First Annual Report of the

Federal Communications Commission

To the Congress of the United States

For the Fiscal Year 1935

COMMISSIONERS

Anning S. Prall, Chairman
Irvin Stewart, Vice Chairman
Eugene O. Sykes — Thad H. Brown
Paul A. Walker — Norman S. Case
George Henry Payne

Herbert L. Pettey, Secretary

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FIRST ANNUAL REPORT OF THE FEDERAL COMMUNICATIONS COMMISSION

FEDERAL COMMUNICATIONS COMMISSION,
Washington, D. C., January 6, 1936.

To the Senate and House of Representatives of the United States of America in Congress assembled:

Herewith is submitted the First Annual Report of the Federal Communications Commission covering the fiscal year ended June 30, 1935.

The Federal Communications Commission was established by an act entitled "Public, No. 416", Seventy-third Congress, approved June 19, 1934, for the purpose of regulating interstate and foreign commerce in communication by wire and radio so as to make available so far as possible, to all people of the United States, a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges, for the purpose of the national defense, and for the purpose of securing a more effective execution of this policy by centralizing authority heretofore granted by law to several agencies and by granting additional authority with respect to interstate and foreign commerce in wire and radio communication.

This act further provided for the transfer to the Communications Commission of all officers and employees of the Federal Radio Commission (except the members thereof whose offices it abolished) whose services were deemed necessary to the efficient operation of the new Commission. It also provided for the transfer of all records and property formerly under the jurisdiction of the Federal Radio Commission and all records under the jurisdiction of the Interstate Commerce Commission and of the Postmaster General relating to the duties, powers, and functions imposed upon and vested in the Commission by the Communications Act.

On July 11, 1934, the following persons, having been appointed by the President, took the oath of office as Commissioners, thus establishing the Federal Communications Commission:

Eugene O. Sykes, appointed for a term of 7 years.
Thad H. Brown, appointed for a term of 6 years.
Paul A. Walker, appointed for a term of 5 years.
Norman S. Case, appointed for a term of 4 years.
Irvin Stewart, appointed for a term of 3 years.
George Henry Payne, appointed for a term of 2 years.
Hampson Gary, appointed for a term of 1 year.

Commissioner Hampson Gary resigned as a member of the Commission on January 1, 1935. To fill his unexpired term, the Presi-

dent appointed Mr. Anning S. Prall, and Mr. Prall was later reappointed for a term of 7 years beginning July 1, 1935.

On July 11, 1934, there were 121 employees at the seat of government and 112 employees in the field service.

On July 17, 1934, the Federal Communications Commission organized its divisions in keeping with the Communications Act. Three Divisions (i. e. Broadcast, Telegraph, and Telephone), composed of two members each, were created with the Chairman of the Commission serving ex offico as a member of each Division.

At the close of business on June 30, 1935, the Commission's staff was composed of 329 employees at the seat of government and 113 employees in the field service.

ANNING S. PRALL, *Chairman.*

REPORT OF THE SECRETARY

HERBERT L. PETTEY

For the fiscal year ending June 30, 1935, there was appropriated $1,146,885. This sum is accounted for as follows:

SALARIES AND EXPENSES

01	Personal services	$893,571
02	Supplies and materials	34,684
0236	Gasoline and oil	928
04	Storage and care of vehicles	2,005
05	Communication service	9,980
06	Travel expenses	28,928
0610	Car fare	1,621
07	Transportation of things	462
082	Stenographic reporting	2,033
10	Heat, light, power, and water	3,692
11	Rents	5,065
12	Repairs and alterations	10,509
13	Special and miscellaneous	956
30	Equipment	131,165
	Total	1,125,599

PRINTING AND BINDING

02	Printed forms and letterheads	10,676
08	Printing and binding	2,842
	Total	13,518

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ANNUAL REPORT

LICENSE AND RECORDS SECTION

WM. P. MASSING, *Chief of Section*

The Federal Communications Commission continued the licensing of radio operators and stations in accordance with applicable provisions of treaty, law, and regulations.

In the reorganization that followed the Communications Act of 1934, this section remained intact and in accordance with the provisions of section 214 of the act the section was charged with the additional duties of examining applications for the construction and the issuance of authorizations of new telegraph, telephone, and cable lines and/or the extension of existing lines.

To comply with the Commission's Order No. 1, six radio services were transferred from the Commercial Unit to the Broadcast Unit.

Collaborating with the Engineering and Law Departments, a complete revision of the Commission's application and authorization forms was effected.

The following is a detailed report, arranged according to service, showing the number of new stations authorized, number of stations deleted and the total number of authorized radio stations as of June 30, 1935:

Nature of service and class of station	New stations authorized	Stations deleted	Total number of stations June 30, 1935
Agriculture: Point-to-point telegraph	0	0	9
Amateur: Amateur	7,416	8,245	45,561
Aviation:			
Aeronautical	62	19	193
Aeronautical point-to-point	43	0	96
Airport	13	12	27
Aircraft	136	219	359
Marker beacon	3	0	3
Broadcast: Broadcast	39	9	623
Emergency:			
Marine fire	0	0	2
Police, municipal	41	0	194
Police, State	32	1	58
Special emergency	7	1	44
Experimental:			
General experimental	516	231	849
Special experimental	61	52	126
Experimental relay broadcasting	0	0	12
Experimental visual broadcasting	1	5	21
Experimental broadcast	0	0	4
Fixed public:			
Point-to-point telegraph	28	38	377
Point-to-point telephone	16	10	111
Fixed public press: Point-to-point telegraph	0	1	77
Geophysical: Geophysical	22	6	131
Marine relay: Marine relay	2	1	42
Mobile press: Mobile press	1	0	5

Nature of service and class of station	New stations authorized	Stations deleted	Total number of stations June 30, 1935
Public coastal:			
Coastal telegraph	4	9	110
Coastal telephone	1	1	2
Coastal harbor	12	8	37
Private coastal:			
Coastal telegraph	0	2	3
Coastal harbor	0	0	2
Ships: Ships	347	404	1,961
Temporary:			
Broadcast pick-up	4	6	34
Motion picture	0	0	1
Total	8,807	9,280	51,074

AMATEUR

In the Amateur Unit is concentrated the work of licensing amateur radio operators and stations, applying the provisions of law and regulations governing such issues. Due to the numbers of applicants, this work involves a great deal of detail in grading examinations for the operator licenses, scrutiny of applications, signature and issuance of license for those approved, assignment of call signals, and maintaining the related records and correspondence.

The work is planned to handle volume. Suitable form letters are frequently prepared; of 16,881 letters emanating from the Unit during the year, 15,248 were form letters and 1,633 drawn specially. The amateur's operator and station licenses are issued on opposite sides of pocket-size form, designed as part of a printed assembly that includes also seven card records of both for the Commission's offices in Washington and the field. Applications are also made on a joint form, usable in applying for both operator and station licenses. Counting as one, each such application whether made for both licenses or for only one of the two, the total handled during the fiscal year is given by the following figures:

AMATEUR RADIO APPLICATIONS

Receipts:	
Pending July 1, 1934	156
Received during the fiscal year	31,275
Total	31,431
Disposals:	
Approved	19,182
Returned to applicants	5,353
Referred to other Federal agencies, etc	385
Failed required examinations	5,032
Total	29,952
Pending close of June 30, 1935	1,479

The return of applications without approval occurred for various reasons precluding license, such as lack of citizenship by the applicant or by the person in control of the station premises, or misconception of the proper use of an amateur station, while many more had only formal defects, curable by amendment of the applications. Thus a substantial number of those returned to applicants were re-

ceived and counted a second time. The same is true of those referred to other offices, commonly due to proposed use of Federal premises. In another sense the foregoing figures include some duplication, in that often an applicant failing an examination, applies again and is reexamined after a lapse of 90 days required by regulation.

The majority of approved applications were for both operator and station licenses, including reissues for the purpose of bringing coterminous on the joint card form the amateur's operator and station licenses formerly issued as separate documents at different times and for different periods. All issues exceeded 100 per day, as follows:

AMATEUR RADIO AUTHORIZATIONS

Station licenses:	
New	7,416
Renewals	2,725
Modifications and reissues	7,597
Total	17,738
Operator licenses	17,532
Operator license endorsements	904
Duplicates of lost or destroyed licenses	351
Total	18,787
Grand total	36,525

During the past fiscal year the licenses of 29 amateur operators were suspended or withheld, in nearly all cases for a period of 6 months, while 94 others who had not qualified were debarred from examination, usually for like period. One license was ordered suspended for 2 years and another obtained by fraud was ordered canceled. Only five amateur station licenses were revoked.

TOTAL NUMBER OF AMATEUR STATION LICENSES

Valid of record July 1, 1934	46,390
Issued during fiscal year, new	7,416
Total	53,806
Less:	
Cancellations	2,551
Other deletions	839
Expirations (renewal yet possible) approximately	4,850
Revocations	5
Total	8,245
Net close of June 30, 1935	45,561

This Unit also maintains the one complete record of licenses of various professional classes required to qualify radio operators for service at any of the numerous kinds of transmitting stations maintained by commercial interests. To permit quick service in connection with sea, air, and land stations, the licensing in such cases is decentralized, with 22 offices of issue. Examinations, failures, license issues, renewals, endorsements, etc., are reported for posting on the Commission's central record. During the fiscal year 7,466 such re-

ports were received for record. A large number of the licenses were of radiotelephone third class, for operation of police transmitters, for which the requirements are relatively simple.

Due to improper acts in connection with the operation of a broadcast station, the Commission suspended the licenses of three operators during the year.

BROADCAST

The consolidation of the old records of the Radio Division of the Department of Commerce with those of the Commission for the purpose of maintaining a complete record of each broadcast station from the beginning of control of broadcast stations by the Federal Government was continued.

The records pertaining to the following classes of radio stations that were transferred from the Commercial Unit were revised:

Experimental relay broadcasting.
Experimental visual broadcasting.
Experimental broadcasting.
Broadcast pick-up.
General experimental.[1]
Special experimental.[1]

A complete set of records was devised and installed to comply with the provisions of the Communications Act of 1934 requiring that applicants procure authority to transfer the control of corporations and obtain permits to locate, maintain, or use studio or apparatus for the production of programs to be transmitted or delivered to foreign radio stations.

The work of the Unit may best be summarized by the following tables:

TABLE I.—*Comparison of applications received and authorizations issued during the fiscal years 1931, 1932, 1933, 1934, and 1935*

	1931	1932	1933	1934	1935
Applications received	3,784	2,519	2,193	2,590	3,652
Authorizations issued	3,233	2,534	2,446	2,503	3,434

Applications received and instruments of authority issued comprised construction permits, licenses, modifications of construction permits and licenses, consent to voluntary or involuntary assignments of construction permits and licenses, extension of licenses, installation of automatic frequency-control equipment, special authorizations, emergency authorizations, consent to transfer control of corporations, and permits to locate, maintain, or use studio or apparatus for production of programs to be transmitted or delivered to foreign radio stations.

In addition to the applications shown in table I, there were received in the Unit 1,487 informal applications, which consisted of requests for (1) extension of equipment and program test periods,

[1] All matters relating to or connected with this class of station concerning the development of apparatus for any service assigned to the Broadcast Division.

(2) to operate for a limited period of time in a manner not set forth in a regular license or authorized by regulations, (3) to depart from hours of operation as authorized, and (4) to partially or wholly suspend operation of a station. There were also issued 442 informal authorizations consisting of letters, telegrams, and deviations from time-sharing agreements.

TABLE II.—*New stations authorized (total 39)*

Call letters	Applicant and location	Frequency	Power	Hours of operation
		Kilocycles	*Watts*	
KABR	Aberdeen Broadcasting Co., Aberdeen, S. Dak	1,420	100	Daytime.
KADA	C. C. Morris, Ada, Okla	1,200	100	Do.
KALB	Alexandria Broadcasting Co., Inc., Alexandria, La	1,420	100	Do.
KAST	Abraham Shapiro, Astoria, Oreg	1,370	100	Do.
KELD	T. H. Barton, El Dorado, Ark	1,370	100	Unlimited.
KFRO	Voice of Longview, Longview, Tex	1,370	100	Daytime.
KFUH	Richard Field Lewis, Del Monte, Calif	1,210	100	Unlimited.
KHSL	Wm. Schield, Sydney R. Lewis, and Harold Smithson, trustees Golden Empire Broadcasting Co., Ltd., Chico, Calif.	950	250	Daytime.
KINY	Edwin A. Kraft, d/b as Northwest Radio Advertising Co., Juneau, Alaska.	1,310	100	Unlimited.
KIUJ	J. H. Speck, Santa Fe, N. Mex	1,310	100	Do.
KIUL	Garden City Broadcasting Co., Homer A. Ellison and Frank D. Conard, Garden City, Kans.	1,210	100	Do.
KIUN	Jack W. Hawkins and Barney H. Hubbs, Pecos, Tex	1,420	100	Do.
KIUP	Le Roy Haley, Durango, Colo	1,370	100	Do.
KPLC	T. B. Langford, R. M. Dean, and L. M. Sepaugh, Calcasieu Broadcasting Co., Lake Charles, La.	1,500	100	Do.
KRLC	H. E. Studebaker, Lewiston, Idaho	1,420	100	Do.
KROC	Southern Minnesota Broadcasting Co., Rochester, Minn.	1,310	100	Do.
KVOL	Geo. H. Thomas, Robert M. Dean, L. M. Sepaugh, and T. B. Lanford, d/b as Evangeline Broadcasting Co., Lafayette, La.	1,310	100	Do.
KVSO	The Ardmoreite Publishing Co., Inc., Ardmore, Okla	1,210	100	Daytime.
KWBG	W. B. Greenwald, Hutchison, Kans	1,420	100	Unlimited.
WAIM	Wilton E. Hall, Anderson, S. C	1,200	100	Do.
WCML	The Ashland Broadcasting Co., Ashland, Ky	1,310	100	Do.
WFMD	The Monocacy Broadcasting Co., Frederick, Md	900	500	Daytime.
WISC	Milwaukee Broadcasting Co., Milwaukee, Wis	1,310	100	Do.
WMFD	Richard Austin Dunlea, Wilmington, N. C	1,370	100	Do.
WMFF	Plattsburg Broadcasting Corporation, Plattsburg, N. Y.	1,310	100	Do.
WMFG	Head of the Lakes Broadcasting Co., Hibbing, Minn	1,210	100	Unlimited.
WMFH	Joseph M. Kirby, Boston, Mass	1,120	500	Daytime.
WMFI	Patrick J. Goode, New Haven, Conn	900	500	Do.
WMFJ	W. Wright Esch, Daytona Beach, Fla	1,420	100	Unlimited.
WMFN	Attala Broadcasting Corporation, Clarksdale, Miss	1,210	100	Do.
WMFO	James R. Doss, Jr., Decatur, Ala	1,370	100	Daytime.
WMFR	Hart & Nelson (J. A. Hart and Wayne M. Nelson), High Point, N. C.	1,200	100	Do.
WNBC	William J. Sanders, New Britain, Conn	1,380	250	Do.
WNRI	S. George Webb, Newport, R. I	1,200	100	Unlimited.
WPAR	Ohio Valley Broadcasting Corporation, Parkersburg, W. Va.	1,420	250–LS 100	Do.
WPRP	Julio M. Conesa, Ponce, Puerto Rico	1,420	100 250–LS	Specified.
WTAL	Florida Capitol Broadcasters, Inc., Tallahassee, Fla	1,310	100	Unlimited.
WTMV	Mississippi Valley Broadcasting Co., Inc., East St. Louis, Ill.	1,500	100	Do.
WWPA	Clarion Broadcasting Co., Inc., Clarion, Pa	850	250	Daytime.

Of the 39 new broadcast stations authorized during the year, 31 were authorized under the provisions of section 307 of the Communications Act and were not charged to quota.

TABLE III.—*Stations consolidated (total 2)*

Call letters	Grantee and location	Date of consolidation	Call letters and location of station with which consolidated
WLIT	WFIL Broadcasting Co., Philadelphia, Pa.	Feb. 12, 1935	WFIL, Philadelphia, Pa.
WDAG	Plains Radio Broadcasting Co., Amarillo, Tex.	June 4, 1935	KGNC, Amarillo, Tex.

TABLE IV.—*Stations deleted (total 7)*

Call letters	Grantee and location	Date of decision
KGIX	J. M. Heaton, Las Vegas, Nev. (C. P. only). Construction permit expired Apr. 26, 1935; construction not completed within required time.	May 14, 1935
KWFV	The Hilo Broadcasting Co., Ltd., Hilo, Hawaii (C. P. only). Construction permit expired Sept. 1, 1934. No application for extension of time filed.	Apr. 16, 1935
WAMC	Raymond C. Hammett, Anniston, Ala. (C. P. only). Construction permit expired Jan. 10, 1935. Application for modification construction permit returned and no further application received.	May 14, 1935
WJEM	Britt A. Rogers, Jr., Tupelo, Miss. (C. P. only). Construction permit expired Aug. 1, 1934. No application for extension of time nor application for license filed.	Oct. 2, 1934
WKFI	J. Pat Scully, Greenville Miss. License expired. No application for renewal of license filed.	Oct. 3, 1934
WNBO	John Brownlee Spriggs, Silver Haven, Pa. Licensee voluntarily surrendered license.	Mar. 15, 1935
WWPA	Clarion Broadcasting Co., Inc., Clarion, Pa. (C. P. only). Construction permit expired Jan. 11, 1935. Commission denied application for modification of construction permit Mar. 26, 1935.	Apr. 15, 1935

Three complete lists of radio broadcast stations authorized by the Federal Communications Commission, arranged (1) alphabetically by call signal, (2) alphabetically by State and city, and (3) numerically by frequency, were compiled and prepared for distribution. Monthly supplements to these lists have been prepared for distribution to the general public.

There was also published a list of the visual broadcast stations and relay broadcast stations.

COMMERCIAL

There were received in the Unit a total of 8,221 applications as compared with 8,139 during the previous fiscal year. There were issued 7,722 instruments of authority as compared with 7,336 for last year.

Of the applications received, 256 were returned because they were improperly executed, contained insufficient information, or were otherwise defective. In each case a letter was written informing the applicant of the defect.

TABLE V.—*Comparison of applications received and authorizations issued during the fiscal years 1931, 1932, 1933, 1934, and 1935*

	1931	1932	1933	1934	1935
Applications received	6,246	5,515	6,837	8,139	8,221
Authorizations issued	5,395	6,053	6,617	7,336	7,722

Applications and authorizations shown in the above table comprised construction permits, modifications of construction permits, licenses, modification of licenses, renewal of licenses, and assignments of construction permits and licenses.

The Commission on January 11, 1935, authorized a new class of station in the aviation service, i. e., airway obstruction marker beacon. Three stations of this type were authorized during the year.

The Commission granted 3 telephone and 3 telegraph applications authorizing additional wire line facilities.

During the fiscal year there were received 2,969 applications for ship radio station licenses including modifications and renewals, and 2,920 authorizations were issued including telegraphic communications authorizing emergency operation.

On June 30, 1935, there were 1,961 ship stations licensed aboard vessels of United States registry, including 195 vessels operating on the Great Lakes. Approximately 275 ships are compulsorily equipped with radio telegraph apparatus and the remainder are voluntarily equipped.

Approximately 1,846 vessels have been authorized for regular maritime service, communicating with other ships and coastal telegraph stations. Twenty-six have been authorized to communicate on a designated frequency with specified coastal harbor telephone stations and 27 have been granted authority to operate on the general frequency 2,738 kilocycles for communication between ship harbor stations, either telephone or telegraph.

There are three municipal fire boats authorized to operate on a specified frequency and 58 vessels operating on specific frequencies allocated for Alaskan waters.

Fifteen vessels, yachts operating outside of general traffic lanes, and vessels on special scientific expeditions, have been granted special permission to communicate with amateurs for periods of from 1 to 12 months.

The system of assigning call signals for all radio stations, excepting amateur, was revised during the past year. This revision required the preparation of some 40,000 call cards with the necessary information for identification for the calls already assigned.

Eleven hundred seventy-eight call signals were assigned during the past fiscal year.

The Radio Service Bulletin containing in tabular form a complete record of all new assignments, changes, and deletions relative to all classes of radio stations, commercial and Government, in the United States and its possessions was issued semimonthly.

REPORT OF THE EXAMINING DEPARTMENT

DAVIS G. ARNOLD, *Chief Examiner*

Upon its organization on July 11, 1935, the Federal Communications Commission continued the employment of the examiners of the Federal Radio Commission, two in number, at first upon a temporary basis and later by permanent appointments. The Examining Section was included in the Law Department for the purpose of organization only. Thereafter, a Chief Examiner was appointed and the administrative duties of the Examining Department were defined by the Commission as follows:

EXAMINING DEPARTMENT

The functions of the Department are to conduct hearings, formal and informal, on applications, petitions, and complaints filed with the Commission, when the Commission so directs; and conduct hearings and investigations instituted by the Commission on its own motion concerning rates, rules, regulations, services, and practices of carriers subject to the Communications Act of 1934, as directed by the Commission.

THE EXAMINERS

The Chief Examiner will administer the work of the Department and will also preside at hearings. Examiners will preside at hearings, propose reports containing findings of fact and law with recommendations based on these findings; conduct investigations and hearings under Commission's orders and report thereon and perform such other duties under the functions of the Department as directed by the Chief Examiner.

Additional appointments of examiners were made from time to time so that at the close of the fiscal year the staff consisted of the Chief Examiner and six examiners.

The following tabulation discloses the volume of work handled by the Department during the fiscal year:

Cases heard and unreported as of July 1, 1934		10
Cases heard during fiscal year		199
		209
Cases dismissed without report		13
		196
Cases reported during fiscal year		129
Cases unreported as of June 30, 1935		67

REPORT OF THE LAW DEPARTMENT

PAUL D. P. SPEARMAN, *General Counsel*

The Commission approved the organization of the Law Department into three divisions, each of which was separated into appropriate sections as follows: (1) Research and Advisory Division, with a Research Section and a Liaison Section; (2) Telephone and Telegraph Division, with an Applications and Complaint Section, Operating Control Section, Investigation Section, and Litigation Section; and (3) Radio Division, with an Applications Section, Radio Trial and Hearing Section, and Appeals and Decisions Section.[1]

The activities of each division and section will be reported separately.

I. RESEARCH AND ADVISORY DIVISION

CARL F. ARNOLD, *Assistant General Counsel*

This Division had a vast number of problems of first impression presented because of the new jurisdiction of the Commission. There is outlined below a very brief summary of the nature of the problems with which this Division has been confronted:

(1) RESEARCH SECTION

The Research Section has had primary responsibility for the drafting of proposed bills appended to the Commission's special report of February 1, 1935, construing the legal effects of the various sections of the act, advising the Commission on the legal aspects of administrative problems, preparing extensive summaries of State commission and State and Federal court decisions on accounting, depreciation, valuation, and rate-regulatory problems, and analyses of financial and operating reports made by communications carriers to the Commission pursuant to its orders. The Section has also been primarily responsible for the preparation of a proposed draft of rules of practice for the Commission and the preparation of rules and regulations concerning the filing of tariffs and other administrative practices.

It has also been called upon to analyze the history of congressional legislation over communications carriers from the first regulatory act and the history of American post-office legislation.

(2) LIAISON SECTION

The Liaison Section has been primarily concerned with the activities heretofore vested in various departments of the Government and with relation to the various State regulatory commissions having

[1] Since the period covered in this report the Law Department has been reorganized into sections which conform to the divisions established by the Commission pursuant to the Communications Act of 1934, viz Telephone, Telegraph, and Broadcast.

comparable jurisdiction. Some of the chief problems have been an analysis of Pacific cable contracts transferred from the Department of State; a digest of N. R. A. hearings on codes of fair practice and competition in the telegraph and telephone communications industries; a study of the early post roads acts; consideration of the legal phases of American participation in international conferences; a digest of the court history and citations of outstanding public utility cases of State commissions and State and Federal courts; digest of decisions of the Interstate Commerce Commission with respect to telephone and telegraph accounting, rate regulation, and valuation; cooperation with the State regulatory commissions in matters of annual and monthly report forms and accounting orders; cooperation with the Securities and Exchange Commission in drafting legislation for proposed regulation of security issues; comment on various bills affecting communications introduced in the Congress and in the various State legislatures; report on the Weather Bureau's relation to the telegraph companies in their extensive wire and radio communication of weather forecasts; opinions rendered to the Secretary of the Treasury, the Attorney General, the Bureau of Internal Revenue, the Post Office Department, the Bureau of Investigation of the Department of Justice, and other Government agencies with respect to communications problems; and opinions rendered to members of Congress requesting information and data concerning the activities of the Commission.

II. TELEPHONE AND TELEGRAPH DIVISION

FRANK ROBERSON, *Assistant general counsel*

This Division had primary responsibility for legal matters arising within these two divisions, respectively, of the Commission. The reports for the four different sections of this division are set forth below:

(1) APPLICATIONS AND COMPLAINT SECTION

This section has made an examination of the returns to 7,000 questionnaires which it addressed to the various communications carriers for the purpose of determining to what extent they are subject to the jurisdiction of the Commission. It has acted on a vast number of these advising the carriers to what extent they are subject to the act, and is holding the remainder in abeyance pending the decision of the Commission on the jurisdictional question. It has conducted extensive correspondence with these carriers regarding the questionnaires and further information necessary to a determination of jurisdiction. It has created card-index records of the various carriers. Other problems include complaints concerning franks and free service, consolidation of telephone companies, employees' pension plan, limitation of liability by telegraph companies for transmittal of messages, wire-tapping cases and patent-infringement cases. It has also received and considered 332 applications for interlocking directorates. These applications seek authority to hold from 2 to 50 interlocking directorates. The section has also prepared a 953-page digest of the 9,000-page record in the telegraph rate hearing and a 28-page index of the same.

(2) OPERATING CONTROL SECTION

This section has considered application for certificates of public convenience and necessity for the extension of lines, applications for consolidation and merger of telephone companies, applications for physical connection with telephone companies, proposed rules governing franks and services at reduced charges, exclusive contracts between railroads and telegraph companies, order fixing rates of pay for Government communication by telegraph, and has prepared various memoranda on law and policy with respect to the Commission's regulation of the operations of communications carriers.

(3) INVESTIGATION SECTION

This section has made investigations of various complaints, such as one filed by the American Association for the Protection of the Motion Picture Theatre regarding the operations of the American Telephone & Telegraph Co. and the effect of such operations on telephone rates; the jurisdiction of the Commission to require information from telephone companies regarding bucket-shop operations; jurisdiction of the Commission over the destruction of telephone and telegraph records; the jurisdiction of the Commission over wire tapping; the jurisdiction of the Commission over mergers of telephone companies under State laws without the approval of this Commission; an investigation of Pacific Telephone & Telegraph Co.'s evening toll-rate charges; complaints against employee insurance assessments; new point-to-point telegraph service; the transmittal and handling of messages addressed to Members of Congress with respect to pending legislation; the investigation of various miscellaneous complaints against communications carriers; and personnel matters within the Commission.

