Federal Communications Commission

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19th annual report
Fiscal year ended June 30, 1953

With introductory summary and notation of subsequent important developments

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COMMISSIONERS

Members of the Federal Communications Commission as of June 30, 1953

ROSEL H. HYDE,[1] *Chairman*
Term expires June 30, 1959

PAUL A. WALKER[2]
Term expires June 30, 1953

EDWARD M. WEBSTER
Term expires June 30, 1956

GEORGE E. STERLING
Term expires June 30, 1957

FRIEDA B. HENNOCK
Term expires June 30, 1955

ROBERT T. BARTLEY
Term expires June 30, 1958

JOHN C. DOERFER[3]
Term expires June 30, 1954

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[1] Designated Chairman April 18, 1953, by the President.
[2] Succeeded October 6, 1953, by Robert E. Lee.
[3] Succeeded Eugene H. Merrill, April 15, 1953.

LETTER OF TRANSMITTAL

FEDERAL COMMUNICATIONS COMMISSION

Washington 25, D. C.

To the Congress of the United States:

The nineteenth annual report of the Federal Communications Commission is submitted herewith.

It covers the fiscal year ending June 30, 1953, with introductory notations of developments up to the time of going to press.

This report contains additional annual report data specified in section 4 (k) of the Communications Act as amended July 16, 1952 (Public Law 554).

Because of its volume, the biographical data required for all employees of the Commission at the close of the fiscal year is being transmitted as a nonprinted supplement to this report.

Respectfully,

ROSEL H. HYDE, *Chairman.*

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Introductory Summary

HIGHLIGHTS OF THE FISCAL YEAR

Historically, the fiscal year 1953 marked the 25th anniversary of early television experiments, pioneer trans-ocean radiophoto transmission, inauguration of the first police municipal radio system, and the initial functioning of the Federal Radio Commission which preceded the Federal Communications Commission.

Currently, the 19th year of the Federal Communications Commission closed with nearly 1,100,00 radio authorizations on its books. Over 235,000 of these were for safety and communication purposes on land, sea, and air, almost 5,500 others were broadcast, and the remainder consisted of various types of radio operator authorizations. The radio station authorizations cover the use of about 600,000 transmitters, of which number more than 430,000 are mobile.

Commission regulation of interstate and international telephone and telegraph communication is emphasized by the fact that there are now more than 48 million telephones in the United States, telephone service is provided to 106 overseas points, and there is telegraph service to 87 countries and through them to almost every point on the globe.

National Defense

Under Presidential authority, many wire and radio communication services are being linked through Commission cooperation to the military and civilian defense program. Of major importance is the CONELRAD (Control of Electromagnetic Radiation) plan for minimizing the possibility of radio signals being used as navigational aids by hostile aircraft and missiles. Through the cooperation of broadcasters, the first application of this plan was made to broadcast stations, effective May 15, 1953. Various radio services authorized by the Commission are dedicated to defense, disaster, and other emergency purposes.

Common Carriers

The public's use of telephone services continued to grow with no signs of leveling off—with domestic and international telegraph operations running at about the same level as the previous year.

Telephone.—For the calendar year 1952, the Bell System, which operates about 82 percent of the more than 48 million telephones in this country, reported new highs of a daily average of 143 million local and 6 million toll calls. Bell System's revenues amounted to $4 billion, which produced net income of $406 million, both up 11 percent over 1951. The public's unsatisfied requirements for telephone service continue at about the same level despite the addition of 2 million phones and a record $1.3 billion construction by Bell companies in 1952.

The dynamic growth in telephone business has been expressed in new kinds of services and facilities as well as in size. More than 2 million telephone circuit miles are provided by microwave radio; 35,000 miles of broad band channels (microwave and coaxial cable) are available to carry television programs; and mobile radiotelephone service is offered in 193 cities and is increasing rapidly.

In May 1953 the Bell System filed tariffs changing rates for teletypewriter exchange service (TWX) and teletypewriter private line service, which were designed to increase TWX revenues by $8 million a year with no change in private line revenues. The Commission permitted these rates to go into effect July 1, 1953.

During the year the Commission also permitted increases in interstate exchange rates in 13 border exchanges in Iowa and several border exchanges in Texas which are served by Bell companies. These increases are estimated to amount to about $1 million a year. Effective in January 1953, the Commission authorized the American Telephone and Telegraph Company to release an employment stabilization reserve during calendar 1953 to bolster interstate earnings. In addition, the Commission prescribed depreciation rates for 7 Bell companies, reducing their annual depreciation charges by $5.4 million.

The Commission concluded proceedings involving petitions by motion picture interests which requested assignment of a band of frequencies for intercity transmission of theater television programs. The Commission, in a decision issued June 25, 1953, concluded that such service can be provided by existing or future common carriers on frequency bands already established for common carrier operations. The Commission also held that the questions of public convenience and necessity could only be resolved when an application is before it for consideration.

Telegraph.—Western Union, the domestic telegraph carrier, experienced setbacks in calendar 1952, mainly as a result of a prolonged strike by employees in April and May. The volume of landline business for 1952 dropped to 159.7 million messages from 189.6 million messages in 1951. Revenues and earnings likewise were affected, with domestic gross revenues decreasing to $184 million, and earnings from all operations amounting to only $1.1 million.

The Commission permitted Western Union to increase rates in the fall of 1952 and it was estimated this would add $13.2 million in annual revenue. This increase was justified to offset like increases in wages. Effective July 1, 1953, Western Union revised rates for interstate telegraph private line service in view of similar rate revisions by the Bell System. Western Union estimates that this will reduce its revenues by $357,000 annually.

Western Union's operations for the calendar year 1953 promise to be much improved with revenues and earnings at the highest level since 1947. The carrier is experiencing rapid growth in private line telegraph services.

In March 1953 the Commission ordered Western Union to cancel proposed tariff schedules which would have restricted the use of telegraph facilities for disseminating horse and dog racing news to certain classes of subscribers. The tariffs were intended to prohibit the use of such news by gambling interests. However, the Commission decided that the tariffs would not accomplish this purpose and that their provisions were arbitrary and discriminatory.

International.—International telephone and telegraph carriers have continued to increase their world-wide networks. Telegraph service is offered to 87 countries and through them to almost every point on the globe, while telephone service is offered to 106 countries and overseas points.

The volume of international telegraph in calendar 1952 declined slightly to 516 million paid words. Total operating revenues, on the other hand, increased slightly to $58 million, reflecting a growth in special services.

The Commission was represented at an international conference in London, where payments to United States carriers on inbound messages from the United Kingdom were increased, and in Holland, where international operating procedures were reviewed.

The international carriers and the Commission are meeting the United States objectives of world leadership in promoting more orderly global use of the radio spectrum. By continuing strenuous efforts to revise frequency assignments, the Commission has cancelled two-thirds of all "out-of-band" frequency assignments to international carriers, placing these operators "in-band."

Hearings were held on the requirements of the Communications Act that Western Union divest itself of its cable system, to determine what position the Commission should take in the matter. Further hearings are scheduled for fiscal 1954.

In September 1952, following an investigation, the Commission issued a decision increasing the charges for improving the rate structure with respect to telegraph service between this country and ships at sea.

Safety and Special Radio Services

The largest group of radio stations comprise what is known as the Safety and Special Radio Services. The more than 235,000 authorizations for these 45 classes of nonbroadcast services represent the use of nearly 152,000 land and fixed transmitters and 433,000 mobile transmitters.

Safety of life and property at sea, in the air and on the land is aided by many of these services. There are nearly 40,400 stations in the marine services, more than 39,000 in the aeronautical services, and over 13,600 land public safety stations such as police, fire, forestry-conservation, highway maintenance and special emergency. The marine services use nearly 39,000 transmitters; the aeronautical services, over 44,000, and the public safety services, nearly 142,000. Of the latter number, more than 97,000 are employed for police communication.

The land transportation services embrace nearly 10,000 stations and 116,000 transmitters. They are utilized by railroads, city transit systems, intercity buses, taxicabs, highway trucks, and automobile emergency services. Routing of taxicabs alone requires nearly 88,000 transmitters.

The growing utilization of radio by industry is reflected in 9 types of service for which there are nearly 17,400 authorizations for the use of 127,000 transmitters. These services concern power, petroleum, forest products, special industrial, low power industrial, relay press, motion picture, agriculture, and radiolocation-land. The power industry has nearly 62,000 transmitters; special industrial, over 30,300; and petroleum, 21,800.

Authorized amateur stations now approach 112,000. (See reference in "Radio Operators" to the number of amateur operators.)

Direct public benefits are received from increased efficiency in navigating ships and aircraft, police and fire protection, emergency calls for doctors, ambulances, tow trucks, etc., and in the operations of land transportation, industry, pipelines, power and other utilities.

Broadcast Services

Television.—In the first 12 months of processing applications for new TV stations following the lifting of the freeze, 398 new TV stations were authorized and about 600 applications (mostly competitive) were pending. Eighty-nine of the new grantees received authority to go on the air with interim equipment, to augment the 108 pre-freeze operating stations. Of the post-freeze TV grants, 256 were for operation in the new UHF (Ultra High Frequency) bands, and 142 were for VHF (Very High Frequency) operation.

Seventeen grants were made to noncommercial educational TV stations, one of which started operating. Municipalities in which channels have been reserved for noncommercial education use were increased to 245.

TV stations have been authorized in all states except Vermont (where the only two applicants were in competition), and grants have been made in Hawaii and Puerto Rico. TV authorizations at the year end totaled 500.

In mid-1953 the Commission received various petitions to adopt the National Television System Committee (NTSC) "compatible" color TV specifications to replace the present "noncompatible" standards.

AM.—The older commercial AM (amplitude modulation) broadcast service continued to expand. The 2,584 authorized stations at the close of the year was an increase of 164 over 1952. Most of the newcomers were low-power daytime stations.

FM.—The number of authorized and operating FM (frequency modulation) stations continued to decrease—to 601 and 551 respectively—which was a loss of 47 construction permits and 31 licenses during the year. However, noncommercial educational FM gained 12 stations, making a total of 116.

Miscellaneous.—In addition to the broadcast services mentioned previously, there were 259 auxiliary TV stations (an increase of 38); 1,305 remote pickup stations (a gain of 130); 47 studio-transmitter links, 1 developmental station, and a fluctuating number of international broadcast stations.

Thus, the nearly 5,500 authorizations in the broadcast services represent a net gain of nearly 700 over 1952.

Field Engineering and Monitoring

Field engineering and monitoring is conducted through 9 regional offices which supervise 33 offices and 18 monitoring stations in this country and its possessions.

During the year the monitoring network, in addition to obtaining technical data, investigated more than 1,700 domestic and foreign radio interference complaints, inquired into nearly 500 reports of possible illegal radio operation, and obtained over 80,000 direction finding bearings necessary to identify transmissions, of which number 2,200 concerned sea or air craft lost or otherwise in distress.

The number of interference complaints requiring field investigation increased to nearly 22,000, which was almost double the number for the previous year. Most of the broadcast interference complaints were due to increased TV operation and the high susceptibility of its reception to interference. Other complaints involved interference

from noncommunications equipment and devices. The progress made in organizing FCC-sponsored local citizens interference committees has been helpful to TV viewers combatting interference in nearly 300 communities. Particular parts of the Commission's rules restrict radiation apparatus.

Despite curtailment of some inspection functions due to economy, field engineers made nearly 17,000 inspections of broadcast and nonbroadcast stations, including nearly 9,000 ship radio installations.

The field staff issued in excess of 176,000 commercial radio operator authorizations during the year, and conducted more than 44,600 amateur radio operator examinations.

In studying proposed antenna towers to avoid hazards to air navigation, a special survey group cleared nearly 7,400 structures and referred about 700 others for special review by cooperating aviation interests.

Research and Laboratory

These activities, essential to engineering standards and technical rules, covered a wide range of subjects. They include VHF and UHF wave propagation, directional antenna performance, field conductivity, sunspot cycle records, noncommunications apparatus capable of causing interference, and equipment standards and related matters.

Revised rules, adopted during the year, encourage two classes of experimental radio stations—research and developmental. Nearly 450 such stations are authorized to use about 1,800 transmitters, of which 1,500 are mobile.

In proposing to amend its rules governing restricted and incidental radiation devices to deal with mounting interference problems, the Commission continued its efforts to enlist the cooperation of manufacturers in helping suppress harmful radiation.

June 30, 1953, marked the end of the 6-year period for amortizing obsolete medical diathermy and industrial heating equipment, and April 30, 1953, terminated the 5-year period for miscellaneous electronic equipment to conform to the rules.

The Commission's program of approving equipment before it is manufactured and distributed for use has been an added interference preventative. During the year it issued 36 "type approvals" of FCC-tested items, and 31 "type acceptances" of those tested elsewhere but subject to its review.

Frequency Allocation

The chief activity of the Commission in the international field has been in carrying out domestically the provisions of the Geneva Agreement (1951) to which some 65 countries are parties. Many of the

Commission's actions during the year with respect to national frequency allocations were directly or closely related to this Government's commitments to treaties and other agreements for coordinated and efficient use of frequencies throughout the world.

The Commission assisted in the United States preparation for and participation in 17 international conferences and meetings in fiscal 1953, and in planning for 13 other sessions projected for the future.

In addition to notifying the International Communication Union of new and changed frequency assignments in the United States, the Commission reported nearly 1,700 cases of treaty infractions to appropriate foreign administrations.

Radio Operators

At the close of the year there were nearly 840,000 existing radio operator licenses and permits of varying grades. Of these, more than 730,000 were for commercial station operation and almost 109,000 for amateur station operation.

Commission

The following changes occurred in Commission membership during the year: Vice Chairman Rosel H. Hyde was, on April 18, 1953, named Chairman by President Eisenhower, succeeding Paul A. Walker whose term as Commissioner expired June 30 thereafter. Nominated by the President on March 20, 1953, and confirmed by the Senate on April 2, John C. Doerfer was sworn in as a Commissioner on April 15 of the same year. He succeeded Eugene H. Merrill who, since October 6, 1952, had held a recess appointment vice Robert F. Jones, who resigned the previous September 19. (President Eisenhower, on October 6, 1953, appointed Robert E. Lee to succeeed Mr. Walker, and Commissioner Lee was sworn in that same day.)

On June 30, 1953 the Commission personnel totaled 1,070, which is the lowest number in 13 years.

During fiscal 1953 the Commission operated on an appropriation of $6,408,460, which was less than that for any of the 4 preceding years.

A major administrative activity of the Commission during the year was initiating ways of streamlining administrative procedure and reducing paperwork. These efforts ranged from proposing certain remedial legislation to simplifying forms and curtailing other paper work wherever possible and special attention to speeding the hearing process.

One indication of the Commission's workload is the fact that more than 350,000 applications of all kinds were received during the year, not counting legal, tariff and other filings which also required its consideration.

SUBSEQUENT EVENTS

National Defense

Under Presidential authority, the Director of the Office of Defense Mobilization reestablished the Telecommunications Planning Committee (September 23) to advise the ODM in Government telecommunications matters. It is representative of the Departments of State, Treasury, Defense and Commerce, Central Intelligence Agency, United States Information Agency, and Bureau of the Budget. The office of Vice Chairman is to be filled by a Commissioner of the Federal Communications Commission.

The first nationwide CONELRAD (Control of Electromagnetic Radiation) test was held in the early morning of September 16. Its purpose was to check the air navigation aspect and technical operation of civil defense program facilities and coverage. More than 1,200 AM broadcast stations participated, switching programs from one transmitter to another to confuse simulated "enemy" aircraft. A score of Air Force planes took part, and some 100 commercial airliners made observations.

Common Carriers

Increased rates for interstate long distance telephone service became effective October 1 as provided for in Bell System tariffs filed with the Commission on August 28. It is estimated that the new rates will produce about $65 million annually, exclusive of Federal excise taxes, an 8 percent increase. The Bell System will benefit to the extent of about $30 million annually; the balance will go principally for increased Federal income taxes although independent telephone companies connecting with the Bell System for long distance service will receive almost $2 million and there will also be increased payments to state authorities in the form of income and gross receipts taxes.

The 50th million telephone in the United States was installed on November 18, at the White House.

Safety and Special Radio Services

As of October 31, the number of authorizations in these nonbroadcast services was approaching 245,000. By major categories there were about 43,300 marine; 43,000 aeronautical; 19,300 industrial; 14,300 public safety (police, fire, etc.); 10,300 land transportation; 114,000 amateur, and the rest miscellaneous. These authorizations cover many times that number of transmitters—mobile and fixed.

House Committee on Interstate and Foreign Commerce held hearings on H. R. 3189 and H. R. 3311, which would amend sections 2 and 221 of the Communications Act concerning the respective jurisdiction of the Commission and the various State and local regulatory bodies over communications common carriers. The Commission presented testimony with respect to four bills (H. R. 408, H. R. 477, H. R. 3522 and H. R. 5149) which propose to permit specified agents of the Federal Government to intercept communications in connection with certain cases affecting the national defense.

During the fiscal year the Commission submitted comments to Congress and the Bureau of the Budget concerning more than 35 legislative proposals which had been referred to the Commission for comment.

The Commission also participated in several hearings before congressional committees in addition to those specifically referred to above.

LITIGATION

Section 401 of the Communications Act confers upon the district courts of the United States jurisdiction to enforce the Communications Act and the orders of the Commission. Judicial review of Commission actions is provided for in section 402 of the act. Section 402 (a) gives jurisdiction to the courts of appeal (under Public Law 901, 81st Cong., effective Jan. 28, 1951) over suits to enforce, enjoin, set aside, annul, or suspend any order of the Commission with the exception of orders granting or refusing applications for licenses. Section 402 (b) provides for direct appeal from such other orders of the Commission to the United States Court of Appeals for the District of Columbia Circuit. The great majority of cases involving review of Commission action is instituted in the latter court.

During the fiscal year, there were 36 cases in which the Commission was a party in the Federal courts. Twenty-four of these were instituted during that period—4 in the Supreme Court, 15 in the Court of Appeals for the District of Columbia Circuit, 2 in the Court of Appeals for the Ninth Circuit, and 3 in the District Court for the District of Columbia. The other 12 cases were pending at the beginning of the year.

In addition to cases in which the Commission was a party there were eight cases pending in the Federal courts which involved criminal violations of the Communications Act which were instituted at the request of the Commission. Of these cases, 3 resulted in the conviction and sentencing of the defendant and 1 resulted in acquittal. The rest were pending at the close of the year.

General.—The multiple ownership rules were amended (November 25) to preclude any party, or any of its stockholders, officers or directors, having an interest in more than 7 AM, 7 FM, or 5 TV commercial broadcast stations.

A ban was ordered on the filing of applications in conflict with the rules, even when accomplished by petitions for rulemaking (November 5).

As of October 31, outstanding TV, AM, and FM broadcast authorizations (not including auxiliary and experimental) totaled nearly 3,900. Of this number, nearly 3,500 were on the air. A breakdown follows:

Service	Authorized	Licensed	On air
TV commercial	545	101	315
TV educational	22	0	4
AM commercial	2,603	2,479	2,497
FM commercial	586	536	566
FM educational	118	110	110
Total	3,874	3,226	3,492

Miscellaneous

The Bureau of the Budget directed Federal agencies to establish fees for licensing, registration, and related activities of Federal agencies (November 5). The Commission started drafting proposed rules to that effect. It has not heretofore exacted any fees or other charges in connection with its functions.

The Commission withdrew its proposal of May 13, 1953 (docket 10500) looking to amending parts 10, 11, and 16 of its rules to establish new provisions regarding operational fixed stations functioning above 890 megacycles in the Public Safety, Industrial, and Land Transportation services (October 28).

The term of Restricted Radiotelephone Operator Permits was extended indefinitely, as of November 15.

The Chief, Field Engineering and Monitoring Bureau, was delegated authority (September 30) to issue orders to show cause why cease and desist orders should not be issued, and to issue cease and desist orders in certain cases, in connection with interference from operation of industrial, scientific and medical equipment subject to Part 18 of the Commission's rules.

Due to economy, the Commission closed its ship radio inspection office at Galveston, as of November 1.

General

AUTHORITY AND FUNCTIONS

The Federal Communications Commission operates under authority of the Communications Act of 1934, which created it, and subsequent amendments to that act.

It is basically charged with regulating interstate and foreign communication by radio, wire, and submarine cable. This includes:

Supervising interstate and international rates and services of telephone and telegraph companies subject to its jurisdiction;

Allocating frequency bands for different radio services;

Assigning particular frequencies to individual radio stations;

Authorizing and licensing radio transmitters;

Licensing operators of radio transmitters;

Encouraging more effective and widespread utilization of radio;

Protecting life and property through the use of wire and radio communication;

Participating in formulating and administering domestic wire and radio provisions of treaties and other international agreements to which the United States is a party; and

Helping coordinate the many forms of electrical communication with the national defense program.

Commission authority extends to the territories and possessions of the United States, but not to the Canal Zone. Communication facilities operated by the Federal Government are not subject to its jurisdiction.

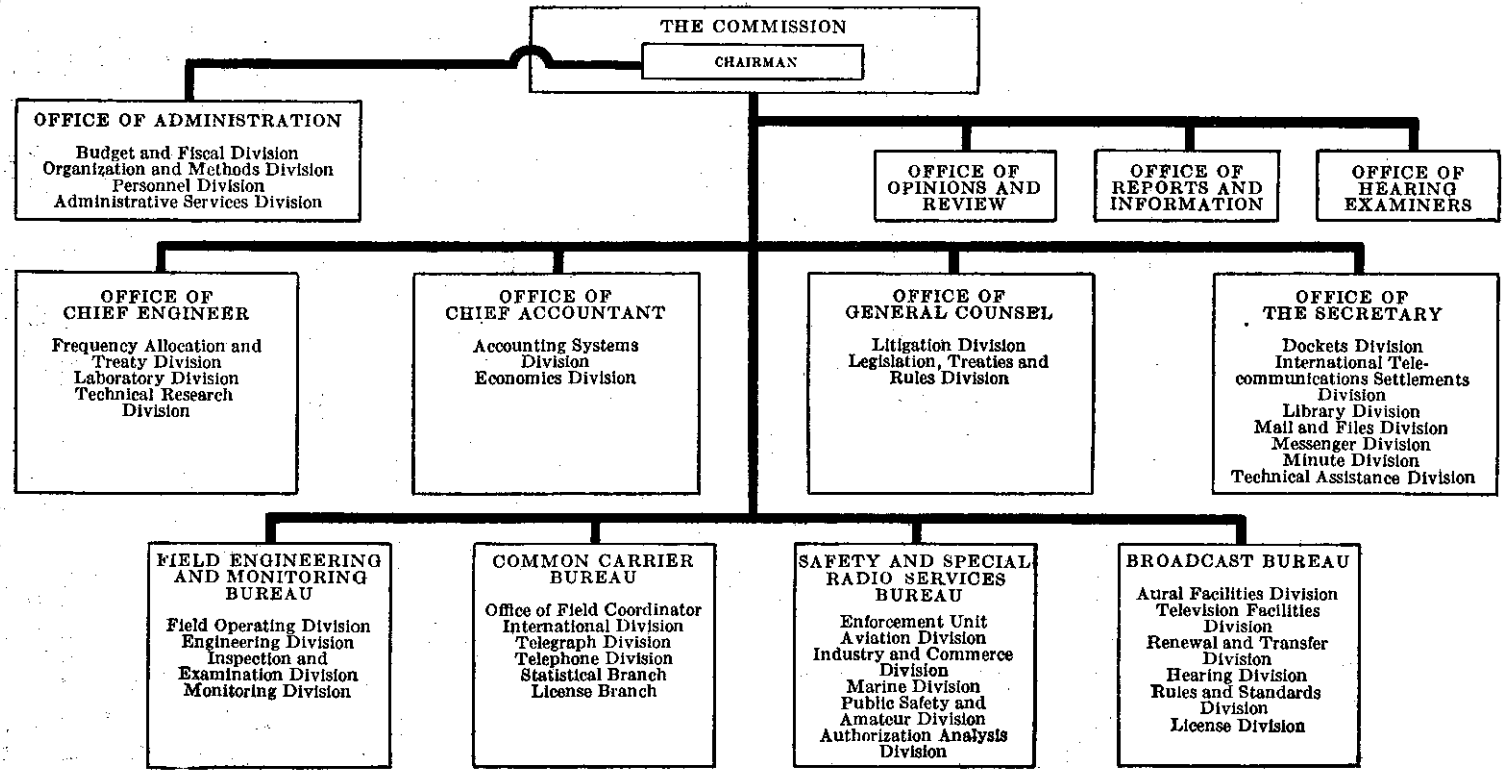
COMMISSION

The Commission is composed of seven Commissioners appointed by the President and confirmed by the Senate. One of these members is designated Chairman by the President without Senate confirmation. The normal term of a Commissioner is 7 years. Not more than four Commissioners may be members of the same political party.

The Commission functions as a unit and makes all policy determination. From time to time, committees of Commissioners or individual Commissioners are designated by the Commission to make special studies and supervise particular undertakings. The Chairman, under

FEDERAL COMMUNICATIONS COMMISSION

Organization Chart as of June 30, 1953



Commission authorization, exercises certain administrative responsibilities.

The following changes occurred in Commission membership during the year:

Commissioner Rosel H. Hyde, then Vice Chairman, was on April 18, 1953, designated by President Eisenhower to be Commission Chairman. In that capacity he succeeded Paul A. Walker, who had been Chairman since February 28, 1952. The current term of Commissioner Walker, a member of the Commission since its creation, expired on June 30, 1953. (President Eisenhower, on October 6, 1953, appointed Robert E. Lee to succeed Mr. Walker. Commissioner Lee took office that same day.)

Commissioner Robert F. Jones resigned on September 19, 1952, and, on October 6 Eugene H. Merrill received a recess appointment from then President Truman to replace Mr. Jones. On March 20, 1953, John C. Doerfer was nominated by President Eisenhower to fill out the remainder of the Jones term, which expires June 30, 1954. Confirmed by the Senate on April 2, Commissioner Doerfer succeeded Mr. Merrill on April 15.

STAFF ORGANIZATION

The staff of the Commission is organized on functional rather than professional lines. This was effected by a reorganization initiated by the Commission in 1949 and completed in 1952.

As a result, the present staff organization and general activities are:

Office of the General Counsel, whose functions as chief legal adviser to the Commission cover matters involving litigation, legislation, rulemaking, and general administrative activities presenting legal problems.

Office of the Chief Engineer, whose duties deal with the engineering phases of frequency allocations, radio rules and standards, technical research and experimentation, and problems of interference;

Office of the Chief Accountant, whose work includes matters of accounting regulation, and economic and statistical research;

Office of the Secretary, which has charge of official records, processing of correspondence and official documents, and certain functions relating to the internal management of the Commission;

Office of Administration, under the direction of the Chairman, reviews the programs and procedures of the Commission and handles its budget and personnel work;

Office of Hearing Examiners, which conducts hearings and prepares and issues initial decisions;

Office of Opinions and Review, which, under Commission direction, advises and assists the Commission in the preparation of decisions;

Office of Reports and Information, which is the central source of public releases and information;

Common Carrier Bureau, which supervises telephone and telegraph matters;

Safety and Special Radio Services Bureau, which supervises non-broadcast and non-common carrier radio services [except for common carrier aspects of marine services].

Broadcast Bureau, which supervises the broadcast services;

Field Engineering and Monitoring Bureau, which is responsible for field engineering, including radio station inspections, monitoring, operator examinations, technical studies, and certain enforcement activities.

An organization chart of the Commission appears as a separate page of this chapter.

PERSONNEL

As of June, 1953 the Commission employed 1,070 persons. This is 68 fewer than the previous year and the lowest number since 1940. About one-third of all Commission employees are in the field—mostly engaged in engineering work. Personnel was distributed as follows:

Office or Bureau	Washington	Field	Total
Commissioners	33	0	33
Office of Opinions and Review	13	0	13
Office of Hearing Examiners	24	0	24
Office of Reports and Information	4	0	4
Office of Administration	83	0	83
Office of Secretary	57	0	57
Office of General Counsel	14	0	14
Office of Chief Accountant	18	0	18
Office of Chief Engineer	85	22	107
Common Carrier Bureau	70	30	100
Safety and Special Services Bureau	101	0	101
Broadcast Bureau	144	0	144
Field Engineering and Monitoring Bureau	56	316	372
Total	702	368	1,070

Biographical information with respect to Commission personnel, required to be submitted to Congress by Section 4 (k) (3) of the Communications Act amendments of 1952, is being submitted to Congress as a mimeographed supplement to this printed report.

APPROPRIATIONS AND EXPENDITURES

For the fiscal year 1953, the Commission received an appropriation of $6,408,460, which was less than that for any one of the four preceding years.

A breakdown of its income and expenditures for fiscal 1953 is shown below:

Appropriation		*Obligations*	
Regular Appropriation (salaries and expenses)	$6,408,460	Personal services	$5,872,993
		Travel	54,764
		Transportaton of things	20,744
		Communications services	151,760
		Rents and utilities	50,523
		Printing and reproduction	18,293
		Other contractual services	59,494
		Supplies and materials	105,655
		Equipment	66,979
		Land and structures	2,550
Total funds available	6,408,460	Total obligations	6,403,755
		Savings, unobligated balance	4,705
		Total	6,408.460

The source of these funds and the authority for expenditures thereunder was Public Law 455, 82d Congress.

PARING PROCEDURE AND PAPER

A major activity of the Commission during the year was initiating ways of streamlining administrative procedure and reducing paperwork to simplify and speed the administrative process for the benefit of both the Commission and the services which it regulates.

These efforts range from legislation proposed by the Commission to modify detailed procedural requirements of the Communications Act to amending its own rules to curtail paperwork wherever possible. The latter includes simplification of the authorization process from the viewpoint of the applicant as well as the Commission, elimination of reports and form data no longer necessary from permittees and licensees, reduction in the volume of filings with and formal issue of the Commission, and means of speeding up the hearing procedure to facilitate the extension of communication services.

While some of these steps were prompted by the broadcast backlog—that of competitive television applications in particular—the net result affects regulation by the Commission as a whole. Specific illustrations are given in sections of this report dealing with individual services, hearings, and legislation.

HEARINGS

The time consumed, the expense involved, and the size of the written record compiled in the hearing procedure has been a major concern to

the Commission. It reached such proportions in early competitive hearings following the lifting of the television freeze that, with the cooperation of the Federal Communications Bar Association, steps were taken to remedy the situation.

The Commission has long provided for pre-hearing conferences in which attorneys for rival applicants could get together and work out stipulations to reduce the subsequent formal hearing to bare essentials. On February 6, 1953, this pre-hearing conference was made a part of the actual hearing. In other words, since that date all hearings have started off with an initial conference. This has worked to the advantage of the applicants as well as the Commission. For example, the first such TV hearing consumed only 4 days as compared with from 40 to 60 days for previous post-freeze cases.

Other Government agencies as well as lawyers practicing before them have evinced particular interest in the pre-hearing idea. In consequence, the Commission and its Bar Association demonstrated a mock pre-hearing conference before a large group on June 29, 1953. It was scheduled to be repeated for the benefit of the American Bar Association at the latter's convention in Boston in August.

The Commission and bar are likewise studying supplemental means of shortening hearings by reducing both the written and oral record. Of course, any such streamlining will have to be consistent with the requirements of law, and its successful operation will depend largely upon the cooperation of lawyers practicing before the Commission.

General Government interest in simplifying Federal hearings is reflected in the President's Conference on Pre-Hearing Procedure. FCC Commissioner John C. Doerfer, who is a delegate to that conference, is Chairman of its Pre-Trial Committee which is interested in adapting to other Government agencies the pre-trial conference idea.

The major portion of the Commission's hearing calendar continued to be occupied by broadcast matters, with AM cases predominating. Docket statistics for the year were:

Class	Pending June 30, 1952	Designated for hearing	Disposed of without hearing	Disposed of following hearing	Pending June 30, 1953
Broadcast:					
AM	210	54	58	53	153
FM	7	5	9	0	3
TV	8	186	53	23	118
Other	2	3	1	0	4
Safety and special	25	17	20	3	19
Common carrier	54	57	29	42	40
Joint and general	23	51	42	2	30
Total	329	373	212	123	367

TAX CERTIFICATES

During the past year the Commission has been called upon to consider a number of requests for tax certificates pursuant to the provisions of section 112 (m) of the Internal Revenue Code which provides that sale or exchange of property, including corporate stock, may be treated as an involuntary conversion of such property if it is certified by the Federal Communications Commission "to be necessary or appropriate to effectuate the policies of the Commission with respect to the ownership and control of radio broadcasting stations". These requests have, in recent years, usually related to situations in which a licensee who held the maximum number of station interests permitted by the Commission's multiple ownership rules wished to acquire a new station and was required, in order to do so, to dispose of one of its existing stations.

The Commission has given careful consideration to the requests for tax certificates in these cases. For the legislative history of section 112 (m) of the Internal Revenue Code appears to show that the problem with which Congress was primarily concerned at the time it adopted section 112 (m) was that relating to the involuntary sale or exchange of property by broadcast licensees resulting from the adoption in 1943 of Commission rules requiring certain licensees to dispose of existing facilities. And it is not clear that Congress, in adopting the section, contemplated that sales or exchanges made as part of a voluntary transaction initiated by the licensee itself and rendered necessary as a result of the voluntary transaction in order to keep licensees within the Commission's multiple ownership rules were to be comprehended within the provisions of the section.

After careful study of the matter, however, the Commission has determined that the language of section 112 (m) is sufficiently broad to include this later category of cases and the Commission has, accordingly, issued certificates in appropriate cases coming within this category. The entire problem of whether further clarification of congressional interest in this matter should be sought is, however, being presented to the Congress in connection with its present overall study of the Internal Revenue Code.

LEGISLATION

Public Law 554, 82d Congress, known as the Communications Act Amendments, 1952, was approved July 16, 1952. These amendments, introduced in Congress by Senator McFarland as S. 658, constituted the most extensive and significant revision of the Communications Act since its original enactment in 1934. Important changes in the organi-

zational structure of the Commission, in licensing procedures and in the provision for court review of Commission decisions and orders were effected.

The new law also added a new section to the United States Criminal Code (18 U. S. C. sec. 1343) making fraud by wire, radio or television a criminal offense. The enactment of the new fraud section was originally recommended to Congress as part of the Commission's legislative program.

Also included in the Communications Act Amendments was a provision, previously recommended by the Commission, amending section 4 (g) to authorize the Commission to construct certain structures relating to its monitoring and research activities.

The Commission submitted to Congress, with the approval of the Bureau of the Budget, several important proposals to amend the Communications Act. All were introduced in the 83d Congress and they included:

An amendment to section 319, which would simplify the procedure for obtaining licenses for certain types of radio stations by eliminating the existing requirement of first securing a construction permit from the Commission (H. R. 4557);

An amendment to section 309 (c), to extend the time within which the Commission is required to act on "protests" filed against the grant without hearing of construction permits for radio stations, from 15 days to 30 days (H. R. 4558);

An amendment to section 501, to change the criminal sanction contained in that section so that initial violations of the act shall constitute a misdemeanor rather than a felony (H. R. 4559);

An amendment to provide for monetary forfeitures in the case of violations of the Commission's rules and regulations relating to radio stations other than broadcast stations (S. 1979 and H. R. 5673);

Amendments to Title III, Part II, dealing with radio equipment and radio operator requirements on board certain ships, to bring those provisions more closely in line with the new Safety of Life at Sea Convention (London, 1948) which was ratified by the Senate on April 30, 1949, and which came into force on November 19, 1952 (S. 2543); and

Legislation to repeal certain provisions of the Ship Act of 1910 which remain in effect but which are no longer necessary (S. 1947).

H. R. 4557, H. R. 4558 and H. R. 4559, which respectively included the Commission's proposals to amend sections 319, 309 (c) and 501 of the Communications Act, were passed by the House of Representatives on May 19, 1953.

Various other important legislative proposals were considered by Congress which directly or indirectly affected the Commission. The

House Committee on Interstate and Foreign Commerce held hearings on H. R. 3189 and H. R. 3311, which would amend sections 2 and 221 of the Communications Act concerning the respective jurisdiction of the Commission and the various State and local regulatory bodies over communications common carriers. The Commission presented testimony with respect to four bills (H. R. 408, H. R. 477, H. R. 3522 and H. R. 5149) which propose to permit specified agents of the Federal Government to intercept communications in connection with certain cases affecting the national defense.

During the fiscal year the Commission submitted comments to Congress and the Bureau of the Budget concerning more than 35 legislative proposals which had been referred to the Commission for comment.

The Commission also participated in several hearings before congressional committees in addition to those specifically referred to above.

LITIGATION

Section 401 of the Communications Act confers upon the district courts of the United States jurisdiction to enforce the Communications Act and the orders of the Commission. Judicial review of Commission actions is provided for in section 402 of the act. Section 402 (a) gives jurisdiction to the courts of appeal (under Public Law 901, 81st Cong., effective Jan. 28, 1951) over suits to enforce, enjoin, set aside, annul, or suspend any order of the Commission with the exception of orders granting or refusing applications for licenses. Section 402 (b) provides for direct appeal from such other orders of the Commission to the United States Court of Appeals for the District of Columbia Circuit. The great majority of cases involving review of Commission action is instituted in the latter court.

During the fiscal year, there were 36 cases in which the Commission was a party in the Federal courts. Twenty-four of these were instituted during that period—4 in the Supreme Court, 15 in the Court of Appeals for the District of Columbia Circuit, 2 in the Court of Appeals for the Ninth Circuit, and 3 in the District Court for the District of Columbia. The other 12 cases were pending at the beginning of the year.

In addition to cases in which the Commission was a party there were eight cases pending in the Federal courts which involved criminal violations of the Communications Act which were instituted at the request of the Commission. Of these cases, 3 resulted in the conviction and sentencing of the defendant and 1 resulted in acquittal. The rest were pending at the close of the year.

The Supreme Court in one case reversed the decision of the Court of Appeals for the District of Columbia Circuit, which had set aside a Commission order, and remanded the case to the Commission for further consideration, and in another case denied *certiorari* on petition for review of a decision of the same court of appeals which had affirmed a Commission decision.

