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384.6 Page Communications Engineers, Inc. NTIS  
P132 Feasibility Study for an Integrated National  
Telecommunications System for the Republic of  
Chile. Dec. 1969.  
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1. Telecommunication - CI. 2. Power resources - CI.
3. Engineering - CI. I. Title.

FEASIBILITY STUDY FOR AN  
INTEGRATED NATIONAL  
TELECOMMUNICATIONS SYSTEM  
FOR THE REPUBLIC OF CHILE

Volume VII - Part 2

Annexes A through F

PCE-R-4952-00-00022B

November 1968

Prepared for

THE SUPREME GOVERNMENT OF CHILE

By

PAGE COMMUNICATIONS ENGINEERS, INC.

A Subsidiary of Northrop Corporation

3300 Whitehaven Street, N. W.

Washington, D. C. 20007

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## ANNEX A-1

### OPERATIONS PROGRAM OF PAGE COMMUNICATIONS ENGINEERS, INC., FOR THE CREATION OF A "COMMUNICATIONS REGULATORY AUTHORITY IN THE REPUBLIC OF CHILE" FOR 1969 - 1970

#### FIRST: (Administrative)

Page will study, analyze and catalog all existing laws and regulations pertaining to communications in Chile.

Page will make a complete analysis of the present regulations, proposing the necessary modifications and recommendations for streamlined legal performance of the Regulatory Authority (RA).

Page will study and propose the structure of the Regulatory Authority, with a detailed description of each of its departments and their duties. In this task, Page will include the necessary recommendations for the following general functions:

- a) LICENSES: Issuing of licenses for the following functions:
  - Operators for public and private services
  - Officers of merchant and tourist ships
  - Amateur radio operators
  - Radio broadcasting operators
  - Telegraph operators and other users of communications frequencies
  - Renewal, revocation and transfer of any license, in accordance with the regulations in force.
  
- b) FREQUENCY ADMINISTRATION: Control of presently authorized radio frequencies, with their rational distribution under a priority plan which respects national and international agreements.

Allocation of frequencies is one of the main problems of the present study and must be carefully studied. The Page team will outline public relations programs and make recommendations for their implementation during the transition period.

- c) OPERATING AND ACCOUNTING RECORDS: Study, revision and control of data regarding held orders, complaints, equipment failures, new lines, abandoned lines, new connections, etc.

Require accounting records of revenues, expenses, or similar financial information. Prescribe uniform system of accounts for regulated entities.

- d) FORMULATING PROCEDURES FOR COLLECTION AND ANALYSIS OF STATISTICAL DATA: On the basis of indices and statistical data which Page will furnish for the contract with ENTEL, data and procedures will exist which will be quite useful to the new RA. Page will provide these procedures to enable the new RA to easily continue data collection and statistical processing. Statistical compilations are an indispensable factor for properly regulating rates, surveying finances, and planning an integrated national communications system.

Page will outline the most efficient and economical approach to collecting statistical data on the growth of all services. Page will design a system of reporting forms for the Regulatory Authority to use in dealing with related companies and the public.

- e) NATIONAL EMERGENCY: Reserve frequency bands for emergency use and require the users to devote their facilities and time to tests. Order alternate routes and test their effectiveness.
- f) GOVERNMENT AND COMMERCIAL SERVICE FACILITIES: Implement regulatory procedures for government and commercial facilities, including foreign concessions.
- g) NATIONAL DEFENSE: Frequency allocation in accordance with the priority plan.
- h) LEVIES, PUNISHMENTS AND FINES: The important problem of levies, punishments, and fines requires special consideration in view of the transition period from an informal

regulatory system to a system with modern and effective legislation. The aspects relating to public relations will receive careful consideration. Page will propose an efficient system of forms to assist in regulating violations during the transition period.

- i) BUDGETARY RECOMMENDATIONS: Page places special emphasis on studying this matter. Budget recommendations will be based on the fact that Chilean Government economic resources are the principal support of this program. Consequently, the budget procedure to be used will totally agree with national legislative methods and bases, such as by each subdivision of responsibility and with standardized accounting practices of various levels of the Chilean Government.
- j) STANDARDS AND TECHNICAL RECOMMENDATIONS: Page must develop engineering standards which include broad studies of technical developments in the national communications industry, particularly in the areas of transmission systems and electronic circuitry. It must propose recommendations concerning the frequency, location, power, type of modulation, and bandwidth that are advisable for existing, experimental, and proposed radio services. These recommendations, of course, must also refer to commercial, industrial, scientific and medical equipment.
- k) PERSONNEL ASSIGNMENTS AND JOB DESCRIPTIONS: This Page task must include the description of the various positions, administration policies, personnel objectives and other related matters for the 1969-1970 period.

Page must differentiate between the administrative duties and the primary duties corresponding to legislative and executive functions in the administrative and technical areas.

Page will recommend training standards for all levels of administrative and executive personnel.

Page will draft a scheme indicating the assignment of special duties to the executives of the Regulatory Authority. In this study, Page must emphasize the use of new techniques which may lead to better means of communications and more efficient use of the radio frequency spectrum. Page must also propose an adequate program to train the personnel who will act on these matters.

SECOND: (Technical)

TECHNICAL TRANSMISSION TESTING: MONITORING STATIONS,  
LABORATORY EQUIPMENT AND INSTRUMENTS

This point contains the following tasks to be developed by Page:

(The personnel and their assignments are considered in point k of the Administrative tasks of this Annex.)

- a) GEOGRAPHIC LOCATION OF THE MONITORING STATIONS FOR ALL TYPES OF COMMUNICATIONS THROUGHOUT THE COUNTRY
- b) DESCRIPTION OF THE EQUIPMENT REQUIRED FOR THIS WORK, WITH COMPLETE AND DETAILED DESCRIPTIONS OF EACH UNIT AND ACCESSORIES
- c) METHODS OF INSTALLATION AND OPERATION
- d) EQUIPMENT LISTS (with Quantities), AREAS OF USE, AND RECOMMENDATIONS FOR MOBILE EQUIPMENT
- e) MONITORING OF TRANSMISSIONS: Page will propose the organization and installation of one or more laboratories to:
  1. Examine the nature of interference problems and their prevention.
  2. Develop methods and procedures for measuring field intensity of radio transmissions.
  3. Page must recommend the personnel, equipment, and operating procedures for a complete monitoring department.
  4. Develop monitoring and measuring equipment suitable for use by the monitoring department.
- f) LABORATORY CONTROL OF COMMUNICATIONS EQUIPMENT AND ACCESSORIES OF VARIOUS MANUFACTURERS, TO VERIFY COMPLIANCE WITH THE TECHNICAL SPECIFICATIONS AS REQUIRED BY LAW: Page will propose a stage-by-stage acquisition plan corresponding to items b, d, e and f of point two of this program, indicating priorities for equipment and accessories which comprise the monitoring stations and laboratories.

This plan will provide for a three-phase program, the first phase covering 1969-1970.

Furthermore, it must indicate a financing plan with specific proposals for obtaining the funds abroad. This plan will serve the Chilean Government as the technical guideline for the introduction of a specific operation.

DIRECTOR OF TELECOMMUNICATIONS  
(2 persons needed, 2 available)

- ① DIRECTOR
- ② OUTSIDE ADVISOR
- ③ SECRETARY

OFFICE OF PLANNING AND COORDINATION  
(3 persons needed, 0 available)

- ③ ENGINEER
- ③ LAWYER
- ③ ECONOMIST

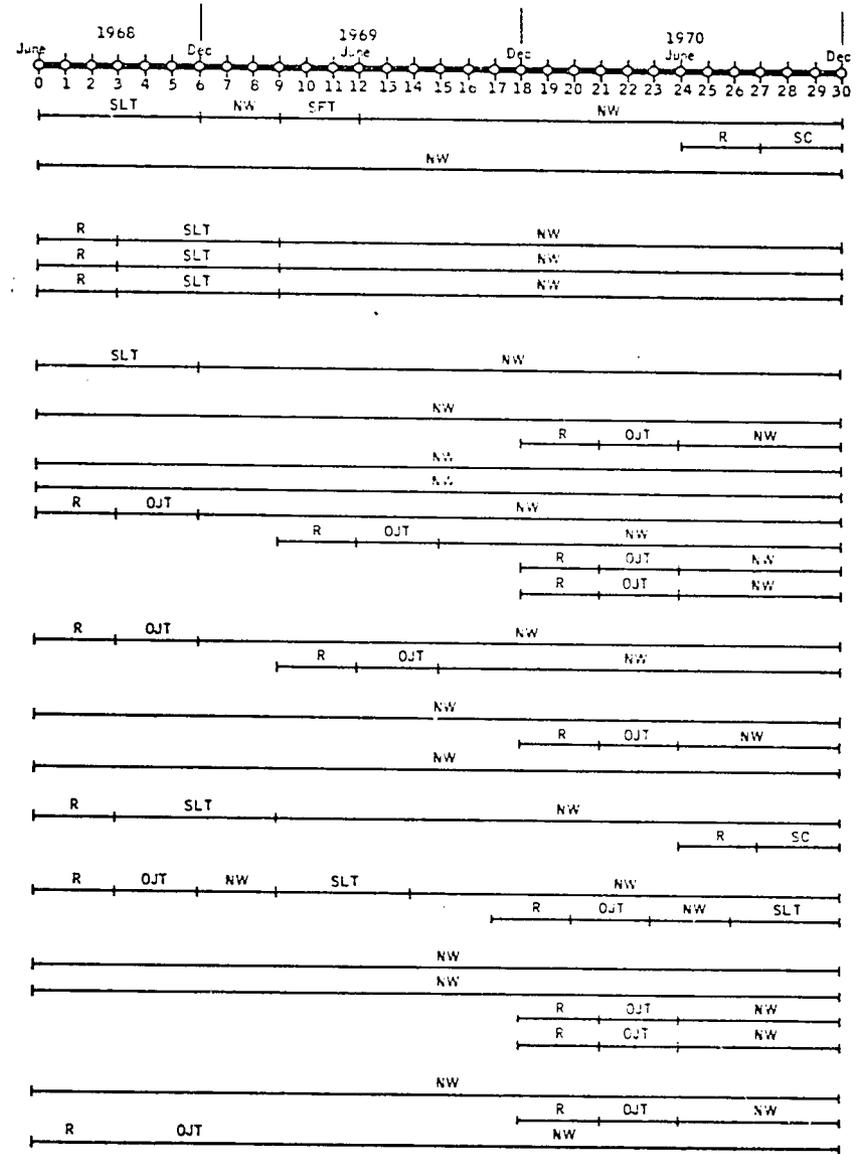
ADMINISTRATIVE DEPARTMENT AND SECRETARIAT  
(14 persons needed, 0 available)

- ④⑩ CHIEF
- ④① PERSONNEL
- (1)
- (2)
- (3) SECRETARIES
- (4) "
- (5) "
- (6) "
- (7) "
- (8) "
- ④② BUDGET AND FISCAL
- (1)
- (2)
- ④③ ADMINISTRATIVE SERVICES / ARCHIVES
- ④④ LICENSES

DEPARTMENT OF ACCOUNTING AND ECONOMY  
(10 persons needed, 3 available)

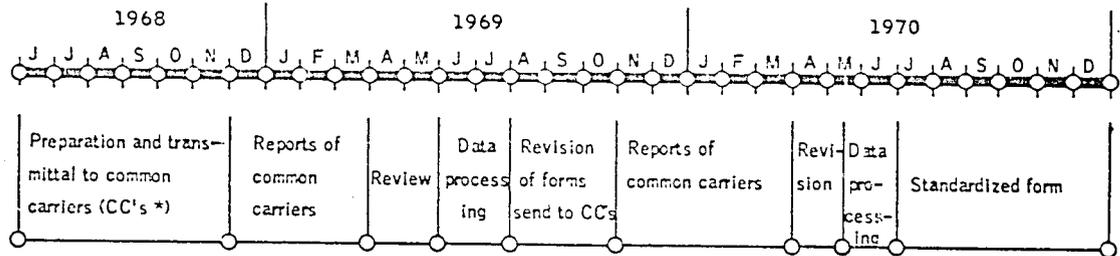
- ⑦⑥ CHIEF
- ⑦⑦ OUTSIDE ADVISOR
- ECONOMY
- (1)
- (2)
- ⑦⑧ ACCOUNTING / REPORTS
- (1)
- (2)
- (3)
- (4)
- ⑦⑨ TARIFFS
- (1)
- (2)
- ⑦④ LEGAL ADVISOR

\*NOTE: SEE LEGEND ON ANNEX B-2 (a)

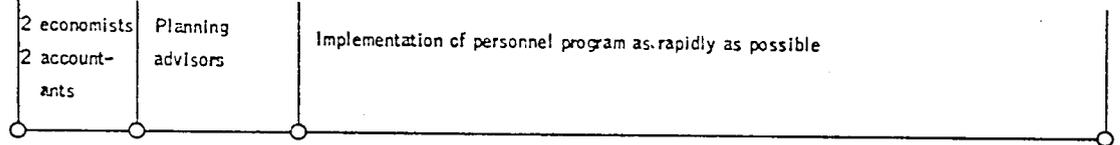


Annex B-2(b)  
Steps in Personnel Expansion

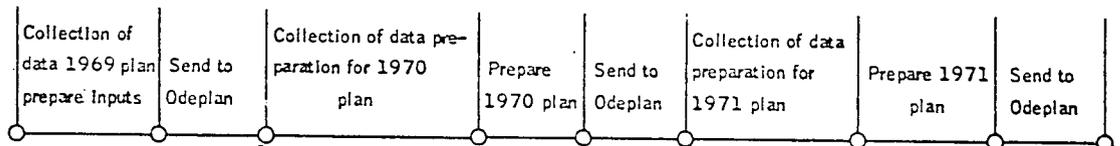
73 STANDARD REPORT FORMS



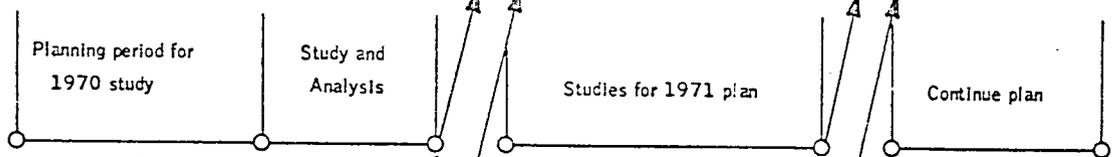
70 PERSONNEL COMPLEMENT



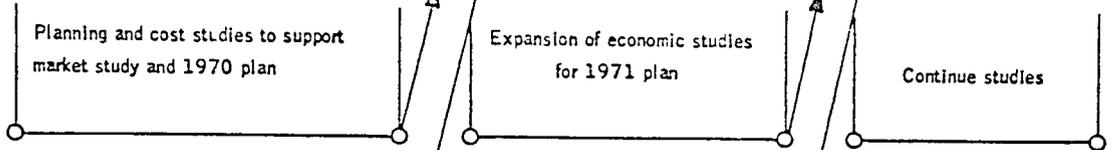
71 SECTOR PLANNING



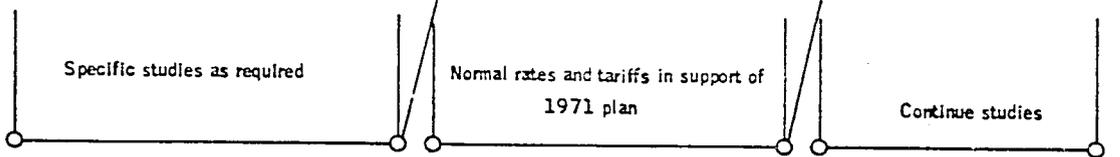
71 MARKET STUDIES



72 COST STUDIES

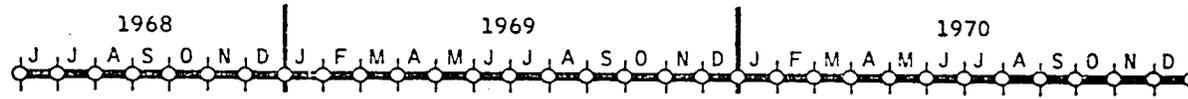


73 RATES AND TARIFFS:



(\*)CC: Telecommunications Common Carriers

Annex B-3  
Accounting Regulation Program



BUDGET PROCEDURES

TOTAL BUDGET GOAL OF THE RA

US \$ 344,800	US \$ 416,800	US \$ 480,900
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AVERAGE COMPLEMENT OF THE RA

23 employees	38 employees	53 employees
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BUDGET PREPARATION OF THE RA

Supplementary Budget		
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LONG RANGE PLANS

10 and 20 year plans
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ORGANIZATION STRUCTURE

PERSONNEL GOAL OF THE RA

30 employees	45 employees	60 employees
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PERSONNEL RECRUITMENT

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TRAINING IN CHILE

Training in the RA and in Chile
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TRAINING ABROAD

Training in other countries
-----------------------------

IMPLEMENTATION OF THE PLAN

Gradually all of the RA functions will be started
---------------------------------------------------

LONG RANGE PLANS

10 and 20 year plans
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Annex B-1  
Implementation Program for Budget Procedures and Organization Structure

DIVISION

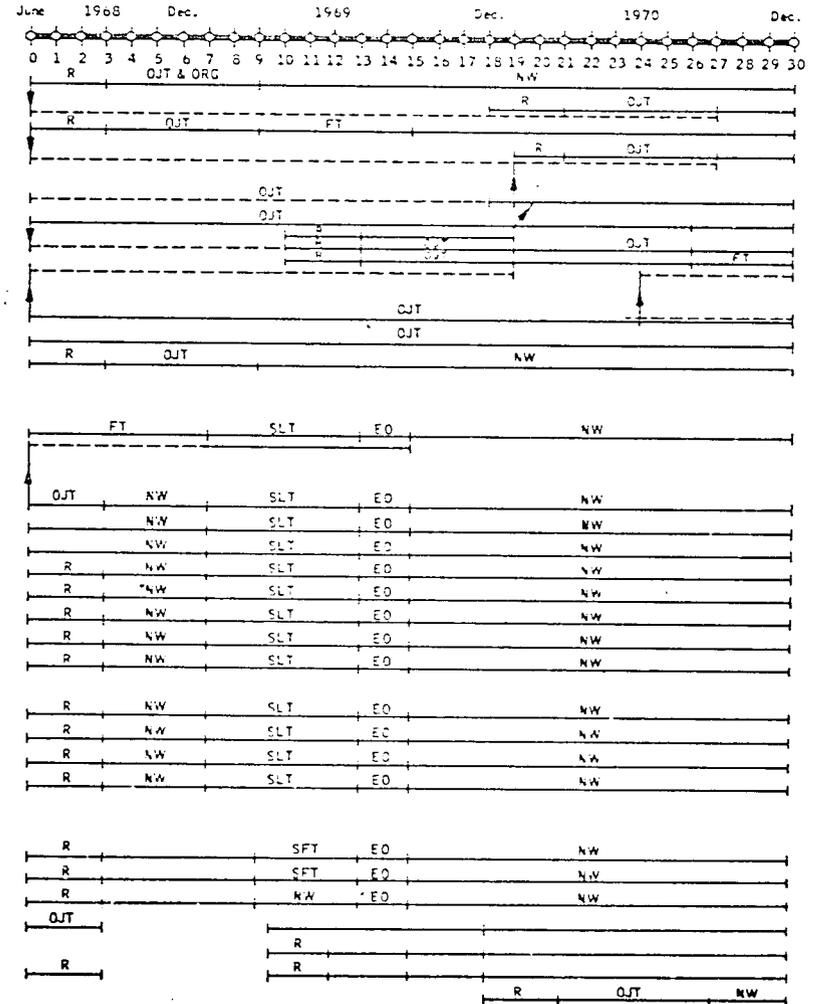
ENGINEERING DEPARTMENT  
(11 persons needed, 3 available)

- 50 CHIEF ENGINEER
- 51 INTERNATIONAL COORDINATING ENGINEER
- 51 NATIONAL COORDINATING ENGINEER
- 51 FREQUENCY ASSIGNMENTS
- 52 FREQUENCY ADMINISTRATION
  - (1) RECORDS
  - (2) APPLICATIONS
  - (3) APPLICATIONS
- 53 ENGINEERING STANDARDS
- 53 APPLICATION OF STANDARDS
- 53 COLLECTION OF DATA
- 53 APPLICATIONS
- 54 LEGAL ADVISOR

MONITORING AND INSPECTION DEPARTMENT  
(20 persons needed, 3 available)

LEGEND	
R	HIRING
SO	OUTSIDE ADVISOR
NW	NORMAL WORK
OJT	ON-THE-JOB TRAINING
FT	FOREIGN TRAVEL
EO	EXPERIMENTAL OPERATION
SLT	SPECIAL LOCAL TRAINING
SFT	SPECIAL FOREIGN TRAINING
ORG	ORGANIZATION

- 60 CHIEF INSPECTOR
- 61 MONITORING
  - (1)
  - (2)
  - (3)
  - (4)
  - (5)
  - (6)
  - (7)
  - (8)
- 62 INSPECTION
  - (1)
  - (2)
  - (3)
  - (4)
- 63 LABORATORY
  - (1)
  - (2)
  - (3)
  - (4)
  - (5)
- 64 PROFESSIONAL EXAMINATIONS
- 65 LEGAL ADVISOR



Annex B-2(a)  
Steps in Personnel Expansion

## ANNEX C-1

### COMMUNICATIONS REGULATED BY THE GENERAL LAW OF ELECTRICAL SERVICES

#### Chapter 1

This law fundamentally governs the communications field for the granting of concessions for:

- a. Telephone exchanges
- b. Telegraph offices
- c. Cable offices
- d. Teleprinter offices and physical lines or other telecommunications systems for urban or interurban service
- e. Radio communications, broadcasting, and television stations.

The above concessions may be granted to operate public or private service installations. The legislator understands public service as that which strives to carry out telecommunications and broadcasting within or between towns. Private service, however, is that which intends to carry out telecommunications for the exclusive use of the persons indicated in the concession. To determine if a service is fundamentally public or private, one must establish whether the concession limits its service to the persons indicated in the concession or if its object is indeterminate and it refers to the public in general.

The law recognizes those instances when communications activities may be carried on without a concession. These instances in this respect are divided into two groups: (a) Communications activities which can legally operate without a concession; (b) Communications activities for which permission has been granted by the DGSE.

Group (a) primarily includes State telegraph service within the country. Such service is a State monopoly and by its nature cannot be the object of concessions (except under the conditions shown in article 7 of Law No. 7, 392 of December 31, 1942). Telegraph and cable companies providing national public service are objects of concessions by virtue of special laws, concessions, or permission granted when Law No. 7, 392 was issued. The legislator respected these companies and allowed them to continue to operate until the termination date of their respective authorization. Also included in this sector are telephone and telegraph lines established on private property for the exclusive use of their builders, such as lines designed exclusively for the operation of transmission lines and distribution of electric power which use their poles or ducts. Radio communications installations on ships, coastal stations, aircraft, and military aeronautical stations, and fixed or mobile police stations are also allowed to operate without a concession. However, they should comply with the technical and safety regulations which require DGSE authorization before certain operations.

Group (b) encompasses those instances in which communications activities can be carried out only with permission. It includes those activities expressly authorized by Supreme Decree of the DGSE, without need of a concession. By this provision, physical telecommunications lines destined for private service may receive authorization to use streets, roads, rivers, aqueducts, navigable canals, railroad tracks, bridges, ferry cables, and other electric lines. Amateur radio communications stations may also be established after special authorization by the DGSE.

The law limits the activity of cable companies and international telecommunications companies to external public service; that is, they may carry on internal communications except as outlined in paragraph one of article 7 of Law No. 7, 392. Private telecommunications service is limited to those points of territory enumerated in the concession, and is authorized to operate only when there is no public service between those points offered by Telégrafo del Estado

or similar public service. The President of the Republic is authorized to declare an end to all private service when a public service enterprise is installed offering service of the same quality between the points served by the private service.

## Chapter 2

### GRANTING CONCESSIONS AND PERMISSIONS AND THE CONSTITUTION OF RIGHTS OF WAY

#### General Rules

All concessions are granted by the President of the Republic by means of a Supreme Decree, and the only beneficiaries should be Chilean citizens, societies organized in accordance with the laws of the country, national corporations, or municipalities performing a public communications service within the territory they administer. Thus, foreigners are excluded from being concessionaires.

A concession always includes the right to use national resources in the public domain to carry out necessary works, but in a way that does not impede their principal use. The concession also permits the President of the Republic to grant the use of Government resources where pertinent.

A concession does not constitute a monopoly so that the President is free to grant new concessions with an identical objective provided that equal obligations are imposed on the second concessionaire as were on the first. The law should provide the rules necessary to avoid interference between the concessionaires and to produce the least obstruction possible in publicly-used national resources. In the case of telephone concessions, the law does not require that obligations be imposed on the second concessionaire equal to those imposed on the first which means that companies may be created that can operate more beneficially than other previous ones.

Finally, the concessionaires of telephone stations have the obligation to accept interconnections so that users of the different services have access to all the telephones of the country.

## Special Rules to Obtain Concessions

To study the special rules that govern concessions, a distinction should be made between those destined for any communications activity and those for radio communications. The first are governed by the same common rules while radio communications concessions have special norms.

### A. Concessions for Communications in General

These are governed by the rules established in Chapter II of the law, articles 23 to 27, and can be classified as provisional or definitive concessions. The difference between them is that provisional concessions study the feasibility of a definitive [sic] concession. The final definitive concession, however, permits specific construction and subsequent operation of a communications system.

The request for a provisional concession is presented to the President of the Republic and should contain all the background necessary to distinguish the petitioner, the nature of the work intended, the time period in which it will be accomplished, the definitive plans, the initiation and termination dates of the work, and the way it will be financed.

An extract of the petition, prepared by the DGSE, will be published two consecutive times in a Santiago newspaper and in newspapers of each departmental capital affected by the work planned. It must also appear once in the Diario Oficial.

The object of publication is to permit those affected by the possible concession to formulate, within 30 days from the date of publication in the Diario Oficial, allegations which they deem pertinent which are made known to the petitioner who has 30 days to answer them. The periods referred to are consecutive days; holidays are not subtracted.

Once the request is presented to the President of the Republic, it is passed to the DGSE for them to issue a report, and on the basis of this, the Executive declares by means of a Supreme Decree that it should be made a public document upon pronouncement.

The Decree for a provisional concession fixes the period for the presentation of the definitive project, which may not exceed two years, and the extension of the definitive concession, if it is granted. It sets, in addition, starting and ending dates of the development work and the capital must be supplied to finance them. It also shows the annual fee which the concessionaire must pay the DGSE for inspecting their construction. Finally, when the provisional concession studies a concession aimed at operating a public service, the respective decree determines a deposit guaranteeing the concessionaire's compliance to his obligations to the public. This deposit may not be less than E<sup>O</sup>50, and sets the fines the concessionaire will pay if he does not finish the work on time.

Note that the request for a provisional concession does not limit the President of the Republic from granting other similar concessions. Furthermore, if two or more petitioners with a provisional concession request a definitive concession, the President decides which of these receives the concession on the basis of which project offers the better public service or the better job concept. Only under identical conditions does he favor the older provisional concessionaire.

The request for a definitive concession should also be presented to the President of the Republic. It should be noted that it is not absolutely necessary to present a request for a provisional concession before a definitive one. Thus, a request for a definitive concession may be presented as an initial request, in which case it should contain the same data as the provisional one.

The definitive plans, budgets, and all studies referring to the work and utilization of the concession should accompany the definitive request. This request should also include special plans for rights of way which will be imposed, and of everything in the new communications works which may affect concessions already established.

The DGSE informs anyone who may possibly be affected by the proposed rights of way which the plans present. This information is distributed, with the help of the Administrators, Governors, and Mayors, so that they may formulate pertinent observations within 60 days.

When the President of the Republic formulates observations on the definitive project, the petitioner is granted a maximum of 120 days to resolve the observations.

A definitive concession is granted through a Supreme Decree by the President of the Republic after a report from the DGSE. This Decree contains the same items contained in a Decree of a Provisional Concession.

The decree for a definitive concession for public telephone service indicates the concession's zone limits for each locality in the system and the initial portion which the concessionaire is obliged to devote to local service. It also shows the toll service which may be established.

In order that the Decree may be issued, the concessionaire should establish a guarantee that he will meet his obligations to the public and pay the corresponding fee in accordance with the scale set in articles 112 to 118 of Law No. 7,392.

All Decrees for definitive concessions of a public communications service show the duration of the concession, which must be from 30 to 90 years and may not be extended. This period is set in accordance with the initial vote on the development of the work. The duration of a concession for private service is not limited but the concession terminates when the scope for which it was granted disappears.

All concessions designed to carry out work complementary to a previous concession are granted only for the period remaining on the concession to be complemented.

Finally, it should be noted that the construction work involved in concessions, public service as well as private, should be strictly subject to the schedules indicated in the request for the concession. Furthermore, the work may only be modified in such a way that it does not alter the original project and must have the previous authorization of the DGSE. When national resources in the public domain are used for construction, a technician with the full power to

reach accord with the DGSE should be in charge. In all cases the expense of governmental inspection of the work will be borne by the concessionaire. Such expenses may not exceed 1% of the total project cost.

#### B. Concessions for Radio Communications Stations

The concessions for the establishment of radio communications, as in the previous case, may be granted to establish both public and private international or national communications service.

This type of concession is always definitive.

To receive a concession, a respective request is made to the President of the Republic; it should contain the data necessary to identify the petitioner, the type of concession sought, the location of the station and its power, and all its technical characteristics. It is also necessary to indicate start and finish dates for respective work and the period when the necessary capital will be provided for financing the work.

In international public service concessions, it is necessary to indicate the entities with which the respective station will communicate. On the other hand, if the concession is for a national public service, the concessionaire must indicate the points of the country between which communications will be established. If the concession is for carrying out a private service, the natural or juridical persons who will use it should be identified.

A summary of the request for the concession which is drawn up by the DGSE is published twice in a Santiago newspaper and in one of the municipal capitals where the stations are located. The same extract is then published in the Diario Oficial.

