26th ANNUAL REPORT

FEDERAL COMMUNICATIONS COMMISSION

FOR THE FISCAL YEAR 1960

(With notation of subsequent important developments)

UNITED STATES GOVERNMENT PRINTING OFFICE • WASHINGTON • 1960

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington 25, D.C. Price 45 cents (paper cover)

COMMISSIONERS

Members of the Federal Communications Commission

(As of June 30, 1960)

FREDERICK W. FORD, *Chairman*
(Term expires June 30, 1964)

ROSEL H. HYDE
(Term expires June 30, 1966)

ROBERT T. BARTLEY
(Term expires June 30, 1965)

ROBERT E. LEE
(Term expires June 30, 1967)

T. A. M. CRAVEN
(Term expires June 30, 1963)

JOHN S. CROSS
(Term expires June 30, 1962)

(vacancy)[1]

[1] Filled by Charles H. King on July 19, 1960, for term expiring June 30, 1961.

A list of present and past Commissioners appears on page IV.

LETTER OF TRANSMITTAL

FEDERAL COMMUNICATIONS COMMISSION,
Washington 25, D.C.

To the Congress of the United States:

The Federal Communications Commission herewith transmits its 26th annual report. In addition to covering the fiscal year 1960, subsequent important developments are noted for more timely reference.

The report furnishes information and data specifically required by the Congress in section 4(k) of the Communications Act of 1934, as amended, including amendments to section 315 relating to political broadcasts; also material pursuant to recommendations made in a report by the House Legislative Oversight Subcommittee.

In general, the report endeavors to point out the tremendous growth of radio services, the expansion of both domestic and international telephone and telegraph facilities, and the Commission's policies and problems in dealing with them.

The Congress in 1960 relieved the Commission of including certain biographical and other data concerning employees as part of its annual reports.

Respectfully,

FREDERICK W. FORD, *Chairman.*

PAST AND PRESENT COMMISSIONERS

Commissioners	*Politics*	*State*	*Terms of service*
*Eugene O. Sykes	Dem.	Miss.	July 11, 1934–Apr. 5, 1939
Chairman			July 11, 1934–Mar. 8, 1935
*Thad H. Brown	Rep.	Ohio	July 11, 1934–June 30, 1940
Paul A. Walker	Dem.	Okla.	July 11, 1934–June 30, 1953
Acting Chairman			Nov. 3, 1947–Dec. 28, 1947
Chairman			Feb. 28, 1952–Apr. 17, 1953
Norman S. Case	Rep.	R.I.	July 11, 1934–June 30, 1945
Irvin Stewart	Dem.	Texas	July 11, 1934–June 30, 1937
*George Henry Payne	Rep.	N.Y.	July 11, 1934–June 30, 1943
*Hampson Gary	Dem.	Texas	July 11, 1934–Jan. 1, 1935
*Anning S. Prall	Dem.	N.Y.	Jan. 17, 1935–July 23, 1937
Chairman			Mar. 9, 1935–July 23, 1937
T. A. M. Craven	Dem.	D.C.	Aug. 25, 1937–June 30, 1944
*Frank R. McNinch	Dem.	N.C.	Oct. 1, 1937–Aug. 31, 1939
Chairman			Oct. 1, 1937–Aug. 31, 1939
*Frederick I. Thompson	Dem.	Ala.	Apr. 13, 1939–June 30, 1941
James Lawrence Fly	Dem.	Texas	Sept. 1, 1939–Nov. 13, 1944
Chairman			Sept. 1, 1939–Nov. 13, 1944
*Ray C. Wakefield	Rep.	Calif.	Mar. 22, 1941–June 30, 1947
Clifford J. Durr	Dem.	Ala.	Nov. 1, 1941–June 30, 1948
Ewell K. Jett	Ind.	Md.	Feb. 15, 1944–Dec. 31, 1947
Interim Chairman			Nov. 16, 1944–Dec. 20, 1944
Paul A. Porter	Dem.	Ky.	Dec. 21, 1944–Feb. 25, 1946
Chairman			Dec. 21, 1944–Feb. 25, 1946
Charles R. Denny	Dem.	D.C.	Mar. 30, 1945–Oct. 31, 1947
Acting Chairman			Feb. 26, 1946–Dec. 3, 1946
Chairman			Dec. 4, 1946–Oct. 31, 1947
*William H. Wills	Rep.	Vt.	July 23, 1945–Mar. 6, 1946
Rosel H. Hyde	Rep.	Idaho	Apr. 17, 1946–
Chairman			Apr. 18, 1953–Apr. 18, 1954
Acting Chairman			Apr. 19, 1954–Oct. 3, 1954
Edward M. Webster	Ind.	D.C.	Apr. 10, 1947–June 30, 1956
Robert F. Jones	Rep.	Ohio	Sept. 5, 1947–Sept. 19, 1952
*Wayne Coy	Dem.	Ind.	Dec. 29, 1947–Feb. 21, 1952
Chairman			Dec. 29, 1947–Feb. 21, 1952
George E. Sterling	Rep.	Maine	Jan. 2, 1948–Sept. 30, 1954
*Frieda B. Hennock	Dem.	N.Y.	July 6, 1948–June 30, 1955
Robert T. Bartley	Dem.	Texas	Mar. 6, 1952–
Eugene H. Merrill	Dem.	Utah	Oct. 6, 1952–Apr. 14, 1953
John C. Doerfer	Rep.	Wis.	Apr. 15, 1953–Mar. 10, 1960
Chairman			July 1, 1957–Mar. 10, 1960
Robert E. Lee	Rep.	Ill.	Oct. 6, 1953–
George C. McConnaughey	Rep.	Ohio	Oct. 4, 1954–June 30, 1957
Chairman			Oct. 4, 1954–June 30, 1957
Richard A. Mack	Dem.	Fla.	July 7, 1955–Mar. 3, 1958
T. A. M. Craven	Dem.	Va.	July 2, 1956–
Frederick W. Ford	Rep.	W. Va.	Aug. 29, 1957–
Chairman			Mar. 15, 1960–
John S. Cross	Dem.	Ala.	May 23, 1958–
Charles H. King	Rep.	Mich.	July 19, 1960–

*Deceased.

Table of Contents

NATIONAL DEFENSE—Continued

SAFETY AND SPECIAL RADIO SERVICES—Continued

COMMON CARRIER SERVICES

COMMON CARRIER SERVICES—Continued

FIELD ENGINEERING AND MONITORING—Continued

Report Summary

GENERAL

More than 2.8 million radio authorizations involving the use of nearly 2.2 million transmitters attest to the role played by this modern Mercury in serving the national convenience, economy and welfare, and, further, demonstrate United States leadership in the field of radio communication.

More than 668,000 radio stations in 65 different categories enhance public safety; expedite land, water, and air transportation; speed telephone and telegraph traffic; provide aural and visual broadcasting, and perform a myriad of tasks for local governments, industry and other business, as well as for private individuals. What is more, these communication systems are geared to and form an integral part of the Nation's defense program.

As one element of the employment represented by the radio industry, permits of commercial radio operators to man these transmitters now exceed 1.9 million.

BROADCAST

Programming

In addition to warning licensees of their responsibilities for keeping "payola" and deceptive "quiz" shows off the air, the Commission considered how far it should go in dealing with programming in view of the no-censorship and free-speech guarantees of the law, its past thwarted attempts to regulate particular types of programs, the lack of legal sanctions against certain unethical practices, and the fact that its jurisdiction is limited to individual station licensees and transmitter operators (not networks, program producers, performers, or advertisers).

As a result, it took a series of actions insofar as its authority would permit. Highlighting these was an inquiry into broadcast programming in general in which it heard from nearly 100 spokesmen for interested groups. Subsequently, it issued a report and statement of policy concerning programming.

In addition to moving to hold its own licensees more responsible for guarding against "payola" and deceptive "quiz" shows, the Commission recommended legislation to make it a Federal offense for producers, sponsors, and performers to engage in such practices. It

also issued a statement interpreting the requirements of the Communications Act concerning identification of the source of broadcast material. Meanwhile, it continued its inquiry into TV network relationship to the production, selection, and supervision of programs.

Of nearly 500 broadcast station license renewals held up at the year end, about half involved consideration of "payola" or other undisclosed advertising.

Political Broadcasts

The Communications Act was amended to exempt from the political equal-time requirement candidates appearing on "bona fide" news-type programs without, however, relieving stations of their obligation "to afford reasonable opportunity for the discussion of conflicting views on issues of public importance." In consequence, the Commission made several interpretive rulings and is keeping close watch of the matter. If it becomes appropriate, it will recommend further legislative remedies to Congress.

At the request of a Senate committee, the Commission queried all TV stations about their policies with respect to political broadcasts. Later, it asked all stations and networks to report after the 1960 election on how they handled political broadcasts during the campaign. Congress suspended the equal-time requirement for broadcast appearances by Presidential and Vice Presidential nominees during the 1960 campaign in order to obtain information for considering permanent change.