(4) LITIGATION SECTION

The Litigation Section has represented the Commission in the conduct of cases involving telegraph rates, regulations, and practices. Complaints against the communications companies, applications for certificates of public convenience and necessity to install a new experimental coaxial cable, hearing on proposed revised uniform system of accounts for telephone companies, hearings on jurisdiction of the Commission over connecting carriers, private wire contracts, questions on radiotelephone circuits between the United States and France, and on rates of pay for telegraph communications.

III. RADIO DIVISION

GEORGE B. PORTER, *Assistant General Counsel*

Section 307 (b) of the Communications Act of 1934, which provides for the grant by the Commission of applications for license for stations not exceeding 100 watts power without regard to quota, if the Commission finds that such operation will not interfere with the fair and efficient radio service of existing stations, and that the granting will serve public interest, convenience, and necessity, has resulted in a large increase in the number of applications received by the Broad-

cast Division of the Commission, and has also proportionately increased the work of this Division and particularly the Applications Section of this Division. There has also been a substantial increase generally in applications filed during the period covered in this report over the number filed during the previous fiscal year. During the period covered by this report this Division had primary responsibility for legal matters arising in the Broadcast Division. A concise report of its sections is set forth below.

(1) APPLICATIONS SECTION

This section is charged with the duty of preparation of the legal forms covering all types of radio cases; collaboration with technicians in drafting of regulations governing radio; the handling of legal questions involved in formal and informal radio cases prior to submission to the Commission; the preparation of bills of particulars in cases recommended for hearing; the conduct of such investigations concerning the regulation of radio stations as are ordered by the Commission from time to time, and particularly investigations and inquiries into the violation of the Communications Act of 1934, international conventions, Commission regulations, or the operation of licensed stations contrary to the public interest. This section also passes upon the legality of contracts and other legal instruments, prepares opinions upon legal problems such as may be referred by the Commission or the General Counsel under title III of the Communications Act of 1934.

The number of formal and informal applications handled by this section during the past year, including legal review, examination of the facts and the law, preparation of opinions, and, in some cases (594), the preparation of bills of particulars, aggregated 7,500. In connection with many of these applications it was necessary to consider upon and recommend disposition of petitions, motions, and other pleadings filed by applicants or other parties in interest. The number of applications for permits for new stations as well as applications for permits and modification of permits for existing stations increased to 988 in comparison with 374 of such cases handled the year prior. Likewise, applications for licenses and modification of licenses increased to 578 from 258 in the fiscal year preceding. The applications for special authorizations of an emergency or experimental character, including those of an informal nature, rose to 815, while applications for renewal of existing licenses during the year totaled approximately 1,300, leaving 3,854 miscellaneous applications covering various services not specifically enumerated above.

In the past fiscal year there has been a notable increase in complaints to the Commission of stations broadcasting objectionable programs, and the Commission has made an extensive inquiry into these complaints under the provisions of the Communications Act of 1934 and its rules and regulations promulgated pursuant thereto. Formal action was taken with regard to 226 separate objectionable programs broadcast over 152 stations. Some action was taken with regard to a much larger additional number of complaints involving several more stations, but these were adjusted informally. The broadcasting of false, fraudulent, and misleading advertising in various guises

has been the chief source of complaint. In many instances the Federal Trade Commission, the Post Office Department, and the Food and Drug Administration had taken action to curtail the objectionable activities of medical advertisers in printed form, the result being that these advertisers resorted to broadcasting in order to disseminate their misleading and often fraudulent sales propaganda. This section handles all matters of inquiry and enforcement from their initial stages to final Commission action.

(2) RADIO HEARING AND TRIAL SECTION

This section is responsible for the preparation and trial of radio cases and formal radio licensing hearings before the Commission and its examiners. It prepares all necessary orders and pleadings incident to such hearings on behalf of the Commission, and passes upon and advises the Commission as to the legal sufficiency thereof with recommendations and rulings on all pleadings filed in hearings by counsel.

It passes on petitions for reconsideration, petitions for rehearing and review of Commission action, consolidations, continuances, orders for taking depositions, and submits recommendations to the Commission as to what action should be taken thereon.

It also reviews examiners' reports and exceptions filed thereto, passes upon questions of law and evidence presented in the hearings and prepares legal opinions for the Commission on such matters. It also prepares correspondence and conducts interviews involving all matters relating to hearings.

This section also passes upon petitions involving legal questions for grant of licenses without a hearing.

It handles matters pertaining to the unlawful operation of unlicensed amateur radio stations, or the operation of amateur stations by unlicensed operators, and all correspondence relative to such matters. It is responsible for the drafting of orders of the Commission for the revocation of amateur station licenses, the suspension of operators' licenses, the drawing of orders for disbarment of persons from taking examinations for operators' licenses because of misconduct, and conducts the hearings on all matters involving the revocation of licenses by the Commission. It cooperates with other Governmental agencies, particularly the Department of Justice, in connection with the prosecution of parties for the operation of stations without station licenses or persons operating stations without operators' licenses. During the past fiscal year there have been 10 persons indicted and convicted in United States courts for violations of the Radio Act of 1927 and the Communications Act of 1934 There was one person arrested and released upon his promise not to engage further in unlicensed activity. There have been 20 unlicensed stations reported and closed without prosecution with the promise of the operators not to engage further in unlicensed activities. There is now one case pending awaiting the meeting of the grand jury before which it will be presented and indictment requested. There are now six investigations being carried on, but in these cases there is not sufficient evidence yet in hand to warrant prosecution.

During the instant fiscal year this section participated in 261 hearings before the Commission and its examiners; 23 oral arguments

before the Commission; wrote 535 memoranda concerning pleadings in cases pending before the Commission; wrote 113 legal opinions upon examiners' reports; prepared 117 orders and/or memoranda concerning the taking of depositions; and wrote interoffice legal opinions and correspondence, 519 in number.

In connection with the operation of unlicensed amateur radio stations, the Commission's agents have apprehended numerous cases in the past year, and operators of these stations have been barred from examination for radio operators' privileges. For violations of the radio laws and rules of the Commission, the Commission has suspended or withheld 29 amateur operators' licenses and has revoked 5 station licenses.

It cooperates with the Research and Advisory Division in the preparation of legal opinions for the Commission and the Radio Division on matters arising under the Communications Act of 1934 and the rules and regulations of the Commission.

Pursuant to section 307 (c) of the Communications Act of 1934 the Broadcast Division held a public hearing October 1 to 20, inclusive, and November 7 to 12, inclusive, 1934, which was the basis for the Commission's subsequent recommendations to Congress with respect to the allocation of fixed percentages of radio broadcasting facilities to particular types or kinds of nonprofit radio programs, or to persons identified with particular types or kinds of nonprofit activities. The hearings covered more than 13,000 pages of typewritten transcript, and more than 100 witnesses appeared and testified. The Law Department made the arrangements for this hearing, sent out proper notices to interested parties, and otherwise assisted in its conduct.

(3) APPEALS AND DECISIONS SECTION

During the period covered by this report, this section of the Law Department has assumed primary responsibility for the preparation for the Commission of its statements of facts, grounds for decisions and orders in 56 cases heard by the examiners of the Commission and the Commission; for all litigation in broadcast cases (other than criminal) in which the Commission was interested or a party, compiling records, preparing pleadings or briefs, and actual presentation of cases before the various courts; examination of the minutes of all divisions of the Commission; and has cooperated with the Research and Advisory Section in the preparation of memoranda and opinions upon legal questions, interpretations of laws and treaties and drafting proposed legislation and rules and regulations pertaining to radio matters, reviewing and answering correspondence involving questions of law in radio cases.

On July 11, 1934, there were four cases pending in the United States Court of Appeals for the District of Columbia which were transferred from the Federal Radio Commission to the Federal Communications Commission under section 604 (d) of the Communications Act of 1934. All were disposed of during the current year as follows: Of those pending in the United States Court of Appeals for the District of Columbia, 1 was dismissed at the request of appellant and 3 were decided by that court, in which the decision of the Commission was affirmed. During the fiscal year 8 new cases

were filed in the United States Court of Appeals for the District of Columbia, of which 4 were dismissed by the appellants, 1 was decided by that court affirming the decision of the Commission, and 3 are still pending; 3 new cases were filed in the Supreme Court of the District of Columbia and 1 in the United States District Court for the Northern District of Illinois. These are still pending.

The cases decided by the United States Court of Appeals for the District of Columbia are, for the most part, of such importance as to warrant special consideration. Accordingly, a brief report of each case is given below:

IN THE UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA

THE DON LEE CASE

(*Don Lee Broadcasting System* v. *F. C. C.*, 76 F. (2d) 998)

This was an appeal from a decision of the Federal Radio Commission denying an application filed by Don Lee Broadcasting System for construction permit to erect a new station at Redlands, Calif., for the use of the frequency 780 kc with 500 watts power, unlimited time. Filed concurrently with this application were several others, including an application of the Pickwick Broadcasting Corporation (station KTM) for renewal of license upon the assignment of 780 kc, sharing time with station KELW, and also for permission to make a voluntary assignment of license to the Evening Herald Publishing Co. of Los Angeles, and an application by Magnolia Park, Ltd. (station KELW), Burbank, Calif., for renewal of license on the assignment of 780 kc, sharing time with Station KTM and permission for voluntary assignment of license to the Evening Herald Publishing Co.

The application of Don Lee Broadcasting System contemplated and requested permission to construct an entirely new station at Redlands, Calif., and the granting of this application would necessitate the deletion of stations KTM and KELW because their facilities were requested by the applicant. The Commission found that the Don Lee Broadcasting System had not shown a substantial need for additional service in the city of Redlands, and that particularly was this true when, in order to establish such service, existing stations would be deleted.

The court held that the decision of the Commission, in granting the applications of KTM and KELW for renewal and assignment of license and denying the application of Don Lee Broadcasting System for construction permit to erect a new station at Redlands, Calif., was based on substantial evidence and was not arbitrary or capricious.

THE RADIO SERVICE CORPORATION CASE

(*Radio Service Corporation* (*station KSEI*) v. *F. C. C.* Decided May 6, 1935. Not yet reported)

This was an appeal by Radio Service Corporation (station KSEI), Pocatello, Idaho, from a decision of the Commission denying its application to change frequency from 900 to 890 kc and granting the application of Symons Broadcasting Co. (station KFPY), Spokane, Wash., to change frequency from 1,340 to 890 kc. Hearings upon these competing applications were conducted by an examiner

appointed by the Commission because it was not feasible for both stations to operate on the frequency in question. The Commission decided that public interest, convenience, and necessity would best be served by granting the application of station KFPY and denying that of station KSEI. Appellant claimed that the grant of the frequency 890 kc to station KFPY would be a violation of the Davis amendment (45 Stat. c. 263, sec. 5), section 307 (b) Communications Act of 1934 (48 Stat. 1084), the ground for this contention being that the coverage of station KFPY would be increased by this change of frequency, and that the State of Washington in which KFPY was located was already over quota. The court held that such a change does not bring the case within the purview of the Davis amendment. It also affirmed the Commission's decision on the ground that there was substantial evidence to support the decision and that the same was not arbitrary or capricious.

THE MAGNOLIA PETROLEUM CASE

(*Magnolia Petroleum Co. and Sabine Broadcasting Co.* v. *F. C. C.*, 76 F. (2d) 439)

This appeal arose as a result of certain concurrent orders made by the Commission affecting stations KRGV, Harlingen, Tex., and KWWG, Brownsville, Tex. Station KWWG had filed applications for renewal of its license and to assign the license to Port Arthur College. There was also an application for construction permit to move from Brownsville to Port Arthur. Station KRGV made application for a modification of its license for unlimited time, without change of frequency or power and without sharing time with KWWG as theretofore. The Commission granted these applications over the protest of Magnolia Petroleum Co. and Sabine Broadcasting Co., licensee of station KFDM, located at Beaumont, whose protest was based upon the theory that the Commission's decision violated the Davis amendment in that some additional units were granted to a State already over quota, and also that the grant subjected them to an economic injury. The court sustained the Commission and held that, in view of the size of the communities and their respective demands for broadcasting service, it was reasonable to believe that there would be sufficient commercial support to maintain a station in each community, and that the college should not be denied the privilege of maintaining a broadcasting station at Port Arthur because it would have to compete with appellant's station at Beaumont. The court further said that the Commission's increase of facilities was not obnoxious to the Davis amendment because the change left the State of Texas "as near to its precise quota as is practically possible."

THE JENNY WREN CASE

(*Jenny Wren Co., a corporation,* v. *F. C. C.* Decided May 27, 1935. Not yet reported)

This was an appeal from an order of the Supreme Court of the District of Columbia denying a motion made by the Commission to dismiss a bill of complaint for injunction filed by the Jenny Wren Co. against the Commission.

Radio station WHB had filed with the Commission an application requesting leave to increase its hours of operation from daytime to unlimited hours at Kansas City, Mo. The Commission, being unable to determine from an examination of that application that the granting thereof would serve the public interest, convenience, and necessity, designated the same for public hearing. The Jenny Wren Co., licensee and operator of station WREN at Kansas City, then filed a petition to intervene in that hearing on the ground that the granting of that application would affect it adversely in that station WHB is in active competition for material, talent, and commercial revenues, and a modification of its existing license so as to permit it to operate evening hours would seriously affect its operation. The Commission declined to permit WREN to intervene, whereupon it filed a bill of complaint for injunction in the Supreme Court of the District of Columbia praying that the Commission be enjoined from holding any hearing on that application unless and until it was permitted to intervene. The Commission's motion to dismiss was predicated upon two propositions: (1) That an economic interest was not such an interest as entitled the applicant to intervene, and (2) even if it had such an interest as would entitle it to intervene, then it had a plain, speedy, and adequate remedy at law under section 402 (d) of the Communications Act of 1934 and, therefore, should not be permitted to employ an extraordinary remedy. The court decided that the remedy provided for appeal under section 402 (d) of the Communications Act of 1934 was the proper remedy for the Jenny Wren Co. to pursue and that was exclusive. It, therefore, directed that the decision of the lower court denying the motion of the Commission to dismiss the plaintiff's bill of complaint be reversed and the cause remanded with instructions to sustain the motion and dismiss the bill.

REPORT OF THE ENGINEERING DEPARTMENT

DR. C. B. JOLLIFFE, *Chief Engineer*

ORGANIZATION

The Engineering Department was organized into three sections, Broadcast, Telegraph, and Telephone, to correspond to the organization of the Commission. In addition an International Section and a Field Section were set up to coordinate special matters which come under the jurisdiction of all three divisions. The duties of each section of the Engineering Department are as follows:

Broadcast Section.—Technical examination of all matters relating to radio broadcasting; preparation and presentation of expert testimony at hearings; preparation of technical regulations; research on use of the facilities, installation, technical operation, maintenance, and development of the monitoring apparatus and other radio equipment.

Telegraph Section.—Technical examination of all matters relating to record communication by wire or radio; fixed and mobile radio services as assigned; preparation and presentation of expert testimony at hearings; preparation of technical regulations; research on use of facilities; prescribe qualifications and classify radio station operators.

Telephone Section.—Technical examination of all matters relating to telephone communication (other than broadcasting) by wire or radio, including fixed and mobile radiotelephone services as assigned; preparation and presentation of expert testimony at formal hearings; preparation of technical regulations; collaboration with the Telegraph Section in matters relating to teletype, telephoto, and facsimile systems.

International Section.—Coordinate international and interdepartmental relations in connection with wire or radio services; make plans for participation in international conferences and technical meetings; advise concerning technical engineering phases of international treaties, agreements, etc.

Field Section.—Administer the work performed by the Commission's field force in twenty-one districts throughout the United States and Hawaii, including holding of operators' examinations, travel by inspectors, inspections, investigations, and special duties as assigned.

BROADCAST SECTION

I. GENERAL

The broadcast Section examines all matters pertaining to broadcast engineering. The services that are included are: regular broadcast, experimental high-fidelity broadcast, experimental relay broadcast,

broadcast pick-up, experimental visual (facsimile and television) broadcast, and very high frequency experimental broadcast (above 30,000 kilocycles).

II. REGULAR BROADCAST

The basic plan of allocation of regular broadcast facilities placed into effect by the Federal Radio Commission has been continued unchanged insofar as concerns the general plan of allocation of stations by frequencies, power, and hours of operation. However, the provisions of section 307 (b) of the Communications Act of 1934 replaced section 9 of the Radio Act of 1927, as amended (known as the "Davis amendment"), which required that the Commission allocate broadcast facilities, as nearly as possible, equally between the zones and fair and equitably between the States in the zones according to population. Section 307 (b) of the Communications Act of 1934 exempted stations of 100 watts power or less under certain conditions from any restrictions insofar as imposed by the quota. This permitted the licensing of many additional stations of 100 watts power in underserved areas where such stations would not interfere with the fair and efficient service of existing stations.

A comparison of the number of broadcast stations licensed or under construction for the fiscal years 1927 to 1935 is given in table VI.

TABLE VI

	1927	1928	1929	1930	1931	1932	1933	1934	1935
Total number of stations	681	677	606	618	612	604	598	593	623
Total simultaneous operations at night	565	514	400	416	420	397	376	397	421

1. MODIFICATION OF RULES

The Commission revised the rules concerning the determination of quota charges (rules 109–111) so that the quota due each zone and State within each zone was divided into night and day sections. The night quota due and day quota due are considered entirely separate and wholly independent of each other. Day and night interference characteristics of broadcast stations are quite different. The quota due is based on the maximum number of assignments that can be made in the smallest zone in order to saturate the zone with regards to mutual interference. The interference characteristics were determined after several years of continued investigation of the night and day propagation characteristics of regular broadcast stations. The day interference range of stations is appreciably less than at night and therefore more day assignments of power and stations can be made than at night.

Applications for new facilities are considered in two parts if both night and day operation is requested and the proper quota due is considered in connection with each part. Prior to the adoption of this revision, each zone was designated as having a total quota due of 80.00 units. Under the new plan each zone was designated as having due a total of 36.00 units at night and 65.00 units daytime. Accordingly, this made possible the granting of many daytime power

increases to stations. The night quota due and assigned as a result of this change did not differ materially from the night portion of the former system since the smaller zones were already saturated with respect to interference.

A summary of quota units due and assigned for day and night operation by zones, as of June 30, 1935, are given in table VII.

TABLE VII

	Units due		Units assigned		Net amount over or under quota			
					Units		Percent	
	Day	Night	Day	Night	Day	Night	Day	Night
Zone 1	65.00	36.00	44.995	34.455	−20.003	−1.545	−31	−4
Zone 2	65.00	36.00	47.61	38.09	−17.39	+2.09	−27	+6
Zone 3	65.00	36.00	62.045	46.115	−2.955	+10.115	−5	+28
Zone 4	65.00	36.00	65.12	39.43	+0.12	+3.43	+0	+10
Zone 5	65.00	36.00	57.74	45.90	−7.26	+9.90	−11	+27
Total	325.00	180.00	277.51	203.99	−47.488	+23.990	−15	+13

The Commission also changed the limitation of maximum daytime power permitted for regional stations from 2,500 to 5,000 watts in order to improve the daytime service to the public in areas where increases could be made without objectionable interference being caused to other existing stations. This change was made simultaneously with the quota revision. The licensees of a number of stations have taken advantage of this change and have applied to the Commission and have been granted increases in day power. There are a number of other similar applications still pending.

2. NEW STATIONS WITHOUT REGARD TO QUOTA

On October 10, 1934, the Commission issued a statement relating to the licensing of additional 100-watt broadcast stations as provided for in section 307 (b) of the Communications Act of 1934. It was stated that these stations would be allocated only to frequencies designated as local channels, namely, 1,200, 1,210, 1,310, 1,370, 1,420, and 1,500 kilocycles, which are allocated for stations of 100 watts. A need for the station must be shown and it must not cause radio interference with the fair and efficient service of existing stations. In determining the interference that may be caused, the existing power-frequency mileage separation tables of the Engineering Department are followed unless a complete engineering survey shows unusual conditions exist, as a result of which no interference would be caused. The technical requirements for the equipment and operation are the same as for other broadcast stations. These stations established in accordance with the last clause of section 307 (b) of the Communications Act of 1934 are not charged to quota.

A total of 31 construction permits have been issued up to June 30, 1935, authorizing the erection of stations in accordance therewith. In addition, construction permits for eight other stations, which were charged to quota, were issued.

3. OPERATION AT 500 KILOWATTS

On April 17, 1934, the Federal Radio Commission granted station WLW, Cincinnati, Ohio, which operates on the clear channel frequency of 700 kilocycles, special temporary experimental authority to increase power from 50 to 500 kilowatts during the regular broadcast hours of operation. Prior to this time the station had been operated with 500 kilowatts power on 700 kilocycles from 1 to 6 a. m., as an experimental station, using call letters W8XO. This additional authority to WLW was granted in the interest of developing the operation of broadcast stations with higher power in order to determine the interference and the benefits to the public which might result because of better reception generally.

This station was operated with power of 500 kilowatts, using a conventional antenna, until February 11, 1935. The Canadian Radio Broadcasting Commission informed this Commission of interference caused to station CFRB, Toronto, Ontario, which operates on the adjacent channel of 690 kilocycles with a power of 10 kilowatts. On December 21, 1934, the Commission adopted a minute specifying that upon expiration of the outstanding authority it would not be renewed except that the application for extension must be based upon 500 kilowatts operation during daytime and 50 kilowatts operation during nighttime or 500 kilowatts at night using a directional antenna such that the signal in the Niagara Falls-New York area (nearest area to Toronto over which this Commission has jurisdiction) would not be greater than delivered by 50-kilowatt conventional antenna. On January 25, 1935, the Commission denied application for operation with 500 kilowatts at night but granted it for 500 kilowatts during daytime. Subsequently, the licensee applied to the Commission and was granted special temporary experimental authority to install a directional antenna so designed that the effective signals toward station CFRB would be controlled and restricted as required. After erecting the new antenna, surveys to determine its effectiveness were made by the licensee, Canadian authorities, this Commission, and other interested parties. These surveys indicated that the directional antenna was suppressing the signal as required and that the interference to station CFRB was no greater than when station WLW operated with 50 kilowatts conventional antenna. On this basis the Canadian Radio Broadcasting Commission stated it had no objection to the continued operation of WLW with 500 kilowatts at night on an experimental basis.

The effects of the operation with this amount of power have not been fully determined in all respects although sufficient data are available to indicate that the service of the station is greatly improved. Also, the experimental operation being conducted offers a means of further studying the effects and the obtaining of additional data on which to base development of future policy on the operation of clear channel stations with a power in excess of 50 kilowatts.

III. EXPERIMENTAL HIGH FIDELITY BROADCAST

Three frequencies in the band from 1,500 to 1,600 kilocycles have been continued for a special class of broadcast stations. These stations are designated as "experimental high-fidelity broadcast sta-

tions." The frequencies allocated are 1,530, 1,550, and 1,570 kilocycles. On June 30, 1935, there were four such stations in operation.

These stations are licensed for the purpose of carrying on research and development in the radio art and are equipped to transmit high fidelity programs. It is the obligation of the licensees of these stations to carry on research and development in the broadcast technical art which is in advance of the work done by the licensees of regular broadcast stations. The transmission of sponsored programs is permitted on the condition that sponsorship will not interfere with the program of research and that the conduct of experiments will not depend solely upon the sponsorship as a means of defraying the cost of experimentation.

Complete reports of the research and development are required each 6 months with the applications for renewal of licenses. The 4 licensed stations have made 1 report with the renewal application for their first 6 months or less of operation.

IV. EXPERIMENTAL RELAY BROADCAST (INTERNATIONAL BROADCAST)

No additional experiment relay broadcast stations were licensed during the fiscal year, however, the general interest of the public increased considerably in this type of broadcast service due to the greatly increased number of so-called " all-wave " broadcast receivers that permit reception of this class of stations along with the regular broadcast stations. Practically all of the better grade of 1934 model receivers include this all-wave feature.

Many of the European and South American stations, as well as those of other nations were received with regularity both day and night subject to wide variations in fading and interference.

Experience has shown that channel widths of at least 20 kilocycles are required for reasonably good reception and reproduction to be obtained on these frequencies. This is because of the extreme and rapid fading, average weakness of received signals, carrier frequency tolerance required, average receiver characteristics, etc. Even with the directive antenna systems and diversity reception, a carrier frequency separation of 10 to 20 kilocycles is necessary for high-grade reception in the present state of the art.

Assignments are now being made, however, by some nations with separations of only 5 kilocycles and other nations are assigning odd channels with separations even less than this. As a result, this international broadcast service is being greatly impaired by reason of mutual interference. It is very important, therefore, that agreements be made between the various participating nations of the world for the shared use of these frequencies during periods of time when interference may be caused. There are times of the day and seasons when relay stations on certain of the frequencies can transmit and be received in one section of the world but during which time it is impracticable or impossible for other sections of the world to employ satisfactorily the same frequencies because the listening public is not available due to the early morning hours, or because of geographical separations, daylight and darkness distributions, and the seasonal and diurnal changes in propagation characteristics.

The relay broadcast frequencies have been selected as those most suitable for transmission to great distances or international services, but due to these great distances the average signals are always weak and therefore it is quite important that the power assignments be not less than 5 or 10 kilowatts. This is considered the minimum power with which it is possible to make efficient usage of an assignment.

A sound engineering and economic allocation of the experimental relay or international broadcast frequencies requires close cooperation, mutual agreements, and treaties between the nations of the world engaging in this service.

V. BROADCAST PICK-UP

Broadcast pick-up stations in both the temporary and experimental services have increased from 85 on July 1, 1934, to 102 on June 30, 1935. This increase in the number of stations licensed reflects very accurately the increase in interest in picking up of programs where wire line facilities are not available. There were many events of national and local interest picked up by means of these stations and broadcast over regular broadcast stations.

VI. EXPERIMENTAL VISUAL BROADCAST

Although the Commission licensed no new visual broadcast (facsimile or television) stations during the past year, the general interest of the public in television has increased substantially. Interest in television has been stimulated greatly by the activities in certain European countries. Great Britain and Germany have given considerable publicity to their activities in this field. Technically, television has been as highly developed in the laboratories of the private companies of the United States as has been accomplished in Europe.

The several companies carrying on television experiments in the United States have not standardized the several essential elements of transmission. Due to the wide band width necessary (approximately 3,000 to 4,000 kilocycles) and other requirements, frequencies above 40,000 kilocycles are the only ones available for high quality television transmission. In order to transmit a picture of approximately 350 lines and 60 frames per second accompanied by voice, the wide band width is required. If this band is reduced, the detail or clearness of the pictures is reduced accordingly. No commercial receivers are at present available to receive such programs. In order to give television service it is necessary for the different manufacturing companies to standardize their transmissions and produce receivers which can receive all programs transmitted. In short, from a laboratory standpoint television programs can be satisfactorily transmitted and received locally at the present development of the art but before it is finally useful to the public there are many commercial problems to be solved.

