4. Trafficking Considerations for Designated Entities

To ensure that installment payments benefit the intended parties, strict guidelines have been adopted. Entrepreneurs' block licensees may not voluntarily assign or transfer control of their licenses for a period of three years from the date of license grant. During the fourth and fifth years of the license term, such licensee may assign or transfer control of its authorization only to an entity meeting the entrepreneurs' block criteria. If a licensee that was awarded installment payments seeks to assign or transfer control of its license to an entity not meeting the applicable eligibility standard for bidding on the entrepreneurs' block licenses during years six through ten of the license term, the FCC requires payment of the remaining principal and any interest accrued through the date of assignment or transfer as a condition of the license assignment or transfer. Moreover, if an entity seeks to assign or transfer control of a license to an entity that does not qualify for as favorable an installment plan, the installment payment plan for which the acquiring entity qualifies will become effective immediately upon transfer.[74] For example, a transfer of a license in the fourth year after license grant from a small minority owned firm to a small non-minority owned firm would require that the transferee begin principal payments and the balance would begin accruing interest at a rate of 2.5 percent above the rate that had been in effect.

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[74] If an investor subsequently purchases an "attributable" interest in the business and, as a result, the gross revenues or total assets of the business exceed the applicable financial caps, then these provisions apply as well.

F. Regulation of Base Station Sites and Antenna Structures

Unlike many other radio services, the FCC does not require routine prior approval for new narrowband PCS facilities. Narrowband PCS operators are granted a blanket license that allows for deployment of facilities anywhere within their licensed service areas subject to the technical limitations described in Section IV. As described below, there are a few instances, however, where the prior approval is required by the FCC, local governments, or other entities.

1. Marking and Lighting of Antenna Structures

Compliance with tower safety requirements is strictly enforced and the FCC has the authority to ensure that licensees are complying with the marking and lighting obligations. These important regulatory obligations cannot be delegated to a contractor; any failure on the part of the contractor or tower owner to maintain full compliance with the FAA and FCC obligations during the construction and continued operation of the tower remains the responsibility of the licensee. Due to the hazards to air navigation, the FCC views any failure to comply with these duties to be a serious breach of a licensee's obligations, leading possibly to substantial forfeitures and even revocation of license. Before undertaking any construction of tower facilities, a licensee therefore *must* ensure its activities are and will continue to be in full compliance with both the FAA and FCC requirements.

a. Federal Aviation Administration Requirements

Notification to the Federal Aviation Administration ("FAA") of new or modified radio tower facilities is required prior to construction where the proposed antenna structure might constitute a hazard to air navigation. Generally, such notification is required where the proposed structure is:

- Located on airport grounds; or
- Greater than 200 feet in height; or
- Located within the glide path to a nearby airport runway.

Notification is not required, however, if the proposed antenna structure is shielded by an existing permanent structure of greater or equal height, or the proposed modification is 20 feet or less and is not increasing the height of an antenna structure.

If notification is required, the notice must be submitted to the FAA on FAA Form 7460-1. Approval by the FAA generally takes approximately two to three months and will include references to specific paragraphs in the FAA's *Obstruction Marking and Lighting Guide* (May 1991) for the painting and illumination of potential air hazards. Occasionally the FAA may also require the filing of supplemental notices when construction begins and when the tower reaches its greatest height (on FAA Forms 7460-2 Parts 1 and 2).

b. FCC Requirements

The FCC's tower and antenna structure safety regulations in Part 17 of the Commission's rules parallel, and overlap with, the FAA's requirements. Thus, any proposed structure that would require FAA notification will also require prior approval by the FCC. Under the FCC's narrowband PCS rules, licensees proposing facilities that require FAA notification are required to file an FCC Form 864, which requests antenna marking and lighting instructions from the FCC's Antenna Survey Branch. These requirements should, however, conform both to the instructions in Part 17 of the FCC's rules and any marking and lighting instructions received from the FAA.

