opening all telecommunications markets to competition.

EFFECTS OF COMPETITION IN THE TELECOMMUNICATION SECTOR

The benefits of introducing competition in telecommunications markets are apparent in all segments of the telecommunications market. For instance, competition in the United States and many other countries in long distance and international telecommunications services has led to a dramatic decline in consumer rates for these services, as well as a dramatic increase in demand and a substantial increase in investment.



International telecommunications services can be particularly important to the development of a stable and robust economy linked to the global marketplace. The 1997 WTO Agreement on Basic Telecommunications Services ushered in a new era for telecommunications competition in many countries of the world. As part of that agreement, 72 countries have made commitments to open their telecommunications markets to foreign suppliers of basic telecommunications services. As these countries implement their commitments, dramatic change has occurred in their telecommunications markets. In many countries, there are several new providers of international and domestic telecommunications services, and prices are dramatically lower. As a result, increased competition has led to lower international settlement rates in many countries which, in turn, has led to lower calling prices for consumers. Lower calling prices means that people can afford to make more calls, more often, creating closer ties between family and friends in different countries and strengthening business relationships. Thus, introducing competition in international telecommunications markets produces benefits throughout a country's economy.

In addition, as part of the WTO Agreement, 49 countries made commitments to open their satellite service markets. These commitments have helped increase the ability of global and regional satellite providers to obtain the requisite authorizations for their systems. Similarly, in many countries private investment and competition in the provision of terrestrial wireless telecommunications infrastructure has led to declining prices for, and widespread use of, wireless telephone service.

In areas where teledensity can increase, moreover, price reductions may expand the number of households that can afford service. This increased demand may make build-out decisions more attractive. For example, in Chile, lower prices increased traffic by 260% from 1994 to 1997. In 1987, there were 6.7 phones per 100 households in Chile; this number rose to 11 in 1992 and to 15.2 in 1996.

As lower prices stimulate greater demand, an overall increase in revenues results despite additional providers in the market. In the U.S. long distance market, lower prices, in combination with an expanding market for services, have offset revenue loss from price reductions and the decrease in market share. For example, while AT&T's long distance market share fell from 90% in 1984 to 45% in 1997, its revenues increased from \$35 billion to \$40 billion during this same period. Thus, although AT&T lost market share, its revenues increased in a competitive marketplace.

The benefits from introducing competition in international and domestic telecommunications markets can be fully realized, however, only when market participants have the incentive to compete vigorously to attract the greatest amount of business. It has been the U.S. experience that these incentives exist only where there



is open entry into the telecommunications services market. Where entry is limited, or where only one or two new entrants are allowed to compete against the incumbent carrier, the benefits of competition are limited as well. For instance, when cellular telephone service was first introduced into the United States in the 1980's there were only two licensees in each market. As a result, prices remained relatively high and demand was more limited. After additional licenses were authorized in each market, prices dropped, new services were introduced and demand exploded.

BUILDING A TELECOMMUNICATIONS SECTOR AS A PART OF ECONOMIC DEVELOPMENT

Developing countries face many infrastructure challenges. While roads, water, and electricity are obvious fundamental requirements, development of a strong communications and information system is vital for the country to survive and prosper. As global developments increasingly push competition and its benefits, developing countries can realize these benefits in part through encouraging the establishment of an indigenous telecommunications sector. And one highly effective way to achieve this is to promote and nurture the growth of small and entrepreneurial entities within that sector.

The United States' experience provides some insight. Historically, most of the cutting-edge commercial and technology breakthroughs in the United States have been developed by individual entrepreneurs or small businesses, from Alexander Graham Bell to Bill Gates. Additionally, America's 22 million small businesses produce more than half of the nation's gross domestic product, and businesses employing fewer than twenty people have created all - - 99.99 percent - - of the nation's new jobs in recent years.

Such a phenomenal success story is due not only to the free enterprise system and profit motive, but also to a carefully developed government policy of supporting and nurturing small businesses. The U.S. has implemented numerous federal programs to assist small businesses in harnessing the engines of economic growth and innovation – loan guarantee programs, technical assistance programs, investment programs, anti-discrimination regulatory programs, outreach efforts, information and training programs. Congress established the Telecommunications Development Fund, some \$25 million, to invest in promising new telecommunications businesses.

Obviously the environment and situation of most developing countries is quite different from that in the United States, and overcoming an embedded monopoly telecom provider is something we've never had to do. Still, some basic steps – privatizing, establishing an independent regulator, developing helpful tax and labor laws, a



willingness to waive regulatory and filing requirements to the extent possible – can produce great benefits. A developing country could make it a condition for foreign carriers and operators serving seeking to provide service to (or within) its territory to undertake efforts to promote or support indigenous and start-up businesses. Supporting the growth of small and entrepreneurial telecom businesses by various means can lead to permanent economic gains for developing nations' economies, and to full participation in the global telecom marketplace.

METHODS OF INTRODUCING COMPETITION IN THE TELECOMMUNICATIONS SECTOR

Restricting methods and modes of entry can cause investment distortions and result in higher prices to consumers. It is by allowing the marketplace to select preferred approaches that policymakers encourage efficient entry. Three methods are typically used to introduce competition into the telecommunications sector:

- ✓ Facilities-based competition
- ✓ Unbundling of network elements
- ✓ Resale

In addition, a technologically neutral policy fosters innovative systems and alternative facilities designed to meet the needs of the marketplace. For example, the construction of a wireless network may be more appropriate in some markets than the development of a competing wireline carrier.

Facilities-Based Competition

When a new entrant constructs a network using its own facilities to reach its customers (*i.e.*, without using the incumbent carrier's network), that type of entry is commonly referred to as "full facilities-based competition." By developing a new network, a facilities-based competitor is not constrained by existing, possibly obsolete embedded plant and instead can install the newest, most efficient technology. As a result, the competitor will be able to supply new or additional services such as faster transmission and switching speeds or higher bandwidth capacity, and may be able to do so at lower costs than the incumbent. Facilities-based competitors not only directly benefit their customers but also create competitive pressure for the incumbent to upgrade its network. In addition, facilities-based entry allows the marketplace to drive competition with less regulatory presence.

As discussed more fully below, full facilities-based entrants still require interconnection for the mutual exchange of traffic with other providers. New entrants' customers need



to be able to communicate with subscribers on other networks, especially the incumbent's network where the majority of users obtain their service. Without the ability to interconnect on fair terms, a new facilities-based competitor cannot survive.

Use of Unbundled Network Elements

While full facilities-based competition has many advantages, it may not always be practical for a new entrant to construct an entire network. For example, it may be economically feasible to construct switching and long distance facilities but infeasible to construct local loops or "last mile" facilities that connect to customer locations. This might be due to economies of scale or the practical difficulties associated with acquiring needed rights-of-way. Thus, a second entry route is one in which the new entrant constructs portions of a network and purchases access to the relevant essential facilities of the incumbent provider's network, such as the local loop. This method of entry is referred to as using unbundled network elements, and typically must be required by law or regulation.

Entry through the use of unbundled network elements has a number of important advantages. First, it reduces entry barriers by allowing new entrants to begin offering service without having to construct an entire network. Second, on a longer term basis, it prevents the incumbent carrier from exploiting any residual monopoly power that may arise through remaining economies of scale or from the practical difficulties of obtaining needed rights-of-way, antenna sites for wireless systems, etc. Third, it allows new entrants additional avenues of innovation. For example, new entrants can purchase unbundled loops from the established carrier and use them with entirely different types of technologies (*e.g.*, packet switches based upon Internet Protocol (IP)) than those employed by the incumbent carrier. In this arrangement, consumers benefit from these new and better services and additional choices that competition provides.

Regulatory intervention is necessary in order to require the incumbent carrier to unbundle its network and to price the resulting elements at economically efficient prices. More specifically, incumbents should be required to provide any requesting telecommunications carrier non-discriminatory access to elements of the incumbent's network on an unbundled basis on rates, terms and conditions that are just, reasonable, and non-discriminatory. Incumbents should be required to provide any reasonable method of interconnection, including physical collocation or virtual collocation, or interconnection at a point between the incumbent's and new entrant's network.

In the United States, the Telecommunications Act of 1996 identified a minimum list of network elements that incumbent local exchange carriers must unbundle. These



network elements include: local loops, network interface devices, local and tandem switching capabilities, interoffice transmission facilities, signaling and call-related databases, operations support systems, and operator services and directory assistance facilities. In addition, new entrants should have access to pole lines, ducts, conduits, and rights-of-way owned or controlled by the incumbent.

Resale

In the telecommunications context, resale occurs when competitors obtain a service at a discounted or wholesale rate from the underlying, established carrier and then sell the service to their own customers.

Resale can serve a multi-faceted role in promoting and sustaining competition in telecommunications services. Resale may be an effective entry vehicle for new entrants that may initially lack the necessary capital to build their own networks. Resale may also allow small competitors, which will not become facilities-based providers, to offer service.

In addition, resellers may stimulate usage of the incumbent's network, and thus may benefit the incumbent facilities-based provider and further growth of the entire sector. Moreover, this competition may help to keep prices lower for consumers, increase consumer choice, and ultimately stimulate economic growth.

Experience in the U.S. long distance market suggests that resale can yield significant public benefits. Resale competition takes the form of arbitrage, where a reseller purchases a large number of minutes at a quantity discount and resells them to small customers at prices lower than the retail prices otherwise available to those customers. By providing affordable prices for the customer, resellers stimulate demand and thus compel facilities-based carriers to bring their prices closer to actual costs. At the same time, the increased competition from resellers expands the availability of innovative services, such as new billing terms and alternative rate structures. In particular, resellers can create consumer value by creating different billing plans or targeting their marketing to under-served groups within the community. Many countries have committed to a policy of resale as part of the WTO Basic Telecommunications Agreement to provide market access for basic telecommunications services.

For smaller countries, resale provides some of the benefits of competition even if the total amount of telecommunications traffic generated is insufficient to attract multiple facilities-based carriers.



Resellers may resell an entire service without modification, which is referred to as Total Service Resale. Resellers may also choose to obtain some services from the underlying carrier and combine them with services that they provide themselves. For example, a carrier may offer long distance services using its own switching facilities but lease long haul facilities from the incumbent provider.

Resale also allows providers to offer bundles of different services without actually constructing the necessary facilities. By doing so, they can achieve certain economies in terms of marketing while providing a package of services for the convenience of their customers. For example, a local exchange carrier can offer long distance services without constructing long haul facilities. Similarly, a carrier offering both local and long-distance services could add mobile services to its package without constructing its own wireless network.

In many industries resale occurs as a natural part of the development of markets. However, in telecommunications, a dominant carrier may be required by law or regulation to make its services available for resale. In particular, a regulatory requirement may be necessary to force the underlying carrier to offer services at a wholesale rate. In a competitive market, however, some providers may find a source of revenue in the provision of services on a wholesale basis. This often occurs when the facilities-based carrier has excess capacity on its network. In the U.S. long distance market, some carriers have constructed nationwide fiber-optic networks with the intent of offering transmission services on a wholesale basis to other carriers.

Real market experience has shown that resale can spur competition. The growth of competition in the U.S. long distance market resulted from a combination of the facilities-based and resale competition models. From the early stages of long distance competition, facilities-based providers and resellers have actively competed against one another. This approach resulted in more affordable rates, new service offerings, and numerous new entrants.

Despite the obvious benefits of resale, it has limitations. First of all, the reseller is limited to a greater or lesser extent by the technical features and functions of the underlying carrier's network. This limits the ability of the reseller to innovate. Second, resale alone does not put competitive pressure on wholesale rates and services because the underlying carrier may not be subject to competitive pressures to innovate at the wholesale level. This means that the regulator must retain some degree of control over the pricing, terms and conditions of the wholesale offering.



INTERCONNECTION, THE KEY TO COMPETITIVE SUCCESS

The key to competition within telecommunications services is the ability of networks to interconnect. Interconnection allows communications to occur across networks, linking competitors so customers of different networks can communicate with one another.

For competition to be successful at maximizing consumer benefits and innovation in the telecommunications market, carriers that compete for customers must also provide competitors with access to those customers. Shared access to customers occurs through interconnection, and access to all customers is necessary both for successful entry and for continued competition. If the incumbent, with the vast majority of customers, does not interconnect with new entrants, it is unlikely that the new entrants will remain economically viable.

A regulatory framework is needed to aid in the transition from a monopoly environment to a competitive environment because a monopoly or dominant provider has a strategic interest to keep out or minimize competitors in its market. As a result, the monopoly or dominant provider has a strong incentive to limit interconnection. Therefore, a regulator that is independent of any operator and of inappropriate political influence should adopt rules that give new entrants bargaining strength equal to the incumbent's.

The price of interconnection (or transport and termination), for example, could serve as a significant barrier to entry for new networks. An incumbent monopolist has an incentive to demand a high price to terminate calls originating on a new entrant's network and pay nothing for calls originating on its own network. In the United States, transport and termination charges are reciprocal and based on the long run incremental cost of providing the transport and termination on the incumbent's network.

Thus, the primary purpose of mandated interconnection is to foster a competitive environment that is fair to all competitors. Because the incumbent service provider has the vast majority of customers, a new entrant must be able to interconnect in order to provide full access to its customers. Without the ability to interconnect, new entrants would be severely restricted in their ability to compete with the incumbent.



REGULATORY TOOLS FOR PROTECTING AGAINST THE EXERCISE OF MARKET POWER DURING THE TRANSITION TO COMPETITION

Special problems may arise when a telecommunications carrier with monopoly power in the provision of a particular service or facility wants to offer a competitive service that is dependent upon the use of the monopoly service or facility. This may occur, for example, where competition has been introduced in the long distance and international markets but the local market remains a monopoly. The two problems are cost-shifting/cross-subsidization and discrimination.

The first problem arises if the monopoly service is regulated on a rate-of-return (profit) basis. If so, there is an incentive for the carrier with monopoly power to shift costs from the competitive service to the monopoly service. Shifting costs in this manner artificially raises the price of the monopoly service and allows the carrier to charge below-cost rates for the competitive service. This results in the captive customers paying above-cost rates for the monopoly services and hampers the development of a viable market for the competitive services. An example of this situation could occur when a carrier with monopoly power in the provision of local facilities or services wants to enter the long distance market or information services market.

The second problem occurs when control over an essential service or facility necessary for a competitive service enables the monopoly carrier to discriminate in favor of its own competitive offering. For example, a carrier with monopoly power in the provision of local facilities or services has the incentive to discriminate in favor of its own long distance or information service. This discrimination may manifest itself in the form of better quality interconnection or faster installation times for needed facilities or services.

What follows is an overview of some of the tools that are available to policymakers and regulators to discourage or prevent cost-shifting/cross-subsidization and discrimination. These tools or techniques can be used alone or in combination. The more stringent techniques may be appropriate when and where the threat is greatest. Less stringent techniques may be appropriate as competition takes hold in the previously monopolized market.

Outright Prohibition on Providing the Competitive Product or Service

One technique for preventing a carrier with monopoly power from cross-subsidizing and discriminating in the provision of a competitive service is to prohibit the carrier from entering the competitive market. Outright prohibitions have been and are being used in the United States. For example, the original agreement (Consent Decree) that led to the divestiture of the Bell Operating Companies from AT&T prohibited the former from



certain activities, including the provision of certain long distance services and information services. Under the Telecommunications Act of 1996, the Bell Operating Companies are prohibited from offering long distance services and alarm services until certain conditions are met.

While outright prohibition prevents cross-subsidization and discrimination, it may also deny the public the benefits of possible economies of scale or scope that may be derived if the carrier is allowed to provide the competitive service. Outright prohibition may also deny the public the benefits of innovation that might come from the participation of the monopoly carrier in the competitive market.

Price Caps for Regulated Monopoly Services

The incentive to shift costs from a competitive service to a monopoly service exists under profit regulation. Under price cap regulation, the prices of the monopoly services are capped (indexed to inflation and expected productivity increases). Price cap regulation has a number of advantages, including incentives for the carrier to be more efficient. It also discourages the monopoly provider from shifting costs from the competitive activity to the monopoly activity, because if the price of the monopoly service is capped, there is no incentive to shift costs from the competitive service to the monopoly service.