In the courts of appeals, the Commission was reversed in 1 case, 2 cases were remanded to the Commission on the Commission's motion, 1 case was dismissed on jurisdictional grounds, and 7 cases were dismissed by agreement of the parties. In the District Court for the District of Columbia, 1 injunction was issued to enforce an order of the Commission and 3 cases were dismissed on jurisdictional grounds. In the District Court for the Southern District of New York an order of the Commission was sustained in part and reversed in part in 3 companion cases.

As of June 30, 1953, 3 cases were pending in the Supreme Court, 9 cases in the Court of Appeals for the District of Columbia Circuit, and 2 cases in the United States Court of Appeals, Ninth Circuit. (After the close of the fiscal year but prior to the completion of this report the Court of Appeals for the District of Columbia Circuit affirmed the order of the Commission in 1 case, dismissed 1 on jurisdictional grounds, and 1 because it had become moot, and 2 cases were dismissed by agreement of the parties. During the same period 5 new cases were filed in that court, and 1 in the District Court for the Northern District of Illinois.)

A tabulation of the status of litigation for the fiscal year follows:

Court	Supreme Court	Court of Appeals for the District of Columbia Circuit, under sec. 402 (b)	Courts of Appeals including District of Columbia Circuit, under sec. 402 (a)	District courts	Total
Total	5	[1] 8	[1] 15	8	36
Decisions affirming Commission or refusing review of favorable decision	1			1	2
Decisions reversing case	[2] 1	1		[3] 3	5
Dismissed on jurisdictional grounds			1	3	4
Dismissed or remanded by agreement of parties		3	6		9
Cases pending June 30, 1953	3	4	8		15

[1] Includes 1 case on appeal from a judgment of the District Court for the District of Columbia.
[2] Reverses Court of Appeals decision adverse to Commission and remands to Commission for further action.
[3] Companion cases, sustained in part, reversed in part.

The following cases decided during the fiscal year were of particular interest:

In *Federal Communications Commission* v. *RCA Communications, Inc.*, (346 U. S. 86) the Supreme Court considered an order of the

Commission authorizing Mackay Radio and Telegraph Co., to render direct radiotelegraph service between the United States and Portugal and the United States and The Netherlands. Direct radiotelegraph service between these points was already being rendered by RCA Communications, Inc., and cable service by Western Union and Commercial Cable Co., an affiliate of Mackay. The Commission found that the addition of a competitive radio circuit to each of these points would not result in any detriment to the public, but also that no specific ascertainable benefits, such as lower rates or more efficient service, would flow from the grant of Mackay's applications. It decided as a matter of policy, relying primarily on the national policy in favor of competition manifested in the antitrust laws, that in situations such as these where competition is reasonably feasible, duplicate radio circuits should be autthorized. In addition, it determined that the grants to Mackay would not result in violation of Section 314 of the Communications Act, which prohibits common ownership, control or operation of radio and cable facilities in international communication where its purpose or effect may be substantially to lessen competition, restrain commerce or unlawfully to create monopoly. The Court of Appeals reversed the Commission's decision. On *certiorari*, the Supreme Court reversed the Court of Appeals. It affirmed the decision of the Commission insofar as it concerned the meaning and application of Section 314. It held that the absence of competition between Mackay and Commercial did not in itself constitute a substantial lessening of competition between cable and radio, but rather that the Commission was entitled to consider the entire competitive scene. The Supreme Court remanded the case to the Commission because of the failure of the Commission to make a determination on the basis of its own expertise regarding the desirability of competition between radiotelegraph carriers, and its reliance instead upon the national policy in favor of competition.

In *American Broadcasting Company, Inc.* v. *Federal Communications Commission, National Broadcasting Company, Inc.* v. *Federal Communications Commission* and *Columbia Broadcasting System, Inc.* v. *Federal Communications Commission* (110 F. Supp. 374), a three-judge district court ruled upon the validity of the Commission's rules pertaining to the broadcast of lottery information. These rules are interpretative of Title 18 U. S. Code, section 1304, which prohibits the broadcast of lotteries. The rules provide, in general, that a license will not be issued to a broadcast station which makes a practice of broadcasting lotteries, and they further delineate the element of consideration in a lottery. In these three companion actions brought to enjoin the enforcement of the rules, the court held that the adoption of the rules was within the Commission's statutory authority. It

further held that the Commission had properly interpreted 18 U. S. C. 1304 in finding it applicable to schemes in which a prize is awarded to a person whose selection is dependent in whole or in part upon chance and where consideration exists in that such winner is required to furnish something of value or to have in his possession a product sold or made by the sponsor. By a divided vote the court ruled invalid that portion of the rules which defines lottery consideration in terms of a requirement that the radio audience listen to a program as a condition of winning a prize or where such listening constitutes a substantial aid to wining a prize. These cases have been appealed by the Commission to the Supreme Court of the United States.

LICENSES AND OTHER AUTHORIZATIONS

At the close of the fiscal year the number of active authorizations on the books of the Commission totaled nearly 1,100,000.

As of June 30, 1953, there were nearly 235,000 nonbroadcast authorizations, representing the use of about 600,000 transmitters, of which number more than 430,000 are mobile. Broadcast authorizations totaled nearly 5,500, including more than 1,600 auxiliary transmitters.

Various classes of radio operator authorizations approached 840,000, including 730,100 commercial and 109,000 amateur operator licenses and permits.

APPLICATIONS AND OTHER FILINGS

The Commission received some 352,000 applications of all kinds during the year. Of this total, more than 193,000 concerned commercial radio operators, nearly 146,000 involved the nonbroadcast services, nearly 7,000 had to do with broadcast, more than 900 were experimental or miscellaneous, and about 4,800 were common carrier.

These figures do not include legal filings, periodic reports, and tariff schedules. In the fiscal period common carriers and holding companies filed 17,500 tariffs and 1,900 annual and monthly reports.

CORRESPONDENCE, RELEASES, AND PUBLICATIONS

Approximately 1,125,000 pieces of correspondence in the form of letters, telegrams, etc., were received or dispatched through the Commission's Mail and Files Division during the year. Of this number, some 750,000 were incoming and 375,000 were outgoing.

Regulatory and administrative procedure required the issuance, during the same period, of mimeographed public notices, orders, deci-

sions, opinions and rule-making which necessitated more than 45,700 stencils, 8,560,000 sheets of paper and about 12,865,000 impressions.

The Commission does not issue any press releases, maintains no public mailing lists, and makes no distribution of its printed publications. The latter are processed by the Government Printing Office and are sold by the Superintendent of Documents. A list appears in the appendix.

POINT 4 PROGRAM ASSISTANCE

Under the Government's point 4 program for foreign economic assistance, 13 representatives of foreign nations completed programs of study in the field of telecommunication with the Commission. Six of these officials were from India, 6 from Pakistan, and 1 from Honduras.

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National Defense

GENERAL

The importance of communication by wire and radio in time of national emergency is emphasized in the Communications Act. Among the stated purposes of that statute is centralized regulation by the Federal Communications Commission in the interests of the national defense as well as to promote safety of life and property in general. The act also gives the President special emergency powers over electrical communication and radiation to further safeguard the Nation's defense and security during war or threat of war.

"CONELRAD" PROGRAM

Electronic developments since World War II have made it necessary to prepare for the control of radiating devices in addition to regular communication facilities in any emergency. This is necessary because certain equipment, though not used for communication purposes, can send out emissions which could be used as a "beam" to guide hostile aircraft, submarines, and radio-controlled missiles.

It was at the request of the Department of Defense that the Commission several years ago initiated a program for regulating electromagnetic radiation in the defense effort. In 1951 Congress gave the President additional emergency authority to deal with these radiations as a defense measure. The Chief Executive subsequently empowered the Federal Communications Commission to draft and enforce regulations in that connection. The text of this legislation and the related Executive Order were published in the Commission's previous annual report.

These additional delegated powers are being used by the Commission to carry out the so-called CONELRAD project for emergency and temporary control.

The first step was effecting a plan of procedure to be followed by broadcast stations during armed attack. This was announced by the White House on December 2, 1952, in the following statement:

> The White House today announced a plan whereby standard radio broadcast stations may remain on the air immediately before and during air attack, while simultaneously minimizing the use of radio as a navigational aid to hostile aircraft.

No engineering method has yet been found to enable FM and TV stations to remain on the air.

The plan, called CONELRAD (Plan for the CONtrol of ELectromagnetic RADiation), is expected to be placed in operation in three months. Under present temporary arrangements, a detected air attack would have the immediate effect of silencing all broadcasting and telecasting until the attack or threat is ended.

This special system of emergency broadcasting, to be administered by the Federal Communications Commission, represents many months of close cooperation by the broadcasting industry with the Government. Although no station is required to remain on the air in this plan, to date more than 1,000 privately owned standard broadcast stations have volunteered to participate in CONELRAD and have spent approximately $1,500,000 of their own funds to make equipment changes necessary to operate in this new system.

The plan was developed on the basis of Executive Order No. 10312 (December 10, 1951) whereby the President authorized the Federal Communications Commission either to silence radio stations or to control their operations so that electromagnetic radiations may not aid the navigation of hostile aircraft, guided missiles and other devices of similar purpose.

CONELRAD will be invoked upon announcement of an air raid alert by the Air Defense Command, USAF. All standard broadcast stations in the CONELRAD system will switch to one of two pre-designated frequencies (640 kc. or 1240 kc.) and broadcast to the public a continuous flow of accurate, official information, news and civil defense instructions.

On April 10, 1953, the Commission released the proposed CONELRAD rules and covering manual for broadcast station operation in an emergency. The rules became effective May 15 thereafter. More than 1,500 individual broadcast stations are now participating.

CONELRAD plans for other radio services are being evolved and will be announced as quickly as each one is completed. The next such plan will be for the Amateur Radio Service.

OTHER DEFENSE ACTIVITIES

The impact of national defense is felt in all fields of electrical communication. Military, civilian defense and defense industry require and use wire and radio communication to an abnormal degree. The Commission's role, in general, is to help common carrier and other communication services cope with present and potential emergencies, to see that wire and radio facilities are linked to the defense effort, and that communication facilities are safeguarded.

In the matter of telephone, telegraph and cable, the Commission is hard pressed to see that additional service is provided for domestic government business and industrial use.

The safety and special radio services come into the defense picture because of the importance of marine, aeronautical, police, fire, land transportation and industrial communication, and the establishment of various special services to deal with present or future emergencies.

Among the special services is the Radio Amateur Civil Emergency Service (called RACES for short), which is for civil defense purposes exclusively. It was established on August 15, 1952, and the first authorization—to the District of Columbia—was issued on March 6, 1953. This service enlists the radio amateur, his equipment and some of his frequencies for expediting civilian defense communication in such matters as first aid, radiological survey, etc., should the need arise.

Another is the Disaster Communications Service, which has been authorized since 1951. It is to enable Government and non-Government stations to join in essential communication when armed attack, disaster or other cause disrupts normal communication facilities.

The Special Emergency Radio Service provides radio communcation for temporary operations by relief organizations, doctors in rural areas, ambulances, etc.

The State Guard Radio Service covers use of radio facilities by state guards in states where the National Guard has been called into Federal service. The Civil Air Patrol also has its own radio service.

Then there are long-established regular radio services used by police, fire, forestry conservation, highway maintenance, and automobile emergency authorities.

All these services are more fully described elsewhere in this report.

Meanwhile, in policing the spectrum with the Government's only monitoring network, the Commission is called upon to furnish bearings to lost aircraft, trace calls of ships in distress, and be on constant watch to detect, locate and close illegal radio transmission and trace interference to authorized radio services.

In addition, the Commission is working on particular defense projects for other Government agencies. These activities cannot be mentioned other than to say that they concern experimental and other authorizations in connection with national defense developments, protection of communication facilities, and arrangements to make circuits available under any contingency.

Because of the scarcity of radio operators for ships and certain land stations, the operator rules have been liberalized in some instances. At the same time, the Commission has made it easier for operators serving in the Armed Forces to maintain their licenses.

An Executive Order of June 17, 1953 abolished the office of Telecommunications Adviser to the President, which had been in operation since October 9, 1951, and transferred its functions to the Director of Defense Mobilization.

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Common Carrier Services

DOMESTIC TELEPHONE

General

Domestic telephone service continued in heavy demand, and the telephone industry maintained an accelerated construction program to supply additional services for millions of new customers. During calendar year 1952 the Bell System expended $1,261 million for new plant facilities, which brought its total plant book cost to approximately $12 billion. Although no precise figures are available, the independent telephone companies also made substantial plant additions which, if added to the Bell System totals, would bring the total telephone plant gross book costs in the nation to about $13.3 billion.

The extent of the telephone plant expansion is illustrated by the fact that Bell System construction expenditures during calendar year 1952 amounted to more than one-fourth of the total amount of its gross plant book cost at the end of 1940. Highlights of developments during fiscal 1953 included completion of new radio relay "backbone" routes between Kansas City, Dallas and San Antonio, between Pittsburgh and St. Louis, between Washington and Atlanta, between Portland and Seattle, and a section to provide a new through system between Albany and Buffalo. New coaxial cable systems were completed between Oklahoma City and Amarillo, between Chattanooga and Knoxville, between Orlando and Tampa, and between Memphis and Little Rock. New techniques were applied to a coaxial system between New York and Philadelphia to triple its capacity, and similar changes were in progress to extend this system to Chicago. Construction was started on 8 additional microwave radio systems which would provide major transmission paths totaling about 16,000 broad band radio channel miles.

Microwave transmission paths already in service were providing more than 2 million long distance telephone circuit miles at the end of calendar 1952. Telephone companies also made considerable progress in establishing alternate routes and dispersing circuit concentrations to insure continuity of service in the event of emergency.

There were more than 48 million telephones in service throughout the nation at the end of calendar 1952, of which 39.4 million were operated by the Bell System and over 8.5 million by independent tele-

phone companies. The Bell System added more than 2 million telephones during 1952 and reported 605,000 held orders for main service and 1.3 million requests for regrades in existing service as of June 30, 1953.

There were about 175 million—143 million in the Bell System—average daily local telephone conversations during calendar 1952 while daily long-distance calls exceeded 6 million. Many calls were reclassified from "toll" to "local" during this period as a result of the expansion of local exchange areas. After adjusting for these reclassifications, the local and toll calls increased 2.8 and 5.2 percent, respectively, over 1951. Teletypewriter exchange service (TWX) calls increased about 12 percent during the same period to reach a total of over 18 million. Telephone calls to and from foreign countries and ships at sea continued to increase, the Bell System reporting a total of 940 thousand calls during calendar 1952, including about 23 thousand to and from ships at sea.

Telephone companies continued to expand the use of dial equipment, both for local and long-distance calls. Seventy-nine percent of all Bell telephones and 57 percent of all independent company telephones are now dial operated. Bell operators were dialing about 40 percent of all toll calls directly through to destination by the end of 1952, and 1,700 cities and towns were connected to the toll dialing network, a gain of about 325 during the year. The number of large traffic centers equipped for operator toll dialing rose to 18 by the end of 1952, and construction was under way to provide like facilities at a number of other cities. Customer toll dialing in the Englewood, New Jersey, area permitted 10,000 subscribers to dial about 96 percent (all station-to-station calls) of toll calls from that area to such cities as Boston, Providence, New York, Pittsburgh, Cleveland, Detroit, Chicago, Milwaukee, Sacramento, San Francisco, and Oakland. These calls are automatically timed and billed.

Bell System operating revenues reached a new high of $4,039,664,218 in 1952, an increase of about 11 percent over the previous year. Bell consolidated net income applicable to American Telephone & Telegraph Co. capital stock amounted to $406,661,306, an increase of 11.4 percent over 1951. However, earnings per share declined from $11.76 in 1951 to $11.45 in 1952 due to increase in number of shares outstanding.

The expansion of the Bell System is illustrated by the following table of selected data:

Year	Number of telephones	Plant book cost	Revenues	Employees
1940	17,483,981	$4,701,177,364	$1,174,322,517	275,317
1945	22,445,519	5,702,056,557	1,930,889,452	387,300
1950	35,343,440	10,101,521,562	3,261,528,032	523,251
1952	39,413,889	11,971,435,727	4,039,664,218	579,500

Domestic Telephone Services

Construction of facilities.—As indicated previously, the Bell System spent about $1,261 million in the expansion and improvement of existing facilities during calendar year 1952. Of this amount, the largest portion went for additions to exchange plant, such as central office buildings, exchange switching equipment, exchange distribution plant, and subscriber station equipment. However, the A. T. & T. Long Lines Department, which provides the bulk of the interstate long distance telephone circuits throughout the nation, spent a record $107 million for new plant construction during that period.

During fiscal 1953, the Commission granted 358 applications involving estimated expenditures of $89,228,416 to the industry for authority to construct, lease, acquire or operate wire and cable facilities in connection with interstate and foreign telephone services.

The following table shows the estimated costs and amounts of wire and cable construction authorized by the Commission since 1943.

Fiscal year	Number of projects	Cost	Sheath miles of cable	Tube miles of coaxial units	Conductor miles of open wire
1944	121	$9,582,239	574.8		7,968
1945	210	70,091,140	2,378.3	7,902	2,963
1946	239	78,896,450	3,193.8	16,580	12,261
1947	289	126,325,771	5,587.7	23,490	15,976
1948	348	127,162,499	2,637.5	46,080	16,373
1949	313	38,638,919	1,370.5	1,323	7,278
1950	141	13,230,678	399.3		3,491
1951	218	45,795,686	957.1	2,704	5,461
1952	323	107,533,688	1,388.7	2,972	5,998
1953	358	89,228,416	1,494.0	5,678	2,006

This tabulation includes 14 authorizations issued by the Commission during fiscal 1953 for the acquisition or lease by telephone companies of the facilities owned by other companies. In one of the largest transactions in this category, Bell companies acquired the private landline communication facilities of the Phillips Petroleum Co. at a cost approximating $1.2 million.

In addition to the cable and wire construction, the Commission received applications from Bell companies during fiscal 1953 for authority to construct 9 new major and 3 new minor microwave radio relay systems. All were approved by the close of the year except for two major microwave systems. The authorized radio construction, when completed, will provide an additional 16,520 channel miles of broad band channels, and will cost an estimated $29.5 million. These additional microwave systems will bring the Bell System expenditures for such radio facilities to more than $120 million, all of which have been constructed since World War II.

At the end of calendar year 1952, the Bell System operated over 2 million telephone circuit miles over microwave radio, an increase of

more than 1.5 million miles during the year. The microwave systems were also being used, together with coaxial cable systems, to provide about 35,000 channel miles of television program circuits to link 140 television stations in 92 cities located in 36 States and the District of Columbia as of June 30, 1953. Plans were underway to connect 67 additional TV stations, of which 55 are located in cities not currently served by the network. The nationwide television network was also linked with the Bell Telephone Co. of Canada to furnish service to Toronto and Montreal.

Part of the new microwave construction will be used to establish so-called round-robin TV networks to link various cities in the east and middle west. These circuits will permit TV broadcasters to originate programs in rapid succession from various points.

Although the Bell companies predominated in the construction of microwave systems, various independent telephone companies also showed continuing interest in using radio for point-to-point telephone service, as evidenced by grants for three new independent company systems during fiscal 1953.

Discontinuance, reduction or impairment of service.—During fiscal 1953, the Commission granted 10 applications for authority to discontinue telephone service. Seven involved the substitution of one carrier for another in furnishing wire line toll service. One involved the closing of a toll telephone station in a community no longer requiring this service. The other two covered discontinuance of domestic public land mobile radio service in Port Sulphur, Louisiana, and Camden, Ohio.

Speed of service.—Despite the increase in long-distance traffic, Bell System speed of service during 1952 was about the same as that rendered in 1951. The average time required by Bell to complete long-distance calls during each of these years was about 1.8 minutes. Bell also reported that it completed 93 percent of all long-distance calls on a "no hang-up" basis.

Foreign attachment cases.—Final decision was still pending in the case of *Hush-A-Phone Corp. et al.* v. *American Telephone and Telegraph Company, et al.* (docked 9189), which involved the lawfulness of the so-called foreign attachment provisions of the defendant's tariffs insofar as they were construed to prohibit the use of the Hush-A-Phone device. Nor has final determination been made in the cases of *Jordaphone Corporation of America, et al.* v. *American Telephone and Telegraph Company et al.* (docket 9383) and *In the Matter of the Use of Telephone Answering Devices in Connection with Interstate and Foreign Telephone Service* (docket 9701), both of which proceedings involve the lawfulness of the foreign attachment regulations as applied to automatic telephone answering devices in connection with interstate and foreign telephone service. The Bell com-

panies themselves offer automatic telephone answering and recording service in all but one state.

On November 5, 1952, the Commission denied a petition for rehearing and reconsideration and for oral argument filed by the complainants in the case of *Walter S. Berkman, et al.* v. *American Telephone and Telegraph Company, et al.* (docket 9100). As reported in previous annual reports, the Commission on March 23, 1949 dismissed the original complaint, which sought use of a call waiting indicator device which would inform a party using the telephone that another call was seeking a connection.

Interconnection cases.—On October 9, 1952, the Commission held that it was neither necessary nor desirable in the public interest to require interconnection of the intercity video transmission facilities of the Bell companies with those of the Western Union Telegraph Co. (docket 9539). A further petition by Western Union for reconsideration and rehearing was denied March 23, 1953.

On December 17, 1952, the Commission dismissed the complaint of *J. L. Dezauche, Jr., and R. A. Gartman, d/b as Mobile Marine Radio* v. *Southern Bell Telephone & Telegraph Co.* (docket 10163) which alleged that Southern Bell had refused to allow the complainants to connect their public coastal radiotelephone station to Southern Bell's telephone facilities upon request. Negotiations had resulted in an agreement to interconnect these facilities.

Domestic public land mobile radio service.—Activity in this service was particularly noteworthy for the interest shown in the one-way signaling type of operation. This operation involves communication from a base station to pocket-type receivers carried on the subscriber's person. On June 30, 1953 there were 45 such authorizations in 35 cities but not all were in operation. In 7 other cities the number of applicants at the end of the fiscal year exceeded the number of frequencies (two) available for the service, necessitating comparative hearings to determine which applications should be granted.

The two-way mobile service furnished by landline telephone companies was extended to 13 new cities during the year, making it available in 193 cities throughout the country and Hawaii. Similar service by miscellaneous (nontelephone company) carriers was established in 31 additional cities, for a total of 224 cities in 38 States and the District of Columbia, Puerto Rico, Alaska, and Hawaii.

Final decisions were issued in comparative cases involving applications to establish such systems in the New York City area (dockets 9761 et al.), the Miami-Fort Lauderdale area (dockets 10017 et al.), and the Los Angeles area (dockets 9723 et al.).

Petitions of Bell Telephone Laboratories, Inc., and the United States Independent Telephone Association, requesting the allocation of spectrum space between 216 and 470 megacycles for a broad band

multichannel public mobile operation, were dismissed because the Commission did not feel that the petitions presented sufficient justification for displacing other established services in the part of the spectrum requested (docket 10323). At the same time, the Commission adopted rules which rearranged the frequency allocations in the 450–460 megacycle band to permit greater flexibility in the assignment of such frequencies to mobile common carriers, among others.

A possible means of alleviating the shortage of frequencies in the 152–162 megacycle band was indicated by grant of an application for a developmental authorization to investigate the feasibility of operation on channels in this band 20 kilocycles wide in lieu of the present 60-megacycle spacing.

Community antenna TV systems.—There has been a continued increase in the number of community antenna television systems whereby a receiving antenna is located at a favorable point for receiving a TV signal from a distant station and the programs so received are distributed to individual subscribers by wire lines. There are now a total of 240 communities in which such systems are located, with another 30 systems in the construction or planning stages. The Commission is presently studying the question of whether persons engaged in furnishing this service are engaged as common carriers for hire in interstate communications and, therefore, subject to the common carrier provisions of the Communications Act.

The growth of these so-called community antenna systems has led to requests for microwave facilities to relay the received TV signal from the point of reception to the point from which it is distributed to the subscriber. Applications for such microwave relay facilities pose substantial legal and policy questions relating, among others, to the status of the proposed operation as a communications common carrier.

Theater television.—During the year the Commission held hearings to consider certain petitions filed by various motion picture industry associations requesting the assignment of frequencies for the rendition of a "theater television" transmission service, whereby video programs would be transmitted to various theaters or other public halls for exhibition (docket 9552). In a report and order issued June 25, 1953, the Commission determined that this was essentially a service which should be performed by communications common carriers. It further determined that there is nothing in the Communications Act or the Commission's rules which would prevent a common carrier from rendering this specialized type of service on frequencies set aside for general common carrier use. Applications for the use of such frequencies, however, will be considered on their individual merits with consideration given to, among other things, whether they

meet the standards of public interest, convenience or necessity, and whether, in the light of any existing general common carrier facilities between the points proposed to be served, there is a need for separate or additional facilities, etc.

Rural subscriber and short haul toll radiotelephone services.—Further expansion was noted in these services which provide short distance radio communication to points where unfavorable terrain factors make it impractical to construct wire lines. The first authorization was issued for rural subscriber service extending across the Canadian border.

Radiocommunication service in territories and possessions (except Alaska).—A rule-making proposal to allocate frequencies in the 76–88 megacycle and 98–108 megacycle bands for the use of common carriers operating in the Territory of Hawaii (docket 10094) was finalized, and those frequency bands are now available for use in interisland communications in that territory.

Coastal and Alaskan services.—These services, though largely authorized on a common carrier basis, are discussed in a separate chapter on Safety and Special Radio Services because of their close relationship to radio aids for the safety of life and property.

Reclassification of telephone companies.—The Commission granted petitions filed by 3 telephone companies requesting that their classification be changed from "fully subject" status to "connecting carrier" status under section 2 (b) (2) of the Communications Act of 1934, as amended. As "connecting carriers", such companies are subject only to the provisions of sections 201 through 205, inclusive, of the act.

Acquisitions and consolidations.—The Commission received 16 applications from domestic telephone carriers for authority under section 221 (a) of the Communications Act to acquire the property of another domestic telephone company. After due notice of public hearings, 13 of these applications were granted. An initial decision looked toward a grant of 2 of the remaining applications, and 1 application was scheduled for hearing.

Interlocking directorates.—The Commission received and granted 10 applications filed by individuals pursuant to section 212 of the Communications Act for authority to hold positions of officer or director of more than one domestic telephone carrier subject to the act.

Contract filings.—The Bell System companies have and are continuing to file thousands of amendments to existing traffic agreement contracts in connection with a recently negotiated revised toll settlement plan for the division of revenue derived from message toll telephone services furnished jointly by Bell and independent connecting companies. These amendments are in addition to the new traffic

agreements, cancellations of, and amendments to contracts arising through normal business. It has been estimated that the revised arrangements will increase the revenue share of the independent telephone companies by $18 million annually.

Rates and Tariffs

Tariff schedules.—At the close of the year, 336 telephone carriers had 752 tariffs and concurrences on file with the Commission. This represented an increase of 42 carriers during the year and was due to new carriers in the Domestic Public Land Mobile Radio Service. These carriers filed 15,171 tariff publications during the year establishing new rates or modifying rates, regulations, practices and classifications of service. Of these, 24 were rejected for failure to comply with the rules. None were suspended.

Special permissions.—Nineteen applications for special permission to make changes in the tariffs to become effective on less than statutory notice, or involving a waiver of certain rule requirements, were received and granted.

Unlawful use of telephone facilities.—On March 19, 1953, the Commission denied a petition for rehearing and reaffirmed its December 21, 1951, decision in the case of *Harry and Bertha B. Katz* v. *American Telephone & Telegraph Co. et al.* (docket 9500) in which it held unjust and unreasonable that part of a tariff regulation providing for automatic refusal or discontinuance of service by the carrier on advice of a law enforcement agency that the telephone is being or will be used for unlawful purposes, but not affecting the tariff condition that telephone service will not be used for unlawful purposes.

Private line teletypewriter service.—Revised tariffs were filed to permit interconnection on customers' premises between private line telegraph facilities provided by Bell System companies with similar facilities provided by an overseas radiotelegraph carrier, where the customer required such connection for communications involving the safety of life and property. Bell System regulations for private line service were amended to include provisions relating to interconnection with facilities of the Army, Navy, and Air Force or those owned by the oil, gas, and other so-called right-of-way companies.

Collect telephone call practices.—Bell System tariffs were revised to permit calls to be made to overseas points from coin telephones. This practice previously had been prohibited because of the limited capacity of the coin receptacles. Lower rates for overseas calls made the previous prohibition obsolete. Arrangements were also completed to permit collect calls to be made from, but not to, most vessels on the high seas.

Bell System TWX and private line telegraph rates.—The Bell System companies filed revised tariff schedules, which became effective July 1, 1953, providing for increases in the rates and charges for interstate teletypewriter exchange (TWX) service and for increases and reductions in the rates and charges for interstate private line telegraph services and facilities.

With respect to TWX service, the 3-minute initial period rates were increased by 5, 10, and 15 cents for TWX connections involving most distances up to 2,300 miles; the overtime charges (per additional minute) were increased from approximately 25 percent of the initial period rate to about 30 percent; and report charges for unaccepted collect calls were discontinued. In addition, the companies established a fixed monthly interstate interexchange charge of $10 per TWX station and discontinued the monthly guarantee of revenue of $10 per station. It was estimated that the rate changes would produce additional annual TWX revenues of about $8 million. The Commission, on June 30, 1953, denied requests made by a group of TWX subscribers for suspension and investigation of the new rates. It also denied a request by the Public Utilities Commission of California for suspension of the fixed monthly interstate interexchange charge portion of the new rates.

The revised Private Line telegraph schedules provided for increases of 20 percent in the charges for the most commonly used types of teletypewriter equipment and reductions in the charges for interexchange telegraph channels as well as a simplification in this part of the rate structure. The net effect of these rate adjustments was a small reduction in annual revenues from the Private Line telegraph services.

The above rate changes were the result of a study, which was instituted by Bell System companies in the early part of 1952, to ascertain approximate current costs applicable to the furnishing of TWX and other telegraph services. This study was made at the request of the Commission inasmuch as many of the plant and operating expense accounts of the Bell companies do not reflect a segregation of costs applicable to telegraph services. In the absence of such a segregation, it had not been possible to determine whether the rates of the Bell companies for the services in question produced sufficient revenues to compensate for the costs incurred in rendering the services.

Interstate telephone exchange service rates.—Effective October 1, 1952, the Northwestern Bell Telephone Co. increased its rates for exchange telephone service in its 13 border exchanges in Iowa which include subscribers in adjoining States. It was estimated that revenues from the 90,000 telephones involved would be increased by $1,000,000 annually. Since there is no State regulatory authority in

Iowa, charges for interstate exchange service are subject to the jurisdiction of this Commission. The rates for exchange service in these border localities had remained at prewar levels although rates in cities in Iowa had been increased several times during the same period. This resulted in a wide disparity in charges for service in the border points as compared with similar charges in the interior points. The rate adjustment removed some of this disparity.

In El Paso County, Tex., where certain exchanges overlap the Texas-New Mexico border, the Commission has jurisdiction over exchange rates in the Texas portion of such localities since in the particular instance there is no State or local regulation. Adjustments were made effective March 7, 1953 in these exchanges to equalize the rates for subscribers on both sides of the State line and to extend the calling areas.

Other Regulatory Matters

Charges for interstate telephone service within Washington metropolitan area.—On March 18, 1953, the Commission dismissed its proceedings referred to in the Eighteenth Annual Report involving the reasonableness of charges for interstate telephone calls between metropolitan area points in Virginia and Maryland, and the jurisdiction of the Commission over such charges (dockets 8110 and 8112). The Commission stated that, because of changed conditions, no substantial basis existed upon which to question the justness and reasonableness of the rates and charges at issue, and that the dismissal was without prejudice to such future determinations as may be made by the Commission with respect to the jurisdictional questions involved.

Depreciation.—The program of continuing studies, in connection with the Commission's responsibility to fix depreciation rates for telephone companies, as required by section 220 (b) of the Communications Act, was carried out during the year with respect to several Bell companies. On the basis of such studies, supplemented by joint reviews of relevant facts with State commissions and the companies concerned, depreciation rates were prescribed during the year for each of the operating areas served by The Mountain States Telephone & Telegraph Co. (eight States) and The Cincinnati & Suburban Bell Telephone Co. (two States). The rates prescribed for these companies resulted in annual depreciation charges aggregating $14,515,000 and represented a reduction of $677,800, or 4.5 percent in the annual charges based on the depreciation rates in effect prior to the Commission's action. In addition, the Commission modified most of the depreciation rates previously prescribed for the Long Lines Department of A. T. & T., and the 4 telephone companies comprising the

Chesapeake and Potomac group. The represcribed rates for these five companies produced annual charges aggregating $57,720,300 and represented a total reduction of $4,763,200, or 7.6 percent in the annual charges based on the rates prescribed previously.

By the end of the fiscal year, the program of prescribing depreciation rates for telephone companies had been carried out with respect to 20 Bell companies, including the Long Lines Department of A. T. & T., out of the 23 companies within the system. In the case of 10 companies, prescribed rates were revised at least once during the past 4 years in order to reflect in depreciation rates and charges changes arising from developments in the art and other factors. The net effect of the rates thus far established by the Commission, estimated on the basis of the annual depreciation charges for 12 months ending April 30, 1953, represents a reduction aggregating approximately $25,400,000, or 6.6 percent in these charges on an annual basis.

This net effect does not include a reduction of approximately $660,000 in depreciation charges of the Pacific Telephone & Telegraph Co. As noted in the last two annual reports, this company has, on its own initiative, adopted depreciation rates recommended by the Commission, although formal action on these rates has been deferred at the request of certain of the state commissions within the territory served by the company.

In spite of the downward adjustments in depreciation rates, depreciation expense charges of telephone companies continued to rise due to a substantial increase in plant facilities. For the 12 months ending April 30, 1953, these charges in the case of the 23 Bell companies amounted to over $419,000,000, an increase of $31,816,000, or 8.2 percent over the charges for the previous year. The increase in depreciable plant facilities, however, (expressed in terms of the recorded book cost) amounted to 8.6 percent during the same period.

NARUC committee on depreciation.—The Commission's representatives continued active participation in the work of this committee of the National Association of Railroad and Utilities Commissioners (NARUC). This Commission provided the committee with a tabulation of Bell System depreciation rates, together with estimated service lives and estimated salvage factors, for incorporation in a publication of the committee containing such data for all utilities.

Western Electric earnings and prices.—The Commission, cooperatively with the NARUC, continued its studies of the prices, earnings, and costs of Western Electric Co., Inc., the manufacturing and supply unit for the Bell System. In the previous annual report, reference was made to the reduction made by Western, effective April 1, 1952, in its prices charged to Bell System companies for switchboards, which reductions amounted to about $45 million annually based on current

sales volume. Effective August 1, 1952, a second reduction amounting to about $65 million annually was made in prices on Western's manufactured products. Western's sales in 1952 to Bell system customers amounted to $936 million as compared with $805 million in 1951. Notwithstanding the above price reductions, the company, in 1952, realized a return on its net investment in assets of 9.9 percent.

Release of A. T. & T. employment stabilization reserve.—As a means of improving interstate earnings of the Bell System companies, the Commission, on January 14, 1953, authorized the American Telephone & Telegraph Co. to transfer its so-called Employment Stabilization Reserve of $11,500,000 to income by monthly installments of $1 million during 1953.

The reserve, which was accumulated through charges to operating expenses by A. T. & T. during the war years (1943–45) pursuant to Commission approval, was intended to meet postwar costs of plant rearrangements and other maintenance projects deferred during the war. However, the reserve was never used for this purpose because it was not found practicable to identify the portions of postwar maintenance which had been deferred, and postwar interstate earnings appeared adequate to meet deferred and current maintenance costs.

In releasing the reserve, the full amount became available for addition to net income. It had not been allowed as a deduction from taxable income during the years of its accumulation. Accordingly, at current Federal income tax rates, it would have required an interstate rate increase of about $24 million annually to produce an annual increase in net income after taxes of $11.5 million.

Bell System Federal income taxes.—In the 1952 annual report it was explained that A. T. & T. had commenced filing consolidated Federal income tax returns for itself and those of its telephone operating subsidiaries eligible for inclusion in such returns. It was also pointed out that the consolidated basis of filing necessitates an allocation of the consolidated tax liability among the companies included in the return and that this matter had been discussed with representatives of the company and with representatives of state regulatory commissions. Attention was given to apportioning the corporate debt of the parent company among the subsidiaries as a part of the tax allocation formula. Work on this matter continued during fiscal 1953 and a report was published by a committee of the NARUC. It is expected that a second report will be issued by the NARUC in fiscal 1954.

NARUC committee on accounts and statistics.—This committee, which includes Commission representation, is developing revised uniform systems of accounts for electric, water, and gas utilities. The principles adopted in these systems will be followed to the extent deemed advisable in revisions of the Commission's systems of accounts.

During the year this committee considered jointly with the NARUC Committee on Depreciation possible revisions in the accounting for telephone station apparatus and the advisability of classifying station installations and drop and block wires as depreciable telephone plant.

The committee also collaborated with the Commission in studies which led to certain revisions, adopted during fiscal 1953, of continuing property record requirements in the Commission's Uniform System of Accounts for Class A and Class B Telephone Companies and in the Standard Practices for the Establishment and Maintenance of Continuing Property Records applicable to telephone companies having a plant investment in excess of $8,000,000.

The committee continued its studies and discussions with respect to appropriate allocation among the companies included in the consolidated tax return of the Federal taxes on the income of the American Telephone and Telegraph Company and its telephone subsidiaries.

Pensions and relief.—Pension plans of Bell System companies were amended in various respects during fiscal 1953. These plans, which were originally placed into effect in 1913, provide in part that any employee who has reached the age of 60 (women, 55) and whose term of employment has been 20 years or more is entitled to retire on a pension at his own request, and an employee must retire at age 65. The minimum pension is $75 per month (before age 65) and $100 per month (after age 65). It had been provided that an amount equal to one-half of all Social Security payments was deducted from company pension payments for those who received more than minimum pensions. As a result, whenever Social Security payments were increased the company pension payments were decreased by one-half of the Social Security increase. The pension plans were revised so that for the increase in Social Security payments made effective September 1, 1952 no reductions were made in company payments and this will be the rule in the future.