Other Actions

The Commission amended its rules to provide for a shorter license term for any station which does not merit a regular 3-year renewal. It also recommended legislation to authorize temporary suspension of licenses or the imposure of fines in cases which do not warrant license revocation proceedings.

TV

A total of 523 commercial TV stations (447 VHF and 76 UHF) were on the air in 275 markets; 56 others had operating authority and 74 more were under construction. About 52 million TV receivers were in use, which was about one-third of the number of aural sets. Eighty-eight percent of all households had TV sets and 11 percent had 2 or more sets.

However, the failure of UHF to take its competitive place continues to necessitate consideration of a variety of possible solutions. Unable to obtain Government VHF channels to augment the 12 used for TV broadcast, the Commission must consider rearrangement of existing VHF and UHF channels and the feasibility of moving TV,

in whole or major part, into UHF if an efficient and competitive TV system is to be realized.

The Commission authorized low-power translators in the VHF band and an amendment to the act enabled it to permit continued operation of so-called booster stations pending their conformity to the new rules. It was also able to waive the operator requirement for both VHF and UHF translators. The latter have been authorized since 1956. Power of VHF translators is limited to 1 watt; UHF translators to 100 watts. Rules were adopted to permit UHF broadcast stations to use boosters to fill in "shadows" in their service areas. About 50 long-idle UHF broadcast permittees were warned to begin construction or face the loss of their permits.

Only 1 application has been received since 1959 when the Commission announced conditions under which it would consider requests by TV stations to engage in trial subscription-TV operations. WHCT, Channel 18, Hartford, filed in June 1960. It was protested and a hearing was held before the Commission in October.

The Commission placed a prohibition on TV stations (other than those licensed to a network) from being represented by networks in sale of national spot time after the close of 1961. However, it concluded that the optioning of station time is reasonably necessary to network operation.

Noncommercial educational TV gained 5 new stations. Of 64 such grants, 47 had operating authority. Seven applications were on file. The number of channels reserved for such operation increased to 267 (90 VHF and 177 UHF).

Various TV educational networks were active or being formed. Purdue University was authorized to test UHF transmission to schools within a 200-mile radius of Montpelier, Ind., from planes over that area.

FM

Commercial FM broadcast showed more gain and interest than in any year since 1948. It netted 143 stations for the year, bringing the authorized total to 912, of which 741 were operating. Applications for 74 new stations were pending, exclusive of those in hearing.

Increased competition for FM facilities was reflected in the fact that of 52 commercial applications designated for hearing 37 were for new stations.

A contributing factor is that, since 1955, the Commission has permitted commercial FM stations to obtain additional revenue by furnishing subsidiary services such as background music, storecasting, etc. In 1960 this scope was enlarged to include multiplexing additional specialized material for subscribers. An example is the paging of

doctors, called "doctor-casting." Over 200 FM stations hold subsidiary authorizations.

Noncommercial educational FM stations, which have always shown a slow but steady gain, added 20 new outlets to bring the total to 181, including 165 on the air. Applications for 11 new stations were pending.

The Commission invited comments to a proposal that educational FM stations be permitted to render subsidiary services, but of an educational nature only.

AM

The number of AM stations exceeded 3,500 by the year end and almost that many were in operation.

The North American Regional Broadcasting Agreement of 1950 was ratified by the Senate in 1960 and so became effective between the United States, Canada, and Cuba. A separate 1957 agreement with Mexico was also approved by the Senate but awaits Mexican ratification.

Two new international broadcast stations were authorized, bringing the total number of these Commission licensees to 5.

SAFETY AND SPECIAL

With nearly 652,000 authorizations and over 2.1 million transmitters, the safety and special services comprise the largest category of radio users and included some of the fastest growing specialized services. This is evinced by the nearly 145,000 new stations and 455,000 transmitters added during the year plus the fact that applications showed a 40 percent increase to reach a new high of over 350,000.

Citizens radio manifested, by far, the biggest single service growth to bring its totals to over 126,000 authorizations and 441,000 transmitters. Amateur stations reached a new high of 217,000.

The marine radio services with more than 97,000 ship and shore stations employ an excess of 106,000 transmitters.

The land transportation services had more than 11,000 stations with nearly 259,000 transmitters aiding rail, taxicab, bus and truck movements.

Air and ground stations in the aviation services increased to more than 91,000 with over 144,000 transmitters.

Nearly 65,000 stations in the industrial services utilized over 640,000 transmitters to aid manufacturing, distribution, and other business.

Almost 33,000 public safety stations represented the use of about 372,000 transmitters for police and fire protection and other local government functions.

COMMON CARRIER

Telephone

More business was handled by the Bell System and the 3,500 independent companies in calendar 1959 than in any previous year. About $8.5 billion was spent for telephone services, which was an increase of 9.6 percent over the previous year.

About 70 million telephones were in use, 85 percent being in the Bell System. Each day the public made an average of nearly 270 million telephone calls—258 million local and 11.3 million toll.

Bell System annual net income passed the $1.1 billion mark. A $50 million yearly reduction in interstate long-distance rates, initiated by the Commission, became effective in 1959.

Bell reported $2¼ billion spent for construction in calendar 1959. During fiscal 1960, the Commission authorized Bell interstate construction projects to cost about $148 million. This included $84 million for new or augmented radio relay systems. Bell had over 236,000 channel miles of radio relay in service, some 75,000 miles of which were used for TV networking. An additional 12,000 miles of linkage was provided by coaxial cable. These relay facilities together served about 365 TV stations.

Growth of private-line telephone and telegraph use was reflected by a 23-percent increase in Bell revenues from those services. Bell handles the major part of the private-line telegraph business. Commission decision in its investigation into both Bell and Western Union private-line services was pending.

Telegraph

Western Union's net income rose to a record of $16.7 million in calendar 1959 as compared with $12.7 million the previous year. Though telegram volume declined from 131.8 million messages in 1958 to 130.9 million in 1959, landline system gross revenue increased $20.1 million to a new high of $260.8 million, principally due to a $10.6 million increase in private wire revenue to a new high of $51.4 million. However, new labor contracts, effective June 1, 1960, expected to add $14.5 million to its expenses, caused Western Union on July 18, 1960 to file increased rates for most of its services.

Western Union was authorized to start construction of a new microwave relay system which, when completed in late 1961, will provide broadband circuits for the military and other Government agencies and a variety of private wire services for the general public.

During the year, it placed in service a 5½ million-mile high-speed communications network for the U.S. Air Force linking more than 350 air bases around the globe, a nationwide bomb alarm system for the

Office of Civil and Defense Mobilization, and began preliminary work on a high-speed facsimile recording network for the U.S. Weather Bureau.

Public "wirefax" (facsimile) service was established between New York, Washington, Chicago, Los Angeles, and San Francisco. "Telex" (teleprinter exchange) service, which now links those cities (except Washington) and 37 Canadian cities, is being extended to 19 additional United States cities as well as to Mexico City.

International

Total revenues of international telegraph carriers reached a new high of over $84 million in calendar 1959, a 9.2 percent increase over 1958. At the same time, revenues from leased channel and "telex" services increased 29.8 percent to over $14 million. Overseas telephone revenues grew to over $32 million, an increase of 24.4 percent.

AT&T, now operating 2 transatlantic telephone cables, plans another which will be the first to connect directly with the United States. It also operates telephone cables to Alaska, Hawaii and Puerto Rico and is authorized to lay another to Bermuda. Some circuits in these facilities are leased for telegraph use.

A proposal by Western Union for divestment of its Atlantic telegraph cables, pursuant to the conditions of its merger with Postal in 1943, was under consideration at the close of the year.

The Commission authorized American Cable and Radio to assume control of Globe Wireless, another international telegraph carrier.

AT&T opened a circuit from Florida to the Bahamas for telephone transmissions by tropospheric scatter (rebound from that upper sky layer) technique.

NATIONAL DEFENSE

The Commission is responsible for establishing, coordinating and advancing emergency communication plans relating to the national defense effort. In addition to supervising the CONELRAD system for radio control in event of an attack, and its incidental peacetime use for storm warning alerts, the FCC, with the cooperation of industry, is active in military and civil defense matters affecting radio and other types of electrical communication.

It has organized a national committee and state industry advisory committees, is training an FCC unit of the National Defense Executive Reserve and, under its auspices, State defense FM networks are being established. It is encouraging the installation of standby and backup communication systems to substitute for regular services which might be disrupted. These provisions include facilities which link its own relocation center with other sites.

FIELD ENGINEERING AND MONITORING

Due in large part to the cooperation of 34 general interference committees, 561 TV interference committees and industry as a whole, interference complaints leveled off to around 16,000. While trouble from industrial heaters has been practically eliminated, the use of low-power communication devices presents a growing problem.

The Commission's network of 18 monitoring stations, which continuously scan the spectrum, helped to fix the areas of 16,200 cases of interference, identified 96,400 signals, provided 94,500 direction finding bearings and responded to 8,200 alerts, many of which were for ships and aircraft in distress, and did $200,000 contract work for other Federal agencies.