2. Environmental Impact Considerations

Under the National Environmental Policy Act of 1969, the FCC is required to assess the effect of any new or modified facilities that might have "a significant effect upon the quality of the human environment." Such assessments are required where the proposed facilities:

- Are located in an official wilderness area or wildlife preserve or may affect or jeopardize threatened or endangered species;
- May affect historical sites or structures or Indian religious sites;
- Are located in a flood plain;
- Will involve a significant change in surface features during the course of construction;
- Are located in a residential neighborhood and will be equipped with high intensity white lights; or,

- Will result in human exposure to radiofrequency radiation in excess of applicable safety limits.

In such cases, an Environmental Assessment must be prepared by the entity proposing new or modified facilities.

An Environmental Assessment must explain the consequences of the proposal and provide sufficient analysis for the FCC to determine whether the proposed construction will have a significant impact upon the quality of the human environment. If the FCC determines that the proposed construction will have a significant environmental impact, the licensee will be provided an opportunity to amend its proposal to reduce or eliminate the problem. If the problem cannot be eliminated, the FCC will prepare an Environmental Impact Statement that will be subject to public comment.

3. Electromagnetic Energy Emissions Limits

Although the health effects of electromagnetic energy from FCC licensed facilities is typically regulated under the FCC's environmental impact regulations, PCS licensees are subject to a separate obligation to ensure that their facilities meet a more stringent emissions limitation. At the time the PCS rules were adopted, the FCC was in the midst of a rulemaking proceeding (ET Docket No. 93-62) to change the basis of its electromagnetic energy exposure limits from the 1982 ANSI C95.1 standard to the 1992 ANSI/IEEE C95.1 standard. Until that rulemaking is completed, which is anticipated to be in the first quarter of 1995, PCS licensees are specifically required to ensure that their facilities and equipment meet the exposure limits, as appropriate, for controlled and uncontrolled environments set

forth in the 1992 ANSI/IEEE C95.1 standard. Sample calculations showing the application of the 1992 ANSI/IEEE standard are shown in Appendix B.

4. Local Zoning

Although the FCC has jurisdiction over the licensing of radio facilities, PCS licensees remain subject to local zoning ordinances with respect to the placement of antenna facilities and towers. These requirements vary greatly among localities. In recent years, there has been an increased tendency on the part of many communities to adopt very restrictive controls on the placement of antennas and associated towers, for aesthetic as well as perceived health and safety reasons. These local ordinances thus may place significant restrictions on system design for PCS operations. A licensee should be sure, before proceeding with system design planning, that it understands the governing requirements and procedures for obtaining necessary permits for the installation of antennas and tower facilities.

G. Privacy Considerations

1. Protecting Subscriber Privacy

Federal statutes impose various obligations and requirements on the providers of wireless telecommunications services with respect to the privacy of customers' communications. Initially, it should be noted that federal laws specifically protect cellular telephone transmissions from unauthorized, intentional interception and disclosure. Because the laws predated the launch of PCS, neither the statutory language nor the associated

legislative history specifically discuss this class of services. By analogy, however, the requirements and prohibitions governing cellular operations likewise should be applicable to PCS providers. Thus, violation of the limitation on interception and disclosure may lead either to civil or criminal penalties.

There are, however, a number of exceptions that permit otherwise prohibited interceptions in certain limited circumstances. These exceptions include:

- *Consent exception.* Where one of the parties has consented, the communication may be intercepted.

- *Governmental request exception.* Communications service providers may provide information, facilities, and/or technical assistance to investigative and law enforcement officers seeking to intercept otherwise protected communications when presented with: (1) a court order directing such assistance signed by an authorizing judge; or (2) a certification in writing by the Attorney General or other authorized person stating that no warrant or court order is required by law, that all statutory requirements have been met, and that the specified assistance is required. The service provider may not disclose the existence of any such interception or surveillance, except as required by the legal process and only after prior notification to the Attorney General or principal prosecuting attorney of the appropriate state.