Another change provided that persons 65 years of age or more who were receiving minimum pension payments prior to September 1 and who were also receiving Social Security payments will receive in combined payments from the company and the Government an amount equal to $100 per month plus one-half of the Social Security payments to which they were entitled August 31, 1952 and all Social Security increases after that date. Previously, the full Social Security payment was included in the combined payments totaling $100 per month. Like treatment would be accorded those retiring after August 31, 1952 at age 65 and qualified only for the minimum pension.

A third amendment in the pension plans did away with the requirement that the plans of all companies in the Bell System must be the same in order to entitle an employee transferring from one company

to another to carry his service record with him for pension credit under the pension plan of the company to which transfer was made.

For the calendar year 1952, pension and other benefit costs (including Federal taxes for Social Security benefits) for the Bell System, including manufacturing and research activities, amounted to approximately $245,000,000. The combined pension trust funds of these companies totaled approximately $1,560,000,000 as of December 31, 1952. At the end of 1952, 30,126 retired employees of these companies were receiving service pensions.

During fiscal 1953, a review was made of the actuarial data underlying each of the basic actuarial factors used in the Bell System pension studies.

Continuing property records.—Studies of the continuing property records plan of the Bell System companies continued. One of the major features of a continuing property records plan is the provisions relating to the retirement of plant costs from the accounts. In general, plant retirements are made on two bases: (1) Actual cost basis for large items of plant, such as buildings and central office equipment, and (2) average cost basis for plant consisting of a large number of similar units, such as telephones, bell boxes, poles, etc., with recognition being given in the development of average costs to size of unit, to type of plant and in certain cases to volume of new plant construction. The Bell System has proposed a revised method for the development of average retirement unit costs which gives recognition also to the trends in the level of costs and to the age distribution of retirements. Further study is being made of this and other methods of developing average costs which would also recognize these factors prior to permitting any change from present procedures.

Plant accounting practices.—An examination of the accounts of one Bell System company revealed plant accounting practices which were considered improper. It was subsequently revealed that these practices were in fairly general use and corrective action was taken. Briefly, the accounting practices to which exception was taken were that certain plant construction costs were being charged directly to telephone plant in service accounts rather than being accumulated in construction work in progress accounts until completion of projects. In other instances there was delay in clearing amounts in construction work in progress to telephone plant accounts upon completion of projects, and there were some unduly long timelags between the time telephone plant was physically retired from service and the time accounting entries were made recording the retirements in the accounts.

Restatement of plant accounts on basis of original cost.—The accounting for several current acquisitions of plant, including mergers of small companies and acquisitions of communication plant from

nontelephone companies, was handled during the year in accordance with the Commission's accounting regulations. In certain instances this involved the disposition of amounts in excess of original cost. As stated in the 1952 report, the restatement of the telephone plant accounts on basis of original cost has been substantially completed. There remain, however, a few significant items among Bell System companies and several items among non-Bell companies for which final adjustments have not been effected in the accounts.

Annual and other reports.—All report forms were reviewed and minor changes made in some. Annual Report Form L (applicable to miscellaneous common carriers operating in the Domestic Public Land Mobile Radio Service) was redesigned and simplified so as to produce only a minimum of data needed by the Commission for its regulatory functions. At the close of the fiscal year rulemaking was in process with regard to revising other reporting requirements.

Uniform systems of accounts.—Several informal interpretations of the system of accounts were made during the year, including such subjects as the accounting classification to be accorded certain items of mobile radiotelephone station equipment and the appropriate accounting for telephone messages in metropolitan "extended areas".

Studies, in collaboration with industry representatives, continued with respect to revision of the lists of retirement units which are used in determining whether costs are to be included in the operating expense accounts or the capital accounts. Amendments were made in the accounting rules with respect to continuing property record procedures.

Accounting research.—Research continued with regard to accounting regulations of other regulatory commissions and accounting principles enunciated by professional accounting organizations, with the purpose of determining the applicability of such regulations and principles to the communications industry. This included a study of accounting to be performed for emergency facilities with respect to which certificates for rapid amortization have been granted pursuant to section 124A of the Internal Revenue Code. Studies also continued with respect to matters as the "all-inclusive" income statement, certain aspects of depreciation accounting, accounting for tax savings under consolidated income tax returns, and original-cost accounting on plant acquisitions of comunications systems from vendors not engaged in the communication carrier field of operation.

DOMESTIC TELEGRAPH

General

The Western Union Telegraph Co. provides practically all of the domestic message telegraph service in the United States. Western

Union also furnishes private line and other nontransmission telegraph services but the telephone companies furnish the great bulk of such services, including teletypewriter exchange service, within the United States.

The financial results of Western Union's landline operations during fiscal 1953 were much improved over fiscal 1952, when the company's employees were on strike for almost 2 months. Western Union agreed to pay its employees increased wages, estimated to increase operating expenses $9,800,000 a year, effective September 1, 1952. At the same time, it was permitted to revise interstate telegraph rates which, together with similar intrastate rate revisions and increased rates for service between the United States and Canada, were estimated to increase annual revenue by $13 million. The increased rates were also designed to offset the September 1951 wage increases, the recovery of which was not provided for in the 1951 rate increases.

For the calendar year 1952, Western Union reported gross landline revenues of $184,335,000 and 159,735,000 messages handled, as compared with $192,089,000 revenues and 189,637,000 messages for 1951. System-wide net income amounted to $1,103,000 after providing $200,000 for Federal income taxes, compared with 1951 net income of $5,405,000 after a $4,900,000 Federal income tax provision.

In the first half of calendar year 1953, Western Union reported net earnings from its combined landline and cable operations of $4,320,000 with $4,773,000 provided for payment of Federal income taxes. The company estimates that it will earn in excess of $8½ million in 1953, or over $7 per share, after provision of over $9 million for Federal income taxes, and after providing for a further wage increase effective in May 1953 estimated to add close to $1 million to annual operating expenses.

Western Union operates, under long-term leases, the properties of several telegraph companies which are physically merged with its own properties. In fiscal 1953, Western Union increased its stockholdings in these lessor companies, thus reducing its reversionary liability thereto, and with respect to three companies, eliminated the reversionary claim entirely and terminated the leases. In exchange for the stock of the largest of these, Northwestern Telegraph Co., Western Union, among other things, issued $2,000,000 of 4¾ percent debentures, due July 1, 1980. These debentures, together with $35,000,000 of 5 percent bonds due March 1, 1960, represent all the company's outstanding long-term bonded indebtedness.

At the close of fiscal 1953, Western Union filed revised rates for its interstate private line telegraph services which are estimated to reduce revenue therefrom by about $357,000 annually. The new rate schedules are similar to those filed by the Bell System companies, effective July 1, 1953.

Services and Facilities

Speed of service.—Western Union is required to conduct daily studies of the speed of service rendered at its 25 largest offices and to report monthly summaries to the Commission. These reports show the average origin to destination speed of service (interval between the time a message is filed by sender and the time it is delivered to addressee, or first attempt) and the average office relay drag (time required for a message to pass through a large message center). The following table compares the average speed of service in minutes reported by Western Union for the fiscal years 1952 and 1953:

	Average speed in minutes	
	1952 (10 months) [1]	1953 (12 months)
Origin to destination:		
Delivered by:		
Telephone	41.6	43.0
Messenger	45.1	46.2
Private tie line	37.5	37.8
Office relay drag	8.5	8.4

[1] Speed of service studies suspended during April and May 1952 because of strike of telegraph employees.

Due to limited personnel and funds, investigations of service conditions by the Commission's Common Carrier Bureau are limited to the most pressing situations. However, the Field Engineering and Monitoring Bureau personnel in 17 district offices assist by making, to the extent feasible, routine speed of service inspections of Western Union offices and agencies during their regular field inspection trips. During the year, the field engineers made 131 such inspections. The Common Carrier Bureau field offices located in Atlanta, New York, San Francisco and St. Louis made similar inspections of 391 Western Union offices located in or adjacent to those cities.

Western Union modernization program.—As an adjunct to 15 reperforator switching centers completed in November 1950, Western Union has provided 214 large branch offices, including 91 added during fiscal 1953, located in 19 nonreperforator cities, with direct circuit connections to distant reperforator centers. Of this number, 203 branch offices are equipped for sending of originating messages and the remainder are equipped for both sending and receiving messages. These direct circuit connections reduce delays in handling messages through manual relays.

Western Union operated about 3,190,000 telegraph channel miles as of June 30, 1953, including 95,000 added during the fiscal year. This is approximately double the 1946 capacity. The increased channel mileage was derived, almost entirely, from the application of carrier equipment to voice frequency channels. About one-half of this mileage is obtained from facilities leased from Bell System companies.

Western Union's long range program provides for the construction of some 7,300 route miles of microwave radio relay facilities. About 1,000 miles of this, constituting a triangle between New York, Pittsburgh, and Washington, has been in operation for several years. Although options on repeated sites have been obtained as far west as Kansas City, there is no indication that this phase of the program will be implemented in the near future.

The principal development affecting the New York, Pittsburgh, and Washington triangle during fiscal 1953 was the increase in power to provide greater continuity of operations during periods of atmospheric disturbance.

On October 9, 1952, the Commission held that it was neither necessary nor desirable in the public interest to require interconnection of the intercity video transmission facilities of Western Union and the Bell System (docket 9539). A further petition by Western Union was denied on March 23, 1953.

Western Union is providing increasing numbers of deskfax tie lines for the purpose of improving the speed and efficiency of local pick-up and delivery of messages. During fiscal 1953, the company installed 4,220 deskfax tie lines, bringing the total to 8,810. The projected installation of deskfax units for the calendar year 1954 is 3,000.

Gross expenditures on the modernization program through calendar year 1952 amounted to some $52 million, with an estimated $29 million to be spent in future years. Estimated savings in operating expenses resulting from this program to date amount to about $30 million a year.

Construction of wire facilities.—The Commission received 8 Western Union requests for wire telegraph construction and extensions. Six were granted and 2 were pending. Those granted covered the leasing of 71,099 telegraph channel miles of line at an annual rental of $109,032 and the construction of 59,427 telegraph channel miles of line and associated equipment at a cost of $1,298,980.

Discontinuance, reduction, or impairment of service.—A total of 1,953 applications for reduction in hours of service or closure of public telegraph offices were filed by Western Union. In addition, 148 such applications were pending at the beginning of the year. Of the total, 1,854 applications were granted, 22 were withdrawn, 1 was denied and 224 were pending. Generally, where hours were reduced or offices closed, substitute service was made available.

Rates and Tariffs

Tariff schedules.—At the end of the fiscal year, 36 domestic telegraph carriers had tariffs or concurrences on file with the Commission.

During the year, they filed 1,010 tariff publications establishing or changing rates, regulations, practices, and classifications of service.

Special permissions.—During the year, 37 requests for special tariff permissions to make changes in tariffs or to file new tariffs to become effective on less than statutory notice, or involving waiver of certain requirements of the Commission's rules, were acted upon. Of this number, 36 were granted and 1 was denied.

Western Union domestic rates.—As reported in the 1952 annual report, Western Union filed revised tariff schedules in June 1952, containing new and increased charges and regulations largely for interstate message telegraph, press, money order, and miscellaneous services, designed to provide a $13,200,000 increase in operating revenues on an annual basis to offset the cost of wage increases in approximately the same amount. After certain adjustments in the proposed rates were made, the Commission permitted the adjusted intra-United States rates to become effective September 1, 1952, while the effective date of the United States-Canada rates was deferred until November 1, 1952.

On June 16, 1953, Western Union filed new and revised rates and regulations, effective July 1, 1953, for interstate leased facilities (private line telegraph services). They result in both increases and decreases, the overall effect of which amounts to an estimated reduction in the company's revenue of $357,000 annually on a systemwide basis. The new schedules were filed by Western Union so as to maintain its interstate leased facilities rates on a competitive level with the revised private line rates of the Bell System.

Teleprinter "ticker" equipment charges.—Western Union's revised tariff schedules establishing new and increased charges and new regulations applicable to "tickers" used in leased facility service were allowed to become effective August 1, 1952 pending a public hearing to determine their lawfulness (docket 10274). Hearings were held in January and April 1953, and on June 30, 1953 the record was certified to the Commission for decision.

Transmission of horse or dog racing news.—In the previous annual report reference was made to the proceedings in docket 10112 concerning the lawfulness of Western Union's tariff schedules applicable to leased facilities used for the transmission of horse and dog racing news. The tariff schedules restricted such use to (1) a press association; (2) a publisher of a newspaper or other periodical entered as second-class matter; (3) a radio station; or (4) a person, firm, or corporation engaged in the collection or transmission of horse or dog racing news to press associations, newspapers, or radio stations for publication or broadcasting. In its decision released March 24, 1953, the Commission found that such tariff provision was arbitrary

and discriminatory in that it would have denied service to persons who would use the facilities for legitimate purposes and would have allowed service to be furnished to persons who have used it for unlawful purposes in the past. Accordingly, Western Union was ordered to cancel this tariff provision.

Acceptance of libelous messages.—A formal complaint was received during the year concerning Western Union's tariff schedules which provided that messages containing libelous language would not be accepted for transmission (docket 10327). In an effort to dispose of the complaint without the necessity for a formal hearing, informal conferences were held between Western Union and Commission representatives. As a result, Western Union amended these schedules, effective May 18, 1953, to provide that messages containing defamatory statements will not be accepted if the receiving clerk knows that the message is spurious or that the sender is acting in bad faith and for the purpose of traducing another. The proceeding was accordingly terminated.

Responsibility of carrier for messages picked up by messenger.—As a result of negotiations between Western Union and the Commission, the company amended its tariff regulations to show that the responsibility of the carrier attaches at the time a message is accepted by its messenger, in those cases where the company dispatches a messenger to pick up the message. Previously, the company's tariff provided that since the messenger acted as agent of the sender and not as an agent of the company, no responsibility attached until a message was accepted at one of the transmitting offices.

Other Regulatory Matters

Original cost of plant and continuing property records.—Commission studies directed toward analysis of methods and procedures applied, verification of accounting performed, and entries recorded in connection with Western Union's reclassification of its plant and equipment on basis of original cost, were still in progress at the end of the year. Concurrently, studies necessary for the verification of the form and content of Western Union's continuing property records and for the evaluation of the effectiveness of continuing property record procedures are being pursued.

Depreciation.—Western Union continued a review of the factors underlying the development of depreciation rates undertaken in cooperation with the Commission. The purpose is to determine what modifications in presently effective rates are necessary to reflect, more accurately, existing plant conditions under the circumstances of obsolescence and retirement of a substantial amount of its older equip-

ment and replacement in the plant structure of newer types of equipment having different service life and salvage characteristics.

Miscellaneous accounting matters.—For the purpose of assuring proper treatment in and reporting of accounts as an aid to effective rate regulation, the Commission directed its attention to the telegraph carrier's accounting procedures regarding, among other things, (*a*) research and development costs incurred under defense contracts, (*b*) rapid amortization for tax purposes of appropriately certified defense facilities, (*c*) traffic damage claims, and (*d*) uniforming of messengers.

Uniform system of accounts.—Tentative drafts of unified accounting rules to be applied to all international (cable and radio) and to domestic telegraph carriers were completed. Further conferences with industry representatives are planned.

During the year interpretations were issued with respect to the retirement unit to be used in connection with accounting for rerouting of ocean cable, and the accounting for revenue from transmission of international messages that do not originate or terminate at, or transit through, points designated as gateway points in the continental United States.

Annual and other reports of carriers.—As of the close of the year, proposed rule making was in progress with regard to revising the reporting requirements.

INTERNATIONAL TELEGRAPH AND TELEPHONE

General

After experiencing two years of increasing traffic volume, the United States cable and radiotelegraph carriers reported a decline in the word volume of international telegraph traffic handled during the calendar year 1952. In 1952, this traffic amounted to 516,261,573 paid words, a decrease of 20,347,060 paid words or 3.8 percent from the 1951 level of 536,608,633 paid words.

Revenues from message traffic accruing to the international telegraph carriers totaled $44,916,817 in 1952, a decrease of 3.3 percent from the previous year's revenues of $46,466,766. Total operating revenues, on the other hand, increased to $57,605,377 in 1952 as compared with $56,948,819 for 1951. As a result of higher operating costs, however, net operating revenues before provision for Federal income taxes decreased to $6,047,939 in 1952, or 23.1 percent below the $7,861,188 reported in 1951.

During 1952, the volume of international radiotelephone calls and the revenues therefrom continued their upward trends and exceeded

the previous record highs established in 1951. The chargeable calls in 1952 rose to a total of 982,860, an increase of 5.4 percent over the previous year. The resulting revenues (including associated landline charges) amounted to $10,345,161 for 1952 or 2.1 percent above those in 1951.

International Services

Telegraph circuits.—At the close of fiscal 1953, 87 foreign countries and overseas points were served by United States radiotelegraph carriers, either by direct radiotelegraph circuits or via the Tangier, North Africa, relay stations. Of this number, 23 were served primarily via the Tangier relay stations, or 12 more than the year previous. Service via Tangier increased because of difficult radio propagation conditions over the North Atlantic. As a result, more reliable service has been provided, particularly to countries in Northern Europe, the Near East and Asia. Relayed service is also provided to many countries in the Far East via the stations of United States companies operating in the Philippine Islands. In addition, connections with the facilities of foreign carriers make telegraph communication possible with most other points in the world.

Certain of the United States radiotelegraph carriers have continued to provide program transmission and reception service. Many of the world news "round-ups" broadcast in the United States are handled by these carriers. The United Nations and the Department of State have utilized program transmission facilities to transmit information to distant points where it is retransmitted in local areas by foreign broadcast stations.

Some United States radiotelegraph carriers also provide radiophoto transmission and reception service which is used primarily by news distributing agencies.

International leased telegraph channel service continues in increasing demand. Such channels provided by United States carriers are used principally by United States and foreign governments and by airlines operating in the international air-travel service.

The demand for international teletypewriter exchange service is also increasing. This service, which is similar to TWX service within the United States, permits subscribers in the New York and Washington areas to conduct two-way teletypewriter communications with subscribers in 11 European countries. Such service is also available between San Francisco and Honolulu.

Telephone circuits.—Radiotelephone message toll service was in effect with 106 foreign countries and overseas points at the close of the year. Of this number, 58 were served directly, while the rest were

served through connecting carriers at the distant points. At the close of the previous fiscal year 93 foreign countries and overseas points were served, 55 being served directly. Bell System companies continued to provide program service and private line service to many foreign countries and overseas points.

Merger.—The Senate Committee on Interstate and Foreign Commerce is continuing its studies of communications pursuant to the authority contained in Senate Resolution 41, 83d Congress, 1st session (1953). Included is the question of legislation authorizing the merger of international telegraph companies.

Applications.—During the fiscal year, licensees in the international fixed public service filed a total of 591 applications for authorizations for additional frequencies, transmitters, and points of communications, as well as for renewal of licenses and temporary authorizations. Licensees in the radiotelegraph service accounted for 430 of these applications while the others were filed by radiotelephone licensees. The Commission acted on practically all of these applications, as well as approximately 100 applications carried over from the previous year.

Applications for authority to use additional frequencies continued to constitute a large proportion of the total volume. This is a result of the Geneva, 1951, agreement whereby the fixed service operations are being gradually transferred to frequencies in accordance with the Atlantic City Table of Frequency Allocations.

About 90 new "in-band" frequency assignments have been made to stations in the international fixed public service and approximately the same number of "out-of-band" frequencies have been deleted. At the close of the year, 35 "out-of-band" frequencies or less than 5 percent of the total assignments remain authorized to the companies in the international fixed public service. This means that approximately two-thirds of all of the "out-of-band" frequencies previously assigned have been deleted from the licenses. Because of the crowded conditions in the spectrum, the problem of deleting the remaining third will be more difficult. However, it is expected that with some additional assignments and continued improvement of techniques in transmission and reception, the task will be completed within the time limits contemplated in the Geneva agreement.

In addition, the Commission has received and acted upon a number of miscellaneous applications filed by international carriers. These include requests for authorization to hold interlocking directorates in two or more companies, authorizations to decrease or discontinue service, and renewal of authorizations to supplement facilities of the international companies by the use of wire lines.

International Conferences

The Commission was represented at a conference held in London during July 1952 to consider further revisions of the Bermuda telecommunications agreement of 1945 (as revised in London 1949). The resulting revisions became effective October 1, 1952. They provide that (1) the accounts for telegraph traffic exchanged between the United States and the United Kingdom or Commonwealth countries shall be drawn up in dollars at the settlement rates in effect July 1, 1952; and (2) where payment is due in a currency other than dollars the conversion of the dollar balances into the currency of payment shall be made at the then current rate of exchange.

The Commission was also represented at the seventh plenary meeting of the International Telegraph Consultative Committee (CCIT) held in Arnhem, Holland, in May–June 1953. The meeting adopted recommendations of the CCIT study groups relating to standardization of operating practices and equipment used in international telegraphy, including facsimile and phototelegraphy.

Docket Cases

Western Union—Globe and Tropical contracts.—Reference was made in the previous annual report to the complaint proceeding (docket 9292) involving the lawfulness of certain agreements between The Western Union Telegraph Company, on the one hand, and Globe Wireless, Ltd., and Tropical Radio Telegraph Company, on the other hand, for the exchange of specified international telegraph traffic. On May 18, 1953 the Commission issued its final decision wherein it concluded that the agreements violate Section 222 of the act and the formula prescribed under the authority of that section, and ordered Western Union, Globe and Tropical to cease and desist from transferring traffic pursuant to such contracts. In addition, it ordered that the parties enter into negotiations with a view to reaching agreement on the question of damages and report the results to the Commission by July 15, 1953. On June 11, 1953, the Commission granted petitions of Western Union, Globe and Tropical for a stay of the effective date of the order pending a decision on petitions for rehearing.

Bank and Fund case.—The 1952 annual report mentioned the proceeding (docket 9362) occasioned by the complaint of the International Bank for Reconstruction and Development and the International Monetary Fund against certain United States international telegraph carriers. This case presented for determination by the Commission the question of whether these agencies should be accorded

the same rates for their outbound official telegraph communications as those accorded to certain governments for similar communications. The Commission's final decision, released March 23, 1953, covered all issues except the question of damages, and held that the Bank and Fund were entitled to government rates provided that, in each case, equivalent rates were accorded these organizations on their official inbound messages and that settlements of traffic accounts were made on the basis of such rates. As of June 30, 1953, 13 countries which are members of the Bank and Fund had agreed to participate in the handling of its messages at government rates. The question of damages was under negotiations at the close of the year.

Puerto Rico application.—Reference was made in the previous annual report to the pendency of an initial decision on the applications of Mackay Radio and Telegraph Company and All America Cables and Radio, Inc., for modification of their respective licenses to permit them to operate a radiotelegraph circuit between the United States and Puerto Rico on a regular instead of an emergency basis (docket 10056). On September 4, 1952, the hearing examiner proposed to deny these applications. Exceptions were filed and oral argument, originally scheduled for February 24, 1953, was postponed upon petition of Mackay and All America.

Western Union divestment.—Section 222 of the Communications Act, which authorized the merger of the Western Union Telegraph Co., and Postal Telegraph, Inc., specifically required that any merger plan should provide for the divestment by Western Union of its international telegraph operations within a reasonable time, and after the Commission found the compensation for the property to be divested commensurate with its value. In approving the merger in 1943, the Commission required Western Union to exercise due diligence to effect such divestment (docket 6517). Since Western Union had not effected this divestment, the Commission on March 5, 1952 instituted an investigation and hearing (docket 10151) into the matter. Hearings were held on 14 days between October 7, 1952 and May 22, 1953 and then recessed until August 4, 1953.

Metropolitan area tieline service.—This is a consolidated proceeding involving complaints by the Western Union Telegraph Co., against an existing tariff provision of RCA Communications, Inc. (docket 10335), and a similar proposed tariff provision of the American Cable and Radio Corporation (AC&R) operating companies, All America Cables & Radio, Inc., the Commercial Cable Co., and Mackay Radio & Telegraph Co., Inc. (docket 10378), relative to the furnishing of teleprinter equipment. The provision in question provides that the companies will, upon reasonable request therefor, provide, install,

and maintain upon the customer's premises in "metropolitan areas" of cities where the carrier has operating telegraph offices, teleprinters connected by wire with such telegraph offices. Formerly, the defendants limited such teleprinters to the customer's premises located within the "corporate limits" of such cities. The issues presented involve the clarity and lawfulness of the tariff provision, and the effect of the practices upon the international formula. At the request of the AC&R companies, the hearings in this matter originally scheduled to commence on March 3, 1953 were postponed.

Duplicate circuits to Turkey.—This is a consolidated proceeding (dockets 10360 and 10489) involving applications of Mackay Radio and Telegraph Company and RCA Communications, Inc., for modification of their point-to-point radiotelegraph licenses to authorize communication with Ankara, Turkey, and the application of Mackay to authorize communication with Istanbul, Turkey. These applications present two important policy questions. The first relates to the question of whether competing circuits to Turkey are in the public interest and the second relates to the question of whether the public interest would be served by authorizing a direct circuit to more than one point in Turkey. Hearings were originally scheduled to begin on March 3, 1953, but were postponed at the request of Mackay.

Buccaneer application.—This proceeding involves an application filed on June 9, 1952, by Buccaneer Line, Inc., for a new fixed public point-to-point radiotelephone station to be located at Jacksonville, Fla., to provide radiotelephone service between Jacksonville and certain points in the Yucatan peninsula of Mexico. This application was scheduled for hearing on April 14, 1953. At a prehearing conference held March 30, 1953, it appears that the American Telephone & Telegraph Co. was negotiating for the establishment of communication between the points desired by the applicant through interconnection of existing facilities. Buccaneer indicated that if such a service could be successfully established, it would not press its application. Accordingly, on March 31, 1953, the hearing was postponed indefinitely. A. T. & T. reported on June 15, 1953, that successful test calls had been made from Tarrytown, N. Y., and Colonia, Yucatan, but that additional tests, including test calls between Jacksonville and points in Mexico, were considered essential before determining the feasibility of the service.

Press Wireless application.—On June 8, 1953, Press Wireless, Inc., requested special temporary authorization to communicate with Hamilton, Bermuda, for the purpose of handling press traffic in connection with the then tentatively scheduled Three Power Conference. RCA Communications, Inc., filed objections to the grant and the application

was designated for hearing (docket 10539). At a prehearing conference on June 11, 1953, the parties waived hearing and requested that the Commission decide the matter on the basis of the pleadings filed by the parties in interest and other relevant data in the Commission's files. Accordingly, the Commission canceled the hearing and, on June 17, 1953, granted the Press Wireless application.

Rates and Tariffs

Rate levels.—There were no changes in the level of rates for telegraph traffic outbound from the continental United States. In the case of telegraph traffic inbound to the United States there were changes in several instances. Of particular interest was the change in rates for telegraph traffic inbound to the United States from the United Kingdom. This upward revision amounting to about 5 cents per full rate word was put into effect September 1, 1952. It is estimated that this new inbound rate, together with certain changes in the division of tolls arrangements between the United States international telegraph carriers and their British correspondents, will provide approximately $800,000 in additional annual revenues to the United States carriers.

Marine rate case.—This is a consolidated proceeding involving an investigation into the matter of charges for coast-station and landline handling of marine traffic (docket 9915) and a complaint by Tropical Radio Telegraph Co. that the Western Union Telegraph Co. had failed to comply with the formula for the distribution of outbound traffic in its division of tolls with Tropical (docket 9822).

The effect of the Commission's action in docket 9915 was: (*a*) to provide additional needed revenues; (*b*) to end an existing disparity between landline and coast-station charges applicable to traffic inbound from ships of foreign registry, on the one hand, and all other marine traffic, on the other; (*c*) to establish a uniform country-wide landline charge for the domestic handling of marine traffic in lieu of a previous zonal system; and (*d*) to end the then existing differences in the divisions of tolls between Western Union and the several marine carriers for the domestic handling of marine traffic. It was estimated that the revised landline rates would produce approximately $75,000 in additional annual revenues to Western Union. The overall annual increase in revenues accruing to the major marine carriers from both the new landline and coast-station rates was estimated at about $110,000.

On May 18, 1953, the Commission issued its decision in the Tropical complaint (docket 9822). It stated therein that the power to prescribe

division of tolls under Section 222 (e) of the act relates to divisions to be observed in the future and does not give the Commission authority to make retroactive adjustments of divisions covering periods prior to the prescription or approval of a specific method for dividing charges. The Commission, therefore, denied the petition insofar as it requested damages for past periods.

Tariff schedules.—At the end of the fiscal year, 94 international cable and radiotelegraph carriers had tariffs or concurrences on file with the Commission. During the year, these carriers filed 1,211 tariff publications establishing or changing rates, regulations, practices, or classifications of service.

Special tariff permissions.—During fiscal 1953 the Commission received and acted upon 40 applications wherein special permission was requested to make changes in existing international telegraph tariff schedules on not less than 1 day's notice.

Contracts and divisions of tolls.—International and marine telegraph carriers filed 267 new contracts, 664 amendments to existing contracts, and 108 reports of negotiations with other carriers and with foreign administrations. In addition, various international telegraph carriers filed 357 statements showing revisions in the division of charges for telegraph messages exchanged between these companies and their overseas correspondents.

Other Regulatory Matters

Depreciation.—Continued progress was made in studies relating to the reasonableness of annual depreciation rates and charges, the recorded depreciation reserves, and the propriety of the depreciation practices of the international telegraph carriers. Further progress was also made in developing information necessary for the Commission to prescribe annual rates of depreciation for these carriers. It may therefore be possible to prescribe depreciation rates for some of these carriers in fiscal 1954.

Continuing property records.—Two of the three international telegraph carriers that had not, at the end of fiscal 1952, completely fulfilled the requirement to establish and maintain continuing property records completed the restatement of their basic records during the year. The third carrier has made considerable progress and is expected to complete its record by the end of fiscal 1954.

Relief and pensions.—Four carriers introduced further changes in their pension arrangements during fiscal 1953, primarily to expand the coverage of employees and to effect liberalization of benefits.

Reclassification of plant.—At the end of fiscal 1953, final adjust-

ments in the accounts of three international telegraph carriers in the matter of restatement of plant on the basis of original cost has not been completed. On the basis of the progress made and with the advice and assistance of the Commission it is expected that the matter will be resolved during fiscal 1954.

Uniform system of accounts.—Plans were made to merge the accounting rules applicable to domestic telegraph operations with those applicable to international operations. This has required special attention to such matters as leased plant accounting, messenger uniforms, depreciation accounting, and domestic revenue.

Preservation of records.—An interpretation of the preservation of records regulations was made with respect to vouchers, invoices, and certain payroll data affecting the plant accounts. Since the carrier was interpreting the rules as providing for retention of these records for a longer period than required, this interpretation provided relief with respect to storage facilities.

In administering the preservation of record rules consideration has been given to the need for retention of certain records in which other agencies of the Government have a special interest.

Annual and other reports to the Commission.—All reports were modified and relief extended on the filing of certain statistical data. As at the close of the fiscal year 1953, rulemaking was in progress with regard to revising the reporting requirements.

STATISTICS

General

Reports were filed on an annual basis by 305 common carriers and 21 controlling companies for the calendar year 1952. Considerable financial and operating data taken principally from these reports are published annually in a volume entitled "Statistics of the Communications Industry in the United States". The larger telephone and telegraph carriers also file monthly reports of revenues and expenses, and summaries of these data are published monthly by the Commission.

Telephone Carriers

The annual reports received from common carriers include those from 91 telephone carriers and 195 carriers engaged in rendering mobile radio-telephone service. Selected financial and operating data concerning large telephone carriers for the year 1952 as compared with 1951 are shown in the following table:

Telephone carriers[1]

Item	1951	1952	Percent of increase or (decrease)
Investment in plant and equipment (as of Dec. 31)	$11, 546, 812, 614	$12, 608, 517, 366	9. 19
Depreciation and amortization reserves	$3, 186, 343, 655	$3, 411, 440, 935	7. 06
Net investment in plant and equipment	$8, 360, 468, 959	$9, 197, 076, 431	10. 01
Local service revenues	$2, 258, 925, 770	$2, 516, 731, 327	11. 41
Toll service revenues	$1, 403, 479, 156	$1, 534, 854, 055	9. 36
Total operating revenues	$3, 817, 536, 794	$4, 228, 750, 352	10. 77
Operating expenses	$2, 698, 098, 095	$2, 986, 565, 273	10. 69
Taxes	$659, 279, 145	$737, 732, 268	11. 90
Net operating income after all taxes	$460, 159, 854	$504, 452, 211	9. 63
Net income	$377, 423, 081	$420, 733, 463	11. 48
Dividends declared	$303, 374, 075	$346, 388, 050	14. 18
Company telephones:			
Business	12, 346, 101	12, 899, 770	4. 48
Residence	27, 568, 621	28, 987, 800	5. 15
Number of calls originating during the year:			
Local [2]	66, 620, 928, 423	68, 389, 589, 937	[3]
Toll [2]	2, 140, 402, 887	2, 194, 086, 251	[3]
Number of employees at end of October	586, 909	615, 141	4. 83
Male	198, 209	207, 350	4. 61
Female	388, 600	407, 791	4. 94
Total compensation for the year	$1, 975, 535, 384	$2, 200, 657, 106	11. 40

[1] Intercompany duplications, except in minor instances, have been eliminated.
[2] Partly estimated by reporting carriers.
[3] The number of calls shown are not comparable, as many calls were reclassified from "Toll" to "Local" during 1952, due to enlargement of numerous local calling areas.

Business and Residence Telephones by States

There were 48,056,300 telephones in the continental United States of which 33,618,900 were located in residences, and 14,437,400 in business establishments, as of January 1, 1953. The number of telephones arranged by States, are shown in the following table. The figures were compiled by the American Telephone & Telegraph Co. and are partly estimated.

State	Business	Residence	Total
Alabama	137, 900	352, 900	490, 800
Arizona	72, 300	122, 900	195, 200
Arkansas	88, 100	188, 500	276, 600
California	1, 468, 200	2, 873, 300	4, 341, 500
Colorado	156, 000	339, 500	495, 500
Connecticut	242, 600	633, 400	876, 000
Delaware	42, 700	92, 700	135, 400
District of Columbia	257, 200	281, 300	538, 500
Florida	335, 100	495, 400	830, 500
Georgia	209, 900	464, 900	674, 800
Idaho	44. 400	110, 600	155, 000
Illinois	1, 043, 400	2, 224, 700	3, 268, 100
Indiana	315, 100	928, 700	1, 243. 800
Iowa	178, 700	688, 700	867. 400
Kansas	154, 100	493, 800	647, 900
Kentucky	141, 200	380, 200	521. 400
Louisiana	175, 400	417, 800	593, 200
Maine	61, 900	182, 600	244, 500
Maryland	219, 500	551, 500	771, 000
Massachusetts	497, 900	1, 204, 500	1, 702, 400
Michigan	593, 400	1, 667, 900	2, 261, 300
Minnesota	242, 500	738, 100	980. 600
Mississippi	75. 100	179, 600	254, 700
Missouri	358, 300	888, 800	1, 247, 100
Montana	48, 800	116, 300	165, 100
Nebraska	104, 600	327, 600	432, 200
Nevada	25, 200	33, 200	58, 400
New Hampshire	39, 800	116, 600	156, 400
New Jersey	537, 700	1, 325, 300	1, 863, 000
New Mexico	61, 200	85, 300	146, 500
New York	2, 164, 600	4, 045, 500	6. 210, 100

State	Business	Residence	Total
North Carolina	197,900	468,200	666,100
North Dakota	34,300	101,600	135,900
Ohio	739,700	2,153,700	2,893,400
Oklahoma	184,500	443,600	628,100
Oregon	144,900	345,300	490,200
Pennsylvania	937,500	2,549,200	3,486,700
Rhode Island	76,200	183,600	259,800
South Carolina	95,400	205,100	300,500
South Dakota	38,900	124,200	163,000
Tennessee	196,900	513,900	710,800
Texas	700,000	1,500,800	2,200,800
Utah	63,400	162,100	225,500
Vermont	25,300	73,300	98,600
Virginia	249,200	549,000	798,200
Washington	241,700	582,000	823,700
West Virginia	102,500	280,500	383,000
Wisconsin	288,100	771,100	1,059,200
Wyoming	28,300	59,600	87,900
United States	*14,437,400*	*33,618,900*	*48,056,300*

Land-Line Telegraph

Annual reports containing financial and statistical data for the calendar year 1952 were received from 19 domestic and international telegraph carriers. The accompanying table sets forth financial and operating data relating to the domestic land-line operations of the Western Union Telegraph Co. for the calendar year 1952 as compared with 1951. The data pertaining to its cable operations are included in a later table relating to ocean-cable carriers.

The Western Union Telegraph Co.[1]

Item	1951	1952	Percent of increase or (decrease)
Investment in plant and equipment (as of Dec. 31)	$284,293,024	$286,371,865	0.73
Depreciation and amortization reserves	$123,825,430	$126,579,320	2.22
Net investment in plant and equipment	$160,467,594	$159,792,045	(0.42)
Message revenues	$161,739,467	$153,086,977	(5.34)
Total operating revenues	$192,089,102	$184,336,414	(4.04)
Operating expenses, depreciation and other operating revenue deductions	$182,022,613	$183,394,757	0.75
Net operating revenues	$10,066,489	$941,657	(90.65)
Provision for Federal income taxes	$4,007,000	[2]$200,000	(95.01)
Net income (or deficit)	$4,711,159	($724,008)	(115.37)
Dividends declared	$3,381,229	$3,688,959	9.10
Number of revenue messages handled [3]	189,636,984	159,735,155	(15.77)
Number of employees at end of October	40,319	39,853	(1.16)
Total compensation for the year	$127,818,175	$126,974,301	(.66)

[1] Represents data for land lines operations. Figures covering cable operations are included in the table below relating to ocean-cable carriers.