Separate Subsidiary Requirement

Under this requirement, the carrier with monopoly power is allowed to provide the competitive service, but only through a separate subsidiary or affiliate. The separate subsidiary requirement is combined with an obligation that the monopoly carrier treat the affiliated company no better than it treats unaffiliated providers of the competitive service. In other words, the monopoly carrier must deal with the affiliate on an "arms-length" basis.

The regulator has the ability to control the degree of separateness. Examples of the requirements for separateness can include requirements that the monopoly provider and its affiliate:

- Maintain separate books of account
- Utilize separate officers and personnel
- Employ separate marketing activities
- Not share common equipment or facilities
- Adhere to certain restrictions on information flows that would unfairly benefit the competitive affiliate



In addition, a typical requirement is that if the affiliate must obtain any transmission services from the monopoly provider, it must do so on a tariffed basis.

Tariffing Requirements

Tariffing is a fundamental technique traditionally used to protect users (both consumers and other carriers) against discrimination. Tariffing requires the regulated monopolist to file tariffs explaining its service rates, terms and conditions with the regulatory agency and to adhere to those rates, terms and conditions once the tariff is filed. Through the tariff and enforcement processes, which include opportunities for public comment, the regulator has some ability to prevent cross-subsidization and discrimination.

Accounting Separation

A requirement to maintain separate books of account can be adopted even without the imposition of a separate subsidiary requirement. Accounting separation typically requires the regulated monopoly provider to set up and maintain separate books of account for the competitive activity and to adhere to prescribed methods of separating costs. This provides a degree of protection against cross-subsidization.

Imputation Requirements

An imputation requirement obligates the regulated monopolist to charge the same amount for a service or facility provided to a competitive affiliate or operation that it charges to an unaffiliated provider, and to include that amount in the price it charges for the competitive service.

Service Quality Reporting Requirements

A service quality reporting requirement obligates the regulated monopolist to collect data and report on the quality of the services provided to both affiliated and unaffiliated competitors. This helps regulators detect and correct discrimination in the provision of essential services or facilities to competitors.

Resale Requirements

As discussed earlier, a resale requirement has a number of advantages in promoting competition. Resale can also help prevent cross-subsidization. For example, where a carrier has market power in the provision of switched services but there is competition in the provision of private lines, the carrier may try to increase the price of the switched



service in order to cross-subsidize and thus under-price its private line offering. If the carrier is required to allow the resale of the private line offerings, however, entrepreneurs could combine the private lines with their own switching, and undercut the prices of the monopolist's switched service offering. This has the effect of discouraging the carrier with market power from engaging in cross-subsidization.

Unbundling Requirements

An unbundling requirement forces the regulated monopolist to make network elements available to competitors on an unbundled basis under rates, terms and conditions that are just, reasonable, and non-discriminatory. To provide incentives for entry, the price of an unbundled element should equal the long run incremental cost of providing the element. Unbundling was discussed earlier as a way of lowering entry barriers and promoting innovation, but it also guards against anti-competitive tying arrangements, which arise when the monopolist requires a customer (*e.g.*, a competitor) to buy something unneeded as a condition of acquiring an essential facility or service.

Comparably Efficient Interconnection Requirements

Technical interfaces are required between the monopoly carrier's network and the equipment and facilities used by competitors. Unaffiliated competitors can be seriously disadvantaged unless they are able to interconnect their equipment and facilities to the monopoly carrier's network on a basis that is as efficient as the monopolist offers to its own affiliate. A comparably efficient interconnection requirement places an obligation on the monopoly carrier to provide such interconnection.

Network Interface Disclosure Requirements

A monopolist can also significantly disadvantage competitors in the process of changing the technical characteristics of the interfaces with which it interconnects with the providers of competitive services. It can do so by making the planned changes known to its affiliated operation far in advance of the notification, if any, that it gives to unaffiliated competitors. Network interface disclosure rules mandate that the monopoly carrier give reasonable advance notice to competitors before changing these interfaces. This gives the unaffiliated competitors a chance to adjust to the network interface changes in order to offer competitive services.

Customer Proprietary Network Information Requirements

In the United States, Customer Proprietary Network Information (CPNI) refers to information that a carrier collects from its customers. For example, a monopoly local



exchange carrier might observe that a large share of calls to a certain subscriber go unanswered or encounter a busy line. Such a customer would be a prime candidate for an answering machine or a network-provided voice-messaging service. The carrier collects this competitively significant information not by virtue of its success in the marketplace but, rather, by the fact that it is the only provider of local exchange services. This customer information would provide a significant and unfair advantage in the provision of competitive customer premises equipment (*e.g.*, an answering machine) or a network-based voice messaging service. CPNI rules prohibit the sharing of information between the monopoly provider and its competitive affiliate or require the information to be shared on the same terms and conditions with competitors (subject, of course, to privacy considerations).

Prompt and Sure Resolution of Disputes

Many of the techniques described in this section aid competitors in detecting discriminatory behavior on the part of the monopoly service provider. However, new entrants are particularly vulnerable to such discrimination. Therefore, delays in responding to complaints can seriously damage new entrants and discourage further entry. Because of this vulnerability, the FCC has recently adopted expedited methods for resolving discrimination complaints. An effective regulator has an arsenal of enforcement mechanism tools, including assessing forfeitures, ordering a carrier to cease engaging in certain practices, and revoking a carrier's license to operate.



VI. Universal Service

An evolving and dynamic telecommunications environment is leading to changes in the definition of and approach to universal service throughout the world. Mechanisms traditionally used to fund, allocate, and administer universal service and universal access programs are being re-evaluated in light of technological innovation and increasing competition worldwide.

This changing environment demands new methods of funding universal service and universal access – methods that are competitively neutral, transparent, non-discriminatory, and cost-efficient. A wide range of methods is possible for the collection and distribution of funds that support universal service. While most nations face a common set of goals, the challenges in promoting universal service vary from country to country.

UNIVERSAL SERVICE AND UNIVERSAL ACCESS DEFINED

Universal service and universal access are closely related concepts. In the United States, the notion of universal service is most commonly expressed as the belief that all households in the nation should have access to the telephone network. This is consistent with the International Telecommunications Union (ITU) suggestion that universal service should be defined as a telephone in every home, while universal access, often seen as a precursor to universal service, should be defined as a telephone within a reasonable distance for everyone.

Universal Access

As described above, universal access is the term often used to describe the initial stages of telecommunications buildout. The emphasis of universal access policies is to increase access to telephones or telecommunications services on a community-wide level. Universal access programs often seek to foster installation of public payphones or public call centers in rural villages or low-income urban areas with the goal of providing a basic and initial connection to the network. Public payphones or call centers are used in some instances to ensure that even the most remote or sparsely populated area has some access to communication services.

Universal Service









Universal service policies are typically aimed at either providing telephone or telecommunications services to all households within a country, including those in remote and hard-to-serve locations, or increasing the number of individuals with telecommunications services. Universal service programs tend to focus on making the cost of obtaining and maintaining telephone service more affordable to individual users or to targeted groups of users such as low-income consumers and residents of high-cost and rural areas.



The services supported by universal service mechanisms range from basic telephone service to advanced services. Some countries with well-developed telecommunications infrastructure have expanded their universal service support programs to include advanced services such as Internet access in schools and libraries and affordable access to rural health care providers.

UNIVERSAL SERVICE IN THE UNITED STATES

The Telecommunications Act of 1996 defines universal service to include:

-  Voice grade access to the public switched network, *i.e.*, dial tone
-  Touch-tone signaling
-  Single-party service
-  Access to emergency services, including access to 911 and E911, where available
-  Access to operator services
-  Access to long distance services
-  Access to directory assistance
-  Limits on basic long distance service fees for qualifying low-income consumers

The success of universal service programs may be measured in terms of changes in telephone penetration and subscription levels on an aggregate level or among specific groups of users. Practically speaking, the achieved level of universal service depends upon such factors as the level of a country's economic and technological development, the level of urbanization, and a country's land mass and topography.

Whether the goal is universal access or universal service, it is important to identify short- and long-term objectives and to establish sustainable policies and regulations that will make telecommunications services available and affordable to the maximum number of people. To this end, regulators should seek to incorporate certain core principles in their universal service or universal access policies.

PRINCIPLES OF UNIVERSAL SERVICE AND UNIVERSAL ACCESS

In 1997, the WTO Agreement on Basic Telecommunications Services identified a minimal set of principles that signatories should follow in developing universal service policies:

- Transparency
- Non-discrimination
- Competitive neutrality
- Non-burdensome application.



In the Telecommunications Act of 1996, the United States Congress directed the FCC to reform its universal service policies to be consistent with the pro-competitive mandate of the Act, and according to the following principles; universal service should assure:

- Quality service at just, reasonable, and affordable rates
- Access to advanced services in all regions
- Access by consumers in rural, insular, and high-cost areas, and by low-income users, to services similar to those available to urban users, and at comparable rates
- Equitable and nondiscriminatory contributions should be made by all providers of telecommunications services
- Specific, *i.e.*, explicit and predictable, financial support mechanisms
- Support should be provided in a competitively neutral fashion
- Access to advanced telecommunications services for schools, health care providers, and libraries

Whether a regulator seeking to implement universal service or universal access in a given country decides to adopt only the basic requirements contained in the WTO Agreement, or includes additional concepts or requirements such as those adopted by the United States, the most effective legislation and regulation will identify the guiding principles, as well as basic definitions of these principles.

Universal Service Core Principles

To implement an effective, pro-competitive plan for universal service or universal access, the following core principles are recommended:

- ⇒ **Transparency** – All proceedings, regulations, documents and information governing the collection and distribution of universal service support funds are made available to the public in a timely manner. Public participation in decision-making is allowed and encouraged.
- ⇒ **Non-Discrimination** – The collection and distribution of universal service support does not discriminate on the basis of facilities, services, country of origin, class of customers, technology used, class of service offered, or routing used to deliver service.
- ⇒ **Competitive Neutrality** -- Universal service support mechanisms and rules do not unfairly advantage or disadvantage one service provider over another, and do not unfairly favor or disadvantage one technology over another.
- ⇒ **Non-burdensome Application** -- Contributions made by telecommunications suppliers to universal service support mechanisms are borne by a large class of telecommunications service providers and do not impose an undue burden on a single service or class of service provider; and the administrative costs of universal service mechanisms are reasonable.



- **Just and Reasonable Rates** -- Rates are typically considered just and reasonable if they are based on cost.
- **Affordable Rates** -- Rates do not impose an undue burden on a customer's budget. Factors used to determine affordability include the number of subscribers in a particular location, the per capita income on a local or regional level (disparities at the national level may render national averages unusable), and the scope of the local calling area.

UNIVERSAL SERVICE FUNDING

One of the most difficult issues for regulators is how to raise and distribute funding for universal service. Historically, many countries have kept rates affordable and promoted universal service by cross-subsidizing local service with revenue from long distance and/or international services. This means that long distance and international rates were priced well above cost to include a subsidy used to keep local rates low. In a competitive environment, however, cross-subsidization is ineffective because the market puts downward pressure on rates that are priced significantly above cost.

General Government Revenues

Some governments allocate a portion of their general revenues to a universal service fund. These revenues typically have been raised through taxes, tariffs, or other similar mechanisms. While this method of providing funding is transparent, explicit, and reduces economic distortions, it does not always raise sufficient funds or receive adequate political support.

Revenues from Privatization, Licensing and Auctions

If the amount of revenue raised is large enough, regulators can allocate proceeds received from privatization, licensing and/or spectrum auctions into a universal service trust fund and use the interest to support universal service programs. This form of funding may make possible the implementation of a transparent, explicit, targeted and non-burdensome mechanism for universal service funding. A major hurdle with this method is obtaining the initial allocation of such proceeds for telecommunications support, rather than for other worthwhile but unrelated government objectives.

Contributions from Telecommunications Companies

In some countries, regulators assess a contribution or tax on the revenues of telecommunications companies. Key regulatory issues involve defining which companies should make the contribution, what the contribution rate should be, and how to avoid duplicate contributions. In general, the contribution rate should be kept low in order to minimize economic distortions. A well-designed contribution mechanism can raise revenues in a manner that is non-discriminatory, non-burdensome, and technologically and competitively neutral. A poorly designed contribution



mechanism can create significant market distortions, create entry barriers for new companies, and/or favor a specific company, technology or service.

International Settlement Payments

Regulators and carriers in some countries use a portion of received international settlement payments to finance universal service and universal access. In many cases there are insufficient mechanisms to ensure that settlement payments are actually used to fund universal service. Furthermore, settlement payments are an unreliable source for universal service funding, since they will decline as the international accounting rate regime is replaced with a cost-based system determined by a competitive market. Funding universal service with settlement payments creates an incentive to maintain high accounting rates. In addition, funding universal service with settlement payments shifts the burden of support to other countries that may have their own alternative calling methods in order to bypass the above-cost accounting rate resulting from universal service mandates and commitments. Ultimately, this form of subsidy will encourage the hubbing of traffic through countries with which the destination country has low accounting rates. For these reasons, relying on settlement payments to support universal service will become increasingly risky.

The U.S. Experience

All telecommunications carriers that provide interstate telecommunications services, including those that provide service on a non-common carrier basis, and payphone aggregators, must contribute to universal service. Internet and on-line service providers and cable companies do not contribute to universal support mechanisms unless they provide interstate telecommunications services.

Carriers that provide only international telecommunications services are not required to contribute to universal service. Only if an international carrier also provides domestic interstate service would it be required to contribute to universal service in the U.S. Contributions for high cost and low income support mechanisms are assessed against interstate end-user revenues -- *i.e.*, the carrier's total revenues from telecommunications services including the revenues from subscriber line charges.

Contributions for universal service support for schools, libraries, and rural health care providers are based on carriers' interstate and intrastate end-user revenues. The contribution rate for schools/libraries is .0075 of total telecommunications gross revenues.

DISTRIBUTING UNIVERSAL SERVICE SUPPORT

Competitive Bidding and Auctions

In some countries, the universal service administrator allocates funds via competitive bidding. The funding is awarded to the bid or proposal that meets a set of defined criteria, such as the bid that requires the lowest level of subsidy to execute the project. Under this method, the universal service fund administrator consults the government, other agencies, and private organizations to



identify priority projects. Bids are solicited to meet the established criteria, and the entity that meets those criteria wins the bid and is allocated proceeds from the fund. This mechanism represents a transparent, affordable, and efficient method of meeting universal service needs.

Grants and Loans

The universal service administrator may allocate funds for projects through grants or loans. Establishing clear and identifiable criteria to select the best project can be difficult, politically sensitive, and administratively burdensome. The use of grants or loans may therefore be most effective when the number of projects is limited.

Allocating Funds to Carriers

The universal service administrator may allocate funds to any carrier or telecommunications service company that can demonstrate an ability to provide universal service. The administrator should establish clear, predictable, and competitively neutral criteria for allocating funds to carriers. There are many factors that can be considered in determining how much money is allocated to each carrier, including call volume, call routing, and the number of low-income or rural residents in the service area of a carrier. A growing number of countries are using forward-looking costs to determine how to compensate carriers that provide universal service.

End-Users/Consumers

Another method of allocation is to give universal service funds directly to end-users. The universal service fund administrator must decide whether to give funds to all end-users or to a particular group. For example, some universal service programs provide funds only to users who live in high-cost areas or only to low-income users. After the recipient group has been selected, universal service fund administrators must decide how the universal service funds can be used. For example, recipients may be allowed to use funds only to pay for all or part of their initial connection costs, monthly phone bills, all calls, local calls and/or long distance calls. Administrators must also decide how funds will be allocated to the targeted recipients. For example, funds may be allocated to recipients indirectly through the carriers (*e.g.*, through rebates, vouchers and/or pre-paid calling cards) or directly to recipients through vouchers, tax credits, government checks, or government-sponsored calling cards. Any method of funding, whether through the carrier or directly to end-users, requires establishing an effective and transparent allocation mechanism.

The U.S. Experience

An independent, non-governmental entity, the Universal Service Administrative Corporation (USAC), manages high-cost and low-income support, administers the schools and health care programs, and provides billing and collection support.

In order to receive universal service support, a carrier designated as eligible by a state public utility commission must offer, throughout a designated service area, all of the services listed in the Act's definition of universal service. It must offer these services using its own facilities or by combining its facilities with another carrier's (resold) facilities. The carrier must widely advertise both that it provides services under the universal service program and its relevant fees. Any



telecommunications carrier meeting these criteria for eligibility can receive universal service support, regardless of the technology it uses.