Within 30 days, counted from the date of publication in the Diario Oficial, those affected by the rights of way which the concession is going to allow and other interested parties may present pertinent observations to the DGSE. These observations are presented to the concessionaire, who has 30 days to answer. Upon receipt of the answer, the President of the Republic is informed, and he resolves the matter by means of a Supreme Decree.

The Decree for a definitive concession sets the technical standards which the broadcaster should meet and the duration of the concession. If dealing with public services, this duration cannot be less than 30 years or more than 50, and is set in accord with the initial cost of the work. Private service concessions do not have a definite duration but expire when their scope is modified or if public service of equal quality is established between the points of communication.

Once this Supreme Decree is issued, it is converted to a public document within a maximum of 60 days.

The progress of construction work on the stations must follow the approved plans which may be modified only with the DGSE's approval.

The DGSE specifies the location of the stations outside city limits according to their power. An exception is the case of television and FM stations where technical or topographical reasons require DGSE consideration.

Whatever the class of station authorized, it may not interfere with existing Government and public service stations.

### C. Granting of Permits

The DGSE grants certain authorizations directly, that is, without the need of a Supreme Decree as in the case of concessions. These authorizations are called permits.

In the matter of permits, the activity of the DGSE relates only to communications in two instances:

- a. The establishment of amateur and experimental radio communications.
- b. The establishment of equipment using electromagnetic waves for medical, industrial, experimental, or other use which is permitted only if it does not interfere with telecommunications services.

The permits granted by the DGSE for the establishment of amateur and experimental radio communications set the technical requisites which the transmission should follow. In addition the permit specifies the program's duration, which may not exceed five years.

### Chapter 3

## LAPSING, TRANSFER, ABOLITION, AND EXPROPRIATION OF CONCESSIONS

### I. LAPSING

Lapsing may be defined as the abolition of concessions by virtue of determined causes established by law. Lapsing is declared by Decree of the President of the Republic after a report from the DGSE.

#### A. Lapsing of Concessions of All Means of Communication (Except Radio Broadcasting)

The lapse may come about before the concession is developed or after it is operating.

1. Lapsing before development is produced in the following cases:
  - a. If the concessionaire does not sign the public document to which the decree of concession should be converted.
  - b. If the development work is not begun within the period established by the Decree of concession.
  - c. If two-thirds of the work has not been executed within the time set in the Decree of concession, unless it was impeded by a case of Force Majeur.

The concession terminates by virtue of the declared lapse and the concessionaire has the right to raze and withdraw the works executed. If the works occupy national resources in the public domain, he must do so within the

period set by DGSE. If it is a public service concession, the deposit of guarantee which the concessionaire must establish, as explained in the previous chapter, is forfeited and becomes part of the national income.

2. Lapsing of Concessions in Operation. The causes of lapsing involve only public service concessions; that is, they do not apply to private service concessions since by their nature they are only justified in the case of a public service. They may result from the following causes:
  - a. When the state of repair of the installations or the quality of service does not correspond to the technical requirements established in the regulations or in the decree of concession. In these cases the DGSE requires the concessionaire to correct the defects, and if it is not done within six months, a lapse is declared.
  - b. If the concessionaire does not expand service to meet the increased needs resulting from increased population. The DGSE determines what the expansion should be and requires the concessionaire to carry it out; if it does not, lapsing is declared.
  - c. If the concessionaire transfers the concession or its operation in any form without previous authorization of the President of the Republic.

#### B. Lapsing of Radio Broadcasting Concessions

The lapsing of radio broadcasting concessions has such special rules that it is necessary to study them separately from other means of communication.

As in the previous case, the lapsing of radio broadcasting concessions is declared by the President of the Republic by means of a Supreme Decree, and the causes justifying it are the following:

1. When the concession or its operation is transferred without prior authorization by the President of the Republic.
2. When transmission is interrupted for more than 30 days without the authorization of the DGSE.

3. If at any time during the term of the concession the DGSE points out that the installations are technically deficient and the concessionaire fails to correct the deficiencies within six months.

## II. EFFECTS OF LAPSING

The effects of lapsing differ in radio broadcasting concessions as opposed to other means of communication.

### A. Effects of Lapsing in All Means of Communication Except Radio Broadcasting

These effects are produced dealing with public service concessions whether the lapse is produced in the period before operation (I, A, 1. c) or during operation (I, A, 2, a, b, c).

In both cases, the result produced is that the President of the Republic orders the transfer of the concession and the assets it involves to public auction.

In regard to public service concessions, when lapsing by items mentioned in numbers 1 and 2 of paragraph A.2 exists, the President of the Republic should order the DGSE to take immediate possession of the assets of the concession. This possession aims at operating it provisionally while suggesting to the concessionaire that within 30 days he carry out the necessary repairs to the technical defects which caused the lapse.

In all cases of lapse of concessions dealt with, the norms governing the concession's transfer to auction are the same. Before the auction can be conducted, a notice must be published in the Diario Oficial showing the day, time, and place where it will take place. This information must also appear in two notices in a Santiago newspaper and one notice in a newspaper of the location of the concession. The Director General of the DGSE acts as the auctioneer. The auctioneer establishes the minimum for bids, the work which must be done on the concession and the period in which it must be done, and the deposit of guarantee necessary to permit bids in the auction. In the case of no bidders, the auction is repeated with the minimums reduced.

After the auction occurs, 10% of the value of the settlement goes to Government revenues and the 90% remaining is given to the proprietor after occasional expenses have been deducted.

The creditors of the proprietor of any kind, including mortgage holders or chattels, may not impede the auction and only have the right to make their claims on the proceeds of the auction, for which reason the proceeds are assigned to a credit institution at the order of the Higher Civil Court of Santiago to whose turn it falls.

#### B. Effect of Lapsing of Radio Broadcasting Concessions

As in the cases covered above, the direct result of a lapse is that the concession terminates; however, its control and that of its assets are not transferred to public auction. Rather, the concessionaire withdraws the assets that remain part of the concession and terminates the respective rights of way.

### III. TRANSFER OF CONCESSIONS

As a general rule, control or new possession of a concession may not be transferred without previous authorization of the President of the Republic.

This means that it cannot be freely sold, mortgaged, donated, rented, have its operation transferred, contribute to a company or carry out anything that confers rights on the concession. Such transfers require DGSE study and subsequent reports to the President of the Republic. The President can then authorize the transfer by means of a Supreme Decree.

If this rule is violated, the penalty is the lapsing of the concession.

In the case of an authorized transfer, the new concessionaire has six months in which to meet all the requirements imposed for developing the concession.

#### IV. EXPIRATION OF A CONCESSION BY COMPLETION OF ITS ALLOTTED DURATION

When a concession expires because of the completion of its allotted duration, the Government has the power to renew it to the same concessionaire for an additional 30-year period.

In order to secure a renewal of the allotted duration, the concessionaire should set forth the bases on which the concession will be renewed. The proposed bases should be compiled five years before the scheduled renewal.

These bases should include two important points:

- a. Recognition in favor of the State of the part of the capital amortized during the period of the concession as participation in the capital of the company.
- b. The obligation to execute, within the time set, the works of expansion and improvement set by the President of the Republic, with a report of the DGSE.

In the case of renewal of the allotted duration, the State becomes a partner in the concession. Therefore, it should receive a part of the profit proportional to its share in the income of the company, which should be paid semi-annually.

Should the State and the concessionaire fail to reach accord on the bases to renew a concession, the concession is offered at public auction with existing bases. The proceeds of the auction are distributed between the State and the old concessionaire in proportion to the part of the amortized capital the State receives and the old concessionaire's balance to be amortized.

If interested parties cannot be found, it is reoffered to the ex-concessionaire after reducing the requirements. If he does not accept it, the concession is again offered at auction. This process is repeated until the concession is renewed or adjudicated.

## V. EXPROPRIATION OF A CONCESSION

When the DGSE considers it necessary to expropriate a concession, it proposes the expropriation to the President of the Republic. The President, in turn, asks Congress to pass a law declaring the concession a public utility and requests funds to pay the indemnization.

An appraisal committee of three persons is formed to set the appraisal value of the concession to be expropriated. These persons should be engineers appointed by the President of the Republic, by the concessionaire, or by the Supreme Court of Justice, respectively.

The committee sets the value of the concession's assets including its commercial value as an established business, deducting the part corresponding to amortized capital. Interested parties may accept the amount of the indemnization or refuse it, resorting to the Courts of Justice as a last resort to set it.

Indemnization should be paid with a 20% surcharge if the concession is expropriated before ten years have passed from the granting of the decree of concession and with a 10% surcharge if expropriated within twenty years from the same date.

## ANNEX C-2

### PREFACE

This annex contains extracts from:

1. Organic Law of Posts and Telegraphs, Decree with Force of Law No. 171 of March 29, 1960.
2. Rules and Regulations of the Organic Law of Posts and Telegraphs, Decree 747 of March 21, 1962.

### ORGANIC LAW OF POSTS AND TELEGRAPHS

#### PARAGRAPH 8

Regarding the access to rights of way which are reserved to the State.

#### ARTICLE 64

The State reserves the access to rights of way for the construction, placement, and maintenance of its telegraph and telephone lines, antennas and broadcasting systems. Such rights of way permit the occupation of municipal or private property and public or government resources.

On public highways or roads, as well as along railroad lines, a right of way should be reserved along their entire length. A one meter strip between the ditch and the fence on the side determined by the DGSE should be reserved for the placement of telegraph or telephone installations.

Regarding lands or assets of the State Railway Co., the rights of way are established after an agreement between the company and the Posts and Telegraphs Administration. In case of disagreement, it shall be resolved by the President of the Republic.

## ARTICLE 65

The State also reserves access to rights of way over the properties and places mentioned in Article 64 to install and maintain telegraph cables and pneumatic tubes, suspended or located in the subsoil, for the rapid transport of correspondence or telegrams. To this end, it will have the right to sufficient space for the length of railway tunnels and highways or on bridges, viaducts, or other structures of a similar kind, whether government, semi-government or private.

## ARTICLE 66

The municipalities will be obliged to prune the trees on the public streets, avenues, or roads when the DGSE deems it necessary to improve construction of State telegraph or telephone lines. An equal obligation rests with the owners of the properties occupied or contiguous to such lines.

## ARTICLE 67

The owner of occupied property will be obliged to permit workmen to enter to carry out construction, repairs, placement and maintenance of the lines. The workmen proceed under the responsibility of the DGSE. An equal obligation rests with the government or private companies included in Article 65.

The Judge, on request of the owner of the property, shall rule, according to circumstances, on the time and way in which this right shall be exercised.

## ARTICLE 68

The owner of property and occupied land may not make plantings, do construction or works of any kind that disturb the free exercise of the rights of way established in this chapter.

## ARTICLE 69

Private homes are obliged to permit brackets, supports, and attachments to be installed for the State telegraph and telephone lines as well as mailboxes on the external boundaries without the right to any indemnization. The yards,

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orchards, and gardens near the houses could be subject to be crossed by aerial lines but they shall be exempt from the other rights of way established by the present decree with force of law.

An indemnization arising will be set according to the procedure shown in Article 72.

#### ARTICLE 70

The State, through the DGSE, reserves the right to use any type of poles, structures, or underground installations for the transport of energy, telecommunications, railways, public transportation, and public lighting to attach its telegraph and telephone lines and cables in places where traffic does not allow new poles and in all cases in which such utilization is necessary. The companies shall not have the right to indemnization for this right of way.

In telegraph or telephone lines and in aerial or submarine cables, the State shall have the right to impose on private communications companies the inclusion of one or more conductors for its service. In return the State grants them compensation corresponding to the increased cost of installation or maintenance. For this, the concessionaires shall be obliged to inform the DGSE previously of their projects for the installation of new telegraph or telephone lines or cables.

After a report from the DGSE the rights of way covered in this article shall be imposed by a Supreme Decree.

#### ARTICLE 71

The Agency shall have the right to establish offices or locate mailboxes and other elements for their installation and maintenance in suitable places in industrial establishments, mines, or other where population density justifies it. They may also locate facilities in railway stations when service necessities require it, after authorization from the State Railway Company.

## ARTICLE 72

All difficulties arising from the rights of way established in this paragraph shall be processed by summary decisions conforming with the rules in Title XI of Book III of the Code of Civil Procedure. An appeal of a definitive sentence of these decisions will be granted only in a "refund."

To qualify as a judge to rule on such an appeal a person shall be:

- a. From the department where the occupied property is located;
- b. From the provincial capital (if the occupied properties should be located in two or more departments of the same province);
- c. A seatholder on the Court of Appeals, (if the occupied properties should be located in two or more provinces under the jurisdiction of the same Court);
- d. A seatholder on the earliest-founded Court of Appeals (if the occupied properties should be located in provinces under the jurisdiction of various Courts).

## RULES AND REGULATIONS OF THE ORGANIC LAW OF POSTS AND TELEGRAPHS

### ARTICLE 45

Regarding the Traffic Section

- a. To be responsible for the operation of the telecommunications lines, installations, and equipment of the State Telegraph;
- b. To assure that the operation of the conductors, installations, and equipment be done with the greatest utility, efficiency, and security for communications;
- c. Verify that the course of telegraph messages, regarding their admission, transmission, and delivery, be done according to the applicable rules and regulations;
- d. Maintain the register of the freedom from telegraph and radio telegraph fees and report on the franchises granted;
- e. Maintain statistical information on the operation of service which pertains to it;

- f. Supervise the change in the course of communications transmission in case of interrupting of the usual routes;
- g. Recommend to the Department Head the annual work program relating to creation, expansion, or decrease in the telecommunications network;
- h. Conduct a permanent study of current rules and regulations of telegraph service and suggest modifications deemed necessary;
- i. Maintain a register of correspondents accredited by national and foreign newspapers or magazines and mediate in all matters relating to this service;
- j. Establish and maintain relations with other administrations and with the International Telecommunications Union Office and other analagous organs which may be established;
- k. Insure that the branch offices comply with the dispositions of internal rules and regulations, international telecommunications conventions and agreements subscribed to by Chile, and instructions required by them;
- l. Complement the Section Network with regard to telecommunications service for the military.
- m. Keep up-to-date the list of telegraph offices in service;
- n. Communicate at the appropriate time information relating to the state of communications in the country;
- ñ. Collect data on the proceedings relating to internal telegraph service and propose the reimbursement of rates on which the Chiefs of Zones were not able to reach an accord;
- o. Collect data on claims made against internal telegraph service. If further consequences are not involved, the head of the Section will resolve them immediately;
- p. Study the proposals of the DGSE or individuals regarding internal telegraph service;
- q. To keep informed and maintain the record of inspection visits to telegraph offices; study and submit for resolution of the Head of the Telegraph Department the steps which should be adopted as result;

- r. Study and propose the design of telegraph forms, and
- s. Prepare resolutions and service orders relating to inspection visits, summary investigations, and administrative summaries ordered on the basis of background known to the Department and which the Director General should formulate. Likewise, it should also prepare reports which, in accordance with Article 24, Letter A, of the present rules and regulations, the Director General requests in relation to these proceedings, setting an appropriate course.

#### ARTICLE 46

##### Regarding the Radio Section.

- a. Keep the radio communications network of the Service fit for operation and study, coordinate, project, propose and carry out the plans which meet the greatest communications demand;
- b. Supervise the functioning of the Agency's radio stations;
- c. Supervise the repair shops that operate in the different zones;
- d. Control radio plants, their intercommunication equipment and the central telegraph offices and their channels to the security devices in the transmission room;
- e. Report on requests for concession for private radio communications service in accordance with Article 7 of the Organic Law of Posts and Telegraphs;
- f. Propose the budgets for the maintenance, repair, and expansion of the radio communications network and supervise the receipt of equipment, material, and spare parts acquired;
- g. Report on studies of contracts or agreements relating to radio communications;
- h. Study, in accord with existing needs and the reserve stocks, the acquisition of equipment, material, and spare parts and perform the technical acceptance of them;
- i. Express an opinion on the studies of the acquisition of property for the installation of radio telegraph plants;

- j. Give an opinion on the studies of construction projects of radio plants from a technical-functional point of view. Likewise, for the building projects or reconditioning of Posts and Telegraph sites in regard to equipment rooms or radio communications materials;
- k. Set the specifications and characteristics that the radio equipment and material acquired for the Agency should meet;
- l. Maintain the register of frequencies assigned to radio communications service of the State Telegraph and propose the changes or requests for new frequencies, and
- m. Maintain the radio station and equipment plans of the Agency.

#### ARTICLE 47

The Telegraph Department, through the Radio Section, will manage the radio stations of government, semi-government, or private services, when so declared by the Supreme Government in accord with the provisions of Articles 4 and 5 of the Organic Law of Posts and Telegraphs.

#### ARTICLE 48

Regarding the Installation Section.

- a. Maintain the internal installations and office equipment in normal operating condition.
- b. Project and perform the installation of telegraph offices or the reinstallation of the same, prompted by changes in site, renovation of material or other cause. This provision only involves internal office installations, meaning the internal portions apart from the protective devices of the installation;
- c. Test the functioning of instruments and equipment acquired or repaired;
- d. Update the file of equipment plans, instruments or internal office installations, as well as those of the sites devoted to telegraph service;
- e. Study jointly with the Radio and Network Sections modern telecommunications systems and the possibility of their adaption to the operation;

- f. Gather and study the information of a technical nature which the private telecommunications companies provide insofar as relevant;
- g. Study and authorize the request for materials which the Equipment and Instrument Subsection should dispatch;
- h. Propose the telegraph, telephone, telex or other systems with which The Telegraph Department proposes to equip its offices;
- i. Maintain control and statistics on the equipment, instruments, spare parts, materials and tools of the telegraph service;
- j. Supervise the delivery of operating installations and of equipment whose use is introduced in telegraph offices, maintaining a direct supervision over its functioning during a prudent period;
- k. Supervise, when necessary, the manufacture of elements destined for telegraph service;
- l. Propose the bases and specifications for the acquisition of equipment and material regarding its specialty.
- m. Study and propose to the Telegraph Department suggestions which experience advises in construction projects or re-conditioning of sites destined for telegraph service;
- n. Suggest the commission of service, when required, to test the functioning and state of telegraph equipment and installations, and
- ñ. Guard the strict compliance of the obligations of the dependent Subsections.

## ARTICLE 50

Regarding the Equipment and Instrument Subsection.

- a. Establish simple accounting and maintain minute detail of the entrance and departure of equipment, instruments, spare parts and telegraphic materials confided to its custody;

- b. Maintain an inventory of installation, equipment, and telegraph elements in operation in each office of the country;
- c. Maintain a collection of samples of telegraph material and equipment;
- d. Make available to the Postal Telegraphic Museum unused types deemed of historical interest;
- e. Dispatch the requests authorized by the Installations Section, and
- f. Propose an annual list of material which should be discarded and request its replacement.

#### ARTICLE 87

##### Regarding the Telegraph Control Section.

- a. Formulate and review the telegraph and radio telegraph interchange accounts of foreign administrations and private telegraph companies in accord with international conventions and special rules and regulations;
- b. Draw up the interchange telegraph and radio telegraph tariffs, and supervise their application in accord with international conventions and corresponding rules;
- c. Be responsible for the file and custody of the interchange accounts and telegrams, and
- d. Destroy, on the termination of the periods shown in the respective agreements, the file referred to in the previous part. This destruction shall be done in accord with the provisions of Telegraph Rules and Regulations.

ANNEX C-3

ORGANIC RULE FOR THE DIRECCION GENERAL  
DE SERVICIOS ELECTRICOS Y DE GAS

Decree No. 3281 of June 15, 1961

PARAGRAPH 4

Regarding the Telecommunications Department.

ARTICLE 23

The Telecommunications Department shall have the following principal obligations:

- a. Report on requests for concessions of telecommunications services and pass judgment on the studies, plans, specifications and estimates of the work presented by the concessionaires;
- b. Supervise and inspect the construction work of the concessions, verify their conformity with the plans approved by the President of the Republic, and study the detailed plans of such work;
- c. Acceptance of the work of telecommunications concessions;
- d. Enforce compliance with the provisions established in the General Law of Electric Services, in the decree with force of law No. 315 of April 1, 1960, and in the respective rules and regulations relating to telecommunications services, and the obligations established in the concession decrees;
- e. Exercise technical and accounting inspection over civilian telecommunications companies and services, and activities using electromagnetic waves;
- f. Study the stability of fixed capital and tariff requests of public service telephone companies or other telecommunications systems;

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- g. Establish norms to avoid mutual interference between electronic systems of any kind;
- h. Enforce compliance with international telecommunications agreements and accords subscribed to by Chile, studying and proposing the passing of laws and rules and regulations for optimum compliance with these agreements and accords;
- i. Assign radio electric frequencies in the way most appropriate for each type of service, avoiding prejudicial interference between radio communications stations;
- j. Attend public meetings and resolve the claims made against concessionaires and authorized technicians referred to in the following item;
- k. Examine the candidates for licenses mentioned in number 4 of article 159 of the decree with force of law No. 4 of 1959 whose specialty belongs to this Department, and send the Director the background necessary for their approval or rejection;
- l. Grant amateur radio and experimental licenses;
- ll. Attend to the coordination of telephone, telegraph, and telecommunications services of all kinds;
- m. Control all the telecommunications services of the country by means of telecommunications control stations;
- n. Monitor and test installations and equipment using electromagnetic waves, especially those destined for telecommunications services;
- ñ. Study the forecast of national telecommunications needs and propose the execution of new installations by the concessionaires to meet the demand for public telecommunications services;
- o. Formulate the statistics on the country's telecommunications services;
- p. Propose to the Director the prohibition of the use of machines, instruments, artifacts, equipment, material, etc., that constitute a danger to people or things. Present for the Director's signature the certificates of approval for those that meet the specifications and standards set by the DGSE upon testing the Telecommunications Department laboratory;

- q. Maintain a complete background file of all companies, services, equipment and installations relating to telecommunications and other applications of electromagnetic waves;
- r. Advise Municipalities that are concessionaires of telecommunications services;
- s. Study and propose rules and regulations for telecommunications companies regarding the relations between such companies and their customers;
- t. The Chief Engineer of the Telecommunications Department will serve as Secretary of the National Telecommunications Commission, created by decree with force of law No. 315 of 1960. The rights and duties of the Department Head when acting as Secretary of the Commission shall be established in the Rules and Regulations of the Commission; and
- u. The Department Head will inform the Director in writing, in the first half of January of each year, of the work accomplished and the activity of the Department during the previous year.

ANNEX C-4

CREATION OF THE NATIONAL COMMISSION  
OF TELECOMMUNICATIONS

Decree No. 315 of April 1, 1960

WHEREAS:

There is a need to achieve coordination in the administration, control, and development of the country's telecommunications, between the present state organization and the Electrical and Gas Services.

Decree With Force of Law

ARTICLE 1

The Telecommunications Commission (hereafter called the Commission) is created as a technical advisory entity in the area of the country's telecommunications. The Commission shall be in charge of coordination, orientation, and improvement studies of all internal and exterior telecommunications. The DGSE will serve as an intermediary to keep the Government informed of all resolutions and standards to be adopted. Telecommunications includes all transmissions or receptions of signals, writing, images, or information of any kind made by wire, electricity, optical means, or any other electromagnetic systems.

ARTICLE 2

The body of the Commission will consist of the following persons:

- a. The Minister of Interior, who will preside over the Commission.
- b. The Director General of Electric Services.

- c. The Under Secretary of Commerce and Industry of the Ministry of Economy.
- d. A representative of the Aeronautical Administration.
- e. A representative of the Coast Guard and Merchant Marine.
- f. A representative of the Ministry of National Defense.
- g. A representative of the Post and Telegraph Services.
- h. A representative of the Industrial Development Corporation (CORFO).
- i. A representative designated by the President of the Republic.

The Director of the DGSE will act as Secretary of the Commission and he will be responsible for matters relating to telecommunications.

The rules and regulations will outline the replacement procedures for the Secretary and Members of the Commission, concerning requirements, inabilities and incompatibilities to perform the duties as a Member of the Commission. In addition, the rules will cover the assignment period for those positions described in items d, e, f, g, h, and i above, of this Article. At the same time, regulations referring to cases where the President is absent or impeded will be covered, or matters related to technical advising quorums so that meetings can be held to pass resolutions and other disposition of functions of the Commission.

### ARTICLE 3

In addition to the resolutions adopted in Decree No. 4 of July 24, 1959, it will be the duty of the DGSE to expedite and develop the telecommunications system in the country and to insure that all the laws, regulations, national resolutions, treaties, international agreements, etc., related to telecommunications are followed and observed.

It will also be the Commission's responsibility to observe and inspect all technical and financial matters related to the various telecommunications

organizations and public services. The Commission shall also regulate all activities that presently use electromagnetic waves, and dictate technical standards which govern equipment, instruments and materials, or any other elements using such waves.

The DGSE will serve as a liaison with the international organizations and will discuss telecommunications subjects with other countries.

#### ARTICLE 4

The Commission will have the following principal obligations:

- a. To provide the Government with national telecommunications policies.
- b. To monitor, through the DGSE, public activities of telecommunications in the country in order to insure that the performance and development of these activities are carried out in an orderly and economic manner.
- c. To promote the improvement of national telecommunications. For this purpose, the Commission will make proposals to the Government for actions necessary for practical improvements while considering any specific matters set forth in the regulations.
- d. Report to the Government regarding the distribution and allocation of funds for the development and implementation of the telecommunications field in relation to the budget and other laws except the distribution of funds allocated by law to a particular service.
- e. Report to the Government on matters concerning the granting of concessions, suspension, expiration or termination of concessions of telecommunication services.
- f. Report to the Tariff Commission (Decree No. 4 of 1969) concerning Legal considerations about Force of Law telecommunications tariffs. The Tariff Commission will have the power to approve tariffs and other conditions relating to the performance of service conditions by concessionaires or tariffs can be fixed by the authority of the Tariff Commission.
- g. Propose and report to the Government, matters concerning resolutions, treaties, and international agreements which are directly related to telecommunications. Once they are approved, the Commission assures that they shall be carried out.
- h. Recommend to the Government the appointment of the Chilean delegates to organizations and international telecommunications

meetings and other associations pertaining to electromagnetic waves.

#### ARTICLE 5

The administrative and technical organization of the DGSE, as it relates to telecommunications will be made by the respective Body.

#### ARTICLE 6

The DGSE will maintain direct contact with the mobile, maritime, aeronautical services without the need to follow official channels of the State Department. The State Department has these services as their charge.

#### ARTICLE 7

Government-owned telecommunications equipment will be regulated by the Decree of Law No. 4 of 1959 and also the present Decree in force of Law and any other legal standards and regulations related to this subject. They need only an authorization rather than a grant, which shall be issued by the Ministry of Interior by previous notification to the DGSE.

#### ARTICLE 8

The exception to Article 7 shall be applied to military or police telecommunications equipment.

The previous paragraph is in accordance with Article 3 of the Decree with Force of Law No. 4 of 1959.

#### ARTICLE 9

In case of civil disturbance, mobilization, or war, the Government shall take total or partial control of the telecommunication services.

ANNEX C-5

ORGANIC STANDARDS OF THE  
TELECOMMUNICATIONS COMMISSION

Decree No. 2103 of April 18, 1961

Established as a Decree with Force of Law 315 of 1960.  
(Published in the Diario Oficial  
No. 24, 948 of March 19, 1961).

Number 2103, Santiago, April 18, 1961 Decree

DECREE

The following Regulations of the Telecommunication Commission have been approved by Decree with Force of Law 315 of April 1, 1960.

ARTICLE 1

By Decree with Force of Law 315, of April 1, 1960, published in the Diario Oficial on April 4 of the same year, the Telecommunications Commission (hereafter called Commission) will have as its objective the study of the coordination, orientation, and improvement of national and international telecommunications. They will also report to the government through DCSE on resolutions and measures that, in their judgment, should be adopted.

ARTICLE 2

The Commission will be formed by the following persons:

- a. The Minister of Interior, who will preside over it
- b. The Director General of Electric Services
- c. The Under Secretary of Commerce and Industry of the  
Ministry of Economy
- d. A representative of the Aeronautical Administration
- e. A representative of the Coast Guard and Merchant Marine

- f. A representative of the Ministry of National Defense
- g. A representative of the Post and Telegraph Services
- h. A representative of the Industrial Development Corporation (CORFO)
- i. A representative designated by the President of the Republic

The Chief of the Department of the DGSE will act as the Secretary of the Commission, and he will be responsible for matters related to telecommunications

### ARTICLE 3

A substitute will be designated for each of the members of the Commission except the representatives indicated in items a. and b. of Article 2.

If the Secretary is not able to attend and take care of the matters mentioned above, a representative designated by the DGSE will take his place.

The substitute will have the power to assist at the meetings and will be granted active voice even when the representative he is representing is also present at the meeting.

### ARTICLE 4

Substitutes for the members of the Commission referenced in paragraphs d., e., f., g., h., and i. of Article 2 will be appointed in accordance with the rules and regulations of the entities which they represent. They will be elected every three years, and they can be replaced or re-elected.

### ARTICLE 5

The elected members who form the Commission should be of Chilean nationality, at least 21 years of age, and shall meet the requirements shown in Decree with Force of Law 338 of 1960, in order for them to become a part of the Administrative Body of Public Administration.

The following points will disqualify a person from becoming a member of the Commission: Persons who by law have been declared in bankruptcy; persons who have their own interests invested in private companies related to public services in telecommunications or broadcasting fields; the spouse of said persons

or any member of the family up to the fourth generation or who are related by marriage in First and Second Degree who have interests in the companies referenced above, will be an impediment for a person to be part of the Commission. The exceptions in such matters are specifically shown by law.

#### ARTICLE 6

The Minister of Interior will preside over the Commission. In case of his absence, the Commission will be headed by the next ranking member on the list in Article 2.

#### ARTICLE 7

The Commission will convene in the offices of the Ministry of Interior, or in the offices of the DGSE, or any other place as specified by the President.

If the Commission has matters pending, they shall meet ordinarily once a week at a date and time previously determined. Under extraordinary circumstances, they will convene whenever the President calls for a meeting.