VII. VERY HIGH FREQUENCY EXPERIMENTAL BROADCAST

Interest in very high frequency experimental broadcasting has continued to develop; however, the full possibilities of the frequencies

for local broadcasting are developing slowly due to the very limited number of broadcast receivers that will tune to this band of frequencies. The very high frequencies above 30 megacycles have such characteristics that they serve a small area and then beyond this range no interference will be caused to other stations. This is different from the propagation characteristics of the stations on the regular broadcast frequencies (550 to 1,500 kilocycles) which have a moderate primary service area but the signals continue for hundreds of miles so that their interference range is enormous compared with the primary service area. Due to this characteristic of the very high frequencies, it has been considered that they offer a means of supplying strictly local service to any number of centers of population with frequency assignments duplicated at relatively low mileage separations. The individual stations would serve only a few miles, probably in the order of 2 to 10 miles depending upon the power, location of the transmitter, its efficiency, and the radio propagation characteristics of the surrounding terrain.

VIII. TECHNICAL DEVELOPMENTS IN REGULAR BROADCASTING

1. ANTENNA REQUIREMENTS

The service of broadcast stations is determined by two main factors: First, the signal or field intensity, and second, the percentage of modulation. The field intensity is determined by the power, efficiency of the radiating system, the frequency, location of station and radio propagation characteristics of the surrounding terrain. The characteristics of the surrounding terrain cannot be controlled, however, the Engineering Department has promulgated a very complete set of empirical standards for the location of transmitters such as to require locations that give the maximum service. The Commission controls directly the assigned power but heretofore little regulation has been applied to the efficiency of the radiating systems.

A study of the radiating systems of many broadcast stations revealed that in many cases the antennas were inefficient and that improvements could be made such that the coverage of the stations would be increased equivalent to a substantial increase in power. The Commission receives many applications for increase in power for the purpose of improving the service whereas an improvement in the antenna system would effect a greater improvement in coverage than the requested increase of power.

It is considered the obligation of every licensee to make full usage of the assignment already authorized before further facilities are granted. Applicants for new stations must show that efficient use will be made of the requested assignment. So as to have a uniform standard for antennas, the Engineering Department set up minimum standards in regard to antenna dimensions or efficiency that must be complied with before favorable reports will be made to the Commission on requests for increase in facilities. Figure 1 gives the minimum heights of antennas for stations of different powers and classes that must be complied with before it may be considered that the radiating system complies with the requirements of good engineering practice. The heights given are the minimum physical vertical height above the station ground system or counterpoise. It is

generally accepted that a vertical antenna of optimum height is the nearest ideal for general broadcast service. In cases where the licensees claim that the required efficiency may be obtained without the height as specified, then the option is given of determining the

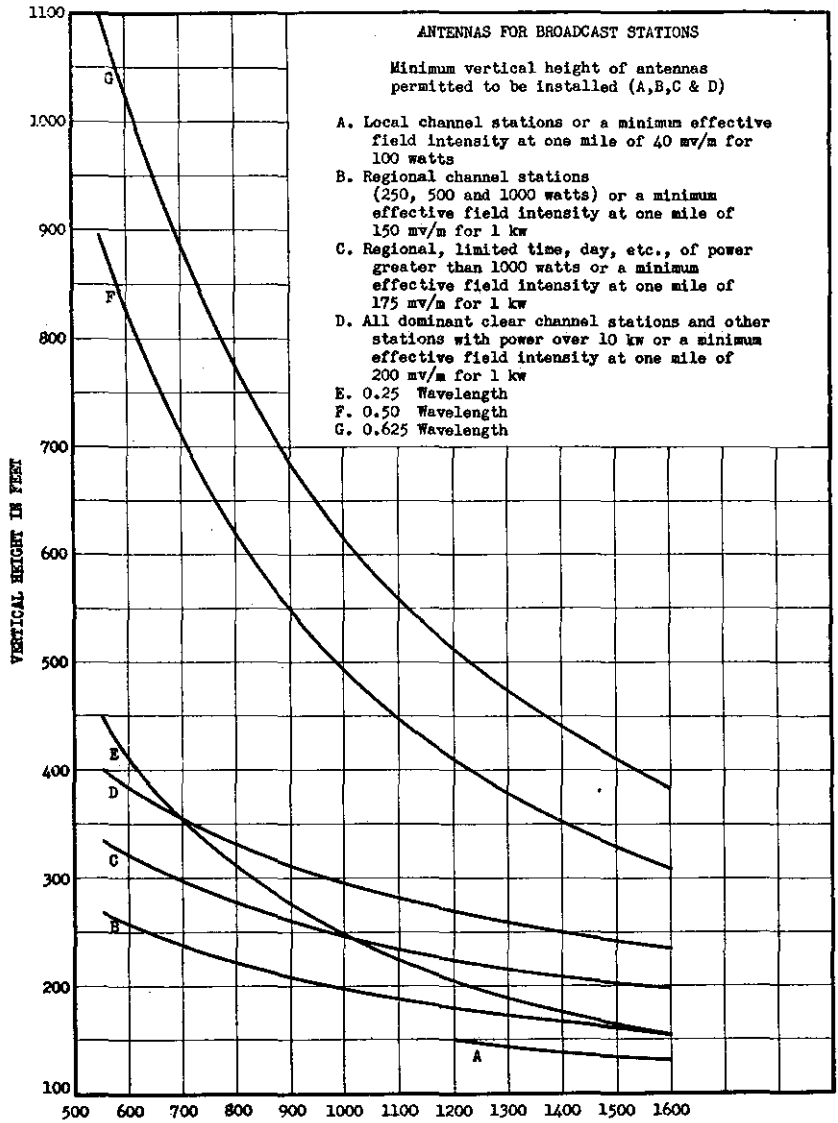

FIGURE 1.—Antenna heights.

field intensity of the station and if this meets the requirements as set out, then it is not necessary to install the height as given. However, it is the obligation of the licensee to prove to the Commission the required efficiency is obtained. The figures on the required field intensity in lieu of height are given on the graph.

2. MODULATION METER

The other essential component of coverage of stations is percentage of modulation of the carrier. Observations were made of the percentage of modulation of many broadcast stations by means of remotely operated cathode ray oscillographs. These observations reveal that the percentage of modulation of different stations varies widely. Some few stations were over-modulating, causing distortion of the program and interference, but a greater number were modulating a low percentage thus appreciably limiting the service rendered by the station.

There has never been developed an entirely satisfactory commercial modulation meter, though it appeared quite possible. With this in mind, the Engineering Department held an informal conference of representatives of all the manufacturers of radio transmitting apparatus, radio operating companies, etc., who might be interested in the design and operation of such a device. The conference was well attended and the subject was thoroughly discussed and it was decided to test and demonstrate several different instruments at the Bell Laboratories in New York City. This demonstration was held on April 29–30, 1935. Various types of instruments made by the different companies were tested before a large group of engineers and expert audio observers. At the close of the fiscal year another meeting was scheduled in Washington, at which time final specifications for the modulation meter were to be written.

3. ALLOCATION SURVEY

Since the allocation of 1928 no specific or basic changes have been made in regulation of the Commission governing the allocation of regular broadcast frequencies. There has been much public and engineering sentiment toward making certain basic changes rather than continuing granting of various applications that did not comply with this basic plan as originally adopted. While much engineering data have been taken by the Field Section of the Commission and at the numerous hearings held before the Commission, and the leading radio engineers throughout the United States have introduced large amounts of data, the Engineering Department was not convinced that it had sufficient information available on which to base a recommendation to the Commission to change the present allocation or to fully substantiate it.

The licensees of 13 clear-channel stations petitioned the Commission that it carry forward a survey in cooperation with them for the purpose of gaining further information. While the petition exactly as made was not accepted, the Commission did decide to carry forward the survey in cooperation with all broadcast licensees. Several informal conferences with all interested parties invited to be present were held when the extent and plan of survey, the prorating of the work, and the setting up of an organization to purchase equipment and management of the survey were decided. During January the survey actually began and the taking of data was closed on May 30, 1935.

The survey was divided into four principal parts, namely:

1. One hundred and sixteen thousand questionnaires were sent to the fourth-class postmasters and to a list of representative rural listeners furnished by the Agricultural Adjustment Administration requesting their preferences in radio stations with respect to satisfaction of reception.

2. The field personnel of the Commission made extended trips and interviewed radio listeners throughout various sections of the United States to obtain their opinions.

3. Continuous recordings were made of the signal received from broadcast stations in 10 different locations of the United States. The number of continuous recorders located at each of these points was from 4 to 8. This is the greatest number of field-intensity recordings heretofore taken and should give reliable information on the signal to be expected at distances from stations of various powers.

4. The radiating efficiency and primary service areas of several representative stations were determined by means of field-intensity equipment located in the Commission's test cars.

The data were all accumulated during the fiscal year 1934–35; however, the analysis, summary, conclusions, and recommendations to the Commision based on the survey were just begun at the close of the fiscal year.

4. DIRECTIONAL ANTENNAS

During the past year a number of licensees and applicants for new stations have installed, or requested the Commission for authority to install, directional antenna systems. These radiating systems are designed to reduce the radiation in one or more desired directions for reduction of interference with other stations which are located in such directions or to increase the field intensity in some other direction so as to give a maximum service over the desired center of population. Where such installations are designed and constructed in accordance with good engineering practice the operation has been satisfactory and the desired results accomplished. In order to obtain maximum utilization of the available facilities and to provide additional service in underserved areas which otherwise would be deprived of adequate service it appears desirable to authorize directional antennas on regional channels after proper showing is made.

Concerning directional antennas on local channels, the Engineering Department recommends that directional antennas not be authorized on local channels for either increasing or decreasing the signal in any direction unless it can be shown definitely that the interests of no other station will be adversely affected and that the general plan for future allocations on local channels will not be impaired. The power of local stations is limited to such that, irrespective of the mileage separation over a certain minimum value, no interference will be caused within the 2 millivolt field intensity contour of stations. If directional antennas are used, power in excess of 100 watts will be radiated in certain directions, which will destroy this fundamental of allocation on such facilities.

On June 30, 1935, 20 stations were operating with directional antennas.

TELEGRAPH SECTION

The rules, regulations, and policy established by the Federal Radio Commission relating to radio stations operating in services other than broadcast were accepted by this Commission upon its organization without any immediate changes. The only changes that have been made are those that are required due to the development of the industry and due to changes in policy necessitated by improvements in the art of radio communication. The existing policy in effect with regard to the various services will be discussed under the appropriate heading.

RADIO

FIXED SERVICE

On July 1, 1935, there were 296 point-to-point telegraph stations licensed for fixed public service and 73 point-to-point telegraph stations licensed for fixed public press service in the United States, its territories,[1] and possessions subject to the jurisdiction of the Commission. Although the larger proportion of these stations are licensed primarily for international and overseas communication there are approximately 120 stations within the continental United States which are licensed to communicate with other stations similarly located, on condition that the use of frequencies above 6,000 kilocycles for domestic service shall not interfere with international service.

The Commission defines one station as all of the radio transmitting apparatus used at a particular location for one class of service and operated under a single instrument of authorization. In the international and overseas service a separate license and call-letter group is issued for each frequency employed at a given location pursuant to requirements of the General Radio Regulations annexed to the Telecommunications Convention of Madrid.

The majority of point-to-point telegraph stations in the United States engaged in international or overseas communication are located near the Atlantic, Pacific, and Gulf coasts. All of these stations were authorized, as of July 1, 1935, to transmit public message traffic to approximately 86 foreign and overseas points. In addition, a large number of these stations are licensed to send addressed program material to many foreign points, to the Territory of Hawaii, and to Puerto Rico for rebroadcast by regular broadcast stations at those points. Several of the stations, in accordance with the terms of their licenses, transmit press traffic to ship subscribers at sea. On low frequencies below 100 kilocycles, this transmission at times is addressed exclusively to ships; however, on high frequencies above 3,000 kilocycles the transmission primarily is addressed to and received at

[1] Excluding Alaska.

5. EMPIRICAL STANDARDS PREVIOUSLY PUBLISHED

There has been no major change made in the empirical standards previously published (Seventh Annual Report of the Federal Radio Commission). The tables of average daytime and nighttime recommended separations, pages 21 and 23, are still used in determination of interference between stations and presentation of engineering testimony in hearings. No substantial departure therefrom appears to be warranted at this time.

6. *LOCATION OF TRANSMITTERS*

The Engineering Department has continued the policy previously adopted in regard to the location of broadcast station transmitters in accordance with recommendations set forth in table I on page 32 of the Sixth Annual Report of the Federal Radio Commission, except for one important change. In the case of stations of 50 or 100 watts power, these stations are now permitted to locate in the center of the business section of any city regardless of the population of the city or metropolitan area, provided that it appears that excessive blanketing interference will not be caused and that reasonable efficiency will be obtained. In lieu of the location of the transmitter in the center of the business section, a site outside of the city will be approved, provided it is within ½ to 2 miles from the business or geographical center of the city and the maximum percentage of total population in the blanket area does not exceed one-half of 1 per cent.

fixed points and is overheard and copied by authorized ship stations during the point-to-point transmission. This additional service rendered by fixed stations is in accordance with the General Radio Regulations of Madrid.

The outstanding developments in the fixed public radiotelegraph service during the year ending July 1, 1935, were the increase in the number of licensed stations for domestic communication and the installation of improved and higher power transmitting facilities at the larger stations operated chiefly for international service.

New radiotelegraph stations, to provide circuits for the present entirely within the continental United States, were licensed or authorized for the first time at or near the following points:

Washington, D. C.
Boston, Mass.
Chicago, Ill.
Detroit, Mich.
St. Louis, Mo.
Oklahoma City, Okla.
Seattle, Wash.
Los Angeles, Calif.
New Orleans, La.
Fort Morgan, Ala.
Mobile, Ala.

New stations for foreign and domestic service were licensed for the first time at Brentwood, Long Island, N. Y. These stations will supplement existing facilities, for point-to-point service, in the New York City area. Additional and replacement transmitting facilities were authorized to be installed in existing stations at the following points:

Garden City, N. Y.
New Orleans, La.
Clearwater, Calif.
Hillsboro, Oreg.
Palo Alto, Calif.
Rocky Point, N. Y.
Bolinas, Calif.
Kailua, Territory of Hawaii

Licenses authorizing certain stations at Bolinas, Calif., to communicate with Mukden, Manchuria, were modified on December 12, 1934, in accordance with changed conditions in that country to designate instead Hsinching, which is the new capital, formerly known as "Changchun."

To illustrate the situation relative to potential interference which exists in the field of international high-frequency communication, several radiotelegraph stations on the Pacific coast and in Hawaii which have operated in the overseas service for the past 6 years on certain frequencies originally allocated by the Federal Radio Commission in 1929, recently experienced serious interference caused by a public-service radiotelephone station in Java inaugurating service to the United States, on adjacent frequencies. The Java station had been transmitting in a westerly direction to other points for a considerable period of time and no interference resulted, but when transmission commenced eastward to this country trouble arose. The situation has been temporarily alleviated by the assignment of alternate frequencies to the involved radiotelegraph stations under jurisdiction of the Commission. For other and similar reasons, several changes in high-frequency assignments have been necessitated for a number of United States stations in the fixed public service.

In the fixed public-press service, the principal development appears to be the expansion of multiple-address transmission of press traffic from fixed radiotelegraph stations to subscribers, including many broadcast stations, located throughout the continental United States and Canada, and to ship subscribers on the high seas. Although

these fixed stations are licensed primarily for transmitting press material to fixed international and domestic stations, transmission on the multiple-address principle to a number of fixed receiving stations is recognized as a secondary service.

Many applications requesting construction permits for the establishment of fixed stations to render private service on behalf of private business organizations and inquiries concerning this subject have been received by the Commission. However, in view of the statutory requirement of public interest and because of the definitely limited number of available frequencies for radio communication, such applications are usually designated for hearing. In no case has fixed private service been authorized except where the safety of life and property is involved and the required service cannot be supplied by wire lines or by public service radio-communication companies. All applicants or prospective applicants interested in fixed private service are advised accordingly in order to avoid a formal hearing, which in all probability and in the light of past experience, would not result in a showing of public interest necessary to the granting of the requested authority.

MARITIME

There are 58 coastal telegraph stations in the public coastal service licensed by the Commission for operation in the United States, Territories, and possessions, exclusive of Alaska.

Three coastal telegraph stations and one coastal harbor station are licensed for private service, some of which are operated by the Inland Waterways Corporation relative to communication with their vessels on the Ohio, Missouri, and Mississippi Rivers.

The total number of licensed ship stations on July 1, 1935, was 1,961. Fifty-eight ship stations are licensed to operate on frequencies allocated for use exclusively in Alaskan waters. The number of vessels authorized for intership communication on the medium high frequency 2,738 kilocycles is 25.

Ship stations licensed according to the class of stations were, on July 1, 1935, as follows:

First class[2]	275
Second class	0
Third class	1,686

The number of ship stations licensed for operation on the Great Lakes is approximately:

First class	12
Second class	0
Third class	183
Total	195

There are three fireboats which have licensed radio stations. These are designated as fireboat stations in the emergency service.

The coastal telegraph station formerly located near Cincinnati, Ohio, has been moved to St. Louis, Mo., in order to serve more efficiently ships navigating the Mississippi, Missouri, and Ohio Rivers.

[2] Includes those having a combined first- and third-class license.

The Commission now requires all ship stations aboard vessels of the United States licensed to carry, or carrying, 50 or more persons, including passengers or crew, or both, to maintain continuous hours of service at all times while the vessel is being navigated between ports or places more than 200 miles apart. Action was taken during the year to prevent interruption of the international distress watch aboard ships, reported to have been caused by use of the direction-finder affecting the ships regular receiving antenna. The Commission also adopted a regulation for the purpose of allowing the operation of very low power transmitters aboard cable buoys under the supervision of cable-repair ships carrying licensed operators to assist these vessels in locating the cable buoy by means of their direction-finder, particularly during conditions of low visibility.

The regulations of foreign countries concerning the use of radio in their territorial waters and harbors were studied in reference to the requirements of the Commission concerning its regulations covering such operation for the United States. At present, transmission by ship stations when within the territorial and inland waters of the United States is limited to messages originating on ships with passengers or members of the crew, and on condition that no interference is caused to the normal communication of other radio services. Except for the handling of emergency communications relating to the safe navigation of the vessel or relating to ships in distress, the privileges granted by this regulation are extended only to those foreign ships which belong to countries granting similar privileges to American vessels in their territorial and inland waters.

AVIATION SERVICE

The past year has been particularly marked by a pronounced growth in the use of air transport by the traveling public as well as by those availing themselves of air-express facilities. This growth in the use of air transport has resulted in the addition of many aircraft schedules. In order that this increased use of aircraft might be given proper protection, additional frequencies were allocated to the aviation service by this Commission. There are at present 7 major chains using 56 frequencies for communication with aircraft and 34 frequencies for point-to-point communication for the transmission of messages incident to the business of operation of air transports.

Due to demands on the Commission for frequencies for radio communication for aviation and many other services, it does not appear probable that frequencies could be provided in sufficient quantity to permit the establishment of parallel radio-communication systems. Under the rules and regulations of the Commission, all aircraft desiring to use radio in flying over routes equipped for radio communication are required to use the frequencies and facilities existing on that route. Although the frequencies are limited, it is expected that frequencies can be made available in sufficient number to accommodate, under this policy, the needs of this important service.

One class of station established during the past year of particular interest is that known as the "radio obstruction marker beacon sta-

tion." This type of station is used as a miniature radio beacon to mark the location of the major obstructions to the airways served by the radio range stations established and operated by the Department of Commerce. Installations have been made up to the present time in connection with broadcast station WOR, Newark; WJR, Detroit; WBNS, Columbus; and WLW, Cincinnati.

POLICE

At the time of the last annual report made by the Federal Radio Commission, 11 frequencies were allocated for the use of States and municipalities for police radio purposes under that Commission's rules and regulations. As this number was obviously insufficient to care for the needs of this important service, the question of assigning frequencies to police stations was placed upon the agenda of the conference at Mexico City in 1933 by the American delegation. As a result of this conference, two bands of frequencies were set aside for the use of police departments of North America, namely, 1,650–1,715 kilocycle and 2,300–2,500 kilocycles. Previous to this conference, no international recognition had ever been given to police radio service as operated by this country. In the International Radiotelegraph Convention of Washington, 1927, and also in the International Telecommunication Convention of Madrid, 1932, a frequency between 37.5 and 100 kilocycles was to be set aside to facilitate rapid transmission and distribution of information of value in the detection of crime and pursuit of criminals, the specific frequency to be selected by regional agreement. On a continent such as Europe, in which there are a large number of separate nations, the use of a single radio frequency for the exchange of information is very valuable. However, in North America, due to the extensive wire system and the large territory embraced within the boundaries of the various nations, such a system has never been established. It is, therefore, felt that the international recognition of a police radio system in which orders and information are transmitted from headquarters to mobile police units is a distinct advance in crime control.

Subsequent to the Mexico City conference, an informal conference was held by the representatives of Canada and the United States, as a result of which a number of frequencies in this band were reserved for the primary use of stations other than those of the United States and others for the primary use of stations within the United States. In addition to the bands specifically reserved by the Mexican conference for police purposes, four frequencies were allocated from other bands which may be used by State police stations without the probability of interference to the service for which the frequency was primarily allocated. There are at the present time 34 frequencies allocated by this Government for the use of States and municipalities.

In order to determine whether or not the zone system established under the Radio Commission's policy of administration for municipal police radio was satisfactory and whether or not the zone separation was adequate, a questionnaire was sent to 117 municipalities. Replies were received from 82, of which only 9 expressed themselves as being not satisfied with the existing zone boundaries. There were no mu-

nicipalities objecting to the zone method of frequency assignment or suggesting any other changes in the Commission's policies.

A very thorough study has been made of the police radio situation and an operating plan is provided which permits the assignment of facilities to every State if and when it is desired to establish police radio, as well as permit the operation of police radio stations by all cities in the United States. Under this plan of operation a specific frequency is allocated to each State. Unfortunately there are insufficient frequencies available to permit the assignment of exclusive frequencies. Further, it was not possible to provide a greater separation between State police frequency assignments than 8 kilocycles, which in many cases is leading to interference for which there is no immediate solution.

The frequencies allocated to municipalities are still assigned on a zone basis. All cities within a zone are required to share and cooperate in the use of a single frequency. As a result of the analysis of the questionnaire referred to above, zone boundaries were changed and additional zones established. The new system has apparently eliminated the conditions of which the nine municipalities complained in answer to the questionnaire and the Commission has found no necessity for changing the system as established by the Federal Radio Commission.

The following table shows the growth in the number of State and municipal police stations regularly licensed to use the conventional frequencies between 1,500 and 2,500 kilocycles:

Year	Number of municipal police radio stations	Number of State police radio stations	Year	Number of municipal police radio stations	Number of State police radio stations
1930	34	9	1933	111	12
1931	52	10	1934	153	27
1932	78	13	1935	194	58

Mention should be made at this point of the fact that a large number of cities have been operating general experimental stations on frequencies above 30,000 kilocycles on an experimental basis and in much the same manner as stations operated under the rules governing municipal police stations. Certain specific frequencies have been made available for this purpose and any or all of these frequencies are available to any municipality. In view of the limited range of the very high frequencies it has not as yet been necessary to adopt a zone system of assignment or to make any particular provision for interference suppression. The following table shows the growth of stations of this class:

Year	Number of licensees	Number of stations licensed	Year	Number of licensees	Number of stations licensed
1932	1	2	1934	124	369
1933	32	87	1935	138	393

Under the Communications Commission the number of stations licensed for police activities have largely increased. A questionnaire was submitted in May 1935, to all municipalities and States using radio in connection with their activities, requesting information embodied in the following table:

(1) CITIES AND COUNTIES

Number of municipalities reporting which answered questionnaire	202
Number of municipal police stations operated	133
Number of fixed general experimental (police) stations operated	82
Number of portable mobile general experimental (police) stations operated	[2] 201
Number of cars equipped with receivers only	[2] 5,260
Number of fixed locations equipped with receivers only	[3] 877
Total population served	48,291,780
Total area in square miles	121,816

(2) STATES

Number of States reporting	7
Number of State police stations operated	24
Number of cars equipped with receivers only	759
Number of fixed locations equipped with receivers only	431
Population served	26,809,731
Area in square miles	231,029

Although information was requested as to the number of arrests and value of property recovered as the result of radio, too few cities maintained data on these items to make the report of any value, other than indicating that a large number of arrests had been made and a great amount of property had been so recovered. Municipalities are almost unanimous in reporting that there has been an improvement in the criminal situation since the installation of radio.

In addition to the stations now licensed a number of States and cities are considering the installation of radio systems, but have been unable to do so due to limitations on funds.

It is evident from the results of the questionnaire and also from information received from other sources that radio is becoming as standard in police administration as is the fire alarm system or police wire telegraph system.

Under the provisions of the rules and regulations of the Commission municipal police radio stations are permitted to exchange messages on a point-to-point basis provided those messages are of primary importance to mobile police units. A great deal of this communication has been carried on and many municipalities have been reported for exceeding this authority.

An organization known as the Associated Police Communication Officers has been organized. That organization believes that the close coordination desirable between law enforcement agencies may be strengthened by exchanging all classes of police information on a Nation-wide basis. In order to make this possible a proposed plan is being prepared for an intercity police point-to-point telegraph communication system which is expected to be presented to the Commission for consideration through the International Association of Chiefs of Police. The Associated Police Communication Officers

[2] Means cars, motorcycles, police boats, etc.
[3] Precinct stations, fire and police headquarters, sheriffs' offices, etc.

recognizes the fact that the band of frequencies assigned to the police departments for mobile communication does not offer wide enough scope to permit the necessary growth which is certain to take place in the field of point-to point police communication.

MARINE FIRE STATIONS

The number of marine fire stations has been reduced to two, operated by the cities of Detroit and Boston. Other cities formerly licensed for this class of station have established municipal police radio stations and have found that orders could be transmitted to their fire boats through police facilities with sufficient dispatch to make it uneconomic to operate a station specifically for communication with fire boats. It is believed that in the future when more funds are available, many of these stations will be reestablished and others will be installed. It is not believed that they will be constructed in sufficient number to make necessary the assignment of additional frequencies for communication purposes.

SPECIAL EMERGENCY STATIONS

Special emergency stations were originally established for telegraphic communication throughout a power-distribution system in the case of disruption of regular communication facilities by storms or other emergencies. As a result of the experience of power companies, this service has grown to embrace many other types of public utilities such as water-distribution systems and forest-protection agencies.

As a result of experience in the use of radio during floods the rules governing this service now permit the use of radiotelephony as well as radiotelegraphy, with a separate frequency for each type of emission.

MOTION-PICTURE STATIONS

This class of station was established by the Federal Radio Commission to meet a need for communication in the production of motion pictures. In the making of films for scenes involving a large body of men, groups of aircraft, radiocommunication is necessary to coordinate the movements of the individuals comprising the groups. Previous to the establishment of radiocommunication this was done by means of hand signals and flags with little success. On other occasions it is necessary for motion-picture companies to go " on location " in remote spots not served by the usual communication facilities. Radiocommunication in these circumstances is also invaluable.

Although this service has been established for some years there is only one station at present licensed and very little use has been made of this facility.