The Commission's 31 field engineering offices, in addition to other duties, traced 450 unlicensed transmitters, including 61 illegal boosters; inspected some 14,000 radio stations of all kinds and issued over 4,700 violation notices. There were 40 cases of indecent language on the airwaves, for which small boat operators were mainly responsible.

Eleven new TV towers, each more than 1,000 feet high, were processed for air safety and are now in operation. The world's present tallest manmade structure is the 1,676-foot shaft of KFVS–TV, Cape Girardeau, Mo. However, a 1,760-foot tower is proposed for joint use of WRBL–TV and WTVM at Columbus, Ga.

FREQUENCY ALLOCATIONS

The first revision of the international radio regulations since 1947 was accomplished at Geneva in 1959. It was necessitated by the advanced developments, techniques and uses in recent years. Many readjustments to meet these changes will be necessary throughout the world.

Among other things, the Geneva session extended the spectrum coverage of the treaty to raise the upper limit of the usable spectrum to 40,000 Mc, instead of 30,000 Mc, made specific allocations for radio astronomy and space research and, insofar as possible, provided frequency space for new or expanding services based on the needs of some 90 member countries.

The FCC participated in 18 international telecommunications conferences to which it furnished 6 chairmen, 1 vice chairman and 49 other representatives, and is preparing for 25 future sessions.

SPACE COMMUNICATION

The era of space travel was presaged by further successful use of radio for contact with objects in outer space and international and

domestic consideration of needs of exclusive frequencies for this purpose. The Commission reopened its proceeding on the allocation of frequencies above 890 Mc to consider immediate space requirements and initiated a separate inquiry concerning long-range needs.

Significant, also, is continuing experimentation in bouncing radio signals off satellites and other objects in space to reach distant points on the globe which are beyond the range of earth-hugging transmissions. This holds promise of ultimately revolutionizing international communication, to the inclusion of live TV relay from one continent to another.

RESEARCH

An FCC research project having important TV implications is being initiated by the FCC in New York City and will extend through fiscal 1961 and 1962 with $2 million appropriated by Congress for the purpose. Arrangements are being made to construct 2 UHF transmitters (one on the Empire State Building) to study the technical and economic feasibility of using UHF channels to cover a metropolitan area satisfactorily. Improvement of UHF receivers will also be investigated. The work will be done largely on a contract basis.

The relative merits of various stereophonic systems proposed for FM broadcast are being analyzed before considering AM "stereo" systems.

Importation of many foreign broadcast receivers prompted the Commission, through the Department of State, to notify overseas manufacturers that sets sold in the United States must be certified as complying with requirements to curb interference.

Type acceptance of transmitters and type approval of certain classes of noncommunications electronic devices prior to their manufacture continues to be an effective guard against potential interference.

COMMISSION

The Commission's 1960 appropriation was slightly more than $10.5 million. At the year end it had some 1,300 employees, approximately one-fourth of whom were engaged in field engineering.

During the year, the President named Commissioner Frederick W. Ford as Chairman to succeed John C. Doerfer, resigned. Charles H. King was given a recess appointment to complete Mr. Doerfer's unexpired term. Commissioner Robert E. Lee was nominated and confirmed for another 7-year term.

LITIGATION AND LEGISLATION

The Commission won all but 1 of 22 cases appealed to the Federal courts during the year. Several of these have impact on other Federal

agencies. It was a party to or participated in 109 Federal court actions, of which 39 were pending at the year end.

Congress enacted 5 amendments to the Communications Act, namely: (1) Exempting the equal-time provision for candidates appearing on news-type programs; (2) permitting waiver of prior construction permits and operator licenses for stations engaged solely in rebroadcasting; (3) enabling a Commissioner to serve after the expiration of his term until a successor takes office; (4) retaining the status quo with respect to consolidations and mergers of telegraph carriers in the light of Hawaii becoming a State; and (5) relieving the Commission of submitting annual personnel reports to Congress.

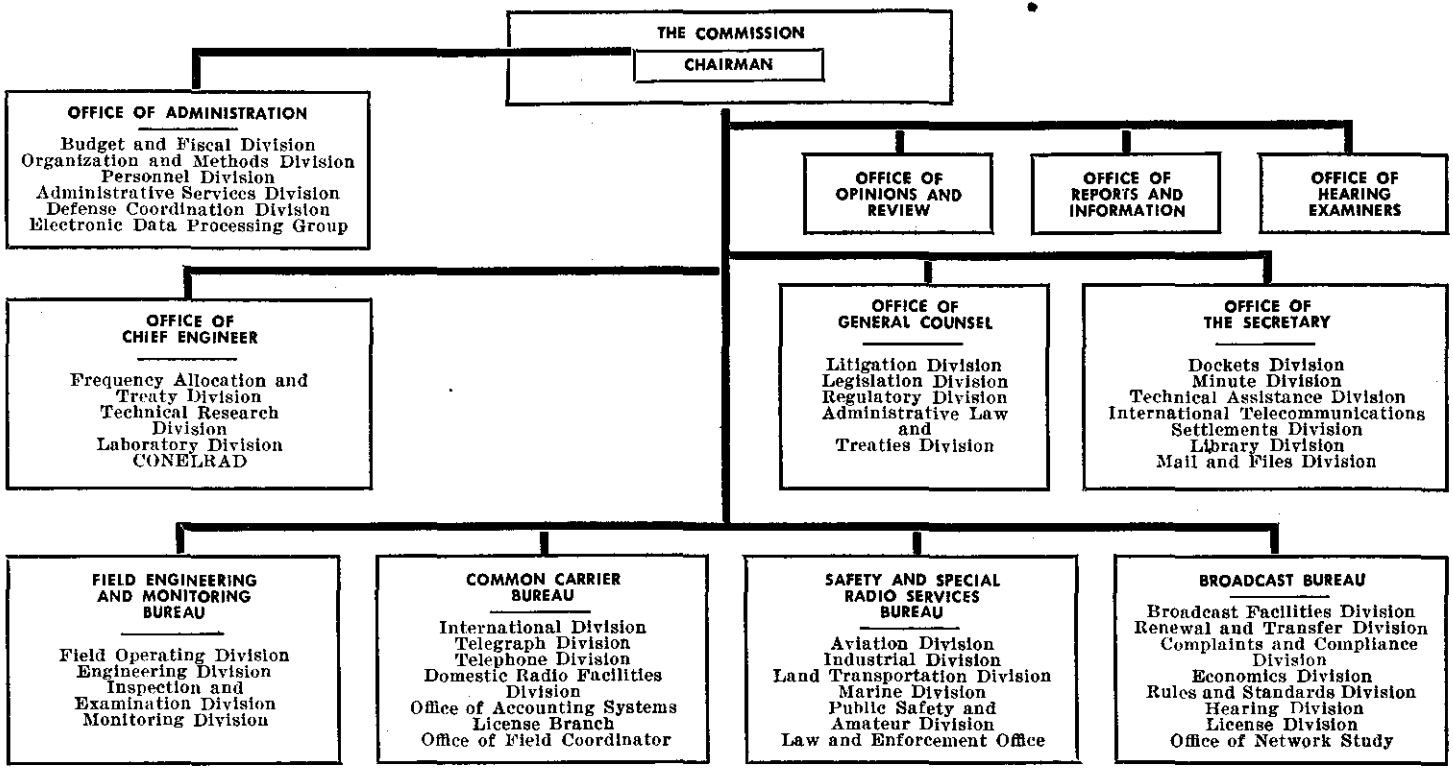
Subsequently, Congress, by joint resolution, suspended for the 1960 campaign the equal time provision with respect to nominees for the offices of President and Vice President.

Congress also authorized short-time grants and fines for individual broadcast stations when warranted; provided sanctions for persons engaging in "payola" and "fixed" quiz show practices; modified the announcement requirement for certain free services furnished in programming; requires broadcast applicants to give local notice; requires FCC approval for competing applicants to merge interests, and established a pre-grant procedure with provision for temporary authorizations in contested broadcast cases.

More than 100 legislative proposals directly or indirectly affecting the FCC were introduced—some 70 in the House and 30 in the Senate. The Commission continued to devote considerable time to furnishing information and assistance to Congressional committees and participating in Congressional hearings. It commented on more than 50 legislative proposals which were referred to it.

FEDERAL COMMUNICATIONS COMMISSION

Organization Chart as of June 30, 1960



General

COMMUNICATIONS ACT

The Federal Communications Commission was created by and is governed primarily by the Communications Act of 1934, as amended. It is an independent Federal agency reporting directly to Congress.

In brief, the Commission is charged with regulating interstate and international telephone and telegraph communication, and all domestic non-Government radio operations to the inclusion of broadcast. As stated in the Communications Act, it was established

> "*For the purpose of regulating interstate and foreign commerce in communication by wire and radio so as to make available, so far as possible, to all the people of the United States a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges, for the purpose of the national defense, for the purpose of promoting safety of life and property through the use of wire and radio communication, and for the purpose of securing a more effective execution of this policy by centralizing authority heretofore granted by law to several agencies and by granting additional authority with respect to interstate and foreign commerce in wire and radio communication . . .*"

REGULATION

General

Under the Communications Act, the regulatory powers of the Commission fall into three major categories—those affecting common carrier services (telephone and telegraph by means of radio, wire, and cable); those dealing with broadcast (program) service, and those relating to nonbroadcast radio (safety and special) services.