A chronological file of the Minutes of the Meetings should be kept up to date by the Secretary. A report covering each meeting should be signed by the President and Secretary.

#### ARTICLE 8

Six members are to be required as a minimum quorum for the Commission meetings. Before the Commission approves a resolution, it must be agreed upon by the majority of the members. If the Commission should ever come to a tie vote, the President of the Commission would be the one to cast the deciding vote.

#### ARTICLE 9

The administrative procedures for the Commission will be established by the DGSE.

Resolutions passed by the Commission will be signed by the President and Secretary. The members of the Commission disagreeing with any of the resolutions approved by the Commission are entitled to have their voting recorded in the Commission's minutes.

#### ARTICLE 10

The Commission will decide, as a jury, and will weigh the evidence in good faith, when no previous laws or bylaws exist on a matter. In such a case, the vote will be approved by two-thirds of the members of the Commission.

#### ARTICLE 11

In order for the Commission to make more meaningful decisions, it shall hear opinions from the representatives of the Associations of Radio Broadcasting, amateur radio operators, private telecommunications companies, interested parties or other parties who are concerned. In addition, the Commission can request reports on professional and technical assistance as governed by Administrative Statutes as well as make available such proceedings as it deems necessary.

#### ARTICLE 12

The Commission will designate a Technical Subcommittee which will be formed by four members of the Commission. The Secretary will preside over this Subcommittee.

The Commission will have the faculty to designate as many Subcommittees as it considers necessary to achieve its objectives.

#### ARTICLE 13

The Technical Subcommittee will study petitions and information concerning the granting of licenses, suspension, expiration, and termination of telecommunication concessions and other pertinent technical matters brought before the Commission. The reports of the Subcommittee will be given to the members of the Commission at appropriate times. If no objections are made to the reports of the technical Subcommittee, all the resolutions adopted by the Subcommittee will be incorporated into the minutes of the Commission meeting.

All the resolutions considered by the Commission will be discussed when the General Assembly convenes.

On behalf of the Commission, the Secretary may gather study information from government and private entities to assist the Subcommittee in arriving at more valid conclusions in their studies.

The report conclusions reached by the Subcommittee shall show specifically all the technical, economical, and general background which are the basis for such a report.

In cases such as granting permits for private telecommunications services, the Technical Subcommittee shall recommend whether or not the concession is in accordance with communication needs.

#### ARTICLE 14

The Commission shall approve, modify, or reject petitions related to the various uses of electromagnetic waves which could affect telecommunications service.

ANNEX C-6

TELECOMMUNICATIONS LEGISLATION IN FORCE IN CHILE

Order Number	Number of Law or Decree	Date	
1	D. 5621	6-12-29	Grants authority to the Director of Electric Service to subscribe Law No. 4791.
2	L. 4791	20-1-30	Grants contract to the Telephone Company, D/015.579 of 23-1-30.
3	DFL 244	15-5-31	Electric Services General Law.
4	DFL 385	30-1-34	Regulations of concessions.
5	D. 3386	16-8-35	Regulations for the development of of lighting power related to Electrical Services.
6	D. 4557	31-10-35	Resettlement of the Long Wave dial.
7	D. 4833	18-11-35	Prohibits the transmission of horse races.  South American Radio Communications Report, Buenos Aires in 1935. Revised in Santiago of Chile in 1940.
9	O. M. S.	6-10-36	Superintendance disposition on information concerning broadcasting concessions.
10	D. 3399	26-7-40	Modifies Decree No. 3386.
11	D. 2939	28-7-44	Modifies Decree No. 3386.
12	D. 3375	28-8-44	Broadcasting Regulation OLOC and amateur radio operation for D/020.013/22-11-44.

Order Number	Number of Law or Decree	Date	
13	D. 4882	22-11-44	Electric Services Tax Regulations.
14	D. 4883	22-11-44	Regulations for the professionals memorandum book.
15	D. 1038	24-4-47	Modifies Decree No. 3386.
16	D. 2270	5-5-48	Modifies Decree No. 3386.
17	D. 5800	30-9-48	Modifies Decree No. 3386.
18	D. 4581	8-10-49	Regulations for Broadcasting Transmissions.
19	D. 4244	3-9-50	Radio Communications Regulations for Amateur Radio Operations Services D/0 21.911, 3-4-51.
20	D. 2332	12-5-52	Assigns authority to the Directorate of Electric Services.
21	D. 3761	28-7-52	Modifies Decree No. 3375. D/0 22.359, 26-10-52.
22	D. 6127	1-12-52	Modifies Decree No. 3375 D/0 22.435, 29-12-52.
23	International Judgment I No. 4019	10-3-55	Concerning transferring rights.
24	L. 11.704	20-10-54	Municipal Income. Taxes applied to Telecommunication Installations Title IV - Article 116.
25	D. 5268	29-11-55	Modifies Decree No. 3386 D/0 dated 2-1-56.
26	D. 2810	12-7-56	Allows concession of broadcasting channels.
27	D. 314	17-1-56	Modifies Decree No. 3386.
28	D. 4821	6-12-56	Modifies Decree No. 3375 D/023. 632, 26-12-56.
29	Agreement	15-2-58	Agreement between the Telephone Company and the Government.

Order Number	Number of Law or Decree	Date	
30	D. 1996	27-3-58	Excludes the telephone service of the disposition shown in Law No. 12.861, Article 113. Incorporated.
31	D. 7039	24-10-58	Regulations for stations of frequencies higher than 29.7 Mcls. D/10 24.204, 26-11-58.
32	D. 373	1958	Modifies Decree No. 4882.
33	D. 6422	9-10-58	Modifies Decree No. 4882.
34	DFL. 4	24-7-59	Electric Services General Law.
35	D. 269	21-1-60	Establish inforcement of DFL 244.
36	D. 315	1-4-60	Creates the National Commission of Telecommunications.
37	D. 5037	6-10-60	Reorganization of DFL 171 Post Office and Telegraph General Law.
38	D. 1432	24-3-60	Modifies Decree No. 4882 D/0 24.634, 3-5-60.
39	D. 1767	8-4-60	Regulations for Tariff Concessions D/0 24.650, 25-5-60.
40	D. 2103	18-4-61	Approves the Constitution of the Telecommunications Commission.
41	D. 3281	15-6-61	Approves the Constitution of the DGSE.
42	D. 693	15-3-62	Regulations for Broadcasting Stations.
43	D. 1104	22-5-62	Appendix to Decree 4581 D/0, 9-6-62.
44	Ley 15.163	13-2-63	Obligation regulations of the Telephone Companies to install telephones in populated areas.
45	D. 2210	6-12-61	Modifies Decree No. 693 D/0 25.423, 21-12-62.
46	D. 1217	28-6-63	Explains Decree No. 693 D/0 25.423, 21-12-62, concerning general services.

Order Number	Number of Law or Decree	Date	
47	D. 1620	29-8-63	Modifies Article 8 of Decree No. 2103 D/0 15.642, 14-9-63.
48	Judgment Ministry of Interior	22-10-63	Concerning documents which should be attached to the requests for licenses for Stock Limited Companies.
49	D. 1990	24-10-63	Modifies Decree No. 7039.
50	D. 2158	26-11-63	Modifies Tax Regulations of Decree No. 4882.
51	D. 1800	25-8-64	Modifies Decree No. 639 D/0 25.949, 26-9-64.
52	D. 1819	27-8-64	Introduces Services for telephone messages.
53	D. 2228	20-10-64	Modifies Decree No. 693 D/0 26.014, 14-12-64.
54	D. 146	21-1-65	Dispositions for radio transmissions during the elections.
55	D. 1071	22-6-65	Approves instructions for the optimum development of public services.
56	D. 606	2-8-65	Economy and development sets prices for television sets.
57	D. 97	24-1-66	Approves International Regulations and Rules of 1959.

ANNEX C-7

CHRONOLOGICAL LIST OF CONCESSIONS

This Annex contains a chronological list of the concessions granted from 1927 to 1967, inclusive. The decree number, date, subject, interested parties, number of stations and frequencies used, as also given.

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
7650	18-XI-27	DGSE and César Cordovez representing the Agencia Haras. Installation of a receiving station for news. 10 years.	1	-
145	9-I-28	DGSE and Alberto Marty and Eduardo Bradley representing the Cía. Nacional en Radio. Installation and operation of a 2nd class radio broadcasting station. 30 years	1	857
5333	26-X-28	DGSE and Cía. International de Radio S. A. Installation of an international commercial transmitting station. 50 years	1	
3130	15-XI-28	DGSE-Chile Telephone Company. Authorization to provide an international telephone service. No fixed term.		
5297	25-X-28	DGSE-The Chile Telephone Company. Authorization to establish a domestic long-distance telephone service (Concepción-Lautaro).		
5576	14-XI-28	DGSE-Cía. Internacional de Radio. Authorizes the connection of radio installations (Decree 5333, 26-X-28) with foreign telephone service.		
5865	4-XI-28	DGSE-The Chile Telephone Company. Authorization to establish a long-distance communications service between the different cities included on the telephone network of said Company.		

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Decree	Date	Subject	No. of Stations	Frequencies (KHz)
5968	11-XII-28	DGSE-The Chile Telephone Company. Authorizes the inclusion of a telephone central office in the Antofagasta district.		
5972	11-XII-28	DGSE-The Chile Telephone Company. Authorizes the establishment of a "differed" communications service on the international telephone service.		
5973	11-XII-28	DGSE-The Chile Telephone Company. Authorizes international telephone communications with Argentina and Uruguay.		
116	11-I-29	DGSE-The Chile Telephone Company. Approves plans for stringing a long-distance line San Miguel-San Barnardo.		
1168	15-III-29	DGSE-Oscar Friedli Tomi. Grants a provisional concession for telephone service in Puerto Porvenir.		
2192	15-V-29	DGSE-Ricardo Roth. Definitive concession for private telephone service Peulla-La Cumbre and Petrohué-Puerto Varas.		
2228	16-V-29	DGSE-The Chile Telephone Company. Long-distance line Santiago-Los Andes.		
2242	16-V-29	DGSE-Empresa de Teléfonos de Llanquihue. Telephone service in Chiloe and Valdivia.		

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
3396	31-VII-29	DGSE-The Chile Telephone Company. Telephone line Chillán-Coihueco.		
3398	31-VII-29	DGSE-Transradio Chilena. Authorizes to connect radio installations with its private lines or any public telephone service.		
3604	17-VIII-29	DGSE-Cía de Administración y Custodia de Valores. Private telephone line between Cocalán and Las Cabras.		
3843	6-IX-29	DGSE-The Chile Telephone Company. Long-distance line Concón-Quintero.		
3391	31-VII-29	DGSE-Ladislao Larraín L. Second-class broadcast station in Los Andes. 30 years.	1	9,375
3523	13-VIII-29	DGSE-Carlos Reiher Lass for Radio Club of Valparaíso. Second-class broadcast station in Valparaíso. 30 years	1	1,153.8
3982	14-IX-29	DGSE-William W. Hall for Soc. Com. "The Southern Radio Corp. Chile Ltda." International commercial station in Santiago. 30 years	1	8,200 4,100
5460	30-XI-29	DGSE-Miguel Angel Dos Reis for Soc. Agencia Americana, Anónima de Servicios Noticiosos y Radio Eléctricos. International commercial station in Santiago. 30 years.	1	9,750 15,400 20,900

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
3909	11-IX-29	DGSE-Soc. Explotadora Tierra del Fuego. Private telephone service Porvenir-Río Grande.		
3911	11-IX-29	DGSE-Soc. Explotadora Tierra del Fuego. Private telephone service Oazy Harbor-Cerro Guido.		
4153	26-IX-29	DGSE-Cía Salitrera Pedro Perfetti. Telephone service in Taltal Department.		
5583	1929	DGSE-The Chile Telephone Co. Long-distance telephone line Valparaíso-Calera-Los Andes.		
5624	6-XII-29	DGSE-The Chile Telephone Co. International telephone service between Chile and the other American and European countries.		
387	25-I-30	DGSE-Horacio Aránguiz Cerda. Private telephone line between La Palma Estate and the telephone office of San Vicente de Tagua-Tagua.		
873	6-III-30	DGSE-Jorge Chodowiecki. Private telephone line between the estates La Araucanía and Los Pinos, Gorbea, Villarica Dept.		
699	28-II-31	DGSE-The Chile Telephone Co. Long-distance telephone line between Viña del Mar and Quintero.		

Decree	Date	Subject	No. of Stations	Frequency (KHz)
876	19-I-31	DGSE-Tacna and Arica Telephone Co. Ltd. Telephone service in the territory of Arica Dept.		
4748	30-XI-31	DGSE-Empresa Periodística El Mercurio. First-class broadcasting station in Santiago. 30 years.	1	705
4878	15-XIII-31	DGSE-Federico Patiño McIver. Second-class broadcasting station in Santiago. 30 years	1	1,145
1066	6-IV-32	DGSE-Emilio Turina Blagina Second-class broadcasting station in Punta Arenas. 30 years	1	1,180
575	18-II-32	DGSE-Eduardo Encina Bustos. Second-class broadcasting station in Santiago. 30 years	1	1,105
1652	27-V-32	DGSE-Soc. Orlanchini y Raggio Ltda. First-class broadcasting station in Santiago. No fixed term.	1	785
3914	17-X-32	DGSE-German Holtelmer Valdivia. Second-class broadcasting station in Santiago. 30 years	1	1,065
3915	do	DGSE-Hernán Medina Lavín. Second-class broadcasting station in Santiago. 30 years	1	1,30
3916	do	DGSE-Rafael Araya Bravo. Second-class broadcasting station in Viña del Mar. 30 years.	1	1,090
3917	do	DGSE-Soc. Sotomayor y Guerra. Second-class broadcasting station in Santiago. 30 years	1	1,265

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
4396	4-XI-32	DGSE-The All American Cables Inc. Rental of a Santiago-Mendoza telegraph line to Panamerican Grace Co.		
3938	17-X-32	DGSE-Jorge Romero Ramírez. Second-class broadcasting station in Rancagua. 30 years	1	1,390
4900	7-XII-32	DGSE-Luis M. Desmaras S. Second-class broadcasting station in Santiago. 30 years.	1	1,345
3918	17-X-32	DGSE-Soc. Periodística de Chile. First-class broadcasting station in Santiago. 30 years	1	825
3919	do	DGSE-Luis Benedicto Bravo. Second-class broadcasting station in Santiago. 30 years	1	1,025
3920	do	DGSE-Fernandel R. Keitel Frías. Second-class broadcasting station in Santiago. 30 years	1	1,385
3922	do	DGSE-Valenzuela y Nelson Ltda. Second-class broadcasting station in Santiago. 30 years	1	1,130
3932	do	DGSE-Guillermo Espinoza R. Second-class broadcasting station in Rancagua. 30 years	1	1,450
3933	do	DGSE-Jorge Wilson Werner. First-class broadcasting station in Santiago. 30 years	1	945
3934	do	DGSE-Sazie Hnos. Ltda. First-class broadcasting station in Santiago. 30 years	1	985

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
3935	do	DGSE-Manuel Casabianca Latorre. Second class broadcasting station in Santiago.	1	1,065
3936	do	DGSE-Soc. Curphey y Jofré Ltda. Second class broadcasting station in Santiago. 30 years	1	1,050
3937	17-X-32	DGSE-Antonio Salgado Oliva. First class broadcasting station in Santiago. 30 years	1	865
4902	7-XII-32	DGSE-Soc. Eleuterio Olivos y Cía. Ltda. First class broadcasting station in Santiago. 30 years	1	585
310	23-I-34	DGSE-Oscar Cornejo Harnecker. First class broadcasting station in Valparaíso. 30 years	1	1,050
311	23-I-34	DGSE-Luis Riesco Leyton. First-class broadcasting station in Viña del Mar. 30 years	1	1,010
385	30-I-34	Approves the attached Regulation of Concessions, required by DFL No. 244 of 15-V-31.		
923	9-III-34	DGSE-Cía Telefónica de Tierra del Fuego. Definitive concession to provide telephone service in the Dept. of Tierra del Fuego.		
924	9-III-34	DGSE-Juan Bautista Oñate Rosas. Second class broadcasting station in Osorno. 30 years	1	1,335
1163	23-III-34	DGSE-Guillermo Vásquez Valdés. First class broadcasting station in Valparaíso. 30 years	1	1,090

Decree	Date	Subject	No. of Stations	Frequency (KHz)
1320	3-IV-34	DGSE-Rolando Beckclorf Sannier. Second-class broadcasting station in Concepción. 30 years	1	1,240
1840	30-IV-34	DGSE-Sociedad Pascual Hnos. First class broadcasting station in Santiago. 30 years	1	1,625
1992	8-V-34	DGSE-Alberto Gatica Soffia. First-class broadcasting station in Valparaíso. 30 years	1	730
2096	15-V-34	DGSE-David Wallace. First-class broadcasting station in Valparaíso. 30 years	1	1,250
2813	19-VI-34	DGSE-Gustavo Helle Wulf. Private telephone line between Valdivia and the Rincón Nuevo Estate.		
3242	10-VIII-34	DGSE-Angel I. Prieto Andreas. First-class broadcasting station in Valparaíso.	1	750
3909	14-VIII-34	DGSE-Francisco Morales Castillo. Second-class broadcasting station in Talcahuano. 30 years	1	870
4148	30-VIII-34	DGSE-Soc. Spencer y Vivado. First-class broadcasting station in Valparaíso. 30 years	1	810
4647	2-X-34	DGSE-Germán Holtelmer Valdivia. First-class broadcasting station in Santiago. 30 years	1	1,385
4648	2-X-34	DGSE-Manuel Casabianca Latorre. First-class broadcasting station in Santiago. 30 years	1	1,065

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
4864	11-X-34	DGSE-Carlos Wiedmaier Huirichsen. First-class broadcasting station in Santiago. 30 years	1	1,105
5060	24-X-34	DGSE-Cristóbal Saenz Cerda. Private telephone line between Chufquén, Quichamanida, and Traiguén estates.		
5328	6-XI-34	DGSE-Emilio Vierling. Receiving station for news messages in Santiago	1	
5761	28-XI-34	DGSE-United Press Association. Receiving station for news messages in Santiago.	1	
744	19-II-35	DGSE-David Arriagada Zavala. Second-class broadcasting station in Osorno. 30 years	1	1,115
2617	17-VI-35	DGSE-Empresa Periodística El Mercurio. Broadcasting station The class is not shown but the term is one year.	-	
2968	16-VIII-35	DGSE-Carlos Segundo Kachler Schroeder. Second-class broadcasting station in Temuco. 30 years	1	1,370
3367	14-VIII-35	DGSE-Empresa de FF. CC del Estado. Telephone line between Pucón and Loncoche.		
3633	30-VIII-35	DGSE-Soc. Nacional de Agricultura. First-class broadcasting station in Santiago. 30 years	1	570

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
3730	8-IX-35	DGSE-Luis Desmaras Stroeymeyte. Second-class shortwave broad- casting in Santiago. 5 years	1	6,150
3816	11-IX-35	DGSE-Ricardo Méndez Maruri. Second-class broadcasting sta- tion in Quillota. 5 years	1	1,130
4255	14-X-35	DGSE-Cía. Internacional de Radio S. A. First-class shortwave broad- casting station in Santiago. 10 years.	1	9,545
4464	29-X-35	DGSE-Soc. Markoff Hnos. Ltda. First-class broadcasting station in Santiago. 5 years	1	1,500
124	8-I-36	DGSE-Soc. Spencer y Vivado, Ltda. First-class broadcasting station in Valparaíso. 5 years	1	840
1573	31-III-36	DGSE-Raquel Palma Severín. Second-class broadcasting station in Antofagasta. 5 years	1	1,270
2213	6-V-36	DGSE-Renard y García Tello, Ltda. First class broadcasting station in Viña del Mar. 5 years.	1	680
3127	6-VII-36	DGSE-Rafael Segundo Barrios Cárcamo. Second-class broad- casting station in Chillán. 5 years	1	1,270
3571	6-VIII-36	DGSE-Antonio Cajiao González. Second-class broadcasting station in Iquique. 5 years	1	630
4661	31-X-36	DGSE-Enrique García Valdés. Second-class broadcasting station in Talca. 5 years	1	1,430

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
4795	13-XI-36	DGSE-Miguel Arrau Sepúlveda. Second-class broadcasting station in Chillán. 5 years	1	1,330
4798		DGSE-Hilda Cuellar Alfaro. Second-class broadcasting station in Tocopilla. 5 years	1	900
5523	31-XII-36	DGSE-Alberto Carrasco Carrasco. First-class broadcasting station in Valdivia. 5 years	1	960
317	25-I-37	DGSE-Tomás Guiart Aulet. Second-class broadcasting station in Puerto Montt. 5 years	1	1,470
387	29-I-37	DGSE-Shell-Mex Chile Ltda. Telephone service between the Company offices and storage points and buoys of the boats.		
803	23-II-37	DGSE-Ricardo Roth Schutz. Radiotelegraph service between Peulla and the State Telegraph station in Puerto Montt.		
1161	17-III-37	DGSE-Angel García y Cía.Ltda. First-class broadcasting station in Antofagasta. 5 years	1	1,410
1216	23-III-37	DGSE-Enrique Becker Germain. First-class broadcasting station in Santiago. 5 years	1	1,360
1220	23-III-37	DGSE-Soc. Aurífera Alhué. Radiocommunication between the Santiago offices and Mina Estero de Agua Fría, Alhué. 20 years	2	6,800
1427	5-IV-37	DGSE-Alberto Carrasco Carrasco. Second-class broadcasting station in Valdivia. 5 years	1	11,900

Decree	Date	Subject	No. of Stations	Frecuencie (KHz)
1448	7-IV-37	DGSE-Universidad Santa María. Second-class broadcasting station in Valparaíso. 5 years	1	1,030
2761	9-VII-37	DGSE-Luis E. Brani Sánchez. First-class broadcasting station in Santiago. 5 years		
3356	25-VIII-37	DGSE-Raúl Grez González. Second-class broadcasting station in Talca. 5 years	1	670
3577	8-IX-37	DGSE-Soc. Orlandini y Raggio Ltda. First-class shortwave broadcasting station in Santiago. 5 years	1	11,740
3910	4-X-37	DG Carabineros-Juan Klienzle. Installation of direct telephone service between the Carabineros precinct stations and the telephone booths in the cities which the Carabineros designate.		
4440	12-XI-37	DGSE-Jorge Echegoyen Ballacey. First-class shortwave broadcasting station in Santiago. 5 years	1	11,850
4738	3-XII-37	DGSE-Broadcasting Soc. Nacional de Agricultura y Cía. Ltda. First-class shortwave broadcasting station in Santiago. 5 years	1	11,800
1843	20-V-38	DGSE-Chile Exploration Company. Private radiotelephone transmitting and receiving stations in Tocopilla and Chuquicamata.	2	7,600
1988	30-V-38	DGSE-Soc. La Cooperativa Vitalicia. First-class shortwave broadcasting station in Valparaíso. 5 years	1	15,100

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
2896	10-VIII-38	DGSE-The West Coast of America Telegraph Co. Ltd. Concession to maintain the installations which they have in the country for over-seas telegraph service.		
3291	31-VIII-38	DGSE-Gustavo Vierling. Authorization to install a radio receiving station in Santiago to receive news from Berlin. Term: Dec. 31, 1939		
3895	4-X-38	DGSE-Ernesto Riedel S. Second-class broadcasting station in Puerto Montt. 5 years	1	1,470
4674	23-XI-38	DGSE-Sociedad Radioemisoras Sur de Chile, Ltda. First-class broadcasting station in Puerto Montt. 5 years	1	1,010
5095	15-XII-38	DGSE-Soc. Ernesto Groene y Cía. Provision of a telephone service between Aysén and Baquedano.		
2367	19-V-39	DGSE-Enrique Becker Germain. First-class broadcasting station in Santiago. 30 years	1	9,600
2769	6-VI-39	DGSE-Daniel De Mayo Levy. Second-class broadcasting station in Temuco. 30 years	1	900
3127	20-VI-39	DGSE-Enrique Becker Germain. First-class broadcasting station in Santiago. 30 years	1	1,300
272	25-I-40	DGSE-Manuel Massoni Bustamante First-class broadcasting station in Rancagua. 30 years	1	630

Decree	Date	Subject	No. of Stations	Frequency (KHz)
3103	29-VI-40	DGSE-Soc. Herrany y Guerra. Second-class broadcasting station in San Fernando. 30 years	1	1,210
3135	29-VI-40	DGSE-Julio Femenías Loyola. First-class broadcasting station in Punta Arenas. 30 years	1	1,130
4382	4-IX-40	DGSE-Ruggero Lauria. Receiving station for news from Italy.		
4518	II-IX-40	DGSE-Bolsa de Comercio de Santiago. Private telephone service Santiago-Valparaíso.		
4520	II-IX-40	DGSE-José Miguel Cifuentes Pincheira. Second-class broadcasting station in Los Andes. 30 years	1	690
4791	30-IX-40	DGSE-All American Cables and Radio Inc. Concession to maintain telegraph lines Arica-Concordia and Cccinare-Chacaña. Telegraph service concession between Arica and Bolivia		
1240	28-II-41	DGSE-Eliás Concha Segara. Second-class broadcasting station in Linares. 30 years	1	1,420
2297	30-IV-41	DGSE-Humberto Castelblanco Agüero. Third-class broadcasting station in Los Angeles. 30 years	1	1,210

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
2726	31-V-41	DGSE-Ferrocarriles del Estado. Transceiving stations for radiotelephone and radiotelegraph service in the following cities:		
		Copiapó	1	160
		Coquimbo	1	8,140
		Calera	1	7,570
		Santiago	1	8,950
				9,100
		Santiago	1	8,710
		Concepción	1	7,820
		Valdivia	1	5,900
		Puerto Montt	1	6,930
				10,060
		Castro	1	6,689
		Achao	1	5,800
		Aysén	1	8,160
		Punta Arenas	1	14,900
				6,980
534	28-I-42	DGSE-Transradio Chilena. a) Commercial radio station for foreign communications. b) Central offices and telephone lines for foreign communications.		
859	13-II-42	DGSE-Francisco Bermúdez Ladouch. Private service stations between Punta Catalina and Punta Arenas.	2	3,360 3,430
860	13-II-42	DGSE-Soc. Fábrica de Cemento El Melón. Private radio-communication stations between Mineral "Los Choros and Coquimbo."		6,750 5,780

Decree	Date	Subject	No. of Stations	Frequen (KHz)
1980	10-IV-42	DGSE-Soc. Turismo y Hoteles de Chile. Private radio-communication stations between Termas de Puyehue and Santiago	2	6,700 14,860 7,430 13,400
3183	8-VI-42	DGSE-Guillermo Amenábar Ossa. Private radio stations between Mineral Cerro Blanco and La Serena.	2	7,400 7,550
3189	8-VI-42	DGSE-Guillermo Amenábar Ossa. Private radio stations between Mineral Cerro Blanco and La Serena.	2	7,400 7,550
4092	20-VII-42	DGSE-Cía Minera Disputada Las Condes. Private radio stations between the Mina Disputada, power plant La Hermita, concentration plant Pérez Caldera and the Company office in Santiago.	4	14,416 14,462 14,514 14,550
4094	20-VII-42	DGSE-Agustín Edwards Budge. Private radio stations between Refugio Farellones and Santiago	2	7,460 7,350
4420	5-VIII-42	DGSE-Guillermo Portales Vicuña. Private radio stations between Coquimbo and Santiago.	2	7,360
4446	7-VIII-42	DGSE-Enrique Rosselot Aravena. Private radio stations between Pampa Llahuinte and Panquipulli	2	6,980 6,945
754	5-II-43	DGSE-Horus Pedrony Palma. Shortwave broadcasting station in Antofagasta. 30 years	1	6,010
2044	20-IV-43	DGSE-Fábrica de Cemento El Melón. Private radio stations between Los Quilos and La Calera.	2	4,005 8,010

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
2815	4-VI-43	DGSE-Soc. "Press Wireless Chilena Ltda." International commercial radio station for communications with Cuba and other countries. 30 years	10	3,035 5,715 9,325 10,120 13,535 14,555 16,310 18,490 19,630 21,270
3328	6-VII-43	DGSE-Eduardo Encina Arancibia. Long-wave broadcasting station in La Serena. 30 years	1	1,080
4586	24-IX-43	DGSE-Cía Minera Cerro Negro. Private radio stations between Santiago and Pitipeumo.	2	3,340 7,330
5867	15-XII-43	DGSE-Fábrica de Cemento El Mélon. Private radio station on the El Sauce ranch, Coquimbo Province.	2	3,380 6,760
5989	22-XII-43	DGSE-CORFO. Private mobile radio station.	1	6,650
183	14-I-44	DGSE-Augusto Duque Becerra. Long-wave broadcasting station in Copiapó. 30 years	1	1,210
297	20-I-44	DGSE-Antonio Cajiao González. Long-wave broadcasting station in Antofagasta. 30 years	1	1,240
2024	26-V-44	DGSE-Soc. Chilena Radiodifusora S. A. Shortwave broadcasting station in Santiago. 30 years	1	15,115
2142	31-V-44	DGSE-S. A. Chile Exploration Co. Private radio stations in Chuquicamata.	2	33,940 39,500

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
2938	29-VII-44	DGSE-Corporación de Radio de Chile. Shortwave broadcasting station in Santiago. 30 years	1	9,500
2959	31-VII-44	DGSE-Soc. Radiodifusora La Mercantil S. A. Shortwave broadcasting station in Santiago. 30 years	1	11,850
4336	16-X-44	DGSE-S. A. Ganadera Valle Chacabuco Private radio stations on Lago Bertrams Ranch, Comuna Río BAKER, Aysén.	3	3,260 3,350 3,475
4578	30-X-44	DGSE-Ferrocarriles del Estado. Private radio stations in:		
		Panguipulli	1	7,320
		Calafquén	1	3,470
		Licán-Rayén	1	3,470
		Pucón	1	6,880
		Puerto Octay	1	6,880
		Futrono	1	6,880
4830	15-XI-44	DGSE-Gastón Pascal Lyon. Long-wave broadcasting station in Viña del Mar. 30 years	1	730
1368	9-III-45	DGSE-Manuel Casabianca Latorre. Long-wave broadcasting station in Santiago. 30 years	1	1,260
2833	30-V-45	DGSE-Hernán Vacarro Zúñiga. Long-wave broadcasting station in Talca. 30 years	1	1,250
3251	27-VI-45	DGSE-Comunidad Fundo La Macarena y Arturo Heskerr. Private telephone line between Estates La Macarena and Quicharco and cross the public highway to San Juan de la Sierra with a longitudinal road.		