GEOPHYSICAL SERVICE

There have been no changes in the rules, regulations, or frequency assignments to the geophysical stations as established by the Federal Radio Commission, nor has there been any marked change in the activity of these stations.

As previously reported by the Federal Radio Commission this class of station is of low power and is for use in connection with the determination of the characteristics of the strata underneath the surface of the earth. Radio is used for the transmission of timing signals between various points strategically located in relation to the area under investigation.

ALASKA

The plan now in force for licensing radio stations in Alaska was formulated by the Federal Radio Commission in cooperation with the United States Signal Corps in 1929. Since the Army is intrusted with the task of assuring reliable communication between the United States and Alaska, and since at the present time it is impracticable for the Commission to establish offices in Alaska, no application is granted until recommendation has been received from the Office of the Chief Signal Officer with respect to the facilities requested.

The main purpose of commercial radio systems in Alaska is to provide adequate facilities to important business interests, such as the mining and packing interests, in places where land line facilities are not available. As the Signal Corps operates the only means of communication between Alaska and the United States the various messages handled from the radio stations operated by these interests are consolidated at strategic points and are routed through appropriate Army key stations. In addition to being responsible for communication with the United States, the Army also operates a communication system within Alaska which is not permitted to be paralleled by commercial radio circuits.

Although as stated above the main purpose of these various radio stations is to handle private communications, all licenses issued provide that those stations must be opened to the general public on a general public service basis.

The period since the establishment of this Commission has been marked by the growth in the number of point-to-point telephone stations established for short distance communication. There have also been established two aviation chains serving Alaskan communities, the largest of which is from Ketchikan to Fairbanks, Fairbanks to Bethel, and Bethel to Nome. The other route reaches from Anchorage through Iliamna down the Aleutian chain.

AMATEUR

There were on June 30, 1935, approximately 45,561 amateur stations licensed by the Commission. Many of these stations are affiliated with the Naval Communications Reserves and the Army Amateur Reserve Corps and regularly engage in practice drills requiring the use of established naval and military operating procedure. A large number of these stations as well as others not affiliated with the Army and Navy continue to cooperate with the American Red Cross in providing temporary emergency radio communication between headquarters and isolated locations or stricken areas in times of disaster or other emergencies occasioned by floods, storms, earthquakes, etc.

There are organized communication networks of amateur stations offering communication facilities to practically all parts of the United States. These stations have been of inestimable value to the public in furnishing, in many cases, the sole means of communication during the existence of emergencies. A number of stations have associated themselves with scientific expeditions and furnish the means of communication between the expeditions and their sponsors in the United States.

On Navy Day, October 27, 1934, the Secretary of the Navy transmitted from the Naval Station at Arlington, Va., and San Francisco, Calif., messages addressed to amateurs, and on Armistice Day, November 11, 1934, the Chief Signal Office, United States Army, transmitted from Washington a message to members of the Army Amateur Reserve Corps. Participation in copying these messages engaged many hundreds of amateur station operators who entered the contest to test their skill and receiving ability.

Partly as a result of the congestion on medium high amateur frequencies and partly because of their eagerness to develop new territory, amateurs have invaded the ultra-high frequency field in great numbers. The result has been the development of new and improved equipment and a better understanding of the characteristics and possibilities respecting the use of these frequencies. Technical progress in the lower frequency assignments has continued and several notable contributions have been developed.

REPORTS OF DISCREPANCY IN OPERATION

All cases of irregular or illegal operation of radio stations other than broadcast, reported by the Field Section, are referred to this section of the Engineering Department for corrective action. During the past year approximately 17 hundred cases were handled. In no case has it been necessary to take drastic steps in order to obtain corrective action, and it is believed that operating conditions in the radio industry have been much improved, particularly the conditions in maritime service.

WIRE TELEGRAPH AND SUBMARINE CABLE

In the United States there are two wire telegraph carriers which offer a Nation-wide domestic public-message telegraph service. These are the Western Union Telegraph Co. and the Postal Telegraph-Cable Corporation. In addition to these 2 major telegraph carriers there are 8 interstate telegraph carriers which serve local areas, as shown below:

Canadian National Telegraphs, Minnesota.
Canadian Pacific Railroad Co., Maine and Vermont.
Central Idaho Telegraph and Telephone Co., Idaho.
Colorado-Wyoming Telegraph Co., Colorado and Wyoming.
Continental Telegraph Co., Idaho, Montana, North Dakota, South Dakota, and Washington.
Interstate Telegraph Co., California and Nevada.
Mountain Telegraph Co., Colorado.
Northern Telegraph Co., Maine.

In addition to the above telegraph carriers, several telephone carriers offer interstate telegraph service. This service is primarily private line (leased wires) and Teletypewriter exchange service.

The Pacific Telephone & Telegraph Co. and its associates and the West Coast Telephone Co. offer a public-message telegraph service in California, Nevada, Oregon, and Washington. The carriers providing this service are:

Bell System companies:
- American Telephone & Telegraph Co., long lines department.
- Bell Telephone Co. of Pennsylvania.
- Chesapeake & Potomac Telephone Co.
- Chesapeake & Potomac Telephone Co. of Baltimore City.
- Chesapeake & Potomac Telephone Co. of Virginia.
- Chesapeake & Potomac Telephone Co. of West Virginia.
- Cincinnati and Suburban Bell Telephone Co. (including the Citizens Telephone Co.).
- Diamond State Telephone Co.
- Illinois Bell Telephone Co.
- Indiana Bell Telephone Co.
- *Michigan Bell Telephone Co.*
- Mountain States Telephone & Telegraph Co.
- New England Telephone & Telegraph Co.
- New Jersey Bell Telephone Co.
- New York Telephone Co.
- Northwestern Bell Telephone Co.
- Ohio Bell Telephone Co.
- Pacific Telephone & Telegraph Co. (including the Home Telephone & Telegraph Co. of Spokane, Bell Telephone Co. of Nevada, and Southern California Telephone Co.).
- Southern Bell Telephone & Telegraph Co.
- Southern New England Telephone Co.
- Southwestern Bell Telephone Co.
- Wisconsin Telephone Co.

Carolina Telephone & Telegraph Co., North Carolina.
Intermountain Telephone Co., Virginia, Tennessee, North Carolina.
Petersburg Telephone Co., Virginia.
Rio Grande Valley Telephone Co., Texas.
United Telephone Co., Kansas.
West Coast Telephone Co., California and Nevada.

The route miles, wire miles, and telegraph-channel miles as of October 1, 1934, operated by the telegraph carriers and the telephone carriers which offer telegraph service, as reported to the Commission under Telegraph Division Order No. 9, are shown below.

Carrier	Route miles	Wire miles	Telegraph channel miles [1]
Bell System	206,332	15,240,759	1,910,725
Canadian National [2]	45	610	44
Canadian Pacific [2]	223	446	446
Carolina Telegraph	1,367	14,545	670
Central Idaho		[3]	
Colorado-Wyoming	651	651	651
Continental	2,726	14,674	13,292
Intermountain	222	1,771	104
Interstate			817
Mountain	17	273	
Northern	640	2,985	2,958
Petersburg	62	794	10
Rio Grande	130	736	107
United	3,077	20,081	3,135
West Coast	211	258	223
Postal	54,339	358,305	678,255
Western Union	212,290	1,611,878	2,159,286

[1] A telegraph channel is a path which is suitable for transmission of telegraph signals between 2 telegraph stations. A telegraph channel mile is 1 mile of any telegraph channel which provides transmission in one direction at a time.
[2] Lines in the United States.
[3] Not reported.

During the fiscal year ending June 30, 1935, the Western Union Telegraph Co. applied to the Commission and was granted permission to intall the following lines to supplement their existing facilities:

From—	To—	Number of conductors	Wire miles	Cost
Glasgow, Mont.	Fort Peck, Mont.	1	20	$950
San Antonio, Tex.	Randolph Field, Tex.	1	14	972
Bristol, Va.	Appalachia, Va.	2	139	7,509
Yukon, Okla.	Oklahoma City, Okla.	1	13	884
Total		5	186	10,315

The ocean cable carriers subject to the jurisdiction of the Commission are as follows:

The Western Union Telegraph Co.
All America Cables, Inc., International Telephone & Telegraph System.
The Commercial Cable Co., International Telephone & Telegraph System.
The Commercial Pacific Cable Co., International Telephone & Telegraph System.
The French Telegraph Cable Co.
The Mexican Telegraph Co.:
40 percent International Telephone & Telegraph System.
60 percent Western Union Telegraph Co.
The Cuban American Telephone & Telegraph Co.:
50 percent American Telephone & Telegraph Co.
50 percent International Telephone & Telegraph System.

The Western Union Telegraph Co. operates 10 trans-Atlantic cable circuits between the United States and Europe and gives direct service between New York, Boston, Washington, and Montreal in North America, to the Azores Islands, Ireland, London, Paris, Emden, and Amsterdam in Europe, and intermediate stations en route. Three of these cables are inductively loaded and are operated by multiplex printer systems similar to the methods used extensively in the Western Union domestic service. One of the loaded cables is operated in one direction only, at a time, by means of eight channel multiplex equipment at a speed of 50 words per minute per channel for a total of 400 words per minute. Equipment has been developed by the Western Union engineers for extending any channel of the cable from any city in the United States to any city in Europe in which the Western Union maintains an office. For economic reasons, however, the extension of channels to inland cities is limited because these points have not sufficient trans-Atlantic traffic to utilize a channel to full capacity. Channels of this cable are normally assigned between Montreal and Amsterdam, between Washington and London, and between New York and Shorter's Court, London.

In addition to the trans-Atlantic circuits, the Western Union operates two circuits from the United States to Cuba, connecting at Habana with the West India & Panama Co. to serve the West Indies; one circuit from the United States to Barbados, British West Indies, connecting at Barbados to serve South American points; one land-line circuit from New York to Galveston, connecting with the Mexican Telegraph Co. to provide direct service between New York and Mexico City.

The capacity of the Western Union trans-Atlantic cable system is 325 words per minute from New York to Europe and 440 words per minute from Europe to New York. In addition to this capacity, the eight channel permalloy cable circuit provides 400 words per minute for use in either direction.

All America Cables, Inc., operates five cable circuits between New York, Cuba, the West Indies, Central and South America, and one cable circuit between Florida and Habana, Cuba. These cables are nonloaded and are operated with three element recorder code in both directions at the same time. The fastest of these circuits operates at a speed of 52 words per minute in each direction. By means of automatic relays and selectors, direct service is provided between New York and all major cities of Central and South America.

The capacity of the All America cable circuits between New York and Central and South America is 175 words per minute in each direction.

The Commercial Cable Co. operates six nonloaded trans-Atlantic cable circuits by means of which direct service is provided from New York to the Azores Islands, Liverpool, London, Shorter's Court (London), Paris, Rotterdam, and intermediate stations en route. The Commercial Cable Co. also operates two multiplex printer channels between New York and Emden on one of the Western Union loaded cables. The fastest of the nonloaded cable circuits is operated at the rate of 87 words per minute recorder code in each direction. As this speed is too great for one operator, this capacity is divided into two equal channels in each direction at 43 words per minute per channel.

The capacity of the Commercial Cable trans-Atlantic cable circuits is 320 words per minute from New York to Europe and 310 words per minute from Europe to New York.

The Commercial Pacific Cable Co. operates one trans-Pacific nonloaded cable circuit to provide service between San Francisco, Honolulu, Midway, Guam, Tokio (via Bonin), Manila, and Shanghai. This cable circuit is divided into three sections: (1) San Francisco-Honolulu-Midway-Guam at 23 words per minute, recorder code, in each direction; (2) Guam-Tokio (via Bonin—the cable from Bonin to Tokio is owned by the Japanese Government) at 23 words per minute, recorder code, in each direction; (3) Guam-Manila-Shanghai, at 25 words per minute, recorder code, in each direction.

The French Cable Co. operates two nonloaded trans-Atlantic cable circuits and provides direct service between New York, London, and Paris. Both cables are operated with recorder code, the fastest of which is at a speed of 30 words per minute in each direction. The capacity of the French Cable Co. trans-Atlantic cable circuits is 50 words per minute in each direction.

The Mexican Telegraph Co. operates two nonloaded cable circuits between Galveston, Tex., and Mexico. One cable circuit is operated in conjunction with the Western Union to provide direct service between New York and Mexico City. The other circuit is used for service between Galveston, Tampico, Vera Cruz, Puerto Mexico, Salina Cruz, and Mexico City. Both circuits are operated with recorder code at 40 words per minute in each direction.

The Cuban American Telephone & Telegraph Co. operates four cables between Miami and Habana, Cuba. The company is interested, primarily, in telephone service, but operates telegraph channels on two of the cables to furnish private line service (leased wires) direct from cities in the United States to Habana. On October 16, 1934, four Manual Morse telegraph channels were in actual use on these cables.

The cable plants and land-line plants used exclusively for ocean cable operation are as follows:

	Cable nautical miles	Land line statute miles		Cable nautical miles	Land line statute miles
Western Union	31,578	26,432	French	7,495	1,032
All America	29,235	8,005	Mexican	1,559	1,385
Commercial Cables	23,558	8,782	Cuban American	205	7,187
Commercial Pacific	10,067	168			

The number of messages from telegraph transmission of the principal carriers for the year ending December 31, 1934, as obtained from their responses to Telegraph Division Order No. 12, are shown below:

	Messages
Western Union	4,047,012
All America	1,896,966
Commercial Cables	2,722,647
Commercial Pacific	328,759

RESEARCH

In order to keep the Commission informed on technical developments and improvements in wire and radio communication, considerable technical research of communication literature is necessary. This is particularly true of those developments which are of fundamental significance and importance to wire and radio service. The department studies all new uses of radio and wire communication in order to insure that the benefits of new inventions and developments in wire and radio communication may be made available to the people of the United States, and further that general encouragement may be given to the most effective use of radio as required by the Communications Act of 1934.

There are no fields of engineering in which new devices and inventions are being disclosed at a more rapid pace than in wire and radio communications. The arts, both in theory and practice, are extremely complex and cover a vast field. New devices and improvements, no matter in what radio or wire services developed, are as a general rule immediately reflected in potentialities for improvement and actual application in all other services.

Reports are received of new developments from wire and radio companies which form the basis for many special studies.

A technical library is maintained which contains some 4,500 books and publications, including research papers and scientific journals.

The subjects range through the general principles, equipment, and operating practices of radio, telephonic and telegraphic communica-

tion systems, mathematics, physics, acoustics, experimental technique in research work, evaluation engineering, public-utility regulation, historical data, and other subjects of like nature. Additions are constantly being made to the library as new books and research papers are published.

The number of current scientific journals subscribed to, both domestic and foreign, now numbers over 40. These are routed regularly to the engineers of the department.

During the year a number of reports have been prepared on the history of inventions and developments in telegraphy, telephony, and radio, and the most important improvements in electrical communication during recent years.

Considerable progress has been made in the collection of data on high-frequency wave propagation. High-frequency waves, such as are required in long-distance circuits, within the bands from approximately 2,500 to 20,000 kilocycles, are subject during their travel from transmitter to receiver to certain losses and effects detrimental to satisfactory communication. The losses are due to their natural spreading in their spherical mode of propagation, to repeated refractions or reflections between the ground and the ionized regions of the upper atmosphere, and to absorption during their passage through these ionized regions. The detrimental effects are fading, caused by variation in ionization of the ionosphere and changes in phase or polarization, due to reception via two or more paths between transmitter and receiver, magnetic storms, which often disrupt communication, echoes, and skip-distance phenomena or zones of silence. All but the first of these are functions of the frequency employed. In addition, the ionization of the upper atmosphere is believed due primarily to the photoelectric effect of the sun's rays, and there is variation in transmission with day and night conditions, with the seasons, and with the years.

Notwithstanding the complexity and variability of the above factors, as a result of the work of mathematical physicists, given a specific path over which transmission is desired, it is possible, with certain simplifying assumptions as to the conditions in the medium of transmission, to make predictions, based on theoretical computations and the results of experience, with a fair degree of accuracy as to the most suitable frequencies to use for the given path and the operating power required for satisfactory service.

There is much need of experimental data with which to verify and check the results of theory and the accuracy of formulae advanced. Commercial operating companies are, of course, intensely interested in this work and are providing a large amount of the data required. Many of them have published comprehensive reports on the transmission characteristics of the frequencies used over their circuits. The Commission is in a position to assist materially in this work by obtaining from all of its licensees and coordinating certain technical data on the actual use being made of the frequencies under discussion. This data, after analysis over the seasons and years, will also assist the Commission greatly in making equitable distribution of the frequencies to the various services and in obtaining maximum use of the spectrum, as congestion increases.

The allocation of the ultra-high frequencies to commercial services remains the foremost allocation problem before the Department at the present time. The Commission has been desirous of proceeding with this work as rapidly as possible in order to provide many new radio services by reason of which both the public and the radio industry would undoubtedly receive many benefits. On the other hand, it has been aware of the dangers and disadvantages to both the public and the industry of an allocation prematurely made, and its policy has been to proceed with caution until assured that the allocation may be based on a firm foundation of engineering facts. Every effort has, therefore, been made, not only during the past year, but throughout the past 4 years, to obtain the requisite technical and nontechnical data. Not only must reliable information on the transmission characteristics of the frequencies be obtained, but the many services seeking frequency assignments must be evaluated from the viewpoint of the public's interest. Also complete information on the apparatus available for, and the conditions obtaining within, each service must be at hand. There are a great many factors which must be carefully studied.

Although many valuable contributions of data, both theoretical and experimental, have recently been published, or reported to the Commission, it has not felt that the available material was sufficient to warrant attempting a commercial allocation at this time. Accordingly, the licenses of experimental stations operating on the ultra-high frequencies were renewed in June for the next license period, with the hope that within it sufficient data would be obtained to allocate at least a portion, if not all of the frequency bands, for which apparatus is available.

During the past year the number of radio stations in the experimental service has increased 26 percent. There are now 991 licensed general and special experimental stations of which 845 are under the jurisdiction of the Telegraph Division, 18 under the jurisdiction of the Telephone Division, and 128 under the jurisdiction of the Broadcast Division.

Of these licensees many are verifying and checking the results of theoretical work or engaged in problems of pure research. Others are interested primarily in the improvement of equipment and methods of operation in the various services. A large proportion, particularly those operating on the ultrahigh frequencies, are endeavoring to determine the usefulness of these frequencies for radio communication in services already authorized on the lower frequencies or in new services at the present time unauthorized. The services in which licensees have shown the greatest interest in this respect are aviation, municipal police, State police, broadcast pick-up, broadcast, visual broadcast, special emergency, geophysical, a proposed service for railroads, a proposed service for forestry, fixed public and public coastal, fixed public press and coastal, and ship harbor.

TELEPHONE SECTION

1. ROUTINE

WIRE

An extensive study was made of the Long Lines Department of the American Telephone & Telegraph Co. In connection with this study detailed maps of the Long Lines Department's telephone and telegraph trunk routes were prepared giving the following data:

a. The cable routes and portions of routes of circuits owned by the Long Lines Department.

b. The open wire routes or portion of routes owned by Long Lines Department.

c. The aerial, underground, and submarine cable extensions of or portions of the Long Lines Department where circuits are owned by the Associated Bell Cos. and leased by the Long Lines Department.

d. The open wire extensions of or portions of the Long Lines Department routes, where circuits are leased from the Associated Bell Cos.

e. Bell System routes extending outside the United States.

f. Route lines extending to connecting companies within or outside of the United States.

g. Radiotelephone transmitting and receiving stations owned by the American Telephone & Telegraph Co.

h. Location of repeater stations, toll test stations, and central office equipment owned and leased by the American Telephone & Telegraph Co.

In connection with this study a detailed study and inspection was made of the telephone, telegraph, and radio equipment located in the New York Long Lines Building located at 32 Sixth Avenue, New York. Also, in this connection a detailed study and inspection was made of the cables, loading coils, duct, manholes, and repeater equipment located at the terminal points and repeater stations between New York and Washington on the American Telephone & Telegraph Co.'s New York-Washington toll route. A study was made of the route, make-up, ownership, classification of telephone and telegraph circuits, toll telephone trunks and maintenance personnel of the American Telephone & Telegraph Co.'s New York-Washington and Pittsburgh-Cleveland cables with diagrams of same indicating the size of cables and wire contained therein.

Study of Extent and Employment of the Bell System Assets

A study was made and a chart was prepared of the assets, percentage of common stock owned by the American Telephone & Telegraph Co., along with the percentage owned by others; and the assets

of the following companies comprising the Bell System along with the companies which aid the American Telephone & Telegraph Co. in serving these companies:

The American Telephone & Telegraph Co.
The Long Lines Department of the American Telephone & Telegraph Co.
The Eastern Telephone & Telegraph Co., (Canada).
The Transpacific Communication Co., Ltd.
The Cuban American Telephone & Telegraph Co.
The 195 Broadway Corporation.
The Bell Telephone Securities Co.
The Bell Telephone Laboratories, Inc.
The Western Electric Co.
The Teletype Corporation.
The Electrical Research Products, Inc.
Associated operating companies of the Bell System:

1. The New England Telephone & Telegraph Co.
2. The Southern New England Telephone Co.
3. The Southern Bell Telephone & Telegraph Co.
4. The Chesapeake & Potomac Telephone Co.
5. The Chesapeake & Potomac Telephone Co. of Baltimore City.
6. The Chesapeake & Potomac Telephone Co. of Virginia.
7. The Chesapeake & Potomac Telephone Co. of West Virginia.
8. The Southwestern Bell Telephone Co.
9. The Illinois Bell Telephone Co.
10. The Indiana Bell Telephone Co.
11. The Cincinnati & Suburban Bell Telephone Co.
12. The Ohio Bell Telephone Co.
13. The Wisconsin Telephone Co.
14. The Michigan Bell Telephone Co.
15. The Bell Telephone Co. of Canada.
16. The New Jersey Bell Telephone Co.
17. The Diamond State Telephone Co.
18. The Bell Telephone Co. of Pennsylvania.
19. The New York Telephone Co.
20. The Pacific Telephone & Telegraph Co.
21. The Northwestern Bell Telephone Co.
22. The Mountain States Telephone & Telegraph Co.

The Bell System Toll Routes

A study was made of the extent of the major physical telephone plant of the Long Lines Department of the American Telephone & Telegraph Co. and its 24 associated telephone companies, comprising the Bell System. In this connection a map was prepared on which was indicated the routes taken between the telephone systems of the United States and the telephone systems of Canada and Mexico; the routes taken by transoceanic telephone connections, ship-to-shore telephone service, and the extent of the network of the associated companies' toll routes.

General Long Distance Toll Service

In connection with study of "long distance toll service" a study of the "general toll switching plan" was made along with the transmission features employed on long distance toll circuits.

Special Studies

The following special studies were made by this department:

1. Frequency band width for certain Bell System services.
2. "Board to board" and "station to station" bases for exchange and "toll-rate treatment."
3. Bell System work estimate accounting.
4. Study of data to be covered by the telephone and telegraph carriers in connection with "Applications for certificates of convenience and necessity."
5. Possibility of employing carrier telephony in cable.
6. Utilization of blight-killed chestnut poles.

Certificates of Convenience and Necessity

Applications were made for the following certificates of convenience.

American Telephone & Telegraph Co., and Diamond State Telephone Co. Application for construction of aerial cable line from Dover, Del., to Delmar, Md.

American Telephone & Telegraph Co., and C. & P. Telephone Co., of Baltimore City. Application for construction of aerial cable line from Delmar, Md., to Salisbury, Md.

C. & P. Telephone Co. of Baltimore City, and American Telephone & Telegraph Co. Application for construction of aerial cable line, Queenstown to Princess Anne, Md.

American Telephone & Telegraph Co., and New York Telephone Co. Application for constructing coaxial cable, New York, N. Y., to Philadelphia, Pa.

In each case, field surveys were made of the engineering and construction methods employed by the various companies.

Uniform System of Accounts for Telephone Companies

This department prepared data for use in revising the uniform system of accounts for telephone companies, including attendance in conferences with Accounting Department of this Commission, representatives of State commissions, and representatives of various telephone companies.

Tariff Circular No. 1

Assistance was given in the preparation of data for use in Tariff Circular No. 1, Interstate and Foreign Wire Radio Communications and attended conferences relating thereto with the Accounting Department of this Commission, representatives of State commissions, and representatives of various telephone, telegraph, and radio companies.

RADIO

Point-to-Point Radio Telephone Stations

On June 30, 1935, there were 36 point-to-point radiotelephone stations licensed for international and/or overseas fixed public service. These stations are located at the following points:

Location	Number of stations	For service to—
Rocky Point, N. Y.	[1] 1	Europe.
Lawrenceville, N. J.	12	Do.
Do	3	South America.
Do	2	Bermuda.
Hialeah, Fla.	1	Bahamas.
Do	1	Central and South America, and the West Indies.
Dixon, Calif.	6	Hawaii, Asia, and Australia.
Kahuku, T. H.	2	United States and Philippines.
Hawaiian Islands	8	Inter-island.

[1] Denotes long-wave station. Others are short-wave (high frequency).

In addition to these stations, an additional long-wave (low frequency) station for service to Europe is under construction near Bradley, Maine, and is expected to be completed by February 1937. At the end of 1934 it was reported that three-quarter million dollars had been expended on this project, which from an engineering standpoint, is one of considerable magnitude.

The trans-Atlantic circuits to Europe which are the most important of all the overseas radio circuits, are subject to the greatest natural difficulty in maintaining high-grade reliable service by short waves (high frequencies), particularly during years of maximum sunspot disturbances. In general when the short-wave circuits are commercially inoperative because of this phenomena, service to Europe is continued by use of the long-wave station at Rocky Point, Long Island. The additional long-wave station now under construction in Maine will supplement the service of the Long Island station and will be particularly valuable during these periods.

During the year the Commission authorized additional direct point-to-point radiotelephone circuits for public service from Hialeah, Fla., to Tegucigalpa, Honduras; Kingston, Jamaica, and Santo Domingo, Dominican Republic. In addition, service was inaugurated during the year via existing radio circuits and foreign land wire telephone systems from the United States to the following new points:

Beirut, Syria, August 27, 1934.
Palestine (principal cities), October 15, 1934.
Rabat, Morocco, December 1, 1934.
Algeria (principal cities), December 1, 1934.
Tunisia (principal cities), December 1, 1934.
French Indo China (three cities), December 1, 1934.
Japan (principal cities), December 8, 1934.
Philippines (Laguna and Tayahas), February 3, 1935.
Barranquilla, Colombia, November 8, 1934.
Brazil (seven new points), September 1934 to May 1935.

A total of more than 60 countries may be reached by this public telephone service which utilizes radio for intercontinental connections and for overseas circuits to the principal islands. On June 1, 1935, evening rates for trans-Atlantic calls were made effective at 5 p. m. local time at points of origin in the United States and from 10 p. m. to 10 a. m. at points of origin in Europe.

There are no point-to-point radiotelephone stations licensed by the Commission for fixed private service at any location or for either private or public service entirely within the continental United States. Point-to-point radiotelephone stations in Alaska are mentioned elsewhere in this report.