In discharging its statutory obligations, the Commission:

Supervises rates and services of interstate and international telephone and telegraph companies;

Establishes and enforces rules and regulations governing the different radio services, radio operators, and common carriers subject to its jurisdiction;

Allocates bands of frequencies for different radio services;

Assigns particular frequencies and call signals to individual radio stations;

Authorizes and licenses radio transmitters;

Licenses operators of radio transmitters;

Encourages more effective and widespread use of radio;

Promotes the utilization of radio for protecting life and property;

Curbs interference to radio communication by regulating the use of interference-producing electronic and electrical equipment;

Participates in formulating and administering domestically the wire and radio provisions of international agreements to which the United States is a party; and

Helps coordinate electrical communication facilities with, and gives technical assistance to, the national defense program.

Common Carrier

The Communications Act recognizes two types of common carriers—those fully subject to the act and those partially so. The latter do not operate facilities crossing state or national boundaries nor engage in interstate or foreign communication except through physical connection with other nonaffiliated carriers. They are exempt from certain provisions of the act which apply to fully subject carriers. Common carriers engaged in purely intrastate communication are not, in general, subject to Commission jurisdiction but come under the authority of State utility commissions.

Among regulatory provisions of the act is the requirement that every subject common carrier furnish service at reasonable charges upon reasonable request. No carrier may construct or acquire interstate or foreign facilities without Commission approval. Likewise, it cannot discontinue or curtail interstate or foreign service without Commission approval. All charges, practices, classifications and regulations in connection with interstate and foreign communication service must be just and reasonable. To implement this requirement, the common carriers concerned file tariff schedules which are subject to review and regulation by the Commission.

The Commission regulates rates for interstate telephone and telegraph services, as well as rates for service between the United States and foreign points and ships at sea. At the same time, it reviews the adequacy and quality of these services.

To aid its regulation of rates and services, the Commission prescribes the forms of records and accounts kept by the carriers. Under this authority, it has established uniform systems of accounts for them to follow. Commission regulation in this respect includes, for example, the establishment and maintenance of original cost accounting, continuing property records, pension cost records, and depreciation records.

Carriers file monthly and annual reports with the Commission, giving specified financial and operating information, also copies of contracts with other carriers relating to traffic subject to the act.

It is unlawful for any person to hold office in more than one carrier unless specifically authorized by the Commission. The latter also passes upon applications of domestic telephone and telegraph carriers for authority to merge or consolidate.

After obtaining the approval of the Secretary of State, the Commission can issue, withhold, or revoke licenses to land or operate submarine cables in the United States.

Broadcast

Since the Communications Act gives the Commission less control of broadcasting than of common carrier operation, its regulation of broadcasting falls into two general phases.

The first phase deals with the allocation of spectrum space to the different types of broadcast services in accordance with Commission policies and rules to carry out the intent of international agreements, the Communications Act, and other domestic laws affecting broadcasting. The Commission promulgates rules that are consistent with such doctrines and laws to obtain an orderly and effective use of broadcast channels.

The second phase is concerned with individual stations, and embraces consideration of applications to build and operate; the assignment of specific frequencies, power, time of operation, and call letters; the periodic inspection of equipment and the engineering aspects of operation; passing upon transfers and assignments of facilities; also the many varied changes in existing authorizations; modifying and renewing construction permits and licenses; reviewing the general service of each particular station to determine whether it has been operating in the public interest; licensing radio operators, and otherwise discharging domestic regulatory responsibilities.

The Communications Act guarantees free speech on the air and enjoins the Commission from censoring broadcast programs. Since the act further declares broadcast stations are not common carriers, the Commission does not regulate their time charges, profits, salaries, employment, etc.

The Commission does not license receiving sets, nor does it regulate their manufacture, sale, or servicing. However, it does impose limitations on their radiations to minimize possible interference to radio communication.

Nonbroadcast

The Communications Act requires the Commission to study new uses for radio. It also stresses the utilization of radio to protect life and property.

In order to realize these objectives, the Commission has authorized many uses for radio other than the traditional and better known broadcast and common carrier services. Collectively, these services make up a group known as the Safety and Special Radio Services. This group embraces practically all radio operations which are neither broadcast nor open for hire to the general public. They are governed in general by the Communications Act, international agreements, and by the Commission's rules and regulations dealing with the particular class of service authorized to use radio.

Owing to the limited number of frequencies available, the Commission has been unable to provide exclusive channels for all specialized services. It, therefore, has established priorities for certain types of public and private services related to the public interest, and requires operation to be in the interest of economical and efficient use of spectrum space.

COMMISSIONERS

The Commission is composed of seven Commissioners who are appointed by the President with the advice and consent (confirmation) of the Senate. Appointment is for seven years except in filling an unexpired term. Under a new law, a Commissioner may now serve until a successor takes office but not beyond the end of the following Congressional session. Not more than four Commissioners may be members of the same political party. A Commissioner may not have financial interest in any business which the Commission regulates.

The President designates one of the Commissioners as Chairman, who also serves as the Commission's chief executive officer.

The Commissioners function as a unit in making all policy determinations. They hold weekly meetings to act on the workload before them. A single session is held during the August recess (the act requires at least 1 meeting a month). The Commissioners also hold monthly meetings with staff officers to review the work status and to give priority direction to pressing matters. In addition, the Commissioners sit in a body in some major proceedings and hear oral argument on exceptions to initial decisions of hearing examiners. In-

dividual Commissioners, in rotation, act on motions in adjudicatory cases.

Certain responsibilities are delegated to committees of Commissioners and individual Commissioners. Examples are the FCC Telephone and Telegraph Committees, Defense Commissioner and, in relation to Government and industry use of radio, membership on the Telecommunications Planning Committee, Telecommunications Coordinating Committee, National Association of Railroad and Utilities Commissioners, Telecommunications Advisory Board, Radio Technical Commission for Aeronautics, Radio Technical Commission for Marine Services, Civil and Defense Mobilization Board, and liaison with the Office of Civil and Defense Mobilization and the Federal Aviation Agency. Individual Commissioners also head or are members of United States delegations to important international telecommunications conferences.

Actions taken by delegated authority, whether by a committee of Commissioners, an individual Commissioner or staff units, are subject to petition for review by the full Commission.

On March 10, 1960 the President designated Commissioner Frederick W. Ford as Chairman to succeed John C. Doerfer, who resigned the same day. Commissioner Ford assumed the Chairmanship on March 15.

On February 18 the President renominated Commissioner Robert E. Lee for another 7-year term, and the latter was confirmed on June 23.

On June 27 Charles H. King was nominated to the Commission, but Congress recessed without Senate action. On July 13 the President gave Mr. King a recess appointment to complete Mr. Doerfer's term, which expires June 30, 1961. Commissioner King took office on July 19, thus filling a vacancy that had existed for more than 4 months.

COMMISSION STAFF

The role of the staff involves furnishing information needed by the Commission in determining policy and deciding individual cases, carrying out the decisions made by the Commission, and processing and otherwise handling the daily administrative business. The staff units have delegated authority to act on routine matters which raise no question of deviation from established rules and regulations.

For these purposes, the Commission staff is organized into 4 operating bureaus—Broadcast, Safety and Special Radio Services, Common Carrier, and Field Engineering and Monitoring—and 7 offices—Secretary, General Counsel, Chief Engineer, Administration, Opinions and Review, Hearing Examiners, and Reports and Information.

A Complaints and Compliance Division was created in the Broadcast Bureau on June 2, 1960 (see Broadcast chapter for further information). On June 22 thereafter the Office of Defense Coordination was transferred from the office of the Defense Commissioner to the Office of Administration, where it became a division. During the year, the name of the Law, Enforcement and Procedures Office in the Safety and Special Radio Services Bureau was changed to Law and Enforcement Office.

Insufficient room for the Commission's offices in the New Post Office Building continued to pose staff working problems. The FCC had been assigned space in an additional building but there was delay in evacuation by the present tenants so it had to obtain supplemental quarters elsewhere. As a result, the Common Carrier Bureau has moved to the new location.

AUTOMATIC DATA PROCESSING STUDY

With the cooperation of the National Bureau of Standards, the Commission completed a preliminary appraisal of its operations and data requirements, and concluded that increased speed and efficiency in handling its workload should be realized through the use of electronic data processing equipment. Further study of current procedures has now been undertaken looking toward establishing specifications for a computer to be used for selected operations.