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
4920	5-X-45	DGSE-Azufrera Aucanquilcha S. A. Private telephone line between the Anita mine and the Ollague refinery.		
5114	17-X-45	DGSE-Soc. de Turismo y Hoteles de Chile. Private communications station on the steamship Carrera, Lake Puyehue.	1	2,275
5142	19-X-45	DGSE-Fábrica Nacional Carburo y Metalurgia. Private radio stations between the hydroelectric plant and the carbide factory.	2	2,210 2,300
5882	21-XI-45	DGSE-Amos S. Neuberger. Private telephone line between Alto de Quilpué and Las Palmas Estate.		
5883	21-XI-45	DGSE-Caja de Crédito Minero. Private radio stations between Carrizalillo and Domeyko, Atacama Province.	2	3,460 4,270
6309	12-XII-45	DGSE-Mateo Hrepich. Private telephone line between Calama and Chiu-Chiu.		
290	16-I-46	DGSE-Ferrocarriles del Estado. Private radio stations in:		
		Arica	1	14,740
		Iquique	1	13,220
		Estación Alameda	1	7,435
		Estación Talca	1	6,730
337	18-I-46	DGSE-Joaquín Larrain Tagle. Private radio stations between the Viña María and El Parrón estates, in Linares	2	2,290 2,840

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1253	22-II-46	DGSE-Cía. Telefónica de Magallanes S. A. Radio stations for:		
		Punta Arenas	1	4,290 5,775 6,685 13,175 15,746 18,455
		Estación Porvenir	1	4,415 6,715 8,936
		Estación Puerto Natales	1	4,635 6,925 9,255
1254	22-II-46	DGSE-Soc. Chilena Radi- fusora S. A. Long-wave broadcasting station in Valparaíso.	1	540
4148	24-VII-46	DGSE-Harold Christie. Long- wave broadcasting station in Concepción. 30 years	1	1,410
4967	13-IX-46	DGSE-Cía Ind. El Volcán. Private radio station between El Volcán and Puente Alto.	2	2,825 3,375
4970	13-IX-46	DGSE-Carlos Cariola Villagrán. Shortwave broadcasting station in Santiago. 30 years	1	7,660
5618	28-X-46	DGSE-Bernardo Cardone B. Private radio stations between Campamento Estate, Malleco and Santiago.	2	7,605 6,830
6518	9-XII-46	DGSE-Luis Humberto Agüero Quiroga. Long-wave broad- casting station in San Antonio, 30 years	1	1,560

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
6817	23-XII-46	DGSE-Empresa Nacional de Electricidad. Private radio stations on the electrical system Pilmaiquén: Osorno	1 2	2,205 2,205 4,320
6821	23-XII-46	DGSE-Luis Guerra Cruzat Long-wave broadcasting station in San Fernando 30 years	1	1,480
6822	23-XII-46	DGSE-Carlos Cariola Villagrán Long-wave broadcasting station in Santiago 30 years	1	1,540
6959	31-XII-46	DGSE-Hermes Pedreny Palma Long-wave broadcasting station in Arica 30 years	1	700
770	7-II-47	DGSE-Teodoro Urbina Chávez Long-wave broadcasting station in Tocopilla 30 years	1	1,240
1032	24-II-47	DGSE-Erasmo Pereira Pacheco Telephone line between Pancul Estate (Imperial) and Santiago		
1356	6-III-47	DGSE-Antonio Cajiao González Shortwave broadcasting station in Antofagasta 30 years	1	6,045

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1849	28-III-47	DGSE-Erasmo Basualto Gómez. Longwave broadcasting station in Los Andes. 30 years	1	1,580
3988	10-VII-47	DGSE-Raúl Jaras Barros. Private radio stations on Isla Más a Tierra and Santiago.	2	7,465 6,850
4099	14-VII-47	DGSE-Soc. Ganadera e Industrial Marcou y Cía. Private radio stations between Caleta María and Punta Arenas.	2	7,355 7,785
5025	3-IX-47	DGSE-Julio Abasolo Aldea. Long-wave broadcasting station in Linares.	1	1,520
5555	2-X-47	DGSE-Luis H. Brain. Long-wave broadcasting station in Santiago. 30 years	1	620
5660	10-X-47	DGSE-Cía. Chilena de Electricidad Ltda. Private radio stations in Bocatoma and the machinery building of the Maitenes plant.	2	38,000 41,000
5661	10-X-47	DGSE-Instituto O'Higgins de Rancagua. Private radio mobile station.	1	6,670
5876	24-X-47	DGSE-Carlos Morales García. Long-wave broadcasting station in Ovalle. 30 years	1	640
6331	15-IX-47	DGSE-Alexis Descouviens Mansilla. Private radio stations in Puerto Arturo, Tierra del Fuego, and P. Arenas	2	4, 3,465

Decree .	Date	Subject	No. of Stations	Frequencies (KHz)
2347	8-IV-48	DGSE-Ferrocarriles del Estado. Private radio stations in:		
		Valdivia	1	2, 225 2, 755 4, 325 4, 565
		Osorno	1	
		Puerto Varas	1	
		Corral	1	
		Tres Bocas	1	
		Los Ulmos	1	
		La Unión	1	
		Purranque	1	
2348	8-IV-48	DGSE-ENDESA Private radio stations in:		
		Central Abanico		
		Charrúa		
		Concepción		
		Chillán		
		Los Angeles		
		Trupán		2, 235
		Copiulemu		2, 770
		Tomeco		4, 330
		Coronel		4, 570
2349	8-IV-48	DGSE-Caja de Crédito Minero. Private radio stations in Sierra Esmeralda and El Salado	2	3, 460 4, 270
2413	16-IV-48	DGSE-Soc. Anónima Diario El Sur. Private radio stations in Concepcion	1	3, 435
		Santiago	1	4, 165
3240	31-V-48	DGSE-Carlos Vial Infante. Private radio stations in El Llano de Pirque and Peralillo (Mataquito) Estate	2	4, 590 6, 890

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
5803	30-IX-48	DGSE-Departamento de Caminos (DGOP). Private radio stations in:		
		Copiapó	1	7,420
		La Serena	1	7,420
		Vicuña	1	7,420
		Ovalle	1	7,420
		Santiago	1	7,420
		Los Angeles	1	7,420
		Temuco	1	7,420
		Osorno	1	7,420
		Valdivia	1	7,420
		Puyehue	1	7,420
		Puerto Montt	1	7,420
		Ancud	1	7,420
		Chaitén	1	7,420
		Antofagasta	1	7,420
		Concepción	1	7,420
7215	9-XII-48	Cía Nacional de Fuerza Eléctrica. Private radio stations in:		
		Linares	1	2,795
		San Javier	1	2,795
		Bobadilla	1	2,795
7269	10-XII-48	DGSE-Salitrera Tarapacá y Antofagasta. Private radio stations in		
		Fundo Enco	1	4,510
		Valdivia	1	4,820
7513		DGSE-Cía. de Acero del Pacífico. Private radio stations in:		
		Santiago	1	3,455
				4,625
				6,770
				9,410
				13,430
		Huachipato	1	3,220
				4,470
				5,835
				9,055
				12,140

Decree .	Date	Subject	No. of Stations	Frequencies (KHz)
		Isla Guarello	1	5,895 9,190 12,285
7711	31-XII-48	DGSE-Salitrera Tarapacá y Antofagasta. Private radio stations in: Oficina Victoria Santiago	1	7,790 9,940
1112	25-II-49	DGSE-Jorge Caballero Garrido. Private radio stations between Punta Arenas and Springhill.	2	5,385 2,730 5,280 2,620
1113	25-II-49	DGSE-Erwin Schulze Moller. Private radio stations between Santiago and Hacienda Chellepin, Coquimbo.	2	3,315 4,440
1430	22-III-49	DGSE-Carlos Streeter Vicuña. Private radio stations between Los Vilos and Santiago	2	6,825 5,375
2268	II-V-49	DGSE-Soc. Arroceras e Ind. Colchagua. Private radio stations between Santiago and Colchagua.	2	4,755 5,080
2405	18-V-49	DGSE-Cía. de Radio Chilena. Frequency modulated station for broadcasting and a link. 30 years.	1	88.1 MHz
2770	15-VI-49	DGSE-Cía. Chilena de Electricidad Ltda. Private radio stations between San Antonio and Santiago	2	4,485 5,060 5,850

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
2847	22-VI-49	DGSE-Cía. Frigorífica Tres Puentes. Private radio stations between Punta Arenas, María Carmelita station and María Emilia Ranch.	3	4,490 4,015 3,385
2848	22-VI-49	DGSE, Soc. Agrícola y Ganadera Los Vilos Ltda. Private radio stations in: Santiago Agua Amarilla Huentelauguén Chigualoco	1 1 1 1	6,915 6,180 6,915 6,180 6,915 6,180
2849	22-VI-49	DGSE-Fernando Mardones Restat. Private radio stations in: Santiago Algarrobo Parcela Santa Mariana	1 1 1	5,315 4,865 4,765
2850	22-VI-49	DGSE-Flaño y Cía. Ltda. Private radio stations in Santiago and Bellavista Estate.	2	7,965 7,830
3049	5-VII-49	DGSE-Cía. Salitrera Iquique. Private radio stations in Santiago and Salitrera Alemania office.	2	6,805 7,495 9,865
3130	6-VII-49	DGSE-CORFO Private radio stations in P. Arenas and Cerro Manantiales	3	4,835 5,090 3,050
3217	15-VII-49	DGSE-Cía Minera Aysén. Private service between Santiago and Puerto Cristal.	2	10,160 12,045

Decree .	Date	Subject	No. of Stations	Frequencies (KHz)
3309	21-VII-49	DGSE-Depto. Hidráulica de la DGOP. Private telephone service between the Filter Plant and Desarenada in Vizcachas		
4456	5-X-49	DGSE-CORFO. Private radio service between Santiago and Hotel Pirihueico	3	3,060 3,330 7,345
4885	31-X-49	DGSE-Chile Exploration Co. Private radio service in Mineral de Chuquicamata. Base Station	1	152 MHz
		Mobile Stations	22	162 MHz
5181	16-XI-49	DGSE-Braden Copper Co. Private radio service between Coya, Caletones and Sewell.	3	33.5 MHz 33.5 MHz 33.5 MHz
5243	21-XI-49	DGSE-Mercantil S. A. Private radio service between Santiago and Sierra de Bellavista, San Fernando.	2	2470 3395
5736	16-XII-49	DGSE-Soc. Andina del Sur. Private radio service in:		
		Puella	1	5305
		Petrohué	1	2430
		Isla Margarita	1	2610
		Puerto Varas	1	2380
		Barco Esmeralda	1	4730
		Barco Don Ricardo	1	4730
5740	16-XII-49	DGSE-Eduardo y Víctor Kuntzman. Private radio service in:		
		Collico Estate	1	2660 3405
		Copilhuepe Estate	1	2660 3405
		Trafún Estate	1	2660 3405

Decrec .	Date	Subject	No. of Stations	Frequencies (KHz)
5882	21-XII-49	DGSE-ENDESA. Private radio service in: Santiago	1	5110 5025 5425 6950 7545 7900 8100
		Talco	1	2220 2750 4410 4560 4985 5950
		Los Cipreses	1	2750 5460 4985 5110 6950
		Los Molles.	1	5029 5425 7545
353	18-I-50	DGSE-Empresa Constructora DESCO. Private radio service in: Embalse Laguna Maule	1	5370 2785
		Santiago	1	6870 2325
480	26-I-50	DGSE-Comunidad Irarrázabal Larraín. Private radio service in: Santiago	1	6940 5430
		Siberia Estate	1	6785 4505

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1531	29-III-50	DGSE-Cía Exploradora de Isla de Pascua. Private radio service in: Santiago	1	12,200
				12,210
				12,220
				12,230
		Isla de Pascua	1	12,205
				12,215
				12,225
1532	29-III-50	DGSE-Luis Cousiño McIver. Private radio service in: Santiago	1	7645
				3205
		Tregua Estate	1	7875
				2820
1698	5-IV-50	DGSE-Juvenal Moreno Bruce. Private radio service in:		Santiago
				5260
				Palquibudi Estate
				4830
		Bureo Estate	1	4845
2579	6-VI-50	DGSE-Soc. Maderera Fenix Ltda. Private radio service in:		Santiago
				9110
				Lincan Ray
			1	9380
2885	31-VI-50	DGSE-Viña Casablanca. Private radio service in:		Santiago
				5285
				Lontué
			1	6845
2888	31-VI-50	DGSE-Chile Exploration Co. Private telephone service between Chuquicamata and Arroyo. Salado Dam.		

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
2890	31-VI-50	DGSE-Aníbal Grez Valdovinos.		
		Private radio service in:		
		Santiago	1	2690
		Viña Las Acacias	1	2445
2986	6-VII-50	DGSE-John E. O'Shea Wilson.		
		Private radio service in:		
		Santiago	1	7440
		Íñaque-Cudico Estate	1	9180
3078	13-VII-50	DGSE-Soc. Ganadera Gente Grande.		
		Private radio service in:		
		Punta Arenas	1	6705
				2810
		Isla Davison	1	6705
				2810
4172	29-IX-50	DGSE-Club Andino de Osorno.		
		Private radio service in:		
		Osorno	1	5735
				2265
		Cancha de Sky	1	5190
				2415
4243	30-IX-50	DGSE-Purrapel y Calcufilo		
		Private radio service in:		
		La Unión	1	5235
				1645
		Quillín Estate	1	do
		Purrapel Estate	1	do
Arrayán Estate	1	do		
		Pichi-Coleuma Estate	1	do
4473	21-X-50	DGSE-ENDESA. Private telephone line between electric substations of De Andalién and San Vicente		

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
4767	10-XI-50	DGSE-Cuerpo de Bomberos de Santiago		
		Private radio service in:		
		Headquarters	1	160 MHz
		Headquarters	1	160 MHz
		Chief's home	1	155 MHz
		2nd Chief's home	1	155 MHz
		3rd Chief's home	1	155 MHz
		Mobile stations	5	158 MHz
4905	30-XI-50	DGSE-ENDESA		
		Private radio service in:		
		Sauzal Plant	1	4560
				5790
				5025
				6950
		Santa Cruz	1	do
		Pichilemu	1	do
		Talca	1	do
		Rancagua	1	30.5 MHz
		San Fernando	1	30.5 MHz
		Curicó	1	30.5 MHz
		Paine	1	30.5 MHz
		Casa Celada Sta. Cruz	1	30.5 MHz
		Mobile stations	5	30.5 MHz
4906	20-XI-50	DGSE-PANAGRA		
		Private radio service in:		
		Autofagasta	1	132.5 MHz
		Cerro Negro Airport	1	132.5 MHz
		Arica	1	132.5 MHz
		El Buitre Airport	1	132.5 MHz
5307	14-XII-50	DGSE-Felix Bassano Rodríguez		
		Private radio service in:		2455
		San Fernando	1	5455
		Termas Vegas del Flaco	1	5455
				2455
		Mobile station		do

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
77	10-I-51	DGSE-The West Coast of America Telegraph Co. Private radio service in: Arica	1	11,150 9800 7575 3740 2715
		Iquique	1	do
		Antofagasta	1	do
		La Serena	1	do
		Concepción	1	do
		Santiago	2	do
217	17-I-51	DGSE-Cemento Cerro Blanco de Polpaico Private radio service in: Factory	1	4885 2245
		Electric Plant	1	do
218	17-I-51	DGSE-Ladislao Bravo Valenzuela Private radio service in: El Peral Estate	1	4960
		Sta. Melania Estate	1	4960
		Bocatoma Canal Ampeo	1	4960
667	12-II-51	DGSE-Luis Dossoulin Private radio service in: Pideuco Estate		3030
		Lolco Estate	1	3030
736	19-II-51	DGSE-Francisco Morales Castillo Long-wave 3rd-class broadcasting station in Ovalle 30 years	1	640
834	26-II-51	DGSE-Viña La Rosa Private radio service in: Santiago	1	4640
		Viña La Rosa	1	5070

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
836	26-II-51	DGSE-Cía Salitrera Tarapacá. Longwave 3rd-class broad- casting station in Iquique, 30 years	1	820
838	26-II-51	DGSE-Cia, Industrial Salitrera Gianoli, Mustakis y Cia. Private radio service in: Santiago	1	10,720 9285 4480 4500
		Salitrera Flor de Chile	1	do
960	8-III-51	DGSE-Municipalidad de Arica. Public telephone service for the Dept. of Arica		
1556	20-IV-51	DGSE-Bosques y Industrias Madereras (BIMA). Private radio service in: Lo Espejo	1	5205 5320
		Cherquenco	1	5320
		Antihuala	1	5320
		Paimín Estate	1	5320
1678	27-IV-51	DGSE-Enrique Gardeweg Baltra. Private radio service in: Santiago	1	5255
		Quenco Estate	1	5255
		Flora Estate	1	5255
2599	30-VI-51	DGSE-Victor Wiren Acuña. Private radio service in: Santiago	1	5755 2845
		San José Estate	1	5270 2450

Decree .	Date	Subject	No. of Stations	Frequencies (KHz)
3788	26-IX-51	DGSE-S. A. Andariveles de Cordillera. Private radio service in: Farellones	1	7515 2705
		Santiago	1	do
478	25-I-52	DGSE-Joaquín Patiño Grand. Private radio service in: Santiago	1	4760
		Ucúquer Estate	1	4760
553	30-I-52	DGSE-Soc. Chilena de Publicaciones y Comercio S. A. Longwave broadcasting station in Pedro de Valdivia. 30 years	1	1350
554	30-I-52	DGSE-Soc. Chilena de Publicaciones y Comercio S. A. Longwave broadcasting station in Tocopilla. 30 years	1	1000
555	30-I-52	DGSE-Soc. Chilena de Publicaciones y Comercio S. A. Longwave broadcasting station in María Elena. 30 years	1	700
557	30-I-52	DGSE-Punitaqui S. A. Private radio service in: Montes de Punitaque	1	10.160 12.045 5210
622	4-II-52	DGSE-Salitrera Anglo Lautaro S. A. Private radio service in: Santiago	1	11.500 8095 5150
		María Elena	1	10.525 7390 4930

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Decree .	Date	Subject	No. of Stations	Frequencies (KHz)
1000	22-II-52	DGSE-Pedro Vergara Keller. Shortwave broadcasting station in Calama, 30 years	1	6100
1048	26-II-52	DGSE-RELECO Private radio service in: Santiago	1	7435 8145 4535
		Releco Estate	1	do
		Chumpullo Estate	1	4535
		Panguipulli Estate	1	4535
		Puñir Estate	1	4535
1053	26-II-52	DGSE-Francisco Cuevas McKenna. Private radio service in: Ovalle	1	5435 2800
		Hydroelectric Plant	1	do
1054	26-II-52	DGSE-Soc. Benítez, Elgueta, Figueroa, Empresa Constructora. Private radio service in: Santiago	1	5290 5335 9920
		Castro	1	do
		Los Vilos	1	do
		La Serena	1	do
1488	20-III-52	DGSE-Chile Exploration Co. Private radio service in Chuquicamata. Mobile Stations	5	162 MHz

Decree .	Date	Subject	No. of Stations	Frecuencie (KHz)
1674	27-III-52	DGSE-Ricardo Buscañán Stonner. Private radio service in: Santiago	1	2270 2390 6960
		Sta. Cristina Estate	1	do
1978	14-IV-52	DGSE-Fbca, Nacional de Carburo y Metalurgia. Private radio service in: San Vicente	1	2295 5365 7675

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
2494	15-V-52	DGSE-Fernando Correa Larraín. Private radio service in: Santiago	1	3590 5920
		Hacienda Nerquihue	1	do
2496	15-V-52	DGSE-Soc. Constructora Peralta Hnos. y Cía. Private radio service in: Santiago	1	5395 9900
		Peñuelas	1	do
2497	15-V-52	DGSE-Azufrera Aucanquilcha. Private radio service in: Antofagasta	1	2345 5760 7975
		Ollagüe	1	do
2614	23-V-52	DGSE-Chile Exploration Co. Private radio service in Chuquicamata Mobile Stations	10	158 MHz
2615	23-V-52	DGSE-Automóvil Club de Chile. Private radio service in: Santiago	1	3165 4465 6785
		Santiago	1	164 MHz 39.3 MHz
		Curacaví Highway Station		3165 4465 6785

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
		Curacaví Highway Station	1	164 MHz 39.3 MHz
		Vista Hermosa Highway Station, Curicó	1	3165 4465 6785
		Vista Hermosa Highway Station, Curicó	1	164 MHz 39.5 MHz
		Santiago No. 1	1	164 MHz
		Santiago No. 2	1	164 MHz
		Santiago No. 3	1	164 MHz
		Curicaví Mobile	1	164 MHz
		Curicó Mobile	1	164 MHz
2985	13-VI-52	DGSE-Torres y Basaur. Private radio service in Talcahuano and Santa Rita Estate	2	5045 2515
2990	13-VI-52	DGSE-Arturo Ariscaín Rosado. Private radio service between Iquique and Mamiña	2	5445 2580
3306	4-VII-52	DGSE-Cía. Chilena de Electricidad Ltda. Private radio service in: Cerro San Cristóbal	1	40 MHz 41 MHz 44 MHz 45 MHz
		Mobile stations	5	do
4334	6-IX-52	DGSE-Fbca. Nac. Paños de Tomé. Private radio service between Santiago and Tomé	2	3625 3885 5405 7590

Decree*	Date	Subject	No. of Stations	Frequencies (KHz)
4498	16-IX-52	DGSE-Soc. Arancibia y Jara Ltda. Private radio service		3870 4490 3245
		Santiago, base stations	2	85 MHz
		Mobile stations	4	85 MHz
4500	16-IX-52	DGSE- Joaquín Tupper Huneeus. Private radio service between Copiapó and Quebrada San Andrés	2	2670 4760
4637	25-IX-52	DGSE-Cía. Minera del M'Zaita. Private radio service between Santiago and Mina El Cerrado	2	3675 5735
4801	3-X-52	DGSE-Eugenio Suárez Herberos. Private radio service between Santiago and Hacienda San Antonio de Petrel	2	2635 5240
5133	21-X-52	DGSE-Soc. Fundición Nac. Paipote Ltda. Private radio service between:  Santiago	4	3363 3990 5310 5915 7410 7875 9155 9845 9845
		Paipote Central Eléctrica ENDESA Copiapó Central Fuerza Paipote and Central Fuerza Planta P. A. Gerda		86 MHz   86 MHz
5154	22-X-52	DGSE-Jorge Petrinovic Baksic. Private radio service between Hacienda Encancho Los Quilos and Hacienda Chacabuco	2	4815 3735

Decree*	Date	Subject	No. of Stations	Frequencies (KHz)
5155	22-X-52	DGSE-Agrícola and Madera Pirihueico Ltda. Private radio service between Coelemu and Pirihueico Estate	2	3780 5880
6210	5-XII-52	DGSE-ENDESA. Private telephone line between Central Sauzal and the station north of the city of Rancagua		
6211	5-XII-52	DGSE-Agustín Edwards Budge. Private radio service between Santiago and Playa Venado.	2	4505 6925 9115 11,665
6222	6-XII-52	DGSE-Cía. Minera del Plomo. Private radio service between Chile Chico, Puerto Aysén, Puerto Guadal and Puerto Ibáñez	4	2615 3675 4830 5735
2569	18-V-53	DGSE-Soc. Radioemisoras Nuevo Mundo. Studio-to-transmitter link.	1	92 MHz
3918	21-VII-53	DGSE-Soc. Explotadora de Tierra del Fuego. Private radio service between:  Valparaíso Punta Arenas (2)	6	5055 7460 10,840 15,460  5755 8185 10,130 16,280 2793 4800 5755

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
		Oazy Ranches		3875.5 4800 4815 5755
		Caleta Josefina Frigorífico		5755 5755
3920	21-VII-53	DGSE-Luis Roldán Morales. Long-wave broadcasting station in Iquique, 30 years.	1	1520
4299	13-VIII-53	DGSE-Feria de los Agri- cultores S. A. Private radio service between Santiago and Panguilemu.	2	2405 5785
4474	27-VIII-53	DGSE-Ramón Abasolo Aldea. Long-wave broadcasting station in Angol. 30 years	1	1600
4663	12-IX-53	DGSE-Juan Rogazi Cazes. Long-wave broadcasting station in Parral.	1	900
4665	12-IX-53	DGSE-Chile Exploration Co. and Andes Copper Mining Co. Private radio service between Santiago Chuquicamata  Potrerillos	3	5170 5825 7335 7935 9120 9475 10,180 10,680
4719		DGSE-Mario Gaete Labarca. Long-wave broadcasting station in Sn. Javier 30 years		1110

Decree *	Date	Subject	No. of Stations	Frequencies (KHz)
5353	7-X-53	DGSE-Cía. Agrícola Chilena S. A. Private radio service between Hacienda Sta. Isabel, Coipúe Estate and Hacienda Hidalgo	3	4505 7350
5606	27-X-53	DGSE-Soc. Peña Inhos. Private radio service between Santiago and Hacienda El Colorado	2	2768 4815
5685	29-X-53	DGSE-Carlos Cockbaine Riquelme. Shortwave broadcasting station in Valdivia; 30 years	1	11,960
6484	17-XII-53	DGSE-Cía. Maderera Villanueva. Private radio service between Santiago and Villarrica	2	5260 7550 10,960
275	23-I-54	DGSE-Victor Turina Blagina. Long-wave broadcasting station in Puerto Natales 30 years.	1	970
410	29-I-54	DGSE-Cía. Azufrera Nacional. Private radio service between Santiago, Planta Aguas Calientes and Arica	3	4015 7345 10,170 14,470
1283	19-III-54	DGSE-Alfredo Moreno Bruce. Private radio service between Santiago and El Carmen de Codigua Estate.	2	3224,5
1392	29-III-54	DGSE-Corp. Chilena de Broadcasting y TV S. A. Long-wave broadcasting station in Arica, 30 years	1	1260

Decree.	Date	Station	No. of Stations	Frequencies (KHz)
1869	5-V-54	DGSE-Carlos Pacheco Díaz and Raúl Renard Saavedra. Long-wave broadcasting station in Santiago.	1	1540
2608	2-VII-54	DGSE-Juan Lodtmann Krönig. Private radio service between Santiago and Sn. José de Perquín Estate.	2	4535
2609	2-VII-54	DGSE-René Jara Garay Long-wave broadcasting station in Molina, 30 years.	1	1430
2610	2-VII-54	DGSE-ENAP. Private telephone line between Punta Arenas y Tres Puentes, Tierra del Fuego.		
3779	24-IX-54	DGSE-Hernán Rivas Freire. Private radio service between Santiago and San Roque Estate	2	5260
3839	1 <sup>o</sup> -X-54	DGSE-Raúl Grez González. Long-wave broadcasting station in San Felipe, 30 years.	1	1530
4295	8-XI-54	DGSE-Comunidades Correa Pereira Bodegas Lontué, Correa Errázuriz y Agrícola, Correa Pereira. Private radio service between Santiago and Lontué.	2	5030
4425	16-XI-54	DGSE-Manuel Aspillaga Sotomayor. Private radio service between Santiago and Hacienda Caillihue	2	3842,5

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
4448	17-XI-54	DGSE-Cía Azufrera Polán. Private radio service between: Santiago	4	7,350 10,380 14,700
		Antofagasta		5,190 7,350 10,380 14,700
		Vilama Mina Polán		14,700 14,700
4568	25-XI-54	DGSE-Tulio Valenzuela Azócar. Longwave broadcasting station in Talca, 30 years	1	1,600
4977	30-XII-54	DGSE-Hernán Vaccaso Zúñiga. Longwave broadcasting station in Victoria, 30 years	1	1,340
208	11-I-55	DGSE-Cooperativa Agrícola Comao Ltda. Private radio service between Santiago and Puerto Bul.		4,970 7,425 10,200
211	11-I-55	DGSE-Soc. Longhi y Cía. Private radio service between Viña del Mar and Campamento Chacabuco.		5,770 8,153 11,020 15,530
501	20-I-55	DGSE-LaMercantil S. A. Long- wave broadcasting station in Santiago. 30 years	1	1,380

Decree .	Date	Subject	No. of Stations	Frequencies (KHz)
2561	7-VI-55	DGSE-Cía Carbonífera y Fundición Schwager. Private radio service between Valparaíso and Schwager.	2	2,546.5 4,585 5,220 6,765 7,405
2562	7-VI-55	DGSE-Cía Carbonífera en Ind. de Lota. Private radio service between Valparaíso and Lota Alto.	2	2,546.5 4,585 6,765 7,405 5,220
2563	7-VI-55	DGSE-Fund. Schwager y Carb. Lota. Private radio service in Santiago.	1	Ditto
2857	28-VI-55	DGSE-Benjamín Matte Larraín. Private radio service between Villa Hermosa and Imahue Estates.	2	4,490 7,830
3782	23-VIII-55	DGSE-Luciano Morales Bravo. Longwave broadcasting station in Vallenar 30 years	1	1,470
4390	4-X-55	DGSE-Raúl Matte Larraín. Private radio service between El Diamante and Sta. Filomena Estates.	2	5,080 7,735
4922	10-XI-55	DGSE-Raúl Vergara Ruiz. Private radio service between Reñaca y Los Quillayes Estate, Melipilla.	2	3,213 5,150