Support for Rural, Insular, and High-Cost Areas in the United States

Carriers that provide service in rural or urban high-cost areas will receive support. A rural carrier is defined as one: whose study area does not include a city of 10,000 or more or any urbanized area; who provides service to fewer than 50,000 access lines; who provides service to any study area with fewer than 100,000 access lines; or less than 15 percent of whose access lines are in cities of more than 50,000.

Before this year, the amount of support a high-cost carrier was entitled to receive, whether it was deemed a rural or non-rural carrier, was based on its embedded costs. Beginning in January 1999, however, the FCC began using forward-looking economic costs to determine high-cost universal service support for non-rural carriers. Rural carriers continue to receive universal service based on their embedded costs. The FCC initiated a new proceeding, to be concluded in the near future, focusing on cost issues for rural carriers.

Support for Low Income Consumers in the United States

Lifeline: The Lifeline program helps low-income households pay monthly service bills. All eligible telecommunications carriers must offer this program to qualifying low-income consumers. Lifeline participants receive a total of \$5.25 a month where a state provides no matching funds. If the state contributes to Lifeline support, the participant can receive up to \$7.00 in federal support.

Lifeline participants are subject to toll limitation (long distance charge limits or blocking). A monthly limit can be set on the amount of money spent on long distance calls and if the bills are not paid, the long distance, but not the local service, can be cut off.

Link-up: The Link-up America program helps low-income subscribers pay the installation costs required to first receive service. Under this program, half of connection charges up to \$60.00 will be paid (\$30.00 maximum in federal support).

Support for Schools and Libraries in the United States

Eligible schools and libraries may purchase any commercially available telecommunications services, internal connections among classrooms, and access to the Internet, at a discount. Higher discounts are available for economically disadvantaged schools and libraries, and those entities located in rural areas. Internal connections include routers, hubs, network file servers and wireless LANs. Internet access means basic conduit access from the school or library to the Internet backbone; it includes the link from the school or library to the Internet service provider, as well as e-mail services.



All non-profit kindergarten through 12th grade schools with an endowment of \$50 million or less are eligible for service discounts. Discounts range from 20 - 90%. The discount level depends on the level of poverty, student population and whether the school or library is located in a rural or urban area. Total expenditures for universal service support for schools and libraries are capped at \$1.925 billion for 1998 through June 30, 1999, although any funds not disbursed in a given year may be carried forward and disbursed in subsequent years.

To receive a discount, schools and libraries must seek competitive bids for eligible services. Price should be the primary factor, but other factors may also be included. The subsidy for authorized services and equipment is based upon whether the school or library is located in a rural or high-cost area, as well as the percentage of students in the district who are eligible for the national school lunch program. The subsidy is to be paid directly to the service provider, who will then supply the services or equipment to the school or library at the discounted rate.

Support for Health Care Providers in the United States

Approximately 9,600 health care providers in rural areas in the United States are eligible to receive telecommunications services supported by universal service funds. Eligible health care providers include teaching hospitals, medical schools, community health centers, migrant health centers, mental health centers, not-for-profit hospitals, local health departments, rural health clinics and consortia or associations of any of the listed providers. Support is provided for distance charges between the rural health care provider and the nearest large city, defined as having a population of 50,000 or more.

Carriers providing service to eligible health care providers receive the difference between the rural and urban rates; the rural health care provider thus pays no more than the highest tariffed or publicly available rate in the nearest large city. Support is provided to rural health care providers for telecommunications services having transmission speeds of up to the T-1 level (1.544 MBPS).

CONCLUSION

Universal access to telecommunications services is a challenge in virtually every country throughout the world — both developed and developing. In order to implement universal service or universal access, it is necessary to identify goals and establish sustainable policies and regulations that will make telecommunications services available and affordable to the largest number of people.

As domestic and international telecommunications markets become increasingly competitive, many countries will be challenged to replace traditional universal service programs with programs that minimize negative effects on competitive markets. For much of the world, the primary objective of universal service or universal access has been to ensure basic telecommunications services at affordable prices to all. A growing number of nations are realizing that universal service policies should be crafted in a pro-competitive and flexible fashion. Whatever policies are implemented to expand access to telecommunications networks, incentives for encouraging continued investment along with rapid growth and innovation remain key common objectives globally.



FURTHER INFORMATION

Report and Order in the Matter of Federal-State Joint Board on Universal Service. CC Docket 96-45. Released May 8, 1997.

Universal Service Obligations in a Competitive Telecommunications Environment. Information Computer Communications Policy 38. OECD.

Kunigami, Jorge. "Options for Delivery of Rural Telephony." Presentation by Jorge Kunigami, Chairman, OSIPTEL-Peru. San Francisco, November 1996.

Hills, Jill. Universal service. Liberalization and privatization of telecommunications. Telecommunications Policy, June 1998.

Muller, Milton. Universal service in telephony history a reconstruction. Telecommunications Policy, July 1993.

Petrazzini, Ben. Competition in telecommunications --- Implications for universal service and employment. Private Sector, World Bank. October, 1996.

Ponce, Fatima. Acceso universal y telecomunicaciones rurales en el Peru: El rol de OSIPTEL. Documentos de Discussion 3. OSIPTEL, Peru.

Von Hesse, Milton. Telecommunications for rural and preferential social interest areas development: Strategy and Funding Policy. Documentos de Discussion 2. OSIPTEL, Peru.

Wellenius, Bjorn. "Extending telecommunications service to rural areas --- the Chilean experience." Viewpoint. Note 105. The World Bank. February, 1997.

Foro CITEI. Seminario sobre servicio universal. 14-15 April, 1998. Buenos Aires, Argentina. Co-published by Asociacion Hispanoamericana de Centros de Invetigacion y Empresas de Telecomunicaciones (AHCIE) and Camara de Informativ y Comunicaciones de la Republica Argentina.

Universal Service and Public Access in the Technologically Dynamic and covering informationn society. OECD. April 1997.

La Transformacion de las Telecomunicaciones en el Peru. Organismo Supervisor de Inversion Privada en Telecomunicaciones. Memoria 1994-1997.

La experiencia de regulacion en telecomunicaciones. Documents del primer encuentro regional de organos reguladores de America Latina y el Caribe. Lima, 22-24 Mayo, 1996.

Final Report of Rapporteurs for Question 1/2. Study Group 1, Working Party A/1. International Telecommunications Union, Telecommunications Development Bureau. June 17, 1997.



VII. Spectrum Allocation, Assignment and Enforcement

Wireless communications and broadcasting play an increasingly vital role in enabling people throughout the world to communicate. These systems also serve to inform, entertain, educate and protect our citizens. Wireless communications are furthering competition in the marketplace, bringing greater choice at lower cost to consumers. Wireless services also present unique regulatory challenges for countries all over the world, especially developing countries.

The FCC has had over 65 years of experience in spectrum, allocation, assignment and enforcement. While spectrum needs of other countries may differ from those of the United States, the following core principles have broad applicability to effective spectrum management:

Core Principles of Effective Spectrum Management

- Maximize the efficient use of radio spectrum
- Ensure that spectrum is made available for new technologies and services, and flexibility is preserved to adapt to new market needs
- Develop a fair, efficient and transparent process for awarding licenses
- Make allocation and licensing assignments based on marketplace demands
- Promote competition
- Ensure that spectrum is available for important public benefits (i.e., safety and health)

SPECTRUM MANAGEMENT

Overview

In the Communications Act of 1934 establishing the FCC, Congress gave the FCC a broad grant of power to regulate spectrum “in the public interest.” As a result, the FCC is constantly working to ensure that spectrum is allocated and assigned in a manner that minimizes or eliminates interference so that the American people receive the maximum benefits of wireless technologies and services.

The FCC shares spectrum management responsibilities and functions with the National Telecommunications and Information Administration (NTIA). While the FCC has authority



over commercial spectrum usage as well as that of local and state governments, NTIA manages the federal government's use of spectrum for defense and other federal purposes. Because radio spectrum is a limited resource and decisions by one agency often affect the other, the two agencies work closely together to ensure that the American public receives the maximum benefits derived from the spectrum resource.

For at least the past two decades, the U.S. has undergone a transition from extensive regulatory planning in its spectrum management toward a dynamic market-based approach. The rapid evolution of wireless technology and ever-changing market demand, make it difficult for any spectrum regulatory body to forecast what services will be available or which frequency range will be efficient for a given service in the near future. The assessment of public demand for a given service is even more difficult. Therefore, we have increasingly adopted a flexible market-based approach. We believe that the certainty associated with extensive long-term planning generally is outweighed by the costs associated with such planning and its inability to accommodate flexible use and the introduction of new services. Although regulators should factor in future considerations in spectrum management, the process should maintain sufficient flexibility to meet future market demands and services. In all of this, the U.S. has attempted to balance its reliance on market forces with the need to safeguard the public interest in those cases where the market does not adequately provide for necessary services, such as public safety services.

General reliance on market forces to shape our spectrum management allows flexibility to respond to the ever-changing wireless communications market. The U.S. relies on private sector petitions to the FCC to determine specific spectrum needs. This approach keeps spectrum management within reasonable and practicable bounds, allowing consideration of specific requirements in the context of the impact on existing users. This approach also enables spectrum regulators to consider issues as they emerge, proceeding on the basis of the most current information while allowing all interested parties participate in the process.

As liberalization, privatization, and competition increasingly characterize wireless communications policy around the world, market-based licensing policies will play a critical role in ensuring that the benefits of telecommunications technologies and services are made available to the widest range of people in the most timely and efficient manner.



SPECTRUM ALLOCATION

Overview

In the United States, the FCC and the NTIA manage the spectrum through a system of frequency allocations, allotments, and assignments. The entire radio spectrum is divided into blocks, or bands, of frequencies established for a particular type of service by the process of frequency allocation. Further, these general allocations can be subdivided into bands designated for a particular service, or "allotment." Within these subdivided bands, specific channel plans may be implemented. For example, allocations made to the land mobile service are divided into allotments for business users, public safety users, and cellular users, with each group allotted a portion of the band in which to operate. Assignment refers to the final subdivision of the spectrum in which a party gets an assignment, or license, to operate a radio transmitter on a specific channel or group of channels at a particular location under specific conditions. The FCC also issues some licenses on a more general geographic basis.

U.S. Table of Frequency Allocations

The FCC has listed U.S. allocations in a Table of Frequency Allocations that can be found in Section 2.106 of the Commission's rules. We invite anyone interested in our rules governing spectrum, including the allocation table, to visit the FCC on the World Wide Web at "<http://www.fcc.gov/oet/info/rules/>".

International Allocations

Because radio waves transcend national borders, and because of the increasing number of global services, international coordination of spectrum is a critical component of the spectrum allocation process. The radiocommunication conferences of the ITU are the principal mechanisms for international spectrum allocation. The ITU's table of allocations represents a global consensus that reflects the needs of ITU Member States. The scheduling of conferences every two to three years with a specified agenda keeps the table of allocations flexible and current. Its general success is evidenced by, for example, the allocations provided during the 1992 conference for mobile-satellite services that are now coming into use.

These conferences may address any service throughout the entire radio spectrum, dependent on the agendas set by the ITU Council. In addition, there are also Regional Radiocommunication Conferences, which meet as necessary and have a restricted agenda devoted to specific services for the ITU region concerned. Based on the agreements reached at these conferences, the ITU publishes the international Radio Regulations, which include allocations and technical rules for radio operation for each of the three regions of the world. The ITU further designates such allocations as primary or secondary.



Primary allocations grant to specific services priority in using the allocated spectrum. When there are multiple primary services within a frequency band, they all have equal rights. A station, however, has the right to be protected from any others that start operation at a later date.

Secondary allocations are made for services that must protect all primary allocations in the same band. Services operating in secondary allocations must not cause harmful interference to, and must accept interference from, primary service stations. All secondary service stations have equal rights among themselves in the same frequency band.

Bilateral Negotiations

The impact of an administration's spectrum allocation decisions is rarely confined to that administration's borders. Consequently, it is often necessary to engage in bilateral discussions to coordinate spectrum use at the borders and to resolve potential and real interference problems. For example, the United States routinely engages in such talks with Canada and Mexico. Those discussions have resulted in dozens of bilateral agreements regarding spectrum use between the United States and Canada and the United States and Mexico. For example, bilateral negotiations have been used to resolve interference complaints between each countries television stations operating near or in the border areas.

Bilateral and multilateral negotiations are also important at the international spectrum management level. The United States regularly develops spectrum and regulatory proposals to submit to the ITU World Radiocommunication Conferences. Prior to those conferences, the United States attempts to engage in bilateral or multilateral discussions with as many ITU member administrations as possible. These discussion take place both at regional WRC preparatory meetings where many administrations may be present, and at visits to individual countries. These discussions serve to resolve spectrum allocation and use differences prior to the convening of WRCs.

PUBLIC INTEREST CONSIDERATIONS

When there are competing interests for specific spectrum, the FCC must determine which use or uses of the spectrum will best serve the public interest. Traditionally, this has been done by considering the following factors:



PUBLIC NEED AND BENEFIT

- † Dependence of the service on radio rather than wirelines or fiber
- † Market demand for the service
- † Relative social and economic importance of the service, including safety-of-life and protection-of-property factors
- † Probability of establishment of the service and the degree of public support which is expected for the service
- † Impact of the new service on existing investment in the proposed frequency band

TECHNICAL CONSIDERATIONS

- ⊗ Necessity for the service to use particular portions of the spectrum, including propagation characteristics and compatibility with services within and outside the selected frequency band
- ⊗ Amount of spectrum required
- ⊗ Signal strength required for reliable service
- ⊗ Relative amount of radio and other electrical interference likely to be encountered
- ⊗ Viability of the technology

EQUIPMENT LIMITATIONS

- ☞ Upper practical limits of the useful radio frequency spectrum and, in general, what higher limit can be expected in the future due to technological advance
- ☞ Operating characteristics of transmitters, including practical limitations (that is, size, cost and technical characteristics)
- ☞ Receivers available and/or being developed, including their selectivity and practical usefulness for the intended service

MARKET-BASED APPROACH TO LICENSING

As liberalization, privatization, and competition increasingly characterize wireless communications policy around the world, market-based licensing policies will play a critical role in ensuring that the benefits of telecommunications technologies and services are made available to the widest range of people in the most timely and efficient manner.



In the past, the FCC relied often on comparative hearings, in which the qualifications of competing applicants were examined to award licenses in cases where two or more applicants filed applications for the same spectrum where they cannot all be granted. Comparative hearings, though, proved time-consuming and resource-intensive. The FCC also utilized lotteries in some cases to award licenses. Lotteries, however, created an incentive to acquire licenses on a speculative basis and resell them. More recently, the U.S. has turned to competitive bidding (auctions) to assign licenses. The FCC experience illustrates that competitive bidding represents an effective way to ensure that licenses are assigned quickly and to the entity who values them most highly, while recovering the value of the spectrum resource for the public.

Over the last 5 years, the United States has conducted twenty-one (21) auctions which have provided valuable insights into the advantages of using competitive bidding as a licensing mechanism.

Auction Advantages

Speed – In order for the public to derive the maximum benefit from spectrum use, authorizations to use spectrum should be assigned in a manner that minimizes delay and inefficiency. The United States has found that competitive bidding is the most effective means of assigning licenses for mutually exclusive applications for initial licenses to provide radiocommunication services, avoiding months or years (as is often the case with comparative hearings or lotteries) of regulatory or other delay.

Transparency – Auctions avoid appearances (and occurrences) of the government making decisions that are biased towards or against individual industry players. They provide a basis by which any potential licensee can determine the basis for the licensing decision. As conducted in the United States, auctions are completely transparent. The rules and procedures of the auctions are clearly established, and the outcomes are definitive.

Promoting Efficient, High-Value Use – Auctions help ensure that spectrum ends up in the hands of those who value it most highly as quickly as possible, thereby helping to avoid wasteful assignment of this scarce resource. This, in turn, encourages that services and technologies be made available more rapidly because the spectrum has been assigned at a cost that is based on the expected return for its use. In addition, “warehousing” of spectrum is discouraged, as auction winners will have to bear the full opportunity cost of letting spectrum for which they have paid go unused.