[2] Represents the provision for Federal income taxes on the net income of the company as a whole. Although applicable to both wire-telegraph and ocean-cable systems, this amount has not been allocated to such systems by the carrier in its records.

[3] Includes domestic transmission of transoceanic and marine messages (about 8,882,000 in 1951 and about 8,620,000 in 1952).

Radiotelegraph and Ocean-Cable Carriers

There are shown in the accompanying tables the principal financial and operating statistics selected from the annual reports filed by the United States radiotelegraph and cable carriers furnishing inter-

national communications services. These tables compare the figures for the calendar year 1952 with those for the previous year.

Radiotelegraph carriers

Item	1951	1952	Percent of increase or (decrease)
Investment in plant and equipment (as of Dec. 31)	$38, 812, 497	$37, 930, 603	(2. 27)
Depreciation and amortization reserves	$18, 508, 966	$16, 966, 280	(8. 33)
Net investment in plant and equipment	$20, 303, 531	$20, 964, 323	3. 25
Message revenues:			
Domestic [1]	$1, 901, 113	$1, 830, 865	(3. 70)
Transoceanic	$21, 974, 835	$21, 599, 495	(1. 71)
Marine	$1, 400, 484	$1, 529, 491	9. 24
Total operating revenues	$29, 887, 139	$30, 582, 922	2. 33
Operating expenses, depreciation and other operating revenue deductions	$25, 258, 232	$26, 563, 787	5. 17
Net operating revenues	$4, 628, 907	$4, 019, 135	(13. 17)
Provision for Federal income taxes	$2, 450, 080	$2, 434, 414	(. 66)
Net income	$2, 577, 215	$2, 314, 585	(10. 19)
Dividends declared	$10, 000	$503, 000	4, 930. 00
Number of revenue messages handled:			
Domestic [2]	57, 957	57, 706	(. 28)
Transoceanic	10, 980, 288	10, 956, 917	(. 21)
Marine	958, 473	1, 039. 681	8. 48
Number of employees at end of October	5, 472	5, 949	8. 7
Total compensation for the year	$20, 082, 510	$22, 295. 352	11. 02

[1] Includes revenues from the domestic transmission of transoceanic and marine messages, and revenues from domestic classification messages (primarily Canadian and Mexican).
[2] Represents domestic classification messages (primarily Canadian and Mexican).

Ocean-cable carriers (including cable operations of the Western Union Telegraph Co.)

Item	1951	1952	Percent of increase or (decrease)
Investment in plant and equipment (as of Dec. 31)	$88, 497, 874	$89, 170, 714	0. 76
Depreciation and amortization reserve	$55, 419, 954	$55, 957, 080	. 97
Net investment in plant and equipment	$33, 077, 920	$33, 213, 634	. 41
Message revenues:			
Domestic [1]	$187, 605	$182, 616	(2. 66)
Transoceanic	$21, 002, 729	$19, 773, 917	(5. 85)
Total operating revenues	$27, 061. 680	$27, 022, 455	(. 14)
Operating expenses, depreciation, and other operating revenue deductions	$23, 829, 399	$24, 993, 651	4. 89
Net operating revenues	$3, 232, 281	$2, 028, 804	(37. 23)
Provision for Federal income taxes	$1, 053, 000		
Net income	$1, 949, 012	$2, 078, 484	6. 64
Dividends declared	$353, 468		
Number of revenue messages handled:			
Domestic [2]	79, 037	81, 897	3. 62
Transoceanic	9, 903, 807	9, 599, 431	(3. 07)
Number of employees at end of October	5, 453	5, 591	2. 53
Total compensation for the year	$13, 037, 247	$13, 759, 322	5. 54

[1] Includes revenues from the domestic transmission of transoceanic messages, and revenues from domestic classification messages (primarily Canadian).
[2] Represents domestic classification messages (primarily Canadian).

International Telegraph Traffic

Reports of international telegraph traffic statistics received from cable and radiotelegraph carriers indicate that a total of 516,261,573 paid words were handled into and out of the United States during the calendar year 1952. In the outbound direction, a total of 258,393,146 paid words were transmitted, while 257,868,427 paid words were received in the inbound direction. The volume of international tele-

graph traffic exchanged between the United States and each of the principal countries of the world during 1952 is shown in the following table.

International telegraph (radio and cable) traffic in words, 1952 (includes traffic transiting the United States)

Country	Number of words	
	Outbound from the United States	Inbound to the United States
EUROPE, AFRICA, AND THE NEAR EAST		
Algeria	162,478	116,678
Arabia	933,249	1,011,923
Austria	1,432,081	1,619,491
Belgian Congo	348,800	301,345
Belgium	4,698,405	4,051,689
British East Africa	267,519	265,273
British West Africa	233,843	203,262
Czechoslovakia	550,659	524,619
Denmark	1,735,300	1,102,624
Egypt	1,381,306	1,519,756
Ethiopia	146,972	115,610
Finland	646,148	740,258
France	14,562,901	13,329,952
French West Africa	125,605	67,010
Germany	11,469,293	12,989,954
Greece	1,802,051	1,336,104
Hungary	268,790	208,207
Iceland	248,259	253,631
Iran	567,919	698,073
Iraq	264,547	176,077
Ireland	775,035	902,298
Israel	2,983,510	2,877,464
Italy	9,671,415	7,894,853
Lebanon	1,009,589	1,107,004
Liberia	486,255	611,893
Libya	108,470	64,427
Luxembourg	111,930	87,063
Morocco—French	678,457	639,633
Morocco—Tangier	593,821	497,521
Netherlands	6,683,127	5,905,044
Norway	2,769,600	2,174,411
Persian Gulf	360,363	484,762
Poland	688,767	401,318
Portugal	1,507,887	945,164
Portuguese East Africa	105,082	102,707
Rhodesia	91,840	112,828
Roumania	102,825	63,348
Spain	3,456,549	2,047,266
Sweden	3,281,880	2,741,989
Switzerland	7,130,746	4,801,343
Syria	215,487	181,005
Transjordania	353,573	184,573
Trieste, Free Territory of	182,692	159,108
Tunisia	108,637	81,446
Turkey	1,127,080	839,002
Union of South Africa	2,504,665	2,629,429
U. S. S. R.	5,169,132	2,271,381
United Kingdom	47,251,735	47,828,569
Yugoslavia	938,988	814,821
All other places	875,692	1,828,149
Total	143,170,954	131,911,355
WEST INDIES, CENTRAL, NORTH, AND SOUTH AMERICA		
Argentina	5,623,826	6,738,099
Bahamas	810,748	925,398
Barbados	211,933	158,049
Bermuda	941,562	931,243
Bolivia	810,212	838,995
Brazil	10,319,856	10,961,201
British Guiana	179,950	180,894
British Honduras	114,563	121,984
Canada	7,689,192	9,556,888
Canal Zone	842,798	887,946
Chile	2,527,797	2,768,043
Colombia	4,942,809	4,619,045
Costa Rica	784,119	668,028
Cuba	6,165,249	8,635,923
Dominican Republic	1,204,514	1,203,749
Ecuador	1,299,608	824,145
Guatemala	1,180,598	1,314,664
Haiti	746,810	714,783
Honduras Republic	733,707	651,991
Jamaica	839,703	695,079
Mexico	1,943,138	1,555,044
Netherlands West Indies	1,083,647	1,180,824
Nicaragua	746,301	664,299
Other British West Indies [1]	163,707	108,086
Panama	1,234,078	960,519
Paraguay	218,689	272,440
Peru	2,262,778	1,854,001
Puerto Rico	3,607,300	3,494,803
Salvador	818,632	693,205
Surinam	138,815	138,670
Trinidad	719,086	464,208
Uruguay	2,060,255	1,828,924
Venezuela	6,427,349	7,547,772
Virgin Islands	296,369	278,578
All other places	154,425	82,444
Total	69,844,132	74,519,964
ASIA AND OCEANIA		
Afghanistan	153,888	101,040
Australia	3,249,729	2,963,119
Burma	615,352	197,472
Ceylon	534,208	396,180
China (excluding Hongkong)	78,559	153,338
Formosa	1,070,468	977,986
French Indo-China	217,513	230,671
Guam	506,007	682,335
Hawaii	4,658,813	4,450,252
Hongkong	1,860,058	1,801,595
India	4,880,579	4,946,663
Indonesia	2,624,420	2,721,752
Japan	13,609,698	18,084,268
Korea	310,298	457,724
Malaya, Federation of	1,475,257	1,506,544
New Zealand	1,098,235	952,471
Okinawa	387,197	632,883
Pakistan	1,671,885	1,535,170
Philippines	4,889,396	5,804,391
Thailand (Siam)	1,096,011	1,062,842
All other places	271,643	252,336
Total	45,259,214	49,961,032
Unknown destination or origin	118,846	1,476,076
Grand total	258,393,146	257,868,427

[1] Points not listed separately.

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Safety and Special Radio Services

GENERAL

The Safety and Special Radio Services include most of the nonbroadcast radio services and comprise by far the largest number of radio stations authorized by the Commission. They are utilized by a broad segment of the public—including individuals, industry, commerce, and state and local governments—in connection with the protection of life and property, industrial and agricultural production, transportation, and civil aid and defense.

There are four general classes of these services:

Safety services—Marine, Aeronautical, Police, Fire, Forestry-Conservation, Highway Maintenance, Special Emergency, and State Guard.

Industrial services—Power, Petroleum, Forest Products, Special Industrial, Low-power Industrial, Relay Press, Motion Picture, Agriculture, and Radiolocation-land.

Land Transportation services—Railroad, Urban Transit, Intercity Bus, Taxicab, Automobile Emergency, and Highway Truck.

Amateur, Disaster Communications, and Citizens services.

These services continue to expand, as indicated in the statistical tables at the end of this chapter. The number of their authorizations now exceeds 232,000, representing the use of nearly 585,000 transmitters.

More and wider usage of radio is being employed for safety and special purposes. Direct public benefits are received from increased efficiency in police and fire protection, safety in navigation by ships and aircraft, emergency calls for doctors, ambulances, tow trucks, etc. The public benefits indirectly through the ever increasing employment in industry and commerce of modern radio equipment. It has been found that the operating efficiency of industry, transportation, pipeline, power and other utilities can be increased through the use of radio, thus providing better service at lower cost.

Licensing and regulatory problems become more complex as additional transmitters are permitted to operate. The privilege to use radio in these services is not exclusive but is granted for shared use of frequencies on the basis of applicant's membership in an eligible

group. Hence, a high level of compliance with regulations governing operation of these stations is necessary. This places an increasing importance on the functions of enforcement on a nationwide scale.

MARINE RADIO SERVICES

Safety at Sea

The basic radio laws currently governing marine safety at sea are contained in (1) the International Convention for the Safety of Life at Sea, (2) Title III, Part II of the Communications Act, and (3) the Ship Act of 1910, as amended. These laws require the installation of radio equipment, and provide for qualified radio operators and other safety features. They apply respectively to (1) certain classes of ships engaged on international voyages and registered in countries signatory to the Safety Convention, (2) certain classes of United States vessels when navigated on the high seas (approximately 1,882 ships), and (3) a few vessels on the Great Lakes. In addition, vessels of countries not parties to the Safety Convention are subject to Title III, Part II of the Communications Act when leaving United States ports.

The International Convention for the Safety of Life at Sea, which was negotiated in London in 1948, became effective November 19, 1952. In order to translate requirements of the new convention into rules for the guidance of industry and to facilitate Commission administration, the Commission on October 23, 1952, adopted brief temporary rules reflecting the additional minimum, nondeferrable requirements. This was an expedient due to the lack of sufficient staff to prepare in advance appropriately detailed rules. The use of the abbreviated temporary rules necessitated numerous subsequent interpretations.

Since November 19, 1952 some progress has been made in providing certain detailed rules. Thus, on December 3, 1952, detailed rules applicable to nonportable and portable compulsory lifeboat radio equipment were adopted. Thereafter, two types of portable lifeboat radio equipment, developed by the electronics industry in accordance with these rules, were type-approved by the Commission. Each consists of a single portable unit weighing not over 60 pounds, capable of floating after being dropped into the sea. Power is secured from a hand-driven generator. The unit contains a two-frequency (500 kilocycles and 8,364 kilocycles) radiotelegraph transmitter, an automatic keyer to permit transmission of the international radiotelegraph distress signal by a person unfamiliar with the International Morse Code, a dual frequency range radiotelegraph receiver, and an antenna system usable in any lifeboat regardless of whether or not a sailing mast is available to support it.

Title III, Part II of the Communications Act.—On March 5, 1953, the Commission submitted to Congress proposed amendments to this section. They were made in the interests of eliminating inconsistencies between the act and the new Safety Convention and to facilitate the administration of both laws. As of June 30, 1953, these proposals had not yet been introduced as bills.

Ship Act of 1910.—During the year the Commission proposed that Congress repeal the Ship Act as of November 13, 1954. On May 20, 1953, such a bill (S1947) was introduced. This proposal resulted from the conclusion of a treaty (Agreement for the Promotion of Safety on the Great Lakes by Means of Radio) with Canada, which will come into force on November 13, 1954. Under the terms of the agreement, radiotelephone safety is provided for several hundred vessels navigating the lakes. A study has been initiated, but not concluded, of legislation which might be necessary to implement this agreement. A parallel study has also been commenced to determine what related rules should be promulgated by the Commission but, because of lack of personnel, no substantial progress has been made.

Exemptions from compulsory safety requirements.—The Commission is authorized by the International Convention for the Safety of Life at Sea and section 352 (b) of the Communications Act to, within prescribed limits, grant exemptions from ship radio installation requirements to certain vessels or classes of vessels. Under this authority it renewed previously granted blanket exemption for one year to all passenger vessels of 15 gross tons or under when navigated not more than 20 nautical miles from the nearest land or more than 200 nautical miles between two consecutive ports; to all passenger vessels of less than 100 gross tons when navigated within certain prescribed areas along the United States coasts; and to a number of individual vessels, most of which were to cover a single voyage.

Individual applications for exemption received during the year numbered 48, of which 35 were granted. Only two vessels of more than 1,600 gross tons were granted original exemptions covering extended periods of navigation. One was a passenger vessel on very short voyages between Wilmington, Calif., and Catalina Island, Calif.; and the other was a cargo vessel specially constructed to use the New York State Barge Canal, which will be navigated on short coastwise voyages along the Atlantic Coast for a 3-month period each year. Both exemptions stipulated that a radiotelephone installation be carried and a radiotelephone watch be maintained.

Distress studies.—Studies of distress communication, made pursuant to section 4 (o) of the Communications Act, are used to strengthen the rules of the Commission to promote use of marine radio for safety of life and property. The international radiotelegraph

distress signal (SOS) was used throughout the world 273 times during the year. This was by or in behalf of 206 foreign ships, 23 United States ships, 37 foreign aircraft and 7 United States aircraft.

A telegraph alarm signal, transmitted before the distress signal, actuates autoalarms on vessels not maintaining continuous listening watch (generally cargo ships which carry only one operator), thus alerting the operator to receive the subsequent distress message. The effectiveness of this device was demonstrated in numerous distress cases during the year. One alarm signal sent by a coast station at Amagansett, N. Y., for the SS *Archimede* in distress in mid-Atlantic, sounded autoalarms on 82 ships within a radius of a thousand miles.

Radiotelephone automatic alarm.—Reports indicate that France and the United Kingdom have been actively engaged in the study program established by the International Radio Consultative Committee (CCIR) in 1951 for the purpose of determining the suitability of a provisionally adopted radiotelephone automatic alarm signal on the basis of thorough tests. By contrast, neither our Government nor industry has found it possible to participate to more than a limited extent. In view of the forthcoming seventh meeting of the CCIR to be held in the fall of 1953 at London, it would appear that adoption of a worldwide radiotelephone alarm signal will be considered without benefit of suitable practical tests in the western hemisphere.

Radio Aids to Navigation

Shore-based radar stations are being developed to assist in the safety piloting of ships entering, leaving, or mooring within harbors. Since the Coast Guard has the responsibility of providing and supervising public aids to marine navigation, the establishment of these private aids is effected only with its concurrence. Very high frequency maritime radiotelephone systems are being used developmentally by these radar stations.

Authorizations were renewed for operation on a developmental basis of shore-based radar stations in the harbors of Long Beach, San Francisco, and Los Angeles, Calif., and a new station at Port Angeles, Wash., was authorized. A station at New York, N. Y., was discontinued during the year. Two shore radar stations were authorized for use in the Gulf of Mexico for the navigation of vessels in connection with oil-well drilling operation.

As of June 30, 1953, approximately 2,262 United States ships were authorized to use radar.

General Marine Radio Communication Systems

Two-way communication between coast stations and ship stations using radiotelegraph or radiotelephone accounts for the great bulk

of frequency utilization in the maritime mobile service. Such communication may be public correspondence or for business or for ship operational purposes. Frequencies involved range widely throughout the radio spectrum covering service over distances of a few miles up to several thousands of miles. Thus, these stations may be in overlapping categories. However, the following figures (as of June 30, 1953) reflect some of the more important categories:

Utilizing frequencies in the 2–3 megacycle band for telephony:	
Public coast	47
Limited coast	4
Ship	34,800
Utilizing very high frequencies for telephony:	
Public coast	21
Limited coast	82
Public ship	1,360
Limited ship	690
Utilizing high frequencies for long distance telephony:	
Public coast	5
Utilizing various frequencies for telegraphy:	
Public coast	32

One of the most significant factors affecting maritime stations during recent years has been the substantial progress made in implementing the Atlantic City Table of Frequency Allocations below 27 megacycles. This has been carried on in accordance with principles, schedules and plans set forth in the Geneva (1951) Agreement. Because of the variety of frequencies employed in the maritime service, the impact of changes in frequency assignments has been felt very heavily by the maritime stations. However, with the cooperation of various licensees, many frequencies have been released for use by other services in accordance with Atlantic City allocations while the maritime services, on the other hand, have activated many of their new frequencies.

As far as the Maritime Radio Services are concerned, the 22 megacycle band has been completely implemented as well as lower frequency telegraph bands; the newly allocated 2 megacycle telegraph band has been established for use on a day-only basis; the 5 and 11 megacycle bands have been relinquished; regulatory steps have been completed for inaugurating on September 1, 1953, on a worldwide basis, the new high frequency ship telegraph calling bands and abandonment of the old calling frequencies by October 1, 1953; a plan has been adopted for assignment of new and relinquishment of old high frequency coast and ship telephone frequencies; and a plan of assignment of high frequency coast telegraph frequencies has been promulgated.

In connection with this implementation program, the first overall revision of 2 megacycle maritime telephone frequencies since 1934 has been promulgated as proposed rule making. This is of major importance since it promises to relieve somewhat the severe congestion existing in this band in which the great bulk of ship stations conduct radiotelephone operations. Another important consequence will be the complete establishment of the frequency 2182 kilocycles as the radiotelephone distress and calling frequency in the 2 megacycle band. The proposal also designates an intership frequency (2830 kilocycles) exclusively for the Mississippi River, Gulf, and Caribbean areas; another intership frequency (2738 kilocycles) for the Atlantic and Pacific coasts, and a third intership frequency (2638 kilocycles) for nationwide usage.

Maritime Fixed Services

Stations in the martime fixed service are classed as marine fixed, marine control, marine repeater, marine relay, and receiver test stations.

Sixty-nine marine fixed stations are licensed. They communicate on ship radiotelephone frequencies, being normally located in coastal waters, and are authorized to communicate with public coast stations primarily for safety purposes. This class of station is intended to meet the communication needs of the petroleum industry in off-shore oil well drilling operations.

Four marine control and one marine repeater station have been authorized in this service. Operation of these stations is in the 72–76 megacycle band and they function in connection with the operation of coast stations.

Alaska Fixed Public and Maritime Mobile Services

Alaskan communities depend largely on radiotelephone and radiotelegraph communication for safety and business purposes because of the scarcity of wire line facilities. Special frequencies are allocated for communication between communities in Alaska, by the Alaska Communication System (ACS) and between coast and ship stations. The main intra-Alaska communication trunk lines are operated by ACS under the Department of National Defense. The ACS routes message traffic to all parts of the world. The Commission maintains liaison with it in coordinating communications facilities in Alaska to serve the public interest.

Revisions contemplated of Part 14 of the Rules Governing Radio Stations in Alaska dealing with the fixed public and maritime mobile

services. This project has been delayed because the limited Commission staff must give priority to more pressing work.

The Commission has partially implemented the Geneva frequency allocations for Alaska. This includes point-to-point operation on low frequencies in the fixed service, coastal telegraph in the medium frequency band, and replacement of two radiotelephone frequencies for point-to-point coast and ship communication. In addition, provision is made for assignment of a 2 megacycle coastal telegraph frequency for Alaska in accordance with the Geneva Agreement.

At the close of the fiscal year there were, exclusive of Government stations, 447 point-to-point telephone stations and 69 point-to-point telegraph stations operating in the fixed public service in Alaska. In addition, 10 public coast stations employing telegraphy and 358 public coast stations employing telephony are authorized.

Radio Technical Commission for Marine Services

The Radio Technical Commission for Marine Services (RTCM) was organized in 1947 so that Government and industrial agencies with marine electronic interests have a joint voice in determining the program and operations by which technical policies are recommended. The RTCM is a nonprofit organization and is supported by financial contributions from industry members and services from the Government. The Commission furnishes an electronics engineer as Executive Secretary for the RTCM.

Six special committees of RTCM are in operation:

Special Committee 16 is studying the need for a commercially adaptable and positive all-weather marine identification device to aid in the reduction of marine casualties and to facilitate the safe movement of vessels in congested and restrictive areas. This committee is giving primary consideration to the use of such a device by and between vessels equipped with marine radar and radio communication.

Special Committee 17 is studying the technical requirements for compulsory radiotelephone installations. The study, when approved by the RTCM, will contain recommendations for the efficient, practical and expeditious implementation of the requirements which must be met by Government and industry in carrying out the terms of the Safety of Life at Sea Convention.

Special Committee 18 was formed for the purpose of recommending a system of channel designators for maritime mobile channels. Its function is to provide a simple and standardized method of identifying the various radiotelephone channels and thereby eliminate the need of referring to channels by the frequency or frequencies used.

Special Committee 19 was organized to determine the nature and potential value of an effective maritime radiotelephone system for short range intercommunication for use by all types of military and nonmilitary vessels to meet the needs of ship operators.

Special Committee 21 was established for the purpose of studying ways and means to improve the present shipboard direction finder marine radiobeacon (285–325 kilocycle) system.

Special Committee 22 is studying the problem of providing worldwide common working frequencies for the maritime telephone service. The RTCM recommendation may furnish the basis for the United States proposal for the next Extraordinary Administrative Radio Conference.

AERONAUTICAL RADIO SERVICES

General

The Aeronautical Radio Services provide the necessary radio facilities for communication essential in connection with aircraft operation and safety of life and property in the air. These facilities consist of Aircraft radio stations, Aeronautical Land and Aeronautical Fixed stations, Airdrome Control stations, Aeronautical Mobile Utility stations, Aeronautical Advisory stations, Flying School stations, Flight Test stations, Aeronautical Public Service stations, Civil Air Patrol land and mobile stations, and Navigational Aid stations comprising radio beacons, radio ranges, radar services, direction finding systems, traffic control operations, approach and instrument landing systems, radio altimeters, and distance measuring devices.

Aviation Organizations and Conferences

The Commission has continued its participation in the various interagency coordinating and policy groups, both on a domestic and international scale, in order to deal with the many new problems which are occurring as a result of increasing telecommunications developments. The most important of these groups are the Air Coordinating Committee (ACC), the Radio Technical Commission for Aeronautics (RTCA), and the International Civil Aviation Organization (ICAO).

The ACC recommends United States policy on aviation to the President, and acts as a vehicle for coordinating aviation matters between the various departments of the Government and industry. The Commission is active in the ACC through its membership on the Technical Division and the following subcommittees of that division. Aeronautical Communications and Electronic Aids; Airspace—Rules

of the Air and Air Traffic Control; Search and Rescue; and Airmen Qualifications.

In addition, the Commission is represented on the Air Traffic Control and Navigational Panel which was established by the ACC on recommendation of the Congressional Aviation Policy Board and the President's Air Policy Commission, for the purpose of guiding the program for providing all-weather air navigation and traffic control facilities as well as a national air defense system.

The Commission is a member of the Radio Technical Commission for Aeronautics, which is a cooperative association of Government and industry aeronautical telecommunication agencies. The RTCA conducts studies of aeronautical telecommunications problems and related matters for the purpose of providing guidance to, and coordinating the efforts of, all organizations concerned. The Commission participates in meetings of the RTCA Executive Committee and serves on several of its special technical subcommittees. During the year it was active in connection with the following problems under consideration by the RTCA:

Implementation of the very high frequency utilization plan and review of transition period communication requirements;

High altitude grid plan for very high frequency omnidirectional radio range and distance measuring equipment (VOR/DME) frequency pairing;

Minimum performance standards for airborne electronic equipment for the transition common system;

Amended program for implementation of the common system of air navigation traffic control;

Evaluation of the necessity for VOR test signals; and

Helicopter air navigation communications and traffic control.

The International Civil Aviation Organization was established in 1944 for the purpose of developing standards, and to recommend practices for international civil aviation. During the fiscal year, the Commission (*a*) assisted in the preparation of the United States Navigation Conference which was held in Montreal; (*b*) assisted in preparing for and participated in the ICAO European-Mediterranean Frequency Planning Special Meeting, Paris; and (*c*) assisted in preparing for and participated in the ICAO Southeast Asia-South Pacific Regional Air Navigation Conference, Melbourne.

The Extraordinary Administrative Radio Conference (EARC) of the International Telecommunications Union (ITU) Geneva, 1951 concluded an agreement which allocated exclusive frequencies for the Aeronautical Mobile Route (R) service. During 1952 and continuing through the fiscal 1953, the Commission has participated in frequency planning and the implementation of this agreement.

Aircraft Radio Stations

At the end of the fiscal year there were more than 30,000 authorized aircraft radio stations, which represents an increase in the number of such stations over that of 1952. Of this figure nearly 28,000 were installed aboard private aircraft.

Aeronautical Land and Fixed Radio Stations

These stations provide non-Government radio communication service necessary for the safe, expeditious, and economical operation of aircraft. Aeronautical land stations are used to communicate between the ground and aircraft in flight. In accordance with Civil Air Regulations, domestic air carriers are required to maintain ground-air-ground communication at terminals and at such other points as may be deemed necessary by the Government to insure satisfactory communication over the entire certificated routes. Such a system is independent of radio facilities provided by Government agencies.

Aeronautical fixed stations are authorized for point-to-point communication to enable operators of airlines to conduct their business more efficiently. The use of these stations is authorized in the United States only where there are no land line facilities available; however, in international operations and in Alaska aeronautical fixed stations provide the primary service.

At the close of fiscal 1953 there were 1,343 authorized aeronautical land and aeronautical fixed stations, which is an increase of 160 such stations over fiscal 1952.

Civil Air Patrol Radio Stations

These stations provide the necessary communication for Civil Air Patrol activities and emergencies pertaining to the protection of life and property. Air shows, missing aircraft search missions, training missions, and communications systems at encampments, bases, and meetings are examples of their activities. To further Civil Air Patrol activities, the United States Air Force has made certain frequencies available for assignment to the CAP.

At the end of fiscal 1953 there were 6,620 authorized land and mobile CAP radio stations as compared with only 798 the year previous.

Airdrome Control Stations

This type of station provides communication between an airdrome control tower and arriving and departing aircraft for the purpose of regulating the separation of aircraft to avoid collision and for main-

taining an efficient flow of traffic into and out of an airport. An airdrome control station also communicates with aeronautical mobile utility stations aboard essential vehicles of an airport.

Airdrome control stations, for the most part, are operated by the Civil Aeronautics Administration; however, at the end of the fiscal year 1953 there were 47 such stations authorized by the Commission.

Aeronautical Mobile Utility Stations

This class of station is installed aboard crash, maintenance, fire and other vehicles which operate on an airdrome in order that the airdrome control operators may direct the movements of such vehicles as necessary.

At the end of 1953 there were outstanding 124 aeronautical mobile utility stations licenses.

Aeronautical Navigational Aid Radio Stations

These stations transmit special radio signals for the purpose of enabling an aircraft to determine its position with reference to the navigational facility involved. Included are radio beacons, radio direction finders, radio ranges, localizers, glide paths, marker beacons, and ground control approach stations.

This service, for the most part, is operated by the Civil Aeronautics Administration; however, 226 of these facilities are licensed by the Commission and installed at locations not served by the CAA.

Flying School Radio Stations

Flying school radio stations aboard aircraft and on the ground are used for communicating instructions to flight students or pilots while actually operating an aircraft.

There were 12 such licensed stations at the end of the year.

Flight Test Radio Stations

A flight test radio station is a station aboard an aircraft or on the ground used for the transmission of communications in connection with the test of aircraft or major components of an aircraft.

As of June 30, 1953, licensed flight test radio stations numbered 101.

Aeronautical Advisory Radio Stations

These ground radio stations provide advisory communication service to aircraft pertaining to the condition of runways, types of fuel

available, wind conditions, available weather information or other information which may be necessary in connection with their safe and expeditious operation.

They may also be used for communicating with private aircraft engaged in organized civil defense activities in event of enemy attack. Further, these stations may, on a secondary basis, communicate with private aircraft engaged in organized civil defense preparations for possible enemy attack.

At the end of fiscal 1953 there were 327 aeronautical advisory radio stations.

Aeronautical Public Service Radio Stations

The public service type of aircraft station has been provided for public correspondence between private individuals aboard aircraft in flight and persons on the ground, and affords communication similar to those available by use of the public telephone. These stations connect to the land line telephone system through the facilities of public coast stations. This service has increased each year largely due to the fact that operators of the "executive" type aircraft consider telephone communications to be essential in their businesses.

There are now 380 such stations.

PUBLIC SAFETY RADIO SERVICES

The Public Safety Radio Services comprise six separate services, namely: Police, Fire, Forestry-Conservation, Highway Maintenance, Special Emergency, and State Guard.

The name of each service is indicative of its use; that is, police radio stations are for communication relating directly to public safety and to the official business of police departments; fire departments, for communication incidental to suppression of fires, generally in urban areas; while forestry-conservation radio stations are employed in connection with the detection and suppression of forest fires and for conservation work. The terms "State Guard" and "Highway Maintenance" likewise describe the use for which these stations are intended. Special emergency radio has a variety of uses incident to emergency.

Police Radio Service

The Police Radio Service had its official beginning in 1928 when the Federal Radio Commission allocated 8 frequencies between 1700 and 2300 kilocycles for police communication. Licenses for such sta-

tions do not appear to have been granted, however, until in 1930, and for a time only a few of the larger cities manifested an interest in radio for police communication. Since then, there has been a constantly increasing demand for police radio facilities and now almost every hamlet in the United States has radio-equipped scout or patrol cars. Many port cities have police radio units installed in harbor patrol boats; other licensees have installed police radio stations in airplanes. The result is that police radio stations now operate on the ground, in the air, and on the water.

Licenses in the Police Radio Service are available to states, counties, cities, towns, and other instrumentalities of local government which maintain organized police departments.

The normal police radio station consists of a base station, usually located at police headquarters, and a group of radio-equipped cars. The radio-equipped cars may include not only official police cars but also ambulances and emergency vehicles used to clear highways of obstructions, etc. The base stations may communicate with each other, thus providing the police departments with a means of setting up extensive road blocks and otherwise cooperating with each other. This type of operation is conducted by voice communication.

There is police need for the dissemination of a large volume of information regarding wanted persons, stolen automobiles and inquiries regarding individuals. This type of communication is speeded by radiotelegraph circuits and wire line teletype. To provide this service, zone and interzone radio stations are used in many localities. The interzone station serves a group of zone stations and intercommunicates with other interzone stations. While there are several zone and interzone stations in the eastern part of the country, the greater part are distributed throughout the midwest with another concentration along the west coast.

As of June 30, 1953, 8,005 police stations held radio licenses.

Prior to 1948, the frequency band 72–76 megacycles was available for base and mobile radio stations in the police and other public safety radio services. However, pursuant to formal rule-making proceedings concluded May 5, 1948, the Commission allocated that frequency band exclusively to fixed operation and ordered licensees of base and mobile stations to vacate it within five years.

Relinquishment of that frequency band for base-mobile operation was accomplished with one exception. The city of Philadelphia, Pa., requested that its several base police radio stations be permitted to continue to operate on the frequency 74.06 megacycles. It alleged that interference would not be caused to television reception by reason of such operation since TV channels 4 and 5 are not allocated for use in the Philadelphia area, and that the cost of making the required

frequency change would be about $336,000. In view of the hardship shown, the Commission granted the petition to the extent that an additional 2 years were allowed for the city to make the required frequency change.

Fire Radio Service

The Fire Radio Service is available to fire departments and other organizations, including volunteer fire departments, responsible for fire protection in urban and suburban areas. The usual installation consists of a base station with an associated group of radio-equipped vehicles. In addition, many departments keep a number of lightweight transceivers (combination transmitters and receivers) which are carried by hand in the fire area and even into burning buildings. Instructions and requests for specific help can be transmitted between personnel at the fire to nearby mobile station for further relay to the base or headquarters station. This service has increased greatly since the eligibility requirements were expanded to include non-government organizations such as volunteer fire departments.

At the close of the year, the total number of fire radio stations was 1,134.

Forestry-Conservation Radio Service

This service is used primarily in rural areas incidental to the detection and suppression of forest fires, and to facilitate work performed in the preservation of timber, game, and other natural resources. Almost all stations operated in this service are licensed to State governments. However, a few stations are operated by private organizations responsible for the care of privately owned forest areas.

The usual forestry radiocommunication system consists of a chain of base stations, most of which are located in fire observation towers and area headquarters buildings, together with many radio units installed on trucks, bulldozers, plows, tankers and other fire suppression vehicles, as well as small hand sets carried by the fire fighters.

Due to the isolation of forest fires, considerable difficulty is encountered in reaching the scene. To cope with this situation, the usual practice is to parachute men and equipment, including a portable transceiver, in the immediate area. Here an on-the-spot observation is made and, if the fire has burned beyond control, a request for additional help can be sent by means of the portable radio which was dropped with the other gear.

There were 2,425 forestry-conservation stations licensed at the year's end.

Highway Maintenance Radio Service

This service is available to instrumentalities of government such as States, cities, and counties for use by their highway departments. Radio communication by highway departments has many advantages in connection with the clearing of obstructions from highways and the prompt marking of road hazards such as bridge washouts, falling stones, and other unexpected road impediments. Another advantage is the saving in money that can be realized by the more efficient dispatching of heavy, expensive road-construction equipment and crews through the use of radio.

Effective June 22, 1953, the Commission amended section 10.404 of the Highway Maintenance Radio Service Rules by the addition of a new paragraph (*c*) to require licensees in that service, which employ a frequency or frequencies shared with the Special Emergency Radio Service, to conduct listening tests before transmitting, and to refrain from transmitting until a reasonable determination is made that harmful interference will not be caused to communication in progress on the frequency. At the same time section 10.405 (*c*), which limited licensees in the Highway Maintenance Radio Service (except States) to use of only one frequency, was amended to permit, upon a satisfactory showing of need, use of more than one frequency.

This service totaled 877 stations.

Special Emergency Radio Service

Licensing in the Public Safety Radio Services is limited, almost exclusively, to instrumentalities of State or municipal government. However, authority to operate in the Special Emergency Radio Service may be granted to any person or organization able to meet the statutory citizenship requirements and to show special conditions requiring use of radiocommunication in emergencies. Eligibles in this service include organizations established for relief purposes in emergencies which have a disaster communication plan, such as the American Red Cross; physicians and veterinarians practicing in rural areas; ambulance services and rescue organizations; beach patrols responsible for life saving activities; school bus operators in rural areas; and communications common carriers desiring standby facilities for use in an emergency when wire lines fail or for use incidental to emergency repair of public communication facilities.

During the past year the Commission revised, substantially, its rules relating to the Special Emergency Radio Service. These changes were made in formal rule-making proceedings (docket 10174) which became effective March 27, 1953. These amendments set forth eligibility requirements in respect to each class; define the class and num-

ber of stations each eligible may operate; describe permissible communications, and detail other particulars concerning the use which may be made of stations by each eligible group.

Among significant changes made was the clarification of the eligibility of physicians by changing the term "remote area" to "rural area" and defining rural area as one outside of a population center of 2,500 or more persons; deletion of the requirement that other communication facilities not be available as a prerequisite for eligibility of rural area physicians, veterinarians, and school bus operators; provision for communications common carriers to utilize this service incidental to emergency repair of public communications facilities; and provision for the secondary use of certain ship telephone frequencies by isolated area special emergency fixed stations where appropriate arrangements can be made with a public coast station. In addition, provision was made for use of emergency standby facilities by private as well as common carrier communication circuit operators during periods of failure of the normal communication circuits.

The number of stations authorized in this service on June 30, 1953, was 1,072, an increase of 402 during the year.

State Guard Radio Service

This service is available to State governments which create state guard organizations to replace the local National Guard when the latter is called into Federal service. To date, only two States—Texas and Connecticut—have obtained licenses in this service. They cover 118 stations.

Civil Defense

Many city and state governmental organizations are obtaining licenses for additional facilities to meet increased civil defense requirements. The Public Safety Radio Services, in conjunction with the Disaster Communications Service and the Radio Amateur Civil Emergency Service, must be ready to furnish critical civil defense communication in the event of enemy attack. Preparation by many State and city governments includes appropriation of funds, which in some cases are matched by the allotment of money by the Federal Civil Defense Administration, to buy radio equipment such as auxiliary base stations, emergency power supplies, and extra mobile units. Present civil defense planning contemplates the assignment of civil defense duties to the different public safety radio services in case of attack.

Licensees in the various Public Safety Radio Services, except the Special Emergency Radio Service, have organized voluntary national,

regional and local committees to assist in the planning and utilization of radio facilities and to aid applicants in planning their radio systems. Frequencies allocated to the public safety services are available only upon a shared basis; hence, close cooperation among licensees is required for orderly and efficient operation. The Commission maintains close liaison with these committees and, annually, sends representatives to their principal conferences and meetings. Many mutual problems of the Commission and the licensees are thus resolved without recourse to hearings and other formal proceedings.