- *Service provider exception.* A service provider may intercept calls as necessary for the purpose of rendering service or protecting the rights and property of the service provider. Thus, a PCS provider could intercept communications in the course of business to ensure the quality of service to its customers or in order to prevent fraudulent use of its facilities. The service provider, however, is specifically prevented from utilizing service observing or random monitoring except for mechanical or service quality control checks.

- *Interference exception.* Interception necessary to identify the source of interference to radio operations or consumer electronic equipment is permissible.

There are also special procedures applicable to the lawful installation or use of a "pen register" or a "trap and trace device." A pen register includes any device that, when

attached to a telephone line, can record the electronic impulses identifying the number dialed on that line. A trap and trace device is a device that captures the incoming impulses that identify the originating number from which a communication was transmitted. In general, such devices may not be installed or used without first obtaining a court order. This prohibition does not apply, however, to service providers in the following three circumstances: (1) for the operation, maintenance, or testing of service, or protection of the service provider's property rights, or the protection of users from unlawful or abusive use of service; (2) to record the fact that a communication was initiated or terminated in order to protect a service provider or user from unlawful or abusive use of service; or (3) where the consent of the user has been obtained.

While federal law protects an individual's privacy in the content of a conversation, there are few restrictions on a service provider's disclosure of call records and other subscriber information. Thus, a carrier may disclose telephone toll or transaction records or other information relating to a subscriber to any person except a governmental entity.

2. Assistance to Law Enforcement

Upon request, a service provider must provide information, facilities, and technical assistance to an investigative or law enforcement officer who has been issued a court order mandating interception or authorizing the installation and use of a pen register or trap and trace device. A specifically designated investigative or law enforcement officer also may intercept communications or install and use tracing devices without first obtaining a court order where an emergency situation exists involving immediate danger of serious bodily

injury to any person, conspiratorial activities threatening the national security, or conspiratorial activities characteristic of organized crime, as long as an application for a court order is sought within 48 hours. A service provider may or may not be entitled to compensation for expenses incurred in complying with a court order or emergency request, depending upon when the equipment was installed or last modified.[75]

A service provider must disclose specified subscriber information and call records to a governmental entity pursuant to a request made in one of the following documents: (1) under certain circumstances, an administrative subpoena authorized by a federal or state statute;[76] (2) a warrant issued pursuant to federal or state law; (3) a court order based upon a finding that the records are relevant to a legitimate law enforcement inquiry; (4) the consent of the subscriber; or (5) a special certification by the FBI seeking subscriber information that is relevant to an authorized foreign counterintelligence investigation. Disclosure of such information to the government is permissible *only* under the enumerated circumstances. If subscriber information is disclosed to the government outside of such circumstances, a carrier may be liable to the customer for violations of the privacy laws.

In general, the government must reimburse service providers for the reasonable costs of producing requested subscriber information. A service provider will not, however, be reimbursed for producing records or other information maintained by the provider that relate

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[75] Under the terms of the *Communications Assistance for Law Enforcement Act* ["CALEA"], the government is required to pay for reasonable modifications necessary for call interception for equipment installed prior to January 1, 1995. For equipment installed or modified after January 1, 1995, the extent of reimbursement depends upon the FCC's determinations as to the reasonableness of complying with CALEA. At this time, the FCC has not commenced the necessary rulemaking proceeding to define what constitutes reasonable compliance with CALEA for PCS or other mobile service providers.

[76] Administrative agencies' subpoena power is more limited than the power of a court issuing a warrant. *See generally* 18 U.S.C. § 2703 (as amended by H.R.4922, 103rd Cong., 2nd Sess.).

to telephone toll records and telephone listings, unless production of such records would impose an undue burden on the provider. In the event that a government request for subscriber information is made by court order and compliance with the request would cause the service provider an undue burden (*e.g.*, production of voluminous records), the service provider may request that the issuing court quash or modify the order.