Preserving the Public Interest – By getting licenses into the hands of those entities that most value the spectrum in the first instance, the public recovers the full value of spectrum.



The FCC believes that licensing mechanisms based on competitive bidding should be considered an integral part of an overall approach to spectrum management that is based on the idea that market forces, not government regulators, are better able to decide what services and technologies consumers will want. For example, auctions combined with partitioning and disaggregation (through which a licensee can sell or lease part or their entire spectrum) allow potential licensees to more closely match market demands with their planned systems

In this context, some countries have expressed concerns that auctions can lead to multiple service areas and result in fragmented services. The U.S. experience has not shown this to be a problem. To the extent that larger service areas are desired, participants in an auction can bid on licenses in several areas or an entire country (or, in some cases, in more than one country). In addition, if users demand unconstrained roaming, operators will work to interconnect their systems, as is the case with U.S. paging, personal communications service, and cellular companies. Conversely, if market forces dictate that smaller service areas make sense, users can partition or disaggregate their spectrum to match consumer needs. Thus, instead of having government regulators artificially defining market boundaries, other than for initial licensing purposes, auctions and associated licensing rules allow the market to determine the correct service area size.

Cases Where Actions May Not Be Appropriate

Auctions may not be appropriate in all circumstances. Where there is no mutual exclusivity, auctions are not necessary because the license can more easily be assigned without consideration of any competing alternatives. In addition, there may be cases, public safety and national defense, for example, in which fundamental public policy goals might not be well served by using a competitive bidding mechanism.

There also may also be cases in which the most efficient and effective use of spectrum is achieved not by granting exclusive licenses to winning bidders, but rather through the shared use of the spectrum, either on a licensed -- as is the case with most private services in the United States -- or unlicensed basis. In such cases, other reimbursement methods may be considered to ensure that the public is adequately compensated for use of the resource.

Satellite Licensing and Auctions

In the U.S., the FCC has used auctions to award satellite licenses in only two instances. In both cases, the satellite systems were recognized by treaty as domestic services. The FCC auctioned orbital locations that had been allotted to the United States for the provision of domestic Direct Broadcast (Video) Satellite Service. The other involved domestic Digital Audio Radio Satellite Service (DARS) where no neighboring country had allocated the spectrum that the United States is using for this service.



With regard to the licensing of satellite systems, the preferred approach of the U.S. is to award licenses for as many systems as possible. The U.S. has avoided using auctions in potentially mutually exclusive situations by thorough negotiations and engineering solutions. In the case of fixed-satellite service, for example, auctions have not been used.

For global systems, sequential auctions in countries where the operator would like to provide service could result in uncertainty to the satellite operator as to the final costs of the system. To avoid this uncertainty it would be necessary to create coordinated, multinational auctions in order to address properly the interdependency between national licensing decisions and international provision of service.

However, a coordinated multinational auction would likely involve a substantial investment of time and resources by multiple administrations, raising issues of national sovereignty and access that could delay service. Thus, all parties can benefit if countries avoid mutually exclusive auction proceedings by using other means, such as negotiations among proponents that are coordinated by the regulator and engineering solutions.

FINANCING FOR SPECTRUM MANAGEMENT

Every country faces challenges in ensuring that its spectrum regulatory body has sufficient funding to meet the costs of spectrum management. License fees represent one way to improve the economic and technical efficiency of national spectrum management. At the FCC, two types of fees are collected -- *application fees* and *regulatory fees* -- to cover the cost of allocating the use the spectrum. In addition to paying for the administrative cost of managing the use of spectrum, the fees may also serve to discourage the filing of frivolous applications. If set too high, however, fees can result in under-utilization of the spectrum.

As of 1987, the FCC has collected *application fees* for all FCC-licensed services. These fees are intended to cover only the direct administrative costs of processing a license application. They are set according to the type of service and are reviewed regularly.

In contrast, the FCC's *regulatory fees* for spectrum users are applied toward the agency's broad range of enforcement, policy, rulemaking and international activities. By statute, the total fees collected must cover (but cannot exceed) the level of funding appropriated by the U.S. Congress for these activities. These fees are assessed annually and vary from service to service.

SPECTRUM MONITORING AND ENFORCEMENT

Effective spectrum monitoring and enforcement requires tools to ensure adherence to spectrum allocation and use regulations, as well as identification and elimination of interference. The U.S. uses a variety of tools to monitor spectrum use and enforce



adherence to U.S. rules and regulations. Among these tools are (1) databases of information on licensed systems; (2) information, in the form of national rules, on general licensing and technical requirements concerning specific services; (3) electronic equipment for determining the sources of interference and illegal radio operations; and (4) regulatory mechanisms for assessing penalties on licensees not complying with regulations.

In both the domestic and international context, maintaining a database of relevant technical parameters on individual communications systems is one tool necessary to monitor compliance with spectrum use regulations. In cases of complaints of non-compliance with regulations, the regulator need merely access the database to obtain technical parameters to help determine whether a station is in compliance.

In some cases, it is not practical to maintain a database on all licensed systems and that system's components. For example, many systems communicate with consumer handsets that are not individually licensed. In those cases, codifying general licensing conditions and technical requirements in a rule book provides a basis for determining compliance.

With either a database of actual system parameters or a rulebook stating required conditions, spectrum regulators can conduct engineering and managerial analyses to ensure that operators comply with the relevant technical rules for spectrum use.

Identifying interference sources is also a critical component of ensuring compliance with spectrum use rules. At the FCC, the electronic direction finder has proven to be highly effective for pinpointing interference sources and taking measures to eliminate interference. If an interference complaint is received, the direction finder can be used to locate an interfering transmitter. In domestic cases of interference, a letter can be sent to the operator of the interfering station or a physical investigation of the transmitting site can be made. In the case of interference from international sources, a special note is sent to the administration of the offending operator, informing that administration of the infringement.

In cases of repeated interference or illegal operations, the FCC has authority to assess penalties on the offending party. For this type of action to be effective, penalties related to specific violations must be clearly defined and publicized. Depending on the severity of the infraction, penalties can include warnings, fines, revocation of license, equipment seizure and in severe cases, incarceration.

Equipment Authorization

Another important role of the FCC in spectrum monitoring and enforcement is related to ensuring that radio transmitters and other electronic devices meet certain standards in order to control interference to radio services.



The FCC carries out this role in two ways. First, it establishes technical regulations for transmitters and other equipment to minimize their potential for causing interference to radio services. Second, the FCC administers an authorization program to ensure that equipment reaching the market complies with all technical requirements. The FCC's authorization program requires that equipment be tested either by the manufacturer or at a private test laboratory to ensure that it complies with all technical requirements. Once the equipment has been tested and found to comply with technical requirements, it may be marketed without approval from the FCC. (Self-certification). However, for equipment that has been determined to pose a greater risk of interference, the FCC requires the submission of an application that must be reviewed and approved before the equipment can be marketed.

USEFUL FCC INTERNET LINKS

Federal Communications Commission: All About Auctions
www.fcc.gov/wtb/auctions/Welcome.html (document wu198pu1.pdf)

Federal Communications Commission: World Radiocommunication Conference Home Page
www.fcc.gov/ib/WRC00

Federal Communications Commission: Rules (Including Allocation Table)
www.fcc.gov/oet/info/rules

Federal Communications Commission: Fees
www.fcc.gov/fees



VIII. Regulating Satellite Networks: Principles and Process

There has been a significant increase in the use of satellite technology for commercial purposes over the past decade and satellite use is expected to continue to escalate.

WHAT IS A SATELLITE NETWORK?

Besides the general spectrum management principles in Chapter VII, satellite licensing involves two additional principles: efficient use of the orbit spectrum resource and open skies.

Efficient Use of Orbit Spectrum Resource

Given that the orbit spectrum is limited the FCC has adopted policies and rules requiring its efficient use. The purpose of this policy is to facilitate licensing of the maximum number of systems possible, with minimal amount of interference. This approach is beneficial for consumers because it also facilitates competition, and provides a greater variety of services at the lowest possible prices.

To this end, the FCC has adopted technical rules for most satellite services. For example, in the domestic satellite service, systems must meet basic technical criteria that will allow geostationary fixed satellites to operate at two-degree orbital spacing. In the Big LEO service, systems must be capable of providing both continuous service to users in the United States and global coverage. The FCC recognizes, however, that private industry is best positioned to determine what type of technology and systems make best business sense and are most responsive to customer needs. Thus, the FCC requires only that the minimum technical requirements needed to prevent interference are met, and seeks to provide licensees maximum flexibility.

The Open Skies Policy

The purpose of the Open Skies Policy is to provide licensees maximum flexibility operating their systems to meet market demands with minimal regulation. Through its satellite licensing policies, the FCC has increased the ability of licensees to adjust to a dynamic environment. Except for limitations created by insufficient amounts of available spectrum, the FCC avoids imposing artificial limits on the number of commercial operators or the types of services they can offer. For example, early satellite systems carried mostly long-haul telephone transmissions. When fiber optic cable became prevalent, satellite



licensees began to focus on other services, such as high-speed data and video services, as well as on providing both domestic and international service. A regulatory approach of flexibility has allowed the industry to thrive despite shifts in customer requirements.

In accordance with the principles of its Open Skies policy, the FCC has licensed private companies that provide a wide range of satellite services. For example, in addition to licensing fixed-satellite services, the FCC has licensed mobile satellite services, direct broadcast services, radiodetermination satellite services, and remote sensing satellite services. These have included both geostationary and nongeostationary systems.

The FCC also removes unnecessary regulatory constraints, wherever possible and continually reviews its rules and policies to respond to changing conditions and developments in the satellite industry. In addition, the FCC seeks to facilitate the introduction of new services to meet the changing needs of customers. To provide customers with more choices, more innovative services, and better prices, the FCC attempts to accommodate the maximum number of systems possible in a particular service. Moreover, the FCC has sought to maximize entry and competition in the satellite service market.

LICENSING OF SPACE STATIONS

The satellite space station licensing process is composed of three distinct processes: allocating available spectrum for the proposed satellite service, developing service rules and granting licenses to qualified applicants. The process is commonly triggered when an applicant files a petition for rulemaking to allocate specific spectrum to a certain service domestically. (In addition, if there is no international allocation for the requested service, the FCC must seek and secure the appropriate allocation at an ITU World Radio Conference). If spectrum is already allocated for a particular service, the FCC will simply accept applications for authority to provide that service without undergoing an allocation proceeding. The allocation request often involves service links (links between the end user and the satellite) as well as feeder links (links between satellites and gateways) and is normally resolved through a notice and comment rulemaking procedure.

Filing of Applications

The FCC's rules require parties seeking to provide satellite service to submit an application. The Commission's general rules for licensing satellites are contained in Title 47 of the U.S. Code of Federal Regulations, Part 25 (See 47 CFR Part 25). Applications must contain certain legal, technical, and financial information. For example, they must contain the technical parameters of the system, services to be provided, planned



implementation, system cost, and financial ability of the applicant to construct, launch, and operate the proposed system.

If the application is acceptable for filing, it is placed on public notice and comments are solicited. An application is usually acceptable for filing if, upon cursory review of the application, there are no factors that would warrant dismissing or not accepting the application. An application is placed on public notice by issuing a one to two page document entitled "Public Notice" describing the authority sought in the application, noting that the application is acceptable for filing, and soliciting public comment within a reasonable time period (usually 30 days). This document provides notice to the public that an application requesting a particular service has been filed. The Commission makes copies of the applications publicly available by placing them in a room open to the public—the FCC's Reference Center.

In the Public Notice, the FCC usually (but not always) establishes a date by which other applicants seeking the same authority to provide the same service in the same spectrum must file their applications ("cut-off date"). This action creates a satellite processing round. If other applications are filed, the FCC will examine the applications submitted by the cut-off date to determine if they are acceptable for filing. If they are, the applications will be placed on public notice, and all applications accepted for filing will be considered concurrently.

In cases where the frequency band is not really allocated for the specific satellite service, an application to provide satellite service is often filed concurrently with the request to allocate spectrum. To expedite service to the public, the FCC often conducts allocation proceedings at the same time it considers system applications.

Establishing Service Rules

The FCC also develops "service rules" for a service through its notice and comment process. Service rules develop legal, technical, or financial requirements that govern all providers of a service. To develop these rules the FCC conducts a rulemaking (see Chapter 3).

Technical rules may require licensees to use state-of-the-art technology, such as full frequency reuse of the assigned spectrum. The technical rules also prevent harmful interference to other stations sharing the band or stations in adjacent bands. For example, Big LEO terminals are required to cease operations when they are within a specified distance of radio astronomy sites operating in the same band. Rules also specify eligibility criteria for licensees. For example, the FCC sometimes requires that satellite applicants demonstrate the basic financial ability to construct their proposed system, in order to prevent orbit spectrum "warehousing."



Acting on Applications

The FCC reviews applications based on the rules for that satellite service and grants authority to those applicants who meet the service rules. Licensing orders contain a milestone schedule setting the dates by which a licensee must begin satellite construction, complete satellite construction, and launch its satellites. The schedule usually concludes six years after the date of grant. A milestone schedule is designed to prevent warehousing of orbit spectrum resource and to ensure that those granted licenses are expeditiously proceeding with system implementation.

If there is insufficient spectrum to accommodate all qualified applicants, the FCC must decide which application to grant among the mutually exclusive applications. For example the FCC has used meetings amongst affected parties to forge settlements. The FCC always seeks to resolve such situations using engineering or other solutions before relying on auctions.

SATELLITE SYSTEM COORDINATION

Satellite coordination process by which administrations seek to achieve a harmonious interaction of satellite networks so that the operation of a satellite network neither causes or subject to interfering emission above a permissible level from another satellite network operating in the same frequency band. The networks involved can be systems with in one own country or involve those of other countries. Thus the coordination can take place on a domestic, regional or international basis. Specifically, satellite coordination occurs by negotiating mutually satisfactory solutions with the effected parties.

All U.S. Satellite licensees are required to coordinate with adjacent domestic geostationary satellite system operators. Coordination is conducted among the operator on an as needed basis with out FCC intervention. If disputes occur in the coordination process, the FCC can be asked to resolve the dispute.

The Need for International Satellite Coordination

The objective of international coordination is to allow new satellite systems into the existing international matrix of satellites. Successful coordination ensures interference-free operations through:

- conformance with international regulations
- continued spectrum availability
- development of allowable satellite system operating parameters



🌐 The Relationship between International Coordination and Satellite Licensing

The FCC licensing process for satellite systems is generally aligned with the international coordination process of the ITU. The FCC requires applicants to prepare ITU coordination information to initiate the international coordination process. When the FCC receives a satellite application for an existing service and the service is already allocated in the proposed frequency band (internationally and domestically) the licensing process follows the steps outlined in Figure 1 below. It begins with the FCC placing the application on its Public Notice. If the frequency band is a shared frequency band with U.S. Government systems, the application is pre-coordinated with NTIA and their initial concerns, if any are evaluated. It is at this time that the FCC will send the Advance Publication information to the ITU. The applicant certifies to the FCC that it will bear any and all expenses associated with its filing at the ITU with respect to cost recovery.

Because the FCC process usually is completed before the international coordination process, FCC space station authorizations are typically conditioned on completion of international coordination thus FCC licensees are required to provide relevant coordination information, and participate in the international coordination process. If necessary, licensees may need to modify operations in accordance with coordination agreements

THE ITU COORDINATION PROCESS

Satellite coordination involving systems of different administrations will follow the ITU Radio Regulations. This section describes the ITU coordination procedures, the FCC role in this process and the working methods for administrations involved in the satellite coordination process.

The ITU establishes satellite coordination procedures, and these are followed by the U.S. and by other members of the ITU.

The FCC deals with the ITU and other administrations on behalf of U.S. satellite system operators. Only the U.S. administration can only enter into an agreement with another administration that has authority over its country's radiocommunication systems. However, agreements solely between or among private entities have no status in the context of the ITU Radio Regulations, and the ITU does not officially recognize a private entity as completing coordination unless its particular network is coordinated through a host member administration(s). The private sector, however, is heavily involved in the coordination process in the U.S. U.S. satellite operators traditionally advise the FCC on technical and operational matters with respect to their particular systems. The satellite operator is in the best position to inform to the FCC about business and economic considerations that could impact the operation of these networks. Additionally, according



to ITU regulations, a satellite operator must coordinate its network through a host administration. However, service does not need to be authorization on a national basis in order for the host administration to undertake coordination on behalf of a private operator.