PERSONNEL

The Commission ended the fiscal year with 1,403 employees on its rolls. Included were 72 employed for the summer months only and 79 performing work for other agencies on a reimbursable basis. The actual average employment for the entire year for staff engaged in "regular" Commission activities was 1,223.8. This represents an increase of 95 over 1959. The average employment for the various organization units was as follows:

	Washington	Field	Total
Commissioners' offices	45.7	0	45.7
Office of Opinions and Review	31.2	0	31.2
Office of Hearing Examiners	29.4	0	29.4
Office of Reports and Information	4.0	0	4.0
Office of Administration	85.8	1.0	86.8
Office of Secretary	57.8	0	57.8
Office of General Counsel	36.6	0	36.6
Office of Chief Engineer	61.7	13.3	75.0
Common Carrier Bureau	103.8	26.7	130.5
Safety and Special Radio Services Bureau	146.6	6.7	153.3
Broadcast Bureau	207.8	0	207.8
Field Engineering and Monitoring Bureau	55.8	304.4	360.2
ADP group	5.5	0	5.5
Total	871.7	352.1	1,223.8

APPROPRIATIONS AND EXPENDITURES

The Commission's appropriation for fiscal 1960 was $10,550,000 or an increase of $768,900 over fiscal 1959. Personal services plus the Commission's share of the Civil Service Retirement Fund accounted for 84 percent of the 1960 budget. A breakdown follows:

Personal services	$8, 702, 786
Travel	113, 858
Transportation of things	28, 510
Communication services	249, 234
Rents and utilities	109, 096
Printing and reproduction	79, 939
Other contractual services	218, 814
Supplies and materials	179, 238
Equipment	250, 124
Land and structures	65, 849
Contribution to Civil Service Retirement Fund	542, 653
Awards and indemnities	6, 360
Taxes and assessments	3, 454
Total amount obligated	10, 549, 915

The source of these funds and the authority for expenditures thereunder is Public Law 255, 86th Congress. Expenditure details and their justification are set forth at length in the FCC budget presentation to Congress.

DOCKETS

Broadcast applications accounted for 612 of the 794 docket cases pending at the close of fiscal 1960. The following docket statistics refer to individual applications in hearing status:

	Pending June 30, 1959	Designated for hearing	Disposed of without hearing	Disposed of following hearing	Pending June 30, 1960
AM broadcast	227	416	111	103	429
FM broadcast	24	52	16	10	54
TV broadcast	84	71	14	25	116
Other broadcast	17	7	4	7	13
Total broadcast	352	550	145	145	612
Safety and special	27	68	33	24	38
Common carrier	47	45	20	8	64
Joint and general	54	25	15	16	48
Total nonbroadcast	128	138	68	48	150
Petitions, etc.	19	34	19	2	32
Grand total	499	722	232	195	794

During the year the Commission issued 145 initial decisions covering 219 applications. Of these, 106 concerned 172 broadcast applications.

Special Cases

Some cases involving allegations of improper presentations during the pendency of TV proceedings before the Commission had been remanded to the Commission by the appeals court, several at FCC request, and the Commission reopened others on its own motion. The Commission appointed a special examiner to rehear such cases subject to its own reevaluation and decision.

During the year the Commission issued its final decisions in the comparative proceedings involving Miami Channel 10 (dockets 9321, 10825–27) and Boston Channel 5 (dockets 8739, 11070, 11072–3). An initial decision was receiving Commission consideration in the so-called "Sangamon" case involving Springfield, Ill.-St. Louis, Mo., Channel 2 deintermixture rulemaking (dockets 11747, 12936). The Miami Channel 7 (dockets 10854–58), Orlando Channel 9 (dockets 11081, 11083), and Jacksonville Channel 12 (dockets 10833–35) comparative proceedings were pending before the examiner.

Pending also is the Peoria, Ill., Channel 8 deintermixture rulemaking which had been remanded by the court for such action, if any, the Commission may find proper after its consideration in the Sangamon case.

AUTHORIZATIONS

More than 2.8 million radio authorizations were on the Commission's books at the close of the fiscal year, which was in excess of 400,000 over the year previous. Figures for these 2 years were:

Class	June 30, 1959	June 30, 1960	Increase or (decrease)
Broadcast services	10,120	11,179	1,059
Safety and special services	507,171	651,993	144,822
Common carrier services	3,845	4,386	541
Experimental services	891	728	(163)
Commercial radio operators	1,705,903	1,947,368	241,465
Amateur radio operators	[1] 188,000	[1] 206,000	[1] 18,000
Total	2,415,930	2,821,654	405,724

[1] Estimated.

These authorizations collectively represent the use of nearly 2.2 million transmitters, since a single grant can cover many transmitters.

APPLICATIONS

Applications of all kinds received by the Commission during the year rose to nearly 700,000, which was 102,000 more than in the previous year. The fiscal 1959 and 1960 figures follow:

Class	1959	1960	Increase or (decrease)
Broadcast services (nonhearing)	12,002	12,613	611
Safety and special services	250,120	350,177	100,057
Common carrier services	5,104	5,612	508
Experimental services	2,026	1,369	(657)
Commercial radio operators	327,466	329,744	2,278
Total	596,718	699,515	102,797

Amateur radio operators are not listed here because their station and operator applications are combined in the safety and special services application total.

CORRESPONDENCE

The Commission's Washington office (exclusive of its Field Engineering and Monitoring Bureau) handled 1,685,000 pieces of mail during the year—over 1 million incoming and over 600,000 outgoing. This was an increase of 185,000 over the 1959 figure.

RELEASES AND PUBLICATIONS

The Commission's Washington headquarters issues 2 general types of mimeographed releases concerning its daily business: (1) public notices of actions, receipt of certain kinds of applications, petitions for rulemaking, hearing calendars, etc., and (2) texts of orders and other public documents. These are released at 11 a.m. or 3 p.m., as they become available. Copies of documents are served on the parties concerned. No public mailing list is maintained for any mimeographed issue. During the year the Commission's mimeographing required nearly 55,000 stencils, 11.6 million sheets of paper, and 16.5 million prints.

All Commission hearing orders and rulemaking proposals and finalizations are published in the Federal Register. In addition, the Government Printing Office sells the texts of the Commission's major decisions in a weekly pamphlet form on a subscription basis and, later, in bound-volume compilations which may be purchased singly.

Printed copies of the Commission's rules and regulations, combined as to categories, are sold by the Government Printing Office to subscribers who also receive from that office subsequent amendments to the volume purchased. The Government Printing Office additionally sells copies of the Commission's annual and special reports, the Communications Act and amendments, etc. This printed material is not available from the Commission but a list of such matter available from the Government Printing Office will be furnished by the Commission on request.

FOREIGN TECHNICAL ASSISTANCE

The Commission continued to cooperate with the Department of State, the International Cooperation Administration and the United Nations in planning and arranging itineraries for visiting officials of friendly foreign governments studying domestic telecommunications. More than 300 administrative and engineering personnel from over 50 nations have thus far been accommodated.

Litigation and Legislation

LITIGATION

The Commission was a party to court cases which enunciated principles of constitutional and administrative law which have had an immediate and significant effect upon the Commission's administrative procedures. Several of these decisions also have had, or will in all likelihood have, a substantial impact upon the operating procedures of other Federal administrative agencies.

The Commission was markedly successful before the courts, during the past year, winning all but 1 of the 22 cases which proceeded to a judicial decision on the merits.

Court of Appeals Decisions of Special Significance

Illustrative of such cases during the past year are the decisions of the Court of Appeals for the District of Columbia Circuit in the following cases:

Bendix Aviation Corp. v. *FCC* and *Aeronautical Radio, Inc.* v. *United States*, Case Nos. 14650 and 14693, decided Nov. 13, 1959, sub nom *Aeronautical Radio, Inc.* v. *United States*, certiorari denied, Feb. 23, 1960.

American Broadcasting-Paramount Theatres, Inc. v. *FCC*, Case Nos. 15,399 and 15,400, decided May 27, 1960.

Deep South Broadcasting Co. v. *FCC*, Case No. 15,257 decided April 14, 1960.

Plains Television Corp. v. *FCC*, Case No. 15,204 decided April 28, 1960.

Morton Borrow v. *FCC*, Case No. 15,473, announced June 30, 1960.

Bendix Aviation case.—In this case the appeals court had before it for the first time the interpretation of section 305 of the act, which provides for dual authority over the radio spectrum between the President and the Commission. The court sustained the Commission's authority to modify its rules so as to limit the use of radio frequencies by non-Government licensees in order to accommodate the frequency requirements of the Government for vital national defense purposes.

Concluding that defense needs were paramount, the Commission had denied applications of Bendix to use the frequencies 420–450 Mc for development of an airborne aircraft collision avoidance system

and changed from permanent to temporary the availability of the 8500–9000 Mc band for civil radionavigation use. The court held that the Commission's action did not impinge upon any treaty to which the United States is a party. It further concluded that the Commission was warranted in accepting the representations of the Office of Civil and Defense Mobilization regarding national defense needs as a basis for its conclusion that the public interest required restrictions on non-Government use of the frequencies involved.