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
4959	28-XII-55	DGSE-Horacio Meléndez Alvarado. Private radio service between Santiago and Mina Cuevas	2	5, 230
5020	15-XI-55	DGSE-Víctor Bustos España. Longwave broadcasting station in San Carlos. 30 years	1	1, 450
319	17-I-56	DGSE-Nicolás Mladinic Beros. Private radio service between Punta Arenas and St. Teresita Sawmill.	2	4, 535 5, 445
438	24-I-56	DGSE-Pedro Vergara Keller. Longwave broadcasting station in Calama. 30 years	1	1, 320
593	1st-II-56	DGSE-Nicolás Mladinic Beros. Private radio service between Punta Arenas and St. Teresita Sawmill.	2	4, 535 5, 445
594	1st-II-56	DGSE-Soc. Agrícola Ñuble y Rupanco. Private radio service between Santiago and Hacienda Rupanco.	2	5, 255 5, 975
831	21-II-56	DGSE-Enrique Zorrilla Concha Private radio service between Santiago and Sta. Juana Estate		3, 847.5 5, 755
832	21-II-56	DGSE-Cía. Técnica Comercial. Private radio service between Santiago and Totoral, P. Varas		4, 505 7, 965

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
833	21-II-56	DGSE-Gastón Lailhacar Brard. Private radio service between Santiago and Montenegro Estate,	2	4880.0 2268.5
855	23-II-56	DGSE-Cía. Minera Tocopilla. Private radio service between La Dehesa, Tocopilla, and Mina La Cocinera.	3	5275 7780
1234	27-III-56	DGSE-Cía. Radio Chilena. Longwave broadcasting station in Santiago. 30 years	1	660
1529	17-IV-56	DGSE-Andes Copper Mining Co. Private telephone line between Potrerillos and Indio Muerto.		
2811	12-VII-56	DGSE-Soc. Mauricio Hoschild y Cía. Ltda. Private radio service between Antofagasta and Mantos Blancos.	2	3253 4465
2903	19-VII-56	DGSE-Soc. O. Scassi y Cía. Private radio service between Viña del Mar, Los Lagos and Lago Ríñihue.	3	5235 9115
3682	11-IX-56	DGSE-Soc. Minera Cerro Imán. Private radio service between Santiago and Copiapó	2	4610 7790 9940
3794	25-IX-56	DGSE-Arturo Vergara Zúñiga. Longwave broadcasting station in Rengo. 30 years	1	1,400

Decree.	Date	Subject	No. of Stations	Frequencies (KHz)
4015	9-X-56	DGSE-Soc. El Tattersall, Private radio service between Santiago and Osorno.	2	7,515 10,300
4016	9-X-56	DGSE-Cía. Minera Santa Bárbara. Private radio service between Santiago and Mina Huantemé	2	3,772.5 5,880
4017	9-X-56	DGSE-U. Técnica del Estado. Longwave broad- casting station in Santiago. 30 years	1	1,200
4501	13-XI-56	DGSE-Armando Alid Martínez. Longwave broadcasting station in La Unión. 30 years	1	820
4502	13-XI-56	DGSE-Cía. Minera Sta. Fe. Private radio service between Santiago		4,870 5,190 7,430 10,260
		Copiapó	1	3,932.5
		Chañaral	1	4,870
		Caldera	1	7,430 10,260
		Mina El Dorado, Ovalle	1	3,932.5
		Coquimbo	1	5,190
		Mina Pleito, La Serena	1	4,870 7,430
4690	27-XI-56	DGSE-Pablo de Smet D'Olbecke Kervyn. Radio service between Chile Chico and Valle Chacabuco	2	5,030
4694	27-XI-56	DGSE-Soc. Lehman Lepe y Piquer Ltda. Private radio service between: Santiago (2) Campamento Que Uota and Campamento Linares	4	72.35 MHz/FM 5295 7735

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
270	15-I-57	DGSE-Chile Exploration Company. Private radio service in vehicles and cranes of the Mineral Chuquicamata	8	158 MHz
740	13-II-57	DGSE-Iván Cortés Maldonado. Longwave broadcasting station in Los Andes, 30 years	1	1470
4556	12-IX-57	DGSE-Andes Copper Mining Co. Private telephone line between Llanta and Mineral El Salvador.		
5027	8-X-57	DGSE-IMMAR S. A. Private radio service between Santiago and Valdivia.	2	7605 10,125
5244	17-X-57	DGSE-Hasbun y Tarud Ltda. Shortwave broadcasting station in Talca, 30 years	1	6025
5545	31-X-57	DGSE-Universidad de Concepción. Shortwave broadcasting station in Concepción, 30 years	1	6135
5470	29-X-57	DGSE-Universidad de Concepción. Longwave broadcasting station in Concepción, 30 years	1	1350
6108	4-XII-57	DGSE-Mario Viveros Jara. Longwave broadcasting station in Lota, 30 years	1	1570

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
6473	30-XII-57	DGSE-Rogelio Gómez Carpio. Longwave broadcasting station in Ancud, 30 years	1	1370
6474	30-XII-57	DGSE-Soc. Radiotelecomunica- ciones Ltda. Longwave broad- casting station in Valdivia, 30 years	1	960
6475	30-XII-57	DGSE-Rogelio Gómez Carpio. Longwave broadcasting station in Santiago, 30 years	1	1360
6476	30-XII-57	DGSE-Radiodifusoras Australes Soc. Ltda. Long- wave broadcasting station in Osorno, 30 years	1	1400
359	20-I-58	DGSE-Soc. Agrícola y Ganadera Dillo Ltda. Private radio service between Santiago and La Fusta Estate.	2	5275 8015
360	20-I-58	DGSE-Nicolás Simurovic Sepeiner. Private radio service between Punta Arenas, Morro Chico and La Portada	3	3253 3872.5 4810
460	23-I-58	DGSE-Chile Exploration Co. Private radio service between vehicles and locomotives in Mina Chuquicamata.	17	158 MHz
513	28-I-58	DGSE-René Mujica Gómez, Longwave broadcasting station in Santiago, 30 years	1	640

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
656	6-II-58	D. G. S. E. -Hasbun y Tarud Ltda. Longwave broadcasting station in Santiago, 30 years.	1	590
2404	15-IV-58	D. G. S. E. -Devis del Río y Torretti Ltda. Private radio service between Santiago, km 630 Panamerican Highway and Rehuen.	3	3968, 5 5795 8110 10,880
2613	22-IV-58	D. G. S. E. -Comunidad Alfredo y Carlos Riesco Grez. Private radio service between Sta Corina and Colihueco Estates	2	7645 9445
2614	22-IV-58	D. G. S. E. -Alfred Cox Lira. Private radio service between Santiago and Sn. Pablo and Manantiales Estates	3	5760
3272	22-V-58	D. G. S. E. -Soc. Pi, Castoldi y Cía Ltda. Private radio service between Santiago and Rio Negro.	2	7675 10,490
3274	22-V-58	D. G. S. E. -Municipalidad de Iquique. Private radio service between Iquique, Mamiña, Tarapaça, Modra and Guatacondo	5	3195, 5 4620 6830 7550
3275	22-V-58	D. G. S. E. -Chile Exploration Co. Private radio service between Antofagasta and Chuquicamata	1	3350 5170 7610

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Decree	Date	Subject	No. of Stations	Frequencies (KHz)
3276	22-V-58	D. G. S. E. - Enrique Crammer Kenrick. Private radio service between Santiago and Chau-chau.		7605 11,060
3278	22-V-58	D. G. S. E. - Chile Exploration Co. Private radio service in Mina Chuquicamata - Fixed Mobile	4 8	158
3279	22-V-58	D. G. S. E. - S. A. de Levaduras y Fermentos Private radio service between Santiago and Colhue	2	2268.5 4,810
3282	22-V-58	D. G. S. E. - Juan Montes Avendaño. Private radio service between Punta Arenas and Cerro Sombrero	2	5,920
3283	22-V-58	D. G. S. E. - Soc. Agrícola y Maderera Neltume. Private radio service between Santiago and Neltume Estate	2	5,430 9,180 13,890
3345	27-V-58	D. G. S. E. - Soc. Prensa y Radio Ltda. Longwave broadcasting station in Arica 30 years	1	1,110
3346	27-V-58	D. G. S. E. - Soc. Prensa y Radio Ltda. Longwave broadcasting station in Valparaíso 30 years	1	580
3347	27-V-58	D. G. S. E. - Víctor Warckmeister Petersen 3rd-class broadcasting station in Temuco 30 years	1	1,530

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
3348	27-V-58	D. G. S. E. -Soc. Prensa y Radio Ltda. 3rd-class broadcasting station in Chillán.	1	630
3349	27-V-58	D. G. S. E. -Soc. Radial y de Información. Long-wave broadcasting station in La Serena. 30 years.	1	1, 250
3402	29-V-58	D. G. S. E. -Corp. de Comunicaciones del Pacífico. Public radio service between Santiago and Arica		7, 470 11, 105 15, 480 7, 805 11, 570
		Radio Links	2	15, 895 149.85 MHz 163.15 MHz
4118	26-VI-58	D. G. S. E. -Carlos Oto Villa. Private radio service between Santiago and Isla Más a Tierra.	2	5, 315 7, 885
4449	10-VII-58	D. G. S. E. -Manuel Fonseca Alvarez. 3rd-class broadcasting station in Concepción. 30 years.	1	970
4682	18-VII-58	D. G. S. E. -Soc. Radiodifusoras Australes Ltda. 3rd-class broadcasting station in Rancagua. 30 years.	1	670
4683	18-VII-58	D. G. S. E. -Soc. Radiodifusoras Australes. 3rd-class broadcasting station in Antofagasta. 30 years.	1	1, 030
4684	18-VII-58	D. G. S. E. -Santiago Hube Ellwanger. 3rd-class broadcasting station in Puerto Montt. 30 years.	1	900

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
4685	18-VII-58	D. G. S. E. -Raúl Zúñiga Daza Longwave broadcasting station in Rancagua. 30 years.	1	1,510
5854	9-IX-58	D. G. S. E. -Jorge Razmilic Vlahovic. Private radio service between Santiago, Antofagasta and El Salvador.	3	5,780 8,015 12,055
6030	16-IX-58	D. G. S. E. -Soc. Prensa y Radio Ltda. 3rd-class broadcasting station in Coyhaique. 30 years	1	1,270
6031	16-IX-58	D. G. S. E. -Soc. Radial y de Informaciones Ltda. 3rd-class broadcasting station in Curicó. 30 years.	1	1,170
6032	16-IX-58	D. G. S. E. -Cía. de Informa- ciones y Radiodifusión Ltda. 3rd-class broadcasting station in Iquique. 30 years.	1	970
6035	16-IX-58	D. G. S. E. -René Lillo Ciscutti. Private radio service between Punta Arenas and Estación Rita.	2	2,477.5 4,620
6036	16-IX-58	D. G. S. E. -Andes Copper Mining Co. Private radio service between Potrerillos and El Salvador.	2	162.3 MHz 162.4 MHz 150.8 MHz
6148	26-IX-58	D. G. S. E. -Soc. Radial y de Informaciones. 3rd-class broadcasting station in Concepción. 30 years.	1	1,370

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
6879	21-X-58	D. G. S. E. -Martínez Pereira y Cía. S. A. N. Private radio service between Santiago, Valparaíso, San Antonio and Antofagasta.	4	4, 535 10, 935
7040	28-X-58	D. G. S. E. -Cía. Industrial S. A. Private radio service between Valparaíso and Planta Quintay.	2	2, 465, 5 4, 590
7041	28-X-58	D. G. S. E. -Carlos Ariztía Ruíz. Private radio service between Santiago, and Monte Aranda and Trapiche Estates.	3	3, 807 5, 300
7042	28-X-58	D. G. S. E. -COPEC. Private radio service between Las Salinas and portable station.	2	156, 3 MHz 156, 8 MHz
8051	11-XII-58	D. G. S. E. -ENAP Private telephone line between offices at Ramón Nieto 920 and Ahumada 339. Santiago		
8061	12-XII-58	D. G. S. E. -Soc. Chilena Radio-difusora S. A. 2nd-class broadcasting station in Antofagasta. 30 years.	1	620
397	19-I-59	D. G. S. E. - Bethlehem Chile Iron Co. Private radio service between Romeral and 3 mobile units.	4	34, 55 MHz 43, 55 MHz
398	19-I-59	D. G. S. E. -Andes Copper Mining Co. Private telephone line between Potrerillos and El Salvador		

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
998	19-I-59	D.G.S.E. - IANSA Private radio service between: Santiago Los Angeles		3, 258.5 5, 355 7, 820 11, 085 3, 350.5
		Llanquihue	4	5, 870 9, 085
		Linares		12, 245
		Radio links	4	158.35 MHz 158.45 MHz 162.85 MHz 162.95 MHz
1001	19-I-59	D.G.S.E. - Pharos, Fca. de Acumuladores. Private radio service between Maipú and Chinchorro	2	7, 460 14, 730
1002	19-I-59	D.G.S.E. - LAN Private radio service between:		10, 430 11, 055 18, 250
		Santiago		19, 100
		Arica		4, 925
		Antofagasta	7	18, 155 4, 480 10, 650
		La Serena		7, 995
		Concepción		7, 775
		Puerto Montt		10, 325 11, 125 10, 925
		Punta Arenas		19, 700
		Radio Links	7	165.65 MHz 170.15 MHz 115 MHz 5, 335

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Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1368	10-III-59	D. G. S. E. - Banco del Estado Private radio service between:		8, 170
				14, 900
				15, 550
				Arica
				20, 860
				Santiago
				5, 335
				7, 770
				8, 170
				10, 770
				14, 900
				15, 550
				20, 160
				Concepción
5, 335				
8, 170				
11, 005				
14, 900				
15, 550				
Punta Arenas				
5, 335				
8, 170				
11, 005				
14, 900				
15, 550				
20, 860				
1370	10-III-59	D. G. S. E. - Mario Giarda Solari Private radio service between Santiago, Copiapó Llanta, Potrerillos and Pueblo Hundido	5	3, 872.5
				5, 180
				9, 910
				14, 880
				3, 872.5
		Mobile units	2	5, 180
1426	2-III-59	D. G. S. E. - José Mir Colomer FM broadcast station (music) to business and individuals without advertising in Santiago 30 years	1	72.65 MHz
				75.10 MHz

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
2033	16-IV-59	D. G. S. E. -Chile Exploration Co. and Andes Mining Co. Private radio service between Santiago and Mineral La Africana	2	70.80 MHz 74.25 MHz
2034	16-IV-59	D. G. S. E. -Chile Exploration Co. Private radio service between mobile units in Chuquicamata	5	158 MHz
2992	9-VI-59	D. G. S. E. -Shell Chile Ltda. Private radio service between Antofagasta, Las Salinas and Sn. Vicente	3	156.3 MHz 156.8 MHz
2994	9-VI-59	D. G. S. E. -COPEC Private radio service between Iquique, Guayaacán and P. Arenas	3	156.3 MHz 156.8 MHz
		Mobile Units	3	156.3 MHz 156.8 MHz
3166	18-VI-59	D. G. S. E. -ESSO Standard Oil Co. Private radio service between Antofagasta and Las Salinas	2	156.3 MHz 156.8 MHz
3665	9-VII-59	D. G. S. E. -Germán Riegel Brandt Private radio service between El Pajomal and Peralillo Estates	2	3,340 5,150
4685	27-VIII-59	D. G. S. E. -Hugo Arellano Herrera Longwave broadcasting station in Limache. 30 years	1	1,490
4686	27-VIII-59	D. G. S. E. -Hernán Arancibia Carrizo, 3rd-class broadcasting station in Putaendo. 30 years	1	1,600

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
4781	1-IX-59	D. G. S. E. -Inés Cortés Muñoz 3rd-class broadcasting station in Cauquenes. 30 years	1	1,470
5384	8-X-59	D. G. S. E. -ENAP Private radio service between Iquique, Peña Chica and Zapiga	3	3,807.5 4,835 7,375 14,505
		Mobile units	6	3,807.5 4,835 7,375 14,505
6168	1-XII-59	D. G. S. E. -Cía. General de Electricidad Industrial Private radio service between base station at offices and mobile unit	2	74.5 MHz
6169	1-XII-59	D. G. S. E. -Chile Exploration Co. Private radio service between locomotives, Mineral de Chuquicamata	4	152 MHz
6230	4-XII-59	D. G. S. E. -Cía Industrial S. A. Private radio service between V. del Mar and Caleta Molle	2	9,435 14,670
248	19-I-60	D. G. S. E. -Cía Industrial S. A. Private radio service between Iquique and Planta Molle	2	154.65 MHz 159.95 MHz
574	3-II-60	D. G. S. E. -Carlos Martínez Oyarzún Private radio service between Santiago and Antofagasta	2	6,825 13,860
575	3-II-60	D. G. S. E. -Andrés Izquierdo Rozas Private radio service between Santiago, San Javier and Parral	3	5,365

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
576	3-II-60	D.G.S.E. -Marcelino Iglesias Estrada Private radio service between Punta Arenas and Puerto Yartu	2	3972.5 4505.
759	12-II-60	D.G.S.E. -Soc. Constructora Industrial Conin Ltda. Private radio service between Santiago, Antofagasta and El Salvador	3	4880 12,080 135 MHz
761	12-II-60	D.G.S.E. -Arturo Korach Silberstein Private radio service between Temuco, Sta. Teresa Estate and Cancha Madera Lago Villarrica	3	4015
762	12-II-60	D.G.S.E. -Soc. Figueroa Alemparte y Cía. Private radio service between Santiago and Illapel Radio link	2 1	5430 9115 132.6 MHz 137.3 MHz
1096	3-III-60	D.G.S.E. -ENAP Private radio service between: Tres Puentes (P. Arenas) Caleta Glarencia Punta Delgada Cerro Sombrero Cullén San Sebastián Tower 1  Tower 2  Tower 3  Tower 4 Tower 5 Mobile Units	1 1 1 1 1 1 1 1  1  1  1 1 1 12	167.6 MHz 167.7 MHz 167.8 MHz 167.5 MHz 167.7 MHz 167.8 MHz 167.7 MHz 172.2 MHz 172.1 MHz 172.2 MHz 172.3 MHz 171.1 MHz 172.2 MHz 172.3 MHz do do do

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1099	3-III-60	D. G. S. E. -ENAP Private radio service between Punta Arenas, Caleta, Clarencia and Cerro Sombrero	3	217 MHz 226 MHz 228 MHz 249 MHz
2102	3-V-60	D. G. S. E. -Andes Copper Mining Co. Private telephone line between Llanta and El Salvador		
2303	13-V-60	D. G. S. E. -ENDESA Private radio service between San Pedro; Quiriquimo, Los Vilos, Combarbalá, Ovalle and El Espino Repeater	6	153.15 MHz 172.5 MHz
		Illapel and Los Molles	2	153.15 MHz 172.5 MHz
		Radio Link	1	161.2 MHz 161.25 MHz 165.7 MHz 165.75 MHz
		Mobile Units	3	153.15 MHz 172.5 MHz
5672	3-XI-60	D. G. S. E. -U. de Chile Shortwave broadcasting station in Valparaíso, 30 years	1	9550 MHz
5723	10-XI-60	D. G. S. E. -U. de Chile FM broadcasting station in Valparaíso. 30 years	1	104.3 MHz
6607	27-XII-60	D. G. S. E. -Cerro Pasco Corp. Private radio service between Santiago, Lagunitas, Rio Blanco and Mina	4	133.4 MHz 137.5 MHz

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
6605	27-XII-60	D. G. S. E. -Chile Exploration Co. Private radio service Mobile Units	10	158 MHz
6606	27-XII-60	D. G. S. E. -ENAP Private ship-to-shore portable radio service	2	156.45 MHz
131	10-I-61	D. G. S. E. -Soc. Lasserre, León, Lepe y Widmer Ltda. Private radio service between Santiago, Carampangue, La Huaica, Fresia and La Punta	5	7390 14,405 14,780
		Radio link	1	148.8 MHz
688	14-II-61	D. G. S. E. -Luis Arturo Ojeda Ojeda Radio broadcasting station in Aysén. 30 years	1	1270

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
689	14-II-61	DGSE-Roberto Campiscó Linares Long-wave broadcasting station in Puerto Varas 30 years	1	1450
990	1-III-61	DGSE-Soc. Agrícola del Estrecho Ltda. Private radio service between Tres Puentes Skyring, Quinta Esperanza and María Emilia, Sarita and Caleta Josefina ranches	6	3178 4970
1216	9-III-61	DGSE-Soc. Transmusic Ltda. FM broadcasting station in Santiago. 30 years	1	70.85 MHz
410	16-III-61	DGSE-U. of Chile Long-wave broadcasting station in Valparaíso 30 years	1	1450
2484	4-V-61	DGSE-Patricio Abalos Labbé Private radio service between Santiago and Toledo and Chigualoco camps. Radio links	3 2	9310 162.15 MHz
2733	16-V-61	DGSE-Foca Cemento El Melón. Private radio service between Santiago, Artificio I, Artificio II and Valparaíso	4	156.5 MHz 156.65 MHz
3109	6-VI-61	DGSE-Cía. Minera de Atacama. Private radio service between Maípu, Puerto		

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
		Calderilla and Adrianitas	3	4630 7490
		Radio links	2	135.2 MHz
4030	26-VII-61	DGSE-U. Técnica del Estado. Long-wave broadcasting station in Valdivia 30 years	1	1240
4161	3-VIII-61	DGSE-Eric Guillermo Sommer Benckle and Joaquín Molfino Chiorrini. FM broadcasting station in Santiago. 30 years	1	91.7 MHz
4166	4-VIII-61	DGSE-Soc. Cía. Comercial y Técnica Ltda. FM broadcasting station in Santiago. 30 years	1	92.9 MHz
5010	7-IX-61	DGSE-Hugo Cuadra Olmos Long-wave broadcasting station in Traiguén. 30 years	1	1530
5527	5-X-61	DGSE-U. Técnica del Estado. FM broadcasting station in Santiago. 30 years	1	96.5 MHz
6002	31-X-61	DGSE-Empresa de Transportes Colectivos del Estado. Private radio service between Mapocho transmitters 1 and 2, Maestranza Mapocho, Servicio Victoria, the Cueto, Lo Videla and Cisternas garages and Troles Latajía depot	8	167.65 MHz 167.7 MHz 167.75 MHz

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Decree	Date	Subject	No. of Stations	Frequencies (KHz)
		Mobile units	20	167.6 MHz 167.63 MHz 167.65 MHz 167.70 MHz 167.75 MHz
6421	30-XI-61	DGSE-U. Técnica del Estado. Short-wave broadcasting station in Santiago. 30 years	1	6170
6494	5-XII-61	DGSE-José Aureliano Valásquez Cárcamo Long-wave broadcasting station in Castro 30 years	1	1090
121	9-I-62	DGSE-Maderas Ralco S. A. Private radio service between Santiago, Bío-Bío Estate and Venécia Estate	3	5760 9220
55	4-I-62	DGSE-Cía. General de Electricidad Private radio service between Concepción, Talcahuano, Rengo and Rancagua	4	170.75 MHz 170.85 MHz 170.95 MHz
		Mobile units	2	do
54	4-I-62	DGSE-Vicente Correa Villalobos Private radio service between Santa Rosa de Apoquindo Estate, Los Lirios Estate and Santa Teresa de Itahue Estate	3	5285
754	22-III-62	DGSE-Corp. de Radio y Televisión Ltda. FM broadcasting station in Santiago. 30 years	1	89.3 MHz

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
842	4-IV-62	DGSE-Braden Copper Co. Private radio service between mobile stations	6	163.75 MHz
858	5-IV-62	DGSE-Banco Osorno y La Unión Private radio service between Quilicura and Chuyaca (Osorno)	2	9110 11,465
		Radio links	4	150.5 MHz
961	18-IV-62	DGSE-Soc. Nacional de Agricultura. FM broadcasting station in Santiago. 30 years	1	94.7 MHz
1103	22-V-62	DGSE-Radio Emisora Nuevo Mundo Ltda. Long-wave broadcasting station in Santiago. 30 years	1	930
1178	7-VI-62	DGSE-Radioemisoras Unidas S. A. Long-wave broadcasting station in Santiago 30 years	1	1090
1361	12-VII-62	DGSE-José Massoud Sarquis Long-wave broadcasting station in Melipilla 30 years	1	540
1508	7-VIII-62	DGSE-Cía. de Teléfonos de Chile S. A. Installation and develop- ment of local public tele- phone service in Coyhaique, Aysén, Balmaceda, Puerto Ibáñez and Chile Chico and		

Decree,	Date	Subject	No. of Stations	Frecuencie (KHz)
		long-distance public service between the same points 30 years		
1707	13-IX-62	DGSE-Soc. Pesquera e Industrial Bonacic y Cía. Private radio service between factory in Porvenir and Campamento Sta. María	2	158,65 MHz
1708	13-IX-62	DGSE-Hoguer Gastón Garrao Garrao. Long-wave broadcasting station in Chañaral 30 years	1	1420
1709	13-IX-62	DGSE-LADECO Private radio service between Santiago, Chuquicamata, Anto- fagasta and Potrerillos	4	5010 7840 10,635 14,445
1874	9-X-62	DGSE-Soc. Caledón y Zañartu Ltda. Private radio service between Santiago, Chaca, La Chimba, Ladrillos, Punta de Piedra, Tambillos, Las Animas, Cato, Canteras, Rapahue, Los Muermos and Rahue Radio links	12 2	7990 15,595 232 MHz 234 MHz
2146	28-XI-62	DGSE-Antonio Arce Antezana. Longwave broadcasting station in Tocopilla. 30 years	1	1200
2254	12-XII-62	DGSE-Hernán Pinochet Adonis. Longwave broadcasting station in Illapel. 30 years		1420

Decree*	Date	Subject	No. of Stations	Frequencies (KHz)
2256	12-XII-62	DGSE-Soc. Colectiva Turima and Cia. Radio Austral. Longwave broadcasting station in P. Arenas. 30 years	1	1090
155	21-I-63	DGSE-James Morris Vela. Longwave broadcasting station in Santiago. 30 years	1	1250
325	7-II-63	DGSE-Soc. Corporación Chilena de Radiodifusion Ltda. Longwave broadcasting station in Santiago. 30 years	1	1460
377	21-II-63	DGSE-Suc. Juan Viola Maele. Private radio service in Punta Arenas and Los Onás Ranch.	2	2811.5 7390
501	7-III-63	DGSE-Carlos Briceño Olivares. Longwave broadcasting station in Santiago. 30 years	1	890
631	28-III-63	DCSE-Radioemisoras Unidas S. A. Longwave broadcasting station in Santiago. 30 years	1	960
632	28-III-63	DGSE-Oscar Pizarro Escalante. Longwave broadcasting station in Santiago. 30 years		

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
913	7-V-63	DGSE-CORFO. Interior public radio service between Santiago, Arica, Iquique, Antofagasta, Puerto Montt and Coyhaique	2	5050 5370 10,550 5362 16,130 5377.5
		Santiago - Iquique	2	4860 10,190 14,370 3958.5 10,465 14,515
		Santiago - Antofagasta	2	3935.5 7960 4935 7915 12,150 12,150
		Santiago - P. Montt	2	5795 5915
		Santiago - Coyhaique	2	7345 7500 12,095 12,210
		Puerto Montt - Coyhaique	2	4885 5190
		<u>Radio Links</u>		
		Arica	2	461.4 MHz 452.2 MHz
		Iquique	2	461.4 MHz 452.2 MHz
		Iquique	2	461.4 MHz 452.2 MHz
		Antofagasta	2	461.4 MHz 452.2 MHz
		Santiago I	2	6765 6645

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Decree	Date	Subject	No. of Stations	Frequencies (KHz)
		Santiago II	2	6765 6825
		Santiago III	2	172.9 MHz 150.15 MHz
		Santiago IV	1	6645
		Santiago V	1	P. Receptora 6825
		Puerto Montt I	2	P. Receptora 460.4 MHz 450.4 MHz
		Puerto Montt II	2	459.8 MHz 451.9 MHz
		Coyhaique I	2	459.6 MHz 451.2 MHz
		Coyhaique II	2	460.4 MHz 450.6 MHz
989	28-V-63	DGSE-Salvador Cortes Planas, Longwave broadcasting station in Valparaíso. 30 years	1	1600
1055	6-VI-63	DGSE-Guillermina Oswald G. vda. de Dümmer. Long- wave broadcasting station in Valparaíso. 30 years	1	1410
1172	25-VI-63	DGSE-Jorge Romero Ramírez Longwave broadcasting station in Rancagua. 30 years	1	1510
1180	25-VI-63	DGSE-Soc. Nac. de Agricultura, Longwave broadcasting station in Valparaíso. 30 years	1	970
1201	27-VI-63	DGSE-U. Técnica del Estado, Longwave broadcasting station in Antofagasta. 30 years	1	1210

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Decree.	Date	Subject	No. of Stations	Frequencies (KHz)
1202	27-VI-63	DGSE-U. Técnica del Estado. Longwave broadcasting station in La Serena. 30 years	1	1440
1203	27-VI-63	DGSE-U. Técnica del Estado. Longwave broadcasting station in Copiapó. 30 years	1	900
1204	27-VI-63	DGSE-U. Técnica de Estado. Longwave broadcasting station in Concepción. 30 years	1	1360
1288	12-VII-63	DGSE-Corporación de Radio Valparaíso Ltda. FM broadcasting station in Valparaíso. 30 years	1	88.5 MHz
1289	12-VII-63	DGSE-Antonio Jaén Buendía. FM broadcasting station in Concepción. 30 years	1	91.1 MHz
1396	25-VII-63	DGSE-Corporación de Radio y TV Ltda. Longwave broad- casting station in La Serena. 30 years	1	680
1397	25-VII-63	DGSE-Mario Sáez Lagos. FM broadcasting station in Concepción. 30 years	1	95.3 MHz
1398	25-VII-63	DGSE-Radio La Frontera Ltda. FM broadcasting station in Temuco. 30 years	1	95.9 MHz