H. Roaming and Roaming Agreements

Cellular carriers currently are expected to provide service upon reasonable request to "roaming" subscribers -- customers of other cellular systems that seek to use the carrier's cellular service while locate in that geographic area. To accommodate subscriber demand for readily accessible roamer service, many cellular licensees have entered into roaming agreements with one another. While such agreements are not required by the FCC's Part 22 rules, the FCC's Mobile Services Division has taken an active role in encouraging arrangements that permit automatic roaming by cellular subscribers at reasonable rates. In addition, cellular carriers are subject to non-discrimination obligations in negotiating such arrangements.

PCS operators are likely to face similar incentives to provide easily activated roaming arrangements for their customers. Customer demand and competitive benefit clearly will motivate many PCS providers to seek to implement informal arrangements like those pursued in the cellular industry. While no formal roaming agreement requirements currently are imposed for PCS operations, again the FCC staff is likely to encourage implementation of such arrangements to benefit individual subscribers.

I. Resale of Interstate and International Communications

Section V(B)(1), above, explained that cellular carriers may not unreasonably restrict resale of their services, and that the Commission is considering whether to extend a similar resale obligation to all CMRS providers, including PCS carriers. The cellular resale requirement derives from the Commission's longstanding prohibition against restrictions on resale of other services within its jurisdiction. This general policy favoring resale gives PCS carriers the ability to expand their service offerings by providing resold interstate or international services to their customers.

This section of the handbook explains the regulatory requirements imposed on PCS providers that resell interstate and international communications services. Resellers are considered common carriers. Accordingly, they are subject to the general obligations imposed by Title II of the Communications Act, except to the extent that CMRS providers have been exempted from complying with those requirements. For example, PCS providers that resell interstate or international services must provide service at just, reasonable, and non-discriminatory rates, are subject to the complaint process, and must act in accordance with the various consumer protection provisions contained in Title II.

In addition, as discussed below, certain entry, tariffing, and reporting obligations may be imposed on resellers. In general, these requirements are minimal for PCS providers that resell domestic interstate services, but are more significant for resellers of international services.

1. Resale of Interstate Services

Entry requirements. There is no entry regulation for resellers of domestic intrastate services. Accordingly, a PCS provider wishing to resell such services need not file an application with the FCC seeking authority to do so.

Tariffing. Under Section 20.17(b) of the FCC's rules, a PCS provider reselling domestic interstate services to its customers as part of its general CMRS offering would not be required or permitted to file tariffs for those services. For example, a PCS provider that provides long distance calling capability to its subscribers by reselling the services of an interexchange carriers would not tariff the long distance portion of its offering. However, if a PCS provider also operated a separate business as a long distance reseller (*e.g.*, marketing long distance services for use in connection with landline telephones), it would have to file a tariff for its resold long distance offerings. In general, tariffs for resold domestic long distance services may contain reasonable ranges of rates, may be filed on one day's notice, and must be accompanied by the appropriate fee.[77]

In addition, under current FCC policies, a PCS provider offering "operator services," such as credit card phones in rental cars, would have to tariff resold long distance services used in conjunction with those offerings. Moreover, if there is a possibility that an entity, whether affiliated or not, would use a PCS provider's resold interstate services to provide operator services, then the FCC's existing rules apparently would require the PCS provider to tariff its resold services.[78]

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[77] *See* 47 C.F.R. §§ 61.20-61.23.

[78] *See* V(B)(4) (discussing TOCSIA tariffing obligations).

Reporting requirements. PCS providers that resell domestic interstate services do not become subject to additional reporting requirements simply by virtue of being resellers.

2. Resale of International Services

Entry regulation. In contrast to resale of domestic interstate services, prior FCC approval is required for resale of international services.[79] An application must be filed that contains, *inter alia*, information about the applicant, a description of the applicant's facilities (which is greatly simplified in the case of resale, since capacity will be obtained from an already-certificated carrier), the type of services to be resold and the name and relevant tariff reference of the underlying facilities-based carrier, and a statement as to whether the applicant is affiliated with a foreign carrier or with the domestic carrier whose services are being resold.[80]

Most applications for international resale authority are subject to streamlined treatment, meaning that they are automatically granted 45 days after the date of the public notice listing the application as accepted for filing. In general, applications to resell switched services are subject to such treatment, unless the reseller is affiliated with the carrier whose facilities are being resold. (Affiliation, for this purpose, is defined as a direct or indirect