Telephony in the Maritime Mobile Service

There are 6 coastal harbor radiotelephone stations and 2 coastal radiotelephone stations in the public coastal service licensed by the Commission for operation in the United States, Territories, and possessions, exclusive of Alaska. In addition, six fixed public radiotelephone stations at Dixon, Calif., are licensed secondarily for communication with ship radiotelephone stations.

Two coastal harbor telephone stations are licensed for private service, one of which is operated by the Inland Waterways Corporation relative to communication with their vessel in the harbor of New Orleans. The other station is operated by the city of New York for communication with the municipal vessel *Macon* used in New York Harbor in officially welcoming distinguished visitors to that city. Twenty-six ship stations were licensed to use radiotelephony for connecting with the land-wire telephone system via public coastal harbor stations, not including stations aboard vessels in Alaskan waters.

Public telephone service from points in the United States to ships at sea is available through the medium of regular coastal radiotelephone stations at Ocean Gate and Lawrenceville, N. J., and through the auxiliary use of a point-to-point radiotelephone station at Dixon, Calif. The following-named vessels, all of foreign nationality, which carry American citizens among their passengers, are equipped to render this service:

German ships:
- *Albert Ballin*
- *Bremen*
- *Columbus*
- *Deutschland*
- *Europa*
- *Hamburg*
- *Homeric*
- *New York*
- *Resolute*

Italian ships:
- *Conte Di Savoia*
- *Rex*

British ships:
- *Aquitania*
- *Berengaria*
- *Caledonia*
- *Empress of Britain*
- *Majestic*
- *Monarch of Bermuda*
- *Olympic*
- *Queen of Bermuda*

French ships:
- *Ile de France*
- *Normandie*

Public coastal harbor radiotelephone stations near Seattle, Wash.; San Francisco, Calif.; San Pedro, Calif.; Lorain, Ohio; New York, N. Y.; and Boston, Mass., are licensed for communication primarily with low-power ship telephone stations aboard vessels in and near harbors and on the Great Lakes. These shore radio stations have facilities for direct connection with the public land-wire telephone system and may be used also for telephone service to ocean-going vessels nearing or leaving principal ports. Substantial development of this service appears to depend upon improved business conditions in the maritime and fishing trade. At present, several fishing trawlers are the principal subscribers to the service of the Boston station; in addition two of the largest passenger steamers on Lake Erie recently obtained Commission authority to operate their shipboard radio stations for public telephone communication with the coastal radiotelephone station near Lorain, Ohio, for connection with telephones ashore.

2. PUBLIC RESOLUTION NO. 8

The investigative work called for by the Communications Act of 1934 and Public Resolution No. 8, Seventy-fourth Congress, has been separately organized in the Engineering Department as follows:

I. Patents, Research, Development, and Servicing

(*a*) Patent structure.

(*b*) Cost of developments and method of paying such costs.

(*c*) Methods of operation of Bell Telephone Laboratories and relationship to all subsidiaries.

(*d*) Electric Research Products, Inc., and methods of handling development of byproducts.

II. Manufacturing

(*a*) Cost of manufacturing of equipment and relationship of sales price, including complete study of loading costs.

(*b*) Relationship of manufacturing and sales costs of Western Electric to those of independents.

(*c*) Manufacture of byproducts and the apportionment of costs between byproducts and telephone equipment.

III. Operations (Long Lines)

(*a*) Separation of toll from exchange, including methods of separating property expense and revenue.

(*b*) Separation of technical jurisdiction as between the Federal Communications Commission and State commissions.

(*c*) Relation of operating companies and effect of service contracts.

(*d*) Effect of consolidations on operations.

IV. Valuation and Depreciation

(*a*) Study of all methods of determining depreciation and their application to telephone.

(*b*) Mergers and consolidations.

(*c*) Methods of determining valuation of telephone plant.

I. PATENTS, RESEARCH, DEVELOPMENT, AND SERVICING

Exhibits have been secured from the American Telephone & Telegraph Co. and associated companies in the form of reports upon the patent structure and developments, and upon agreements between the American Telephone & Telegraph Co. and the associated companies, independent domestic companies, and foreign companies. As an aid to this study and in the determination of the extent of the patent structure of the American Telephone & Telegraph Co. and associated companies, independent manufacturers of telephone equipment have furnished material concerning their patent structures and developments.

Studies based upon these reports have been prepared and a comparison made of the data received in those reports. Special studies are under way on the operations of Bell Telephone Laboratories and their relation to all Bell subsidiaries; the cost of development work and the methods of paying such costs and Electrical Research Products, Inc., and methods of handling the development of byproducts.

Examination has been made of the agreements between the American Telephone & Telegraph Co. and associated domestic and for-

eign companies to determine the extent to which such agreements affect communications and the charges therefor.

Data has been secured upon the policies and management of the Electrical Research Products, Inc., and the preparation of studies relative thereto. This material is being correlated in order to give a comprehensive picture of this phase of the telephone industry.

II. MANUFACTURING

In the preparation of detailed definition of the functions, scope, purposes, and objectives of the unit, plans have been developed to disclose a comprehensive picture of the principles involved in arriving at the cost of telephone-apparatus manufacture.

Exhibits have been secured from Western Electric Co. and several "independent" manufacturers concerning their financial statements, charters, bylaws, manufacturing organization, prices, discount sheets, catalogs, and comparative net prices; forms of annual supply contracts, manufacturing and accounting costing practices, etc. Preliminary visits to, surveys of, and reports upon all American manufacturing establishments engaged in general telephone apparatus and equipment supply have been made.

Studies have been started at the plants of all five manufacturers of hand telephone sets of the detailed break-down of labor, material, and overhead costs on each and every manufacturing operation entering into each piece part and assembly, ultimately constituting the completed set in each case. A similar cost break-down has been started of certain cable manufactured at the Point Breeze works of the Western Electric Co. for an interstate toll line between Dover and Salisbury, Md.

III. OPERATIONS

The chief problem of this unit is to lay the groundwork for the determination of the property properly assignable to the furnishing of interstate and international telephone toll service and the expenses and revenues applicable thereto.

This problem is greatly complicated by the use in common of telephone plant for combinations of local exchange and toll service and the use in common of toll plant for rendering both intrastate and interstate toll service. The joint use of plant for nontelephone service must also be taken into account.

Such use of plant in common makes it necessary to allocate the plant as a whole and even with respect to its component parts according to its actual use in practice. Obviously corresponding allocations of expenses and revenues must also be made.

Two principal methods of allocating plant, revenues, and expenses of telephone carriers have been and are now being employed, notably the so-called "board-to-board" and the "station-to-station" bases. A study is under way to analyze both of these methods. In this connection a classification is being made of all plant elements according to use. This classification includes studies of:

Use for exchange service only;
Use for toll service only—intrastate, interstate, or both;
Use for both exchange and toll service;

Use for both exchange and toll service, but primarily provided for local exchange service;
Use for nontelephone service.

With the object of presenting to the Commission the comparative results of allocation of plant elements on the different bases under consideration, it was early planned to make such allocations of part of the plant of one of the associated Bell companies, selecting for the purpose representative cities in its territory embodying plant features found with minor variations throughout the Bell System. Maryland was selected as representative territory of an operating company. The particular representative towns selected for the preliminary survey are: Baltimore, Hagerstown, Frederick, Cambridge, Towson, Arbutus, Indianhead, Reisterstown.

In addition, the Wisconsin-Bradley exchanges adjacent to the District of Columbia have been selected and the outside toll plant of the Chesapeake & Potomac Telephone Co. of Baltimore City.

All three bases of allocation described above are to be used. The particular allocations will be carried out in considerably greater detail than will probably be required in actual allocations to be made later, the purpose being to present to the Commission data which will enable it to determine the particular broad basis it will eventually prescribe for making allocations and the degree of detail required to reach sufficiently accurate results with a maximum saving in effort and expense.

IV. VALUATION AND DEPRECIATION

The work of this unit has been concentrated on codifying the underlying principles and practices to be followed in determining the various factors pertinent to the valuation of public utilities and which are not directly available for its books of account, as well as the processes and procedures necessary for the interpretation and reconciliation of such various factors.

INTERNATIONAL SECTION

GENERAL

The Section, in addition to the special work mentioned below, has carried on its regular work of coordination of international and interdepartment relations in connection with wire, radio, and cable services.

The personnel of the Section is equipped to make translations from foreign languages, and generally to be of assistance to the other departments and sections of the Commission in the carrying out of the various phases of Commission activity.

Particular attention has been given to the question of reducing interference among the various services using the radio spectrum, notably in the broadcasting band involving stations in North America and in the medium high and high bands involving stations throughout the world. A number of interference cases involving interference between the United States and stations in other countries have been studied and the solution has been found by mutual adjustments, requiring in some cases change of frequencies.

INTERNATIONAL CONSULTING COMMITTEE ON RADIO COMMUNICATIONS

The third meeting of the International Consulting Committee on Radio (C. C. I. R.) met at Lisbon, Portugal, from September 22 to October 10, 1934. The United States Government was represented by a delegation of five members, headed by Dr. J. H. Dellinger, National Bureau of Standards, and including Capt. S. C. Hooper, Director of Naval Communications, Navy Department; Maj. Roger B. Colton, Signal Corps, United States Army; Mr. W. V. Whittington, Department of State; and Mr. Gerald C. Gross, Chief, International Section, Federal Communications Commission. The preparatory work of the United States was done under the active direction of the Commission for a period of approximately 1 year prior to the meeting, during which time representatives of all Government departments and commercial organizations interested in radio met from time to time to prepare the proposals of the United States for the conference and to consider the proposals of other nations. The following countries participated in the conference:

Germany, Argentina, Belgium, Vatican City State, Swiss Confederation, Denmark, Spain, United States of America, France, Great Britain, Hungary, British India, Dutch East Indies, Italy, Japan, Lithuania, Morocco, Norway, Netherlands, Poland, Portugal, Rumania, Sweden, Czechoslovakia.

In addition to these governments, a number of private companies and international organizations participated.

This meeting of the C. C. I. R. was noteworthy for the spirit of good will which characterized its work. There was a somewhat greater output of opinions and new questions than at the other two meetings.

This meeting was the first conference held under the new arrangement for official languages set up by the Madrid Convention (art. 21). The International Bureau provided excellent official interpreters and all proceedings were faithfully conducted on a strictly bilingual basis. This was a vast improvement over the situation in previous conferences; in fact, the insurance that all delegates understood what was being said, and the lack of argument over the language problem, contributed in no small degree to the noteworthy spirit of harmony at this conference.

The results of the conference appear in the formal Opinions Nos. 52 to 77, inclusive, which were adopted unanimously by the conference and which include, for the most part, statements of the technical status of the radio art at the time the opinions were expressed of the various questions considered. These questions had a wide range and covered such matters as selectivity and frequency stability of receiving sets; propagation characteristics of various radio frequencies throughout the radio spectrum; the reduction of interference in the shared bands, and related matters.

The next meeting of the C. C. I. R. will be held in Bucharest, Rumania, in the spring of 1937.

INTERDEPARTMENTAL

A considerable amount of work was done by this Section in correlating the radio activities of the Commission with the activities of other Government departments interested in radio.

The Chief of the Section served as secretary of the Interdepartment Radio Advisory Committee and as a member of the technical subcommittee of that committee. In that capacity he aided in the preparation of a revision of previous Executive orders assigning frequencies to Government departments in accordance with the provisions of the Communications Act of 1934. This work resulted in the effective coordination by the Government radio stations and commercial radio stations, providing for the more efficient and economical use of the radio spectrum.

ENGINEERING CONFERENCES ON AUTO-ALARM EQUIPMENT

Several conferences were held by the representatives of the Commission and other Government departments and manufacturers of radio equipment with a view to adopting specifications for auto-alarm equipment which would meet the requirements of the separate international conventions governing the use of radio on shipboard, including the General Radio Regulations annexed to the International Telecommunication Convention of Madrid, 1932. Tentative specifications and approval tests leading to the issuance of approved type certificates for auto-alarm equipment, if the equipment can meet the tests laid down, were adopted.

FIELD SECTION

On August 13, 1934, the Division of Field Operations was transferred to the Engineering Department of the Commission with the designation of Field Section.

The Field Section has jurisdiction over the activities of the 21 field districts and 2 independent monitoring stations; 1 at Grand Island, Nebr., and 1 at Great Lakes, Ill. Five other monitoring stations are operated in conjunction with headquarters offices, at Boston, Baltimore, Atlanta, Los Angeles, and Portland.

DISTRICTS

The headquarters of the 21 field districts are situated as follows:

District	Headquarters	Inspector in charge
First	Boston, Mass	Charles C. Kolster.
Second	New York, N. Y	Arthur Batcheller.
Third	Philadelphia, Pa	Louis E. Kearney.
Fourth	Baltimore, Md	George E. Sterling.
Fifth	Norfolk, Va	Edward Bennett.
Sixth	Atlanta, Ga	George S. Turner.
Seventh	Miami, Fla	Joe H. McKinney.
Eighth	New Orleans, La	Theodore G. Deiler.
Ninth	Galveston, Tex	Louis L. McCabe.
Tenth	Dallas, Tex	Frank M. Kratokvil.
Eleventh	Los Angeles, Calif	Bernard H. Linden.
Twelfth	San Francisco, Calif	V. Ford Greaves.
Thirteenth	Portland, Oreg	Kenneth G. Clark.
Fourteenth	Seattle, Wash	Landon C. Herndon.
Fifteenth	Denver, Colo	Edwin H. Heiser.
Sixteenth	St. Paul, Minn	John M. Sherman.
Seventeenth	Kansas City, Mo	William J. McDonell.
Eighteenth	Chicago, Ill	Harold D. Hayes.
Nineteenth	Detroit, Mich	Emery H. Lee.
Twentieth	Buffalo, N. Y	Milton W. Grinnell.
Twenty-first	Honolulu, Hawaii	James M. Chapple.

The Honolulu office was opened on February 15, 1935. There are employed in the field 67 inspectors, 39 clerks, 1 Diesel engineman, 1 janitor; Washington office, 2 engineers, 2 clerks. Total number of employees, 112.

ADDITIONAL LAND AT GRAND ISLAND, NEBR.

Under authority granted in the First Deficiency Appropriation Act, fiscal year 1935, approved March 21, 1935, funds were made available for the purchase of an additional tract of land containing approximately 10 acres adjacent to that now owned at Grand Island, Nebr. The purchase of this land permitted an extension of the antenna system for monitoring purposes thus increasing the efficiency of this station. Authority was also given to enclose the property, which is being done.

RENTED QUARTERS

Because of there not being Government office space available it is necessary to rent space as follows: Atlanta, Ga., monitoring station; Los Angeles, Calif., office space; Los Angeles, Calif., monitoring station; Chicago, Ill., office space. At Galveston, Tex., the Commission occupies space obtained for it by the local chamber of commerce without the usual rental charge.

SHIP INSPECTIONS FOR SAFETY

The importance of frequent inspections at all ports of ship radio installations as contemplated under the act of June 24, 1910, amended July 23, 1912, the purpose of which is to promote safety of life at sea, is best demonstrated by the fact that during the year all of the vessels so inspected which met with disaster were able to use their radio stations to summon assistance. Among the outstanding cases were the American steamship *Morro Castle*, American steamship *Havanna*, and the American steamship *Mohawk*.

During the year there were 13,384 clearances from our ports of American and foreign ships subject to the above act. During the same period 6,376 inspections were made. On voluntarily equipped ships 3,233 inspections were made.

CAPACITY TEST OF EMERGENCY STORAGE BATTERIES

During this year a standard method of determining the available capacity of storage batteries used as an emergency source of power on compulsorily equipped vessels was inaugurated. These tests developed the inefficiency of the batteries in a number of cases, some of which involved the entire installation, while in others a few defective cells were detected. In each case new installations were made or the defective cells were repaired or removed and new cells added.

INSPECTION OF STATIONS ON LAND

Under existing instructions, inspections of broadcast stations are made semiannually, and annual inspections are made of aeronautical, aircraft, aeronautical point-to-point, airport, coastal stations in the public coastal service, marine relay, municipal and State police, special emergency, and marine fire stations. Special inspections are made of the following: Point-to-point telegraph and telephone stations in the fixed public and fixed public press services, geophysical, experimental, broadcast pick-up, and motion-picture stations and amateur.

During the year 1,205 broadcast station inspections were made.

There were 1,027 inspections made of fixed and land stations other than broadcast.

In addition to the above, 134 inspections were made of the 359 licensed aircraft stations.

BROADCAST ALLOCATION SURVEY

The seven test cars participated in the allocation survey for the purpose of determining the radiation characteristics of clear-channel

stations and the night service area of regional and local broadcasting stations in cities in the areas covered by each car.

The Baltimore test car was used in connection with determining the effective height of the antennae employed at points where receivers and automatic recorders were installed. This trip included the following cities: Lexington, Mass.; Morristown, N. J.; Atlanta, Ga.; Dallas, Tex.; Los Angeles, Calif.; San Francisco, Calif.; Portland, Oreg.; Seattle, Wash.; Salt Lake City, Utah; Denver, Colo.; Grand Island, Nebr.; and Chicago, Ill. The total distance covered on the above trip was 10,484 miles.

UNLICENSED STATIONS

During the year reports were received of operation of 441 unlicensed radio stations. In each case an investigation was made which resulted in discontinued operation of 371, leaving 70 pending cases at the close of the year. These are being investigated.

INTERFERENCE COMPLAINTS

There were received during the year 3,754 complaints of interference with radio reception. As a result of investigations, remedial action was taken resulting in the closing of 3,407 of these cases. The remaining 347 open cases are being investigated. In each case every effort is made to insure relief to the complainant before the case is closed.

FREQUENCY MEASUREMENTS

During the year there were made 13,668 measurements of the frequencies of United States broadcast stations. There were 355 deviations beyond the permitted tolerance of 50 cycles (plus or minus). Of stations other than broadcast, there were 27,877 measurements made and 2,766 deviations reported. Foreign-station measurements numbered 720, with 207 deviations. As a result of monitoring the above United States stations, 2,528 discrepancy notices were served for violations of the international treaty, national laws, and regulations of the Commission. There were reported by the monitoring stations, 86 cases of excessive harmonic emissions.

INSPECTIONS OF STATIONS

There were 6,376 inspections made of the radio installations on American and foreign ships required by law to be equipped with radio apparatus. These inspections developed 191 cases where the sailing of the vessel would have been in violation of the law had not corrective action been taken. In 184 cases the masters were served with official notices. Inspections of voluntarily equipped ships numbered 3,233. These inspections developed 618 cases necessitating notification being made to the master of defects found in the radio installation. In addition 1,595 ship stations were inspected for license; semiannual and special inspections of broadcast stations,

1,205; land stations other than broadcasting, 833; amateur stations, 194; aircraft stations, 134. As a result of inspections of stations other than ships, there were served 747 discrepancy notices.

MISCELLANEOUS ITEMS

Mail handled, incoming, 157,497; outgoing, 140,612. Trips made, 277; miles traveled, 200,989.

FIELD ACTIVITIES

Following is a statement, by districts, of the work performed during the past fiscal year:

District no. and location	Stations inspected							Frequency measurements					
								United States broadcast		United States other than broadcast		Foreign	
	Ship, under act	Ship, voluntary equipment	Ship for license	Land	Broadcast	Amateur	Aircraft	Measurements	Deviations	Measurements	Deviations	Measurements	Deviations
1. Boston, Mass	375	274	146	42	85	5	0	1,722	18	887	107	65	15
2. New York, N. Y	2,999	311	253	33	76	10	0	0	0	0	0	0	0
3. Philadelphia, Pa	142	348	137	14	48	20	0	0	0	0	0	0	0
4. Baltimore, Md	322	343	166	9	19	21	0	2,488	31	895	111	14	5
5. Norfolk, Va	144	293	112	9	38	3	0	0	0	0	0	0	0
6. Atlanta, Ga	0	0	0	76	77	3	5	1,202	22	606	40	6	3
7. Miami, Fla	106	38	5	33	19	12	1	0	0	0	0	0	0
8. New Orleans, La	342	165	107	24	60	21	0	0	0	0	0	0	0
9. Galveston, Tex	25	187	92	20	16	1	6	0	0	0	0	0	0
10. Dallas, Tex	0	0	0	40	82	2	8	0	0	0	0	0	0
11. Los Angeles, Calif	692	483	184	57	79	34	14	1,411	31	1,169	308	134	122
12. San Francisco, Calif	519	427	217	77	41	6	5	0	0	0	0	0	0
13. Portland, Oreg	106	179	44	21	40	15	7	1,027	30	3,275	215	25	14
14. Seattle, Wash	402	116	107	60	56	2	8	0	0	0	0	0	0
15. Denver, Colo	0	0	0	10	40	0	7	0	0	0	0	0	0
16. St. Paul, Minn	0	0	0	29	62	0	6	0	0	0	0	0	0
17. Kansas City, Mo	0	8	0	41	94	4	26	0	0	0	0	0	0
18. Chicago, Ill	16	1	1	33	87	3	18	0	0	0	0	0	0
19. Detroit, Mich	64	35	12	128	103	31	19	0	0	0	0	0	0
20. Buffalo, N. Y	22	12	8	36	81	1	0	0	0	0	0	0	0
21. Honolulu, Hawaii [1]	100	13	4	41	2	0	4	0	0	0	0	0	0
Grand Island, Nebr	0	0	0	0	0	0	0	3,378	180	16,937	1,790	427	23
Great Lakes, Ill	0	0	0	0	0	0	0	2,440	43	4,108	195	55	25
Total	6,376	3,233	1,595	833	1,205	194	134	13,668	355	27,877	2,766	720	207

[1] Office opened Feb. 15, 1935.

OPERATORS EXAMINED

District no. and location	Commercial								Amateur	
	Extra first	First telegraph	Second telegraph	Third telegraph	First telephone	Second telephone	Third telephone	Code test only	Class A	Class B
1. Boston, Mass.	0	10	70	7	158	8	534	85	241	819
2. New York, N. Y.	1	33	110	22	132	31	401	50	451	1,712
3. Philadelphia, Pa.	0	4	26	6	33	2	201	12	152	568
4. Baltimore, Md.	0	10	19	17	37	5	66	32	53	135
5. Norfolk, Va.	0	3	4	2	30	10	89	11	59	159
6. Atlanta, Ga.	0	3	8	7	49	8	141	1	55	130
7. Miami, Fla.	0	18	38	4	30	11	59	11	55	28
8. New Orleans, La.	0	21	56	4	69	0	42	47	55	0
9. *Galveston, Tex.*	0	5	16	11	29	3	33	18	22	108
10. Dallas, Tex.	0	3	45	11	95	17	96	8	93	398
11. Los Angeles, Calif.	0	18	81	12	135	26	299	24	283	619
12. San Francisco, Calif.	1	23	88	9	53	39	117	29	125	454
13. Portland, Oreg.	0	14	36	3	55	4	32	154	76	141
14. Seattle, Wash.	0	24	74	20	55	10	229	16	148	193
15. Denver, Colo.	0	0	23	1	67	21	15	0	85	119
16. St. Paul, Minn.	0	0	6	1	36	10	57	3	113	221
17. Kansas City, Mo.	0	0	26	3	148	19	184	157	247	562
18. Chicago, Ill.	0	14	111	16	228	30	402	6	328	1,061
19. Detroit, Mich.	0	1	68	12	128	36	247	13	356	1,340
20. Buffalo, N. Y.	0	1	92	11	108	18	84	7	158	873
21. Honolulu, Hawaii	0	1	3	1	1	0	1	1	14	22
Total	2	206	1,000	180	1,676	308	3,329	685	3,169	9,662

OPERATORS LICENSED

District no. and location	Commercial														
	Extra first	First telegraph	First with first telephone endorsement	First with second telephone endorsement	First with third telephone endorsement	Second telegraph	Second with first telephone endorsement	Second with second telephone endorsement	Second with third telephone endorsement	Third telegraph	Third with first telephone endorsement	Third with second telephone endorsement	Third with third telephone endorsement	Telephone first	Telephone second	Telephone third
1. Boston, Mass.	0	33	13	1	0	46	13	1	0	4	0	1	0	101	4	485
2. New York, N. Y.	1	49	28	2	0	62	15	2	0	10	4	1	2	97	24	385
3. Philadelphia, Pa.	0	10	5	0	0	12	0	0	2	1	0	0	1	24	2	136
4. Baltimore, Md.	1	14	15	2	1	11	5	1	0	7	0	0	3	24	6	24
5. Norfolk, Va.	0	9	4	1	0	2	3	0	0	0	1	0	1	15	6	78
6. Atlanta, Ga.	0	1	2	0	0	3	3	0	0	4	0	0	0	36	2	117
7. *Miami, Fla.*	1	15	1	0	0	12	4	0	11	1	0	0	0	20	6	46
8. New Orleans, La.	0	24	9	1	1	41	16	1	0	5	0	0	7	48	0	31
9. Galveston, Tex.	0	5	3	0	0	11	3	0	0	5	0	1	2	22	3	30
10. Dallas, Tex.	0	4	0	0	0	28	4	2	1	3	0	1	0	64	20	86
11. Los Angeles, Calif.	0	27	13	0	0	47	35	1	0	3	1	0	1	102	21	293
12. San Francisco, Calif.	1	31	18	0	0	54	6	0	0	6	0	0	0	36	45	111
13. Portland, Oreg.	0	9	3	0	1	15	9	0	1	0	0	0	0	35	9	29
14. Seattle, Wash.	0	12	9	1	0	62	5	2	0	8	3	2	1	35	7	220
15. Denver, Colo.	0	0	0	0	0	5	8	1	0	1	0	0	0	38	19	18
16. St. Paul, Minn.	0	2	1	0	0	5	1	0	0	1	1	0	0	27	8	45
17. Kansas City, Mo.	0	0	0	1	0	7	3	0	0	1	1	0	1	75	12	186
18. Chicago, Ill.	0	6	9	0	0	62	26	1	0	7	4	0	0	101	16	334
19. Detroit, Mich.	0	4	6	0	0	31	9	3	0	5	0	1	1	86	16	209
20. Buffalo, N. Y.	0	1	5	0	0	25	15	1	0	4	1	1	0	55	16	75
21. Honolulu, Hawaii	0	4	0	0	0	3	1	0	0	1	0	0	0	0	0	1
Total	4	260	144	9	3	544	184	16	15	77	15	8	20	1,041	242	2,939

COMPLAINTS AND INVESTIGATIONS

Complaints	Amateur	Unlicensed broadcast	Unlicensed other	Miscellaneous	Total
Carried over from previous year	199	3	8	40	250
Received this year	2,730	66	375	1,024	4,195
Closed this year	2,470	56	315	1,200	4,041
Number of those cases closed requiring personal investigation	301	27	109	300	737
On hand at close of this fiscal year	260	10	60	87	417

REPORT OF ACCOUNTING, STATISTICAL, AND TARIFF DEPARTMENT

WILLIAM J. NORFLEET, *Chief Accountant*

The Accounting, Statistical, and Tariff Department was established in October 1934 but did not have an appreciable number of employees until March 1935. At the end of the fiscal year the department was still in need of a considerable number of additional employees.