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1399	25-VII-63	DGSE-Radio Cristóbal Colón S. A. Longwave broadcasting station in Valparaíso. 30 years	1	840
1441	1-VIII-63	DGSE-Ambulancias Sta. Lucía Ltda. Private radio service between a one stationary and 2 mobile stations in Santiago.	3	139.7 MHz
1442	1-VIII-63	DGSE-Ricardo Vivado Orsini. Longwave broadcasting station in Santiago. 30 years	1	820
1469	6-VIII-63	DGSE-Mario Sáez Lagos. Longwave broadcasting station in Concepción; 30 years	1	620
1525	17-VIII-63	DGSE-Radioemisoras Unidas S. A. Longwave broadcasting station in Punta Arenas. 30 years	1	1350
1526	17-VIII-63	DGSE-Antonio Jaén Buendía. Longwave broadcasting station in Concepción. 30 years	1	320
1590	27-VIII-63	DGSE-Soc. Inmoviliaria Diego Portales S. A. FM broadcasting station in Santiago. 30 years	1	95.9 MHz
1827	3-X-63	DGSE-Radio Santiago S. A. Longwave broadcasting station in Santiago. 30 years	1	690

Decree.	Date	Subject	No. of Stations	Frequencies (KHz)
1909	15-X-63	DGSE-Alberto Guerra Cruzat. Longwave broadcasting station in Curicó. 30 years	1	1260
1929	17-X-63	DGSE-Radioemisoras Unidas S. A. FM broadcasting station in Antofagasta 30 years	1	95.1 MHz
1930	17-X-63	DGSE-Radio Recreo S. A. FM broadcasting station in Viña del Mar. 30 years		93.7 MHz
1931	17-X-63	DGSE-Corp. Chilena de Broadcasting y TV S. A. FM Broadcasting station in Arica. 30 years	1	91.1 MHz
2249	10-XII-63	DGSE-Soc. Radiodifusora Occidente. Longwave broadcasting station in La Serena. 30 years	1	1090
2365	30-XII-63	DGSE-Radioemisoras Nuevo Mundo Ltda. Shortwave broadcasting station in Santiago. 30 years	1	5955
2366	30-XII-63	DGSE-Corp. Chilena de Broadcasting y TV S. A. Shortwave broadcasting station in Arica. 30 years	1	9520
2368	30-XII-63	DGSE-Inmobiliaria Diego Portales S. A. Shortwave broadcasting station in Santiago. 30 years	1	5975

Decree	Date	Subject	No. of Stations	Frecuencie (KHz)
203	28-I-64	DGSE-Joaquín Venegas Venegas. Longwave broadcasting station in Viña del Mar. 30 years	1	1240
494	10-III-64	DGSE-Doris del Carmen Figueroa Concha. Longwave broadcasting station in Pueblo Hundido. 30 years	1	1530
495	10-III-64	DGSE-Nicanor Páez Ruiz Longwave broadcasting station in Villarrica. 30 years	1	1560
618	2-IV-64	DGSE-Emisoras Diego Portales S. A. Shortwave broadcasting station in Santiago. 30 years	1	9560
619	2-IV-64	DGSE-Mario Téllez Chiappa. Longwave broadcasting station in Loncoche. 30 years	1	1410
623	2-IV-64	DGSE-Ignacio Riesco Rivas. Private radio service between San Carlos Estate and La Montaña Hacienda.	2	5095
850	5-V-64	DGSE-Pedro Valenzuela Peña. Longwave broadcasting station in Santiago. 30 years	1	1330
852	5-V-64	DGSE-Soc. Agricola Huaquén Ltda. Private radio service between Huaquén farm and vehicule	2	2786.5

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Decree.	Date	Subject	No. of Stations	Frequencies (KHz)
947	19-V-64	DGSE-Alejandro Ruiz Esquide Espinoza. Longwave broadcasting station in Talcahuano. 30 years	1	1460
1067	9-VI-64	DGSE-Francisco Morales Castillo. FM broadcasting station in Ovalle. 30 years	1	92.7 MHz
1075	9-VI-64	DGSE-Soc. Radiodifusora Latinoamericana S. A. FM broadcasting station in Santiago 30 years	1	95.3 MHz
1127	18-VI-64	DGSE-Radiodifusión El Conquistador Ltda. FM broadcasting station in Osorno. 30 years	1	88.7 MHz
1128	18-VI-64	DGSE-Radiodifusión El Conquistador Ltda. FM broadcasting station in Concepción 30 years	1	92.9 MHz
1130	18-VI-64	DGSE-Radiodifusora Docente Ltda. FM broadcasting station in Santiago 30 years	1	97.7 MHz
1369	3-VII-64	DGSE-Cía. Chilena de Comunicaciones S. A. Longwave broadcasting station in Santiago. 30 years	1	760
1411	9-VII-64	DGSE-Soc. Chitena Radiodifusora S. A. FM broadcasting station in Santiago. 30 years	1	89.9 MHz

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Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1435	14-VII-64	DGSE-Radio Santiago, S. A. FM broadcasting station in Santiago. 30 years	1	97.1 MHz
1436	14-VII-64	DGSE-Ludmila Ibatulín Naletova. FM broadcasting station in Valparaíso. 30 years.	1	94.5 MHz
1468	6-VIII-64	DGSE-Corp de Radio y TV Ltda. Longwave broadcasting station in Concepción 30 years.	1	1440
1497	21-VII-64	DGSE-U. Técnica del Estado. Longwave broadcasting station in Temuco. 30 years.	1	1270
1594	30-VII-64	DGSE-Sociedad Agro-Quillota Ltda. Private radio service between mobile tents on vehicles	4	4980
1656	5-VIII-64	DGSE-Soc. Radio Cristóbal Colón. FM broadcasting station in Valparaíso 30 years	1	93.1 MHz
1657	5-VIII-64	DGSE-Eduardo Gómez Rozas. FM broadcasting station in Concepción. 30 years.	1	89.5 MHz
1687	6-VIII-64	DGSE-Isidora Hoecker Nodenflycht. Longwave broadcasting station in Temuco. 30 years.	1	1600
1701	11-VIII-64	DGSE-Hugo Hernán Andrades Moya. FM broadcasting station in Viña del Mar. 30 years	1	100.5 MHz

Decree.	Date	Subject	No. of Stations	Frequencies (KHz)
1820	27-VIII-64	DGSE-Leonardo Guillermo Espoz Reynolds. FM broadcasting station in Santiago. 30 years.	1	100.7 MHz
1878	3-IX-64	DGSE-Elena Vukovic Archeta. Longwave broadcasting station in Punta Arenas. 30 years.	1	1210
1961	15-IX-64	DGSE-Julio Pincheira Aedo. FM broadcasting station, intended for background music in Valparaíso. 30 years	1	328.4 MHz
1962	15-IX-64	DGSE-Nelson Tarud Beltrán y Victor Manuel Alvarez Alvarez. FM broadcasting station in Valparaíso. 30 years. Background music.	1	325 MHz
1963	15-IX-64	DGSE-Emisoras Diego Portales S. A. FM broadcasting station in Santiago. 30 years.	1	98.9 MHz
2106	6-X-64	DGSE-Radio Porteña S. A. Longwave broadcasting station in Valparaíso. 30 years.	1	1340
2221	20-X-64	DGSE-Soc. Chilena Radiofusora S. A. Longwave broadcasting station in Santiago. 30 years.	1	1060
2223	20-X-64	DGSE-Manuel Casabianca Latorre. Longwave broadcasting station in Santiago. 30 years.	1	1540

Decreto	Date	Subject	No. of Stations	Frequencies (KHz)
2224	20-X-64	DGSE-Fernando Felgueras Huerta. FM broadcasting station in Quilpué. 30 years.	1	95.1 MHz
2225	20-X-64	DGSE-Fernando Eggers Gunther. Private radio service between La Campana Estate and Panique Island.	2	3188.5
2276	27-X-64	DGSE-Carlos Carrasco Ruiz. Longwave broadcasting station in Lautaro. 30 years.	1	1520
2351	30-X-64	DGSE-Marta Collao Lermada. Longwave broadcasting station in Chillán. 30 years.	1	900
2353	30-X-64	DGSE-Soc. Chilena Radiodifusora Ltda. Longwave broadcasting station in Viña del Mar. 30 years.	1	1270
2376	31-X-64	DGSE-Rosa Elena Valenzuela Valenzuela. Longwave broadcasting station in Curacautín. 30 years.	1	840
2444	10-X-64	DGSE-Transradio Chilena. SHF linking service between offices and the Quilicura Plant.	2	7175
2476	13-XI-64	DGSE-Cía Minera Andina S. A. Private radio service on the Santiago Pan American Highway.	1	3322
		VHF link in Santiago	2	133.4 MHz
				137.5 MHz
		Río Blanco	2	3322
		Saladillo	2	3322
		Lagunitas	2	3322
		Mobile stations	5	3322
				4970

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
2618	24-XI-64	DGSE-Emilio Ochkers Hollstein. Private radio service between Puerto Montt and El Remanso Estate.	2	5395
2683	10-XII-64	DGSE-Braden Copper Co. Private radio service between mobile stations.	5	163.75 MHz 164.05 MHz
2831	22-XII-64	DGSE-Empresa Pesquera EPERVA S. A. Private radio service between Arica, Iquique and Santiago.	3	12,190 13,975
		Radio Link	1	170.55 MHz 172.72 MHz
546	26-III-65	DGSE-Minera Mantos Blancos S. A. Private radio service between the mine and mobile stations.	1	156.65 MHz 158.45 MHz
		Mobile Units	20	do
763	27-IV-65	DGSE-Cía. Consumidores de Gas de Stgo. S. A. Private radio service between San Borja Factory and Rodó Street.	2	137.60 MHz 137.75 MHz
		Mobile Units	44	do
		Portable	1	do
787	30-IV-65	DGSE-Jorge Figueroa Miranda. Longwave broadcasting station in Taltal. 30 years.		1560

Decreto	Date	Subject	No. of Stations	Frequencies (KHz)
870	14-V-65	DGSE-Soc. Fábrica Nacional de Loza de Penco. Private radio service. Radio link	1	156.6 MHz 161.5 MHz
		Carrascal-Penco Factory	2	3253 3817.5 6825 7455 10,105 10,480 11,460
		Mobile Units	4	3253 3817.5 6825 7455 10,105 10,480 11,460
871	14-V-65	DGSE-Ladislao Errázuriz Pereira. Private radio service between Viña Sta. Carolina, La Cabaña Hacienda, La Esperanza Station and Atalaya Estate.	4	4520
999	8-VI-65	DGSE-Comunidad Puntigudo Ltda. Private radio service between Puntigudo Estate and Pichi-Damas Estate.	2	5240
1043	15-VI-65	DGSE-Alejandro Arrau Unzueta. Private radio service between Guayacán Station and Las Bandurrias Estate.	2	5315

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1346	3-VIII-65	DGSE - ENAMI. Private radio service between Ventanas Foundry and San Pedro Substation	2	149.7 MHz
1537	7-IX-65	DGSE - Minera Mantos Blancos S.A. Private radio service between Santiago offices and the transmission plant.	1	138.2 MHz
1538	7-IX-65	DGSE - Cía Arrocería Miraflores S.A. Private radio service between Lo Espejo, Quepe, and Talca Radio Link	3 1	7440 148.45 MHz
1570	10-IX-65	DGSE - Victor Bustos España. Long-wave broadcasting station in Temuco. 30 years.	1	1350
1607	21-IX-65	DGSE - Soc. Chilena Radio-difusora S.A. Shortwave broadcasting station in Santiago. 30 years.	1	9750
1655	28-IX-65	DGSE - Jorge Romero Ramírez. FM broadcasting station in Rancagua. 30 years.	1	96.3 MHz
1782	22-X-65	DGSE - ENAP. Private radio service between Santiago and Concón. El Roble Repeaters	2 2	217 MHz 219 MHz 226 MHz 228 MHz
1784	22-X-65	DGSE - Ricardo Simpson Echeverría. Private radio service between Santiago, Mina Las Adrianitas and Copiapó.	3	3345.5 7780

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1947	30-XI-65	DGSE - Anglo Chilean Asphalte S.A. Private radio service between Conchalí, Campamento Lagunas and Campamento Coigüe.	3	7605 5390
		Santiago Link	1	170.07 MHz
		Cochalí Link	1	173.95 MHz
1968	3-XII-65	DGSE - Chile Exploration Co. Private radio service between base and mobile stations. Ship-to-shore service in Tocopilla and Antofagasta.	5	152 MHz
1992	10-XII-65	DGSE - Jorge Luis Villalón Gamboa. Long wave broadcasting station in Santa Cruz. 30 years.	1	1580
232	25-I-66	DGSE - Empresa Minera Mantos Blancos S.A. Private radio service in Collahuasi.	1	4465 7890 11,670
533	30-III-66	DGSE - Industrias Forestales S.A. Private radio service between Nacimiento and San Vicente (Huachipato)	2	156.5 MHz
584	7-IV-66	DGSE - Cía Manufacturera de Papeles y Cartones. Private radio service between Laja and Sn. Vicente	2	72.15 MHz 75.90 MHz

Decree	Data	Subject	No. of Stations	Frequencies (KHz)
610	18-IV-66	DGSE - Devés, del Río y Torretti Ltda. Private radio service between Santiago and Buín.	2	138.35 MHz 138.85 MHz
680	3-V-66	DGSE - Soc. Nac. de Agricultura. Long wave broadcasting station in Santiago. 30 years.	1	570
838	7-VI-66	DGSE - S. A. C. San José de Coquimbo. Private radio service between Santiago and Guayacán de Coquimbo.	2	5445
843	8-VI-66	DGSE - Braden Copper Co. Private radio service between base and mobile stations in San Antonio.	4	33.5 MHz
850	10-VI-66	DGSE - Luz Alvarez Yoemans, María Luz Bauzá Alvarez and Lorenzo Bauzá Alvarez. Private radio service between Coquimbo, Los Molles, Quebrada Sequita and Cogotí.	4	5305 3247
1024	15-VII-66	DGSE - Empresa de Obras y Construcciones Ltda. Private radio service between one fixed station and 5 portable units in Santiago.	6	6985
1249	29-VIII-66	DGSE - Guillermina Domínguez Jaramillo and Vicente Papić Ramos. Long wave broadcasting station in Osorno. 30 years.	1	1110

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1329	6-IX-66	DGSE - Sergio Melelli Beletti. Long wave broadcasting station in Angol. 30 years.	1	1580
1480	7-X-66	DGSE - Fernando Otayza Carrazola. Long wave broadcasting station in Constitución. 30 years.	1	630
1503	11-X-66	DGSE - Saavedra y Coho Soc. Constructora. Private radio service between Santiago, Hijuella San Lorenzo, Sta. Clara Estate, Huenucheo Estate and Parcela El Bosque.	5	4990 3225
264	10-II-67	DGSE - Francisco Valdés Subercaseaux (Obispado de Osorno). Long wave broadcasting station in Rahue. 30 years.	1	900
352	2-III-67	DGSE - César Summar Pachá. Private radio service between Santiago and Castilla Ranch.	2	9130
355	3-III-67	DGSE - América Velasco Ramírez. Long wave broadcasting station in Talca. 30 years.	1	1600
537	10-IV-67	DGSE - Luis Fernando Améstica Hortuvia. Long wave broadcasting station in San Vicente de Tagua-Tagua. 30 years.	1	1580

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
553	13-IV-67	DGSE - Bethlehem Chile Iron Mines Co. Private radio service between 2 base and 6 mobile stations in Mina El Romeral	8	150.05 MHz
699	9-V-67	DGSE - Empresa de Movilización Colectiva Interprovincial "Vía Sur Ltda." Private radio service between Santiago, Talca, Chillán, Concepción, Temuco and Valdivia.	6	159.9 MHz 173.5 MHz
		Repeaters in Cerro Queime, Pilcoltué and Cuesta de Lastarria.	3	173.5 MHz
		Mobile units in vehicles.	25	159.9 MHz 167.45 MHz
735	15-V-67	DGSE - Oscar Spichiger y Cía. Ltda. Private radio service between Lo Espejo, Agua La Gloria and Compa.	3	5080 8185
832	3-VI-67	DGSE - Soc. Agrícola y Ganadera de Osorno. Long wave broadcasting station in Osorno. 30 years.	1	780
850	9-VI-67	DGSE - José Aureliano Velásquez Cárcamo. FM broadcasting station in Castro. 30 years.	1	90.1 MHz
928	26-VI-67	DGSE - Alejandro Salazar. Long wave broadcasting station in Talcahuano. 30 years.		840

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1197	18-VIII-67	DGSE - Arturo Crisóstomo Gutiérrez. Private radio service between Santa Catalina farm and Parcela 38 de Santa Ana de Chena.	2	9925
1306	8-IX-67	DGSE - Productora Azufre Carrasco. Private radio service between La Chimba and Ollagüe.	2	7515
1364	21-IX-67	DGSE - Santiago Planas Casas. Private radio service between a base station and 32 mobile units installed in automobiles for rent.	33	148.25 MHz 148.35 MHz 148.6 MHz 148.75 MHz
1510	16-X-67	DGSE - Federación de Sindicatos Profesionales de Estibadores Marítimos de Chile. Private radio service between Arica, Iquique, Tocopilla, Antofagasta, Coquimbo, Valparaíso, San Antonio  Talcahuano, Corral, Pto. Aysén, Pto. Natales, Pta. Arenas and Pto. Montt.	4  3 6	3224.5 3308.5 3224.5 3308.5 3224.5 3308.5
1541	20-X-67	DGSE - Alfonso Lagos Villar. Longwave broadcasting station in Chillán. 30 years.		1340
1599	30-X-67	DGSE - Cía. Chilena de Comunicaciones S.A. Long wave broadcasting station in Temuco. 30 years.		640

Decree	Date	Subject	No. of Stations	Frequencies (KHz)
1719	24-XI-67	DGSE - European Organization for the Astronomical Investigation of the Southern Hemisphere F.S.O. Private radio service between Cerro Galán and Cerro La Silla	2	6800 7560
		Radio Links	2	170.2 MHz 166.95 MHz
1810	20-XII-67	DGSE - Julio Cerda Corral. Long wave broadcasting station in Mulchón. 30 years.	1	730
53	5-I-68	DGSE - Francisco Morales Castillo. Long wave broadcasting station for time service in Santiago. 30 years.	1	1600
61	9-I-68	DGSE - José Aureliano Velásquez Cárcamo. Mobile link for radio Chiloe de Castro.	1	142.6 MHz

## ANNEX D-1

## DGSE BUDGET FROM 1966 to 1968

CLASSIFICATION	YEAR 1966		YEAR 1967		YEAR 1968	
	TOTAL	DEPT.	TOTAL	DEPT.	TOTAL	DEPT.
<u>I. NATIONAL CURRENCY</u>						
<u>A) OPERATING EXPENSES</u>						
a) Salaries	2, 060, 085	--	2, 410, 000	176, 971, 12	3, 534, 000	--
b) Purchase of consumer items and non-personal services	546, 635	--	620, 000	28, 389, 45	474, 000	--
c) Travel Expenses	79, 000	--	60, 000	6, 621, 60	123, 000	--
Sub-Total	E° 2, 685, 720	--	3, 090, 000	311, 982, 17	4, 131, 000	--
<u>B) CAPITAL BUDGET IN NATIONAL CURRENCY</u>						
a) Actual Investment	862, 000	--	1, 170, 000	-0-	1, 440, 000	--
Total in National Currency	E° 3, 547, 720	--	5, 260, 000	311, 982, 17	5, 571, 000	--

## ANNEX D-1 (Continued)

## DGSE BUDGET FROM 1966 to 1968

CLASSIFICATION	YEAR 1966		YEAR 1967		YEAR 1968	
	TOTAL	DEPT.	TOTAL	DEPT.	TOTAL	DEPT.
<u>II. PRESENT BUDGET IN FOREIGN CURRENCY CONVERTED TO US\$</u>						
<u>A) OPERATING EXPENSES</u>						
a) Expenses of Personnel and Freight	US\$ 4,000	--	4,000	1,563	--	--
b) Durable Goods	16,000	--	16,000	-0-	--	--
c) ITU Transfer Expenses	25,000	-0-	25,000	25,000	-0-	--
Total	US\$ 45,000	-0-	45,000	26,563	-0-	--

ANNEX D-2

COMPUTATIONS SUPPORTING THE AVERAGE SALARY

An average salary of US\$3,700 per annum for the RA is derived as follows:

- 22 Professionals at an average of E° 3,000 per month or E° 36,000 per annum
- 26 Non-professionals at an average of E° 2,000 per month or E° 24,000 per annum
- 12 Secretarial-Typist-Clerical at E° 1,000 per month or E° 12,000 per annum

$$\begin{array}{r} 22 \times E^\circ 3,000 = E^\circ 66,000 \\ 26 \times E^\circ 2,000 = \quad 52,000 \\ \underline{12 \times E^\circ 1,000 = \quad 12,000} \\ 60 \qquad \qquad \qquad E^\circ 130,000 \end{array}$$

Average for 60 RA employees = E° 2,170 per month  
= E° 26,000 per annum

At ratio of 1 to 7

## ANNEX E-1

### GLOSSARY OF TERMS

This glossary is presented to establish common definitions for terms used in this report.

**ADMINISTRATION:** The total activity of the manager which includes the work of planning, organizing, motivating, coordinating, controlling, and operating.

**ASSIST:** To help by providing advice and service. Assistance involves providing aid without exercise of command authority. For example, the personnel manager assists the president.

**AUTHORITY:** Powers or rights delegated to or assumed by a person for the purpose of performing work.

**CONTROL:** The evaluation of work after it is performed, in terms of predetermined standards. Control involves the establishments of performance standards, the measurements of work by recording and reporting, the evaluation of actual performance against the standard, and the institution of corrective action in terms of exceptions or variances.

**DEVELOP:** To build by successive alterations and additions. Development refers to the process followed in creating plans and ideas by pooling the suggestions of many people, or in building by increments from a simple beginning.

**FUNCTION:** The total of positions encompassing one kind of work grouped to form an administrative unit.

**LINE:** A relationship involving command authority with respect to end result. The "line" elements of the organization are those which have responsibility and authority for accomplishments of the primary objectives or end results of the organization.

**OBJECTIVE:** Goal or purpose toward which work is directed.

**ORGANIZATION:** The process of identifying and grouping the work to be done.

**PERFORM:** To carry out work. Performance refers to the process of accomplishing work to the point at which it is ready for measurement or evaluation. Performance implies continuing activity or observation until a designated end point is reached. A manager performs a function by working at it constantly. Performance can be accomplished in part by delegation.

**PLAN:** A proposal designed to guide and direct the work to be performed. Plans consist of five major elements: objectives, policies, programs, schedules, and budgets.

**POLICY:** A standing decision to guide repetitive action. Policies are binding upon all parts of the organization to which they apply.

**POSITION:** Work grouped for performance by one individual.

**PREPARE:** To make ready for use. The process of getting something ready for presentation or final use. For example, a policy is developed, then prepared in written form to present to management.

**PROCEDURE:** A prescribed way of performing specified work.

**PROGRAM:** A sequence of action designed to accomplish a specific objective.

**RECOMMEND:** To offer or suggest for use. A recommendation describes the presentation of plans, ideas, or things to others for adoption.

**RESPONSIBILITY:** The work assigned to a position.

**SCHEDULE:** A time sequence for the accomplishment of specified work.

**STAFF:** A relationship which involves one position or element of the organization providing advice and service to another position or element. "Staff" elements of the organization have a predominantly advisory and service role.

**WORK:** Physical and mental effort.

## ANNEX E-2

### OPTIONAL TRAINING PLANS

In addition to the training program already discussed in the report proper, training plans are presented below which the RA may implement at their choice.

#### PLAN A: International Telecommunications Union School Programs

Attendance at the school programs of the International Telecommunications Union (ITU), Geneva, Switzerland. Instruction in ITU matters including IFRB standards and procedures in international technical regulations. Detailed indoctrination in modern principles and practices concerning frequency allocation and other necessary topics.

#### PLAN B: University Extension Program

Key officials are encouraged to take specialized courses in universities, especially in the fields of public administration, economics, and accounting. Instructions received by the trainee are on the university level.

#### PLAN C: CENET Training Programs

CENET is the national training center for telecommunications personnel and is officially named the Centro de Entrenamiento Nacional en Telecomunicaciones. CENET's general objective is to provide specialized training to telecommunications personnel to meet the demands of private and public institutions. It is interesting to note that the International Telecommunication Union also participates in the training program. CENET headquarters are in the Department of Electricity of the University of Chile, Santiago. The courses offered by the

center are aimed mainly to supply the lower and medium levels of staff of the Chilean public telecommunication system. Further information about CENET is given in Annex E-3.

PLAN D: Secretarial School Training

Administrative clerks are encouraged to attend the secretarial and stenography courses offered by the various schools in Santiago. The courses generally last for 6 to 8 months and can be taken by the employees after office hours.

PLAN E: Cooperative Training Program

Arrangements are made to employ college engineering students during their academic careers. Such students usually alternate every three months between college and work at the Regulatory Authority. The object of this arrangement is to insure the influx of graduate engineers to the organization.

## ANNEX E-3

### THE LEVEL, TRAINING AND WORK FIELD OF CENET (CENTRO DE ENTRENAMIENTO NACIONAL EN TELECOMUNICACIONES) TRAINEES

#### I. INTRODUCTION

CENET is a US\$ 2,5 million joint venture by the Government of Chile (through the University of Chile as executing agency), the Government of France (Technical Assistance Program) and the United Nations Development Program (UNDP). CENET started its training activities early in 1967, and has been sustained by the University and the French Technical Assistance Program; the contact with UNDP is still being discussed. Once the U.N. agreement comes to life, the French contribution of men will be transferred to the U.N. program, avoiding duplication. French contributions in kind, as well as support to research (a point not covered by U.N.) will continue to flow additionally.

At present the Project Manager is the chief of the French Technical Mission in Chile; a Chilean Director is his local counterpart and will take over after the agreement expires. The U.N. plan considers a five-year implementation program and, thereafter, the complete shift of duties to the Chilean staff. The International Telecommunications Union (ITU) will be the executing agency for the U.N.

Being a national, governmental center, no duplication will occur; all foreign aid or technical assistance on telecommunications training is officially channeled towards the CENET. The CENET Project Manager is the official adviser to the Chilean Government on telecommunications training and the national coordinator for all such activities.

The use of UNDP contribution will be supervised by an Advisory Board formed by:

- a. The Director of the Department of Electricity (University of Chile)
- b. One representative from ENTEL
- c. The Project Manager assigned by ITU
- d. The CENET Chilean Director
- e. The UNDP Resident Representative in Chile, or his deputy
- f. One representative from ODEPLAN.

The two latter only have a voice on the Board; the former four have voice and vote.

## II. MAIN ASPECTS OF THE CENET 5-YEAR PROGRAM

The general objective of CENET is to provide specialized training to telecommunications personnel according to the necessities of Chilean private and public institutions. The seat of CENET is the Department of Electricity of the University of Chile, in Santiago; future establishment of branches in other cities is within possibility.

CENET provides (or will provide) at least the following levels of training:

1. Specialization courses for the two-year electronics graduates; six to twelve months' duration, aimed at employees of telecommunications services and public utilities.
2. Training for telecommunications maintenance and installation personnel ("radio-operadores"), available for people without experience or previous studies in telecommunications; six to twelve months' duration, aimed at (prospective or actual) employees of the telecommunications public utilities.
3. Training of "technical assistants," which are clerical staff who will be in charge of stock rooms, lowest-grade handling of statistical material, etc., in telecommunications public utilities; aimed at (prospective or actual) clerical staff in these institutions.
4. Specialization and updating courses for graduate engineers and technicians; duration up to six months.

These same courses can be taken by people not meeting the specific requirements of previous formal academic training but who pass suitable examinations. The courses strive to prepare lower and medium levels of staff required for the installation, maintenance and expansion of the Chilean public telecommunications systems. However, it is expected to enhance the developing electronics industry (manufacturers of TV and radio receivers, etc.), the non-public telecommunications systems (police, etc.) and eventually supplying whatever training Chile needs in the field.

The main subjects covered in CENET's courses are (or will be) the following:

1. microwave radio links and multichanneling.
2. telegraphy and telex.
3. cables.
4. HF radio links.
5. telephone switching.
6. tariffs and accountancy of telecommunications public utilities.
7. TV reception and transmission.

Other levels and subjects may be included when desirable for the country's needs.

### III. OTHER OBJECTIVES OF CENET

In addition to training, the CENET program includes the following additional objectives:

- a. To promote and assist in defining characteristics for the various professional levels or categories of telecommunications work in Chile, towards the establishment of a well organized management structure.
- b. To collaborate with neighboring nations in eventual efforts towards the establishing of new training centers in Latin America.

#### IV. COURSES OFFERED CURRENTLY BY CENET

The following regular courses are offered in 1968 at non-university level:

- a. Maintenance and installation technician for radio links ("Radio operadores, especializados en Enlaces Hertzianos"); one year, full time.
- b. Maintenance and installation technician for telex systems ("Radio operadores especializados en Telex"); one year, full time.
- c. Maintenance and installation technician for TV reception and transmission ("Radio operadores, especializados en Recepción y Transmisión de TV"); one year, full time.
- d. Radio and TV servicing ("Reparadores de Radio y TV"); two years, evenings only.

In addition, a number of specially-requested courses will be given, of which the following are fairly certain:

- a. Advanced maintenance and installation technician, for ENTEL personnel; 4 months, full time.
- b. Maintenance and installation technician, for Dirección General de Carabineros (police).

Various courses at higher levels, in the postgraduate (non-credit) department's program, are offered by the CENET staff or by regular university lecturers or professors through the administrative coordination of CENET. Some of these are the following:

- a. Telephone Long Distance Transmission Systems.
- b. Calculation of HF and VHF Radio Links.
- c. Antennas and Propagation.
- d. Telecommunications Planning.

These are usually introductory at professional level, aimed at university graduates who have not received specific training in the given subject; also available to non-graduates who have an equivalent background of experience and self-study. These courses do not count as credits for regular or higher degrees; performance is credited when requested.

## V. OTHER COURSES AVAILABLE THROUGH CENET

In general, training programs on any of the subjects mentioned in Annex E-3 can be obtained from CENET on specific request and with about 6 months' notice. The support in staff and kind, from either of the three contributors, can be modified to match national needs.