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[79] *See* 47 C.F.R. §§ 20.17(c), 63.01, 63.12, and 63.15. It might be contended that the Commission exempted CMRS providers from having to apply for authority to provide international resale; Section 20.17(b)(4) states that CMRS providers are not required to "[s]ubmit applications for new facilities or discontinuance of existing facilities" under Section 214 of the Act. The text of the *CMRS Second R&O*, however, notes that the Commission declined to act on a suggestion that it propose forbearance for international CMRS. 9 FCC Rcd at 1481 n.369. Consequently, forbearance from Section 214-related requirements apparently applies only to domestic CMRS.

[80] 47 C.F.R. § 63.01.

controlling relationship.) Applications to resell private line services are less likely to enjoy streamlined treatment, particularly if the applicant is affiliated with a foreign carrier or the applicant seeks authority to resell international private lines to a country for which the Commission has not determined that "equivalent resale opportunities" exist between the U.S. and the destination country.[81] *In light of the complexity of the Commission's rules in this area, PCS providers wishing to resell international services (either switched or private line) are advised to consult telecommunications counsel.*

Tariffing. Unlike PCS providers that resell domestic interstate services to their subscribers, PCS providers that resell international services must file tariffs for those offerings. Tariffs of international resellers are presumed reasonable and need not be accompanied by cost support. However, they must be filed on 14 days' notice, filed on both diskette and paper, and accompanied by the appropriate filing fee and fee form.[82]

Reporting requirements. Under Section 43.61 of the FCC's Rules, providers of international telecommunications services, including resellers, generally must file an annual report including actual traffic and revenue data for every international service provided, divided among service billed in the U.S., service billed outside the U.S., and service transiting the U.S. Apparently, however, the FCC has exempted CMRS providers that offer international services from complying with this requirement.[83]

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[81] *See* 47 C.F.R. § 63.12.

[82] *See* 47 C.F.R. §§ 61.20, 61.58(b).

[83] *See* 47 C.F.R. § 20.17(b)(2) (exempting CMRS providers from reporting requirements generally and from Sections 1.781-1.814 of the FCC's rules specifically; Section 1.790 implements the international traffic reporting requirement).

J. Reporting Requirements and Regulatory Fees

PCS licensees apparently will be subject to the same reporting requirements imposed on other CMRS operators. First, the licensees will need to submit FCC Form 395 annually to the Commission. This form reflects compliance with FCC-imposed equal employment obligations. Carriers with more than sixteen employees must answer questions about employee categories, and submit this information to the FCC by May 31 of each year.

PCS licensees that also are licensees of common carrier microwave facilities must file FCC Form 430 on an annual basis each March 31. This form includes information about a licensee's ownership and other radio authorizations it holds.

Finally, the FCC has, at the direction of Congress, instituted annual regulatory fee filings for radio station licensees and other entities regulated by the FCC. These fees are meant to reimburse the Commission for its overall regulatory activities at they related to a particular entity. The first set of fee filings, covering radio licenses issued as of October 1, 1993, were submitted in August and September 1994. Filing dates for future years may be adjusted. In addition, the FCC can be expected to modify the current schedule of fees to include PCS licensees.

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VI. BACKBONE MICROWAVE AUTHORIZATION PROCEDURES AND OPERATIONAL REQUIREMENTS

A. Uses

As CMRS operators, PCS providers likely will use Part 21 common carrier microwave facilities in support of their systems. The point-to-point microwave facilities may be used to support PCS operations in a number of ways, including:

- Linking cell sites with the PCS switch;
- Linking cell sites with one another and with any intermediate nodes;

- Interconnecting PCS systems with one another; and
- Interconnecting the PCS system with the local exchange carrier or with a long distance carrier.