Advance Publication

The first step of the ITU coordination process is the “advance publication” stage. An administration submits an “Advance Publication” (“AP”) to the ITU. An AP sets forth the general characteristics of the satellite system -- the frequency bands, the type of orbit, service area, and responsible administration(s). The receipt date of the information by the ITU establishes the start date for the coordination process. The process must be completed and the satellite network brought into use within seven years of this date (5 years plus a 2-year extension if necessary). If the satellite is not brought into use by this time, the ITU will cancel all records of this network and the coordination process will be terminated.

In the U.S., the FCC is responsible for submitting an AP to the ITU. Thereafter, the ITU publishes this information in its weekly circular to member administrations. Member administrations are then afforded an opportunity to comment on the published system. This provides information to the initiating administration about which parties may be affected.

Request for Coordination

The next step of the ITU process is the “request for coordination “ stage. In this step, an administration sends more detailed information to the ITU on the particular frequency assignments to be used by the proposed satellite system. If information relating to the concerns of an administration is known at that time, the FCC will attempt to address these issues by providing analyses to show that the potential for interference can be resolved with minimal or no design changes to the proposed system. The satellite operator generally provides the analyses and the FCC will evaluate the proposal to ensure that it is consistent with U.S. rules, regulations and policies.

Once the request for coordination is received by the ITU, the priority date is established for the satellite system. The date of priority is important since it defines the order in the ITU “queue” relative to other satellite systems that are planned to operate in the same frequency band. The coordination process generally works on a first-come, first-served basis.

The ITU publishes coordination information in weekly circular publications. At that point, the administrations involved in the coordination have notice of the additional information. Thereafter, they will generally try to resolve potential interference difficulties through



correspondence. The channel of communication is opened and maintained by the governments of the initiating administration and the affected administrations. The private entities do not have direct contact with governments of affected administrations, except through their coordinating administration. At this stage, there is an exchange of specific system data sufficient for other administrations to evaluate the potential for mutually unacceptable interference. The satellite operators provide technical support to the coordinating administration (FCC in the U.S.) in developing any possible sharing proposals with other satellite systems.

Notification of Satellite Systems

The last stage of the coordination process is to “notify” the satellite system assignments with the ITU in order to be listed in the Master Register. When the coordination process is completed with all affected administrations, all potential unacceptable interference situations have presumably been resolved. Therefore, the new satellite system should not interfere with systems already listed in the formal ITU Publication Register, and the new system is provided international recognition and protection of its frequency assignments from subsequently coordinated systems.

Coordination Meetings

The working methods for coordination include correspondence and face-to-face meetings. For simpler coordination correspondence is the preferred means. For resolving complex technical issues, face-to-face meetings are more affective.

Coordination meetings have several objectives, which should be reflected on the agenda:

- identify the network requiring coordination
- for each affected network, identify the affected satellite carrier frequency that may cause or receive interference
- agree to calculation methodology, and assumption concerning satellite characteristics, interference protection and operational characteristics that are to be used to determine the severity of the potential interference
- develop solutions to the identified potential interference to include such things as satellite or earth station power constraints, transponder frequency plan, or improved satellite and earth station antenna performance and capacity constraints
- determine the areas of agreement or disagreement
- identify future work actions to address areas of disagreement



- record all agreements, disagreements, and information exchanged during the meeting in a summary record; and,
- agree to notify the ITU of all satellite networks that have completed coordination

THE INTELSAT COORDINATION PROCESS

INTELSAT signatories must consult with INTELSAT on the technical and economic aspects of planned satellite systems of their administrations. Consultations with INTELSAT are conducted under Article XIV of the INTELSAT Agreement for technical compatibility between the respective systems. With the possible privatization of INTELSAT organizations, it is anticipated that more emphasis will be placed on the ITU coordination procedures to resolve technical compatibility issues.

ITU CONFERENCES AND STUDY GROUP MEETINGS

World Radiocommunication Conferences (WRCs) adopt new and modified ITU Radio Regulations that may have a direct impact on the operation and regulation of satellite networks. Certain ITU Study Group meetings address issues related to sharing among satellite services and sharing between satellite systems and other services such as terrestrial operations. The ITU meetings adopt Recommendations and Conference Preparatory Meeting Report text, which serve as a technical input to a WRC and upon which Administrations base their decisions

ITU Recommendations are often used by the U.S. and other administrations as the technical basis for satellite operations and for satellite coordination. ITU Rules and Recommendations are also often used as a basis for U.S. service rules to regulate satellite services. Spectrum sharing arrangements and other satellite operational parameters developed in the U.S. are then sometimes brought into the ITU Study Group process to facilitate the operation of satellite systems on a global basis

SATELLITE COST RECOVERY AND DUE DILIGENCE

The ITU Radiocommunication Bureau processes the satellite network filings of administrations. There is currently a backlog in this process of up to a year in some cases. The ITU has proposed two mechanisms to help reduce this backlog of network filings: cost recovery and administrative due diligence. The ITU has adopted and is now finalizing a cost recovery approach that will assign fees to cover the costs of processing notifications filed after November 7, 1998. The ITU has also adopted and implemented administrative due diligence requirements as a regulatory measure to reduce the backlog of "paper



satellites.” This requires administrations to notify the ITU that a satellite network has been brought into use in the time frame provided for in the Radio Regulations. If this does not occur the network will be cancelled by the ITU, and it will no longer be included in the coordination process with other satellite networks.

SATELLITE EARTH STATIONS

Licensing of Earth Stations

In addition to licensing the space station segment of the satellite system, the FCC is responsible for licensing earth stations. A satellite earth station is defined as a complex of transmitters, receivers, and antennas used to relay and/or receive communications traffic (voice, data, and video) through space to and from both satellites in geostationary satellite orbits (GSO) and non-geostationary satellite orbits (NGSO). The predominant bands for earth station transmissions are the C-band, the Ku-band and Ka-band for fixed satellite services, and the 1.6/2.4 GHz bands and the 137-138/148-149.9 MHz bands for mobile satellite service

The FCC rules for earth station licensing are contained in part 25 of Title 47 of the Code of Federal Regulations. There are several classes of earthstations—Fixed Earth Station (transmit/receive), Temporary-Fixed Earth Station (non-permanent, transportable, transmit/receive), Fixed Earth Station (receive-only), Fixed Earth Station (VSAT Network, 12/14 GHz), Developmental Earth Station (fixed or temporary-fixed), and Mobile Earth Station (hand-held units and vehicle-mounted units). Such earth stations may be used for domestic and/or international services. Earth stations are licensed in the United States, generally, for a period of 10 years, except for Developmental Earth Stations, which are licensed for one year. All earth station licenses are subject to renewal by the FCC.

Any commercial entity proposing to operate a transmitting earth station in the United States must first obtain a license to operate from the FCC. Applications for transmitting earth stations are filed in accordance with procedures outlined in the FCC’s Rules and Regulations. Earth stations must meet certain technical requirements before they can be authorized. These technical system parameters include: antenna performance standards, antenna size, environmental impact (including radiation hazard standards), Radio Frequency power conservation (eirp and eirp density), modulation formats, and antenna structure heights. The FCC also issues a single blanket license for large number of technically identical earth stations (*e.g.*, VSATs, SNG and Mobile earth stations). The number of terminals per application is not limited by the FCC, but is independently requested by the applicants. Any modifications to a transmitting earth station also require prior authorization.



Separate filings are required for new transmitting-earth station licenses and for making modifications to existing stations. Earth station applications, like other FCC applications, are placed on public notice for a 30-day comment period in which interested parties may comment. In cases where no adverse comments have been filed, the applications are granted, and licenses issued, after the appropriate filing fee is received.

An Example of Earth Station Licensing: VSAT Operations

“VSAT” is an acronym for Very Small Aperture Terminal. The word terminal is used interchangeably with the words antenna and station. A VSAT network consists of two major components, a ground segment and a space segment. The ground segment consists of a central hub station and a family of remote terminals (satellite earth stations) generally referred to as remote VSATs. The space segment consists of the satellite and its on-board transponders. Hub stations use larger antennas (greater than 3.0-meters in diameter). VSAT stations use smaller size antennas (1.2-meters, 1.8-meters, and 2.4-meters). Most VSAT networks in the United States are constructed/licensed in the Ku-band, 14000-14500 MHz (uplink) and 11700-12200 MHz (downlink), while a limited number of C-band VSAT networks have been licensed.

To assist applicants in the filing of VSAT applications, the FCC developed forms for the submission of licensing information. A sample of the FCC’s earth station Form 312, for licensing a VSAT system is shown in Appendix A-3. Appendix A-4 provides general information and sample filled-in applications for other types of earth stations (Point-to-Point, Temporary-Fixed (SNG), Receive-only, etc.)

Coordination of Earth Stations

Bilateral Earth Station Coordination with Terrestrial Systems

The radio spectrum is used by a variety of both terrestrial wireless and satellite services. Thus, it is necessary that satellite earth stations often share the same frequency bands with purely terrestrial wireless systems. In that event, earth stations may need to be coordinated with terrestrial systems that operate across adjacent borders.

An example of spectrum sharing is found in the 4/6 GHz bands. In those bands, the Fixed Satellite Service (FSS) shares the bands co-equally with the terrestrial Fixed Service (FS).

If the communicating paths are not configured properly, this sharing arrangement can result in interference, for instance from a 6 GHz transmitting earth station to a 6 GHz point-to-point microwave receiver.



Since both the Fixed Satellite Service and Fixed Service stations are stationary (“fixed”) it is possible to carefully plan the station locations, antenna pointing directions, transmit powers, frequencies, etc. so that real interference situations do not arise. In order to accomplish this, the technical parameters of all stations must be fully known to all operators using the frequency band. This exchange of information is accomplished through “frequency coordination.”

When both the FSS and FS stations are located within the same country, this frequency coordination is purely a domestic matter. In the USA, Section 25.203 of the FCC Rules provides a frequency coordination process that must be followed by applicants seeking to operate earth station within the USA. Prior to filing an application to license an earth station, applicants must successfully complete this frequency coordination process with all terrestrial microwave operators that could be impacted by their earth station operations. In the USA, a number of commercial companies maintain microwave databases and provide frequency coordination services for hire.

ITU S9/11 Frequency Coordination of Earth Stations

When FSS and FS stations are located close to each other on the opposite sides of a national border, the frequency coordination enters the international realm. The ITU Radio Regulations provide a detailed procedure (S9/11) for the international frequency coordination of earth station facilities between neighboring countries. This procedure involves the computation and plotting of a “coordination contour” map around each earth station (see figure). This coordination contour is the extreme theoretical distance in all directions from the earth station beyond which interference with terrestrial stations is impossible. Hence, the earth station must be frequency coordinated with only those terrestrial stations that lie within this contour. S21 of the ITU Radio Regulations provides the methodology for determining the coordination contours.

According to S9/11, coordination with a neighboring country is required only when the S21 coordination contour crosses the national border and extends into the territory of the neighboring country. In those cases, an Administration must inform the neighboring Administration of the technical parameters of the earth station. ITU Form APS4/III, “Form of Notice - Earth Station”, can be used for this purpose.

As a way to simplify the ITU process the U.S. has entered into the bilateral agreements. As an example, the u.s. has an informal bilateral arrangement with Canada that has operated since the end of 1987. Under this arrangement, the two countries developed coordination boundaries around the Canadian/USA border based upon the methodology of S21 of the ITU Radio Regulations. Four (4) lines on each side of the common border are based upon various levels of earth station transmit power and station size.



This approach is a simplification to the ITU S21 procedure. S21 coordination contours are not computed and mapped for each and every earth station. Rather, under the bilateral arrangement, only earth stations that operate between the particular coordination line and the common border are coordinated with the other administration. For those earth stations subject to this bilateral coordination, a subset of the ITU ApS4/III technical parameters for the earth station (see figure/table) is exchanged in an electronic fashion (*i.e.* on diskette, or by e-mail).

The U.S. has coordinated with Canada over 2000 USA earth stations that operate in the 5925-6425 MHz band under this arrangement. The U.S. has a similar agreement with Mexico.



IX. The Internet

OVERVIEW

In just a few short years, the Internet has become a global phenomenon, transforming the way we conduct business, interact, and learn. In 1995, fewer than 10 million people were using the Internet. Today, there are over 140 million users worldwide. In 1999, it is estimated that for the first time more people will access the Internet from outside the United States than from within the country. This growing medium offers limitless possibilities, providing users with multi-media applications involving data, voice, and video. If realized, Internet-based services have virtually unlimited potential to bring people together from across the world, enhancing opportunities in education, health care, commerce, and entertainment. Indeed, it is not just a physical network but a network of people. It links people together through e-mail and chat rooms; it allows schoolchildren from around the globe to learn in an exciting environment; it is crucial to the development of telemedicine; and it has produced a booming economy known as e-commerce.

WHAT IS THE INTERNET?

The Internet is a vast network of networks that communicate with each other based upon a set of software protocols that direct traffic so information can pass among the networks. The Transmission Control Protocol (TCP) and Internet Protocol (IP) define the rules by which packets of data are addressed and transmitted across physical fiber, copper, satellite, and wireless networks.

The physical Internet network is made up of a variety of components including:

- *Fiber networks owned or leased by Internet backbone providers*
- *Routers*
- *Network Access Points (NAPs) where Internet service providers (ISPs) connect their networks in order to exchange Internet traffic*
- *Host servers that hold the content*
- *Access lines that provide business customers and home user connections to the point of presence (POP) of the ISP*



Given the Internet's potential to drive future economic and cultural growth, a key challenge for developing countries is to implement sound policies to encourage Internet growth within their borders. Government policy can have a profound impact on Internet development; it can either foster it or hinder it. To date, the Internet has flourished in large part due to the absence of regulation. A "hands-off" approach allows the Internet to develop free from the burdens of traditional regulatory mechanisms. Regulatory policies governing the telecommunications market, however, have a direct impact on Internet development and usage by consumers. Basic transmission capacity is the physical infrastructure fundamental to the operation of Internet services and e-commerce applications. Policies to promote this infrastructure pave the way for increased Internet usage.

ENSURING A TRULY GLOBAL E-COMMERCE MARKETPLACE

A truly global e-commerce marketplace cannot exist without the participation of developing countries. Approximately 97% of Internet users, however, are in high-income countries, which account for just 15% of the world population. In 1997, Africa had just 0.6% of the Internet hosts in existence; Latin America and the Caribbean had 1.0% and Asia just 6.3%. Yet e-commerce offers the unprecedented opportunity to create a truly global marketplace. Increasing shares of commercial transactions are occurring online. Estimates are that by 2002 e-commerce will account for over \$300 billion in trade per year.

The Internet is especially important for small/medium enterprises (SMEs) as it enables SMEs to minimize marketing costs while reaching a wide market.

Both developing countries and industrialized nations stand to benefit economically and socially from increased participation in this growing electronic marketplace. The Internet provides a low-cost gateway linking millions of potential buyers and sellers from disparate populations around the world, transcending geographic and time barriers.

E-commerce has begun to unleash a revolution in entrepreneurship and innovation, providing a cascade of new, exciting services and products. The advent of the Internet has transformed the traditional business model by allowing a business to establish a website that provides a global marketing and sales distribution scheme. The Internet makes possible direct interaction between producers and consumers, cutting out the middlemen. Both sides benefit.



In the United States, the U.S. government has played a role in fostering a global e-commerce marketplace. In the 1997 document, "*A Framework for Global Electronic Commerce*," the U.S. Government outlined a series of principles to guide the development of the e-commerce marketplace, including:

- The private sector should lead
- E-commerce should be driven by market forces, not regulatory actions
- Where government involvement is needed, it should support a predictable, minimalist, consistent, and simple legal environment for commerce
- Government should follow a decentralized, technology-neutral approach to policy
- E-commerce should be a seamless global marketplace

The *Framework* urges governments to refrain from imposing unnecessary regulatory actions that could stifle the growth of the Internet and e-commerce, and recommends that competition and consumer choice be the guiding principles for a prosperous e-commerce marketplace.

In the United States, consumers are already enjoying the promises of e-commerce. The benefits of the Internet and e-commerce are increasingly reaching more middle income and lower income Americans. Whether for news, education or commerce, the Internet has made an indelible mark on global communications.