AMATEUR RADIO SERVICE

General

The Amateur Radio Service is a means by which interested persons may engage in nonprofessional radio communication and experimentation as a hobby. It is one of the oldest radio services and has served as a training ground for future electronics and communications experts, and the discovery of many new electronic techniques had its origin in amateur experimentation. Many of the nation's leading authorities on radio trace the beginning of their careers to operation in the amateur service.

In order to participate in amateur activity it is necessary to qualify for an amateur operator license and to obtain a station license. The applicant must be a citizen of the United States and must demonstrate ability to send and receive the International Morse Code, and knowledge of radio theory, operation, laws, treaties and regulations applicable to the amateur service. Depending upon the applicant's knowledge and ability and the operating privileges desired, five classes of operator licenses ranging from the Novice to the Extra are available by examination.

Amateurs engage in experimentation; they design and construct equipment, and communicate with other amateurs all over the world. This, and the frequent and extensive communication service amateurs have provided in nearly every natural disaster, more than justifies the privileges conferred upon them in licenses granted by the Commission.

At the end of the fiscal year there were some 111,389 amateur radio station licenses and 108,951 amateur operator licenses in effect. The number of amateur station licenses is slightly higher than the number of amateur operator licenses because many operators are the licensee of more than one amateur station, either as trustee-licensee of one used by an amateur radio club or a military unit, or as owner of personal stations at more than one address.

The popularity of the Novice class operator license, which is the most elementary type of amateur operator license available, is re-

flected by the fact that 9,386 such licenses were issued in a year. In the same period 3,652 Technician class licenses were issued. The number of Extra class licenses at the close of the year was over 1,300.

Despite an enviable record of self-policing on the part of the amateurs, it was necessary for the Commission to issue a number of citations relating primarily to frequency deviations or other infractions of rules. The Commission suspended the licenses of 4 amateurs involved in more serious violations of rules and revoked 2 licenses.

Radio Amateur Civil Emergency Service

The most important change in the amateur rules during the year was the establishment of the Radio Amateur Civil Emergency Service (RACES) on August 15, 1952. This service will enable radio amateurs to provide radio communication for civil defense purposes on a local, regional, and national basis during the present national emergency. The planning for this service was coordinated with Government, military, and civil defense agencies.

The RACES rules are substantially the same as those proposed by the Commission on December 19, 1951. They do not change the existing amateur rules, but are additions thereto. Stations operating in that service will utilize certain frequencies in the bands regularly allocated the amateur service. Public announcement of these selected frequencies was made simultaneously by the Federal Civil Defense Administration and the Commission on January 17, 1951. Under these rules, amateurs holding operator and station licenses (other than Novice or Technician) may apply to the Commission for authority to operate in the RACES. However, such applications must be in accordance with the provisions of the RACES rules and the proposed operation be under and in accordance with an approved civil defense plan.

A station in the RACES may consist of one or more transmitters, fixed or mobile. A network would consist of a combination of stations operating in a given area under the same communication plan in conjunction with a single control station. Local networks are organized by the civil defense authority of the area concerned and are under the immediate direction of the Civil Defense Radio Officer. Stations in this service communicate with each other and with stations in other services, including Government stations. Communications may relate to any phase of civil defense work including practice tests and drills, safety of life, preservation of property, maintenance of law and order, or related emergency matters.

Unless the present national emergency intensifies to the extent that normal amateur communication must be suspended, operation of stations in the RACES must be on a shared basis with normal amateur operation on the same or adjacent frequencies. However, the Commission expects that all amateurs will extend full cooperation to the civil defense effort and will respect any appropriate request to suspend operation on a particular frequency or frequency band during the progress of civil defense drills in cases where interference might otherwise be caused to civil defense communication.

The first authorizations in the RACES were issued to radio amateurs in the District of Columbia on March 6, 1953, and the communications plan approved for the District of Columbia was the first such plan received by the Commission in appropriate form. At the close of the fiscal year the Commission had issued 99 RACES licenses authorizing operation in accordance with 12 approved communications plans. Two applications were pending.

Other Amateur Rule Changes

Several other changes were made in the amateur rules during the year. The geographical divisions of the United States into areas in which the 1800–2000 kc frequency band can be utilized by radio amateurs were modified to provide more satisfactory sharing of frequencies in that band with the Loran system of radionavigation.

Radiotelephone privileges were provided in the 3.5 and 14 megacycle amateur radiotelephone bands for all classes of amateur radio operators except Novice and Technician. For more than two decades operation in these radiotelephone bands, because of possibilities of interference to other operation, was restricted to holders of the highest class of amateur operator license. However, modern equipment and techniques are such that the restriction is no longer justified as a precaution against interference.

Radiotelephony was authorized in the 7200–7300 kilocycle portion of the frequency band 7000–7300 kilocycles, which heretofore has been reserved exclusively for A1 (radiotelegraph) emission. Provision was also made for radioteleprinter operation in the so-called cw portion of the 3, 5, 7, and 14 megacycle frequency bands. Radiotelephony and radioteleprinter operation likewise was provided for in the new amateur frequency band 21,000–21,450 kilocycles. Station identification procedure was simplified, and additional frequency space provided for the Novice operator in the frequency bands 7000–7300 kilocycles and in the new 21,000–21,450 kilocycle band. The

rules governing operation in emergencies were modified by specifying procedure for the expeditious declaration of a state of communications emergency in any critical area, and for clearing normal amateur operation from the frequencies selected for the emergency communication.

Following the receipt of a petition, which in effect requested that radio amateurs operating aboard ship outside the territorial limits of the United States be permitted to use the new 21,000–21,450 kilocycle frequency band in addition to frequencies already available for that purpose, the Commission on May 13, 1953, proposed rules to that effect.

Also pending are three petitions which request confinement of single side band voice operation to a small portion of the 3.5–4.0 megacycle band; allocation of 3.75–3.80 megacycle exclusively to mobile voice operation; expansion of voice privileges to include the 14.30–14.35 and 28.25–28.50 megacycle segments of the 14 and 28 megacycle amateur bands; provision for the use of type AØ emission in the 52.5–54.0 megacycle segment of the 50 megacycle amateur band, and provision for Novice operation, including voice, in the 51.0–53.0 megacycle segment.

Amateur-TV Interference

Interference to the reception of television broadcasting continues to be a matter of mutual concern to the Commission and to amateurs. The Commission is continuing study with a view to clarifying individual responsibilities in cases where the operation of amateur stations cause interference to TV reception; however, definite standards have not yet been adopted.

The Commission's field engineers, individual amateurs and amateur committees have accomplished outstanding results in clearing many interference cases. Upon investigation, a great number of cases attributed to amateur operation have been found to be due to other causes. In a majority of cases where the interference came from the operation of an amateur station, the fault was found to rest with the inherent sensitivity of TV receivers to frequencies outside the TV channels. Usually, simple filtering and shielding applied to the TV receiver has eliminated the interference. In most cases where the radiation of spurious and harmonic emissions by an amateur transmitter in the TV channels has caused interference, the amateurs have been able to eliminate such interference satisfactorily. In only a small percentage of such cases has it been necessary to enforce corrective action.

Public Service of Amateurs

In keeping with their record of public service in prior years, the radio amateurs again rendered outstanding aid during a number of disasters during the past year. Some 60 amateur stations handled communications on August 30 and 31, 1952, as a result of damage caused to communication facilities by a hurricane which struck the Carolina coast. Over 100 amateur stations provided emergency communication following the earthquake in the southern California area on the early morning of July 21, 1952. Late in November 1952, a 22-inch snowstorm fell in Kentucky, Virginia, and Tennessee. More than a half dozen cities in eastern Tennessee were without communications with the outside world except for amateur radio. Some 200 radio amateurs handled a large number of messages for Government agencies, wire services, power companies, and state and local authorities, including many personal messages for individuals.

Fourteen amateur stations handled telephone and telegraph communications when southwestern Minnesota, particularly Fairmont, Minn., was crippled by a severe sleet storm followed by a blizzard on January 14, 1953. On March 28, 1953, 100 amateurs handled traffic and emergency communications in Maine during severe floods. On May 11, 1953, Waco, Tex., and vicinity was lashed by a tornado. Radio amateurs in the area did yeoman duty clearing outgoing traffic and in bringing aid to the stricken area.

Amateur Operation Boon to Physically Handicapped

The value of amateur radio to physically handicapped persons is an important consideration. The Commission receives many reports of its therapeutic and morale building influence in such cases. Blind persons find amateur radio a satisfying diversion, and the Commission has licensed a considerable number of such amateurs. Amateurs confined to beds or wheelchairs are able to converse with other amateurs in far places, handle messages for third parties, and even participate in amateur civil defense activities.

DISASTER COMMUNICATIONS SERVICE

The Disaster Communications Service is designed to provide essential radio communication in connection with disasters or other incidents which involve loss of normally available communication facilities or which require temporary establishment of supplemental facilities. The frequency band allocated to this service—1750 to 1800

kilocycles—was set aside pursuant to a proposal made in the Commission's Report of Proposed Frequency Allocations Below 25,000 Kilocycles of May 21, 1945, although the service was not actually established until March 21, 1951.

Any person eligible to hold a radio station license is eligible for a license in the Disaster Communications Service, provided that the station will constitute an element of a bona fide communications network organized, or to be organized, and operated in accordance with a locally or regionally coordinated disaster communications plan. United States Government stations may also operate in this service if authorized to do so by their controlling agencies.

When there is no impending or actual disaster, stations in this service may communicate only with respect to drills and practice sessions and conduct necessary equipment tests. When there is an emergency or disaster, they may be used for all communication necessary or essential to relief work, including the transmission of personal messages for individuals directly affected.

For the most part, applications submitted and disaster communications plans filed during the past year related to use of these stations for civil defense purposes.

As of June 30, 1953, 191 disaster communications stations had been licensed.

INDUSTRIAL AND LAND TRANSPORTATION RADIO SERVICES

The Industrial and Land Transportation Radio Services provide for the use of radio by various commercial and industrial enterprises which have a need for their own private radio communications systems. These systems represent a comparatively new industrial tool, the popularity of which is spreading rapidly. Today radio is used to coordinate and speed the movement of materials and men in steel mills, in coal mines, on railroads, trucks and buses; it is used to help discover oil on land and under offshore waters; and then used to speed the flow of oil and gas through pipelines. In short, it has a place in almost every phase of industry.

In order to simplify the administration of these services, frequencies are allocated and eligibility is determined on an industry-wide basis. All frequencies are shared, and to qualify one need show only that he is engaged in the particular type of industrial operation for which frequencies have been provided. This permits the handling of many more applications than would be possible if individual determinations had to be made in every case as is done in the common carrier

and broadcast fields. However, although all frequencies are available on a shared basis only, care must be taken in making assignments so that interference between users will be minimized. To this end, many of these industries have set up frequency advisory committees. These committees have made substantial contributions by guiding and supplying applicants with information relative to the selection of frequencies.

Channel-Splitting

The ever increasing demand for two-way radio communication is taxing the capacity of the radio spectrum. As soon as a radio service receives public acceptance, the inevitable problem of too many users for too few channels arises. This makes it necessary to seek an answer to the problem of how to increase the utilization of the frequencies available. A recent development that offers considerable promise in alleviating some of the congestion is known as channel-splitting. The net result of channel-splitting would be to provide more channels in the same amount of space.

At the present time, the Commission has under consideration a plan that is being worked out jointly with industry looking toward inaugurating a channel-splitting program during the coming year. The great problem here is how a changeover can be made, especially in the more crowded parts of the spectrum, without too rapid obsolescence of equipment already in use. In addition, the Commission has initiated a frequency utilization study looking toward a revaluation of the frequency requirements of these radio services. The results may indicate that some adjustments are necessary among the present classes of users.

Microwave

Of increasing importance are the frequencies above 890 megacycles which are available for point-to-point communication. These are known as microwaves and they are especially well suited for those systems which require special circuits between specific points. Because of their line of sight characteristics, they can be directed much the same way as a spotlight. These channels are wider than standard radio circuits and more intelligence can be transmitted over them. Because of this, a single multichannel microwave system may provide a licensee with a private phone system capable of handling a dozen or more simultaneous conversations, several teletype and facsimile circuits and the remote control of unattended industrial equipment.

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Thus far the principal users have been the so-called right-of-way industries such as public utilities, pipelines, and railroads.

There are still many things to learn about transmissions in this portion of the spectrum and no one can speculate with certainty concerning their future but already microwave relays have shown that they will play a vital part in meeting the communication needs of our nation in peace or in war. Their ability to withstand the storms and icing that have plagued pole-supported wire lines is a major reason for believing that the thousands of miles of microwave relays now in service and being constructed will take their place alongside wire, cable, and coaxial systems as a conveyor of the world's messages.

Other Developments

Another recent development which promises to alleviate some of the spectrum congestion is the use of frequencies in the vicinity of 450 megacycles. Experimentation has proved that frequencies of this order are extremely well adapted for mobile communications in urban areas. Since it is in these areas where much of the congestion occurs, it is believed that some relief at least can be achieved here. To further encourage the use and development of this band, the Commission recently rearranged the frequencies available to the various services in order to provide greater flexibility in making assignments.

The Commission is faced with perplexing problem in the Industrial and Land Transportation Services relating to the use of frequencies in the band 72–76 megacycles. These frequencies have been used to provide numerous public safety and industrial point-to-point circuits which are generally links in a mobile radio communications system. They are particularly valuable because they are the only frequencies available for domestic communication between fixed points that do not require line of sight transmission paths. However, the 72 to 76 megacycle band is adjacent to television channels 4 and 5. This creates a serious interference potential which, with the recent rapid growth of TV broadcasting, is becoming more acute. The Commission has proposed rule making looking towards a solution which will reasonably protect TV reception on the one hand and permit continued use of these vital communication circuits on the other. Unless a satisfactory solution can be found, the efficiency of many of these mobile systems, particularly those operating in mountainous terrain, will deteriorate.

At the year's close there were more than 17,000 authorizations in the Industrial Radio Services and nearly 10,000 in the Land Transportation Radio Services.

CITIZENS RADIO SERVICE

The Citizens Radio Service provides for the use of radio by any person who is not eligible in any of the other established radio services. Its facilities may be used for private or personal radiocommunication, radio signaling, control of objects or devices by radio, and for other purposes not specifically prohibited by the regulations.

The Commission has continued a policy of encouraging the development and use of the Citizens Radio Service which, due to the absence of readily available equipment, had failed to expand until recently. In the year past, however, this service has experienced a phenomenal growth due in part to the availability of commercial equipment designed for operation in the land mobile bands adjacent to the citizens band, and in part to the widespread acceptance and use of the recently added 27.255 megacycle frequency which is available for, among other things, the control of objects such as model planes, etc.

To further encourage the development and manufacture of low-cost transmitting equipment for use in this service, the Commission recently proposed to relax the technical standards applicable to the low-powered equipment of the "walkie-talkie" type.

Citizens radio authorizations now approach 4,000.

ENFORCEMENT UNIT

The Enforcement Unit, in addition to centralizing enforcement and compliance activities of the Safety and Special Radio Services Bureau, acts as legal adviser to the chief of that bureau on special legal, policy, and legislative problems. In the previous year the time of this unit was about equally divided between enforcement matters and special problems. During this year considerably more than half of its time had to be devoted to the latter, because of the variety of new issues arising under the Communications Act Amendments of 1952.

Steps continued to be taken to further revise the internal enforcement procedures for more effective compliance. These were highlighted by delegations of authority to the bureau chief to act on certain enforcement matters which previously had to be disposed of by the Commission en banc. Also, revisions of enforcement procedures applicable to license revocation and cease and desist proceedings became necessary in order to meet the Communications Act amendments.

The imposition of monetary forfeitures under title III, part II of the act continued, as in the previous years, to be an important part of enforcement activities. The Commission is empowered, upon appli-

cation, to remit or mitigate the forfeitures incurred. A total of $4,750 was collected. The prompt application of these penalties in improving the general level of compliance is more important than the sum collected.

APPLICATION PROCESSING

Since application processing activities in the Safety and Special Radio Services were consolidated into one division during fiscal 1951, considerable progress has been made toward standardization and simplification of filing and handling applications. A new renewal form (FCC Form 405–A) and associated procedures have been in use for over a year. Renewals in these services are now issued within 5 to 10 days of receipt, except where it is necessary to delay issuance until 30 days before expiration in accordance with section 307 (d) of the act. This form is filled in completely by the applicant from information on his current license, notarized, and upon approval by the Commission, the certificate of renewal is validated and returned to the applicant for attachment to his license. New FCC Forms 400 and 400–A for applications in the Public Safety, Industrial, and Land Transportation services have been in use for more than 5 months. These are combined application and authorization forms which are completed by the applicant and, if in order, are approved by the Commission without the necessity of preparing authorization documents.

An increased use of form letters, application return "check-off" letters, and bulletins explaining the several safety and special services has resulted in less manually prepared correspondence and quicker replies to the public. Most inquiries which are not of a highly specialized nature are now being answered by the newly established Public Reference Room by means of such printed material, thus removing the load from the application processing groups for each of the services.

STATISTICS

Number of Stations in Safety and Special Radio Services

Stations in the Safety and Special Radio Services (exclusive of experimental, which are treated in a separate chapter) exceeded 232,000 at the close of the fiscal year. This represents a net increase of about 20,000 during the year. The numbers of authorized stations in the various services are shown below:

Class of station	June 30, 1952	June 30, 1953	Increase or (decrease)
Aeronautical Services:			
Carrier aircraft	1,921	2,190	269
Private aircraft	27,678	27,945	267
Public service aircraft	364	380	16
Aeronautical and fixed	1,183	1,343	160
Civil air patrol	798	6,620	5,822
Airdrome control	59	47	(12)
Aeronautical navigational	166	226	60
Flight test	100	101	1
Flying school	20	12	(8)
Aeronautical utility mobile	105	124	19
Aeronautical advisory	209	327	118
Total	32,603	39,315	6,712
Marine Services:			
Ship	32,229	36,889	4,660
Ship radar	1,958	2,282	324
Coast	107	196	89
Marine utility		10	10
Alaskan coastal	379	368	(11)
Alaskan fixed public	568	516	(52)
Maritime radiolocation service	22	20	(2)
Maritime fixed service	64	76	11
Other marine services	173	0	(173)
Total	35,500	40,357	4,857
Public Safety Services:			
Police	7,008	8,005	997
Fire	764	1,134	370
Forestry-conservation	2,070	2,425	355
Highway maintenance	555	877	322
Special emergency	670	1,072	402
State guard	76	118	42
Total	11,143	13,631	2,488
Land Transportation Services:			
Railroad	757	928	171
Urban transit	110	101	(9)
Inter-city bus	34	68	34
Taxicab	3,639	4,018	379
Automobile emergency	146	227	81
Highway truck	341	580	239
Citizens	1,401	[1] 3,829	2,428
Total	6,428	9,751	3,323
Industrial Services:			
Power	6,065	6,809	744
Petroleum	3,787	4,540	753
Forest products	685	877	192
Special industrial	2,760	4,563	1,803
Low power industrial	259	419	160
Relay press	51	54	3
Motion picture	23	23	
Agriculture	9	9	
Radio location—land	41	84	43
Total	13,680	17,378	3,698
Amateur and Disaster Services:			
Amateur	113,092	111,389	(1,703)
Disaster	71	191	120
RACES		99	99
Total	113,163	111,679	(1,484)
Grand totals	212,517	232,111	19,594

[1] Includes 1,651 authorizations issued by Field offices through Mar. 31, 1953.

NOTE.—For the purpose of the above table, each separate license, construction permit, or combination construction permit and license is counted as one station. For example, a station might include 1 base transmitter and 65 mobile transmitters.

Applications Received in Safety and Special Radio Services

Almost 146,000 applications for stations in the Safety and Special Radio Services were received during 1953. This represents an increase of over 4,000 applications compared with the previous year. The number of applications received in each service is shown below:

Class of station	Received 1952	Received 1953	Increase or (decrease)
Aeronautical Services:			
Aircraft	18,252	16,527	(1,725)
Ground	1,260	2,808	1,548
Civil air patrol	2,501	7,548	5,047
Total	22,013	26,883	4,870
Marine Services:			
Ship	16,893	16,819	(74)
Ship radar	1,084	1,136	52
Coast	113	458	345
Marine utility		10	10
Alaskan coastal	255	680	425
Alaskan fixed public	318	829	511
Maritime radio location service	26	25	(1)
Maritime fixed service	161	57	(104)
Other marine services	165	42	(123)
Total	19,015	20,056	1,041
Public Safety Services:			
Police	6,823	5,650	(1,173)
Fire	881	1,193	312
Forestry conservation	1,548	1,223	(325)
Highway maintenance	571	780	209
Special emergency	910	1,256	346
State guard	140	136	(4)
Total	10,873	10,238	(635)
Land Transportation Services:			
Railroad	870	856	(14)
Urban transit	105	78	(27)
Intercity bus	70	86	16
Taxicab	4,414	3,871	(543)
Automobile emergency	220	229	9
Highway truck	591	673	82
Citizens	246	[1] 2,347	2,101
Total	6,516	8,140	1,624
Industrial Services:			
Power	4,786	4,167	(619)
Petroleum	3,671	3,659	(12)
Forest products	800	700	(100)
Special industrial	4,039	4,768	729
Low power industrial	383	452	69
Relay press	54	22	(32)
Motion picture	14	24	10
Agriculture	19	39	20
Radio location—land	105	148	43
Total	13,871	13,979	108
Amateur and Disaster Services:			
Amateur	69,175	66,018	(3,157)
Disaster	90	249	159
RACES		141	141
Total	69,265	66,408	(2,857)
Grand total	141,553	145,704	4,151

[1] Includes 1,651 applications received by field offices through Mar. 31, 1953.

Number of Transmitters in Safety and Special Radio Services

Approximately 585,000 transmitters were authorized to operate in the Safety and Special Radio Services on March 1, 1953. Of these,

152,000 land and fixed stations represent an increase of 15,000, and 433,000 mobile units represent an increase of about 80,000 or a total increase of 95,000 transmitters during a 1 year and 2 months period. A tabulation by service and class of station follows:

Class of station	Land or fixed station transmitters	Mobile station transmitters	Total transmitters
Aeronautical Services:			
Aircraft		32,447	32,447
Ground	2,145	504	2,649
Civil air patrol	4,000	5,000	9,000
Total	6,145	37,951	44,096
Marine Services:			
Ship		35,410	35,410
Ship radar		2,200	2,200
Coast	196		196
Marine utility	2	19	21
Alaskan coastal	367		367
Alaskan fixed public	514		514
Maritime radiolocation	20		20
Maritime fixed	75		75
Total	1,174	37,629	38,803
Public Safety Services:			
Police	5,838	91,600	97,438
Fire	801	15,784	16,585
Forestry-conservation	2,125	14,041	16,166
Highway maintenance	623	6,472	7,095
Special emergency	827	3,483	4,310
State guard	92	169	261
Total	10,306	131,549	141,855
Land Transportation Services:			
Railroad	735	10,092	10,827
Urban transit	77	1,798	1,875
Intercity bus	47	572	619
Taxicab [1]	3,848	[1] 84,115	[1] 87,963
Automobile emergency	193	2,141	2,334
Highway truck	377	4,764	5,141
Citizens		7,032	7,032
Total	5,277	[1] 110,514	[1] 115,791
Industrial Services:			
Power	5,068	56,845	61,913
Petroleum	3,808	17,996	21,804
Forest products	573	6,649	7,222
Special industrial	2,524	27,800	30,324
Low power industrial		4,821	4,821
Relay press	26	653	679
Motion picture	10	185	195
Agriculture	10		10
Radiolocation	55	75	130
Total	12,074	115,024	127,098
Amateur and Disaster Services:			
Amateur	116,697		116,697
Disaster communications	205	252	457
RACES [2]			
Total	116,902	252	117,154
Grand total	151,878	432,919	584,797

[1] Taxicab mobile transmitters were shown in error as 122,037 in the Eighteenth Annual Report, Fiscal Year 1952. The figure should have been approximately 74,000. Corresponding figures of the 1952 report should be reduced as follows:
Land Transportation mobile transmitters, from 140,156 to 92,000.
Grand total, mobile transmitters, from 399,962 to 352,000.
Total transmitters, Taxicab service, from 125,354 to 77,000.
Total Land Transportation transmitters, from 144,458 to 96,000.
Grand total, all transmitters, from 537,649 to 490,000.

[2] Radio Amateur Civil Emergency Service, established Aug. 15, 1952; no transmitter estimate available.

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Broadcast Services

TELEVISION (TV) BROADCAST SERVICE

TV Expansion

The fiscal year witnessed a tremendous expansion in television broadcasting. The Commission on April 11, 1952, adopted its Sixth Report and Order which concluded comprehensive rule-making proceedings and lifted the "freeze" on the authorization of additional TV stations. Processing of TV applications was resumed on July 1, 1952 under a priority system designed to bring TV programs promptly to major cities and surrounding areas without TV service and, at the same time, to provide local TV stations in cities without them. Compared with the 108 TV stations authorized as of July 1, 1952, one year later saw this number increase nearly five-fold—to a total of 500.

Auxiliary and experimental TV broadcast stations are dealt with elsewhere in this chapter.

In addition to the 12 existing VHF (Very High Frequency) channels, the Commission's Sixth Report and Order added 70 UHF (Ultra High Frequency) channels for TV broadcasting. (VHF channels are numbered 2 to 13; UHF, 14 to 83.) Of the 2,053 TV assignments made by that order to 1,291 communities, more than two-thirds were UHF. Nearly two-thirds, or 256, of the grants during the year were for UHF stations, and 142 for VHF stations. The first commercial UHF station began operation in Portland, Oregon, in September 1952, bringing that area its first TV service.

This TV milestone signifies the importance of UHF stations in bringing new or additional TV service to millions of people who could not be served by stations on the small number of VHF channels available. New TV receivers usually provide for UHF reception as well as VHF, and other VHF-only sets can be used for UHF reception by modifying them or by using a UHF converter. Many makes of UHF converters and special UHF antennas are now on the market.

By the end of the fiscal year, some 90 of the newly authorized TV stations had commenced operation and many areas were receiving video service for the first time. About half of the new stations were UHF, and most of the new stations—both VHF and UHF—began operation with low-powered equipment on an interim basis while awaiting delivery of additional equipment.

The Commission's Sixth Report and Order required 30 of the existing 108 TV stations to change VHF channels as a part of the new TV assignment plan, and a majority of the 30 stations had made these shifts by the end of the fiscal year. Many of these 108 stations enlarged their service areas by increases in power or by using higher antennas, or both.

Noncommercial Educational TV

The Commission's final television report provided for noncommercial educational TV stations, and made channel assignments to 242 communities, including 46 "primarily educational centers," for the exclusive use of such stations. A separate processing procedure was established for the consideration of applications by educational interests on those channels.

In a Memorandum Opinion issued July 13, 1951, the Commission upheld its right to reserve channels for noncommercial educational use and to make assignments to specific communities accordingly. On May 11, 1953 it reaffirmed that such reservations continue "indefinitely," again pointing out that, because educational institutions require more time than commercial interests to prepare for TV operation, a reservation of channels is necessary; and, while such reservation should not be for an excessively long period and should be surveyed from time to time, "it places no limit whatever on the duration of the assignment of channels reserved for noncommercial educational operation."

Up to June 30, 1953, the Commission had granted construction permits for 17 noncommercial educational TV stations. One of this number—KUHT, in Houston, Tex.—was the first to begin operation. The others were planning to go on the air as quickly as possible. At that time applications for 29 additional noncommercial educational TV stations were pending.

By the end of fiscal 1953, the number of TV channels reserved for noncommercial educational use had increased to 245.

(The "Noncommercial Educational FM Broadcast Service" section of this report deals with noncommercial educational stations operating with frequency modulation.)

Processing Procedure

With the lifting of the TV "freeze", the Commission adopted a "temporary processing procedure" to handle the flood of applications. This procedure, in general, established two processing lines. Group A comprised applications for stations in cities without operating

TV stations and more than 40 miles from the nearest operating TV station. Group B comprised applications for stations in cities with TV stations in operation or less than 40 miles from an operating station. Group B was further subdivided into several subgroups, with a priority afforded to communities where all the VHF channels were in operation and UHF channels only remained available. Within each group and subgroup, cities were arranged by order of population. The procedure provided that group A and group B applications would be processed simultaneously in separate processing lines. The Commission prepared and published a list of cities arranged in the order of these priorities on the basis of the stations on the air at the time the TV "freeze" was lifted.

When TV application processing was resumed, more than 700 applications were on file and many others followed. In order to cope with this problem and to permit the authorization of new TV stations as rapidly as possible, the staff processing the applications was enlarged. Lawyers, engineers, accountants, and clerical personnel were drafted from other Commission units and given intensive coaching in TV processing work.

The first group of applications was granted on July 11, 1952, when permits were issued for 18 TV stations in various cities. That the methods employed permitted fast action on the TV backlog is indicated by the fact that by March 1953 the Commission had become current in the processing of uncontested TV applications that were in proper form; thereafter the processing of new applications continued on a current basis.

As expected, the major delay in processing involved the group of hundreds of competitive cases requiring hearings before the best qualified applicants could be determined. Nearly all of the Commission's limited number of hearing examiners were assigned to TV, at the expense of AM broadcasting and other matters on the hearing docket. While hearing procedures naturally are time-consuming as compared with uncontested application processing, measures were taken to shorten hearing records and to reduce the time required for completion of hearing cases. (See Broadcast Hearings in this chapter.)

In many instances, competitors for TV assignments have merged their interests and thus made possible early action by the Commission on the single application remaining. In several instances, two rival applicants have resolved their problems by requesting shared-time operation permitted by the Commission's rules. In another instance, the Commission permitted the joint ownership of a TV station by parties having interests in two AM stations in the same community,

where it appeared that adequate steps were taken so that operation of the AM stations would remain on an independent and competitive basis.

During the year the Commission instituted several basic changes in the processing procedures concerning TV applications and comparative hearings. On August 6, 1952, it stated that "for the time being the order in which the hearings are being scheduled is in accordance with the order of priorities set forth in the temporary processing procedure now being followed by the Commission in connection with the initial consideration of television applications." In designating TV applications for hearing and in setting hearing dates since that time, the Commission has employed the priorities set out in the temporary processing procedure. In October 1952, this procedure was amended to provide for the processing of competing applications, in order of priority, consistent with the flow of the hearing schedule.

In view of the fact that the Commission was current at the end of the fiscal year in the processing of "in the clear" TV applications, and in view of the fact that the temporary processing procedure had become more or less obsolete for processing mutually exclusive applications because of the number of new stations going on the air, the Commission was preparing a revised processing procedure which would take these changed conditions into account.

Color TV

At the close of the fiscal year proposals had been made or were impending for adoption of a new and "compatible" color TV standards advanced by the National Television System Committee (NTSC), representative of the TV industry.

The present rules for color TV transmission were adopted by the Commission in 1950. However, equipment for this "field sequential system" is not now being produced and there are no such color broadcasts.

This system is "incompatible" in the sense that existing black-and-white sets can not receive its color transmissions in monochrome without adaptation. In adopting this system as the best proposed at that time, the Commission stated that if a satisfactory compatible color system had been available it would have been advisable to adopt it. It recognized the need for further experimentation and research and, in 1951, specified the steps that would be required of the proponents of an improved color system.

In 1950 the Radio-Television Manufacturers Association directed the NTSC to develop new and compatible color TV specifications. The NTSC is a voluntary association of engineers and scientists inter-

ested in the advancement of TV, and its members include representatives of many companies engaged in the manufacture of TV equipment.

The Commission has been kept advised of the progress of NTSC in this field by means of various reports submitted to the Commission and by attendance at demonstrations of its proposed "simultaneous" system. The Commission has also granted numerous authorizations for on-the-air testing.

(See Introductory chapter for notation of subsequent events.)

For color transmission, a special color receiver is necessary, or a number of changes would have to be made in the black-and-white receiver. Most important would be replacement of the present tube with a color tube.

Table of TV Assignments

Among other things, the Sixth Report and Order adopted rules and standards and a nationwide table of TV assignments. In order to permit uninterrupted processing of applications for new stations in accordance with this table, and in order to provide the Commission with experience in implementing it, a rule was adopted as part of the report which precluded any petitions for rule making to amend the table for a period of one year with certain express exceptions. These exceptions were for communities not listed in the table nor within 15 miles of a listed community, and where the petitioner sought a first commercial or noncommercial educational channel in a listed city. In all cases the petitions were limited to assignments which could be made without any other changes in the table or "drop-in" (new) assignments.

During the 1-year waiting period, about 50 changes were made in the table including the addition of 13 "drop-in" assignments, 3 of which were noncommercial educational assignments. Most of the other changes were corrections of deficiencies in the assignment spacings in order to conform with the separation rules governing stations and assignments. At the end of the year there were pending approximately 12 petitions for rule making to amend the table.

"Satellite" and "Booster" TV Stations

Experiments with "satellite" and "booster" TV stations as a means of relaying TV service to places beyond the normal range of existing TV stations are discussed in the Experimental Television Stations section of this chapter.

TV "Community Antenna Systems"

The rapid development of so-called community antenna systems to bring TV programs to weak signal areas poses interference problems and the question whether such services constitutes common carrier or some other operation which comes within the Commission's jurisdiction. These antenna do not transmit on the air, but pick up programs and send them by coaxial cable to the homes of subscribers. (See other reference in chapters on Common Carriers and Field Engineering and Monitoring.)

Share-time TV Stations

Commission rules permit shared-time operation on the same channel by two TV stations in the same area. In a number of cases two competing applicants have reached an agreement under which they have obtained authorizations for two stations to divide time on the same channel. The resultant operations present problems for the Commission since channel-sharing stations must maintain separate and independent operations.

Subscription TV

An important problem is presented by current proposals with respect to subscription or "pay-as-you-see" television. Several types of subscription systems have been the subject of experimentation under Commission authorization. They differ in both the techniques employed for sending "scrambled" pictures to decoding receivers in the homes of subscribers and the methods of collecting fees for the program.

In addition to the basic policy question whether the authorization of a subscription TV service would serve the public interest, substantial legal questions must be determined, particularly, whether such a specialized service is "broadcasting" within the meaning of that term as defined in the Communications Act, or common carrier or some other special radio service not coming within either the broadcasting or common carrier categories. Also, there is the Engineering problem of where such a service could be squeezed into the crowded radio spectrum.

STANDARD (AM) BROADCAST SERVICE

Notwithstanding the increased interest in television, the use of the standard broadcast band continued to grow. As in recent years, most

of the new AM authorizations were to small communities which had no previous local radio service.

The AM broadcast service netted 164 additional authorizations during the year, making a total of 2,584 at the year's close.

An important rule-making proceeding affecting AM proposes a new ground conductivity map of the United States based upon an analysis of thousands of measurements of the signal strength of AM stations during the past 15 years (see chapter on Research and Laboratory).

Under provisions of the 1952 amendments to the Communications Act, the Commission now formally notifies an applicant of any deficiencies in his application before taking action. By this means, many AM applications have been amended to make authorization possible where, under past procedure, the original applications would have been designated for hearing.

North American Regional Broadcasting Agreement

This treaty, which is intended to regulate the assignment and operation of AM broadcast stations in the North American Region in such a manner as to minimize interference, was signed on November 14, 1950, by representatives from all countries of the region except Mexico and Haiti. The new agreement was negotiated to replace the Interim Agreement, which extended and modified the provisions of the First North American Regional Broadcasting Agreement. The Interim Agreement expired on March 29, 1949, after Cuba refused to agree to its further extension. Subsequently, Cuba made a number of new station assignments and changes in existing assignments which would not have been permitted under the terms of the expired treaty, and which resulted in serious interference to stations in the United States. The other North American countries, by more or less informal agreement, continued to conduct their radio relations in general accordance with the terms of the first NARBA.

The new agreement provides for the adjustment of differences between Cuba and the United States, and upon its entry into force the interference now being caused by Cuban stations should be substantially reduced. Mainly because of the inability of other countries to satisfy its requirements for additional clear channels, Mexico refused to sign.

To become effective, the NARBA requires ratification by three of its major adherents. Cuba ratified it in December 1951. In this country the signed document was submitted by the President to the United States in February 1951, where it was referred to the Committee on Foreign Relations. Through two sessions of the Congress the pressure

of other business precluded action by this committee looking toward ratification of the agreement.

However, during the past session a subcommittee of the Foreign Relations Committee was created to consider the question of NARBA ratification, and at the year's end had scheduled hearings on the subject.

Since the expiration of the Interim Agreement, the Commission has been following a policy, formalized in October 1951, of avoiding actions which might endanger the implementation of the new NARBA, and has thus not made station assignments under conditions inconsistent with the treaty provisions.

540 kilocycles.—As a result of an agreement reached at the Extraordinary Administrative Radio Conference, Geneva 1951, the frequency 540 kilocycles, first added to the broadcast band by the Atlantic City Convention of 1947, became available for broadcast use in region 2 as of December 1, 1952. Rule changes necessary to open 540 kilocycles to applicants in the United States were duly accomplished and the Commission has before it a number of applications for use of this frequency. The classification of the channel is established in the 1950 NARBA, which gives Canada priority for clear channel use. However, the United States can utilize the frequency with stations having powers up to 50 kilowatts, provided that adequate protection is afforded the Canadian priority.

Clear channels.—There are now 12 times as many United States stations assigned to Canadian clear channels as in January 1945. Of the present total of United States facilities on these channels nearly four-fifths are daytime stations. A number of the newer stations operate with powers of 25 kilowatts or more. While these United States assignments were made in accordance with the engineering standards of the NARBA, Canada has of late become deeply concerned with interference caused by certain of these stations to its own clear channel stations. This interference has occurred principally in the early morning or late afternoon, and results from the persistence or early onset of skywave signal transmission, a factor not specifically provided for in the NARBA allocation standards.