All training in telecommunications and related matters are the official duty of CENET and its purpose is to provide precisely the training programs required by the major employers of telecommunications systems in Chile. The organization and supply is elastic enough to adapt to rapid variations in estimates of needs for specific programs.

## VI. REFERENCES

- a. "Project for the establishment of a training center in Chile for telecommunications personnel, with assistance of U.N. Special Fund." (Translation from original to Spanish; Department of Electricity, University of Chile, Jan. 1964).
- b. "Programa de curso de Radio Operadores." (CENET, Nov. 1967).
- c. "Programa de curso de Reparadores de Radio y TV." (CENET, October 1966).

## ANNEX E-4

### THE LEVEL, TRAINING AND PROFESSIONAL FIELD OF ELECTRICAL ENGINEERS AND ELECTRICAL TECHNICIANS AT THE UNIVERSITY OF CHILE

#### I. INTRODUCTION

This annex presents details concerning the levels of the electronic engineers and electronic technicians graduated from the University of Chile. In addition, the fields of professional work and the main employers for these graduates in Chile is described.

#### II. ELECTRICAL ENGINEERS

The electrical engineer, as defined by the University of Chile, is a professional capable of applying sciences and scientific methods to the analysis and solution of the techno-economic problems of his specialty. He is qualified to independently follow the progress taking place in his field and make contributions. He has a broad background in basic sciences and engineering sciences and receives specialized professional training through selective courses in the last (6th) year. Due to his solid scientific base, the electrical engineer of the University of Chile is well prepared to proceed with equal success within any of the various fields in the area of electricity.

The academic obligations of this career last six years full time and, to obtain the degree of Electrical Engineer, the student must prepare a thesis and pass an examination on it. The thesis usually (but not necessarily) contains original contributions to engineering practice or technology, and usually includes considerable laboratory work.

The University of Chile gives preference to the scientific basis of technology and to methods applicable to a large variety of problems when training an electrical engineer. Instruction based solely on current techniques is avoided, because these techniques change rapidly and often are so extreme as to hinder adequate treatment.

The teaching of professional subjects has formative (rather than informative or descriptive) character and is supported by basic and engineering sciences. Teaching of professional matters is organized around projects, which serve the purpose both of giving the student adequate contact with problems of professional practice and of preparing him for his functions of creative analysis and project.

As a fundamental part of the engineer's training, he is given resources needed to face the economic and human factors of his profession; this is provided through an administrative-economic cycle included in the compulsory curriculum of the last three years of study (4th, 5th and 6th).

The University feels that one of its fundamental roles, when educating professionals, is the formation of cultured people who can think freely and intelligently on the various aspects of the existence of man. The curriculum of the electrical engineering career incorporates, for this purpose, a series of humanistic subjects which deal with art, philosophy, social sciences, etc.

The fields of professional practice for electrical engineers in Chile can be classified into three main areas:

- a. power systems
- b. electronics and telecommunications
- c. automatic control and data processing

The field of power systems comprises the project, design, construction, operation and maintenance of power generating plants, transmission lines, distributing stations, electrical equipment factories, installation of power and light in industries and buildings. It also includes the application and use of electric power in industrial processes and works, as well as in transportation and other fields.

The main employers of electrical engineers in the power area are ENDESA, CHILECTRA, some of the larger manufacturers of power transformers and motors (SINDELEN, RHONA), the State Railways (Ferrocarriles del Estado), CORFO, mining companies, heavy industries (CAP), etc. Research is carried out mainly in the University and now in a few large industries; electrical engineers are usually people engaged in research in their field, there being no higher degrees awarded in the country oriented to research.

In the area of electronics and telecommunications, the main field of work is the telecommunications public utilities, some of the manufacturers of electronic home devices (TV and radio sets) and the coming applications to instrumentation and data processing. The main employers are ENTEL, NASA (Santiago tracking station run jointly by the University of Chile and NASA), IBM, ENDESA (telecommunications section), ENAP, CORFO, LAN (Chilean Airlines), etc. All research in the field is carried out in the University by electrical engineers with or without higher degrees obtained abroad.

Finally, in the area of automatic control and data processing the main activities in the country are in industrial process control: in the power systems, in the textile industries, in airlines (LAN), in copper refineries and in oil refineries. Data processing is mainly found in users of general-purpose computers, in accounting-type computers, in satellite tracking (NASA and now ENTEL), etc. The situation in the field of research is similar to the above.

### III. ELECTRICAL TECHNICIANS

As defined by the University of Chile (and in this connection the concept varies radically from one institution to the other), the electrical technician is a highly specialized professional in particular fields within the area of electrical engineering. They are specially trained for field work collaborating in the implementation of large projects. Thus, they are becoming indispensable elements both for the installation of complex systems and for its efficient maintenance and operation.

The general outline of the career is similar to that of the electrical engineer, except in the following points.

The academic obligations last 4 years full time. An additional six-month period of controlled industrial practice is required, which ends in a short report and final degree examination. Since organization leans toward high specialization, basic sciences are not given so extensively to technicians as to engineers; engineering sciences and professional courses are introduced earlier and laboratory work is very intensive. Two specializations are offered: a) Telecommunications and b) Power and Control. The separation of (1) Power and (2) Control and Data Processing as individual options is foreseen in a year or two.

The fields of practice and the main employers are the same as for the electrical engineers. In general, though, technicians do not enter a research career.

Entry level for electrical engineers and electrical technicians is after 6 years of primary school and 6 years of secondary studies plus an Academic Aptitude test and other specific examinations. The average entry age is 18-19.

#### IV. REFERENCES

- a. "Proyecto de Plan de Estudio y Programas para la Carrera de Ingeniería Civil Electricista." December, 1963. (Internal report of the Faculty of Physical and Mathematical Sciences, University of Chile).
- b. "Prospecto General y Programas de las Carreras de Ingeniero Civil Electricista y Técnico Electricista." (General prospectus, 1968; Department of Electricity, University of Chile).
- c. "Carreras ofrecidas por el Departamento de Electricidad; su campo profesional y formación en la Universidad de Chile." (Student's introductory prospectus, Dept. of Electricity, University of Chile, 1968).
- d. "La investigación en ingeniería eléctrica en la Universidad de Chile." (B. Wellenius, article in IEEE, Latin American Section, December 67).

## ANNEX E-5

### THE LEVEL, TRAINING AND PROFESSIONAL FIELD IN CHILE FOR 2-YEAR GRADUATES OF ELECTRONICS

This level is intermediate between that of a skilled workman and a four-year Electrical Technician.

A man of this background finds his field of application in repair shops, installation of straightforward apparatus and their standard maintenance, minor alterations of standard equipment, etc.

He is assigned mostly to practical field work in the broad area of electronics. His background is just enough to enable him to understand the most common principles of operation in electronic techniques and to permit him to build, repair, and maintain simple devices usually found in everyday work.

The course provides theoretical and practical knowledge in electricity and electronics as well as enough mathematics, physics, and technical drawing to support the rest of the subjects presented. Manual ability and mechanical as well as electrical imagination and creativity are required and stimulated. Subjects in general education and culture are part of the curriculum.

The entry level is after the standard 12 years of general education, with an average age of 18 - 19.

About 50 of these graduates are produced yearly in Santiago and about half as many in Temuco.

Main employers for Electronics two-year graduates are ENTEL, LAN, some manufacturers of radio and TV domestic sets.

The course holds an unusual position within the University, and is not commonly understood as a "University-level career." There is considerable emphasis currently put into increasing the capacity of this course in Santiago and Temuco as well as implementing it in other regional centers. The Ministry of Education, particularly concerned with opening up short, medium-level careers for high-school licensees, has put additional funds into the development of the Electronics career.

#### REFERENCE

"Carrera de Electrónico: Plan de Estudios y Programas."  
(F. Casabellas, B. Dezerega y J. Löbel; Centros Regionales,  
1965).

## ANNEX E-6

### LIST OF INSTITUTIONS KNOWN TO OFFER TRAINING IN TELECOMMUNICATIONS AT NON-UNIVERSITY LEVEL

#### I. CIVILIAN INSTITUTIONS

- A. CENET (National Telecommunications Training Center; see details in Annex E-3).
- B. On-the-job training at C. T. C., Standard Electric and ENTEL.
- C. Dirección de Aeronáutica Civil (trains staff for airport communications).
- D. Correos y Telégrafos (trains telegraph operators, etc.)

#### II. MILITARY INSTITUTIONS

- A. Escuela de Telecomunicaciones de la Armada.
- B. Escuela de Especialidades de la Fuerza Aérea.
- C. Escuela de Especialidades del Ejército.

## ANNEX F-1

### BOTTOM OF THE BARREL

#### The Problem of Congestion

William L. North  
Federal Communications Commission

#### A. GENERAL DISCUSSION OF THE PROBLEM

1. When discussing among knowledgeable people the subject of frequency allocations for the land mobile service, one is almost invariably confronted with two opposite points of view -- both of them usually expressed rather strongly. On the one hand we are told that there really is no shortage of spectrum space for this service and that the real problem lies with the use of outmoded frequency management machinery in the areas of frequency allocation and assignment. What is really needed, say these people, is a new look at our management practices, the use of modern machinery, and the adoption of improved operating and equipment techniques that are available under the present state-of-the-art. On the other side of the fence, we are told that there is really nothing fundamentally wrong with our present procedures and that, while some improvements would be worthwhile, these alone can never solve the land mobile frequency congestion problem. These people believe very strongly that additional frequency allocations are required if we are to make available to our nation, the truly public interest potentials of vehicular radio.

2. We have rather substantial evidence that there are serious congestion problems in various places in several of the land mobile services. We are also told that in certain areas this frequency congestion problem is so acute that many

licensees have junked their mobile gear rather than put up with an impossible interference situation. Statistical information and special studies have been cited by many land mobile authorities to prove their points, <sup>1, 2, 3.</sup> Unfortunately, while many studies have been made on a broad brush basis and tend to show that the congestion problem is serious, not much has been done toward analyzing the problem in smaller detail to determine exactly the types of actions that need to be taken. <sup>4</sup> The ultimate result is that, while the difficulties have been pointed out, we are left where we started with the divided opinions mentioned previously.

3. In view of the foregoing, an attempt has been made herein to put a magnifying glass on a particular problem area, to assess the present situation, and to point out some logical remedies that appear to be worth serious consideration.

#### B. THE EXISTING SITUATION

1. The area chosen for study is a square of approximately 100 miles on a side and defined by the geographical coordinates of 39:30-41:00 North and 73:30-75:30 West. Figure 1 shows this area which includes New York City at the northeast corner and Philadelphia near the southwest corner. The reason for this selection is because one of the ACLMRS subcommittees, for other purposes, obtained a special Commission computer list for this area which is considered to be one of the worst for heavy land mobile congestion and the computer tape was available without additional effort. The list contained station, location, and license information for all of the land mobile bands between 25 and 470 MHz and contained over 8,100 individual line entries. A sample page is shown in Figure 2.

2. Figure 3 is a tabulation of information extracted manually from the list. It should be noted that the figures shown in the second through fifth columns are 10% less than actual count. This reduction was made after consultation with appropriate Commission staff members indicated that there is a probability of up to 10% duplication in licensee "code numbers." It is probable that the figures for mobile units are somewhat higher than those which are actually authorized since

licensees with more than one frequency assignment, often have many, if not all, of their mobile units authorized on each channel.

3. Frequency assignments in most of these services are now made generally on the bases of 20 kHz separation in the 25-50 MHz band, 30 kHz separation in the 150-162 MHz band and 50 kHz separation in the 450-470 MHz band. Although 15 kHz separation has been authorized in the 150 MHz band for some services, it appears that effective use of these "split channels" is very limited and they have been disregarded for the purpose of estimating the total existing channel supply. Based upon the above separations, it is estimated that the Safety and Special land mobile services now have allocated to them approximately the following number of individual channels (two-frequency system allocations such as for taxicabs and for mobile relay facilities have been counted as two channels):

25-50 MHz	620 channels (20 kHz)
150.8-162 MHz	293 channels (30 kHz)
450-470 MHz	<u>320 channels (50 kHz)</u>
Total	1,233 channels

In this count, channels allocated exclusively to remote pickup stations and public service companies, and non-Government allocations in the 162-174 MHz band have been disregarded. This treatment of the 162-174 MHz band appears to be justified since TV Channel 7 interference considerations tend to make band utility questionable in the overall picture.

4. The above channel count is based upon the amount of spectrum space allocated to the Safety and Special Services rather than a count of channels shown under the individual rules of the Commission. It is considered to be a more accurate reflection of the total potential than a "rule count" since inter-service sharing of many channels and the rule making proceedings which have frozen some channels make it difficult to arrive at an accurate figure.

5. Under the present administrative system, certain bands are allocated to individual services and technical standards specify the spacing between individual channels. The actual frequencies that are assigned to stations are, in a few cases such as certain services in the 25-50 MHz band, based upon a predetermined

plan. In all other cases, frequency assignments are made by the Commission on the basis of applications which have either been coordinated with industry coordinating committees or where the frequency applied for is based purely upon the choice of the applicant who may or may not have had technical advice from some other party.

6. Within certain rule limitations, an applicant may apply for any power, antenna height, or location he wishes, irrespective of the size or location of the area in which his mobile units operate. If the application is in accordance with the rules, the granting of it is almost automatic and the Commission makes no check as to whether the assignment may be compatible with other assignments in the same area. Except for highly coordinated services, the resulting overall assignment pattern is a hodgepodge and leads to many incompatible situations resulting in serious co-channel, adjacent-channel, receiver overloading, and receiver and transmitter inter-modulation interference problems.

7. Perhaps the best example of a service having such problems is the Business Service. This service has no organized frequency coordination procedure and the total result of the administrative system for making assignments is said to be leading to chaotic interference conditions in many areas. The data shown in Figure 3, when considered with other information, tend to support this contention.

8. Let us take a real close look at this service in a band and in an area where congestion is said to be near its worst. The FCC's computer was programmed to select all 150 MHz band Business Service assignments in a 34-mile square area centered on Metropolitan New York (Figure 4). There are fifteen 30 kHz channels allocated exclusively to this service in the area under consideration. Eleven unlimited adjacent channels have been considered here. The computer tells us that there are 521 licensees, 544 base stations and 4570 mobile units are authorized to share these eleven channels -- upon which all systems operate on a single-frequency simplex basis. This square represents a reasonable example in which most of the licensees should expect to receive some co-channel

interference from almost all systems within the area sharing the same channel. The average loading for these eleven channels is 47 licensees, 49 base stations, and 410 mobile units per channel.

9. In order to determine the distribution of frequency assignments within this thirty-four mile square, it has been divided into 64 separate areas. Assignment records were machine-sorted and the distribution is shown in Figure 5. Each area has been arbitrarily numbered from 1 to 64 and each channel has been numbered from 2 to 12, inclusive, in ascending frequency order (30 kHz between each individual channel). The number of each square appears in the upper left corner "box." Immediately below it are entered three numbers which, reading downward, indicate respectively the number of channels assigned, the number of licensees and the number of mobile units authorized in each square. Then follow four other columns of numerals each one of which represents the numbers of the channels assigned. If channel 2 is assigned, it is indicated in the second column upper left and, as indicated on the figure, each channel number always occupies the same position in each small square. The purpose of this arrangement is to readily compare the channel assignments in adjacent squares.

10. Looking at Figure 5, it becomes obvious that, in the central portion of the 34-mile square, almost every individual square has nearly every channel assigned. What may we learn from this? Square 29 has all channels assigned, has 52 licensees and 404 mobile units. Square 30 is almost as closely packed and square 37 and 47 run a close third and fourth. Beyond any reasonable doubt whatsoever, the licensees in these individual areas are faced with severe co-channel, adjacent channel, and intermodulation interference difficulties, not only from their own immediate area but from almost every adjacent area and then some. This is indicative of what one may expect when little, if any, efficient frequency management is applied to the making of assignments. More will be said of this later.

11. But what does this type of frequency loading lead to? Is it too high or is it reasonable? It is believed that the following information will indicate, beyond any reasonable doubt, that the Business Service is truly in a chaotic state in this area. Further, it will be shown that the average channel loading for all of the Safety and Special Services in the 150 MHz band is such that we are on the verge of a general communications "breakdown."

12. Certain independent studies of typical urban area channel loading have been made by others.<sup>5, 6, 7</sup> The JTAC report has not been formally released but permission has been obtained to analyze it and to draw independent conclusions from the data shown therein. Therefore, the following conclusions are not those of JTAC.

13. From actual on-the-air activity measurements of several typical land mobile systems in one urban area, it appears that one may conclude that, depending upon the nature of the system being analyzed, from 60% to 80% time usage of a channel may be expected when something in the order of 40 to 80 mobile units are active during peak traffic periods. It also appears that, by the time typical systems are loading a channel as high as something in the order of 80%, it should be expected that one may have to wait as long as 30 or 40 seconds when trying to originate traffic into a system. In one special case, where one licensee essentially controlled a given channel with no significant sharing required, loading the channel with about 80 mobile units occupied about 65% of the time. Heavier loading caused the system to break down. In another case, a 40-unit licensee, sharing the channel with 11 others during peak periods, was having nearly 30% of his traffic interrupted by interference. In this case, approximately 130 mobile units were active on the channel during the peak period which extended from about eight o'clock in the morning to five o'clock in the afternoon.

14. From the foregoing, it appears reasonable to conclude that, while permissible loading may vary among services, it is dangerous to attempt to load a channel with more than about 80 mobile units and that a loading of 60 is probably closer to what should be tolerated.

15. From the foregoing it appears logical to conclude that the Business Service, in the New York City area, is faced with an existing frequency saturation problem in the 150 MHz band.

16. Figure 6 has been prepared to show the average channel loading in the area outlined in Figure 4. Although this information may be of interest, it is believed to encompass too large an area for channel loading evaluation purposes. It is shown that the average channel loading for the 25-50 MHz band is about 53 mobiles, for the 150 MHz band is about 115 mobiles and for the 450-470 MHz band, is about 19 mobiles. However, in the 450-470 MHz band it is believed that terminals operate predominantly on a two-frequency per channel basis and the actual mobile loading is probably closer to double that shown or about 38 per channel.

17. Although the average channel loading shown in Figure 6 is of questionable value for analysis purposes, data contained in the tabulation, when weighted properly, are useful for a more critical look at existing loading conditions in the congested areas of New York and Philadelphia.

18. It has been shown that land mobile system density and growth trends correlate rather closely with the general population density and growth.<sup>1</sup> Data taken from the U.S. Census for 1960 have been analyzed for the 100 mile square shown in Figure 4. The total population of this area is approximately 18,936,000 persons. That part of the New York Standard Metropolitan Area (SMA) that is within the described area has a population of approximately 13,493,000 or 72% of the total. That part of the Philadelphia SMA that is within the described area has a population of approximately 4,130,000, or 22% of the total. These figures may be used to estimate the average mobile unit channel loading as follows:

	<u>New York</u>	<u>Philadelphia</u>
25-50 MHz:	$\frac{32,600 \times 0.72}{620} = 38.0$	$\frac{32,600 \times 0.22}{620} = 11.5$
150 MHz:	$\frac{33,500 \times 0.72}{293} = 82.7$	$\frac{33,500 \times 0.22}{293} = 25.0$
450 MHz:	$\frac{6,200 \times 0.72}{160} = 28.0$	$\frac{6,200 \times 0.22}{160} = 8.5$

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19. The above figures, when compared with the previously cited channel loading studies, indicate that the average 25-50 MHz band loading for both areas could be substantially increased. However, it is believed that it would be a serious mistake to accept this conclusion since, over a fairly large part of the sunspot cycle, long range propagation occurs and this increases greatly the actual loading that obtains. In short, it is believed that practically no land mobile expansion can occur in this band. The above tabulation also indicates that there should be room for considerable expansion for Philadelphia in the 150 MHz band, but little, if any, possibility for it at New York. It seems clear that a rather large degree of expansion of systems can take place in both areas in the 450 MHz band.

20. Logically the question arises as to what effect concentrated use of 150 MHz tertiary channels (15 kHz splits) may have upon 150 MHz expansion in New York. It is believed that the answer to this is that, unless allocation and assignment procedures are changed, these split channels have so many engineering problems associated with their use that they provide little hope for major expansion in congested areas.

C. PROJECTIONS UNDER PRESENT ALLOCATION AND ASSIGNMENT PRACTICES.

1. It is believed reasonably to have been shown that, for the critical area of New York City, the only hope for expanded land mobile service, under present practices, lies in the 450-470 MHz band. The possibilities will be examined.

2. Although the number of channels effectively available for present Safety and Special Service use in the 450-470 MHz band has been shown to be about 160, the Commission's recent action in splitting them to 25 kHz spacing doubles this number to 320. The following estimates assume that, under the new equipment standards adopted for these land mobile services, all of the channels may be used satisfactorily under the existing types of allocation and assignment practices. This view may be overly optimistic due to intermodulation and other interference problems that may arise from more intensive use.

3. Figure 7 shows the growth trend of the Public Safety, Industrial and Land Transportation Services for the five-year periods, 1955-1960-1965. If the present trend continues, it may be seen that the number of authorized mobile units may be expected to double about every five years. Figure 8 shows that at this rate, and assuming a permissible loading of 80 mobiles per channel, the present 160 channels will be saturated in the New York SMA by about 1973 and the 160 new 25 kHz splits will be saturated by about 1977. If one uses a more realistic figure of 60 mobiles per channel, these dates would be advanced to about 1971 and 1976, respectively.

4. These predictions assume that all expansion takes place in the 450-170 MHz band, and that stations in some services overloading the 150 MHz band or in the 25-50 MHz band do not transfer to this part of the spectrum. Additionally and as previously indicated, intermodulation and other technical problems not related to co-channel use have been disregarded.

#### D. FUTURE CONSIDERATIONS

1. It has been shown that, without changes in allocation and assignment practices, New York City land mobile services would be in serious trouble in about ten years. This prediction was made on an assumption of average frequency loading among the several land mobile services. Historically, the block allocations which have been made by the Commission have not been made under the pretense of providing equal channel loading among the services. The higher priority services, such as police, generally have had a sufficient number of channels allocated to them so as to provide for a minimum of sharing between these systems. On the other hand, the lower priority services such as Business, have been expected to accomplish a very high degree of sharing among users. Therefore, if one looks at these services on individual bases, it will be found that in actual practice, many of them exceed the average loading established in this paper while others do not even approach it.

2. It is considered likely that the different types of operation required by some of these services may lead to different loading factor requirements. Nevertheless, it is believed that the average loading factors discussed can be used to estimate the total number of channels expected to be required for the entire group of Safety and Special Services. If it is desired to estimate what different loading factors should be applied to individual services and thus rationalize the size of block allocations to each, there needs to be rather detailed treatment of each service. The previously cited JTAC Report<sup>7</sup> appears to be a start in this direction. More work in this area may be desirable if, in fact, there is a justification for different loading factors and if block allocations are to be continued.

3. One rather detailed study has concluded that the use of two-frequency land mobile service systems, under ideal conditions, may offer the potential of improving geographical density by a factor of 3.6:1 on a given channel<sup>8</sup>. The study points out that this may not be true for some services and that the systems need to be engineered carefully in order to achieve this advantage. To the extent

that this type of operation is applicable to a service, it may be desirable to require it, at least insofar as the 450 MHz band is concerned. To a large extent, the allocations between 450 and 470 MHz have been arranged to provide for such systems. However, provision has also been made so that single-frequency systems may operate on half of a two-channel pair used by two-frequency systems in the same area. This is obviously incompatible. Further, and especially in the 460--470 MHz portion of the band, one will find a conglomeration of assignments in the same area, some operating single-channel systems, some two-channel but with different "pairing" of the channels compared to others, mixed mobile relay and point-to-point operations, etc. In fact, the assignment situation results largely from a case-by-case approach with little consideration for efficient frequency management. It seems clear that, unless this situation is cleared up, the capacity for the band to absorb land mobile expansion will be greatly reduced. It seems particularly timely to unscramble this situation now. The band is not now near saturation, the new technical standards applicable to this band, the splitting of channels to 25 kHz and proposed or contemplated allocation changes in the band are very likely to result in requiring existing users to modify equipment and change channels of operation in any event.

4. It is not the purpose of this paper to discuss possible sources of additional allocations. However, it seems clear that unless they are obtained within about the next ten years, which requires decision much before that time, the growth of the land mobile service will have to come to a screaming halt, at which point it may become necessary to engage in a program of retrenchment for some important services so as to provide expansion space for those that are involved directly in the protection of public life and property.

5. The foregoing paragraphs of this section deal largely with generalities. It is considered desirable to discuss briefly some specific problems and remedies available under the present state-of-the-art.

a. Block allocations. The present practice of generally allocating a block of frequencies to a particular service on a nationwide basis tends to

result in geographic inequities in which one service may be experiencing unreasonable congestion and another be relatively free of it and, in many cases, only lightly occupying a given band. The bases for this allocation scheme primarily have been to alleviate a tremendous administrative task which the Commission has been hard-pressed to cope with and to attempt to reserve for future use blocks of frequencies for important services. Without this frequency management policy, it has been rather a common view that less important, but faster growing services, might quickly occupy the spectrum and freeze out the more important services. It is probable that, for some services, this block allocation principle is justified. On the other hand, it is believed that, for many services, similar channel loading factors can be established and that a greater sharing of channels among them will lead to less interference and more efficient service.

b. Computer techniques and planned allocations. There appears to be a rather large group of experts of the opinion that computer systems can be used effectively to assign channels in a far more efficient manner than is involved in present frequency management procedures. It is believed that two general methods have been suggested. The first one would involve the storage of existing assignment information and new assignments would be designed so as to present the most compatible situation with assignments already on the air. The second approach would involve the application of allocation techniques not unlike those now used by the Commission in devising its UHF TV allocation. This latter method involves the design of a pre-determined assignment pattern in which a licensee's channel is selected in accordance with this pattern.

An example of the second approach is indicated in Figure 9. A block of 16 adjacent channels has been assumed. It has been further assumed that it is desirable to have essentially interference-free service on each channel. To accomplish this for the 150 MHz band, one needs to separate co-channel usage areas by about 36 miles. Figure 9 shows one way in which this can be done. Channels are numbered arbitrarily from 1-16, inclusive. It can be seen that, in this example, co-channel average separations are about 36 miles and adjacent channel

average separations are about 12 miles. Further, intermodulation difficulties are minimized with the non-uniform frequency separations provided for adjacent areas.

The advantage of this type of technique should be emphasized. Refer for a moment to Figure 5 which represented the completely incompatible situation for the Business Service in the 150 MHz band. If one were to provide a 16-channel plan for New York City and reduce the co-channel separations shown in Figure 9 to about 17 miles instead of 36, an assignment plan made up of 64 small areas, approximately 4-1/4 miles on a side could be provided. Within this difficult area, one could provide for average adjacent channel separations of about 8 miles and a rather remarkable reduction of intermodulation problems in the whole area. If these co-channel and adjacent channel separations permit us to assume that FM capture effect allows us largely to disregard the interference originating in areas external to any particular one we wish to consider, a rather dramatic improvement over the present situation may be obtained. Figure 5 indicates that in areas 29, 30, 37 and 38, there are a total of 114 licensees and 1093 mobile units authorized. This appears to be the most heavily concentrated portion of the entire area and presumably, under present conditions, the average loading for the entire area is reasonably applicable to these four smaller areas -- 47 licensees and 410 mobile units per channel. If each of the 64 areas were assigned one channel only, the average loading for the four areas mentioned above would become 28.5 licensees and 273 mobile units per channel. However, of perhaps even greater significance is the fact that under this type of assignment plan, one approaches quite rapidly the consideration that it may be possible to use the 15 kHz tertiary channels that have never been allocated. If the example 16-channel plan were revised to permit the best arrangement of 32 channels, the loading shown above would come down to about 14 licensees and 137 mobile units per channel for the four sub-areas mentioned above. Further, it might be possible to accomplish this without changing the existing so-called 30 kHz equipment standards.

c. Possible improvements in the 150 MHz band. Figures 10 and 11 are selected sheets of a monitoring survey analysis compiled by the Commission's Office of Chief Engineer. They have been reproduced here to indicate typical examples of actual channel loadings of portions of the 150 MHz band in New York City. It is understood that the techniques used in this survey result in a probable accuracy of about 71%. Figure 10 is quite representative of a block of channels in which some are heavily loaded, some lightly loaded, and some which may be unassigned within the area. Figure 11 is representative of a block of channels which generally are rather heavily occupied.

Based upon the foregoing, one cannot help but theorize upon possible improvements that could be made to the frequency management practices in the 150 MHz band. In spite of the fact that, on an average, the band seems loaded to about the maximum limit and different frequency management and assignment concepts could require large-scale upheaval of existing frequency assignments, what might be gained in an overall long range plan of attempting to increase the frequency utilization of this band? It would appear worthwhile to seriously consider the conversion of the band to essentially two-frequency operation with some sort of grid allocation plan as illustrated in Figure 9. The total cost of changing numerous systems would be enormous. However, when it is considered that the normal life of equipment may be from five to ten years, at which time it has to be replaced in any event, this type of drastic approach might be well worthwhile.

d. Cooperative base stations for multiple users. In many services it is common practice for many users, in rather close proximity, to have their own base stations, even though the number of mobile units in use by each may be small. Since users are now permitted to choose their own effective radiated powers, their own station locations and antenna heights, a situation is created in which a large number of incompatibilities is created. This has been demonstrated in the New York Business Service data. A single base station used by several licensees can overcome many of these interference difficulties by virtue of the fact that only one base station site is involved. Coupled with the use of two-frequency systems, it is believed that the potential advantages of common base

station operation far exceed the disadvantages of cost and inconvenience that might be involved in converting to them. The cost of base station operation is shared among the users and, if the area involved is not too large, wireline connections between the base station and user control points are nominal. Alternatively, the use of low powered control stations operating on the mobile half of the channel could do the interconnection job satisfactorily.

e. Standard system parameters. Under the present frequency management policies, each user decides upon the technical parameters of his system. He decides whether he wants a single-frequency or a two-frequency system and how much ERP and antenna height he will use. Unless cooperatively operated base stations are used, the conglomeration of system configurations in the same area, sharing a channel, can become rather imposing. It would appear desirable for all concerned to establish standard ERP's and antenna heights or whatever other parameters are necessary to obtain some reasonably standard service and interference area concepts. This does not necessarily require the elimination of wide-area service concepts with more ERP or higher antennas than normal. However, it would require a radical change in frequency management policy. This change, as a practical matter, could take either one of two directions or perhaps a combination of both. Channels could be classified as to wide-area coverage and small-area coverage without a mixture of the two kinds of systems on the same channel in the same area. Alternatively, and especially if the previously mentioned computer method can be made effective, the mobile units of users with wide-area coverage requirements could be required to switch to the allocated channel in whatever area the mobile units may be operating. The latter course would require some kind of interconnection between the user control points and the base stations located in the areas in which the mobile units are operating.