A HANDS-OFF REGULATORY APPROACH

The Internet has evolved at an unprecedented pace, in large part due to the absence of government regulation. Consistent with the tradition of promoting innovation in new communications services, regulatory agencies should refrain from taking actions that could stifle the growth of the Internet. During this time of rapid telecommunications liberalization and technology innovation, unnecessary regulation can inhibit the global development and expansion of Internet infrastructure and services. To ensure that the Internet is available to as many persons as possible, the FCC has adopted a "hands-off" Internet policy. We are in the early stages of global Internet development, and policymakers should avoid actions that may limit the tremendous potential of Internet delivery.

PRINCIPLES TO PROMOTE INTERNET INFRASTRUCTURE

Basic transmission capacity is the physical foundation necessary for the operation of Internet services and e-commerce applications. As a result, telecommunications regulatory policies can have a direct impact on the development of the Internet. Experience indicates that market-oriented policies spur the development of affordable and available infrastructure required for Internet services and e-commerce to flourish.



Three basic drivers — competition, investment, and technological neutrality — promote the establishment of the global information infrastructure upon which Internet applications thrive. Countries must have the physical infrastructure necessary to be a part of this new, Internet-based world; otherwise they may miss out on the future benefits derived from the global economy.

Competition

Open and vigorous competition is a principal driver for establishing the physical infrastructure necessary for Internet services to thrive. To succeed in a competitive marketplace, competitors just innovate, provide quality services, and reduce prices. By fostering a pro-competitive climate, economies can create self-sustaining Internet networks.

In the United States, the benefits of competition are evident in the telecommunications market. Networks have accelerated adoption of more innovative technology; service providers have responded to consumer demands; lower costs have stimulated use of the networks; and home and business users alike have enjoyed lower prices and a wider array of services.

Alternatively, limiting the ability of new competitors to access, build, and utilize the underlying network inhibits infrastructure deployment and ultimately retards the introduction of facilities necessary for the Internet to flourish.

Investment

Attracting private sector investment is the most effective way for countries to build the physical infrastructure necessary for a robust Internet network. To attract private sector investment, policymakers must remove barriers and establish favorable investment incentives. Without such investment, the benefits of the Internet will go untapped.

No single government has the wherewithal to capitalize the global Internet infrastructure.

Besides supplying inflows of capital, private investment stimulates development of new technologies, equipment, new sources of information, and managerial skills—all of which speed infrastructure growth. To increase capital from both domestic and foreign sources, nations are permitting a variety of commercial arrangements, ranging from joint ventures to direct foreign investment and from privatization of state-owned providers to licensing of privately owned competitors.



The need for capital investment is particularly acute in countries developing infrastructures, where limited government resources often make private financing all the more critical. The challenge, therefore, becomes to establish effective mechanisms to attract foreign investment.

Attracting Foreign Capital

The following steps can be effective measures to attract capital:

- § Privatization attracts capital to build out advanced telecommunications technologies
- § Creation of a stable and open commercial environment supported by transparent regulation
- § Establishment of fair and open bidding practices for infrastructure projects
- § Recognition of the concept "return on capital" that investors require
- § Establishment of sound repatriation policies
- § Promotion of private investment through legal and regulatory reform

Technological Neutrality

A policy of technological neutrality provides for the equitable treatment of different technologies and spurs innovation. Wireline facilities make sense in some places, while satellite and terrestrial wireless infrastructures may work better in others. Many regions of the world, for example, have great difficulty accessing high-speed Internet services because they do not have sufficient infrastructure. In these areas, satellite systems may be the answer. Policymakers should strive to create an environment in which such distinctions are of no great consequence to consumers. Governments should seek to promote competition among various technologies and industry segments with the goal of accelerating innovation and the deployment of advanced services. Simply put, regulators should not be in the business of selecting winners or losers of information technologies. With a policy of technological neutrality, the real winners will be consumers, as they will benefit from lower prices, improved quality, and more innovation.

POLICIES TO FOSTER INTERNET SERVICES

As noted above, the fundamental regulatory decisions made in the telecommunications market have a direct impact on the development of Internet services and usage. The policies below-- broadband access, cost-based capacity, and fair local charges-- allow ISPs to provide, and consumers to access, services at lower prices, with improved speed and quality.



Broadband Access

As people across the globe access the Internet, they realize one thing - - they need to go faster. To fully utilize this network - - to tap the potential of multi-media applications involving voice, data, and video - - they need bandwidth. Internet users should have access to networks that are capable of supporting the broadest range of Internet offerings. It is critical, therefore, that the underlying network supports advanced communications.

In establishing the necessary incentives for the development of advanced technologies, technological neutrality is an important policy to adopt. Regulators should not favor one technology over the other, but should set policies to stimulate competition among various technologies and industry segments that will lead to the development and deployment of broadband capacity.

In wireline, cable, terrestrial wireless, and satellite, many new technologies are starting to be deployed. These include wireline telephone providers finding new ways to send high speed data over the telephone network, cable television operators offering high speed Internet access using specialized cable modems, and satellite operators providing higher data rates for downstream access with a standard dial-up telephone return path.

Cost-Based Transmission Capacity

Cost-based transmission capacity is necessary to achieve lower prices for Internet services and e-commerce applications. All ISPs either lease or own the capacity necessary to develop their Internet network. If the price of this capacity is high, ISPs must either absorb the extra cost or pass the cost forward in the form of higher prices to consumers. As a result, high transmission costs impact demand estimates and build-out of the information infrastructure.

High cost transmission capacity for ISPs may be directly related to the lack of competition in telecommunications services within a market. For example, telecommunications incumbents often seek to extend their dominant position to the provision of Internet access service by restricting the supply of transmission capacity. In contrast, a competitive telecommunications environment results in more affordable prices for, and greater availability of, such capacity.

Local Service Pricing

Local telephone charges are a part of the overall cost of Internet usage for consumers, and affordable local loop pricing is an important component of the cost structure for Internet



access necessary for all Internet customers. Local service pricing that is prohibitively high restrains Internet usage. Indeed, one factor that contributes to the disparity of Internet usage among countries is the cost of accessing Internet services. This cost is directly related to the regulatory framework and level of competition permitted in the local telecommunications sector. Regulators can consider policies to drive the price of local service to cost as they seek to promote Internet usage.

CONCLUSION

The Internet will continue to change our lives in ways we have yet to imagine. What is certain, however, is the importance of ensuring that all corners of the world participate in and benefit from these profound changes. By maintaining a hands-off approach to the Internet, while implementing pro-competitive policies for the underlying transmission capacity, policymakers will go a long way towards ensuring that their citizens are full partners in the global Internet community and the emerging e-commerce marketplace.



FURTHER INFORMATION

U.S. Government Working Group on Electronic Commerce, First Annual Report,
November 1998

A Framework for Global E-Commerce www.iitf.nist.gov/elecomm.ecomm.html

How the Internet Works, Special Edition, Preston Gralla

Challenges to the Network, Telecoms and the Internet, ITU, 1997

29 Digital Tornado: The Internet and Telecommunications Policy, March 1997, Kevin
Werbach

*"Net" Impact: Guide to the Internet Changes the Industries and Companies in Which you
Invest*, Bill Whyman, Legg Mason Precursor Group 202-778-1972

E-Commerce: Virtually Here, Merrill Lynch & Co., Global Securities Research & Economics
Group, Global Fundamental Equity Research Department, Special Report, April 1999,
Jeanne Terrile 1-212-449-1893

Links

www.internetnews.com

www.internet.com

www.e-commerce.internet.com

www.pulver.com

www.boardwatch.com

www.totaltel.com

www.helsinki.fi/~aunesluo/eueng.html

www.ispo.cec.be

www.cordis.lu/esprit/src/ecomproj.html

www.euro.ispa.org.uk/papers/telecoms1.html

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GLOSSARY OF USEFUL TELECOMMUNICATIONS TERMS



Glossary of Frequently Used Telecommunications Terms

-A-

Access Charge

A fee charged subscribers or other telephone companies by a local exchange carrier for the use of its local exchange network facilities.

Active Satellite

A functioning satellite that receives and transmits or retransmits radio-communication signals to or from a base station.

Advanced Television (ATV)

New television technology that provides better audio and video quality than the current standard television broadcast system. High Definition TV (HDTV) is a form of ATV.

Affiliate

A broadcast station that airs a network's programs and commercials, but is not owned by that network.

Agenda Item

At the FCC, a term that refers to the document which is to be voted on by the Commission at an agenda meeting. The final document is released to the public the same day or as soon as possible.

Aggregator

Any person or business who, in the normal course of business, provides a public telephone for the use of patrons through an Operator Service Provider (OSP).

Analog

Analog is "shorthand" for the word analogous, which means similar to. The signal being sent — voice or video — is sent as a stream of changing radio waves and is similar to what is received. This produces a nearly square video picture with generally a 480 line resolution picture.

Amateur Radio Operator ("HAM")

A noncommercial, private radio operator. There are six classes of amateur radio licenses that can be earned after passing FCC-administered examinations.

American Standard Code for Information

Inter exchange (ASCII) ASCII is a uniform code used in computer and data communications systems. ASCII code letters, numbers, punctuation and actual control systems in digital codes of "0s" and "1s." For example, the capital "C" is 100011 and a "3" is 0110011.

Amplitude Modulation (AM)

A type of transmission used in either the standard radio broadcast band at 535-1705 kilohertz, shortwave broadcasting, and in some private radio services such as citizens band (CB) and aviation.



Auxiliary Service Station

A type of station used by television and radio stations to facilitate the broadcast of programming to the general public.

Audio Text

The term used to describe a system that provides automated interactive telephone information, such as stock prices, sports scores and personals.

-B-

Bandwidth

A range of frequencies in the broadcast spectrum that is occupied by a signal. (For example, a television channel may have a bandwidth of 6 MHz.) The “necessary bandwidth” is the amount of spectrum required to transmit the signal without distortion or loss of information. Commission rules require suppression of the signal outside the band to prevent interference.

Base Station

A land station in the land mobile service. For example, in cellular and personal communications uses, each cell has its own base station; each base station is interconnected with other base stations and with the public switched network.

Basic Trading Area (BTA)

Geographic boundaries that segment the country for licensing purposes. BTAs are based on Rand McNally’s Commercial Atlas & Marketing Guide. BTA boundaries follow county lines and include the county or counties whose residents make the bulk of their shopping goods purchases in the area. The FCC has used BTAs to license a number of services including broadband and narrow band Personal Communication Services.

Baud

A measure of the speed at which data is transmitted, computed in number of elements changed per second. The “Baud Rate” is the speed in which computers can transfer data through a modem using communications software.

Baudot

A seven-bit code, only five of which are information bits. Baudot is used by some text telephones to communicate with each other.

Bidding Credit

A spectrum auction term. It is a credit given to eligible FCC auction applicants which allows them to receive a discount on their winning bids in an auction.

Bird

A colloquial expression used to refer to a communications satellite.

Binary Information Unit or Binary Digit (BIT)

The smallest unit of digital information. A single digit number in “base-2”, either a 0 or a 1. Bandwidth is usually measured in bits-per-second (bps).



Blackout

A term used to describe the non-broadcast of a live event (i.e. sports, cultural) usually imposed by the sponsor(s) of the event.

Booster

A television or FM broadcast station, operating at relatively low power that receives a distant input signal, amplifies it, and re-transmits it on the same channel.

Broadband

Broadband is a descriptive term for evolving digital technologies offering consumers a single switched facility offering integrated access to voice, high-speed data services, video-demand services, and interactive information delivery services. Broadband also is used to define an analog transmission technique for data or video that provides multiple channels. A cable TV system, for example, employs analog broadband transmission. (See Bandwidth)

Broadcast

To transmit a signal over the spectrum to be received by two or more receiving de-vices.

Browser

A software program used to query, search and view information on computer sites connected to the Internet.

Byte

A set of "bits" that represent a single character. Usually there are eight bits in a Byte.

-C-

Cable Converter Box

Equipment often provided by a cable company in a subscriber's home that allows access or controls interference to cable services.

Cable Signal Leakage

Excessive levels of radio frequency (RF) energy that leak from cable television systems. Leak can cause interference to com-munications users, including safety service users such as aviation, police and fire departments. FCC rules specify the maximum RF leakage, and require that cable television systems be operated within certain guidelines.

Cable Television Transmission

The transmission, usually for a fee, of television signals, including signals that originate at over-the-air television stations, to consumers on a wired network.

Cable Television Relay Service (CARS)

The relaying of television, FM radio, cablecasting and other signals on a micro-wave frequency band to a terminal for distribution over CATV or over cable line.



Cellular Mobile Radio Telephone System

Also called “Cellular.” A high capacity land mobile telephone system wherein channels assigned to the system are divided among several geographical “cells” covering a defined service area. A cellular system is capable of re-using the same channels in different cells within the service area. The use of many small cells in an area, with low transmitter powers, permits the intensive re-use of channels, thereby increasing system capacity.

Churn

The term used to describe turnover rate of subscribers to a service or product.

Circuit

A two-way communications path. Circulation (FCC term) an FCC term, circulation is the procedure whereby items are routed to Commissioners for notation voting without a need for discussion at an open or closed agenda meeting. Voting is done electronically from each Commissioner’s office.

Clear Channel

A clear channel protects stations designated as Class A stations from objectionable interference within their primary and secondary service areas. The secondary service areas of the stations may extend outward for a distance of up to 750 miles at night. To provide this wide area service, Class A stations operate within a power range of 10 to 50 kilowatts.

Closed Captioning

A service for persons with hearing disabilities that translates television program dialog into written words on the television screen. Closed captioning is not visible without the use of a specially installed decoder.

Closed-circuit Television (CCTV)

A system in which a signal is transmitted from a point of origin to only those receivers who have previously arranged access to it. Examples of its use are: lectures by professors in educational institutions, theater television, sports, and video conferencing.

Coaxial Cable (COAX)

A type of cable commonly used in cable television systems which is composed of two concentric conductors: an inner wire, and an outer braided sleeve.

Common Carrier

The term used to describe a telephone company. It is a telecommunications company that is available for hire on a nondiscriminatory basis to provide communication transmission services, such as telephone and telegraph, to the public.

Communications Assistant (CA)

A person who translates conversation from text to voice and from voice to text between two end users of Telecommunications Re-lay Service (TRS). This service allows a person with hearing or speech disabilities to communicate with anyone else via telephone at no additional costs. CA supersedes the term “TDD operator.”

Communications Satellite

A satellite that is used to relay telecommunications information.



Communications Satellite Corporation

(COMSAT)

A corporation, chartered by Congress, as an exclusive provider of international telecommunications satellite channels to the United States. COMSAT also represents the United States in INTELSAT. (See INTELSAT)

Community Antenna Television (CATV)

A service through which subscribers pay to have local television stations and additional programs brought into their homes from the antenna via a coaxial cable.

Compact Disc (CD)

A five-inch disc on which a digital audio signal is inscribed so that it can be read especially by a laser beam device in a computer or CD player.

Competitive Access Providers

Common carriers who provide local service and compete against local telephone companies' access services that connect customers to long distance companies. These carriers often use fiber optic networks.

Competitive Bidding

Another term for an auction. (See Spectrum Auction)

Convergence

In this context, convergence means that providers of communication systems can deliver products and services that compete with the products and services now delivered by other networks. One example would be a cable company providing local phone service or a local phone company providing video services.

Crosstalk

Occurs when a receiver on one communications channel inadvertently receives information being sent by a neighboring communications channel, either radio or wire line.

Customer Premises Equipment (CPE)

Telephone terminal devices, such as handsets and private branch exchanges (PBXs), located on the customer's premises.

Cyberspace

A term introduced by science fiction author William Gibson in 1984. "Cyberspace" is where human interaction occurs over computer networks, through E-mail, games or simulations.

-D-

Dedicated Line

A communications circuit or channel provided for the exclusive use of a particular subscriber. Dedicated lines are used for computers when large amounts of data need to be moved between points.



Descrambler

An electronic circuit that restores an intentionally scrambled video signal to its original standard form.

Dial-It Service

A telecommunications service that permits simultaneous calling by a large number of callers to a single telephone number. There is usually a fee for calls to 900 numbers or 976 numbers.