The court found no error in the Commission's conclusion that good cause existed for waiving the notice requirements of section 4 of the Administrative Procedure Act. And, finally, the court honored the Government's claim of privilege with respect to certain classified material, declining either to make it available to the parties to the litigation or to examine such material itself. Although Aeronautical Radio, Inc., sought Supreme Court review, its petition for certiorari was denied.

American Broadcasting-Paramount Theatres case.—On May 27, 1960, the appeals court affirmed an important aspect of the Commission's still pending proceedings to determine the permanent frequency assignment of radio station KOB in Albuquerque, N. Mex. KOB lost its Class I frequency in 1941 as a result of a North American Regional Broadcasting Agreement and has operated since that time on 1030 or, under a series of special service authorizations, on 770 kc, pending resolution of the administrative proceedings and 3 previous court appeals.

The instant appeal by American Broadcasting Co. on behalf of its New York radio station WABC, challenged the Commission's action in amending section 3.25 of its rules to permit the assignment of 2 Class I stations on the clear channel frequency 770 kc and its determination that the public interest would be served by duplicate Class I operation of stations KOB and WABC on 770 kc.

The court upheld the Commission's decision to find a permanent location for station KOB without awaiting the outcome of its overall clear channel proceeding (docket 6741) and found no abuse of discretion in the Commission's conclusion that Class I operation by KOB on 770 kc would better serve the public interest than any of the other proposed modes of operation which were considered by the Commission.

Deep South case.—This is the first decision by the court expressly upholding the Commission's authority to require a specific commitment of funds from an applicant proposing to build an unusually tall TV tower and the Commission's further statutory authority, from the standpoint of technical qualifications and the public interest in safety and uninterrupted service, to inquire into the structural suit-

ability of a proposed tower. The court approved the Commission's conclusion that Deep South was not financially qualified, having made no specific commitment of funds, and that it had failed to sustain its burden of showing that the proposed tower was in fact structurally suitable.

Plains case.—The Commission's authority to accept waivers of section 309(b) letters by applicants and known parties of interest was sustained for the first time in this case. The court concluded that the Commission had acted properly in permitting mutually exclusive applicants for Channel 10 in Terre Haute, Ind., to waive their rights to receive these notification letters and in immediately designating their applications for comparative hearing. It rejected, as contrary to the purpose of that section, appellant's arguments that unknown parties in interest were entitled to such notice and unduly deprived of an opportunty to file competing applications.

Morton Borrow case.—On the last day of the fiscal year, the court handed down a decision of far-reaching significance sustaining the Commission's authority to interrogate an applicant for operator's license concerning membership in the Communist Party or any group which advocates the violent overthrow of the Government. In a 2 to 1 decision, the majority recognized the close connection between radio communication and national defense and the danger that would be presented by a subversive radio operator in time of emergency.

The court held that the statutory language of section 303(1) of the Communications Act permitted the Commission to inquire into an applicant's character and that this "obviously" included his reliability in the situations in which such an applicant must operate. The queries propounded by the Commission were held to be legitimate inquiries into the applicant's reliability and fitness and his refusal to answer, found unjustified after hearing, to warrant dismissal of the application. Finding statutory authorization to ask the questions, the court saw no procedural defect in the Commission's proceedings in the case, and rejected the applicant's contentions that his rights under the First Amendment to the Constitution had been infringed.

This was the first case in which the Commission's authority to refuse a license to an applicant who declines to answer questions about membership in the Communist party was sustained. The Supreme Court, on November 14, 1960 refused to review the lower court's decision.

Other Court Cases

In addition to the American Broadcasting-Paramount case the courts also sustained the Commission in a number of previously remanded cases involving long-pending litigation:

Helena TV, Inc. v. *FCC*, 277 F. 2d 88 (C.A.D.C.) (Community Antenna TV case).

W. S. Butterfield Theatres, Inc. v. *FCC*, 272 F. 2d 512 (C.A.D.C.) (Flint, Mich., comparative TV case).

Federal Broadcasting System, Inc. v. FCC, 270 F. 2d 914 (C.A.D.C.), certiorari denied, 362 U.S. 935 (Rochester share-time TV protest).

Moreover, the Commission was affirmed in several other cases of first impression:

Jackson Broadcasting and Television Corp. v. *FCC*, Case No. 15,306 (C.A.D.C.) (Parma-Onondaga comparative TV case, sustaining the Commission's power to make an area-wide television allocation).

Brigham v. *FCC*, 276 F. 2d 828 (C.A. 5) (upholding the Commission's declaratory ruling that a licensee need not, under section 315 of the Communications Act, afford equal time to opposing candidates because its regularly employed weathercaster becomes a candidate for the State legislature).

Red River Valley Broadcasting Corp. v. *FCC*, 272 F. 2d 562 (C.A. D.C.) (sustaining the Commission's action in allowing an AM station to change from full-time operation to daytime only where increased-daytime service outweighed the loss of the community's only local nighttime service).

Delaware, Lackawanna and Western R.R. Co. v. *FCC*, 272 F. 2d 706 (C.A. 2) (affirming the Commission's refusal to exempt ferry boats operating between Hoboken and New York City from the statutory provisions requiring radiotelephone installations for passenger vessels on tidewater adjacent to the open sea).

Recent appeals and pending cases have brought up, or will bring up, for review major legal and policy problems affecting the nature and scope of the Commission's jurisdiction and procedure, involving, among other things:

The validity of Commission's rule governing "freeze" of applications for new daytime stations on clear-channel frequencies.

Validity of Commission's report and order in the daytime skywave case.

Validity of Commission's procedural rules governing acceptance and processing of AM applications (cut-off rule).

Effect of court's holding in *Community Broadcasting* case on Commission's authority to permit temporary operation during pendency of comparative hearings for regular license.

Obligation of Commission to permit *nunc pro tunc* amendment of protest under section 309(c).

Validity of Commission ruling in another Lar Daly case re obligation of network to provide "fair and balanced coverage" of controversial issues.

Whether allegations as to a loss of listeners beyond an AM station's normally protected contour are sufficiently specific to confer standing to challenge the grant of a new station.

Also, there are continuing challenges of the Commission's authority and procedures with respect to interrogating applicants as to Communist Party membership.

Court Case Statistics

During the fiscal year the Commission was a party to or participated in 109 Federal cases. Fifty-eight were instituted during that period—40 in the United States Courts of Appeal in various circuits, 6 in the Supreme Court, 1 in the Court of Claims, and 11 in the United States District Courts. Six petitions for writ of certiorari were filed in the Supreme Court, 5 by parties other than the Commission, and 1 on the Commission's behalf by the Solicitor General.

All 6 petitions for certiorari were denied by the Supreme Court. In the Courts of Appeal, the Commission was affirmed in 21 cases and reversed with a remand in another. (The only Commission action reversed by the courts was that reviewed in *Community Broadcasting Co. Inc.* v. *United States and FCC*, 274 F. 2d 753 (C.A.D.C.), Case Nos. 15,313 and 15,314. The proceeding bore 2 case numbers because Community sought review under both section 402(a) and section 402(b) of the Communications Act, and the court did not deem it necessary to determine which of these mutually exclusive avenues of review was appropriate.) Seventeen cases were dismissed—either by the court on jurisdictional grounds, on motion by the appellant, by agreement of the parties, or as being moot. Eleven cases terminated with a remand, upon joint motion of all the parties for further consideration by the Commission in the light of the Functional Music case. (*Functional Music, Inc.* v. *FCC*, 274 F. 2d 543; cert. denied 4 F. 2d 60.) In the district courts, appropriate orders were issued at the Commission's request or the cases were dismissed under agreement for voluntary compliance.

As of June 30, 1960, there were 38 cases pending in the Courts of Appeal, and 1 in the Court of Claims. Of the 38 pending appeals, 2 were submitted, but undecided, at the end of the fiscal year, and the court retained jurisdiction in 12 previously remanded cases.

A tabulation of cases decided and pending in the courts for fiscal 1960 follows:

	Supreme Court	Court of Appeals (402b)	Court of Appeals (402a)	Court of Claims [1]	District Court	Total
Total	7	61	28	1	11	[3] 109
Cases affirming Commission		18	3		[2] 10	31
Cases reversing Commission		1	[4] 1			2
Cases dismissed on jurisdictional grounds or by agreement of the parties or as being moot		10	7		1	18
Cases terminated with a remand		9	2			11
Cases in which mandamus to Commission was denied	1					1
Actions denying certiorari by parties other than Commission	5					5
Cases denying certiorari by Commission	1					1
Cases pending June 30, 1960	0	23	15	1	0	39

[1] The FCC is not a party, but has been asked to supply information in *Commercial Cable Co.* v. *United States* Case No. 213–60.
[2] The Commission's *amicus* brief was accepted for filing by the Court of Appeals for the Second Circuit in *Grove Press* v. *Christenberry*, 276 F. 2d 433 (Case No. 25861).
[3] Includes cases dismissed under agreement for voluntary compliance.
[4] See the explanatory footnote as to the *Community Broadcasting* case, *supra*.