FUNCTIONS

The functions of the department have to do with three related fields of activity—namely (1) accounts, (2) statistics, and (3) tariffs. In general, the department assists the Commission in the administration of sections 203, 213, 215, 219, and 220 and, to a lesser extent, sections 204, 211, 214, and 221, of the Communications Act of 1934, hereinafter called the act, and in the administration of various other sections as directed by the Commission.

ORGANIZATION

The department is divided into five sections, 1 relating to statistical activities, 1 relating to tariff and rate activities, and 3 relating directly to accounting activities. These five sections are designated as follows:

Classification Section.
Depreciation and Cost Analysis Section.
Investigation and Field Examination Section.
Statistical Section.
Tariff Section.

There follows a brief description of the functions of each of the five sections of the department and a résumé of their accomplishments during the fiscal year ending June 30, 1935. In reviewing the activities of each of these sections, however, it should be kept in mind that they were sparsely supplied with personnel prior to the close of the fiscal year as hereinbefore indicated. Notwithstanding this fact, much important work was accomplished during the few closing months of the year.

CLASSIFICATION SECTION

FUNCTIONS

The department, through this section, formulates and recommends, for prescription by the Commission, uniform accounting systems for various classes of communication companies, and revisions and

modifications of such systems from time to time; maintains, through correspondence, an information service for the purpose of interpreting accounting regulations and directing the manner of recording unusual transactions and passing upon the accounting for certain other transactions or adjustments required to be submitted by the carriers to the Commission; formulates and recommends, for prescription by the Commission, rules governing the destruction of carriers' records, forms of and accounting for franks, work-order systems, records of property changes, and related matters; considers the propriety of all exceptions taken by field investigators to accounting performed by carriers; and performs other duties as assigned.

RÉSUMÉ OF ACTIVITIES

While there was a recognized need for a thorough revision of uniform accounting systems for (1) telephone companies and (2) telegraph and cable companies, transmitting by wire; and for the formulation and promulgation, for the first time, of an appropriate uniform system of accounts for radiotelegraph communication service, it became necessary, during the fiscal year ending June 30, 1935, to confine the activities of the Classification Section principally to a revision of the uniform system of accounts for telephone companies. This revision was confined to Interstate Commerce Commission Docket No. 25705, Accounting Rules of Telephone Companies, which was continued as Federal Communications Commission Docket No. 2551. This proceeding involved consideration of numerous recommendations made by State commissions and other interested parties.

As a result of deliberations in the above proceeding, the Telephone Division, on June 19, 1935, issued a revised uniform system of accounts for telephone companies which was ordered to become effective on January 1, 1936.

The Classification Section, during the fiscal year, also engaged in various other activities, including the following:

1. Abstracting of pertinent data relating to communication companies from the topical indices of accounting interpretations maintained by the Interstate Commerce Commission.

2. Drafting (in conjunction with the Engineering Department) of proposed rules governing work-order systems and perpetual records of property changes.

3. Study of proposed changes in the classification of telephone companies for the purpose of accounting regulations.

4. Study of most desirable accounting for telegraph services performed by telephone companies.

5. Study of the regulations, promulgated forms, procedures, etc., of the Securities and Exchange Commission as auxiliary guides to the advisability of changing the regulations and terminology relating to the accounting for financial transactions of communication companies.

6. Handling of notifications relative to the accidental destruction of records of communication companies and consideration of changes in existing regulations governing the destruction of records (which regulations became effective on Jan. 1, 1920) to meet present-day conditions in the industry and to promote cooperation between the

regulatory activities of this Commission and the activities of certain other governmental agencies.

7. Consideration and recommendations relative to certain applications by communication companies for permission to construct new lines or to supplement existing facilities; and the formulation of recommendations to the Telegraph and Telephone Divisions with reference to suitable requirements to be laid down in the case of such applications.

DEPRECIATION AND COST ANALYSIS SECTION

FUNCTIONS

Depreciation

The Department, through the Depreciation and Cost Analysis Section, advises the Commission with reference to the prescription of classes of depreciable property, the methods of determining depreciation bases, and the rates applicable thereto; conducts necessary field examinations in connection with depreciation studies; prepares statistical tables in such form as to make depreciation accounting of the various communication companies readily comparable; and makes recommendations, from time to time, with reference to proper depreciation accounting.

Cost Analysis

The Department, through this section, also makes cost analyses relating to various communication services and operations and with reference to plant properties; makes investigations relative to the feasibility of cost-accounting systems for communication companies and makes recommendations with reference thereto; and performs various other duties as assigned.

RÉSUMÉ OF ACTIVITIES

Since depreciation studies in most instances have not been exhaustively pursued by governmental bodies, and since the communication industries have never been called upon to justify their determinations of depreciation, it was considered necessary to first assemble factual information relative to depreciation experiences and practices of communication companies. The early work of this section, therefore, was and is a survey of the practices of various classes of communication companies in regard to depreciation and the problems involved in the regulation of these practices.

A brief mention of some of the subjects of this investigation in its initial stage and of certain related activities follows:

1. Study of the relationship of depreciation reserves of many large telephone and telegraph companies to plant, capital, and other accounts, and the relationship of annual depreciation charges to revenue and related accounts.

2. Field examinations at the offices of two large telephone companies for the purpose of determining the retirement history of those carriers, the sufficiency of reserves created through annual depreciа-

tion charges, and the experience of those companies in toll service as compared with their experience in exchange service.

3. Examination of the records of a large company engaged in radiotelegraph service in order to determine the experience of this carrier as distinguished from wire-communication companies.

This examination, which is not yet completed, is important because this company represents a comparatively new industry which has received only limited study with reference to depreciation practices.

4. Geographical analysis of exchange rates of telephone companies and study of possible relationships to depreciation practices of companies involved.

Various other activities were engaged in by this section, such, for instance, as traffic-density studies at certain offices of Western Union Telegraph Co. and Postal Telegraph-Cable Co., which were performed at the request of the Telegraph Division.

INVESTIGATION AND FIELD EXAMINATION SECTION

FUNCTIONS

The Department, through this section, conducts regular and special field examinations of the accounts, records, and memoranda of communication companies subject to the act; considers, investigates, and makes recommendations (in conjunction with the classification section and the engineering department) relative to applications of communication companies for permission to make extensions of lines or to supplement existing facilities; classifies telephone properties as between intrastate and interstate service; and performs various other functions as assigned. The usual objects of the regular field examinations are to see that accounting regulations are being complied with and that records are being preserved as required, to detect deficiencies in existing regulations, to check additions to plant-investment accounts for overstatement of amounts, to pass upon distributions of large repair items to investment and expense accounts, and to secure other necessary information needed regularly in administration of the act. Special field examinations and investigations may be made from time to time, as required by the Commission, to secure other information deemed necessary by the Commission in the regulation of communication companies.

RÉSUMÉ OF ACTIVITIES

Several important field examinations were being conducted by this Section at the close of the fiscal year. These examinations included a cost audit of a large manufacturing plant to determine the actual costs of certain telephone-plant units involved in new construction of telephone toll-exchange cable. Two other important field examinations which were in process at the end of the fiscal year involved analyses of the accounts of (1) an important radiotelegraph company, and (2) a large telegraph company engaged in wire-communication service. These examinations were for the purpose (among other things) of securing information deemed necessary (1) in the formulation, for the first time, of a uniform system of accounts for radiotelegraph carriers; and (2) in a necessary revision of the exist-

ing uniform system of accounts for telegraph companies which was prescribed for companies engaged in wire communication and which become effective on January 1, 1914.

STATISTICAL SECTION

FUNCTIONS

The Department, through this Section, conducts special studies into economic problems affecting communication companies; formulates and recommends, for prescription by the Commission, appropriate forms and schedules for annual, monthly, and special reports of communication companies; examines the general balance sheets and income and surplus statements contained in the annual reports of these carriers to the Commission; prepares monthly summaries of the operating returns of communication companies, which reports are distributed generally throughout the country to interested parties; compiles, and prepares for publication, various statistical data relative to communication companies, including a comprehensive annual compilation of financial and operating data relating to companies subject to the act; prepares and recommends, for prescription by the Commission, special report forms for holding companies which control communication companies subject to the act; compiles statistical information with reference to such holding companies; develops, through economic and statistical research, information for the use of the Commission in rate and other proceedings; and performs various other duties as assigned.

RÉSUMÉ OF ACTIVITIES

All communication companies subject to the act, except telephone companies whose operating revenues are $50,000 per year or less, are required to file annual reports on prescribed forms. Pursuant to this requirement, 286 telephone companies filed annual reports for the calendar year 1933, of which 187 were class A companies and 99 were class B companies. For the calendar year 1934, 217 telephone companies filed annual reports, of which 145 were class A companies and 72 were class B companies. Annual reports of 15 telegraph and cable companies and 22 radiotelegraph companies were also filed during the fiscal year.

Telephone companies whose operating revenues exceed $250,000 per year are also required to file monthly reports of their operating results, in addition to the annual reports above mentioned. Heretofore 103 such companies filed monthly reports with the Interstate Commerce Commission. During the fiscal year ending June 30, 1935, only 60 such companies filed monthly reports with this Commission, and 43 claimed exemption under section 2 (b) (2) of the act. The companies that are now filing monthly reports, however, represent the bulk of the telephone business of the country.

The Statistical Section also conducted studies and made recommendations relative to appropriate forms of annual reports of holding companies to be prescribed by the Commission.

Studies were also in progress at the end of the fiscal year looking toward the adoption of a plan to secure, on a monthly basis, statistics

concerning employees of carriers engaged in communications. This plan was being developed in collaboration with other departments of the Government interested in employment statistics.

Compilations of statistical data were furnished, upon request, during the fiscal year, to other agencies of the Federal Government, universities, banking institutions, insurance companies, State commissions, labor organizations, and other groups engaged in economic research.

There are submitted herewith, as appendix A, certain tables numbered I to XII, inclusive, and certain charts numbered 1 to 6, inclusive, pertaining to communication companies.

TARIFF SECTION

FUNCTIONS

The Department, through the Tariff Section, receives and examines all tariffs and tariff supplements filed with the Commission; formulates and recommends, for prescription by the Commission, regulations governing the form and manner of filing tariffs and traffic contracts; examines the provisions of traffic contracts in their relation to tariff provisions; conducts broad general surveys of rate structures, paying particular attention to classes of service and relationships between the various rates, in order to detect discriminations and to make recommendations for rate adjustments deemed to be in the public interest and to be productive of wider utilization of communication services; prepares press releases with reference to rate changes or changes in rules, regulations, classes of service, or conditions under which services are rendered; makes recommendations to the Commission with reference to rate changes proposed by communication companies, particularly on the question as to whether such proposed rate changes should be suspended by the Commission for inquiry as to their lawfulness; passes upon and makes recommendations relative to applications by communication companies for special authority to make rate changes effective on less than the usual notice to the public; in the event of rate hearings or suspension proceedings, prepares exhibits and other data for use by the Commission; prepares rate and traffic information for the Commission and other employees and departments of the Commission, and, under proper circumstances, for other departments and officials of the Government; and maintains a public reference room where all tariffs are made conveniently available to members of the public who seek rate or traffic information.

RÉSUMÉ OF ACTIVITIES

Tariff schedules were filed by 105 communication companies during the fiscal year. These schedules comprised 4,829 separate tariff publications. Of these publications, 3,558 were filed by telephone companies and 1,271 by telegraph companies. Carriers made 150 applications for special authority to effect changes in their rates, regulations, classifications, or practices on less than 30 days' notice. Authority to make such changes was granted in 134 instances and was denied in 15 instances. In one instance the application for such authority was withdrawn.

In 10 instances tariff schedules tendered for filing by communication companies were rejected because of failure to give lawful notice of their effective date.

A reduction in telephone rates between the hours of 7 and 8:30 p. m., in a section of the country comprising several States, was brought about through the Commission suspending certain schedules containing proposed rate changes. The suspension proceeding did not result in a hearing because voluntary revisions of the tariff schedules were made by the communication companies involved, following the suspension order by the Commission.

Numerous exhibits and rate memoranda were prepared at the request of the Telephone and Telegraph Divisions of the Commission, including rate and traffic exhibits which were introduced in evidence in the formal hearing on telegraph services held pursuant to Telegraph Division Order No. 12 and similar data which were used in drafting Telegraph Division Order No. 15.

Considerable attention was given to the task of formulating, for the first time by a Federal agency, suitable rules and regulations governing the construction, filing, and posting of tariffs by communication companies. A tariff circular containing such rules and regulations was being put in final form at the close of the fiscal year.

Rate information was supplied on a number of occasions to other departments or employees of the Commission, to other governmental departments, including State commissions, and, to a limited extent, to members of the public. The public reference room was visited frequently by members of the public for the purpose of inspecting or examining the tariffs on file.

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APPENDIX A

STATISTICAL DATA CONCERNING CARRIERS ENGAGED IN WIRE OR RADIO COMMUNICATIONS

The following tables and charts are assembled into two major groups. The first group relates to annual reports for the calendar year 1934, and the second group refers to monthly reports received by the Federal Communications Commission.

ANNUAL REPORTS

The data included in table 1 cover reports received from 145 class A telephone carriers (including 2 period reports filed by a reorganized company) and 72 reports from class B telephone carriers. Selected financial and operating data for 15 telegraph and cable carriers are shown in table 2 and for 17 radiotelegraph carriers in table 3. In addition, five reports were filed by radio carriers, but as the returns were incomplete they could not be used for tabulation purposes. These five reports were received from the Aeronautical Radio, Inc.; City of Seattle, Harbor Department; Gulf Radio Service (George Collins Warner, Jr.); Mayor and City Council of Baltimore, Md.; and Pacific Communication Co.

TABLE I.—*Telephone carriers reporting to the Federal Communications Commission*

[Selected financial and operating data for the calendar year 1934]

Item	Class A carriers	Class B carriers	Total
Investment in telephone plant	$4,551,139,433	$22,187,678	$4,573,327,111
Other investments	2,648,721,769	22,405,645	2,671,127,414
Cash	52,344,184	846,269	53,190,453
Material and supplies	55,454,210	897,508	56,351,718
Total current assets	427,344,831	3,778,494	431,123,325
Capital stock	4,331,325,300	17,872,784	4,349,198,084
Funded debt	1,036,343,761	11,195,216	1,047,538,977
Total current liabilities	92,206,656	1,579,723	93,786,379
Depreciation reserve	1,023,420,212	5,419,304	1,028,839,516
Total surplus	460,289,770	2,685,720	462,975,490
Operating revenues	960,376,209	4,135,808	964,512,017
Operating expenses	676,489,875	3,204,935	679,694,810
Operating taxes:			
Other than U. S. Government taxes	70,671,781	254,379	70,926,160
U. S. Government taxes	23,161,621	94,639	23,256,260
Total	93,833,402	349,018	94,182,420
Net operating income	189,945,221	574,313	190,519,534
Net income	259,216,188	323,463	259,539,651
Dividends declared	310,026,822	390,758	310,417,580
Plant mileage in service:			
Miles of pole line	606,768	30,092	636,860
Miles of wire in cable	78,327,402	129,228	78,456,630
Miles of aerial wire	4,843,736	119,246	4,962,982
Total miles of wire	83,171,138	248,474	83,419,612
Underground conduit-miles of single duct	127,248	184	127,432
Central offices—Type of switchboard:			
Magneto-manual	5,802	395	6,197
Common battery-manual	2,926	84	3,010
Auto-manual	39	6	45
Dial (automatic) system	1,162	21	1,183
Total	9,929	506	10,435
Total company telephones	14,718,484	135,014	14,853,498
Service telephones	332,782	12,135	344,917
Private-line telephones and other stations	97,410	27	97,437
Total telephones	15,148,676	147,176	15,295,852
Average number of local calls originated per month	2,117,680,750	17,010,444	2,134,691,194
Average number of toll calls originated per month	64,518,004	567,308	65,085,312
Average number of telephones	14,820,924	141,304	14,962,228
Total number of employees in service at close of year	275,620	2,301	277,921
Total compensation	$391,847,760	$1,870,017	$393,717,777

TABLE II.—*Telegraph and cable carriers reporting to the Federal Communications Commission*

[Selected financial and operating data for the calendar year 1934]

Name of carrier	Investment in plant and equipment	Other investments	Cash	Material and supplies	Total working assets	Capital stock
Total	$501,753,560	$55,057,183	$17,312,000	$9,843,498	$64,020,428	$166,398,823
All America Cables, Inc.[1]	32,572,731	3,230,824	2,668,478	324,477	5,151,166	27,037,100
Canadian Pacific Ry. Co. (lines in United States)	(2)	(2)	(2)	(2)	(2)	(2)
Central Idaho Telegraph & Telephone Co	104,517				9,199	100,000
Colorado & Wyoming Telegraph Co	38,710		33,617	284	35,378	56,300
Commercial Cable Co	31,422,138	30,043,654	585,092	458,161	16,514,716	25,000,000
Commercial Pacific Cable Co	22,971,723		1,792,741	175,078	7,000,815	6,000,000
Continental Telegraph Co	299				1,773	5,000
French Telegraph Cable Co.[3]	233,381	1,606,993	38,327	246,167	865,560	709,430
Great North Western Telegraph Co. of Canada[4]	(5)	(5)	(5)	(5)	(5)	(5)
Interstate Telephone & Telegraph Co.[4]	25,702				1,909	[6] 1
Mackay Companies (The) (Postal Telegraph-Cable Co.)	82,247,420	942,651	1,772,838	967,850	5,563,268	
Mexican Telegraph Co	3,127,585	3,832	206,140	12,015	693,083	2,685,500
Mountain Telegraph Co	9,378		574		9,667	15,000
Northern Telegraph Co	336,315		45,813	5,277	83,203	262,600
Western Union Telegraph Co	328,663,661	19,229,229	10,168,380	7,654,189	28,090,691	104,527,892

Name of carrier	Unmatured funded debt	Total working liabilities	Accrued depreciation	Total corporate surplus	Operating revenues	Operating expenses	Tax accruals
Total	$126,564,000	$35,174,102	$106,036,082	$107,178,422	$119,053,078	$102,802,369	$4,354,451
All America Cables, Inc.[1]		474,937	10,421,748	2,188,338	4,409,109	3,473,310	274,168
Canadian Pacific Ry. Co. (lines in United States)	(2)	(2)	(2)	(2)	3,364	16,528	(2)
Central Idaho Telegraph & Telephone Co				13,716	983	523	110
Colorado & Wyoming Telegraph Co		2,662	10,501	4,625	14,528	8,760	1,229
Commercial Cable Co	20,000,000	2,376,811	22,607,349	6,212,444	4,424,021	3,502,066	68,041
Commercial Pacific Cable Co		256,277	19,949,060	865,465	1,255,908	747,743	93,135
Continental Telegraph Co		1,773		14,616	34,389	1,760	
French Telegraph Cable Co.[3]		1,552,269		[7] 444,235	[8] 319,840	[8] 307,875	[8] 17,583
Great North Western Telegraph Co. of Canada[4]	(5)	(5)	(5)	(5)			324
Interstate Telephone & Telegraph Co.[4]	50,000	25,009	6,345	[9] 49,969		1,644	500
Mackay Companies (The) (Postal Telegraph-Cable Co.)		19,173,943	20,628,747	[9] 6,462,806	21,016,334	20,227,601	490,000
Mexican Telegraph Co		50,943	716,910	308,307	302,113	249,545	3,300
Mountain Telegraph Co		527	9,378	[9] 5,860	3,528	3,324	240
Northern Telegraph Co		6,383	29,527	123,329	58,506	43,596	2,561
Western Union Telegraph Co	106,514,000	11,252,568	31,656,517	103,536,098	87,230,228	74,185,465	3,401,500

Name of carrier	Operating income	Net income	Dividends declared		Revenue messages transmitted	Employees	
			Amount	Rate per-cent		Number on June 30	Total compensation for year
Total	$11,024,120	$1,057,874	$1,796,498		160,700,029	68,621	$73,129,228
All America Cables, Inc.[1]	601,631	707,028	540,742	2.00	1,896,966	1,664	1,813,352
Canadian Pacific Ry. Co. (lines in United States)	[2]	[2]			15,115	8	7,908
Central Idaho Telegraph & Telephone Co	350	350			[10] 1,380	10	[11]
Colorado & Wyoming Telegraph Co	4,539	1,608			[10] 14,832	[12] 23	7,242
Commercial Cable Co	829,914	[9] *67,553*	500,000	2.00	2,722,647	1,595	2,156,300
Commercial Pacific Cable Co	415,030	653,924	740,000	[13]	338,156	291	401,450
Continental Telegraph Co	[9] *21,548*				[10] 155,532	[14] 37	7,472
French Telegraph Cable Co	[8 9] *5,618*	[8 9] *9,088*			[8] 207,936	[8] 98	159,379
Great North Western Telegraph Co. of Canada [4]	[9] *324*	17,546					
Interstate Telephone & Telegraph Co [4]	[9] *2,144*	[9] *4,278*					
Mackay Companies (The) (Postal Telegraph-Cable Co.)	108,733	[9] *2,521,331*			[10] 32,812,704	15,276	13,418,141
Mexican Telegraph Co	48,868	22,597			[10] 284,100	[15] 102	140,108
Mountain Telegraph Co	[9] *37*	[9] *779*			6,253	[16] 9	3,000
Northern Telegraph Co	12,076	14,816	15,756	6.00	[10] 146,808	51	33,000
Western Union Telegraph Co	9,032,650	2,243,084			[10] 122,097,600	49,457	54,981,876

[1] Figures include data for the Cuban All America Cables, Inc.
[2] No data reported as these lines are an integral part of the Canadian Pacific Railway System, and separate capital accounts are not kept.
[3] The comparative general balance sheet of this carrier has been rearranged to conform with the Uniform System of Accounts, and the data reported in francs have been converted into dollars at the average exchange rate for the year 1934 of $0.065688.
[4] Lessor company.
[5] No data reported as these lines are an integral part of the Canadian National Telegraph Co., and separate capital accounts are not kept.
[6] Represents book liability for 1,000 shares of common stock without par value.
[7] Represents $54,993 reported as "Reserve for contingencies fund, interest on bonds, and bonds payable", and $389,242 reported as "Reserve required by law."
[8] Figures cover operations of New York City office.
[9] Deficit or other reverse item.
[10] Estimated on basis of the number of messages transmitted during the month of January.
[11] No compensation reported; employees are carried on the pay roll of the Pacific & Idaho Northern Ry. Co.
[12] Includes 14 employees who receive no compensation from respondent.
[13] Represents 9 percent on $6,000,000 of capital stock outstanding, and 5 percent on $4,000,000 of capital stock retired during the year.
[14] Includes 10 employees who receive no compensation from respondent.
[15] Includes 6 employees who receive no compensation from respondent.
[16] Includes 5 employees who receive no compensation from respondent.

TABLE III.—*Radiotelegraph carriers reporting to the Federal Communications Commission*

[Selected financial and operating data for the calendar year 1934]

Name of carrier	Investment in plant and equipment	Other investments	Cash	Material and supplies	Total working assets	Capital stock	Unmatured funded debt
Total	$30,425,724	$11,781,898	$1,356,994	$697,735	$4,962,577	$7,318,857	$3,789,000
Central Radio Telegraph Co	12,181		1,467		1,846	12,000	
Globe Wireless, Ltd.[1]	933,662		658	4,681	203,601	[2] 683,700	
Hearst Radio, Inc	197,820	331,373	8,383	6,193	73,986	1,000	125,000
Mackay Radio & Telegraph Co., Inc. (California)	3,252,824		45,884	24,548	122,843	1,000,500	
Mackay Radio & Telegraph Co., Inc. (Delaware)	2,926,756	1,740,105	15,169	251,321	708,381	[3] 4,000	
Magnolia Radio Corporation	12,475				1,547	5,000	
Michigan Wireless Telegraph Co	5,865		2,525	55	2,850	7,000	
Olympic Radio Co	3,482		367		367	25,000	
Pere Marquette Radio Corporation	6,756		903		1,532	5,000	
R. C. A. Communications, Inc	19,547,835	9,697,360	1,166,040	110,963	2,654,797	[4] 5,000,000	3,664,000
Radiomarine Corporation of America	1,745,907		104,944	282,438	634,074	500,000	
South Porto Rico Sugar Co. (of Puerto Rico)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Tidewater Wireless Telegraph Co	10,000		869		869	10,000	
Tropical Radio Telegraph Co	1,695,258	12,560	5,921	17,536	539,902	10,000	
United States-Liberia Radio Corporation	22,165		2,792		13,045	[6] 5,000	
Wabash Radio Corporation	25,000				1,865	[7] 25,000	
Western Radio Telegraph Co	27,738		1,072		1,072	[8] 25,657	

Name of carrier	Total working liabilities	Accrued depreciation	Total corporate surplus	Operating revenues	Operating expenses	Tax accruals	Operating income
Total	$14,018,840	$14,615,555	$4,391,865	$7,023,868	$6,626,287	$251,359	$185,599
Central Radio Telegraph Co	3,901	8,549	[9] *8,349*	7,597	6,588	294	[9] *2,531*
Globe Wireless, Ltd.[1]	*16,217*	*46,196*	*391,004*	*136,188*	*137,781*	*1,499*	[9] *3,197*
Hearst Radio, Inc	863,243	183,549	[9] *533,054*	950	46,652	3,734	[9] *67,871*
Mackay Radio & Telegraph Co., Inc. (California)	2,853,519	378,138	[9] *918,150*	871,024	896,276	20,000	[9] *45,226*
Mackay Radio & Telegraph Co., Inc. (Delaware)	6,672,834	119,312	[9] *1,478,508*	756,687	939,503	5,000	[9] *189,574*
Magnolia Radio Corporation	3,231	10,071	[9] *4,281*	*2,481*	*3,753*	*118*	[9] *1,390*
Michigan Wireless Telegraph Co	3,991	2,116	[9] *4,392*	5,491	4,001	249	1,240
Olympic Radio Co	1,800		[9] *126*	2,143	2,271		[9] *128*
Pere Marquette Radio Corporation	564	634	567	8,626	8,533	93	
R. C. A. Communications, Inc	1,487,485	11,919,999	6,851,484	4,194,374	3,557,051	183,631	*426,355*
Radiomarine Corporation of America	108,954	1,137,646	944,527	421,034	382,403	25,045	105,813
South Porto Rico Sugar Co. (of Puerto Rico)	(5)	(5)	(5)	8,407	9,452	158	[9] *1,203*
Tidewater Wireless Telegraph Co		10,000	[9] *10,251*	4,935	5,555	105	[9] *725*
Tropical Radio Telegraph Co	1,996,474	795,212	[9] *814,081*	534,136	551,245	8,452	[9] *27,754*
United States-Liberia Radio Corporation	66		30,144	56,598	58,393	2,595	[9] *4,391*
Wabash Radio Corporation	65		1,800	10,924	10,448	70	406
Western Radio Telegraph Co	*4,496*	*5,133*	[9] *6,475*	2,273	6,382	316	[9] *4,485*

Name of carrier	Net income	Dividends declared		Revenue messages transmitted	Employees	
		Amount	Rate percent		Number on June 30	Total compensation for year
Total	[9] *$125,607*	$300,000		5,063,259	2,298	$3,930,350
Central Radio Telegraph Co	[9] *681*			[10]	4	5,261
Globe Wireless, Ltd.[1]	[9] *3,396*			[11] 29,640	60	94,943
Hearst Radio, Inc	[9] *67,911*			3,021	[10]	330,553
Mackay Radio & Telegraph Co., Inc. (California)	[9] *192,506*			[12] 820,644	291	446,583
Mackay Radio & Telegraph Co., Inc. (Delaware)	[9] *510,276*			[12] 458,508	245	420,320
Magnolia Radio Corporation	[9] *1,385*			[12] 1,476	1	2,547
Michigan Wireless Telegraph Co	1,240			4,992	5	3,367
Olympic Radio Co	[9] *128*			[10]	1	1,620
Pere *Marquette Radio Corporation*				3,851	10	8,201
R. C. A. Communications, Inc	546,783			3,117,459	1,242	1,994,290
Radiomarine Corporation of America	111,445	300,000	60.00	[12] 323,772	151	316,188
South Porto Rico Sugar Co. (of Puerto Rico)	[9] *1,203*			8,337	6	6,155
Tidewater Wireless Telegraph Co	[9] *725*			4,238	[10]	[10]
Tropical Radio Telegraph Co	1,538			232,994	[13] 253	283,834
United States-Liberia Radio Corporation	[9] *4,385*			[12] 3,756	[14] 9	4,941
Wabash Radio Corporation	407			[13] 39,204	[15] 12	9,174
Western Radio Telegraph Co	[9] *4,426*			11,367	[16] 8	2,373

[1] Report for period Apr. 20 to Dec. 31, 1934.
[2] Represents book liability for 6,837 shares of common stock without par value.
[3] Represents book liability for 12,000 shares of common stock without par value.
[4] Represents book liability for 50,000 shares of common stock without par value.
[5] No data reported as radio operations are an integral part of the South Porto Rico Sugar Co., and separate capital accounts are not kept.
[6] Represents book liability for 50 shares of common stock without par value.
[7] Represents book liability for 40,000 shares of common stock without par value.
[8] Represents book liability for 5,000 shares of common stock without par value.
[9] Deficit or other reverse item.
[10] Data not reported.
[11] Estimated on basis of the number of messages transmitted during the month of May.
[12] Estimated on basis of the number of messages transmitted during the month of January.
[13] Includes 81 employees who receive no compensation from respondent.
[14] Includes 5 employees who receive no compensation from respondent.
[15] Includes 6 employees who receive no compensation from respondent.
[16] Includes 4 employees who receive no compensation from respondent.