Digital/Digitized

Any type of information that can be out-put, transmitted and interpreted as individual bits of binary information (the use of the numbers 0 and 1), using electrical or electromagnetic signals that can be modulated to convey their specific content. A TV picture will be more like a rectangle and have up to 1,080 lines of resolution, producing a crisper picture.

Digital Audio Broadcasting (DAB)

Radio broadcasting using digital modulation and digital source coding techniques.

Direct Broadcast Satellite (DBS)/DISH

A high-powered satellite that transmits or retransmits signals which are intended for direct reception by the public. The signal is transmitted to a small earth station or dish (usually the size of an 18-inch pizza pan) mounted on homes or other buildings.

Distant Signal

A television channel from another market imported and carried locally by a cable television system.

Distributor

A person/company that distributes signals from a satellite carrier and provides that transmission either directly to individual subscribers for private home viewing or to other program distribution companies for transmission.

Docket Number (FCC term)

A number assigned to a proceeding opened by the issuance of either a Notice of Proposed Rule Making or a Notice of Inquiry, or if an adjudicatory or tariff proceeding, has been instituted. Since January 1, 1978, the docket numbers indicate the year they were initiated and the Bureau which initiated the docket (e.g., MM 89-494 and CC 87-313).

Downlink

The part of a satellite system that includes the satellite itself, the receiving earth station and the signal transmitted from the satellite to earth stations.

Download (Receive)

To receive data from another computer into your computer. It is also called "receive." The opposite is called "Upload."



-E-

Earth Station

Equipment on earth that can transmit or receive satellite communications. In general usage, this term refers to receive-only stations.

Electronic Bidding

A process by which bidders in an auction use computers to place their bids. (See Spectrum Auction)

Electronic Book

Computer program (often called an electronic book) that uses text, graphics, animation and audio to guide the user through an instruction or teaching process, an electronic “help-desk.”

Electronic Bulletin Board

A system located on a computer network which allows users to post or receive information; it facilitates file sharing.

Electronic Funds Transfer (EFT)

An electronic system that transfers money and records financial transactions, replacing the use of paper.

Electronic Mail (E-Mail)

E-Mail allows the user to send a message via a computer instantly to one or many persons around the world. E-mail users typically have a “mailbox” on a network or a videotext system where other users can send messages to be retrieved by the recipient.

Emission

In this context, radiation produced by a radio transmitting station.

Enhanced Service Providers

A for-profit business that offers to transmit voice and data messages and simultaneously add value to the message it transmits. Examples include telephone answering services, alarm/security companies and transaction processing companies. An enhanced service provider offers voice as well as data services.

En Banc

An en banc meeting is a hearing held by the Commissioners to hear various presentations on specific topics by diverse parties. The Commissioners or other officials question the presenters and their comments and presentations can be used by the Commission when it considers rules.

Equal Opportunity (“Equal Time”) Rule

If a political candidate obtains time on a broadcast station, other candidates for the same office (or their appointed representatives) may obtain an “equal opportunity” on that station. An equal opportunity usually includes equal time, but the term means more than equal time. For example, it means the right to obtain time in a period likely to attract approximately the same size audience as the period in which the opposing candidate appeared. News shows are exempt.



Ex Parte Presentation

Any communication addressing the merits or outcome of a particular proceeding made to decision-making personnel (or in some proceedings, from the decision-making personnel), which, (1) if written, is not served on the parties to the proceeding, or (2) if oral, is made without opportunity for the parties to the proceeding to be present.

-F-

Facsimile (Fax)

The electronic transmission of printed material by electronic means over a telephone system. An image is scanned at a transmitting point and reconstructed at a receiving station, where a printed copy can be produced.

FCC Number

Sequential number assigned by the Secretary's Office (Agenda Branch) to all documents approved by the Commission. This number is assigned after the item has been adopted by the Commission. Ex-ample: FCC 96-123. The first two digits reflect the year.

FCC Record

A bi-weekly comprehensive compilation of decisions, reports, public notices and other documents released by the Commission. The FCC Record replaced the FCC Reports in October 1986. The Record is available for a fee. The ordering address: Superintendent of Documents, PO Box 371954, Pittsburgh, PA 15250-7954; by phone: (202) 512-8200.

Fiber Optics

A method for the transmission of information (sound, video, data) in which light is modulated and transmitted over high purity, hair-thin filaments of glass. The bandwidth capacity of fiber optic cable is much greater than that of copper wire.

Fixed Service

Radio-communications service between specified fixed points.

Flat Rate

A method of pricing in which a fixed rate is charged for a given service, regardless of usage. The fixed monthly charge which a residential subscriber in a local exchange pays to be allowed to make an unlimited number of local calls is an example of a flat rate.

FM Cable Service

The offering of FM radio signals over a cable system for a fee. A cable is connected to the subscriber's FM stereo receiver for service.

Footprint

The area in which a specific transmission can be received. Some footprints cover as much as one-third of the earth, such as satellite or cell systems.



Franchise Authority

The franchise authority is the local body, usually a local government entity, that enters into a contractual agreement with a cable company. A franchise agreement defines the rights and responsibilities of each in the construction and operation of a cable system within a specified geographical area.

Freeware

Software, which is free to users and is available from many locations on the Internet.

Frequency

A measurement of the number of electromagnetic waves that pass a given point in a given time period. It is equal to the speed of light divided by wavelengths, and is expressed in Hertz (cycles per second).

Frequency Modulation (FM)

Radio transmission covering 88-108 megahertz on the broadcast band. FM is less susceptible to interference than AM broadcasting, and is also used in other frequency bands for two-way communications in land mobile and marine services.

Frequently Asked Questions (FAQs)

FAQs on Internet sites answer the most often asked questions.

Further Notice of Proposed Rule Making

(FNPRM)

A Commission term, a Further Notice of Proposed Rule Making is issued by the Commission to further clarify and seek more information and public comment on the Commission's proposed changes. (See Notice of Proposed Rulemaking)

-G-

Gateway

Gateways provide a single source through which users can locate and gain access to a wide variety of computer services. Gateways typically offer a directory of services available through them, and provide billing for these services.

Geostationary Orbit

The revolutionary path traveled by a satellite in which the satellite travels in sync with the Earth's motion, so that it appears stationary in the sky. A stationary antenna located on Earth can remain pointed at the satellite at all times.

Geostationary Satellite

A satellite whose circular and direct orbit lies in the plane of the Earth's equator and which remains fixed relative to the earth.

Gigahertz (GHz)

A unit of frequency equal to one billion hertz (one billion cycles per second).



Gopher

A tool used on the Internet which permits users to locate and retrieve information quickly throughout the Internet.

-H-

Hearing Designation Order (HDO)

A Commission term, a Hearing Designation Order institutes a comparative or other adjudicatory hearing proceeding, usually before an Administrative Law Judge.

Headend

The electronic control center of a cable system. This is the site of the receiving antenna and the signal processing equipment essential to proper functioning of a cable system.

Hearing Carry Over (HCO)

A form of TRS where a person with a speech disability is able to listen to the other end user and, in reply, a Communications Assistant speaks the text as typed by the person with the speech disability.

Hertz (Hz)

A unit of frequency equal to one cycle per second (cps). One kilohertz equals 1000 cps; one megahertz equals 1 million cps; one gigahertz equals 1 billion cps.

High Definition Television (HDTV)

An improved television system which provides approximately twice the vertical and horizontal resolution of the existing television standards. It also provides video quality approaching that of 35 mm film, and audio quality equal to that of compact discs. (See Advanced Television)

Home Satellite Dish (HSD)

A home receiver that permits the consumer to receive existing satellite transmissions.

Horizontal Concentration

The share of consumers subscribing to a commonly owned system.

Host

Your Internet access provider's computer. You may use one of its hard-wired terminals, if you are at an institution with a main-frame computer connected directly to the Internet, or you may dial up via modem to connect with the Internet access provider's host computer.

Hyper-text

Text that links to other documents that can be retrieved from one document.

Hyper-Text Mark-Up Language (HTML)

Hyper-Text Mark-up Language is the programming language used to design and present computer sites on the Internet in a graphical user interface fashion. HTML is the language used by programmers to design a Home Page for computers on the Internet as part of the World Wide Web project.



Hyper-Text Transport Protocol (HTTP)

The method for moving “hypertext” files across the Internet. Requires an HTTP pro-gram at one end and a server at the other.

-I-

Information Superhighway

A term describing a network of integrated telecommunications systems connecting people around the world to information, businesses, governments and each other. (See National Information Infrastructure)

Input Selector Switch (A/B Switches)

A switch used by cable customers to alternate between cable and over-the-air television reception through a cable box.

Inside Telephone Wiring

Telephone wiring: For a residence, the wiring usually starts where the line enters the house. It’s called the demarcation line. For businesses, the location of the demarcation point varies.

Instructional Television Fixed Service

(ITFS)

A service provided by one or more fixed microwave stations operated by an educational organization and used mainly to transmit instructional, cultural and other educational information to fixed receiving stations.

Integrated Services Digital Network

(ISDN)

Switched network providing end-to-end digital connection for simultaneous transmission of voice and/or data over multiple multiplexed communication channels and employing transmission that con-forms to internationally-defined standards. ISDN is considered to be the basis for a “universal network” that can sup-port almost any type of communications device or service.

Interactive Video Data Service (IVDS)

A communication system, operating over a short distance, that allows nearly instantaneous two-way responses by using a hand-held device at a fixed location. Viewer participation in game shows, distance learning and E-mail on computer networks are examples.

International Telecommunications Satellite

Organization (INTELSAT)

Formed under a multilateral agreement, it is the organization which owns, maintains, and operates the global satellite system used by over 100 participating countries around the world. COMSAT is the U.S. representative to and participant in INTELSAT.

Interconnection

The connection of one telecommunication carrier’s network to another or the connection of a piece of telephone equipment to the nation-wide telephone network.

Interface

The point at which two systems or pieces of equipment are connected.



Interference

Unwanted electrical signals or noise causing degradation of reception on a communications circuit.

International Record Carrier (IRC)

A common carrier engaged in providing overseas telecommunications service. Services furnished traditionally include telex, private line service and alternate voice data service.

International Shortwave Broadcast Station

A station that sends programs overseas either for direct reception by listeners abroad or for intermediate reception by overseas relay stations that rebroadcast the programs on shortwave or medium wave stations to nearby audiences.

Internet

A computer network stretching across the world that links the user to businesses, government agencies, universities, and individuals. The Internet provides computers with the ability to connect with other computers for communicating, disseminating and collecting information.

Intersatellite Link

A message transmission circuit between two communication satellites, as opposed to a circuit between a single satellite and the earth.

-L-

Land Mobile Service

A public or private radio service providing two-way communication, paging and radio signaling on land.

Lifeline /Link-Up Services

Programs that help qualify low-income households afford local telephone service. Lifeline assists with monthly telephone bills and Link-Up assists with connection and installation charges.

Local Access and Transport Area (LATA)

A contiguous local exchange area which includes every point served by a local phone company within an existing community of interest. It also serves as the dividing line for the allocation of assets and liabilities between AT&T and the Bell Operating Companies. LATAS were established by the Department of Justice as a result of the AT&T divestiture.

Local Multipoint Distribution Services

(LMDS)

This is a point/multipoint service with two-way capability to transmit voice, data, and other video information. LMDS can offer innovative consumer services such as two-way interactive video, advanced teleconferencing, telemedicine, telecommuting, and high-speed data services.

Lottery (random selection)

In this context, an alternative method to auctions and comparative hearings for allocating spectrum space to competing applicants in various services. In a lottery, the winning applicant is chosen at random.



Low Power Television Service (LPTV)

A broadcast service that permits program origination, subscription service, or both via low powered television translators. Low Power Television service includes the existing translator service and operates on a secondary basis to regular television stations. Transmitter output is limited to 1000 watts for a UHF station, 10 watts for a normal VHF station, and 100 watts when VHF operation is on an allocated channel.

-M-

Major Trading Area (MTA)

Boundaries that segment the country for telecommunication licensing purposes. MTAs are based on Rand McNally's Commercial Atlas & Marketing Guide. Each MTA is named after one or more cities which are Major Trading Centers. MTAs are larger than BTAs. The FCC has used MTAs to license a number of services, including broadband and narrowband PCS.

Master Antenna Television System

(MATV)

An antenna system that serves a concentration of TV sets such as in an apartment building or hotel. MATV utilizes one central antenna to pick up broadcast signals.

Meeting

At the FCC, the term "meeting" is applicable for the "Sunshine Act" (see Sunshine Act). The deliberations of at least the number of individual agency members (see Member) required to take action on behalf of the agency (a majority at the FCC) where such deliberations determine or result in the joint conduct or disposition of official agency business. A closed meeting is one at which public attendance is restricted.

Member

At the FCC, the term "member" refers to a Commissioner.

Microwave Band

Those frequencies from about 1 gigahertz upward that use microwave frequencies for point-to-point and point-to-multipoint communications, including common carriers, cable TV operators, broadcasters, and private operational fixed users.

Modem

An abbreviated term for "modulator-de-modulator." A modem converts digital signals into analog signals (and vice versa), enabling computers to send and receive data over the telephone networks.

Multi-User Dimension (MUD)

This term refers to users who connect to each other via a host computer.

Multichannel Multipoint Distribution Service (MMDS)

A service which uses omnidirectional microwave signals to deliver video programs to subscribers.

Multimedia

The combination of various forms of media (texts, graphics, animation, audio, etc.) to communicate information. The term also refers to information products that include text, audio, and visual content.



Multiple Address Systems (MAS)

A microwave point-to-multipoint communications system, either one-way or two-way, serving a minimum of four remote stations. The private radio MAS channels are not suitable for providing a communications service to a larger sector of the general public, such as channels the Commission has allocated for cellular, paging, or specialized mobile radio service (SMR).

Multiple System Operator (MSO)

A company that operates more than one cable TV system.

Multipoint Distribution Service (MDS)

Also known as “wireless cable,” this is a one-way, domestic public radio service broadcast on microwave frequencies from a fixed station that transmits (usually in an omnidirectional pattern) to multiple receiving facilities located at fixed points determined by the subscriber’s location.

Must Carry (retransmission)

A term from the 1992 Cable Act, it refers to a cable system’s mandatory signal carriage of both commercial and noncommercial television broadcast stations that are “local” to the area served by the cable system.

-N-

Narrowband

A term applied to telecommunications facilities capable of carrying only voice, facsimile images, slow-scan video images and data transmissions at “kilobit” speeds. The term is commonly applied to voice-grade analog facilities and to digital facilities operating at low speeds (less than 1.544 Nbps).

Narrowcasting

The delivery of cable programming to a small community or audience where that programming addresses the audience’s specific needs or desires. It is the opposite of broadcasting.

National Information Infrastructure (NII)

The NII refers to a nationwide network of integrated telecommunications that connects people, businesses, schools, institutions and governments with one another. (See Information Superhighway)

National Television Standards Committee

(NTSC)

A television industry group that develops standards for television broadcasting and receiving equipment in the United States.

Nationwide/Statewide Cost Averaging

A method of averaging costs to establish uniform prices for telephone service so that subscribers using more costly-to-serve, lightly-trafficked routes — such as those between small communities — receive the same service for the same price as subscribers on lower-cost, highly-trafficked metropolitan routes.

Netiquette

Network + etiquette= netiquette. Customs and socially accepted behavior for using the Internet networks.



Network/Networking

A group of computers connected in any way that allows data to be sent among these computers.

Non-Duplication Rules

Restrictions placed on cable television systems which prohibit them from importing distant programming that is simultaneously available locally.

Notice of Inquiry (NOI)

A Commission term, a *Notice of Inquiry* (NOI) is adopted by the Commissioners primarily for fact gathering, a way to seek comments from the public or industry on a specific issue. The NOI also states where and when comments may be submitted, where and when you can review comments others have made, and how to respond to those comments. After reviewing comments, the FCC may issue a *Notice of Proposed Rulemaking* or it may release a *Report & Order* (R&O) explaining what action or non-action—is taken.

Notice of Proposed Rulemaking (NPRM)

A Notice of Proposed Rulemaking (NPRM) is adopted by the Commissioners to detail proposed changes to FCC rules and to seek public comment on these proposals. The NPRM also states where and when comments may be submitted, where and when comments can be reviewed, and where and when comments others have made can be reviewed and responded to. After reviewing the comments to the NPRM, the FCC may issue a “Further NPRM” to provide an opportunity for the public to comment further on a related proposal. The next step is a *Report & Order*.