LEGISLATION

During the 86th Congress more important legislation affecting the Commission was considered and enacted than in any Congress since the 82nd. Not only did Congress correct by legislation evils exposed by the Subcommittee on Legislative Oversight of the House Interstate and Foreign Commerce Committee in its investigations of deceptive quiz programs and "payola", but it also enacted comprehensive legislation to provide much needed relief from the administrative burdens the 1952 amendments to the Communications Act imposed on the Commission.

Enacted Laws

Subsequent to June 30, 1959, 8 measures were enacted which directly concern the activities of the Commission. All were amendments to the Communications Act, namely:

Public Law 86–274, approved September 14, 1959, amended section 315 to provide that the equal-time provisions with respect to candidates for public office shall not apply to bona fied news-type programs.

Public Law 86–533, approved June 29, 1960, repealed, among other things, section 4(k)(3) to relieve the Commission of the 1952 requirement of submitting to Congress an annual report on new personnel taken into the employment of the Commission.

Statutes enacted after the end of the 1960 fiscal year were:

Public Law 86–609, approved July 7, 1960, amended sections 318 and 319 to provide that the Commission may waive the licensed operator and prior construction permit require-

ments for stations engaged solely in rebroadcasting; e.g., translators and boosters.

Public Law 86–619, approved July 12, 1960, amended section 4(c) to provide that at the expiration of his term of office, a Commissioner may continue to serve until his successor is appointed and has qualified.

Public Law 86–624, approved July 12, 1960, amended section 222(a)(10) to retain the status quo with respect to consolidations and mergers of telegraph carriers in light of the entrance of Hawaii into the Union.

Public Law 86–677, approved August 24, 1960, amended section 315 to suspend for the 1960 campaign the equal opportunity requirements of section 315 for nominees for the office of President and Vice President.

Public Law 86–751, approved September 13, 1960, amended section 202(b) to expand the Commission's authority to regulate charges and services of common carriers for the use of microwave and other point-to-point radio circuits (use of wires only was heretofore provided) in chain broadcasting or incidental to radio communication of any kind.

Public Law 86–752, approved Semtember 13, 1960, provides a pre-grant procedure for certain broadcast, common carrier and other applications; imposes limitations on payoffs between broadcast applicants; requires disclosure of payments made for the broadcast of certain matter; prohibits deceptive practices in broadcast contests of knowledge, skill of chance; requires applicants for new broadcast stations or major changes in existing stations to give local notice of such applications and of any subsequent designation of an application for hearing; and authorizes short-term grants and forfeitures in the broadcast services. Its provisions became effective with enactment except the pre-grant procedure, which is effective December 12 thereafter. The latter requires petitions opposing applications to be filed within 30 days after an application has been made. Letters notifying applicants that a hearing is indicated are no longer required.

FCC Legislative Program

Of the 10 FCC proposals submitted to Congress during the first session of the 86th Congress, 5 were enacted; and 4 proposals submitted to Congress during the second session were either enacted or resulted in legislation similar to that proposed by the Commission.

In addition, during the second session of the 86th Congress, the Commission submitted 4 other legislative proposals to amend the Communications Act, which were introduced and included the following:

An amendment to section 303 and a proposed new section 330, which would give the Commission authority to prescribe minimum performance capabilities for TV receivers (S. 3115, H.R. 10817). The proposal would permit the Commission to require that all TV receivers transported in interstate commerce be capable of receiving channels on the UHF band. The Commission believes that a possible answer to the TV allocations problem created by the limited number of VHF channels available for non-Government use would be greater utilization of the UHF portion of the spectrum. This proposal is intended to stimulate the growth of UHF stations by increasing the number of UHF receivers in public use.

An amendment to section 303(q), which would give the Commission authority to require the painting and/or illumination of abandoned radio towers (S. 2812, which passed the Senate; H.R. 10259). The Commission feels that air safety requires abandoned or unused radio towers to be painted and lighted as if they were being used pursuant to license issued by the Commission.

A proposed new section 302, to expand the Commission's authority over the installation, height and location of receiving antenna towers (S. 3343, H.R. 11877). The Commission considers this legislation, which has been coordinated with the Air Coordinating Committee and its member agencies, also of importance in facilitating a solution to air safety problems.

A new section to title V of the Communications Act, which would authorize the Commission to bring suit to enjoin any person engaged in, or about to engage in, any violation of the Communications Act (S. 3528). In effect, the Commission is looking toward authority to request the courts, in some situations, to enjoin or restrain an offending practice pending a final determination of the matter in an appropriate administrative proceeding. This proposal would enable the Commission to move more expeditiously in critical cases without depriving its licensees of due process.

Another Commission proposal awaits Bureau of the Budget coordination before submission to Congress. It is an amendment to section 5(e) to relieve the Commission of the 1952 requirement of submitting monthly reports to Congress of cases which have been pending before it more than 3 and 6 months and stating the reasons therefor. These monthly reports have been found to be of minimal value.

Other Legislative Proposals Affecting the FCC

In the 2nd session of the 86th Congress, more than 100 bills and resolutions affecting the Commission, directly or indirectly, were

introduced (some 70 in the House and 30 in the Senate). These proposals included such subjects as:

Establishing minimum standards of public service programming.

Reservation of noncommercial educational TV channels.

Establishing Federal matching grants for educational TV.

Limiting control of mass media of communications.

Extending the time for annual inspections of ship radio stations.

Congressional Committee Work

During the 1960 fiscal year, the Commission adopted and submitted to committees of Congress and the Bureau of the Budget written comments concerning over 50 legislative proposals which had been referred to the Commission for study.

The Communications Subcommittee of the Senate Interstate and Foreign Commerce Committee and the Communications and Power Subcommittee of the House Interstate and Foreign Commerce Committee held hearings on various bills of interest to the Commission, including those relating to spectrum allocations, ethics, conflicts of interest, use of TV time for Presidential candidates, and other matters.

The Special Subcommittee on Legislative Oversight of the House Interstate and Foreign Commerce Committee also conducted extensive hearings concerning "payola" and "rigged" quiz programs.

A significant portion of the Commission's legislative activity was devoted to furnishing information and assistance to Congressional committees, to testifying at Congressional hearings, and to rendering technical advice and assistance to the Communications Subcommittees of the Senate and House Interstate and Foreign Commerce Committees.

In addition, the Commission's staff gave technical advice and assistance to House and Senate Committees in the drafting of legislation that was eventually enacted by the Congress.

National Defense

EMERGENCY AUTHORITY

Section 606 of the Communications Act empowers the President to take precautionary measures with respect to wire and radio communication and other radiating devices in time of war or other national crisis. Under this authority, facilities can be closed or used for emergency purposes, priorities established for essential messages, and protection given vital communication facilities. By Presidential directive, the Commission has, since 1951, established and enforced regulations governing electromagnetic radiation from noncommunication equipment which could be used as beams to guide enemy aircraft and missiles.

CONELRAD

One important program for which the Commission is responsible is called CONELRAD, an abbreviation for *CON*trol of *EL*ectromagnetic *RAD*iation. It was established at the request of and with the cooperation of the Department of Defense and the Office of Civil and Defense Mobilization. Its purpose is to harness, for emergency purposes, the entire civilian communications industry.

The Commission has put into effect CONELRAD plans for most of its radio services. Other CONELRAD projects are classified. In general, however, they establish means for alerting all radio stations to leave the air. Certain AM stations would resume operation to broadcast civil defense and other pertinent information on the Emergency Broadcast System frequencies of 640 and 1240 kc. Designated stations in other radio services would operate under controls for essential emergency service. All others would remain silent until the CONELRAD all-clear is sounded.

The Commander in Chief of the North Atlantic Air Defense Command is responsible for invoking the CONELRAD radio alert. It is transmitted to key broadcast stations which, in turn, broadcast the CONELRAD attention signal, followed immediately by the alert message. All other radio stations (broadcast and nonbroadcast) are required to monitor a key broadcast station in order to receive the alert.

A new instantaneous nationwide CONELRAD alerting system is under development which will provide a "hard copy" teletype record.

It is proposed to utilize the teletype circuits which now supply news to broadcast stations.

A nationwide 30-minute CONELRAD Drill was held on May 3, 1960. Participation was mandatory for all broadcast stations. Other classes of stations were not required to take part. Reports indicate that the drill was most successful and that the service areas provided by the Emergency Broadcast System stations during daytime hours extended considerably beyond that predicted. Some 40 governors as well as 90 percent of local civil defense authorities took part.

Peacetime CONELRAD Use

In addition to its national defense purposes, the CONELRAD alerting system has, since 1957, been put to an important peacetime use by the Commission in cooperation with the U.S. Air Force and the U.S. Weather Bureau. On threat of a storm or other natural element which might endanger life and property, the local weather bureau alerts cooperating broadcast stations which then transmit, on their regular frequencies, the attention signal and the weather warning.

STATE DEFENSE FM NETWORKS

A number of States have established pre-attack and post-attack State Defense FM Networks. These facilities have the capability to accept and relay the main FM program channel, the subsidiary channel and other derived ultrasonic multiplexed voice and/or teletype channels. Some of these networks carry a "live" statewide weather summary at least once each day from the weather bureau.