In table IV tax accruals, by States, are shown for telephone carriers reporting to the Commission for 1934. A list of telephone carriers in the hands of receivers, or trustees, showing the dates of appointment of the fiduciaries, is given in table V, together with the amounts of investment and capitalization involved. There were no telegraph, cable, or radio carriers reporting to the Commission for the year 1934, which were in the hands of receivers or trustees.

TABLE IV.—*Telephone carriers reporting to the Federal Communications Commission*

[Summary of taxes by States for the calendar year 1934]

State	Class A carriers	Class B carriers	Total	State	Class A carriers	Class B carriers	Total
Total, United States	$93,833,402	$349,018	$94,182,420	Nebraska	$682,123	$2,730	$684,853
				Nevada	164,086		164,086
				New Hampshire	330,006		330,006
Alabama	495,591	1,747	497,338	New Jersey	3,773,442		3,773,442
Arizona	347,705		347,705	New Mexico	101,102		101,102
Arkansas	346,079	6,981	353,060	New York	14,770,596	9,653	14,780,249
California	5,054,271	29,930	5,084,201	North Carolina	836,578	4,899	841,477
Colorado	638,868		638,868	North Dakota	167,235	1,587	168,822
Connecticut	729,357		729,357	Ohio	4,323,591	27,904	4,351,495
Delaware	87,693	145	87,838	Oklahoma	1,054,811	1,067	1,055,878
Florida	618,888		618,888	Oregon	951,161		951,161
Georgia	644,380	10,544	654,924	Pennsylvania	1,437,450	10,331	1,447,781
Idaho	248,206		248,206	Rhode Island	208,292		208,292
Illinois	7,590,399	10,148	7,600,547	South Carolina	431,081	874	431,955
Indiana	1,782,671	44,400	1,827,071	South Dakota	272,310		272,310
Iowa	710,709	12,012	722,721	Tennessee	687,759		687,759
Kansas	908,159	9,949	918,108	Texas	2,380,760	16,328	2,397,088
Kentucky	713,846		713,846	Utah	285,062		285,062
Louisiana	978,668	4,850	983,518	Vermont	107,886	1,627	109,513
Maine	322,286		322,286	Virginia	655,229	7,988	663,217
Maryland	1,198,401		1,198,401	Washington	2,218,769	5,437	2,224,206
Massachusetts	3,103,920	4,883	3,108,803	West Virginia	471,588		471,588
Michigan	2,516,457		2,516,457	Wisconsin	1,201,480	8,918	1,210,398
Minnesota	795,771	12,445	808,216	Wyoming	141,536		141,536
Mississippi	567,070		567,070	District of Columbia	459,832		459,832
Missouri	1,861,627		1,861,627	U. S. Government	23,161,621	94,639	23,256,260
Montana	296,994	7,002	303,996				

TABLE V.—*Telephone carriers in the hands of receivers and trustees*

[Year ended Dec. 31, 1934]

Name of carrier	Receivers or trustees		Date of appointment	Investment in telephone plant	Capital stock	Funded debt	Matured funded debt
	Name	Title					
CLASS A							
Central West Public Service Co.[1]	Arthur B. Darling and Ennalls Berl.	Trustees	June 8, 1934	[2] $7,690,529	[3] $8,852,757	$10,001,500	$2,802,500
Kansas Telephone Co	M. B. Gourley and M. F. Cosgrove.	Receivers	Feb. 27, 1932	895,084	[4] 5,000	620,500	
Mid-West States Utilities Co	Lon J. Jester	Trustee	June 29, 1934 [5]	816,105	[6] 2,186,676	1,915,000	509,700
Southwest Telephone Co. (Dallas, Tex.)	William H. Heald and Chester H. Loveland.	Receivers	Nov. 9, 1932	4,370,493	[7] 540,500	2,852,400	650,000
Southwestern States Telephone Co	do	do	do	3,765,272	[8] 500,000	2,300,000	800,000
Total class A				20,780,984	12,493,178	19,715,900	4,762,200
CLASS B							
Kansas Home Telephone Co	M. F. Cosgrove and A. L. Mullergren.	Receivers	Nov. 20, 1934	491,995	[9] 160,730	186,000	
Total class B				491,995	160,730	186,000	
Grand total				21,272,979	12,653,908	19,901,900	4,762,200

[1] Owns and operates eletcric, gas, ice, and water utilities; segregation of capitalization, etc., not available.
[2] Represents return for telephone business only.
[3] Includes $6,653,402 book liability for 288,896 shares of common stock without par value.
[4] Represents book liability for 1,000 shares of common stock without par value.
[5] Lon J. Jester was appointed receiver on Nov. 9, 1931, and appointed as trustee as of June 29, 1934.
[6] Represents book liability for 88,221 shares of class A common stock without par value and 150,000 shares of class B common stock without par value.
[7] Includes $12,500 book liability for 25,000 shares of common stock without par value.
[8] Includes $100,000 book liability for 25,000 shares of common stock without par value.
[9] Includes $85,730 book liability for 500 shares of common stock without par value.

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The amount of revenues received by class I steam railways, during 1934, is shown in table VI. The returns are included in account 138, "Telegraph and telephone", in the annual reports filed by railways with the Interstate Commerce Commission. The carriers will be requested to segregate the amount applicable to telegraph and telephone service in future reports.

TABLE VI.—*Revenues received by class I steam railways as reflected in account 138, "Telegraph and telephone" in the annual reports filed by railways with the Interstate Commerce Commission for the year ended Dec. 31, 1934*

Name of railway	Amount of revenue	Name of railway	Amount of revenue
Akron, Canton & Youngstown Ry. Co.	$128	Nevada Northern Ry. Co.	7,804
Ann Arbor R. R. Co.	1,816	New Jersey & New York R. R. Co.	95
Atchison, Topeka & Santa Fe Ry. Co.	300,432	New York Central R. R. Co.	6,814
Atlanta & West Point R. R. Co.	130	New York, Chicago & St. Louis R. R. Co.	2,050
Baltimore & Ohio R. R. Co.	60,167	New York, New Haven & Hartford R. R. Co.	28,703
Boston & Maine R. R. Co.	18,293	New York, Ontario & Western Ry. Co.	5,950
Central R. R. Co. of New Jersey	7,450	New York, Susquehanna & Western R. R. Co.	199
Chesapeake & Ohio Ry. Co.	6,734	Norfolk Southern R. R. Co.	6,134
Chicago, Burlington & Quincy R. R. Co.	136,816	Norfolk & Western Ry. Co.	121
Chicago Great Western R. R. Co.	456	Northern Pacific Ry. Co.	80,810
Chicago & Illinois Midland Ry. Co.	329	Northwestern Pacific R. R. Co.	598
Chicago, Indianapolis & Louisville Ry. Co.	1,186	Oklahoma City-Ada-Atoka Ry. Co.	502
Chicago, Milwaukee, St. Paul & Pacific R. R. Co.	38,423	Oregon Short Line R. R. Co.	57,505
Chicago, Rock Island & Gulf Ry. Co.	827	Oregon-Washington Railroad & Navigation Co.	499
Chicago, Rock Island & Pacific Ry. Co.	12,360	Pennsylvania R. R. Co.	118,976
Clinchfield R. R. Co.	3,889	Pennsylvania-Reading Seashore Lines	5,926
Colorado & Southern Ry. Co.	871	Pere Marquette Ry. Co.	4,500
Delaware & Hudson R. R. Corporation	14,065	Pittsburgh & Lake Erie R. R. Co.	37
Delaware, Lackawanna & Western R. R. Co.	6,274	Pittsburg & Shawmut R. R. Co.	457
Denver & Rio Grande Western R. R. Co.	3,328	Pittsburg & Shawmut & Northern R. R. Co.	1,419
Denver & Salt Lake Ry. Co.	5,811	Reading Co.	5,595
Detroit & Mackinac Ry. Co.	343	Rutland R. R. Co.	367
Detroit, Toledo & Ironton R. R. Co.	801	St. Joseph & Grand Island Ry. Co.	2,970
Duluth, Missabe & Northern Ry. Co.	72,506	St. Louis, San Francisco & Texas Ry. Co.	119
Duluth, South Shore & Atlantic Ry. Co.	304	San Antonio, Uvalde & Gulf R. R. Co.	2,299
Duluth, Winnipeg & Pacific Ry. Co.	1,075	San Diego & Arizona Eastern Ry. Co.	2,656
Erie R. R. Co.	5,601	Southern Pacific Co.	40,971
Georgia R. R. (lessee organization)	298	Spokane International Ry. Co.	135
Grand Trunk Western R. R. Co.	6,913	Spokane, Portland & Seattle Ry. Co.	3,574
Great Northern Ry. Co.	112,950	Texas Mexican Ry. Co.	4,557
Gulf, Mobile & Northern R. R. Co.	6,744	Texas & New Orleans R. R. Co.	11,030
Lake Superior & Ishpeming R. R. Co.	1,786	Texas & Pacific Ry. Co.	3,057
Lehigh & Hudson River Ry. Co.	607	Toledo, Peoria & Western R. R.	1,926
Lehigh Valley R. R. Co.	11,060	Union Pacific R. R. Co.	88,127
Long Island R. R. Co.	6,598	Virginian Ry. Co.	2,163
Los Angeles & Salt Lake R. R. Co.	17,502	Western Ry. of Alabama	41
Louisville & Nashville R. R. Co.	41,449	Wichita Falls & Southern R. R. Co.	861
Maine Central R. R. Co.	626	Yazoo & Mississippi Valley R. R. Co.	3,285
Midland Valley R. R. Co.	651		
Minneapolis & St. Louis R. R. Co.	716	Total for United States	1,483,377
Minneapolis, St. Paul & Sault Ste. Marie Ry. Co.	52,890	Copper River & Northwestern Ry. Co. (located in Alaska)	1,910
Mississippi Central R. R. Co.	305		
Missouri & North Arkansas Ry. Co.	278	Grand total	1,485,287
Missouri Pacific R. R. Co.	9,750		
Nashville, Chattanooga & St. Louis Ry.	9,007		

In the accompanying chart no. 1 the total operating revenues, total operating expenses, and net operating income of all communication carriers are indicated. The relative amounts applicable to telephone, and to telegraph, cable, and radiotelegraph carriers are shown separately. The uniform system of accounts used by telephone carriers differs from that prescribed for telegraph, cable, and radiotelegraph carriers. In the former classification the amount of "Uncollectible operating revenues" is deducted from the gross operating revenues when transferred to the income statement, whereas in the latter classification it is handled as an income account and deducted subsequently. The "Uncollectible operating revenues" applicable to telegraph, cable, and radiotelegraph carriers, which were deducted from the gross operating revenues during 1934, amounted to $946,113.

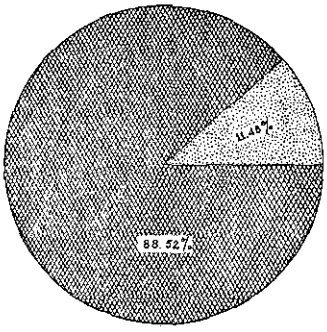
OPERATING REVENUES, OPERATING EXPENSES, AND NET OPERATING REVENUES FOR THE YEAR, 1934, OF ALL COMMUNICATION CARRIERS REPORTING TO THE FEDERAL COMMUNICATIONS COMMISSION.

CHART NO. 1.

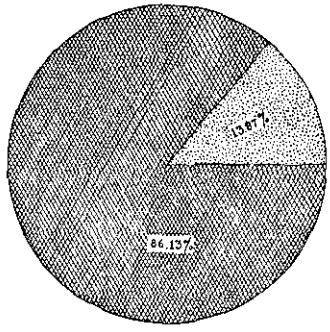
KEY

TELEGRAPH, CABLE, AND RADIO.

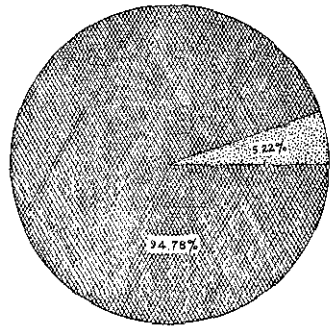
TELEPHONE.



	$
TELEPHONE CARRIERS	964,512,017
TELEG. & CABLE	118,167,777
RADIO	6,963,056
TOTAL TELEGRAPH, CABLE, & RADIO CARRIERS	125,130,833
TOTAL ALL REPORTING CARRIERS	1,089,642,850



	$
TELEPHONE CARRIERS	679,694,810
TELEG. & CABLE	102,802,369
RADIO	6,626,380
TOTAL TELEGRAPH, CABLE & RADIO CARRIERS	109,428,749
TOTAL ALL REPORTING CARRIERS	789,123,559



	$
TELEPHONE CARRIERS	284,817,207
TELEG. & CABLE	15,365,408
RADIO	336,676
TOTAL TELEGRAPH, CABLE & RADIO CARRIERS	15,702,084
TOTAL ALL REPORTING CARRIERS	300,519,291

AUGUST, 1935

PREPARED IN THE ACCOUNTING, STATISTICAL, AND TARIFF DEPARTMENT, FEDERAL COMMUNICATIONS COMMISSION.

MONTHLY REPORTS

A list of the 59 telephone carriers reporting on a monthly basis is shown in table VII, and the carriers marked with an asterisk are included in the Bell System. Table VIII represents the "Summary of monthly reports of large telephone carriers", showing data for the month of May 1935 and cumulative figures for the period from January to May 1935, inclusive. These summaries are issued on a monthly basis by the Commission and distributed to a wide range of organizations.

TABLE VII.—*List of 59 large telephone carriers reporting on a monthly basis to the Federal Communications Commission during 1934*

Name of carrier	Office address
American Telephone Co	Abilene, Kans.
*American Telephone & Telegraph Co	New York, N. Y.
*Bell Telephone Co. of Nevada	San Francisco, Calif.
*Bell Telephone Co. of Pennsylvania	Philadelphia, Pa.
Bluefield Telephone Co	Bluefield, W. Va.
Carolina Telephone & Telegraph Co	Tarboro, N. C.
*Chesapeake & Potomac Telephone Co	Washington, D. C.
*Chesapeake & Potomac Telephone Co. of Baltimore City	Baltimore, Md.
*Chesapeake & Potomac Telephone Co. of *Virginia*	*Richmond*, Va.
*Chesapeake & Potomac Telephone Co. of West Virginia	Charleston, W. Va.
*Cincinnati & Suburban Bell Telephone Co	Cincinnati, Ohio.
Commonwealth Telephone Co. (Pennsylvania)	Kingston, Pa.
*Dakota Central Telephone Co	Aberdeen, S. Dak.
DeKalb-Ogle Telephone Co	Sycamore, Ill.
*Diamond State Telephone Co	Philadelphia, Pa.
*Home Telephone & Telegraph Co. of Spokane, Wash	San Francisco, Calif.
*Illinois Bell Telephone Co	Chicago, *Ill.*
Indiana Associated Telephone Corporation	La Fayette, Ind.
*Indiana Bell Telephone Co	Indianapolis, Ind.
Inter-Mountain Telephone Co	Bristol, Tenn.
Interstate Telephone Co	Spokane, Wash.
Jamestown Telephone Corporation	Jamestown, N. Y.
Keystone Telephone Co. of Philadelphia	Philadelphia, Pa.
Lincoln Telephone & Telegraph Co	Lincoln, Nebr.
Michigan Associated Telephone Co	Madison, Wis.
*Michigan Bell Telephone Co	Detroit, Mich.
Middle States Telephone Co. of Illinois	Pekin, Ill.
*Mountain States Telephone & Telegraph Co	Denver, Colo.
Nebraska Continental Telephone Co	Columbus, Nebr.
*New England Telephone & Telegraph Co	Boston, Mass.
*New Jersey Bell Telephone Co	Newark, N. J.
*New York Telephone Co	*New York*, N. Y.
*Northwestern Bell Telephone Co	Omaha, Nebr.
Ohio Associated Telephone Co	Erie, Pa.
*Ohio Bell Telephone Co	Cleveland, Ohio.
*Pacific Telephone & Telegraph Co	San Francisco, Calif.
*Petersburg Telephone Co	Richmond, Va.
*Rio Grande Valley Telephone Co	Dallas, Tex.
Rochester Telephone Corporation	Rochester, N. Y.
San Angelo Telephone Co	San Angelo, Tex.
Southeast Missouri Telephone Co	Cape Girardeau, Mo.
*Southern Bell Telephone & Telegraph Co	Atlanta, Ga.
*Southern California Telephone Co	San Francisco, Calif.
Southern Indiana Telephone & Telegraph Co	Seymour, Ind.
*Southern New England Telephone Co	New Haven, Conn.
Southwest Telephone Co. (Texas)	Brownwood, Tex.
Southwestern Associated Telephone Co	Lubbock, Tex.
*Southwestern Bell Telephone Co	St. Louis, Mo.
Southwestern States Telephone Co	Brownwood, Tex.
Star Telephone Co	Ashland, Ohio.
*Tri-State Telephone & Telegraph Co	St. Paul, Minn.
Two States Telephone Co	Texarkana, Tex.
*United Telephone Co. (Kansas)	Abilene, Kans.
United Telephone Co. (Missouri)	Do.
United Telephone Cos., Inc	Do.
United Telephone Co. of Pennsylvania	Harrisburg, Pa.
West Coast Telephone Co	Everett, Wash.
Western Telephone Corporation of Missouri	Kansas City, Kans.
*Wisconsin Telephone Co	Milwaukee, Wis.

* Represents carriers included in the Bell System.

TABLE VIII.—*Summary of monthly reports of large telephone carriers*

[Compilations, subject to revision, from reports of revenues and expenses of 59 telephone carriers, each having annual operating revenues in excess of $250,000]

MONTH OF MAY

Item	1935	1934	Increase or decrease (−)	
			Amount	Ratio
Number of carrier telephones in service at end of month	14,354,501	14,031,414	323,087	*Percent* 2.3
Operating revenues:				
Subscribers' station revenues	$51,365,846	$50,362,204	$1,003,642	2.0
Public telephone revenues	3,632,241	3,527,700	104,541	3.0
Miscellaneous local service revenues	856,773	934,888	*−78,115*	*−8.4*
Message tolls	21,250,329	20,443,423	806,906	3.9
Miscellaneous toll service revenues	2,426,047	2,489,400	*−63,353*	*−2.5*
Revenues from general services and licenses	1,049,229	1,041,910	7,319	.7
Sundry miscellaneous revenues	3,156,747	2,922,461	234,286	8.0
Uncollectible operating revenues (Dr.)	331,177	318,054	13,123	4.1
Operating revenues	83,406,035	81,403,932	2,002,103	2.5
Operating expenses:				
Depreciation and extraordinary retirements	14,649,716	14,608,917	40,799	.3
All other maintenance	15,367,530	15,262,131	105,399	.7
Traffic expenses	11,740,111	11,451,676	288,435	2.5
Commercial expenses	6,567,961	6,261,089	306,872	4.9
General office salaries and expenses	4,703,914	3,957,660	746,254	18.9
General services and licenses	1,019,729	1,013,968	5,761	.6
All other operating expenses	5,010,251	4,784,600	225,651	4.7
Operating expenses	59,059,212	57,340,041	1,719,171	3.0
Income items:				
Net operating revenues	24,346,823	24,063,891	282,932	1.2
Rent from lease of operating property	209	115	94	81.7
Rent for lease of operating property	7,086	7,792	*−706*	*−9.1*
Net operating income before tax deduction	24,339,946	24,056,214	283,732	1.2
Operating taxes	8,287,657	8,381,909	*−94,252*	*−1.1*
Net operating income	16,052,289	15,674,305	377,984	2.4
Ratio of expenses to revenues (percent)	70.81	70.44	0.37	
Change in capital items:				
Increase during month:				
In "Telephone plant"	$3,014,233	$2,744,727		
In "Capital stock"	*−$17,805*	100		
In "Funded debt"	221,680	*−56,500*		

FIVE MONTHS ENDED WITH MAY [1]

Operating revenues:				
Subscribers' station revenues	$253,579,540	$248,634,019	$4,945,521	2.0
Public telephone revenues	17,421,451	17,268,386	153,065	.9
Miscellaneous local service revenues	4,271,573	4,715,806	*−444,233*	*−9.4*
Message tolls	99,599,137	97,386,684	2,212,453	2.3
Miscellaneous toll service revenues	12,063,480	12,624,999	*−561,519*	*−4.4*
Revenues from general services and licenses	5,213,953	5,092,712	121,241	2.4
Sundry miscellaneous revenues	15,595,736	14,643,411	952,325	6.5
Uncollectible operating revenues (Dr.)	1,694,654	2,171,722	*−477,068*	*−22.0*
Operating revenues	406,050,216	398,194,295	7,855,921	2.0
Operating expenses:				
Depreciation and extraordinary retirements	73,186,898	73,036,038	150,860	.2
All other maintenance	73,093,144	71,941,432	1,151,712	1.6
Traffic expenses	55,588,207	54,177,854	1,410,353	2.6
Commercial expenses	31,762,159	30,534,415	1,227,744	4.0
General office salaries and expenses	23,065,711	19,791,790	3,273,921	16.5
General services and licenses	5,066,270	4,949,082	117,188	2.4
All other operating expenses	25,331,522	23,883,701	1,447,821	6.1
Operating expenses	287,093,911	278,314,312	8,779,599	3.2
Income items:				
Net operating revenues	118,956,305	119,879,983	*−923,678*	*−.8*
Rent from lease of operating property	1,081	747	334	44.7
Rent for lease of operating property	35,556	38,210	*−2,654*	*−6.9*
Net operating income before tax deduction	118,921,830	119,842,520	*−920,690*	*−.8*
Operating taxes	41,271,040	39,839,044	1,431,996	3.6
Net operating income	77,650,790	80,003,476	*−2,352,686*	*−2.9*
Ratio of expenses to revenues (percent)	70.70	69.89	0.81	
Changes in capital items:				
Increase during month:				
In "Telephone plant"	$5,389,159	$3,084,475		
In "Capital stock"	*−$17,805*	20,001,600		
In "Funded debt"	*−1,647,070*	*−975,400*		

[1] Returns in 1935 reflect adjustments covering estimated refunds.

The tabulation of "Operating data from monthly reports of telegraph carriers" in table IX shows data for the month of May 1935 and cumulative figures for 5 months. It is also issued on a monthly basis by the Commission.