B. Application Procedures and Prior Coordination Procedures

The basic steps associated with placing Part 21 point-to-point microwave facilities into operation are:

- Prior coordination of proposed frequency usage with existing licensees and applicants.
- Preparation, filing, and FCC processing of Form 494 application.
- Grant of conditional license by FCC.
- Construction of facilities and initiation of operations.
- Filing of Form 494-A to certify completion of construction.

These activities are described in greater detail below.

Prior Coordination Procedure. The process is initiated with an identification of the site coordinates for the antenna location. Because even relatively minor changes or corrections in the site data may require reinitiating the coordination process, it is important to begin with correct information. The frequency coordinator first undertakes a preliminary analysis of the interference environment. Then, the coordinator must notify all possible affected carriers and pre-existing applicants of the proposed frequency use, including certain required information about the nature of the operations. The notified carriers and pre-existing applicants have thirty days in which to respond and advise the frequency coordinator whether the proposal would present any interference problems. The frequency coordinator

must resolve any cases of potential interference (which may require some changes on the part of the applicant's proposal) and prepare a report to be filed with the FCC as part of the Form 494 application.

Application Procedures. Applications for common carrier point-to-point microwave authorizations are submitted on FCC Form 494, which is used primarily to seek FCC authority to build and operate new microwave facilities, obtain FCC approval to make certain changes in existing licensed facilities, or to notify the FCC of certain permissive changes. The application seeks information about technical aspects of the proposal as well as the applicant's legal qualifications to hold a license.

Forms 494 are subject to the FCC's public notice and petition to deny procedures. Thus, after the application is filed with the FCC with the appropriate fee, it is placed on public notice as accepted for filing. Interested parties then have 30 days in which to submit a petition to deny.

Once the FCC grants a conditional license, the licensee has 18 months in which to construct the authorized facilities. The licensee may initiate operations as soon as the facilities are constructed. After the facilities are constructed, the licensee must notify the FCC of that fact by filing FCC Form 494-A.

C. License Term

The license term for point-to-point microwave facilities is a maximum of ten years. The FCC imposes a set date for the expiration of all point-to-point microwave licenses. New licenses issued in the next few years will all bear an expiration date of February 1, 2001.

D. Temporary Fixed Authority and Blanket Special Temporary Authority

Companies may apply to the FCC for blanket special temporary authority ("BSTA") to construct and operate microwave facilities until applications for permanent authorization are acted upon by the FCC. The BSTA permits the construction and operation of microwave facilities as soon as the relevant FCC Form 494 has been placed on public notice. The following limitation apply:

- All operations must be in exact accordance with the application on file.
- The application may not request any waiver of the FCC rules.
- The facilities may not be within 35 miles of an international border or within a radio "quiet zone."
- The antenna structure must comply with an existing FAA final determination, if one is required.
- The operations must have been fully coordinated.
- The operations must have no significant impact on the environment.

Finally, the BSTA must be renewed every six months.

The FCC's rules also provide for the granting of special temporary authority, which the staff will do only in appropriate circumstances. The special temporary authority is intended for "immediate" or "temporary" use of facilities. The request is submitted as an informal application, at least ten days prior to the date of proposed construction or operation. The request must provide a description of the operations, the public interest benefits, and a description of why the temporary authority is necessary.

VII. 2 GHz MICROWAVE LICENSEE RIGHTS AND OBLIGATIONS

It is likely that many 2 GHz microwave licensees be relocated from spectrum recently allocated for PCS in order for these services to reach their full potential. To ensure an orderly transition of the spectrum from microwave operations to PCS, the FCC has adopted rules to govern the relocation process. These rules establish time frames for the relocations, provide interference protection to microwave systems prior to their relocation, as well as require that PCS operators provide full financial compensation and comparable facilities to relocated microwave licensees.