At the request of the Canadian Government, meetings were held in February 1953 between its representatives and representatives of the Commission and of the Department of State. These meetings laid the foundation for a bilateral agreement which, supplementing the NARBA standards for clear channel protection, would specify permissible limits for power radiated during the early morning and late afternoon hours toward the common border by any United States or Canadian station operating on a clear channel on which the other country enjoyed priority. The proposed agreement is not generally

retroactive, and its provisions would apply to new assignments on these channels. Provision is made for intergovernmental clearance of assignments not satisfying the requirements of the agreement.

On April 8, 1953, the Commission outlined the features of the proposed agreement and requested comments thereon. These comments are being studied by the Commission before taking further action.

Daytime Skywave Interference

Closely related to the clear channel problem is the matter of daytime skywave interference, since many daytime-only-stations operating on clear channels interfere with the dominant stations during the early morning and early evening hours.

In early 1947 the Commission instituted a hearing to determine whether rules governing daytime skywave transmissions of AM stations should be promulgated (docket 8333). Because of their relationship, the Commission later that year consolidated the skywave and clear channel proceedings (docket 6741). Meanwhile, it was found necessary to defer action upon applications for new or increased daytime facilities on clear channels.

Delay in United States ratification of the North American Regional Broadcasting Agreement (NARBA), which would establish, among other things, specified protection from interference for clear channel operation, impelled the Commission on August 10, 1953 to sever the two proceedings, preparatory to rendering a separate decision in the matter of daytime skywave interference.

Proposed Revision of "10% Rule"

On May 13, 1953, the Commission proposed relaxing certain rules governing the assignment of particular classes of broadcast stations in the AM band.

Under present requirements dealing with efficient use of the frequency, a station in the designated classes may be assigned if the population residing in the area between the normally protected contour and the contour in which objectionable interference will be received does not exceed approximately 10 percent of the population of its actual primary service area (so-called 10% rule).

The proposed change would permit assignment if, as an alternative to the above 10 percent criterion, either of the following two conditions were met: (a) provide the community with its first local AM station; and (b) provide the first primary service to 25 percent more of its primary service area.

FREQUENCY MODULATION (FM) BROADCAST SERVICE

During the year, in addition to new commercial FM broadcast station authorizations, 2 noncommercial educational FM broadcast stations changed frequencies from the educational FM band to the commercial portion of the band. Many of the new commercial grants went to licensees of AM stations. Fourteen new stations were authorized in the six southern States of Alabama, Florida, Georgia, North Carolina, South Carolina, and Tennessee. The freedom from static interference makes FM particularly advantageous in the southern part of the country. The nighttime interference which limits the coverage of many AM stations has also caused some AM licensees to turn to FM to obtain nighttime coverage.

There were 601 commercial FM broadcast stations authorized at the end of the year, or 47 less than the year previous. Most of the deletions were because the stations were losing money; some FM operators desired to enter the TV field.

A number of FM stations specialize in good music programing. These stations find that they have a small but devoted audience for such programing. Many of these listeners build high-fidelity receiving installations in order to realize the full range of FM transmissions. Many of the stations featuring good music publish monthly program booklets. These are purchased on a yearly subscription basis by the listeners. Such subscriptions give the stations an indication as to the number of their listeners.

"Functional Music", "Storecasting" and "Transit Radio"

As a means of obtaining additional revenue, various commercial FM stations are engaging in supplemental services known as "functional music", "storecasting", and "transit radio". In the functional music operation, an FM licensee undertakes to supply background music programs to commercial establishments having special receiving apparatus which, when activated by a supersonic signal, eliminates the spoken material. In storecasting and transit radio, the programing is designed to reach store customers and transit passengers in public vehicles, respectively, with the supersonic signal employed to increase the sound level of the spoken material.

These specialized operations are under Commission study in connection with the overall FM situation. Determination is required as to several legal and policy questions—whether such operations are "broadcasting" within the meaning of the Communications Act, whether they meet the Commission's rules, and whether they are in the public interest.

Noncommercial Educational FM Broadcast Service

The noncommercial educational FM broadcast service continues to expand but at a rather slow pace. There were 14 new grants for stations in this service during the past year.

One of the new authorizations was for a station in Honolulu, Hawaii. Just as the first commercial FM authorization was granted in the Hawaiian Islands this past year, this was the first noncommercial educational FM station authorization in the islands and was the only outstanding authorization for a station in this service in any of the territories or island possessions of the United States.

Of the total of 116 stations now authorized in this service, 49 use transmitters with power ratings of 10 watts or less; the remainder employ transmitters ranging in power from 250 watts to 50 kilowatts. One of the 10-watt stations which began operation during the year is using a directional antenna system to better cover the desired service area.

EXPERIMENTAL BROADCAST SERVICES

The experimental broadcast services provide means whereby stations may be licensed to conduct research and experimentation that promises substantial contribution to the advancement of the broadcasting art. There are three classes of stations in this service: (1) Experimental television stations, which delve principally into research involving television transmission; (2) Facsimile broadcast stations, concerned with the development of equipment or techniques for the transmission of fixed images with a view to their reception in a permanent form; and, (3) Developmental broadcast stations, devoted to experimentation in the aural broadcasting field.

Experimental Television Stations

During the past year the tempo of experimentation in the television broadcast field has steadily increased. Manufacturers of TV broadcast transmitters and antennas have utilized experimental facilities to develop and test new and improved equipment. Experimentation with color TV has continued apace and authorizations have been issued to a number of TV broadcast stations to conduct tests of the NTSC (National Television System Committee) specifications. Proponents of subscription television continued to experiment with various systems of "scrambling" the transmissions.

The lifting of the TV "freeze" and the inauguration of TV service in many new areas emphasized the problem of those places which lie

beyond the normal reception range of existing TV stations and which lack the population density necessary to make the market attractive to prospective TV broadcasters. The Commission has authorized several experimental operations which are expected to provide valuable engineering data with respect to the technical problems posed by the operation of low-powered "slave" stations. Two basic systems are being explored, viz: "satellite" stations which are actually low-powered TV transmitters but which employ no cameras or other studio facilities for the local production of programs and derive their program material by retransmitting, on a separate channel, the signals of TV broadcast stations; and "booster" stations, which intercept the signals of a TV broadcast station, amplify them, and retransmit the signals on the channel on which they were received. The data obtained by these experimental stations will enable the Commission to determine whether or not either or both systems provide answers to the problem of unserved areas.

Experimental Facsimile Broadcast Stations

FM broadcast stations may transmit facsimile either on a simplex or multiplex basis. (Simplex facsimile can be transmitted only when no aural program is being broadcast; multiplex facsimile can be transmitted at the same time an aural program is being broadcast.) A station used exclusively for the transmission of facsimile material for reception by the general public would be considered to be a facsimile broadcast station. During the past year no experimental facsimile broadcasting was conducted and very little interest was shown in the transmission of facsimile over FM broadcast stations. A few FM broadcast stations are authorized to transmit facsimile.

Developmental Broadcast Stations

This service has remained more or less dormant during the past year. Operation has been confined to the testing of aural broadcast transmitters and antennas by manufacturers of broadcast equipment. Some interest has been expressed in the operation of an FM broadcast "satellite" station to solve a terrain "shadowing" problem, but no operating authority has as yet been requested.

AUXILIARY BROADCAST SERVICES

The auxiliary broadcast services provide for the licensing of radio transmitting apparatus that is used by broadcast stations for such supplemental use as the pickup and relaying of programs or events that occur outside of a regular studio, i. e., parades, fairs, sporting

events, conventions, and newsworthy occurrences. Transmitters may also be licensed to provide a program circuit between the studio and transmitter of a broadcast station and, in the case of television, may be used for intercity relaying of video programs, thus making possible network broadcasting in areas where common carrier intercity TV transmission facilities have not yet been constructed.

Five basic classes of stations are licensed in the broadcast auxiliary services: remote pickup broadcast, aural broadcast STL (studio-transmitter links), television pickup, television STL, and television intercity relay stations.

Remote Pickup Broadcast Stations

Remote pickup broadcast stations are operated by broadcast station licensees for on-the-spot coverage of events that occur outside a regular studio. They are used primarily by aural broadcast stations—AM and FM—but may be used by TV stations to relay the aural portion of such programs where the visual portion is relayed by means of TV pickup stations. Portable or mobile equipment is employed ranging in power from a fraction-of-a-watt "handitalkie" that can be carried in one hand to transmitters of a hundred watts or more installed in automotive vehicles, boats, or aircraft and capable of transmitting signals over relatively long distances. Most of this equipment is self-powered and can be used to provide emergency communication facilities in the event of disruption of normal circuits resulting from floods, storms, or other disasters. Extensive use of remote pickup facilities was made during the 1952 political conventions and the subsequent inauguration ceremonies, giving the listening public the most comprehensive coverage of these occasions yet achieved.

Aural Broadcast STL Stations

Aural broadcast STL (studio-transmitter link) stations make it possible for AM or FM broadcast station licensees to locate their transmitters at favorable sites even though wire-line circuits are not available or practical at such locations. They are used to provide a radio circuit for the transmission of program material from the studio to the transmitter. During the past year this service has grown apace with the aural broadcast services.

Television Pickup Stations

Television pickup stations are the visual pickup equivalent of remote pickup stations in the aural broadcast field. They provide a means

whereby TV stations are not limited to sources of program material at places which have a physical wire connection to the broadcast station. Because such wire circuits must use a special kind of cable (known as coaxial cable) to carry video programs, and such special circuits are not generally available, TV broadcasters rely more heavily on their pickup stations than do aural broadcasters. The past year has seen a rapid growth in this service and it is expected that this growth will continue as more and more new TV stations commence operation.

Television STL Stations

Television STL (studio-transmitter link) stations are used to provide a program circuit between the studio and transmitter of a TV broadcast station. Both the visual and aural portions of such programs may be transmitted on a common microwave channel by means of multiplexing, or separate transmitters may be employed. The use of such radio circuits permits locating the TV transmitter on mountain tops or other desirable sites so as to provide wider coverage where the installation of special coaxial cable circuits is impractical. With the rapid expansion of TV broadcasting this service has greatly increased.

Television Intercity Relay Stations

For frequency conservation the Commission requires that intercity transmission of TV programs for network television broadcasting be handled by communication common carriers as is the case in aural broadcasting. However, it is recognized that common carriers are not able to construct the special facilities required for TV transmission as rapidly as they might be needed. Therefore, provision is made in the Commission's rules for the operation of private intercity relay systems by TV broadcasters on an interim basis pending the availability of adequate common carrier facilities. Although the common carriers have greatly expanded their TV relay facilities, there are many places not so served. This service is expected to continue to expand until the common carriers are able to catch up with the demands for TV intercity relay service.

Remote Control Operation of Broadcast Stations

The Commission amended its rules and regulations during the year to permit the operation of AM and FM broadcast stations using nondirectional antenna systems and operating with transmitter powers of 10 kilowatts or less by holders of operator licenses other than radio-

telephone first class and the remote control of such stations. Approximately 2,000 comments were received from individual operators, labor unions, trade schools, individual broadcast stations, associations of broadcasters, and national networks.

Factors such as the marked improvement and reliability of transmitter equipment, the satisfactory utilization of lesser grade operators during World War II and on a temporary basis at a number of broadcast stations since January 1951, the successful operation by nontechnical personnel of many electronic devices of a complex nature upon which the safety of life and property is often dependent, and the extensive reliance of stations on their chief engineers for significant repair work, were considered by the Commission in reaching its decision.

The amended rules became effective April 15, 1953, and by the end of the year there were granted authorizations for remote control to 35 FM broadcast stations and to 102 AM authorizations for remote operation using wire lines for control and telemetering purposes. In the cases of the radio controlled remote operations, multiplex techniques at both the remote control position and the transmitter were used for transmitting the control and telemetering information.

A number of stations are constructing their own remote control equipment while others are purchasing manufactured equipment. The initial investment in such equipment can in most cases be recovered in a short time through savings in salaries of personnel. Remote control further permits the use of transmitter sites otherwise impractical to use and is especially advantageous to those FM stations with transmitter installations placed on mountain tops to obtain good coverage. Many such stations found it difficult to recruit personnel willing to stand transmitter watches at such remote sites and also found in cases of bad winter weather that the sites were practically inaccessible and operators might be marooned there for days at a time.

BROADCAST HEARINGS

The Commission took several steps intended to simplify and expedite the general broadcast hearing procedure.

It amended its rules to require all competing applications for the same facility to be on file at least 30 days prior to the scheduled hearing instead of the previous 20-day "cut-off" period.

It also specified that broadcast hearings start with a hearing conference between the hearing examiner (or other presiding officer) and representatives of parties to the proceeding looking toward agreement on matters respecting the conduct of the hearing. The parties are required to state all the matters which they will rely upon in the

hearing. The hearing examiner then issues an order setting forth these matters, and the proof to be adduced by the parties is limited by the order unless modified for cause shown. The hearing conference idea had previously been followed, but as a "pre-hearing" conference.

These changes were prompted largely by complications occasioned by Section 309 (b) of the Communications Act, as amended in July 1952. This section requires that applicants who face a hearing be notified to that effect and be given an opportunity to reply prior to the actual designation for hearing.

The changed procedure develops and sharpens the major issues sufficiently in advance of the oral testimony to curtail much of the time spent in the course of the hearing. In this fashion the hearings are expedited, yet comply with the letter and spirit of the recent amendment of the Communications Act.

In addition, findings are now made on the basic qualifications of the applicants (legal, financial, technical, etc.) before designating them for hearing on comparative qualifications. In most instances this has eliminated lengthy testimony on matters upon which no actual controversy exists.

Policy was also established for completing each TV case designated for hearing even if the competitive applicant or the cause for the hearing is removed, instead of taking the surviving application from hearing and returning it to the processing line for administrative action. This has resulted in a number of applicants merging their interests and thus eliminating hearings and speeding TV service to the public.

Rules affecting the taking of depositions in broadcast hearings were changed to eliminate the filing of petitions by parties and an order by the Commission or the Motions Commissioner before depositions could be taken. The rules now provide for the taking of depositions on reasonable notice and more flexibility with regard to the persons whose depositions are taken.

The Commission substituted a certificate of service in broadcast cases for the old method of proving service by an affidavit. This method of proof of service has been operating successfully.

Commission counsel in the past generally declined to enter into stipulations in hearings on the ground that they could not be a party to an agreement which dispensed with proof involving any matter put in issue by the Commission. Since most matters in an application were put in issue, all of them usually had to be proved. This was not too burdensome in AM and FM hearings, but with the advent of TV hearings it was an almost endless proposition. Broadcast Bureau counsel were accordingly authorized to enter into stipulations of uncontested facts which were verified by oath. This has contributed to shortening the hearing procedure.

BROADCAST RULE CHANGES

In addition to the significant revision of the rules reported elsewhere in this chapter, there were other major rule changes in the broadcast service.

A number of rule changes were adopted for AM, FM, and TV which removed obsolete sections, simplified others, and brought many sections up to date in accordance with new practices and policies.

Rules governing practice and procedure were amended to provide for (1) continuing in effect licenses of stations engaged in activities of a continuing nature without further Commission action pending determination of their renewal applications, and (2) temporary extension of licenses of stations engaged in activities of a noncontinuing nature pending action on their renewal applications.

The Commission finalized its rule-making proposal of June 8, 1951, which precludes further assignments of Class IV standard (AM) broadcast stations on regional channels to prevent any further increase of the interference level to the degradation of the service on those channels. The 20 (mostly 250 watt) Class IV stations now operating on regional channels were not required to change frequency or power. All such stations are not protected against interference from Class III stations, which also use regional channels.

The Commission revised and brought up to date several of its application forms. It consolidated into one form (FCC Form 323) its Annual and Interim Ownership Reports of Broadcast Stations now submitted on separate forms (323—Annual Ownership Report, and 323–A—Interim Ownership Report). The consolidated form spells out what information is required, simplifies the process of filing and, by the nature of the information requested, emphasizes the necessity of obtaining Commission consent prior to any change in ownership that involves a transfer of control or an assignment of license.

As a means of facilitating the issuance of papers incident to the grants of renewals and modifications of licenses, the Commission adopted a short form Certificate of Renewal of Station License (FCC Form 359).

In the 1952 annual report mention was made of modification of the rules covering the filing of the "Annual Financial Report of Networks and Licenses of Broadcast Stations" (FCC Form 324) to specify single copy instead of the duplicate filing previously required. During the past year, after a conference with the industry advisory committee, this report form was further simplified by eliminating several schedules and modifying others to materially lessen the burden on those preparing the report.

STATISTICS

Broadcast Authorizations

There was a net gain of nearly 700 broadcast authorizations during the year. Television authorizations rose from 108 to 500 (including 17 noncommercial educational grants) as a result of the first year of processing following the lifting of the "freeze." The 2,584 AM authorizations were 164 more than the year previous. Commercial FM authorizations decreased from 648 to 601, but noncommercial educational FM added 12. A breakdown of authorizations for the different broadcast services follows:

Class of broadcast station	June 30, 1952	June 30, 1953	Increase or (decrease)
Commercial standard (AM)	2,420	2,584	164
Commercial television (TV)	108	483	375
Noncommercial educational TV		17	17
Auxiliary TV	221	259	38
Commercial frequency modulation (FM)	648	601	(−47)
Noncommercial educational FM	104	116	12
Remote pickup	1,175	1,305	130
Studio transmitter link	44	47	3
Developmental	2	1	(−1)
Total	4,722	5,413	691

These figures do not include international broadcast stations, which are in a state of flux.

There is no separate facsimile broadcast service, but commercial FM stations can engage in facsimile operation and there is provision for facsimile experimentation.

Growth of Broadcasting

The number of authorized and licensed commercial AM, FM, and TV broadcast stations at the close of each fiscal year for the past 11 years is shown in the following table:

	AM		FM		TV		Total	
	Authorized	Licensed	Authorized	Licensed	Authorized	Licensed	Authorized	Licensed
1943	912	911	48	37	6	6	966	954
1944	924	912	52	45	9	6	985	963
1945	955	931	53	46	25	6	1,033	983
1946	1,215	961	456	48	30	6	1,701	1,015
1947	1,795	1,298	918	48	66	6	2,779	1,352
1948	2,034	1,693	1,020	142	109	7	3,163	1,842
1949	2,179	1,963	865	377	117	13	3,161	2,353
1950	2,303	2,118	732	493	109	47	3,144	2,658
1951	2,385	2,248	659	534	109	81	3,153	2,863
1952	2,420	2,333	648	582	108	96	3,176	3,011
1953	2,584	2,439	601	551	483	101	3,668	3,091

Broadcast Authorization Deletions

Commercial broadcast station deletions in fiscal 1953 numbered 108 as compared with 72 in 1952 and 161 in 1951. FM deletions rose from 36 in 1952 to 79 in 1953. The 23 AM deletions in 1953 were 2 less than the year previous. There were 6 TV deletions in the past year; 1 in 1952. Monthly figures for 1953 were:

Month	AM	FM	TV	Monthly total
1952				
July	1	4	0	5
August	1	5	0	6
September	1	4	0	5
October	4	5	0	9
November	3	3	0	6
December	2	12	0	14
1953				
January	2	5	0	7
February	0	1	0	1
March	3	5	0	8
April	2	12	1	15
May	2	11	1	14
June	2	12	4	18
Year's total	23	79	6	108

Broadcast Applications

Of nearly 7,000 broadcast applications received during the year, nearly half were for AM, more than 1,200 were for TV, and slightly more than 700 for FM. There were 655 applications for new TV stations as compared with 198 for AM and 45 for FM.

	Pending June 30, 1952	Received	Disposed	Pending June 30, 1953
AM				
New stations	323	198	271	250
Change in facilities [1]	214	141	170	185
Renewals	281	1,355	1,294	342
License	48	346	324	70
Transfers	72	442	462	52
Miscellaneous	59	725	708	76
Total	997	3,207	3,229	975
FM [2]				
New stations	11	45	45	11
Change in facilities [1]	30	118	115	33
Renewals	88	291	327	52
License	24	83	97	10
Transfers	18	83	89	12
Miscellaneous	15	98	110	3
Total	186	718	783	121
TV [2]				
New stations	717	655	771	601
Change in facilities [1]	73	113	165	21
Renewals	40	98	101	37
License	7	2	5	4
Transfers	12	51	54	9
Miscellaneous	6	302	240	68
Total	855	1,221	1,336	740
All other				
New stations	66	287	317	36
Change in facilities [1]	48	101	141	8
Renewals	193	864	865	192
License	71	285	273	83
Transfers	67	191	241	17
Miscellaneous	7	106	108	5
Total	452	1,834	1,945	341
Grand total	2,490	6,980	7,293	2,177

[1] Includes changes in power, frequency, directional antenna, hours of operation, and location.
[2] Includes noncommercial educational.

Broadcast Receiving Sets

The Commission does not license or otherwise regulate broadcast receiving sets. Industry estimates that more than 110,000,000 receivers are in use. Many are capable of dual reception. Thus, about 25,000,000 can receive TV and 10,000,000 can receive FM. Radio homes approximate nearly 45,000,000, with about 75,000,000 sets. Sets in automobiles exceed 26,000,000, with about 9,000,000 other sets in business establishments, etc.

Networks

The Commission does not license networks as such; only individual stations. However, stations are subject to chain broadcasting regulations, adopted by the Commission in 1941 to promote competition in broadcasting. There are national, regional and state networks. The major networks are those of American Broadcasting-Paramount Theaters, Inc.; Columbia Broadcasting System, Inc.; Mutual Broadcasting System, Inc.; National Broadcasting Co., and DuMont Television Network.

Broadcast Industry Financial Data

In the calendar year 1952, the grand total revenues of the broadcasting industry (radio and television) reached nearly $800 million, the highest on record. Total revenues, which comprise revenues derived from the sale of time, talent, and program materials to advertisers, were reported at $793.9 million. Radio revenues increased from $450.4 million in 1951 to $469.7 million in 1952, while aggregate TV revenues of $324.2 million in 1952 were 37.5 percent greater than the $235.7 million for 1951.

Broadcasting profits of $115.6 million in 1952 were 16.6 percent greater than those of 1951. The industry reported a profit from television broadcast operations of $55.5 million, one-third higher than in 1951. Earnings from radio broadcast operations increased by 4.5 percent from $57.5 million in 1951 to $60.1 million in 1952. All profit figures are before payment of Federal income tax.

The following tables show the comparative calendar year 1951–52 radio and television financial data for the radio and television broadcast industries:

All networks [1] and stations, 1951–52

Item	1951	1952	Percent increase in 1952
	Millions	*Millions*	
Total broadcast revenues	$686.1	$793.9	15.7
Radio [2]	450.4	469.7	4.3
Television	235.7	324.2	37.5
Total broadcast expenses	587.0	678.3	15.6
Radio	392.9	409.6	4.3
Television	194.1	268.7	38.4
Broadcast income (before Federal income tax)	99.1	115.6	16.6
Radio	57.5	60.1	4.5
Television	41.6	55.5	33.4

[1] Networks engaging in joint radio-TV operations have indicated that certain overhead expenses not readily allocable between radio and television have been charged to radio. To the extent that this occurred, the above figures may understate radio income and overstate television income.
[2] Radio includes AM and FM broadcasting.

NOTE.—The 4 nationwide radio networks (ABC, CBS, MBS, and NBC) owned and operated a total of 18 stations and the 3 regional radio networks (Don Lee, Texas State, and Yankee) owned and operated a total of 7 stations in 1951 and 1952. As a result of ownership changes in 1952, however, operation of three such stations are included only for that part of 1952 during which the stations were network-owned and operated. The three stations are included in "All other stations" for the remainder of the year. The 4 TV networks (ABC, CBS, DuMont, and NBC) owned and operated a total of 15 stations in 1951 and 1952.

Nationwide networks only, [1] 1951–52

(Including owned and operated stations)

Item	1951	1952	Percent increase (or decrease) in 1952
Revenues:	*Millions*	*Millions*	
Radio	$99.0	$95.8	(3.2)
Television	128.4	180.2	40.3
Total	227.4	276.0	21.4
Expenses:			
Radio	89.5	85.6	(4.4)
Television	117.4	170.3	45.1
Total	206.9	255.9	23.7
Income (before Federal income tax):			
Radio [2]	9.5	10.2	7.4
Television [2]	11.0	9.9	(10.0)
Total	20.5	20.1	(2.0)

( ) Denotes loss.
[1] Radio includes AM and FM broadcasting.
[2] Radio includes AM and FM broadcasting.

NOTE.—The 4 nationwide radio networks (ABC, CBS, MBS, and NBC) owned and operated a total of 18 stations in 1951 and 1952. As a result of ownership changes in 1952, however, operation of two such stations are included only for that part of 1952 during which the stations were network-owned and operated. The two stations are included in "All other stations" for the remainder of the year. The 4 TV networks (ABC, CBS, DuMont, and NBC) owned and operated a total of 15 stations in 1951 and 1952.

FM broadcast revenues, expenses, and income, 1951–52

Item	1951		1952	
	Number of stations	Amount	Number of stations	Amount
FM broadcast revenues				
FM stations operated by:				
AM licensees:		*Millions*		*Millions*
Reporting no FM revenues [1]	381		406	
Reporting FM revenues	179	$1.8	149	$1.5
Non-AM licensees	66	1.2	56	1.1
Total FM stations	626	3.0	611	2.6
FM broadcast expenses				
FM stations operated by non-AM licensees	66	3.0	56	2.1
Industry total		(1)		(1)
Total FM broadcast income (before Federal income tax)				
FM stations operated by non-AM licensees	66	(1.8)	56	(1.0)
Industry total		(1)		(1)

( ) Denotes loss.

[1] In view of the difficulty in a joint AM–FM operation in allocating FM operation expense separately from AM station operation expense, licensees of such stations were not required to report FM station expense separately. As a result, FM industry totals for expense and income are not available. AM–FM licenses, however, were requested to report separately the revenues, if any, attributable to FM station operation if such data were readily available. In only a few instances did AM–FM licensees state they were unable to segregate the FM revenues.

TV broadcast revenues, income and investment, 1952

[In thousands]

Item	4 networks and their 15 owned and operated stations	93 other stations [1]	Industry total
Revenue from network time sales	$101,484	$36,014	$137,498
Revenues from sale of time to national and regional advertisers and sponsors	21,781	58,264	80,045
Revenues from sale of time to local advertisers and sponsors	16,623	48,228	64,851
Total revenues from time sales	139,888	142,506	282,394
Commissions paid to representatives, etc	27,509	18,923	46,432
Incidental broadcast revenues:			
Revenues from sale of talent, etc	47,504	8,700	56,204
Furnishing material or service	10,352	7,580	17,932
Other incidental revenues	9,969	3,527	13,496
Total broadcast revenues	180,204	143,390	323,594
Total broadcast expenses	170,301	97,601	267,902
Total broadcast income (before Federal income tax)	9,903	45,789	55,692
Investment in tangible broadcast property:			
Original cost	61,019	63,110	124,129
Depreciation to date	14,589	24,739	39,328
Depreciated cost	46,430	38,371	84,801

[1] Excludes 14 stations which commenced operations during 1952, having TV broadcast revenues, expenses, and loss of $629,247, $824,314 and ($195,067) respectively.

Radio [1] broadcast revenues, income and investment, 1951–52

[In thousands]

Item	4 nationwide networks and their 18 stations [2]		3 regional networks and their 7 stations [2]		All other stations [3]		Industry total	
	1951	1952	1951	1952	1951	1952	1951	1952
Total broadcast revenues	$99,045	$95,824	$4,983	$4,796	$345,197	$367,972	$449,226	$468,592
Total broadcast expenses	89,517	85,590	4,417	3,807	296,041	318,119	389,975	407,516
Total broadcast income (before Federal income tax)	9,528	10,234	566	989	49,156	49,853	59,251	61,076
Investment in tangible broadcast property:								
Original cost	29,533	28,241	1,097	976	[4] 224,100	238,124	254,731	267,341
Depreciation to date	16,446	15,375	984	862	87,504	100,394	104,934	116,631
Depreciated cost	13,087	12,866	113	114	136,596	137,730	149,797	150,710

[1] Excludes independently operated FM stations, 66 in 1951 and 56 in 1952.
[2] Includes the operations of 25 network-owned stations in both years. As a result of ownership changes in 1952, however, operation of three such stations are included only for that part of 1952 during which the stations were network-owned and operated. The three stations are included in "All other stations" for the remainder of the year.
[3] Includes 2,175 stations in 1951 and 2,299 stations in 1952.
[4] Data available from 2,161 stations in 1951 and 2,289 stations in 1952.

Field Engineering and Monitoring

GENERAL

The twofold purpose of Commission field engineering and monitoring is to provide service to industry, the public and Government, and to enforce radio laws, treaties and regulations. There is no substitute for this grass roots representation and fact development.

The Field Engineering and Monitoring Bureau has a Field Operating Division which supervises 9 regional offices, 24 district offices, 6 suboffices, 3 ship offices and 18 monitoring stations; also three staff divisions which advise and set standards in monitoring, inspection and examination, and field engineering work.

The Bureau's scope of operations includes:

Inspection of radio stations of all types and serving notices for discovered discrepancies;

Conducting radio operator examinations and issuing operator licenses to those found qualified;

Monitoring the radio spectrum to assure that stations operate on their assigned frequencies with satisfactory signal quality;

Doing special monitoring for military and civilian Government agencies;

Locating and closing unauthorized transmitters;

Investigating complaints of interference to various radio services;

Obtaining and correlating technical data for Commission use; and

Furnishing direction finding "fixes" to aircraft and ships which are lost or otherwise in distress.

The Bureau additionally processes data concerning new or modified antenna construction to insure that no hazard to air navigation will result, and administers Parts 15 and 18 of the Commission's rules and regulations pertaining, respectively, to restricted radiation devices and industrial, scientific, and medical equipment.

MONITORING

Monitoring Stations and Facilities

The Bay St. Louis, Miss., secondary monitoring station was closed early in the fiscal year for economy reasons. The monitoring network

continued to operate with 11 primary and 7 secondary stations, including 1 in Hawaii and 2 in Alaska. (See list in appendix to this report.)

These stations have high frequency direction finders which were rebuilt and modified for remote operation during the year. Exceptions are the stations at Lexington and Anchorage which are to be relocated. Seven monitoring stations are also equipped with low frequency direction finders: namely, Kingsville, Laurel, Livermore, Millis, Portland, Santa Ana, and Fort Lauderdale. All of this type are also operated from the monitoring position and are "remote controlled" in design.

For $2,550 paid to the General Services Administration in January 1953, the Commission acquired the Spokane monitoring station property formerly used for an Army radio station. The purchase required special congressional appropriation and presidential approval.

In December 1952 the Commission completed an interchange of property with the Oregon Highway Commission which was necessitated by the routing of an express highway near the Portland monitoring station. Although no funds were involved, it required a special congressional authorization to exchange these tracts.

Monitoring Participation in Defense Projects

Military agencies found need for the services of the Commission's monitoring stations, particularly in several projects wherein direction finding and monitoring from widespread points were necessary. A sum of $56,650 was transferred to the Commission by two separate branches of the military for these services. This made duplicate installation unnecessary and furthered the undertaking. Expenditures were almost entirely for personal services.

Monitoring Surveys

The Commission was asked to perform 37 monitoring surveys relating to problems of international frequency usage and allocations. Some involved only one frequency and a few days work by one monitoring station, but most required the entire network for periodic observation of frequencies for considerable periods of time. One such survey necessitated observations by 18 monitoring stations over a 3-month period; covered 360 frequencies and totaled 4,680 monitoring hours.

Monitoring Data for ITU

The United States participates along with many other countries in furnishing data concerning frequency usage and band occupancy to

the International Frequency Registration Board (IFRB) of the International Telecommunication Union (ITU). The United States Centralizing Office for Monitoring (provided for by the 1947 Atlantic City conference) is vested in the Field Engineering and Monitoring Bureau of the Commission. As far as is known, the Commission's monitoring stations are the only United States source of this data being furnished the IFRB. During the year, reports of 5,100 monitoring observations were submitted.

Monitoring for Interference

Resolution of an interference problem frequently requires monitoring on a large geographical scale. Requests for such service came from sources listed below:

	Fiscal year 1952	Fiscal year 1953
United States Army	124	125
United States Air Force	292	200
United States Navy	112	40
United States Coast Guard	88	78
Civil Aeronautics Administration	188	125
Other Government agencies	89	30
Law enforcement agencies	37	15
Commercial air lines	519	266
Commercial concerns	458	410
Foreign Governments	10	35
Miscellaneous		400
Total	1,917	1,714

As an example of an interference case solved by monitoring:

On March 3, 1953, a large communications company in New York reported to the Commission that it was experiencing severe interference to one of its stations from what appeared to be a broadcast station at Leopoldville in the Belgian Congo. The international frequency list showed a station listed on the complained of frequency at Leopoldville. However, monitoring observations proved that a European broadcast station was responsible and the matter was resolved.

Other Monitoring Cases

While interference figures in the majority of cases handled, special monitoring is required to determine illegal radio operation, locate clandestine radio stations, and obtain information in other matters. Such cases handled last year totaled 448 as compared with 828 for 1952. This reduction is due to personnel curtailment and the priority of special assignments.

Direction Finding

Long-range direction finder bearings are very useful and at times absolutely necessary to identify strange transmissions. Should the station be illegal or clandestine, then bearings are required to locate it. Bearings are also the only practical way to trace the source of radio interference of otherwise unidentifiable nature, such as spurious radiation, unmodulated carriers, and experimental or complex types of emissions. Some of these emissions are unintentional but nevertheless constitute serious interference until they are located and suppressed.

The monitoring stations obtained a total of 80,208 bearings in 1953 compared with 83,196 the year previous. As part of Commission participation in the Air Sea Search and Rescue program, the direction finder network obtained 2,170 bearings on lost or disabled aircraft or seacraft. There were 130 requests for this type of assistance compared with 138 for 1952.

One of the interesting lost plane cases is summarized below:

On May 2, 1953, the United States Coast Guard requested Commission aid in obtaining a fix on a Navy plane en route from Bermuda to Norfolk. The plane was handicapped by compass trouble and had turned back toward Bermuda. Monitoring control furnished five fixes to the Coast Guard. An Air Force plane and a Coast Guard plane then made visual contact with the distressed plane and escorted it to a safe landing in Bermuda. According to the Coast Guard: "The prompt accurate fixes furnished in the case of lost aircraft Navy 7461 aided largely in successful conclusion of intercept and escort. Your assistance greatly appreciated."

Additional Monitoring Statistics

Item	Fiscal year 1952	Fiscal year 1953
Bearings obtained	83,196	80,208
Alerts, unknown or suspicious signals discovered	7,167	6,500
Identification cards made	56,823	56,950
Cases referred to other agencies for investigation	35	33
Unlicensed stations monitored	114	105
Citations served (monitoring)	10,139	8,762

INVESTIGATIONS

Investigative Facilities

At 31 of the Commission's field offices and monitoring stations there are stationed one or more radio direction finding cars equipped for locating unauthorized radio stations and for tracking down sources

of interference to radio reception. In most instances the search or investigation is initiated as the result of reports or complaints from the public, Commission licensees and military or other Government agencies. An important function of these mobile units is to complete the job of running down illegal stations and interference sources localized to a particular area by the Commission's fixed long-range monitoring stations.

Interference

During fiscal 1953, the number of interference complaints requiring investigation was 21,749, an increase of 11,625 over the 10,124 received in 1952. AM, FM, and TV broadcasting accounted for 19,932 complaints with TV cases predominating.

This increase in interference complaints made it impossible for the limited field investigative staff to give prompt or complete attention to every case. Priority was given those causing interference to safety services, such as aviation, and to others involving illegal radio activity.

The continued progress made in organizing Commission-sponsored local citizens interference committees has proved very helpful to TV viewers in combating interference. There are now 293 cooperating committees functioning in 282 communities, with additional committees continuing to be established. American radio operators, TV set owners, manufacturers' representatives, and others thus work together to solve TV interference problems on a local level.

Attempts to receive television in weak signal areas, particularly in communities located in valleys where rooftop antennas give unsatisfactory reception, have led to creation and growth of "community antenna systems". In such a system TV signals are picked up by an antenna on a high tower or atop a nearby mountain, and then carried by coaxial cable to subscribers' TV receivers. About 200 such systems are now in use, with at least one installation using over 100 miles of cable to serve over 1,500 subscribers. Unfortunately, many of these wired TV systems have radiated and caused interference.

Operation of industrial, scientific, and medical equipment utilizing radio frequency energy continued to cause interference to safety services as well as to TV and other radio reception. While most of the interference originated with equipment manufactured six or more years ago, some of it was caused by newer equipment, usually due to failure to take certain necessary interference prevention precautions at the time of installation. In 1953 there were 619 cases involving interference by such equipment compared with 641 in 1952.

The following is an example of interference caused by such equipment:

Long-range radio bearing from the Commission's monitoring stations showed that interference complained of by the Los Angeles Police Department was originating in the general vicinity of Chehalis, Wash. A mobile unit dispatched from Seattle promptly found the radiation to be coming from an industrial radio frequency heater in a factory at Chehalis, 900 miles from the city in which it was disrupting police communications.

With the increasing number of radio receivers in use, not only are there more listeners to complain of interference, but at the same time there are more receivers which, unknown to their owners, are continuously radiating a signal capable of causing interference to other receivers as well as to safety communication services. One instance of continuous interference to TV neighborhood reception was traced to a console type shortwave receiver which had accidentally been left on for 5 weeks—the console being so covered with vases, flowers, books, magazines, ashtrays, and doilies that its original function had been forgotten.

During the year there were 1,498 cases of interference from electrical equipment other than radio. Because of personnel limitations, investigations of complaints were limited primarily to cases involving interference from radio stations and from equipment utilizing radio frequency energy and, in particular, where interference to a radio safety service was involved.

The following case illustrates the potential seriousness of even simple electrical interference:

In May 1953 interference caused to International Airport, East Boston, Massachusetts, was traced to a partly broken 4400-volt power cable inside a metal conduit on a high line pole 2½ miles from the airport.