Number Portability

Number portability is the term used to describe capability of individuals, businesses, and organizations to retain their existing telephone number(s) -- and the same quality of service—when switching to a new local service provider.

-O-

Open Outcry Auction

An auction in which bidders openly shout out their bids.

Operator Service Provider (OSP)

A common carrier that provides services from public phones, including payphones and hotel/motel phones.

Open Video Systems (OVS)

An Open Video System is similar to a cable system. In an OVS, the system operator must lease channel capacity to unaffiliated programmers at just, reasonable, and non-discriminatory rates.

-P-

Paging System

One-way mobile radio service where a user carries a small, lightweight miniature radio receiver capable of responding to coded signals.



Pay-Per-View

Programming (usually movies or special events) that a cable subscriber specially requests to receive for a single fee added to the monthly cable bill.

PC

Personal computer.

Personal Communications Services (PCS)

A term coined by the FCC, it describes a two-way, voice and digital, wireless telecommunications system. PCS encompasses cordless phones, cellular mobile phone, paging systems, personal communications networks, wireless office phone systems and any other wireless telecommunications systems that allow people to place and receive voice/data calls while away from home and office.

Petition For Reconsideration

A Petition for Reconsideration is a written request submitted to the FCC for review of an action it has previously taken. Applicants have 30 days after a *Report and Order* is published in the *Federal Register* to file comments with the FCC. The agency will consider public comments, replies, and industry concerns before finalizing its initial decision. As a result of the review process, the FCC will either issue a *Memorandum Opinion and Order* amending its initial decision, or deny the Petition for Re-consideration.

Pixel

The smallest area of a television picture capable of being sampled, transmitted through a system and displayed on a monitor.

Pole Attachment

A communications relay or receiving device attached to a pole, duct or conduit owned or controlled by a utility company.

Premium Channels

Channels not included in a cable provider's regular service tiers. There are additional monthly fees charged for receiving premium channels.

Presubscription

This term is used to describe the selection of a particular long distance carrier to handle all calls for "1+dialing" zones. (See Primary Interexchange Carrier)

Primary Interexchange Carrier (PIC)

The PIC is the main long distance carrier used for "1+dialing" through which all interstate long distance toll calls are made. (See Presubscription)

Private Home Viewing

The viewing of television in a private home with reception by satellite equipment that is operated by an individual in that house-hold and which serves only that household. It is a secondary transmission (via satellite) of a primary transmission of a television station licensed by the FCC.

Private Line Service

Dedicated telecommunications channels provided between two points or switched among multiple points. Privately leased for high-volume voice, data, audio or video transmissions.



Private Radio Service

Radio communications authorized for local governments and private enterprises. Amateur and citizen band radio are private radio services as are several other services in the categories of: Aviation, Marine, Public Safety, Industrial, Land Transportation and Microwave.

Program Log

Records once kept by a broadcasting station in a public file which provided a record of programs broadcast, program type and program length. The logs also included commercial and public service spots. Broadcasters are no longer required to maintain program logs.

Public Notice (PN)

A Public Notice is issued by the Commission to notify the public of an action taken or an upcoming event.

-Q-

Quorum

At the FCC, the minimum number of Commissioners required to be present at a meeting or to participate in voting by circulation before the Commission can validly proceed to transact business. A quorum consists of a majority of the Commissioners.

-R-

Reach

“Reach” refers to the availability of a service in the community. It is the number of homes to which the service is available regardless of whether or not residents choose to subscribe.

Real Time

Usually used to describe situations when two or more people are interacting via their keyboards on the computer in real time, versus delayed back-and-forth communication, such as with e-mail.

Regional Bell Operating Company

(RBOC)

Any one of the seven local telephone companies

Created in 1984 as part of the break-up of AT&T. The RBOCs are Ameritech, Bell Atlantic, Bell South, NYNEX, Pacific Telesis Group, Southwestern Bell, and U. S. West.

Regulatory Fee

A fee charged users of certain FCC services, such as license applicants and holders, to help support such services. Regulatory fees go to the U.S. Treasury.

Radar

A radio determination system based on the comparison of reference signals with radio signals reflected, or retransmitted, from the position to be determined.



Radiation

The outward flow of energy from any source in the form of radio waves.

Radio Common Carrier

Part of the domestic land mobile radio service. Signals are received and transmitted from mobile transmitters.

Radio Determination

The determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters by means of the propagation properties of radio waves.

Radiotelegraphy

The use of a radio (instead of wire) to communicate a messages over a distance.

Radiotelephony

The use of radio to communicate sounds (e.g., speech).

Report & Order(R&O)

A Commission term. After considering comments and reply comments to Notices of Inquiries or Notices of Proposed Rulemakings, the FCC may issue a *Report & Order* amending the rules or deciding not to do so. Summaries of R&Os are published in the Federal Register. Issuance of an R&O triggers a 30-day period for Petitions for Reconsideration.

Resale Carrier or Reseller

A carrier that does not own transmission facilities, but obtains communications services from another carrier for resale to the public for a profit.

Resolution

The amount of detail that can be seen in a broadcast image. The resolution of a TV screen is defined by the number of horizontal lines of picture elements that the screen displays and the number of pixels per line.

Rulemaking Number

A number assigned to a proceeding after the appropriate Bureau/Office has reviewed and accepted a Petition for Rulemaking, but before the Commission has taken action on the petition. The rulemaking number should appear on all appropriate documents, even those which carry a docket number.

Rural Cellular Radio Service Area

A market area not based on Metropolitan Statistical Areas which under existing rules applicants may propose to provide with cellular service, as long as the proposed area does not exceed 2,000 square miles.

-S-

Satellite

A radio relay station that orbits the earth. A complete satellite communications system also includes earth stations which communicate with each other via the satellite. The satellite receives a signal transmitted by an originating earth station and retransmits that signal to the destination earth station(s). Satellites are used to transmit telephone, television, and data signals originated by common carriers, broadcasters,



and distributors of CATV program material.

Satellite Carrier

An entity that owns or leases the facilities of a satellite or satellite service to establish and operate a channel of communications for point-to-multipoint distribution of television station signals.

Satellite Dish

A kind of antenna used to pick up transmissions broadcast from a satellite.

Satellite Master Antenna Television

(SMATV)

A satellite dish system used to deliver signals to multiple dwelling units (e.g. apartment buildings and trailer parks).

Scrambler

A device that electronically alters a program signal so that it can be seen only by persons, typically paid subscribers, with appropriate decoding devices.

Shortwave Station

A broadcast station that transmits on frequencies of 6-25 megahertz. These waves are shorter than those sent out by AM stations but longer than those of the Very-High frequency FM radio and television stations.

Simultaneous Multiple Round Auction

An auction in which many licenses are put up for auction at the same time. Bidders have the opportunity to top the high bids from the previous round. The auction ends when no bidders are willing to top the bidders from the previous rounds on any of the licenses.

Slamming

The term used to describe what occurs when a customer's long distance service is switched from one long distance company to another company without the customer's permission. Such unauthorized switching violates FCC rules.

Special Emergency Radio Services (SERS)

A Private Land Mobile Radio Service employed by persons or organizations engaged in emergency medical and rescue service, health care, or similar activity.

Specialized Common Carrier (SCC)

A company (other than the telephone company) that provides point-to-point communications service on a common carrier basis. For example, point-to-point services are used to connect points on the telephone network that normally cannot be connected using standard wire line or fiber optic because of terrain.

Specialized Mobile Radio Services (SMR)

A private, two-way radio system providing land mobile communications service to eligible persons on a commercial basis. Typical SMR customers using dispatch communications include construction companies with several trucks at different jobs or on the road, with a dispatch operation in a central office.

Spectrum

The range of electromagnetic radio frequencies used in the transmission of sound, data, and television.



Spectrum Auction

A public sale of spectrum space in which the price is increased by bids until the highest bidder becomes the purchaser. The U.S. Treasury receives all profits from the FCC spectrum auctions. (See spectrum)

Spectrum Allocation/Management

The assignment of available spectrum space; the coordination of spectrum used to maximize efficiency and to prevent interference.

Spurious Emission

Any emission or part of it which appears outside of the authorized bandwidth (See Part 2 of the Code of Federal Regulations).

Subcarrier

An inaudible portion of the broadcast signal that is added to the program signal of FM or TV sound and can be used for either broadcast or non-broadcast purposes. Uses include stereo sound, augmented audio for the blind, bilingual programming and paging.

Subscriber Line Charge (SLC)

A monthly fee paid by telephone subscribers that is used to compensate the local telephone company for part of the cost of installation and maintenance of the telephone wire, poles, and other facilities that link your home to the telephone network. These wires, poles, and other facilities are referred to as the "local loop." The SLC is one component of access charges.

Subscription Television (STV)

A special service providing additional pro-grams in encoded form to television viewers who pay a monthly rate. Devices that attach to the subscriber's set are able to de-cipher transmitted signals that have been scrambled.

Sunshine Notice/Period

A Public Notice is released seven calendar days before an Open or Closed Commission Meeting, announcing the day and time of the meeting, and listing each item to be considered. The Sunshine Notice is printed in the Federal Register after it is released to the public. The Sunshine Period runs from the time a public notice placing an item on the Sunshine Agenda is released until the text of the decision is issued or a public notice is released stating that the matter has been deleted from the Sunshine Agenda or returned for further consideration. Presentations to decision-making personnel and discussions of the item are generally prohibited during the Period.

Superstation

A television broadcast station, other than a network station, licensed by the FCC that is secondarily transmitted by a satellite carrier.

Surfing

A slang term used to describe switching a television from channel to channel in a continuous order with a remote control. Also used to describe the process of scanning entries on the Internet.

Syndicated Exclusivity (SYNDEX) Rule

This rule requires cable systems carrying distant signals to black out syndicated programming (usually on superstations) for which a local broadcaster owns exclusive rights. (See "Black Out")



-T-

Tariff

A statement by a communications company that sets forth the services offered by that company, and the rates, terms and conditions for the use of those services.

Time Division Multiple Access/TDMA & Code Division Multiple Access /CDMA

These terms are used to describe multiple access systems. For example, **CDMA** is a method of spreading spectrum transmission for digital wireless personal communications networks that allows a large number of users simultaneously to access a single radio frequency band without interference. **TDMA** is a method of digital transmission for wireless telecommunications systems that allows a large number of users simultaneously to access a single radio frequency band without interference.

Telecommunications

Any transmission, emission or reception of signs, signals, writing, images, sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems.

Teleconferencing

The use of audio, video, or computer equipment brought together through a communications system to permit geographically separated individuals to participate in a meeting or discussion.

Telephony

The word used to describe the science of transmitting voice over a telecommunications network.

Teletext

Textual and graphic information broadcast in the vertical blanking interval between conventional video frames in television signals. It requires a special adapter.

Teletypewriter Exchange Service (TWX)

A dial-up worldwide telegraph service (similar to telex, but operating at different transmission speeds, and with a different code) used in the United States and Canada. It enables subscribers to send each other printed messages.

Television Receive Only Earth Station

(TVRO)

Earth station equipment that receives video signals from satellite or MDS-type transmissions. Such stations have only receiving capability and need not be licensed by the FCC unless the owner wants protection from interference. Authority for reception and use of material transmitted must be given by the sender.

Telex Service

A public switched service in which teletypewriter stations are provided with lines to a central office for access to other stations.

Text Telephone (TT)

A machine that employs graphic communication in the transmission of coded signals through a wire or radio communication system. TT supersedes the term "TDD" or "telecommunications device for the deaf."



Tier

Levels of cable television service providing selected channels.

Translator

A television or FM broadcast station, operating at relatively low power, that receives a corresponding television or FM signal on one channel, amplifies it, and retransmits it on another channel.

Transponder

The device in a communications satellite that receives signals from the earth, translates and amplifies them on another frequency, and retransmits them.

Twisted Pair

This is the term used to describe the traditional copper cable that is used for short distance communications.

Two-way Cable TV Capability

Interactive services offered by cable systems, for example, home shopping, banking and polling services.

-U-

Ultra High Frequency (UHF)

The part of the radio spectrum from 300 to 3000 megahertz that includes TV channels 14-83, as well as many land mobile and satellite services.

Unbundling

Unbundling is the term used to describe the access provided by local exchange carriers so that other service providers may buy or lease portions of its network elements, such as interconnection loops to serve subscribers.

Uniformed Resource Locator (URL)

The standard way to give the address of any resource that is on the Internet and is part of the World Wide Web. For example, the FCC's URL is <http://www.fcc.gov>

Universal Service

This term describes the financial support mechanisms that constitute a universal fund which helps compensate telephone companies or other communication entities for providing access to telecommunications services at reasonable and affordable rates throughout the country, including rural, insular, and high cost areas, and to public institutions.

Uplink

The signal that carries information from an earth station source up to a satellite.

Upload

To send a text file or software program via telecommunications to another computer (See Download).



Usenet Groups

Usenet groups are also known as newsgroups, or discussion groups. Users exchange information generally provided in a “chat room.”

User Name

A short name (with no spaces allowed) unique to you on your Internet access provider’s system. Sometimes these are assigned and sometimes you can select your own. The user name, or ID, followed by your site address, becomes your e-mail address. For example, if Ben Franklin had an account at world.std.com and he chose a user name of bfranklin, his e-mail address would be bfranklin@world.std.com.

-V-

Value Added Network (VAN)

A national (or international) enhanced network that is designed expressly to carry data communications. VANs provide special services to their customers, such as access to databases.

Vertical Blanking Interval (VBI)

The period of time between television pictures, which is visible as a black bar when the picture rolls. The VBI contains signals that allow receivers to keep the picture stable and has additional signal capacity that can be used to carry closed captioning information, test, cue and control signals, and other data services.

Vertical Integration

The involvement of cable systems in other links of the video distribution chain, such as program production and supply.

Very High Frequency (VHF)

The part of the radio spectrum from 30 to 300 megahertz which includes TV channels 2-13, the FM broadcast band, and some marine, aviation and land mobile services. VHF Drop-Ins Full power VHF TV stations that may be squeezed into locations that do not comply with the FCC’s spacing requirements.

Videodisc

A phonograph record-type disc that displays recorded video information when played on an attachment to a television set.

Videotext

An interactive service connecting a TV set and text or video recorder to a central computer by phone lines or cable TV. The computer provides textual information on demand and transactional services.

Virtual Reality

A computer simulation usually experienced through headgear, goggles and sensory gloves that allows the user to experience being present in a computer generated environment, and to interact with the images being displayed there.



Voice Carry Over (VCO)

A reduced form of TRS where the person with the hearing disability speaks directly to the other end user. The Communications Assistant then types the response back to the person with the hearing disability. The Communications Assistant does not voice the conversation.

-W-

Wide Area Network (WAN)

Local Area Network (LAN)

The term WAN is used to describe a data network used to interconnect a companies' remote sites, or widely-dispersed computer equipment. The term LAN is used to describe a local data network, one that is used to interconnect the computer equipment of a commercial user.

Wavelength

The length of one complete wave of an alternating or vibrating phenomenon, generally measured from crest to crest or from trough to trough of successive waves.

Wide Area Telecommunications/Telephone Service (WATS)

Discount long-distance service offered to high-volume customers on a subscription basis.

Wireless Cable/Multipoint Distribution Service

Multipoint Distribution Service (MDS) is defined as a medium of mass communications. It may be licensed as a common carrier where non-affiliated programmers, usually pursuant to a tariff on file with FCC, lease time from the MDS licensee to "air" its programming. Alternatively, a licensee may choose to operate as a non-common carrier and program its own facility of lease transmission time to an affiliated programmer without the requirement of filing a tariff. Unlike conventional broadcast stations whose transmissions are received universally, MDS programming is designed to reach only those who have opted to subscribe to the service.

Wireless Communication

Any broadcast or transmission which can be received through microwave or radio frequencies without the use of a cable connection for reception.

World Wide Web (WWW)

Created in Switzerland, WWW is client/ server software. It uses the HTTP (Hypertext Transfer Protocol) to exchange documents and images. The FCC is on the "web," along with most government agencies, the White House, and the Library of Congress. To reach the FCC's world wide web page, and to access its material, here's the address: <http://www.fcc.gov>



APPENDIX