A. Interference Protection

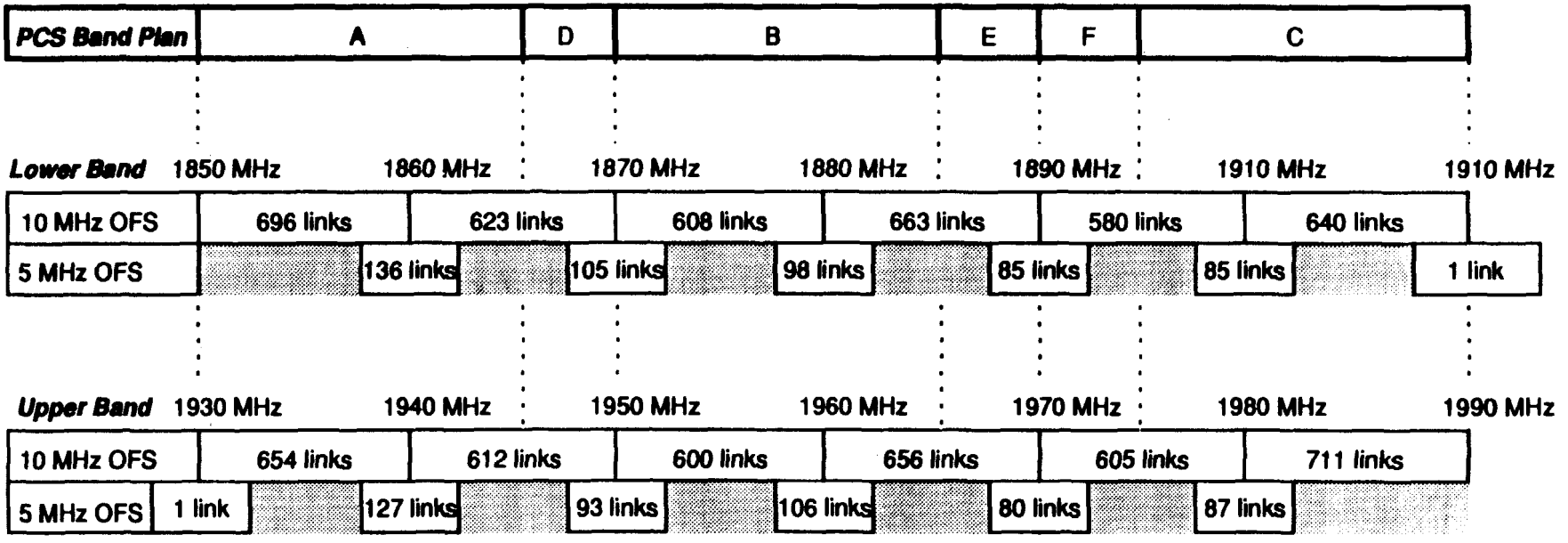
To ensure that microwave licensees are protected from interference from PCS operations, the FCC has established coordination procedures to prevent harmful interference. These procedures specify the coordination obligations of PCS licensees, prediction methods for interference calculations, and acceptable levels of interference. These obligations extend to all PCS licensees co-existing with incumbent fixed microwave licensees in the 1850-1990 MHz band.

The coordination distances required for PCS services are specified in Table 7:

TABLE 7: PCS/OFS COORDINATION TABLE (Distances Given in Kilometers)													
Base Station e.i.r.p.	Base Station Antenna HAAT in Meters												
	5	10	20	50	100	150	200	250	300	500	1000	1500	2000
0.1 Watt	90	93	99	110	122	131	139	146	152	173	210	239	263
0.5 W	969	100	105	116	128	137	145	152	158	179	216	245	269
1 W	99	103	108	119	131	140	148	155	161	182	219	248	272
2 W	120	122	126	133	142	148	154	159	164	184	222	250	274
5 W	154	157	161	168	177	183	189	194	198	213	241	263	282
10 W	180	183	187	194	203	210	215	220	225	240	268	291	310
20 W	206	209	213	221	229	236	242	247	251	267	296	318	337
50 W	241	244	248	255	264	271	277	282	287	302	331	354	374
100 W	267	270	274	282	291	297	303	308	313	329	258	382	401
200 W	293	296	300	308	317	324	330	335	340	356	386	409	
500 W	328	331	335	343	352	359	365	370	375	391	421		
1000 W	354	357	361	369	378	385	391	397	402	418			
1200 W	361	364	368	376	385	392	398	404	409				
1640 W	372	375	379	404	410	416	421						

Note: If the actual value does not match table values, round to the closest higher value on this table. *See* Section 24.53 of the Commission's rules for the HAAT calculation method.