Investigation of Unlicensed Stations

Mobile investigative units located and closed 92 illegal stations in 1953 as compared with 114 in 1952. This decrease is due in part to greater awareness of the likelihood of apprehension, and to the increased number of interference cases handled. Some illegal operation involved the transmission of race results. However, track and police officials are more vigilant to prevent this practice.

One illegal broadcast station purporting to operate at Sonora, Mexico, was actually transmitting from near Long Beach, California. Although the station moved operations during the investigation, it was finally located by mobile monitoring units. The operator was arrested, later convicted, and fined.

COMMERCIAL RADIO OPERATORS

Radio stations of all classes licensed by the Commission are, in the main, required by law to be operated by radio operators also licensed by the Commission. The grade of license required is determined by the complexity of the station and the degree to which the station's operations are vital to safety of life and property. The Commission has waived the licensed operator requirements for operation of certain types of stations.

Radio operator licenses are issued in a variety of grades to meet the operating requirements of the various radio services and stations. They are issued only to citizens of the United States.

Operator Examinations and Authorizations

Radio operator license examinations continued to be given at 91 examination points at quarterly, semi-annual or annual intervals throughout the United States and its territories. The places and times of these examinations are published in an official examination schedule obtainable from any of the district engineering field offices listed in the appendix to this report.

A substantial increase was noted in the number of amateur radio operator examinations given during the year. A total of 44,685 such examinations were conducted in 1953 as compared with 35,389 in 1952. (See section of chapter on Safety and Special Radio Services which deals with amateurs.) The increase was due to popularity of the new Novice class license and the role of amateur radio in the military service.

Commercial radio operator licenses and authorizations totaling 176,169 were issued in 1953 as compared with 179,928 in 1952. This represents a decrease of about 2.1 percent and brought the total of outstanding commercial licenses of all classes to approximately 730,136 at the close of the year.

Comparative figures by grades of licenses follow:

Class of license	June 30, 1952	June 30, 1953	Increase or (decrease)
Radiotelegraph:			
First class	5,244	5,477	233
Second class	9,248	9,694	446
Third class [1]	1,694	1,930	236
Temporary limited: Second class	617	644	27
Radiotelephone:			
First class	44,537	47,221	2,684
Second class	27,672	30,297	2,225
Third class	8,953	13,218	4,265
Restricted radiotelephone operator permit	463,607	525,685	62,078
Aircraft radiotelephone operator authorizations	117,564	95,970	(−21,594)
Total	679,136	730,136	51,000

[1] Includes restricted radiotelegraph operator permits.

INSPECTIONS

Broadcast Station Inspections

Among the duties performed by Commission field engineers is that of inspecting radio station equipment in all classes in the broadcast services. Various phases of technical operation of the station are observed, and records of past technical operations are reviewed to ascertain whether the stations are operated efficiently and in compliance with technical rules and standards and the terms of the operating authorization. Inspections help insure that an adequate technical service is rendered to the listening and viewing public and that the station's towers do not create a hazard to air navigation as a result of improper antenna marking or lighting and, further, to prevent interference to other broadcast stations through improper technical adjustments.

Broadcast station inspections totaling 881 were performed during 1953, while 532 were accomplished in 1952. Discrepancies observed during these inspections totaled 366 in 1953, compared with 232 in 1952. The ratio of violations to inspections is roughly comparable for both years.

Ship Station Inspections

The safety of life and property at sea requires marine radio equipment to be both accurate and reliable. Periodic inspections of ship radio equipment, therefore, are made by Commission engineers in accordance with provisions of the Communications Act and the Safety of Life at Sea Convention. These inspections assure that the equipment is adequately installed, protected, and maintained in a state of effectiveness and readiness for emergency operation and that qualified operators are in charge of the installation at all times.

Inspections were made during the past 2 years as follows:

Number of ship inspections	1952	1953
United States ships	7,901	5,923
Foreign ships	2,706	2,942
Total	10,607	8,865

Deficiencies requiring corrections were noted as follows:

Number of deficiency notices served	1952	1953
United States ships	5,778	3,564
Foreign ships	1,032	1,243
Total	6,810	4,807

Deficiencies which were corrected by stations during inspection do not result in the issuance of formal notices. The number of the corrected deficiencies is shown below:

Violations cleared during inspections	1952	1953
United States ships	3,531	2,844
Foreign ships	495	554
Total	4,026	3,398

During the year the Commission inaugurated a program of assistance to owners and operators of small business or pleasure marine craft, furnishing squadrons, flotillas, yacht clubs, and individual small boat owners with informative pamphlets to assist them in achieving greater usefulness in the operation of their radio communication equipment. A further step in this effort culminated in an "enlarged self-education" program among organizations of small boat owners. Also, the Commission provided an unofficial "check off" sheet which is used by members to check their own installations, and the radio installations on boats of other members at their request. This helped to maintain equipment in an efficient operating condition and avoided, to a large extent, mutual radio interference among the small boat owners and operators.

Inspections of Other Radio Stations

During the year inspections of other than broadcast and ship radio stations totaled 7,134, while 8,926 inspections were made in 1952. Discrepancies of a technical nature totaling 2,393 were disclosed in 1952, while 1,360 were discovered in 1953.

In this category, too, the number of radio station inspections was of necessity drastically curtailed due to reduced personnel and budgetary travel limitations.

The Commission continued its "self-inspection" program inaugurated in 1951 in the case of several classes of other-than-ship stations. A special "check off sheet" assisted them, through their own efforts, to maintain their equipment in an efficient manner and, at the same time, relieved the Commission of the need of more frequent inspections.

FIELD ENGINEERING FACILITIES

A problem of major importance was brought about by the provisions of the Atlantic City conference of 1947 pertaining to more stringent frequency tolerances for many classes of stations. These pro-

visions became effective this year. However, the operating frequency of many of the stations cannot be checked at the monitoring station because of low power, distance from the monitoring stations, or propagation characteristics of the frequency used. This necessitates the use of portable frequency measuring equipment which can be taken to the vicinity of the station to be measured. As a result of the more exacting frequency tolerances, the Commission has had to provide portable frequency measuring equipment with considerably greater accuracy than had been used in the past. This new portable frequency meter has a tolerance of 0.001 percent as compared with 0.01 percent for that previously available.

To keep abreast of the growing use of the higher frequency ranges, there is a continuing problem of providing new or improved facilities to the enforcement offices and monitoring stations for rule enforcement and for obtaining propagation and other data in connection with frequency allocation and with promulgation of new or revised rules and engineering standards. For example, an urgent need for additional UHF field intensity measuring equipment for use in determining the extent of radiation from ultra high frequency TV receivers was partially met by the purchase of a second UHF field intensity meter.

A new precision frequency standard was purchased for the Grand Island monitoring station. It will take the place of the obsolete frequency standard that has been in use for the past 22 years. Nine new automobiles were acquired as replacements for some of the 1941 and 1942 cars that are still being operated in the field fleet of investigative and inspection cars. Thirteen heavy-duty battery charging systems were provided for some of the newer investigative cars.

Progress has been made on a long-range plan to locate all of the monitoring stations on Government properties that are owned or controlled by the Commission. Liaison is maintained with the General Services Administration for purposes of reviewing its real estate listings of surplus property which might provide suitable sites for those monitoring stations that are still located on leased lands.

FIELD ENGINEERING PROJECTS

The program to provide all monitoring stations with remote-controlled long-range direction finders was accelerated. Beginning the year with 4 stations operating with this equipment, the number had increased to 14 as the year ended. Construction is under way at two additional stations.

This activity was a part of approximately 7,600 man-days spent on 108 field engineering projects, 50 of which were initiated during 1953,

while 58 other projects were carried over from previous years. These projects were distributed among the monitoring stations and field offices with the former accounting for nearly 80 percent of the project time, or about 6,000 man-days.

Field intensity recording and analysis projects relating to propagation studies were maintained at about the same level as in 1952. An extensive program of continuous recordings of VHF and UHF stations was carried out in cooperation with the Central Radio Propagation Laboratory of the Bureau of Standards. Including the long established recording of noise level and signal strength of AM broadcast stations, a total of 39 recorders were in continuous operation at various monitoring stations.

Engineering projects, as in other years, covered a variety of subjects. Some of these included investigation of interference to ship radiotelephone services from Loran stations transmitting on nearby frequencies, the use of pulse transmissions for direction finding purposes, field intensity measurements and recordings of community television systems, commercial carrier current installations and UHF television stations along with the field intensity measurements of radiation by UHF television receivers. Construction and development projects are under way for items such as a compact mobile monitoring receiver for the investigative cars and for new and improved adcock direction finder beams, structures and tuning units for the remote controlled direction finders.

MISCELLANEOUS RADIATION DEVICES

The Field Engineering and Monitoring Bureau is responsible for administering the Commission's rules concerning restricted radiation devices (part 15) and equipment operating in the industrial, scientific and medical service (part 18). Restricted radiation devices include such sources of radio-frequency energy as garage door openers, phonograph record players and carrier current systems. Industrial, scientific and medical equipment includes industrial heating equipment, medical diathermy machines, used for therapeutic purposes, welding devices, hair removing apparatus and other types of equipment using radio-frequency energy coming within the scope of part 18.

The end of the fiscal year marked the close of the period in which the operation of pre-July 1, 1947 diathermy and industrial heating equipment was permitted without compliance with the technical standards of part 18. After June 30, 1953 such equipment must comply with those standards. (See also Industrial, Scientific and Medical Service in chapter on Research and Laboratory.)

April 30, 1953 was also the end of the period in which pre-April 30, 1948 miscellaneous equipment was permitted without compliance with those standards. After that date the operation of all miscellaneous equipment must be in compliance with the rules and regulations. (See also Restricted and Incidental Radio Devices in chapter on Research and Laboratory.)

The final date for diathermy and industrial heating equipment was originally set as June 30, 1952 but, because of a shortage of critical materials, equipment and engineering services, the Commission extended the date to June 30, 1953. Thus a 6-year amortization period had been provided for the operators of diathermy and industrial heating equipment and a 5-year amortization period for operators of miscellaneous equipment.

A few operators of pre-July 1, 1947 diathermy and industrial heating equipment indicated a desire to operate such equipment beyond June 30, 1953, but in no instance did they indicate that necessary materials, equipment, and qualified engineers were not immediately available to effect compliance with the rules. Therefore, no extensions were granted.

Toward the end of the year a special effort was made to obtain compliance with part 18 by those operators of pre-July 1, 1947 industrial heating equipment who have failed to comply with the rules. Such operators were requested to do so without further delay or to discontinue operation. There were 13 such cases, and unless compliance is effected promptly injunction proceedings may be necessary. It is the policy of the Commission to seek action to eliminate objectionable interference through the cooperation of the responsible individual or organization. Where the responsible party indicates inability or unwillingness to take the requisite action, more formal proceedings may be instituted under the Communications Act.

The number of inquiries concerning the rules governing the operation of diathermy and industrial heating equipment decreased during the year, indicating that industry is now familiar with the requirements of part 18.

ANTENNA OBSTRUCTION MARKINGS

All radio transmitting towers licensed by the Commission are studied to avoid authorization of antennas which would be hazards to air navigation. Pursuant to the Communications Act stipulation that the Commission require painting and/or illumination of radio towers if and when in its judgment such towers constitute, or there is a reasonable possibility that they may constitute a menace to air navigation, the Commission promulgated part 17, Rules Concerning the Construc-

tion, Marking, and Lighting of Antenna Towers and their Supporting Structures.

The Antenna Survey Branch in the Engineering Division of the Field Engineering and Monitoring Bureau administers part 17. Its primary functions are to study the height and location of proposed antenna construction. Where necessary, tower proposals which violate the criteria set forth in subpart B of part 17 are referred to appropriate Regional Airspace Subcommittees (ASP) of the Air Coordinating Committee (ACC) for special aeronautical study by aviation interests in cooperation with the applicant. In this manner it is usually possible to effect a compromise and to prescribe, when necessary, appropriate obstruction markings.

Prior to fiscal 1953, the number of antenna proposals requiring Commission reference to the ASP for special aeronautical study amounted to approximately 25 per month or about 5 percent of all those processed by the Antenna Survey Branch. During 1953 the number approximately doubled as a consequence of the lifting of the TV "freeze" and the Commission's approval of new TV service which employs high antenna towers. The quantity of referrals to ASP would have been further increased but for a procedure mutually acceptable to the Commission and to the ASP, whereby an applicant may request an ASP regional subcommittee to make a preliminary study of an antenna proposal prior to the filing of the application, and receive a preliminary recommendation of which the Commission takes cognizance.

During the year, the Commission amended part 17 to provide standards of obstruction markings for towers up to 1,500 feet in height in accordance with recommendations of a joint Government-industry conference which studied the new hazard problem created by high TV antenna towers, whereas previous standards were for heights up to 500 feet. However, rulemaking covering standards for the obstruction marking of guy wires was deferred pending further study of practical methods whereby guy wires can be satisfactorily lighted.

New obstruction marking standards for high towers require 20 new separate lighting specifications, depending upon tower heights, in addition to the continuance of 20 existing specifications. To eliminate the requirement for 40 separate specification forms, a new specification sheet (FCC Form 715) was adopted March 30, 1953. This form incorporates by separate paragraphs all previously approved specifications. In the future, appropriate paragraphs of FCC Form 715 will be specified for all construction permits and licenses that require obstruction markings.

The charting of obstructions to air navigation is a function of the Coast and Geodetic Survey and it is becoming increasingly important in view of the construction of extremely high TV towers and the

great speed obtained by modern aircraft. It is the responsibility of that agency to furnish information to aviation interests through the medium of accurate, current and complete aeronautical charts. Part 17 was amended to request construction permittees whose antennas require obstruction markings to mail a post card report of completed antenna construction to the Coast and Geodetic Survey.

Antenna Statistics

Statistics of antenna construction proposals processed by the Antenna Survey Branch for the fiscal year, including the number referred to the Air Space Subcommittee for special aeronautical study, follow:

Services	Pending July 1, 1952	Received in ASB	Cleared by ASB	Pending June 30, 1953[1]
Broadcast:				
AM	2	404	377	29
FM	2	71	66	7
TV	65	1,506	1,166	405
International	0	11	11	0
Experimental	1	10	11	0
Total broadcast	70	2,002	1,631	441
Safety and special	659	5,081	5,485	255
Common carrier	0	290	279	11
Total	729	7,373	7,395	707

[1] Totals in this column include totals respectively shown in last column of the next table.

Services	Pending at airspace July 1, 1952	Sent to airspace during year	Received from airspace during year	Pending at airspace June 30, 1953
Broadcast:				
AM	2	97	94	5
FM	0	11	11	0
TV	59	484	412	131
International	0	0	0	0
Experimental	1	0	1	0
Total broadcast	62	592	518	136
Safety and special	1	92	79	14
Common carrier	0	28	28	0
Total	63	712	625	150

Research and Laboratory

TECHNICAL RESEARCH DIVISION

General

The Technical Research Division deals with problems relating to wave propagation, technical standards, and allied subjects. In this connection, it obtains technical data from within the Commission or outside sources, inaugurates theoretical studies, participates in technical studies incident to international matters, coordinates the research work of the Commission with that of other Government agencies and industry, handles problems relating to the engineering standards and technical rules of the Commission, and administers the Experimental Radio Services.

The division continued its long-term radio wave propagation projects at about the same level but gave increased attention to the higher frequencies, especially UHF because of the availability of commercial TV operation there.

It continued collecting and analyzing basic radio propagation data for the use of the Commission and other Government agencies.

Progress was made on the equipment type approval and type acceptance program of the Commission with considerable work being done on uniform technical rules for the various services administered by the Commission.

There was considerable increase in the number of experimental service applications. A completely revised set of rules governing this service was adopted by the Commission.

The Chief of the division was Commission representative on Panel II of the Telecommunications Planning Committee. This panel is concerned with the coordination of the development and application of new and improved systems of communication. Associate membership was held in the Panel on Antennas and Propagation of the Research and Development Board of the Department of Defense. This served as a means of keeping informed of new developments sponsored by the military which might have an impact on frequency allocations and commercial communications.

Directional Antenna Performance Studies

There is in preparation a report concerning the actual performance characteristics of directional antennas in the standard broadcast band. One phase of this work culminated in a report dealing with the nature of variations between the theoretical and measured performance of directional arrays, whereas the second phase deals with practical methods of estimating the expected performance of directional arrays based on known theoretical array parameters.

Revision of Ground Conductivity Map

A revision was undertaken of the United States ground conductivity map published by the Commission in 1938 which was based on a relatively meager amount of field intensity measurements and was frequently found to be at variance with ground conductivity values established by later field intensity surveys. This task was completed in cooperation with the Bureau of Standards and is based on a vast amount of accumulated field intensity measurements made since the original publication.

Sunspot Cycle Recording

This work is a continuation of the previously inaugurated recording project of signals from a number of AM broadcast stations at the several monitoring installations of the Commission. Certain statistical techniques for establishing the dependence of the received sky-wave fields upon the several propagation parameters were developed. Some progress in applying these techniques to the processing of the available data was made. However, completion of the final phases has been delayed by other higher priority assignments.

Technical Consultation and Advice

A considerable amount of time has been devoted in rendering technical advice and consultation to the Commission and its staff on a variety of subjects such as radio wave propagation phenomena, antenna performance, equipment performance, etc. These activities took the form of special studies, attendance at hearings and numerous informal conferences.

To illustrate the wide diversity of technical problems handled for other divisions of the Commission mention should be made of a study performed for the Frequency Allocation and Treaty Division dealing with the determination of the optimum usable frequencies for ship to shore radiotelephone communication between a fleet of Mississippi

riverboats and their coast station terminals. Another project, undertaken for the Common Carrier Bureau, involved a VHF frequency allocation study for establishing a one-way radio paging service which involved the appraisal of propagation conditions, expected signal to noise ratios, receiver characteristics and other allied data.

Government-Industry Propagation Committees

The publication of information concerning VHF propagation resulting from the work of the Ad Hoc Committee over the period from October 1948 through April 1952 has stimulated interest not only in this country but also abroad. This work was, by necessity, limited to prediction by scientific methods of the extent of radio and TV broadcast service areas that would be provided by transmitters under different amounts of radiated power, different atmospheric conditions encountered in various geographic regions, different topographical conditions, and different heights of transmitter antenna towers. All of these factors have an important bearing on the distance by which two or more transmitters could be spaced and, consequently, on the number of stations that could be authorized.

With the rapid expansion of television, new problems are continually being encountered, and the facilities provided by high power transmitters operating in new frequency bands offer means by which refinements to more exacting tolerances are being accomplished. Considering the material available at the time, the predictions contained in the Ad Hoc Committee reports have proven to be remarkably accurate. However, only a meager start has been made concerning the properties of UHF propagation as applied to high-power TV broadcasting.

In order to facilitate the resolution of new problems involving propagation, a Radio Propagation Advisory Committee was organized, composed of engineers from other Government agencies, from the industry, and consulting engineers who practice before the Commission. The committee has already developed information which indicates that considerable refinement is desired with respect to the methods of determining performance characteristics of TV transmitting antennas as specified in the Commission's rules.

Field Measurements of VHF and UHF Propagation

During the year urgently needed VHF and UHF field strength measurements were made of FM and TV broadcast stations. This was made possible through the loan of equipment and financial support by the Central Radio Propagation Laboratory of the National

Bureau of Standards. At longer distances the signals are characterized by wide variations with time, and for this reason it is necessary to make continuous graphical recordings and calibrations with each set of equipment over a long period. Recordings were made of 34 stations during the year, the recorder charts were analyzed for each hour, and monthly data sheets were assembled for each station. Special studies were made in cases where unusual results were indicated by the measurements.

Special VHF Propagation Studies

Measurements were continued on certain aspects of VHF ionospheric transmissions involving the use of high-power transmitters for long-distance communication paths. These measurements are being analyzed to determine the extent to which interference may be caused by such transmissions.

Measurements concerning long-distance VHF propagation involve painstaking statistical work with large quantities of graphical material. In efforts to improve the accuracy of the measurements and to reduce the amount of time required to analyze them, many different systems were studied and new methods are being proposed.

Special investigations were carried out in connection with the presentation of technical evidence in the Commission's public hearings involving rulemaking procedures for various types of radio services utilizing frequencies above 30 megacycles and in hearings where questions arise concerning VHF propagation.

UHF Propagation

The advent of commercial UHF television provides the opportunity to obtain further information regarding UHF propagation. Several sets of equipment were completed for recording UHF field intensities and the results are being analyzed. Plans are being made for projects of field intensity recordings to obtain new information under different conditions so that the effects of distance, antenna height, and directivity, terrain, climate, season, etc., may be evaluated.

Experimental Radio Service

The Communications Act requires that the Commission "study new uses for radio, provide for experimental uses of frequencies, and generally encourage the larger and more effective use of radio in the public interest". Accordingly, the Commission provides for the operation of experimental radio stations. Part 5, Rules and Regulations Govern-

ing Experimental Radio Services, became effective October 1, 1939, and has been modified from time to time as the demands of the experimental service required. During fiscal 1953 extensive revisions were adopted and a new part 5 of the rules became effective March 17, 1953. These rules were designed to encourage and promote all types of experimentation relating to the radio art.

The new rules provide for two classes of experimental stations, namely, Experimental Service (Research) and Experimental Service (Developmental). Experimental (Research) stations are for the use of persons engaged in fundamental or general research, experimentation and development of the radio art; or for the development, testing or calibration of radio equipment. Experimental (Developmental) stations are for the development of equipment, engineering data for techniques for an existing or proposed radio service. Class 3 authorizations, which were formerly available to individuals interested in conducting experimental programs on their own behalf, are no longer provided for in the rules.

There are two subclasses of Experimental (Research) stations. These are contract developmental and export developmental stations. The former classification includes experimental stations for developing equipment or techniques under contract with the departments of the United States Government. The other classification is for the development of equipment intended for export purposes and for eventual ownership and operation by stations under the jurisdiction of foreign governments.

The majority of Experimental (Research) stations, formerly known as Class I stations, are operated by manufacturers of equipment and by research and development organizations. These stations are engaged in development of new equipment and the improvement of existing equipment, the development of new techniques in the electronic art and fundamental studies involving radio propagation. Development work is being continued on narrow-band communication equipment which will effect a more efficient use of the radio spectrum. New and improved radio aids to navigation are being developed while other development work includes radiolocation equipment, and microwave communication equipment.

Continued experimental work is being done in ionospheric investigations and propagation studies on various frequency bands throughout the spectrum, particularly in the upper range where available information is meager. In the past frequencies above 30,000 megacycles have been considered unusable for radio purposes. Experimentation is now going forward on these frequencies.

The Commission's table of frequency allocations provides for the experimental use of frequencies throughout the radio spectrum, sub-

ject to the condition that harmful interference is not caused to services or stations to which the frequencies are regularly assigned.

Experimental (Research) stations are used extensively by manufacturers and sales engineers for the purpose of making field intensity or coverage surveys in areas where it is proposed to establish radio communication systems. The results of these surveys provide useful information for choosing the operating frequency, power, emission, and antenna location for optimum performance.

Applications for Experimental (Developmental) stations, formerly known as class 2 stations, include proposals for types of operation which are not recognized in the present rules. Since the establishment of the land mobile services on a regular basis, the number of stations of this type has decreased.

Class 3 authorizations are no longer granted. Because of the limited scope of experimentation permitted under this class of authorization, the Commission received few requests for such stations. The types of experimentation formerly permitted under class 3 authorization may now be conducted under the present research type of authorization or, for qualified persons, under the rules governing the Amateur and Citizens Radio Services.

Statistics covering the experimental radio services for fiscal 1953 are given below. These data show that approximately 20 percent more authorizations were handled in 1953 than in 1952.

Number of experimental radio stations

Class of station	June 30, 1952	June 30, 1953	Increase	
			Number	*Percent*
Class 1 (research)	322	384	62	19.2
Class 2 (developmental)	47	60	13	27.6
Total	369	444	75	20.3

Mobile and non-mobile transmitters

Class of station	Nonmobile units	Mobile units	Total transmitters	Increase over 1952	
				Number	*Percent*
Class 1 (research)	304	1,317	1,621	230	16.5
Class 2 (developmental)	17	156	173	27	18.5
Total	321	1,473	1,794	257	16.7

Experimental applications

Class of station	Received 1952	Received 1953	Increase	
			Number	*Percent*
Class 1 (research)	835	968	133	15.8
Class 2 (developmental)	80	87	7	8.3
Total	915	1,055	140	15.3

Restricted and Incidental Radiation Devices

In 1938 the Commission formulated certain rules to govern the operation of various types of low-power devices then used for remote control purposes. The separate licensing and detailed regulation of these devices was not considered to be administratively feasible at that time. Since then many low power techniques have been adapted to an ever-increasing variety of uses. Typical of these adaptations are carrier current broadcast stations, which employ carrier current for the distribution of programs essentially broadcast innature; community antenna systems, which amplify and distribute TV broadcast signals in areas of poor reception; industrial carrier current signaling systems; phonograph oscillators; garage door openers; etc.

Recognizing the inadequacy of the present part 15 with respect to the regulation of many thousands of low power communication devices and several million unintentional radiators such as ignition systems, electrical appliances, etc., the Commission has proposed rulemaking setting forth broad administrative and engineering factors to be considered in amending part 15. While much basic work has been done and many comments have been received, additional information will be necessary before a satisfactory solution can be found to the many problems concerning restricted and incidental radiation devices. (See also Miscellaneous Radiation Devices in chapter on Field Engineering and Monitoring.)

The Commission is continuing its efforts to encourage manufacturers to suppress radiation from TV and FM broadcast receivers. An industry report dated September 1952 indicated an improvement over previous years and it is believed that these efforts will effectively help to reduce the interference created by these devices. The Commission has been fortunate in enlisting the aid of various industry committees in studying the question of spurious radiation. This will aid the Commission in arriving at methods and standards for dealing with the practical problems which it faces in its regulatory functions.

Industrial, Scientific, and Medical Service

One of the limiting factors in the use of radio transmitting and receiving equipment is the existence of electrical interference which tends to prevent the satisfactory reception of radio signals. Such interference may be in the form of atmospheric background noise, or it may be the result of spurious and harmonic emission from various types of electrical and radio frequency generating equipment. Equipment generating radio frequency energy, but not designed for communication purposes, contributes a substantial portion of the interference to authorized radio services, and has often resulted in

destructive interference to radio communication systems. Such interference occurs not only to broadcast services, but frequently interrupts those services concerned with the safety of life and property.

To minimize the probability of interference from particular kinds of noncommunication equipment generating radio frequency energy, the Commission adopted, effective June 30, 1947, part 18 of its rules which relates to the Industrial, Scientific, and Medical Service.

Medical diathermy equipment includes any apparatus (other than surgical diathermy apparatus designed for intermittent operation with low power) which generates radio frequency energy for therapeutic purposes. Industrial heating equipment includes apparatus using radio frequency energy for the purpose of heating operations in manufacturing or production processes. Miscellaneous equipment includes apparatus, other than medical diathermy or industrial equipment, in which the action of the radio frequency energy generated is applied directly to the workload.

Specific frequency bands have been allocated for the operation of industrial, scientific, and medical equipment and part 18 sets forth the conditions under which such equipment may be operated without a license. The suppression of spurious and harmonic radiations on frequencies outside the allocated bands is required.

Interference problems arising from the operation of equipment governed by part 18 have been administered, first on a request-for-cooperation basis, and, in those cases where cooperation has not been satisfactorily accomplished, by the use of the enforcement provisions. In the administration of part 18, the Commission has been guided by a desire to provide interference-free communication and, at the same time, permit the necessary use of medical diathermy, industrial heating and miscellaneous equipment. The Commission's endeavor to eliminate interference by the cooperative efforts of the complainant and the equipment used has, in general, been well received.

The expansion of TV facilities and the further congestion of the frequency spectrum by other services has increased the number of interference cases reported. Thus far, the procedure set up for processing major complaints of interference to radio reception has been satisfactory. However, the growth of broadcasting, communication and safety services may lead to an increase in the number of difficult situations which can be resolved only by the use of stronger measures available under the Communications Act.

The Commission has held conferences with representatives of manufacturers and retailers of equipment regulated by part 18. These conferences have been helpful to both industry and the Commission in the solution of problems relative to equipment. Type approval certificates were issued covering 7 diathermy machines and 9 types of miscellaneous equipment.

The Commission has successively postponed the effective date of part 18 as it concerns arc welding equipment which uses radio frequency energy, until January 31, 1954. The Commission is working with industry to develop mutually satisfactory standards.

June 30, 1953, marked the end of the 6-year period for amortization of obsolete medical diathermy and industrial heating equipment. April 30, 1953, terminated a period of 5 years for most of the electronic apparatus classified as miscellaneous equipment. New types of miscellaneous equipment envisioned but not in general use at the time the rules were first adopted became subject to its provisions when they came into use.

During the year, rule-making was initiated to further simplify and clarify the rules with regard to the operation of miscellaneous equipment without a license from the Commission. Changes were made to provide a detailed procedure for the certification of industrial heating equipment when several units are being used at one location. The rules respecting medical diathermy equipment operated outside of the assigned frequency bands were amended to permit operation in an unshielded room.

Studies were made to keep the rules abreast of the ever-increasing number of devices used in this service, keeping in mind the limitations required to prevent interference to the increasingly sensitive receivers used in the various services. Seven additional type approval certificates for miscellaneous equipment were issued during the year.

Equipment Standards and Related Matters

Studies were conducted looking toward the solution of problems arising from rapid developments which require new or revised rules relating to definitions of technical terms, equipment standards, and similar matters.

These took the form of analysis of technical literature, representation at various conferences and demonstrations and consultations with Government and industry groups. Another important activity is participation in the work of the United States groups studying technical questions which the ITU has referred to the CCIR.

Of increasing importance is the technical preparation of new or revised rules covering standards, equipment performance requirements, spurious radiation limitations, interference prevention, etc. During the year it was proposed to establish a new policy governing assignments to operational fixed stations in the 72–76 megacycle band which would minimize interference to the reception of TV signals on channels 4 and 5.

It was also found necessary to require harmonic and other spurious emissions of TV transmitters to be reduced to a lower level than has

been the past practice. A temporary standard of such attenuation of 60 decibels was adopted. Further studies are expected to result in a requirement of additional attenuation, especially for high powered units.

Type Approval and Type Acceptance

Radio equipment used aboard ship has been type approved since the early days of radio. Monitoring equipment and transmitters used in aural broadcast stations have been similarly approved for many years. More recently, the Commission initiated a program to "type accept" (i. e., certify as acceptable for licensing) radio equipments used in other radio services. Type approval, as the term is now used, signifies that actual tests have been conducted by the Commission, either in its laboratory or at other locations under the supervision of Commission personnel. Type acceptance signifies that tests have been conducted not under Commission supervision but with data being reviewed by the Technical Research Division. Shipboard VHF radio equipment has been in the type accepted category for 2 years.

It is expected that the type acceptance program will be expanded to cover all services. Expansion of this program will reduce interference between stations due to the requirements for reduction of spurious emissions. A corollary to such type acceptance will be the issuance of lists of equipments which have been type accepted. Such lists will reduce the time required for processing applications in the various services involved. This year saw the issuance of a list of equipment acceptable for licensing in the land mobile radio services. This list contains technical data for some 700 transmitters built by 38 different manufacturers.

The major responsibility for type approval and type acceptance of transmitting equipment rests with the Technical Research Division. Actual tests of equipment for type approval (not type acceptance) are conducted by the Laboratory Division, with the actual approval and administrative work being handled by the Technical Research Division.

The following tabulation indicates the approximate number of applications handled and the number of equipment specifications filed during the year. It excludes consideration of approval of equipment used for industrial, scientific, and medical purposes which is noted elsewhere in this report.

	Type acceptance	Type approval	Specifications filed
Received	41	27	138
Issued	31	20	77
Pending	10	7	61

LABORATORY DIVISION

General

The Laboratory Division makes technical measurements and engineering investigations to aid the Commission in allocating frequency bands, establishing and revising engineering standards and regulatons for new as well as existing services, and drafting regulations covering noncommunications type of equipment employing radio-frequency energy which may interfere with the radio communication services. It maintains a laboratory near Laurel, Maryland.

Activities of the Laboratory Division embrace:

Investigation of various methods of transmission and reception to determine their utility and interference factors;

Tests of transmitters to determine whether interference signals are emitted on frequencies other than the assigned channel;

Tests of receivers to determine how close together the Commission might place stations without the listeners receiving several stations at the same time;

Tests of receivers to determine what interference they may produce in other nearby receivers either in the same service or in other services;

Tests of equipment such as apparatus involving safety at sea for reliability of operation;

Investigation of interference produced by noncommunication uses of radio-frequency energy;

Tests of frequency and modulation monitors for accuracy and reliability; and

Development of special monitoring equipment for use of Commission engineers in the field, and maintenance of the accuracy of measuring installations and equipments.

In general, the laboratory tests a type of equipment rather than individual units. Attempt is made to anticipate interference problems and have remedial measures taken prior to the manufacture and distribution of a large number of units.

In some instances type tests are required by the rules and regulations, and formal approval is given. In other cases the laboratory makes type tests not specifically required, in order that the Commission may be aware of the existing service and interference problems encountered in practical operation, so that either the allocation structure may be designed to fit the units available or the Commission may take other action leading to improved equipments which will permit more efficient use of the available radio frequencies.

Type testing also is required of certain noncommunications equipment which employs radio frequencies and may cause serious interference unless the frequencies are properly maintained and the harmonic and spurious emissions sufficiently restricted.

A summary of particular laboratory activities engaged in during the year follows:

Broadcasting

Most of the laboratory work in the broadcast field concerned tests as to receiver oscillator radiation and the various spurious responses of receivers, with especial emphasis as to impact of these problems on the implementation of the UHF television band. Studies were made of a number of proposed UHF tuners and receivers submitted by manufacturers. In order to obtain propagation data for the UHF band, the laboratory made field intensity recordings of 2 UHF–TV stations.

Changes were made in the laboratory's TV signal generator equipment to facilitate operations on both color and monochrome. Permanent facilities are being installed to permit examination of interference between several color signals and the examination of new TV systems or methods for transmission. Tests are also being conducted on proposed types of color receivers.

Nonbroadcast Services

Measurements were made of the selectivity, intermodulation, and other spurious responses of receivers used in other than broadcast services. The oscillator radiation of nonbroadcast receivers was tested and examination was made of the performance of deviation limiting devices now required in many transmitters to reduce interference on channels near the one in use. The art has progressed to the point where, with good equipment, consideration is being given to the implementation of closer channel spacings to provide more communication facilities.

At the present time, automatic equipment which responds to distress signals is required only on certain ships which are radiotelegraph-equipped. Through international conferences it has been agreed to extend this general type of protection to radiotelephone-equipped vessels. A number of units operating on the latest proposed type of signal have been designed and constructed at the laboratory, and tests on the new type signal are under way.

Lifeboat radio transmitter-receivers of 2 different types were tested and approved during the year.

Calibration of Installations and Apparatus

In its enforcement and investigation activities, the Field Engineering and Monitoring Bureau uses a large amount of testing and field intensity recording equipment. The Laboratory Division calibrates the signal generators, field intensity sets and other equipment used in the field.

Noncommunication Equipment

Industrial heating, medical diathermy, and other miscellaneous uses of radio-frequency energy for purposes other than communication have expanded to such an extent that the power used by this group exceeds the total transmitter power required for radio communication. Since such noncommunications equipment employs frequencies of the same order as used by the communications industry, severe interference may be expected unless these units are designed and operated properly. Some of these units use power far in excess of the 50-kilowatt maximum permitted AM broadcast stations. Devices in this category are covered by part 18 of the Commision's rules and regulations.

Medical diathermy apparatus which falls within this classification is type approved by the laboratory to insure that the frequency is maintained within one of the specified bands and that the harmonic and spurious radiations are within the prescribed limits. During the year 18 diathermy machines were submitted for test.

In addition, the laboratory made tests on 16 other devices employing radio-frequency energy and capable of causing interference.

The Laboratory Division is represented on the following committees which are working toward reduction of interference from receivers, industrial radio-frequency heating equipment, power lines, etc.: I. R. E. Industrial Electronics Committee; A. I. E. E. Subcommittee on Induction and Dielectric Heating; A. I. E. E. Subcommittee on Radiation Measurements above 300 Megacycles; I. R. E. Oscillator Radiation Subcommittee; A. S. A. Technical Subcommittee No. 1 of Committee C63; and CCIR Study Groups.

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Frequency Allocation

GENERAL

A continuing study of the radio spectrum is essential in order that channels can be allocated and used in conformity with advancements in electronics and the rendition of maximum public service.

Frequencies in the various portions of the spectrum have different characteristics. For that reason, one group of frequencies may be useful to a particular service but not to others. Consequently, bands must be allocated to those services for which they are most suitable. In some instances these bands have to be subdivided to serve more specific purposes.

Further, the transmissions of radio stations are not limited by national boundaries. There must be coordination by different nations to minimize interference by stations of one country with those of other countries. Also, there must be international agreement on the designation of frequencies for the many radio services, and universal practice and procedure in their use.

INTERNATIONAL FREQUENCY ALLOCATION

The chief activity of the Commission in the international radio field has been concerned with carrying out domestically the provisions of the Geneva Agreement (1951), which was signed by some 65 countries at the close of the Extraordinary Administrative Radio Conference of the International Telecommunication Union (ITU). This program ties in with the Commission's objectives under section 1 of the Communications Act to make "* * * available, so far as possible, to all the people of the United States a rapid, efficient, nationwide, and worldwide * * * radio communication service with adequate facilities * * * for the purpose of the national defense, for the purpose of promoting safety of life and property through the use of wire and radio communication * * *".