TABLE IX.—*Operating data from monthly reports of telegraph carriers*

[Compilations, subject to revision, from reports of revenues and expenses of telegraph, cable, and radiotelegraph carriers]

FOR THE MONTH OF MAY 1935

Name of carrier (a)	Total operating *revenues* (b)	Total operating *expenses* (c)	Operating income [1] (d)	Net income (e)
All America Cables, Inc.	$382,383.14	$336,132.06	[2] $3,282.34	$29,518.58
Canadian Pacific Ry. Co. (lines in United States).	307.32	1,580.11	[2] 1,272.79	(3)
Central Idaho Telephone & Telegraph Co.	171.93	64.36	98.37	98.37
Central Radio Telegraph Co.	656.17	1,202.76	[2] 848.66	26.34
Colorado & Wyoming Telegraph Co.	1,236.81	887.10	269.64	32.22
Commercial Cable Co. (New York and Limited).	357,079.63	280,525.55	63,144.24	[2] 16,451.08
Commercial Pacific Cable Co.	38,314.85	62,332.23	18,025.18	26,677.50
Continental Telegraph Co.	1,058.76	2,741.13	[2] 1,873.34	(3)
Globe Wireless, Ltd.	30,990.83	24,134.28	6,585.35	6,558.65
Great Northwestern Telegraph Co. of Canada.				[4] 1,583.71
Mackay Companies, The (Postal Telegraph Cable Co.)	1,947,619.66	1,721,858.16	169,094.83	[2] 57,449.82
Mackay Radio & Telegraph Co., Inc. (California)	91,853.03	75,546.46	16,324.03	2,430.86
Mackay Radio & Telegraph Co., Inc. (Delaware).	69,045.42	91,250.52	[2] 22,671.06	[2] 53,808.11
Magnolia Radio Corporation	294.70	273.95	21.53	21.53
Michigan Wireless Telegraph Co.	615.62	400.74	214.88	214.88
Minnesota & Manitoba R. R. (lines in United States)	511.22	418.45	92.77	92.77
Mountain Telegraph Co.	296.06	274.51	3.05	[2] 62.54
Mutual Telephone Co. (wireless department, Hawaii)	4,258.61	3,743.32	85.29	85.29
Northern Telegraph Co.	4,582.34	3,791.10	544.60	748.09
Olympic Radio Co.	148.50	260.00	[2] 131.48	[2] 131.48
Pere Marquette Radio Corporation.	900.13	900.13		
R. C. A. Communications, Inc.	349,644.58	329,655.73	1,356.17	8,694.36
Radiomarine Corporation of America.	76,864.63	64,397.63	9,504.00	9,914.59
Tidewater Wireless Telegraph Co.	371.87	535.04	[2] 172.27	[2] 172.27
Tropical Radio Telegraph Co.	46,950.87	46,858.31	393.64	2,567.25
United States-Liberia Radio Corporation.	5,800.92	4,663.26	818.56	818.85
Wabash Radio Corporation.	922.28	885.04	32.12	32.12
Western Radio Telegraph Co.	1,135.22	252.78	876.94	767.07
Western Union Telegraph Co.	7,861,316.81	6,241,748.64	1,281,160.17	680,275.56
Total	11,325,331.91	9,291,313.35	1,538,393.42	643,083.29

FOR 5 MONTHS ENDED WITH MAY 1935

All America Cables, Inc.	$1,886,740.38	$1,510,799.04	$221,529.51	$266,455.40
Canadian Pacific Ry. Co. (lines in United States).	1,014.27	7,268.02	[2] 6,253.75	(3)
Central Idaho Telephone & Telegraph Co.	504.74	215.24	243.50	243.50
Central Radio Telegraph Co.	916.65	2,169.26	[2] 1,685.12	[2] 810.12
Colorado & Wyoming Telegraph Co.	6,191.39	3,612.40	2,178.86	965.29
Commercial Cable Co. (New York and limited).	1,625,801.06	1,408,477.13	150,387.69	[2] 222,524.01
Commercial Pacific Cable Co.	441,141.54	305,362.26	161,299.68	154,273.36
Continental Telegraph Co.	5,522.26	12,410.29	[2] 7,812.00	(3)
Globe Wireless, Ltd.	141,497.31	116,365.01	23,932.20	23,853.12
Great Northwestern Telegraph Co. of Canada.			[2] 204.59	[4] 7,145.94
Mackay companies, The (Postal Telegraph-Cable Co.)	9,131,199.65	8,497,849.78	350,016.54	[2] 776,019.30
Mackay Radio & Telegraph Co., Inc. (California)	416,156.38	378,720.56	27,693.41	[2] 41,658.48
Mackay Radio & Telegraph Co., Inc. (Delaware).	325,999.67	442,185.20	[2] 117,166.50	[2] 265,632.03
Magnolia Radio Corporation.	1,159.18	1,400.52	[2] 232.63	[2] 232.63
Michigan Wireless Telegraph Co.	1,412.49	1,530.61	[2] 118.26	[2] 118.26
Minnesota & Manitoba R. R. (lines in United States)	1,632.63	1,655.93	[2] 23.30	[2] 23.30
Mountain Telegraph Co.	1,347.57	1,365.93	[2] 111.00	[2] 428.95
Mutual Telephone Co. (wireless department, Hawaii)	20,676.67	18,722.34	[2] 90.67	[2] 90.67
Northern Telegraph Co.	25,165.57	18,104.66	5,479.16	6,371.78
Olympic Radio Co.	858.29	964.41	[2] 215.71	[2] 215.71
Pere Marquette Radio Corporation.	4,247.01	4,247.01		
R. C. A. Communications, Inc.	1,692,904.08	1,568,629.92	39,605.98	76,893.29
Radiomarine Corporation of America.	370,931.23	311,098.01	45,566.22	47,703.59
Tidewater Wireless Telegraph Co.	1,943.15	2,033.33	[2] 155.28	[2] 155.28

Footnotes at end of table.

TABLE IX.—*Operating data from monthly reports of telegraph carriers*—Contd.

FOR 5 MONTHS ENDED WITH MAY 1935—Continued

Name of carrier	Total operating revenues	Total operating expenses	Operating income [1]	Net income
(a)	(b)	(c)	(d)	(e)
Tropical Radio Telegraph Co.	$279,956.48	$236,049.17	$43,982.70	$54,862.54
United States-Liberia Radio Corporation	26,901.80	23,301.23	2,541.09	2,543.03
Wabash Radio Corporation	5,170.11	4,993.16	153.31	153.31
Western Radio Telegraph Co.	3,072.16	3,835.85	[2] 791.49	[3] 901.36
Western Union Telegraph Co.	36,173,754.78	30,246,619.05	4,257,252.73	1,405,575.15
Total	52,593,818.50	45,129,985.32	5,137,002.28	738,229.20

[1] Represents difference between columns (b) and (c), also includes deductions for uncollectible operating revenues and taxes assignable to operations.
[2] Deficit or other reverse item.
[3] Operating deficit assumed by parent company.
[4] Operated by Western Union Telegraph Co., lessee.

A summary of monthly reports received from 29 carriers in the Bell System is given in table X showing the amounts applicable to telegraph operations, and reflecting only the items which are readily available from the carriers' accounts. This summary covers the month of May 1935 and the cumulative figures for 5 months. It includes the Christian-Todd Telephone Co. and the Home Telephone & Telegraph Co. of Southern Oregon, which do not file regular monthly reports, inasmuch as their annual operating revenues are less than $250,000. The Dakota Central Telephone Co., the Rio Grande Valley Telephone Co., and the Tri-State Telephone & Telegraph Co. are included in the Bell System and file regular monthly reports. They are primarily engaged in furnishing telephone service, and do not report any revenue from telegraph operations.

TABLE X.—*Summary of monthly reports of large telephone carriers relative to available data concerning telegraph operations*

[*Compilations, subject to revision, from reports of revenues and expenses of 29 Bell System carriers*]

Item	May 1935		Cumulative figures	
	Total operating revenues and expenses	Amounts applicable to respondents' telegraph operations [1]	Total operating revenues and expenses [2]	Amounts applicable to respondents' telegraph operations [2]
Operating revenues:				
Subscribers' station revenues	$49,580,923	$7,659	$244,776,482	$38,220
Public telephone revenues	3,605,061		17,290,766	
Miscellaneous local service revenues	821,813	192,592	4,096,050	980,210
Message tolls	20,692,696	322,214	97,006,983	1,442,360
Miscellaneous toll service revenues	2,411,911	1,180,614	11,996,733	5,952,878
Revenues from general services and licenses	1,048,645		5,211,050	
Sundry miscellaneous revenues	3,058,466		15,117,672	
Uncollectible operating revenues (Dr.)	314,048	676	1,608,851	6,217
Total	80,905,467	1,702,403	393,886,885	8,407,451
Operating expenses:				
Depreciation and extraordinary retirements	14,216,562	42,473	70,978,022	208,706
All other maintenance	14,938,779	298,685	70,987,102	1,503,712
Traffic expenses	11,334,735	101,058	53,627,140	479,532
Commercial expenses	6,378,829	23,278	30,835,163	133,450
General office salaries and expenses	4,550,453		22,304,924	
General services and licenses	1,009,897	315	5,017,160	1,568
All other operating expenses	4,901,059	109,059	24,774,482	542,563
Total	57,330,314	574,868	278,523,993	2,869,531
Net operating revenues	23,575,153	1,127,535	115,362,892	5,537,920

[1] Reflects only items which are readily available from carriers' accounts.
[2] Returns in this column reflect adjustments covering estimated refunds.

Table XI shows the operating revenues, operating expenses, and net operating income of the telephone carriers reporting on a monthly basis, from January 1933 to May 1935, inclusive, and chart no. 2 indicates the trend during this period. The refunds, in excess of $16,000,000, to Chicago coin-box subscribers cover an 11-year period and were deducted during June 1934 by the Illinois Bell Telephone Co. They have been excluded from table 11, but restored in chart no. 2 to preserve the consistency of the trend.

TABLE XI.—*Monthly telephone operating statistics showing revenues, expenses, and net operating income as reported by large telephone carriers from January 1933 to May 1935, inclusive*

Month	Operating revenues	Operating expenses	Net operating income
1933			
January	$77,770,502	$56,935,698	$13,509,781
February	74,142,647	54,338,092	12,570,032
March	77,031,165	56,148,510	13,760,374
April	76,173,578	54,469,262	14,364,306
May	78,888,681	56,099,741	15,449,167
June	78,793,476	54,997,987	15,645,565
July	77,525,294	54,289,555	16,402,089
August	77,453,068	54,510,020	15,834,100
September	76,706,882	54,123,136	15,250,313
October	78,516,222	55,012,772	16,055,009
November	77,349,341	55,573,550	14,481,857
December	78,778,569	57,749,700	14,911,664
Total	929,129,425	664,248,053	177,234,257
1934			
January	79,640,131	55,595,597	16,175,496
February	76,614,086	53,608,708	15,229,109
March	80,696,191	56,566,019	16,073,173
April	79,839,955	55,203,947	16,851,393
May	81,403,932	57,340,041	15,674,305
June	[1] 64,626,505	[1] 40,102,676	[1] 16,908,761
July	78,576,342	57,525,077	13,263,070
August	79,290,310	57,347,305	14,149,842
September	78,075,839	55,719,928	14,660,444
October	81,638,451	58,051,599	16,209,469
November	79,583,123	57,050,446	15,118,955
December	[1] 80,411,034	[1] 58,713,909	[1] 14,980,225
Total	[1] 940,395,899	[1] 662,825,202	[1] 185,294,242
1935			
January	81,475,230	57,823,355	15,377,419
February	[1] 77,834,421	[1] 55,419,745	[1] 14,214,133
March	81,207,443	57,292,323	15,793,043
April	82,127,087	57,499,276	16,213,906
May	83,406,035	59,059,212	16,052,289
Total	[1] 406,050,216	[1] 287,093,911	[1] 77,650,790

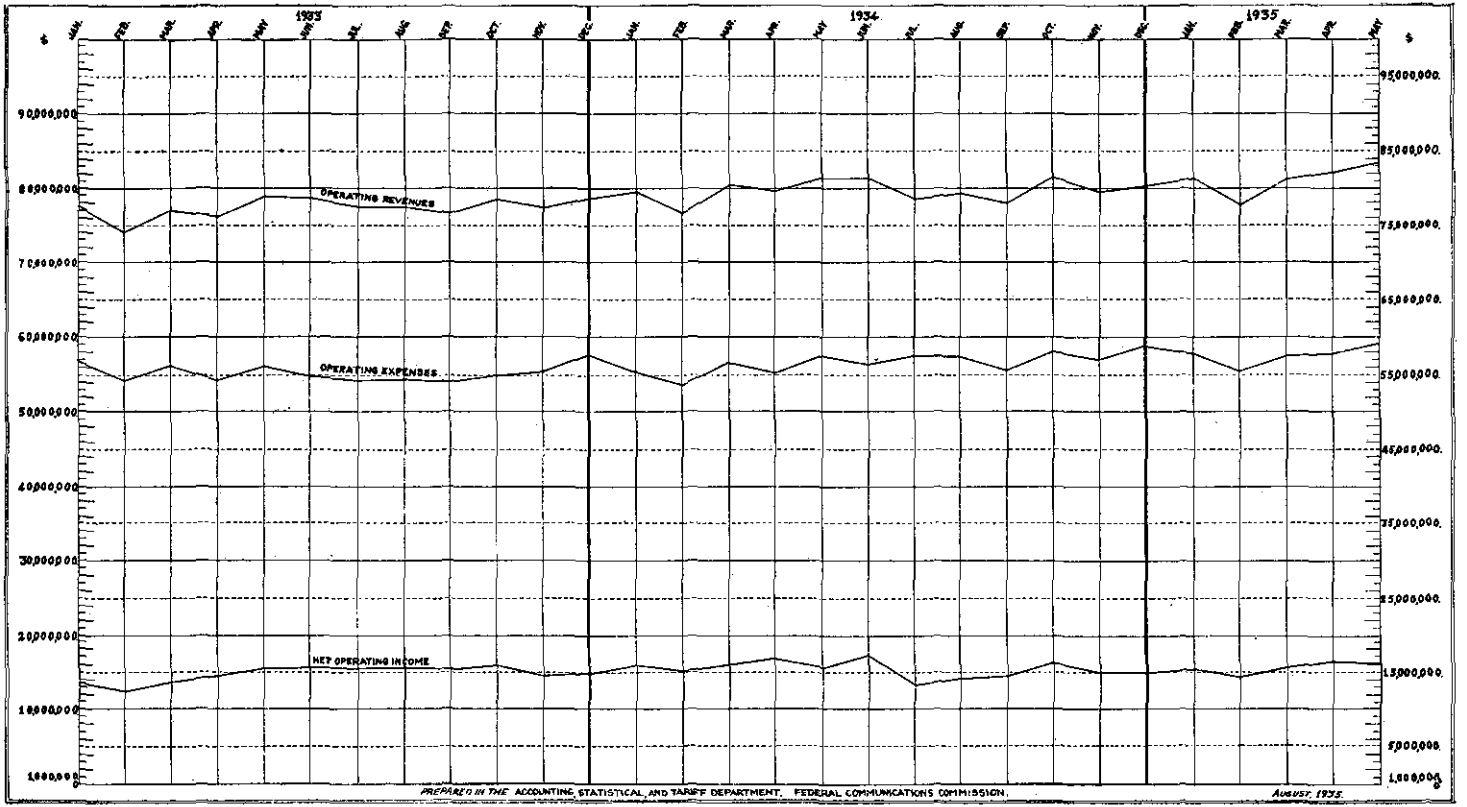
[1] These returns reflect adjustments covering estimated refunds.

Table XII shows the operating revenues, operating expenses, operating income, and net income of large telegraph, cable, and radiotelegraph carriers reporting on a monthly basis from July 1934 to May 1935, inclusive, and chart no. 3 indicates the trend during this period. The following is a list of the telegraph cariers which have reported regularly on a monthly basis and are included in table XII:

All America Cables, Inc.
Commercial Cable Co. (N. Y. and Ltd.).
Commercial Pacific Cable Co.
Globe Wireless, Ltd.
Mackay Cos., The (Postal Telegraph-Cable Co.)
Mackay Radio & Telegraph Co., Inc. (Calif.).
Mackay Radio & Telegraph Co., Inc. (Del.).
R. C. A. Communications, Inc.
Radiomarine Corporation of America.
Tropical Radio Telegraph Co.
Western Union Telegraph Co.

TELEPHONE STATISTICS SHOWING REVENUES, EXPENSES, AND NET OPERATING INCOME AS REPORTED BY LARGE TELEPHONE CARRIERS.

CHART NO. 2.



PREPARED IN THE ACCOUNTING, STATISTICAL, AND TARIFF DEPARTMENT, FEDERAL COMMUNICATIONS COMMISSION. August, 1935.

OPERATING REVENUES, OPERATING EXPENSES, OPERATING INCOME, AND NET INCOME OF LARGE TELEGRAPH, CABLE, AND RADIO CARRIERS.

PREPARED IN THE ACCOUNTING, STATISTICAL, AND TARIFF DEPARTMENT, FEDERAL COMMUNICATIONS COMMISSION. AUGUST, 1935.

CHART NO. 3.

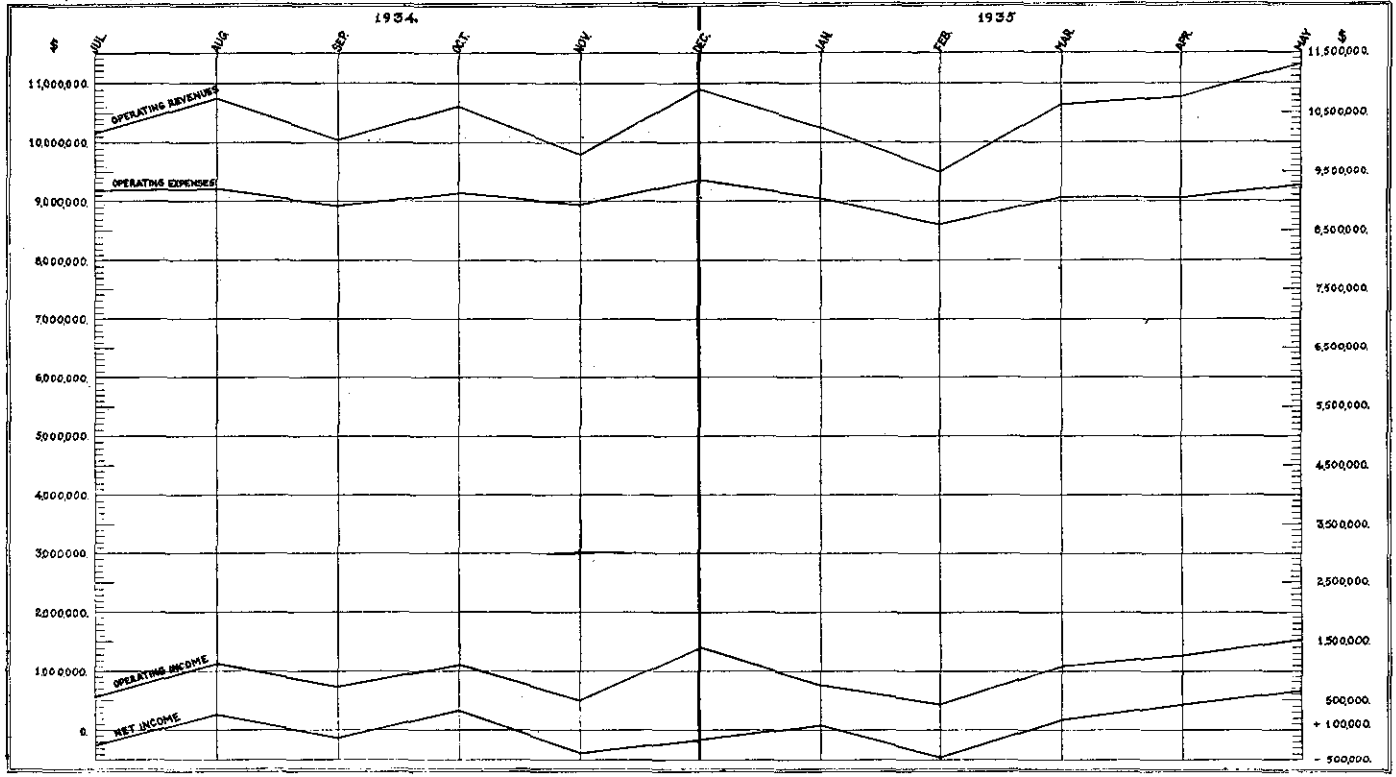


TABLE XII.—*Monthly operating statistics showing operating revenues, operating expenses, operating income, and net income as reported by large telegraph, cable, and radiotelegraph carriers from July 1934 to May 1935, inclusive*

Month	Operating revenues	Operating expenses	Operating income	Net income
1934				
July	$10,187,606	$9,190,316	$560,687	[1] $241,494
August	10,788,336	9,214,474	1,129,707	263,984
September	10,084,138	8,922,574	734,833	[1] 151,196
October	10,624,331	9,136,716	1,111,103	312,163
November	9,840,905	8,935,064	501,616	[1] 396,928
December	10,905,635	9,350,594	1,412,584	[1] 197,683
Total	62,430,951	54,749,738	5,450,530	[1] 411,154
1935				
January	10,260,120	9,042,419	767,745	72,894
February	9,523,416	8,602,729	465,491	[1] 463,699
March	10,623,767	9,066,799	1,100,390	194,291
April	10,776,716	9,041,769	1,270,840	426,156
May	11,302,063	9,268,440	1,539,634	638,929
Total	52,486,082	45,022,156	5,144,100	868,571

[1] Deficit or other reverse item.

The amount of operating revenues, operating expenses, and net operating income, during 1934, of large telephone carriers, reporting on a monthly basis, are shown in chart no. 4 with the portion applicable to the Bell System. In chart no. 5 the number of telephones in service of large telephone carriers reporting on a monthly basis, are shown with the number applicable to the Bell System, and the number in service of carriers other than those in the Bell System.

Employees of the large telephone carriers and large telegraph, cable, and radiotelegraph carriers reporting on a monthly basis, are shown in chart no. 6, indicating the number of employees in the Bell System, and the total number of telephone employees, in contrast with the number of telegraph and cable, and radiotelegraph employees.

TELEPHONE STATISTICS SHOWING REVENUES, EXPENSES, AND NET OPERATING INCOME AS REPORTED BY LARGE TELEPHONE CARRIERS.
A COMPARISON OF BELL SYSTEM CARRIERS WITH OTHERS

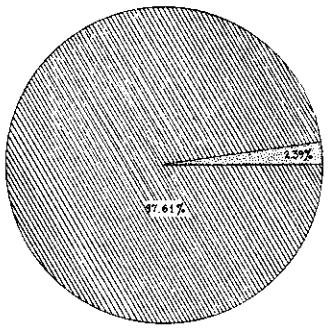
CHART NO. 4.

KEY

BELL SYSTEM CARRIERS

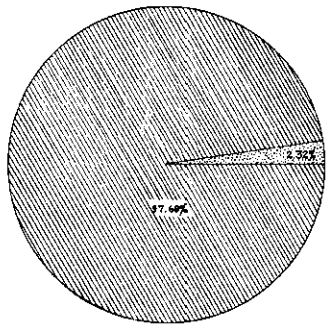
OTHER THAN BELL SYSTEM CARRIERS

OPERATING REVENUES
1934



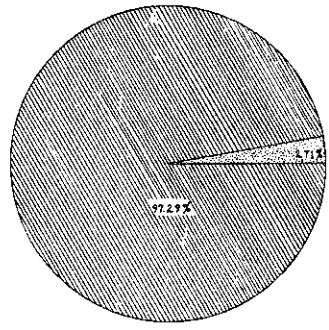
	$
ALL LARGE TELEPHONE CARRIERS	940,395,699.
BELL SYSTEM CARRIERS	917,958,321.
OTHER THAN BELL SYSTEM CARRIERS	22,437,378.

OPERATING EXPENSES
1934



	$
ALL LARGE TELEPHONE CARRIERS	662,825,202.
BELL SYSTEM CARRIERS	647,442,051.
OTHER THAN BELL SYSTEM CARRIERS	15,383,151.

NET OPERATING INCOME
1934

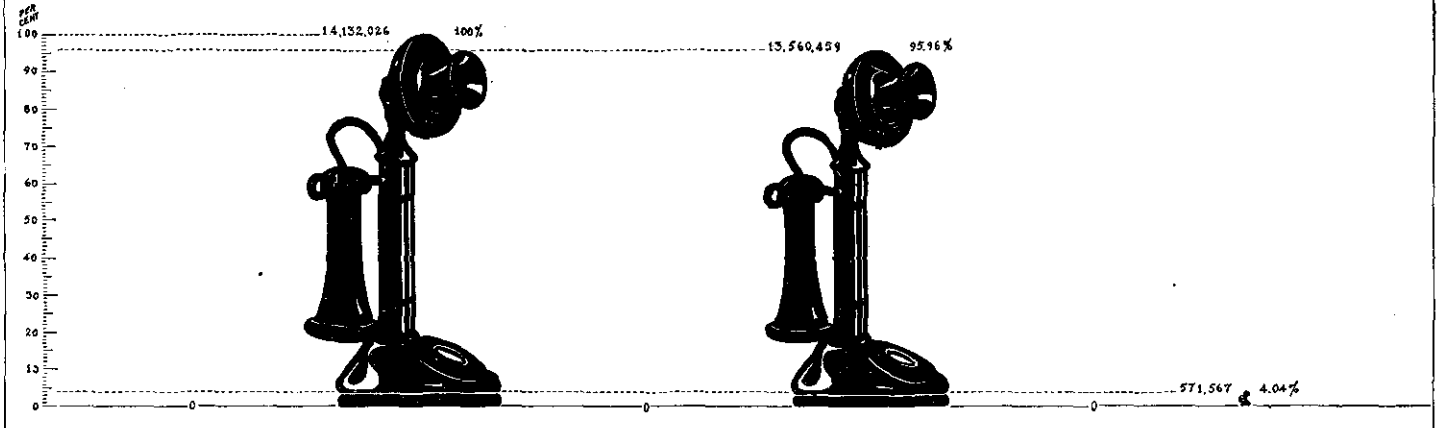


	$
ALL LARGE TELEPHONE CARRIERS	165,294,242.
BELL SYSTEM CARRIERS	160,265,791.
OTHER THAN BELL SYSTEM CARRIERS	5,028,451.

August, 1935.

PREPARED IN THE
ACCOUNTING, STATISTICAL, AND TARIFF DEPARTMENT,
FEDERAL COMMUNICATIONS COMMISSION.

CHART SHOWING NUMBER OF TELEPHONES IN SERVICE AT END OF YEAR 1934, AS REPORTED BY LARGE TELEPHONE CARRIERS.
A COMPARISON OF BELL SYSTEM CARRIERS WITH OTHERS



AUGUST 1935.

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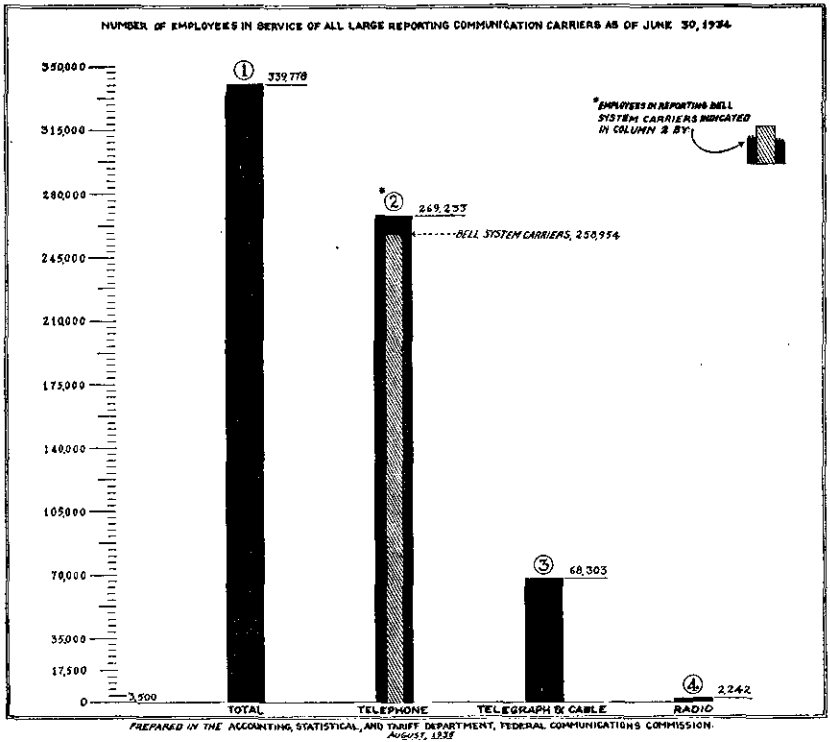
FEDERAL COMMUNICATIONS COMMISSION.

CHART NO. 6.



PREPARED IN THE ACCOUNTING, STATISTICAL, AND TARIFF DEPARTMENT, FEDERAL COMMUNICATIONS COMMISSION.
AUGUST, 1935