Distribution Of OFS Links In Relation To The FCC's Block Allocations For Personal Communications Services



All data extracted from the FCC's XFS database, 9/30/93.

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If a PCS licensee seeks to locate a base transmitter within the distance specified in the table to an incumbent microwave user, the PCS licensee must calculate the potential interference to the microwave facility and ensure that interference above acceptable limits will not result. The method specified by the Commission for calculating total interference to the microwave facility involves a complex summation and averaging of interference caused by individual base station sites and mobile units. This calculation methodology is provided in Appendix C. The interference criteria can also be computed using good engineering practice and procedures developed by the Electronics Industries Association, the Institute of Electrical and Electronics Engineers, Inc., the American National Standards Institute, or any other recognized authority.

PCS licensees must ensure that the total calculated interference to the microwave system does not exceed specified limits. For microwave paths of 25 kilometers or less, the interference determinations are based on the carrier-to-interferer ("C/I") criteria set forth in TIA Bulletin 10-F. For microwave paths longer than 25 kilometers, the interference protection criterion shall be such that the interfering signal will not produce more than 1.0 dB degradation of the practical threshold of the microwave receiver for the analog system, or such that the interfering signal will not cause an increase in the bit error rate from 10^{-6} to 10^{-5} for digital systems.[84]

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[84] 47 C.F.R. § 24.237(e), (f).

B. Microwave Licensees Affected by the Transition Rules

The FCC's transition rules affect existing microwave licensees that use operating frequencies in the ranges 1850-1990 MHz, 2130-2150 MHz, or 2180-2200 MHz (the "2 GHz bands"). In addition, the rules only protect the rights of "co-primary," as opposed to "secondary," licensees in these frequency ranges. Secondary facilities operating in these frequency ranges must not interfere with PCS use of the radio channels, must accept any interference caused by PCS transmitters, and will not be financially compensated if forced to move to alternative facilities due to interference. Microwave authorizations licensed prior to January 16, 1992, are co-primary and microwave licenses issued for the 2 GHz bands after that date generally are secondary.

Co-primary microwave licensees, however, are permitted to make certain modifications to their systems without loss of co-primary status. Permissible changes include:

- Minor modifications under the FCC's rules;
- Changes in antenna azimuth, beamwidth, or height;
- Changes in authorized power, channel loading, emission, or station location;
- Changes in ownership or control; and,
- Reductions in authorized frequencies or addition of frequencies not in the 2 GHz bands.

Modifications which do not meet these guidelines could have an adverse impact on the microwave licensee's rights to compensation unless the FCC grants the licensee a waiver.

C. Relocation Periods for Microwave Licensees

The FCC's transition rules for relocation of microwave licensees include a voluntary negotiation period, a mandatory negotiation period, and involuntary relocation deadline. While the basic transition process will apply to all microwave licensees, the length of the negotiation periods differ depending upon the what kind of new user is seeking relocation and the class of microwave licensee being relocated. For purposes of the transition rules, there are two types of entities that can seek relocation -- new licensed PCS providers and manufacturers of unlicensed PCS devices -- as well as two classes of microwave users -- Public Safety and non-Public Safety microwave licensees. The minimum negotiation periods are as follows:

TABLE 8: MINIMUM NEGOTIATION PERIODS FOR 2 GHz MICROWAVE RELOCATION

Entity Seeking Relocation	Entity Being Relocated			
	Public Safety Licensee		Non-Public Safety Licensee	
	Mandatory Negotiation Period	Voluntary Negotiation Period	Mandatory Negotiation Period	Voluntary Negotiation Period
PCS Licensee	3 years	2 years	2 years	1 year
Unlicensed PCS Equipment Manufacturer	3 years	2 years	0 years	1 year