Progress has been made for each of the six principal radio services in the high-frequency spectrum as follows:

Aeronautical mobile (R).—The Commission has cleared about 53 percent of the various frequencies in the aeronautical mobile R

(Route) bands which will be used by aeronautical and aircraft stations engaged in serving both domestic and international civil aviation. Additional clearances are being arranged on a continuing basis as rapidly as possible. Thus, the band 5500–5550 kilocycles has been converted from its Cairo allocation for ship telegraph to the Atlantic City allocation for aeronautical mobile (R) use. An entire 50 kilocycle band has been made available for the latter service in beginning the intricate "chain reaction" adjustments in the 5 megacycle band. The aeronautical mobile (R) plans for the North Atlantic and European-Mediterranean areas are being studied by the Commission with a view to clearing the service frequencies involved. Similar clearances will be effected for other areas based on plans adopted by the International Civil Aviation Organization (ICAO) for exclusive service-allocation of spectrum space to the aeronautical mobile (R) service as provided by the Atlantic City Radio Conference. In addition, 34 frequencies intended for assignment to domestic routes remain to be cleared.

Aeronautical mobile (OR).—The Commission does not at this time intend to license any stations in the aeronautical mobile OR (Off Route) service but it does recognize the importance of clearing these bands at the earliest date so that they may be brought into use by the stations concerned in accordance with the Geneva Agreement. Existing assignments made by the Commission on frequencies within the OR bands can be moved to their planned frequencies in accordance with the Geneva Agreement as soon as the latter frequencies are cleared with the exception of those fixed station assignments above 4 megacycles which are at the present time in the OR bands. Deletions from licenses have been made from 29 of the total 41 fixed assignments in the OR bands (71 percent). Solution to some of the remaining out-of-band problems are being considered by the licensees concerned, and additional progress in removing existing out-of-band fixed assignments will be reflected in actions now pending.

Amateur service.—All of the adjustments in the service-allocations for the amateur service envisaged by the Atlantic City Table of Frequency Allocations were made by the Commission early in 1952. These consist of the clearance and introduction of the new 21 megacycle amateur band (21,000–21,450 kilocycles) and the reallocation of 50 kilocycles of spectrum space at 14 megacycles (14,350–14,400 kilocycles) from the amateur to the fixed service. A considerable number of other countries also have made the new 21 megacycle band available to their amateur services. No additional action is required of the United States with respect to amateur frequencies.

Fixed service.—The fixed service presents a serious frequency problem. This service is allocated more spectrum space between 4 and 25

megacycles under the Atlantic City Allocation Table than all the other services combined. It represents our major use of the high-frequency spectrum.

Fixed stations provide rapid communication by telegraph, telephone, facsimile, radiophoto, and other transmissions to most of the principal countries of the world. Yet there is no international plan of time and frequency sharing for this vital radio service, nor will there be until agreement is reached by the various countries on the International Frequency List. Drafts of this list are being prepared by the International Frequency Registration Board (IFRB), based on the in-band fixed service occupancy now developing as the result of the Geneva Agreement procedures.

The traffic handled by our fixed stations is such as to make difficult, in certain cases, the discontinuance of frequency assignments which were in-band with respect to the Cairo (1938) allocations but which are now out-of-band under the Atlantic City (1947) allocations. However, the original 166 out-of-band assignments with respect to Atlantic City have been reduced to 52 (69 percent), and proposals are under consideration by the Commission and the licensees with respect to 35 of the remaining frequencies. Thus a solution either has been found or is imminent to 90 percent of the original total.

The Commission has assisted fixed licensees in adjusting their out-of-band operations so as to accommodate the traffic load on appropriate in-band fixed frequencies. These efforts are being intensified to eliminate the relatively few remaining out-of-band fixed frequency assignments in a manner satisfactory both to the licensees concerned and to the Commission.

In accordance with the Atlantic City allocations, the Cairo ship telegraph band 11,000–11,100 kilocycles has been relinquished by the maritime mobile service to the fixed service and the band 14,350–14,400 kilocycles has been converted from the amateur service to the fixed service. These actions were taken by the Commission to compensate, as far as possible, the net loss of spectrum space to the fixed service in the Atlantic City allocations as compared to the Cairo allocations.

HF broadcast service.—All high frequency broadcast stations licensed by the Commission are assigned frequencies within the Atlantic City broadcast bands. This completes the initial task of bringing the broadcast service within the Atlantic City allocations insofar as the Commission is concerned.

However, the Geneva Agreement provides that the International Frequency Registration Board adjust the Mexico City basic plan and the draft plans prepared by the Technical Plan Committee at Paris, and prepare such additional plans as are considered necessary to deal with seasons and phases of solar activity. These plans have not yet

been completed by the IFRB. The various countries will have to reach agreement on precise frequencies and hours for high frequency broadcast operation. At the present time there is no international channeling of the high frequency broadcast bands and no specifications as to hours of use for frequencies within those bands.

Maritime mobile service.—The Atlantic City Radio Regulations provide the martime mobile service with exclusive bands for each of 4 classes of stations—ship telephone, ship telegraph, coast telephone, and coast telegraph.

The Geneva Agreement anticipates the introduction of the ship telegraph bands in successive steps as follows: calling bands, cargo working bands, and passenger working bands. Introduction of these three families of subbands at 4, 6, 8, 12, and 16 megacycles, in the order listed, is to be followed by the introduction of the Atlantic City ship telephone bands. The Commission has completed all of the frequency changes envisaged by the Geneva Agreement for the entire spectrum between 20 and 27.5 megacycles.

The Geneva Agreement anticipates the introduction of coast telegraph and coast telephone assignments, one at a time as clearances can be effected.

The Commission has already established September 1, 1953, as the date for the introduction of the Atlantic City ship telegraph calling bands (4177–4187, 6265.6–6280.5, 8354–8374, 12,531–12,561, 16,708–16,748, and 22,220–22,270 kilocycles).

The Commission has not yet completed its part of the clearance of the cargo working bands and the passenger working bands for ship telegraph stations. Appropriate announcements will be made as these clearances occur and the shipping industry and affected licensees will be kept advised in a manner similar to that employed for the clearance and introduction of the calling bands. The present international target date for opening of the cargo working bands is March 1, 1954.

As regards coast telegraph stations, there are 127 assignments to be activated for the bands between 4 and 20 megacycles and 22 coast telegraph assignments in the 22 megacycle band, making a total of 149 assignments between 4 and 27.5 megacycles. As of June 30, 1953, 94 of these 149 assignments (or 63 percent) have been cleared and the licensees notified. Additional clearances are being arranged on a continuing basis, and licensees are kept informed of the status of clearances of interest to them.

In the matter of the maritime mobile radiotelephone service for public correspondence, a substantial portion of the frequency adjustments resulting from the Geneva Agreement has been made and service to ships is now provided on 57 percent of the ship assignments and 67 percent of the coast assignments.

NATIONAL FREQUENCY ALLOCATION

Many of the Commission actions during the past year concerning the allocation of frequencies on a national scale are directly or closely related to carrying out the obligations of the United States Government in its international commitments.

A list of the major of these domestic frequency allocation actions follows:

Made final a change in the allocation of frequencies in the bands between 76–88 and 98–108 megacycles so as to permit the common carrier fixed service to use these bands in the Territory of Hawaii only.

Amended Part 2 of its rules so as to permit non-Government radio stations to use frequencies below 25 megacycles which are not in accordance with the Commission's Table of Frequency Allocations where such use is necessary for coordination with Government stations.

Rearranged the frequency allocations in the 450–460 megacycle band to provide greater separation between the frequencies available for assignment to each of the services having allocations in that band.

Recognized theater television as an existing service (common carrier) and found no necessity to provide a separate allocation of frequencies for the exclusive use of this service. (See chapter on Common Carriers.)

Proposed the deletion of certain frequencies presently available to stations in the fixed Public Agricultural service.

Additionally and in connection with frequency changes described in "International Frequency Allocation," the Commission proposed or adopted many other modifications to its Table of Frequency Allocations to further bring it into conformity with the Atlantic City Table of Frequency Allocations, thus permitting a more effective and efficient utilization of the radio spectrum by stations in the various services.

INTERNATIONAL CONFERENCES AND MEETINGS

The Commission assisted in the United States preparation for and participation in 16 international conferences and meetings during the year. These were worldwide, regional or bilateral in nature. Most of the major conferences were convened under the auspices of the International Telecommunication Union (ITU) or the International Civil Aviation Organization (ICAO). Approximately 90 nations participate in the activities of the ITU and some 60 participate in the activities of the ICAO.

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The Commission furnished 3 delegation chairmen or vice-chairmen and 5 representatives to the following conferences and meetings:

Name	Place	Date
Discussions with British Post, Telegraph and Telephone on use of FM vs. AM on VHF range by Maritime Mobile Service.	London, Paris, and Geneva.	June 20–July 22, 1952.
ITU Conference for Revision of London Agreement, 1949	London	July 9–21, 1952.
ITU Plenipotentiary Conference	Buenos Aires	Oct. 2–Dec. 22, 1952.
ICAO European Mediterranean Special Frequency Meeting.	Paris	Oct. 28, 1952.
ICAO South East Asia-South Pacific Regional Air Navigation Meeting.	Melbourne	Jan. 13, 1953.
US–UK Meeting Concerning Distance Measuring Equipment.	Washington	Jan. 26, 1953.
CCIR Study Group XI—TV Questions Related to Single Side Band.	Stockholm	May 20–27, 1953.
CCIT 7th Plenary Meeting	Arnhem	May 26–June 3, 1953.

In addition, the Commission engaged in preparatory or follow-up work directly connected with the following conferences and meetings:

Name	Place	Date
URSI International Executive Committee	Sydney	Aug. 8, 1952.
URSI 10th General Assembly	do	Aug. 11–21, 1952.
CCIT Study Group 6 Vocabulary and Definitions	Geneva	Oct. 14, 1952.
CCIT Study Group 1 General Telegraphy	do	Oct. 14, 1952.
1st Air Navigation Conference	Montreal	Feb.–Mar. 1953.
CCIF Study Group on Trials Semi-Auto Phone Operations	Geneva	Mar. 1, 1953.
CCIF Study Group on Operating and Tariff Questions	do	Mar. 1, 1953.
ITU 8th Session of Administrative Council	do	May 2–June 1, 1953.
CCIF Sub-Study Group on Quality of Transmissions	Stockholm	June 1, 1953.

The following conferences and meetings are projected for the future:

Name	Place	Date
US-Mexico Meeting for Implementation Extraordinary Administrative Radio Conference.	Undetermined	Tentative—1953.
US-Canada Meeting for Implementation Extraordinary Administrative Radio Conference.	do	Tentative—1953.
ICAO 5th Communications Division Meeting	Montreal	October 1953.
ICAO 2nd African Indian Ocean Regional Air Navigation Meeting.	Canary Islands	November 1953.
URSI 11th General Assembly	Netherlands	1954.
ICAO 3d Caribbean Regional Air Navigation	Undetermined	1954.
ICAO Middle East Regional Air Navigation Meeting	do	Undetermined.
International HF Broadcast Conference	Buenos Aires	1954.
International Administrative Council	Geneva	1954.
ICAO South American Regional Air Navigation Meeting	Undetermined	1955.
ICAO South Atlantic Regional Air Navigation Meeting	do	1955.
International Telephone and Telegraph Conference	Buenos Aires	1955.
ICAO 4th European Mediterranean Regional Air Navigation Meeting.	Undetermined	1956.

COORDINATION AND NOTIFICATION

The Commission was active during the year in coordinating nationally the many changes necessary in frequency assignments to licensees

of the Commission and the Federal Government stations. Also, the IFRB of the ITU at Geneva was notified daily of all changes made by users of the radio spectrum in the United States and its territories as a result of the Geneva Agreement, in addition to the normal notifications of all radio frequency assignments to domestic stations which are capable of causing harmful interference internationally.

The number of international interference cases coming to the Commission's attention includes those due to normal use of the radio spectrum, plus those occurring because of the thousands of frequency changes which are being made all over the world. The total number during the year was 780, of which over 700 were resolved.

Infractions by foreign stations of the International Telecommunication Convention and Radio Regulations and of the radio provisions of the International Convention for the Safety of Life at Sea, detected by the Commission's monitoring stations and inspection offices, were screened and forwarded to the appropriate foreign administrations in accordance with internationally agreed procedures. During the year a total of 1,670 cases of treaty infractions were so reported. Most of these involved spurious emissions, harmonic radiations, off-frequency operation, or some other technically improper operation, all of which constituted sources of actual or potential interference to radio communication, or involved the safety of life and property in the air and on the sea.

The exchange of technical data concerning proposed frequency assignments in portions of the VHF and the UHF spectrum continued between the Commission and the Canadian Department of Transport. This informal procedure announced in 1950 permits an effective and efficient exchange of engineering comments on proposed United States and Canadian assignments in border areas. The effectiveness of this exchange has been demonstrated by the fact that insoluble cases of interference between stations of the two countries in these portions of the spectrum no longer occur. Approximately 640 letters on this subject were exchanged between the two countries during the year.

INTERDEPARTMENT RADIO ADVISORY COMMITTEE

Frequency assignments to United States Government radio stations are made by the President upon recommendation of the Interdepartment Radio Advisory Committee (IRAC), on which the Commission is represented. At the close of the year the administrative servicing of IRAC was transferred from the Commission to the Department of Commerce.

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Appendix

FIELD OFFICES

Of the Commission's 64 field offices, 60 are engaged in engineering work through 9 regional offices, 24 district offices, 6 suboffices, 3 ship offices, and 18 monitoring stations of the Field Engineering and Monitoring Bureau. The other four offices are maintained by the Common Carrier Bureau.

A list of these offices follows:

Field Engineering and Monitoring Bureau

Regional Offices	*Headquarters*
North Atlantic	954 Federal Bldg., New York 14, N. Y.
South Atlantic	411 Federal Annex, Atlanta 3, Ga.
Gulf States	332 U. S. Appraisers Bldg., Houston 11, Tex.
South Pacific	323–A Customhouse, San Francisco 26, Calif.
North Pacific	801 Federal Office Bldg., Seattle 4, Wash.
Central States	832 U. S. Courthouse Bldg., Chicago 4, Ill.
Great Lakes	1029 New Federal Bldg., Detroit 26, Mich.
Hawaiian	P. O. Box 1142, Lanikai, Oahu, T. H.
Alaskan	52 Post Office and Courthouse, Anchorage, Alaska.

District Offices	*Address*
1	1600 Customhouse, Boston 9, Mass.
2	748 Federal Bldg., New York 14, N. Y.
3	1005 U. S. Customhouse, Philadelphia 6, Pa.
3	508 Old Town Bank Bldg., Baltimore 2, Md.
5	402 Federal Bldg., Norfolk 10, Va.; (ship office) 200 Post Office Bldg., Newport News, Va.
6	411 Federal Annex, Atlanta 3, Ga.; (suboffice) 214 Post Office Bldg., Savannah, Ga.
7	312 Federal Bldg., Miami 1, Fla.; (suboffice) 409-410 Post Office Bldg., Tampa 2, Fla.
8	400 Audubon Bldg., New Orleans 16, La.; (suboffice) 419 U. S. Courthouse and Customhouse, Mobile 10, Ala.
9	324 U. S. Appraisers Bldg., Houston 11, Tex.; (suboffice) 329 Post Office Bldg., Beaumont, Tex.; (ship office) 406 Post Office Bldg., Galveston, Tex.
10	500 U. S. Terminal Annex Bldg., Dallas 22, Tex.

District Offices	*Address*
11	539 U. S. Post Office and Courthouse Bldg., Los Angeles 12, Calif.; (suboffice) 15–C U. S. Customhouse, San Diego 1, Calif.; (ship office) 326 U. S. Post Office and Courthouse, San Pedro, Calif.
12	323-A Customhouse, San Francisco 26, Calif.
13	307 Fitzpatrick Bldg., Portland 5, Oreg.
14	801 Federal Office Bldg., Seattle 4, Wash.
15	521 New Customhouse, Denver 2, Colo.
16	208 Uptown Post Office and Federal Courts Bldg., St. Paul 2, Minn.
17	3200 Fidelity Bldg., Kansas City 6E, Mo.
18	826 U. S. Courthouse, Chicago 4, Ill.
19	1029 New Federal Bldg., Detroit 26, Mich.
20	328 Federal Bldg., Buffalo 3, N. Y.
21	502 Federal Bldg., Honolulu 1, T. H.
22	322–323 Federal Bldg., San Juan 13, P. R.
23	7–8 Shattuck Bldg., Juneau, Alaska; (suboffice) 53 U. S. Post Office and Courthouse Bldg., Anchorage, Alaska.
24	Briggs Bldg., 22nd & E Streets, N. W., Washington 25, D. C.

Primary Monitoring Stations	*Secondary Monitoring Stations*
Allegan, Mich.	Searsport, Maine
Grand Island, Nebr.	Spokane, Wash.
Kingsville, Tex.	Twin Falls, Idaho
Millis, Mass.	Fort Lauderdale, Fla.
Santa Ana, Calif.	Lexington, Ky.
Laurel, Md.	Muskogee, Okla.
Livermore, Calif.	Fairbanks, Alaska
Portland, Oreg.	
Powder Springs, Ga.	
Lanikai, Oahu, T. H.	
Anchorage, Alaska	

Common Carrier Bureau Field Offices

Atlanta, Ga., 733 Hurt Building
New York, N. Y., 90 Church Street
St. Louis, Mo., 815 Olive Street
San Francisco, Calif., 180 New Montgomery Street

PUBLICATIONS

The Commission's printed publications are not available from the Commission, but are sold by the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at the prices indicated in the following list:

Title	*Price*
Communications Act of 1934, with amendments and index, revised to Jan. 1952	$0.25
Federal Communications Commission reports (bound volumes of decisions and orders exclusive of annual reports):	
Volume 3, July 1936 to February 1937	2.00
Volume 4, March 1937 to Nov. 15, 1937	1.50
Volume 5, Nov. 16, 1937, to June 30, 1938	1.50
Volume 6, July 1, 1938, to Feb. 28, 1939	1.50
Volume 7, March 1, 1939, to Feb. 29, 1940	1.50
Volume 8, March 1, 1940, to Aug. 1, 1941	1.50
Volume 11, July 1, 1945, to June 30, 1947	3.75
Volume 12, July 1, 1947, to June 30, 1948	3.50
Annual reports of the Commission:	
Thirteenth Annual Report—Fiscal year 1947	.25
Fourteenth Annual Report—Fiscal year 1948	.30
Fifteenth Annual Report—Fiscal year 1949	.35
Sixteenth Annual Report—Fiscal year 1950	.40
Seventeenth Annual Report—Fiscal year 1951	.40
Eighteenth Annual Report—Fiscal year 1952	.40
Nineteenth Annual Report—Fiscal year 1953	(1)
Statistics of the Communications Industry:	
For the year 1939	.25
For the year 1940	.20
For the year 1942	.35
For the year 1943	.30
For the year 1945	.50
For the year 1946	.55
For the year 1947	.75
For the year 1948:	
Secs. A and B	1.00
Sec. B (Broadcast only)	.35
For the year 1949:	
Secs. A and B	1.00
Sec. B (Broadcast only)	.25
For the year 1950 (Common Carrier only)	.50
For the year 1951 (Common Carrier only)	.40
Report on Public Service Responsibility of Broadcast Licensees (Blue Book), 1946	.35
The Safety and Special Radio Services—a Public Primer, 1950	.15
Telephone and Telegraph—a Public Primer, 1949	.10
An Economic Study of Standard Broadcasting, 1947	.40
Study Guide and Reference Material for Commercial Radio Operator Examinations, revised to Feb. 1, 1951	.35
Standards of Good Engineering Practice:	
Concerning Standard Broadcast Stations, revised to Oct. 30, 1947	1.25
Rules and Regulations:	
Part 0, Organization, Delegation of Authority, etc	(2)
Part 1, Practice and Procedure	(2)

[1] In the process of printing—*available at Government Printing Office at a later date.*
[2] Being revised—not available at present.

Title	*Price*
Rules and Regulations—Continued	
Part 2, Frequency Allocations and Radio Treaty Matters; General Rules and Regulations, revised to July 30, 1952	$0.25
Part 3, Radio Broadcast Services, revised to June 30, 1953	.50
Part 4, Experimental and Auxiliary Broadcast Services, revised to Oct. 30, 1950	.15
Part 5, Experimental Radio Services, revised to Mar. 17, 1953	.10
Part 6, Public Radiocommunication Services, revised to Apr. 27, 1949	.10
Part 7, Stations on Land in the Maritime Services, effective July 23, 1951	.20
Part 8, Stations on Shipboard in the Maritime Services, effective July 23, 1951	[2]
Part 9, Aviation Services, revised to July 14, 1953	.10
Part 10, Public Safety Radio Services, revised to Apr. 27, 1949	.15
Part 11, Industrial Radio Services, revised to July 29, 1953	.15
Part 12, Amateur Radio Service, revised to June 6, 1951	.10
Part 13, Commercial Radio Operators, revised to June 27, 1950	.05
Part 14, Radio Stations in Alaska (Other than Amateur and Broadcast), revised to Apr. 28, 1948	[2]
Part 15, Restricted Radiation Devices, recodified July 21, 1948	[2]
Part 16, Land Transportation Radio Services, revised to Jan. 7, 1953	.10
Part 17, Construction, Marking, and Lighting of Antenna Structures, revised to June 30, 1953	.05
Part 18, Industrial, Scientific, and Medical Service, revised to Jan. 25, 1950	[2]
Part 19, Citizens Radio Service, effective June 1, 1949	.10
Part 20, Disaster Communications Service, effective Mar. 21, 1951	.05
Part 31, Uniform System of Accounts for Class A and Class B Telephone Companies, revised to May 12, 1948	.40
Part 33, Uniform System of Accounts for Class C Telephone Companies, revised to May 12, 1948	.30
Part 34, Uniform System of Accounts for Radiotelegraph Carriers, revised to Oct. 14, 1949	.20
Part 35, Uniform System of Accounts for Wire-telegraph and Ocean-cable Carriers, revised to Oct. 14, 1949	.25
Part 41, Telegraph and Telephone Franks, revised to Dec. 4, 1947	.05
Part 43, Reports of Communication Common Carriers and Certain Affiliates, revised to Sept. 21, 1953	.05
Part 45, Preservation of Records of Telephone Carriers, effective Oct. 1, 1950	.10
Part 46, Preservation of Records of Wire-telegraph, Ocean-cable and Radiotelegraph Carriers, effective Oct. 1, 1950	.10
Part 51, Occupational Classification & Compensation of Employees of Class A and Class B Telephone Companies, effective Oct. 10, 1951	.05
Part 52, Classification of Wire-telegraph Employees, effective July 11, 1944	.05
Part 61, Tariffs, Rules Governing the Construction, Filing and Posting of Schedules of Charges for Interstate and Foreign Communications Service, revised to Aug. 1, 1946	.10

[2] Being revised—not available at present.

[3] Obtainable temporarily from the Federal Communications Commission without charge.

Title	Price
Rules and Regulations—Continued	
Part 62, Applications under Sec. 212 of the Act to Hold Interlocking Directorates, revised to May 23, 1944	$0.05
Part 63, Extension of Lines and Discontinuance of Service by Carriers, revised to Dec. 30, 1946	[3]
Part 64, Miscellaneous Rules Relating to Common Carriers, revised to July 16, 1948	.10

[3] Obtainable temporarily from the Federal Communications Commission without charge.

Purchasers of the Commission's Rules and Regulations are furnished a form by the Superintendent of Documents which, when filled out and forwarded to the Commission, entitles the purchaser to receive any future amendments to the part or parts purchased until a complete revision thereof is reprinted. AM and FM Standards of Good Engineering Practice and most of the rule parts are printed on 8- by 10½-inch pages and punched to fit standard three-ring binders. Standards with respect to television are now incorporated in part 3 of the broadcast rules.

The Commission is not able to supply lists of radio stations but, on request, will furnish a fact sheet about commercial sources of such lists, also one on commercial radio publications and services.

TREATIES AND OTHER INTERNATIONAL AGREEMENTS

For informational purposes, the applicable Federal laws, international treaties, agreements, and arrangements in force relating to electrical communication, and to which the United States is a party, are listed below.

(Unless otherwise indicated, copies of these documents may be obtained from the Government Printing Office, Washington 25, D. C.)

Date	Series [1]	Subject
1910		Ship Act of 1910 as amended July 23, 1912. (Those provisions relating to required radio-communication for ships navigating the Great Lakes).
1925	T. S. 724-A	Arrangements between the United States of America, Great Britain, Canada, and Newfoundland. Effected by exchange of notes September and October 1925, providing for the prevention of interference by ships off the coast of these countries with radio broadcasting. (Not available at the Government Printing Office.)
1928 and 1929	T. S. 767-A	Arrangement effected by exchange of notes between the United States of America and Dominion of Canada governing radio communications between Private Experimental Stations. Signed Oct. 2, 1928, Dec. 29, 1928, and Jan. 12, 1929.
1929	T. S. 777-A	Arrangement between the United States of America, Canada, Cuba, and Newfoundland relating to assignment of high frequencies on the North American continent effected by exchange of notes signed at Ottawa, Feb. 26 and 28, 1929. (Cuba ceased to be a party by virtue of notice to Canadian Government of Oct. 5, 1932, effective Oct. 5, 1933. Arrangement still in force with respect to United States of America, Canada, and Newfoundland). (Not available at the Government Printing Office.)
1934		Communications Act of 1934, as amended.

See footnotes at end of table.

Date	Series [1]	Subject
1934	E. A. S. 62	Radio communications between private experimental stations and between amateur stations. Arrangement between the United States of America and the Dominion of Canada (continuing arrangement effected by exchange of notes signed Oct. 2, 1928, Dec. 29, 1928, and Jan. 12, 1934). Effective May 4, 1934. (Not available at the Government Printing Office.)
1934	E. A. S. 66C	Radio communications between amateur stations on behalf of third parties. Arrangement between the United States of America and Peru Effective May 23, 1934.
1934	E. A. S. 72	Radio communications between amateur stations on behalf of third parties. Arrangement between the United States of America and Chile. Effected by exchange of notes signed Aug. 2 and 17, 1934.
1937	E. A. S. 109	Exchange of information concerning issuance of radio licenses. Agreement between the United States of America and Canada. Effected by exchange of notes signed Mar. 2 and 10, Aug. 17, Sept. 8 and 20, Oct. 9, 1937. This agreement was largely superseded by the notification procedure established in the NARBA (T. S. 777-A, T. S. 962, E. A. S. 227 and TIAS 1553) and under the Inter-American Radio Communications Convention (T. S. 938). (Not available at the Government Printing Office.)
1937	T. S. 938	Inter-American Radio Communications Convention between the United States of America and Other Powers. Signed at Habana, Dec. 13, 1937 (First Inter-American Conference). (Not available at the Government Printing Office.)
1937	T. S. 962	North American Regional Broadcast Agreement between the United States of America, Cuba, Dominican Republic, Haiti, and Mexico. Signed at Habana, Dec. 13, 1937. NOTE.—See E. A. S. 227 and TIAS 1553 which supplement this agreement. (Not available at the Government Printing Office.)
1938	E. A. S. 142	Radio Communications between Alaska and British Columbia. Agreement between the United States of America and Canada effected by exchange of notes June, July, August, September, October, November, and December 1938.
1938	E. A. S. 136	Radio Broadcasting Arrangement between the United States of America and Canada. Effected by exchange of notes signed Oct. 28 and Dec. 10, 1938. (Not available at the Government Printing Office.)
1938	T. S. 949	Regional Radio Convention between the United States of America (in behalf of the Canal Zone) and Other Powers. Signed at Guatemala City, Dec. 8, 1938. (Not available at the Government Printing Office.)
1939	E. A. S. 143	Use of Radio for Civil Aeronautical Services. Arrangement between the United States of America and Canada. Effective Feb. 20, 1939. (Not available at the Government Printing Office.)
1940	E. A. S. 196	Agreement between the United States of America and Mexico with regard to broadcasting. Effected by exchange of notes signed Aug. 24 and 28, 1940. Effective Mar. 29, 1941. (Not available at the Government Printing Office.)
1941	E. A. S. 227	Supplementary North American Regional Broadcasting Agreement signed at Washington, Jan. 30, 1941. (See T. S. 962 and TIAS 1553.) (Not available at the Government Printing Office.)
1944	E. A. S. 400	Agreement with Canada Regarding Construction and Operation of Radio Broadcasting Stations in Northwestern Canada. Effected by exchange of notes signed at Ottawa, Nov. 5 and 25, 1943, and Jan. 17, 1944. Agreement is to "cease with termination of war." (Not available at the Government Printing Office.)
1946	TIAS 1527	Agreement between the United States of America and Union of Soviet Socialist Republics on Organization of Commercial Radio Teletype Communication Channels. Signed at Moscow, May 24, 1946.
1946	TIAS 1553	North American Regional Broadcasting Interim Agreement between the United States of America and Other Governments (Modus Vivendi). Signed at Washington, Feb. 25, 1946. (See T. S. 962 and E. A. S. 227. Amended by TIAS 1802.)
1947	TIAS 1652	Telecommunication Standardization of Distance Measuring Equipment Agreement between the United States of America and the United Kingdom of Great Britain and Northern Ireland. Signed at Washington, Oct. 13, 1947.
1947	TIAS 1670	Interim Arrangement between the United States of America and Canada with respect to Mobile Radio Transmitting stations. Effected by exchange of notes signed at Washington, June 25 and Aug. 20, 1947.
1947	TIAS 1676	Agreement between the United States of America and the United Nations relative to headquarters of the U. N. Signed at Lake Success, June 26, 1947. Brought into force Nov. 21, 1947, by an exchange of notes between the United States Representative to the United Nations and the Secretary General of the U. N. (The provisions of this agreement were also made Public Law 357 of the 80th Cong., approved Aug. 4, 1947.)
1947	TIAS 1726	Agreement between the United States of America and Canada providing for frequency modulation broadcasting in channels in the r. f. band 88-108 Mc. Effected by exchange of notes signed at Washington, Jan. 8 and Oct. 15, 1947. (Not available at the Government Printing Office.)

See footnotes at end of table.

Date	Series [1]	Subject
1947	TIAS 1901	International Telecommunication Convention, Final Protocol and Radio Regulations. Signed at Atlantic City, N. J., Oct. 2, 1947, superseding the International Telecommunication Convention, Madrid, 1932. Radio Regulations effective Jan. 1, 1949, except for regulations enumerated in article 47. However, the effective date provisions of article 47 have been superseded by the provisions of the Agreement signed at the Extraordinary Administrative Radio Conference, Geneva, 1951 (see below). (This printing does not contain the Additional Radio Regulations, since the United States is not a party thereto. Copies of the final acts of the Atlantic City conference which include the Additional Radio Regulations are available only from the International Telecommunication Union, Geneva, Switzerland. (Not available at the Government Printing Office.)
1948	TIAS 1802	Radio Broadcasting. Engineering Standards Applicable to the Allocation of Standard Broadcasting Stations (540–1600 kc). Arrangement between the United States of America and Canada. Effective Apr. 1, 1948. (Not available at the Government Printing Office.)
1948	TIAS 2495	International Convention for the Safety of Life at Sea and annexed Regulations. Signed at London June 10, 1948. Entered into force: Nov. 19, 1952.
1949	TIAS 2175	Telegraph Regulations (Paris Revision, 1949), annexed to the International Telecommunication Convention (Atlantic City, 1947) and Final Protocol to the Telegraph Regulations. Signed at Paris, Aug. 5, 1949. Effective July 1, 1950. Instrument of ratification of the United States deposited with the International Telecommunication Union, Sept. 26, 1950.
1949	TIAS 2435	Telecommunications Agreement between the United States of America and Certain British Commonwealth Governments. Signed at London, Aug. 12, 1949. Effective Feb. 24, 1950.
1949	TIAS 2489	Inter-American Radio Agreement between the United States of America and Canada and other American Republics.[2] (Fourth Inter-American Radio Conference.) Signed at Washington, July 9, 1949. Entered into force: Apr. 13, 1952, subject to the provisions of Article 13.
1950	TIAS 2433	Radio communications between amateur stations on behalf of third parties. Arrangement between the United States of America and Ecuador. Effective Mar. 17, 1950.
1951	TIAS 2366	Agreement between the United States of America and Mexico which assigns television frequency channels to cities within 250 miles of the United States-Mexican border. Effected by exchange of notes dated Aug. 10, 1951, and Sept. 26, 1951.
1951	TIAS 2223	Radio communications between amateur stations on behalf of third parties. Agreement between the United States of America and Liberia. Effective Jan. 11, 1951.
1951		Agreement signed at the Extraordinary Administrative Radio Conference to bring into force the Table of Frequency Allocations and other provisions of the Radio Regulations (Atlantic City, 1947) not yet in force. Signed at Geneva, Dec. 3, 1951. Entered into force: Mar. 1, 1952. (Not available at the Government Printing Office. Available from the International Telecommunication Union, Geneva, Switzerland.)
1951	TIAS 2259	Use of Facilities of Radio Ceylon. Agreement between the United States of America and Ceylon. Entered into force May 14, 1951.
1951	TIAS 2459	Agreement between the United States of America and Cuba concerning the Control of Electromagnetic Radiation. Entered into force Dec. 18, 1951.
1952	TIAS 2508	Treaty with Canada effective May 15, 1952, relating to Mutual Recognition by the United States of America and Canada of Certain Radio Station and Operator Licenses issued in either country.
1952	TIAS 2520	Radio communications between amateur stations on behalf of third parties. Agreement between the United States of America and Cuba, effective Apr. 14, 1952.
1952	TIAS 2548	United States of America and Denmark. Registration of Frequencies Used in Greenland by United States Authorities. Entered into force Apr. 4, 1952.
1952	TIAS 2594	Agreement between the United States of America and Canada which assigns television frequency channels to cities within 250 miles of the United States-Canadian border. Effected by exchange of notes dated April 23, 1952, and June 23, 1952. Entered into force June 23, 1952. (Not available at the Government Printing Office.)
1952	TIAS 2705	London Revision (1952) of the London Telecommunication Agreement (1949) between the United States of America and Canada and Certain British Commonwealth Governments. Entered into force Oct. 11, 1952. (Not available at the Government Printing Office.)

[1] T. S.—Treaty Series. E. A. S.—Executive Agreement Series. TIAS—Treaties and Other International Act Series.

[2] In addition, certain Resolutions and Recommendations were adopted by a number of countries, members of the International Telecommunication Union Region 2 at Washington, July 9, 1949. (Not available at the Government Printing Office. Available from the International Telecommunication Union, Geneva, Switzerland.)

In addition, the United States is bound by certain other treaties and agreements which are generally considered as superseded because certain of the contracting countries other than the United States did not become a party to subsequent treaties and agreements. The United States is, in such instances, bound to the original document with respect to our relations with those particular countries. These include the following:

Date	Series [1]	Subject
1912	T. S. 581	International Radiotelegraph Convention, Final Protocol and Service Regulations, signed at London, July 5, 1912. (Not available at the Government Printing Office.)
1927	T. S. 767	International Radiotelegraph Convention and General Regulations, signed at Washington, Nov. 25, 1927.
1929	T. S. 910	Safety of Life at Sea Convention, with Regulations, between the United States of America and Other Powers, signed at London, May 31, 1929.
1930	T. S. 921	Amendment to Regulation XIX of Annex 1 to the Safety of Life at Sea Convention, Dec. 31, 1930.
1932	T. S. 867	International Telecommunications Convention; General Radio Regulations annexed to the International Telecommunications Convention, signed at Madrid, Dec. 9, 1932. (Not available at the Government Printing Office.)
1937	E. A. S. 200	Inter-American Arrangement concerning Radio-communications and Annex. Signed at Habana, Dec. 13, 1937. This arrangement was replaced by Inter-American Agreement concerning Radio-communications signed at Santiago, Jan. 26, 1940 (E. A. S. 231). Countries which approved the 1937 arrangement but which have not yet approved the 1940 arrangement are Dominican Republic, Haiti, Mexico, Panama, and Peru. (Not available at the Government Printing Office.)
1938	T. S. 948	General Radio Regulations (Cairo Revision, 1938) and Final Radio Protocol (Cairo Revision, 1938) annexed to the International Telecommunications Convention of Madrid, 1932. Superseded by Radio Regulations annexed to the International Telecommunication Convention, Atlantic City, 1947.
1940	E. A. S. 231	Inter-American Radio Communications Agreement between the United States of America, Canada, and other American Republics. (Second Inter-American Radio Conference.) Signed at Santiago, Chile, Jan. 26, 1940.

[1] T. S.—Treaty Series. E. A. S.—Executive Agreement Series. TIAS—Treaties and Other International Act Series.

The following treaties, agreements, and arrangements have been signed by the United States and are included for informational purposes because of their importance or the imminence of their effective dates:

Date	Subject
1950	North American Regional Broadcasting Agreement between the United States of America, Canada, Cuba, Dominican Republic, United Kingdom of Great Britain and Northern Ireland for the Territories in the North American Region (Bahama Islands and Jamaica). Signed at Washington, D. C., on Nov. 15, 1950. Agreement will enter into force subsequent to ratification of at least three of these four countries, in accordance with Part III, paragraph I, of the Agreement: Canada, Cuba, Mexico, and the United States of America, subject to ratification procedure in the United States. (Not available at the Government Printing Office. Available through the International Telecommunication Union, Geneva, Switzerland.)
1952	Agreement between the United States of America and Canada for the purpose of promoting Safety on the Great Lakes by Means of Radio. The agreement applies to vessels of all countries as provided for in Article 3. Enters into force: Nov. 13, 1954. (Not available at the Government Printing Office.)

There are, in addition to the foregoing, certain treaties, agreements, or arrangements primarily concerned with matters other than the

use of radio but which affect the work of the Federal Communications Commission, insofar as they involve communications. Among the most important of these are the following:

Date	Series [1]	Subject
1944	TIAS 1591	International Civil Aviation Convention. Signed at Chicago, Dec. 7, 1944. Effective Apr. 4, 1947.
1946 to present		ICAO Regional Air Navigation Meetings, Communications Committee Final Reports.[2]
1946		ICAO Communication Division, Second Session, Montreal.[2]
1949		ICAO Communication Division, Third Session, Montreal.[2]
1951		ICAO Communication Division, Fourth Session, Montreal.[2]

[1] T. S.—Treaty Series. E. A. S.—Executive Agreement Series. TIAS—Treaties and Other International Act Series.

[2] Not available at the Government Printing Office. Available from the Secretary General of ICAO, International Aviation Building, 1080 University Street, Montreal, Canada.

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