6. The foregoing paragraphs outline certain improved frequency management policies which, to the extent they can be put into practice, have a potential for the following improvements over system configurations now generally in use:

- a. Substantial reduction of receiver intermodulation interference.

- b. Substantial reduction of co-channel and adjacent-channel interference.
- c. Substantial reduction of receiver overloading problems.
- d. Better coordination of channel use and operating practices of licensees would result from natural forces.
- e. Reduction in total base station cost where cooperative base stations are used.
- f. Equalization of interference and service areas and the minimizing of so-called "power wars" among users.
- g. Assures more effective utilization of split channels.

#### E. CONCLUSIONS

1. There is little question about the present and near future land mobile congestion problem. It is not just alleged, it is real.

2. We have within our means and the present state of the art, methods for making much more effective use of the spectrum by the land mobile service. They are going to have to be applied.

3. The application of improved techniques and different frequency management policies will not alone solve the land mobile congestion problem. Additional allocations are needed and they must be arranged for now if a serious national problem is to be avoided.

4. The land mobile service is at THE BOTTOM OF THE BARR

## FOOTNOTES

1. EIA Land Mobile Section Report to the Commission November 9, 1964.
2. Numerous Subcommittee reports of the ACLMRS.
3. Docket 11977 Proceedings.
4. EIA Report of November 9, 1964 analyzed in great detail the entire U.S.
5. Loading curves submitted informally to the Commission in connection with Improved Mobile Telephone System (IMTS).
6. JTAC Task Group 63.1.1 Draft report dated April 1, 1966.
7. JTAC Task Group 63.1.1 Draft report dated January, 1967.
8. "Two frequency vs Single Frequency Systems," ACLMRS Project Coordinating Group No. 4 of the ACLMRS, report dated November 4, 1966.

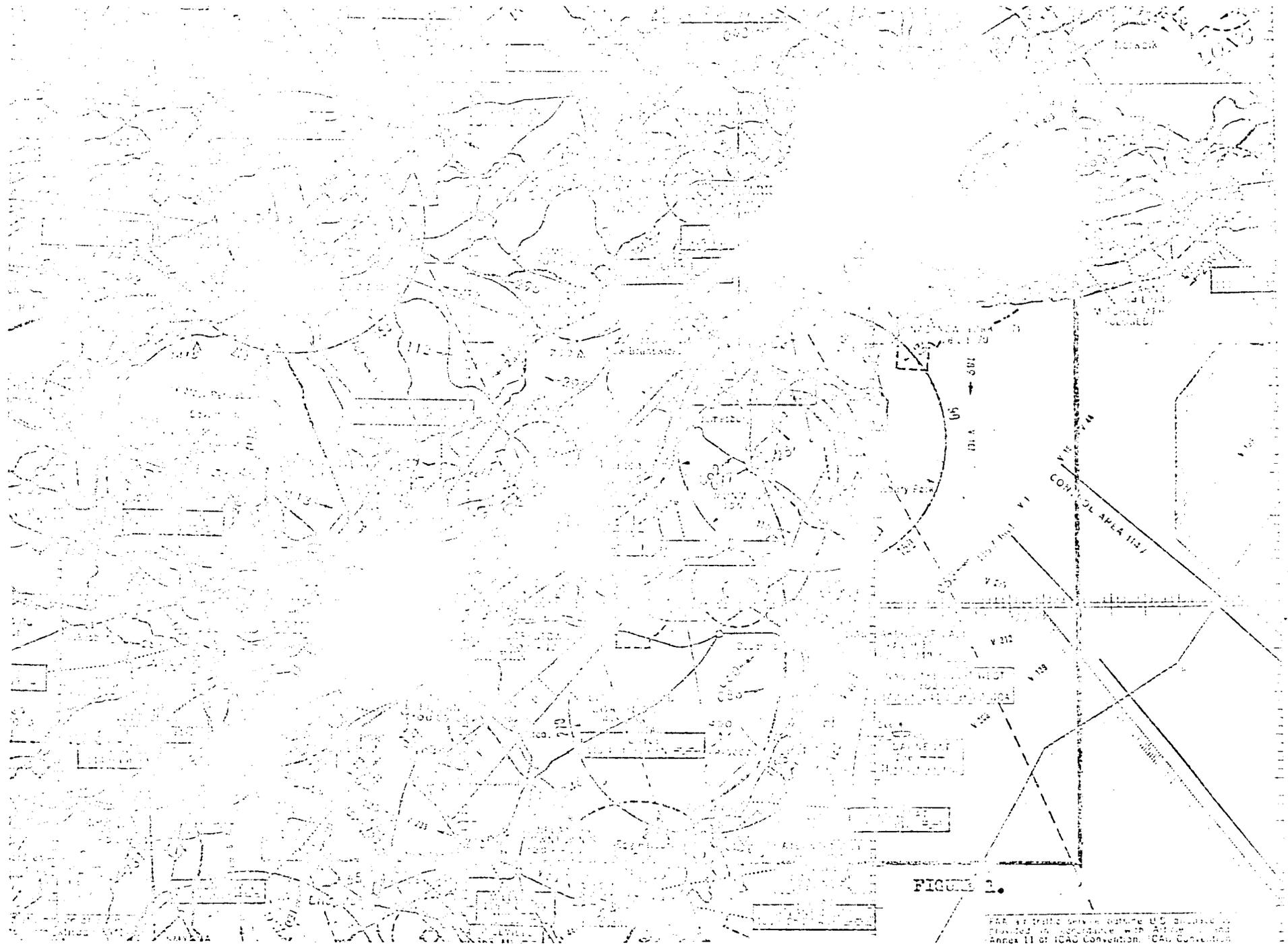


Figure 1. New York - Philadelphia Corridor

FIGURE 2.

FAA's traffic services within U.S. airspace provided in accordance with Part 71 and Annex 11 of ICAO Convention. ICAO Convention

151895.0	30/01/63	KCX507	MASPETH	NY	073 55 28W	40 43 53N	IB FBM	20.0F3	3 48744
151895.0	12/01/62	KBQ992	NEW ROCHELLE	NY	073 46 47W	40 54 55N	IB FBM	20.0F3	8 30836
151895.0	31/08/60	KAQ844	NEW YORK	NY	073 53 28W	40 46 14N	IB FBM	20.0F3	8 12957
151895.0	30/04/63	KDD263	NEW YORK	NY	074 05 03W	40 38 04N	IB FBM	20.0F3	3 49732
151895.0	7/06/63	KDF363	NEW YORK	NY	073 52 01W	40 53 02N	IB FBM	20.0F3	14 51508
151895.0	31/07/63	KDK493	NEW YORK	NY	073 56 04W	40 51 18N	IB FBM	20.0F3	4 55750
151895.0	16/03/64	KDX704	NEW YORK	NY	073 56 01W	40 49 28N	IB FBM	20.0F3	6 75954
151895.0	19/07/60	KEJ934	NEW YORK CY	NY	073 58 30W	40 45 36N	IB FBM	20.0F3	40 10817
151895.0	29/01/64	KER365	NEW YORK	NY	073 58 24W	40 46 05N	IB FBM	20.0F3	8 81637.
151895.0	29/01/65	KFG325	NEW YORK	NY	073 59 02W	40 46 27N	IB FBM	20.0F3	9 43353
151895.0	16/04/65	KFL258	NEW YORK	NY	073 58 20W	40 45 25N	IB FBM	20.0F3	15 03164
151895.0	3/05/65	KFN328	NEW YORK	NY	073 56 58W	40 43 27N	IB FBM	20.0F3	2 08113
151895.0	4/01/67	KJD458	NEW YORK	NY	073 56 45W	40 39 29N	IB FB	20.0F3	61102
151895.0	15/05/63	KDD794	QUEENS VILLAGE	NY	073 42 50W	40 40 35N	IB FBM	20.0F3	3 50119
151895.0	17/01/61	KAX547	RIDGEWOOD	NY	073 55 00W	40 42 30N	IB FBM	20.0F3	7 17908
151895.0	27/05/64	KOK602	STATEN ISLAND	NY	074 06 55W	40 35 57N	IB FBM	20.0F3	20 15094
151925.0	17/03/65	KBZ635	SEWARD	NEB	097 07 10W	40 54 20N	IB FB	20.0F3	36685
151925.0	13/10/64	KEZ736	HOBOKEN	NJ	074 01 40W	40 44 05N	IB FBM	20.0F3	3 87871
151925.0	16/08/61	KBJ953	NEW MILFORD	NJ	074 00 13W	40 54 31N	IB FBM	20.0F3	9 25997
151925.0	28/09/66	KEH287	WEST ORANGE	NJ	074 15 18W	40 47 15N	IB FBM	20.0F3	114 08539
151925.0	7/03/61	KBA220	BRONX	NY	073 50 15W	40 53 00N	IB FBM	20.0F3	23 19445
151925.0	13/12/65	KAY557	FLUSHING	NY	073 49 30W	40 42 15N	IB FBM	20.0F3	12 18613
151925.0	24/06/65	KFQ522	GREAT NECK	NY	073 43 10W	40 48 00N	IB FBM	20.0F3	6 10374
151925.0	14/09/60	KAR415	INWOOD	NY	073 46 00W	40 36 03N	IB FBM	20.0F3	8 13960
151925.0	1/03/65	KEJ375	JAMAICA	NY	073 47 49W	40 39 41N	IB FBM	20.0F3	32 05593
151925.0	3/08/65	KFS921	LONG ISLAND CY	NY	073 55 48W	40 45 22N	IB FBM	20.0F3	10 11274
151925.0	25/10/62	KBN969	NEW YORK	NY	073 56 20W	40 49 15N	IB FB	20.0F3	43883
151925.0	4/12/61	KBP523	NEW YORK CY	NY	073 59 59W	40 45 19N	IB FBM	20.0F3	5 29999
151925.0	13/07/62	KCN276	NEW YORK	NY	073 54 31W	40 50 46N	IB FBM	20.0F3	10 38913
151925.0	14/08/63	KDL592	NEW YORK	NY	073 54 12W	40 45 30N	IB FBM	20.0F3	15 56173
151925.0	17/10/63	KDP521	NEW YORK CY	NY	074 06 00W	40 41 00N	IB FBM	20.0F3	9 60120
151925.0	31/10/63	KDP791	NEW YORK CY	NY	073 45 00W	40 43 00N	IB FBM	20.0F3	9 60584
151955.0	17/03/64	KCK754	JERSEY CY	NJ	074 04 20W	40 44 15N	IB FBM	20.0F3	10 38265
151955.0	13/05/63	KDE344	JERSEY CY	NJ	074 04 20W	40 44 15N	IB FBM	20.0F3	3 51803
151955.0	22/01/62	KBR885	NEWARK	NJ	074 12 15W	40 45 10N	IB FBM	20.0F3	4 31175
151955.0	30/06/64	KDB272	NEWARK	NJ	074 10 16W	40 44 10N	IB FB	20.0F3	83086
151955.0	15/01/63	KCV582	NORWOOD	NJ	073 57 30W	40 59 20N	IB FBM	20.0F3	15 45103
151955.0	4/01/63	KCV941	PATERSON	NJ	074 10 00W	40 55 00N	IB FBM	20.0F3	15 41967
151955.0	20/07/64	KET534	SECAUCUS	NJ	074 05 06W	40 47 40N	IB FBM	20.0F3	10 84941
151955.0	5/06/64	KEU795	SOUTH KEARNY	NJ	074 05 30W	40 42 60N	IB FBM	20.0F3	5 84577
151955.0	17/06/64	KEP901	TENAFLY	NJ	073 58 12W	40 55 37N	IB FBM	20.0F3	7 80841
151955.0	28/12/65	KFT885	UNION CY	NJ	074 02 07W	40 45 42N	IB FBM	20.0F3	15 44039
151955.0	18/07/66	KGH957	UNION	NJ	074 14 58W	40 42 18N	IB FBM	20.0F3	10 11887
151955.0	15/01/67	KEM347	WEST ORANGE	NJ	074 15 10W	40 47 17N	IB FB	20.0F3	78257
151955.0	5/10/60	KAS527	BROOKLYN	NY	073 59 43W	40 36 06N	IB FBM	20.0F3	5 14321
151955.0	18/12/61	KBO456	BROOKLYN	NY	073 59 50W	40 37 29N	IB FBM	20.0F3	20 30292
151955.0	23/04/64	KC2235	BROOKLYN	NY	073 58 27W	40 34 36N	IB FB	20.0F3	4 47465
151955.0	27/02/64	KDI587	FOREST HILLS	NY	073 50 48W	40 43 33N	IB FBM	20.0F3	3 53204
151955.0	8/08/60	KOP211	INWOOD	NY	073 46 02W	40 36 03N	IB FBM	20.0F3	20 11987
151955.0	20/08/63	KDM471	JAMAICA	NY	073 47 38W	40 41 59N	IB FBM	20.0F3	16 56888
151955.0	5/06/64	KEO858	JAMAICA	NY	073 47 02W	40 39 57N	IB FBM	20.0F3	6 79902
151955.0	27/09/63	KAP678	NEW YORK CY	NY	073 42 53W	40 44 47N	IB FBM	20.0F3	10 58663
151955.0	12/10/62	KCR629	NEW YORK	NY	073 58 57W	40 46 01N	IB FBM	20.0F3	8 43541

Figure 2. Sample Section of 8, 100 Area License Holders

Figure 3.

SAFETY AND SPECIAL SERVICES-LAND MOBILE LICENSEES  
NEW YORK CITY-PHILADELPHIA AREA  
(As of November, 1965)

Service	Number of licensees	Number of base stations (Mc band)			Total base stations	Average mobiles per licensee	Total mobiles
		25-50	150.8-174	450-470			
	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>		<u>2/</u>	
<b>PUBLIC SAFETY</b>							
Highway maint.	50	20	48	21	89	40	2000
Fire	491	375	247	1	623	15	7400
Local Govt.	221	114	166	18	298	15	3300
Forestry	3	9	13		22		
Police	412	250	253	10	513	30	12360
Special Emerg.	<u>113</u>	<u>89</u>	<u>46</u>	<u>—</u>	<u>135</u>	<u>6</u>	<u>678</u>
Totals	1290	857	773	50	1680	AVG. 20	25738
<b>INDUSTRIAL</b>							
Business	2335	1539	1162	404	3105	8	18600
Petroleum	17	15	30	1	46	28	475
Motion Picture	2		2		2		
Sp. Industrial	754	598	271	13	882	13	9800
Telephone Maint.	6		8	11	19	100	600
Power	106	147	249	2	398	15	1590
Manufacturers	64		84	4	88	60	3840
Relay Press	<u>12</u>	<u>—</u>	<u>12</u>	<u>—</u>	<u>12</u>	<u>23</u>	<u>276</u>
Totals	3296	2299	1818	435	4552	AVG. 11	35181
<b>LAND TRANSPORTATION</b>							
Citizens Class A	78			90	90		
Interurban Pass.	11	14		14	28	20	220
Interurban Prop.	139	105	55		160	28	3900
Railroad	52		167	1	168	24	1250
Urban Pass.	11	11			11	8	88
Urban Prop.	91	20	76	14	110	31	2800
Taxicab	210	6	401	27	434	8	1680
Auto Emerg.	<u>162</u>	<u>4</u>	<u>154</u>	<u>4</u>	<u>162</u>	<u>9</u>	<u>1450</u>
Totals	754	160	853	150	1163	AVG. 15	11388
S&S Service Total	5340					AVG. 13.5	72307

1/ This has been reduced 10% based upon estimate of licensee code duplication and duplicate entries for "base" and "base/mobile" assignments.

2/ "Mobile only" listings were not contained in the computer list.



BUSINESS RADIO SERVICE

11 Channels in the 150 Mc Band

521 Licensees

4570 Mobile Units

47 Licensees per channel

410 Mobile units per channel

Figure 4. Metropolitan New York

1		2	6	3	10	4		5		6	2	7	6	8		
1	7	3	7	5	3	2	3	3	7	2	3	3	6	1		
1		2	12	7	4	2		3	12	3		3		1		
10		15		44	5	20		35		30		12	5	9	3	9
9		10	2	11	2	12	2	13		14	2	15	10	16	6	
		6	3	9	3	6	3	3		8	3	3		1		
		9	4	17	4	10	4	3	4	16	4	4	4	1		
		78	5	118	5	54	9	23	9	173	5	26	9	2		
17		18	6	19	2	20		21	2	22	2	23		24	6	
		2		6	3	2	3	7	3	8	7	2		2		
		2		7		2	4	15	4	24	4	2	4	2		
		5	9	70	5	14		87	9	217	5	8		14	9	
25		26	2	27	6	28	2	29	2	30	6	31	2	32	10	
6	7	8	3	5	3	9	3	11	3	9	3	6	3	5	3	11
7	4	10	8	5	8	12	4	52	4	21	4	8	4	8	4	
184	9	42	5	33		115	5	404	5	312	5	51	9	55	5	
33		34	2	35	2	36	2	37	2	38	6	39	2	40	2	10
4	3	8	3	6	7	11	3	9	3	5	3	8	3	7	7	
6	4	17	4	9	4	16	4	27	4	14	8	8	4	11	8	12
49	9	104	9	66	9	120	5	221	5	156		136	9	82	5	9
41	2	42	6	43	6	44	2	45	2	46	2	47	2	48	2	10
5	3	6	3	7	3	3		9	3	9	3	11	3	7	7	
10	4	10	4	9	4	4		15	4	14	4	25	4	10	4	8
92		78	5	59	5	41	9	151	5	165	5	220	5	52	5	9
49	2	50		51	6	52		53	2	54		55	6	56	2	
8	3	1	7	4	7	2	3	5	3	2		8	3	5	7	
13	4	1		6	8	3		8		2		9		11	4	8
85	9	4		64		14	5	59	5	8	5	85	5	78	9	
57	2	58		59		60		61		62		63		64		
6	7	1	3													
11	4	3														
120	5	9														

Figure 5. Tabulation of Channel Assignments for Metropolitan New York

Figure 6.

NEW YORK-PHILADELPHIA AREA

Service	Number of Base Stations						
	Total	25-50 Mc	%	150 Mc	%	450-470 Mc	%
Safety	1680	857	51	773	46	50	3.0
Commercial	4552	2299	50.5	1818	40	435	9.5
Transportation	1163	160	14.0	853	73	150	13.0
Totals	7395	3316	45	3444	46.5	635	8.5

Estimated number of Mobiles  
 (Assumed to have same distribution as base stations within bands)

72,300	32,600	45	33,500	46.5	6,200	8.5
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Average Channel loading 25-50 Mc band  $\frac{32,600}{620} = 53$

Average Channel loading 150 Mc band  $\frac{33,500}{293} = 115$

Average Channel loading 450-470 Mc band  $\frac{6200}{320} = 19.4$

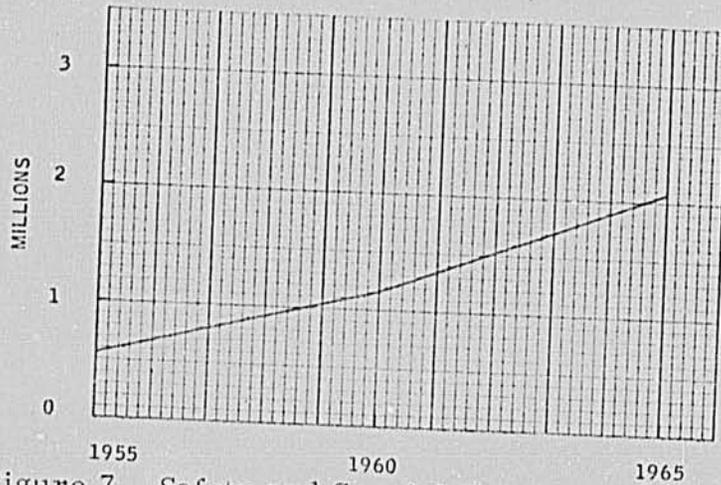


Figure 7. Safety and Special Service Land Mobile Transmitters (From FCC Annual Reports)

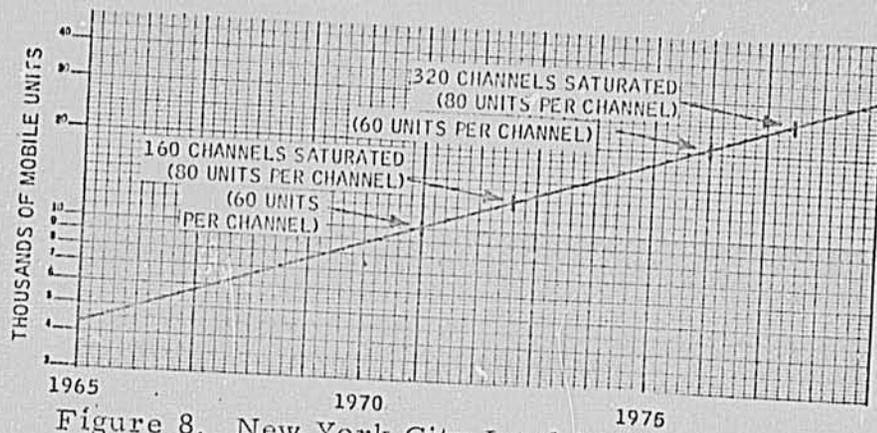


Figure 8. New York City Land Mobile Unit Growth

11	9	1	3	11	9
15	4	14	6	15	4
12	7	10	2	12	7
5	16	13	8	5	16
11	9	1	3	11	9
15	4	14	6	15	4

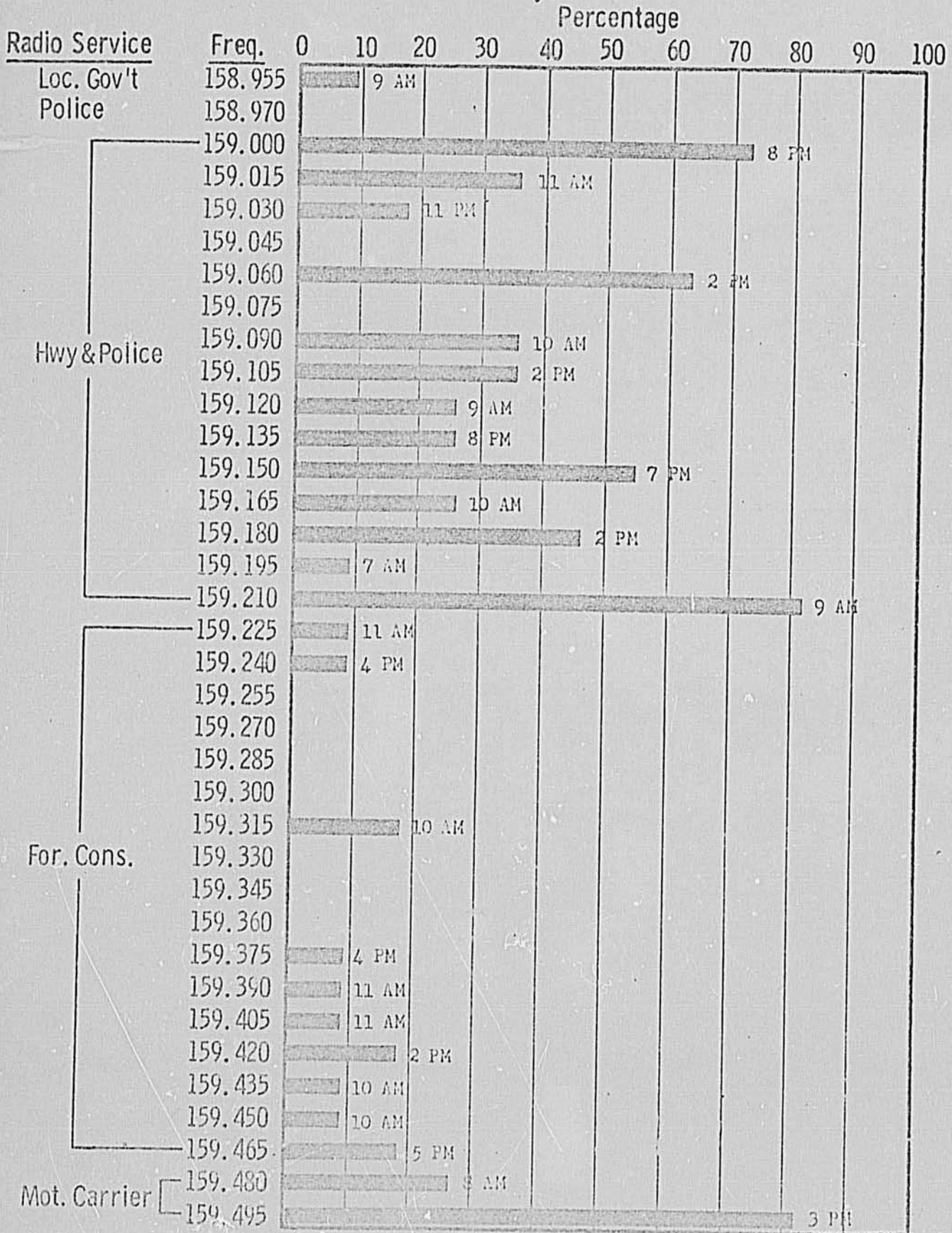
Figure 9. 16 Channel Allocation

Figure 10

FREQUENCY OCCUPANCY OF LAND MOBILE SERVICES

New York City, March, 1966

Peak Hour Analysis



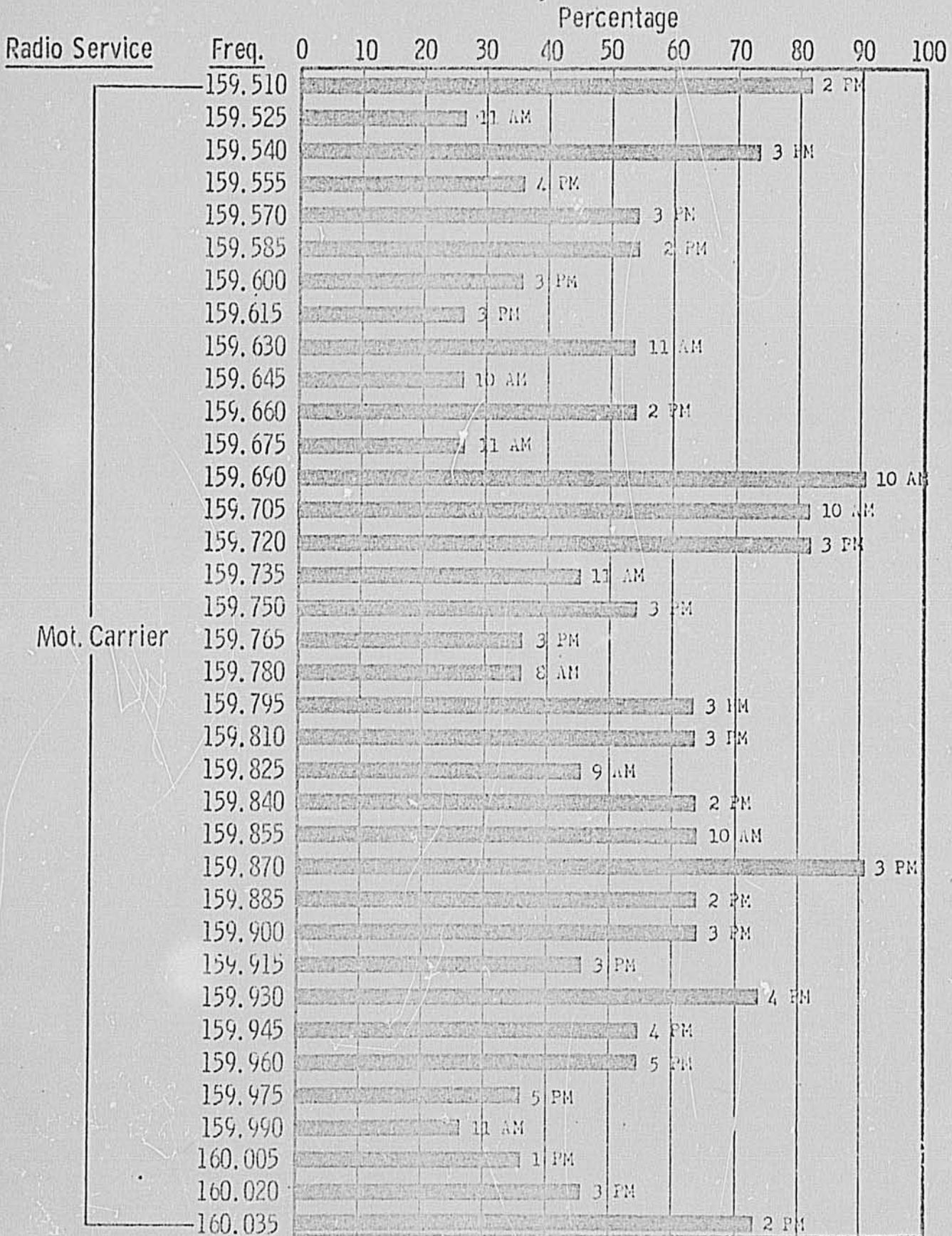
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Figure 11

FREQUENCY OCCUPANCY OF LAND MOBILE SERVICES

New York City, March, 1966

Peak Hour Analysis



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