The Florida and other Atlantic seaboard FM nets rendered invaluable service in connection with hurricane "Donna" in September 1960, their first test under actual emergency.

INDUSTRY ADVISORY COMMITTEES

Under authority of Executive Order 10312 of December 10, 1951, the Commission has appointed a National Industry Advisory Committee to assist it in executing the provisions of that order. This committee consists of representatives from each of the radio services licensed by the Commission. Its purpose is to formulate and develop emergency plans including development of standby and backup communication facilities which, among other things, would insure continuity of the Emergency Broadcast System and the flow of essential intercommunications; evolve plans to restore normal operations as quickly as possible following a CONELRAD all-clear, and assist military and civilian officials insofar as possible.

The NIAC meets every 8 weeks in furthering the attainment of these objectives. This type of approach makes available, without

expense to the Government, the benefit of the vast talent in the electronic industry to advise the Commission in its overall communications defense planning.

In addition, practically every State now has a State Industry Advisory Committee. These committees work with local, State and Federal civil defense as well as the military in strengthening emergency defense communication facilities.

The industry advisory committees have rendered valuable assistance in planning and testing the linking of privately owned radio facilities to furnish alternate service in the event that common carrier systems are disabled. Such backup systems can interconnect many radio stations at nominal cost, thereby providing efficient and reliable substitute communication nets.

NATIONAL DEFENSE EXECUTIVE RESERVE

A National Defense Executive Reserve was authorized by Congress in 1955 and activated by an Executive Order in 1956. Under its provisions, the Office of Civil and Defense Mobilization established an Interagency Executive Reserve Committee representing Federal departments and agencies, including the FCC, for the purpose of providing supplementary executive manpower to assist the carrying out of essential Government functions in an emergency.

The FCC unit of the Executive Reserve presently comprises 23 members. They are selected active or retired experts from diverse branches of the communications industry and professions to train for coping with the many problems which would arise from discharging essential functions of the FCC in the event of enemy attack.

The FCC Executive Reserve unit has received intensive training in the handling of the agency's essential functions under simulated conditions. The unit, together with the National and State Industry Advisory Committees, participated in defense communication seminars in 1959 and 1960. Also in 1960, the FCC Executive Reserve unit attended the Second National Training Conference. Such conferences are held approximately every 2 years.

OPERATION ALERT 1960

FCC headquarters participation in Operation Alert 1960 included assignment of a cadre of bureau heads and staff officers to the OCDM classified location center, a representative at the National Damage Assessment Center, and manning the FCC's own emergency relocation site. Participation by FCC field personnel was greater in scope than for any previous exercise. In addition to being represented at each of the 8 OCDM regional offices, the FCC field force activated

certain of its relocation sites. The 1960 tests demonstrated the ability of communication facilities at emergency locations to function effectively under simulated conditions.

FCC EMERGENCY COMMUNICATION

A mobile radio communications center, together with its associated emergency power supply, is available for emergency communication between the Commission's relocation site and its monitoring network in the event of failure of landline circuits. The mobile center is capable of handling radioteletype as well as radiotelegraph. It has sufficient range to contact directly any one of a number of the Commission's radio-equipped field monitoring stations. These, in turn, could function as relay points to other stations. During the year the mobile facilities were used in successful tests between the FCC relocation site and the OCDM classified location.

Emergency radiotelephone and radiotelegraph equipment, together with a gasoline engine-driven generator for emergency power, are installed at the FCC family rendezvous point. The physical facilities at this location include shelter from radiation fallout and for mass feeding. The emergency communication facilities are capable, under normal conditions, of linking this point to other radio-equipped FCC stations including the agency's emergency relocation site. Also, certain FCC monitoring stations have been linked with OCDM's 8 regional offices (to each of which an FCC district engineer has been assigned) by short-range circuits for emergency use and, meanwhile, handle a limited number of essential messages.

FCC DEFENSE COORDINATION

The FCC Division of Defense Coordination is primarily concerned with mobilization planning and liaison with Federal departments and agencies on defense matters other than CONELRAD and radio frequency management activities under the Chief Engineer. Now under the Executive Officer, it reports to the Defense Commissioner.

A Defense Steering Committee representative of each bureau and staff office of the Commission assists in the overall planning. One necessary action was the establishment of a line of succession for key FCC officials for emergency purposes.

The Division of Defense Coordination arranged for the annual training of members of the FCC National Defense Executive Reserve unit, also for the training of more than 25 FCC employees in the Interagency Communications System procedures including teletype, cryptography and facsimile. It further arranged instruction for 3 classes in first aid and 1 class in radiological monitoring techniques.

The Damage Assessment Officer in the Division of Defense Coordination participated in the staffing of the National Damage Assesssment Center operated by OCDM. A national system using high speed computers is in operation at the center. The data computed comprises approximately 75 categories of resources of which 3 pertaining to telecommunications are under the general direction of FCC personnel. These 3 categories are being continually up-dated by the FCC.

During the year, the computer was used to assess damage to broadcasting resources under simulated conditions. The FCC was in the process of installing a Kineplex printer at its emergency relocation site for the purpose of receiving damage assessment data directly from the NDAC via wire lines.

Broadcast Services

PROGRAMS

General

The broadcast subject of major general interest during the year was the Government's relation to programming. This was intensified by the attention given to the fixed "quiz" and "payola" revelations and criticism from many quarters about program content—especially that of TV.

The FCC, for its part, considered how far it could go in dealing with these matters in view of the no-censorship and free-speech provisions of the law, its past thwarted attempts to regulate certain types of programs (lotteries and "giveaways"), the lack of legal sanctions to proceed against unethical practices, and the fact that Commission jurisdiction is limited to individual station licensees and transmitter operators (not the networks, program producers, performers or advertisers). As a result, it took a series of actions designed to correct these abuses.

To summarize them:

Programming Inquiry

In February 1959 the Commission instituted an inquiry into the TV network selection process. This was a continuation of the Commission's prior network study (docket 12782) which did not cover programming. The purpose of the supplemental inquiry was to obtain information about TV network policies, practices and procedures involved in the production, selection and supervision of programs.

In May 1959 hearings were opened in New York and continued in that city and Washington during July, when leading advertising agencies testified as to their role. In the following November various film producers on the West Coast were interviewed preparatory to a subsequent hearing on the part played by the film industry in TV network programming.

On November 10, 1959, following disclosures of rigged "quiz" shows and "payola" practices before the House Legislative Oversight Subcommittee, the Commission enlarged its inquiry to include consideration of broadcast programming in general and to obtain comment and opinion relative to its authority in this area. Beginning December 7, 1959, and continuing from time to time to February 1, 1960,

the Commission heard from nearly 100 spokesmen for religious, educational, women's and other associations, broadcasters, advertising and talent organizations, and other listener and professional groups. It produced a record of nearly 5,000 pages.

On June 15, 1960, an interim staff report—"Responsibility for Broadcast Matter"—was submitted to the Commission by the Office of Network Study. Subsequently, on July 29, the Commission issued a "Report and Statement of Policy" in the programming inquiry and, at the same time, made public the staff report.

The Commission's overall programming inquiry is continuing. Additional public proceedings were scheduled to start in Los Angeles in October, at which time representatives of the TV film industry and others will be heard.

Other Programming Actions

On December 2, 1959, the Commission requested all broadcast stations to report what matter they had broadcast since November 1, 1958, for which money or other consideration had been received but not announced, and what they have done to control this situation. (A tabulation of responses announced April 5 thereafter showed 59 percent of the stations alleging no "payola" or other hidden payments.)

On January 21, 1960, the Commission announced, among other things, that it would propose rules requiring broadcast licensees to prevent broadcast of unannounced "payola" received by their employees, and that its consideration of renewal and other broadcast applications would include replies to its "payola" questionnaire as well as information furnished by the Federal Trade Commission.

On February 4, 1960, the Commission announced that it was preparing suggested legislation to deal with deceptive "quiz" and "payola" practices and would tighten its own rules concerning the responsibility of broadcast licensees in such matters, meanwhile considering other recommendations made in the December 30, 1959, "Report to the President by the Attorney General on Deceptive Practices in Broadcasting Media."

On February 5, 1960, the Commission proposed rules to ban "payola" and other hidden paid announcements, also prearranged "quiz" and other contest programs, unless payment or other prearrangement is announced.

On February 11, 1960, it announced the draft of proposed legislation to provide criminal penalties for producers, sponsors or presenters of deceptive "quiz" shows and "payola."

On February 18, 1960, it announced supplementary liaison arrangements with the Federal Trade Commission relating to unannounced sponsorship of broadcast material.

On March 16, 1960, it issued a statement on "Sponsorship Identification of Broadcast Material" interpreting the requirements of Section 317 of the Communications Act. On April 1 thereafter it afforded those interested an opportunity to file comments but did not suspend the effectiveness of its March notice.

On May 12, 1960, it announced an inquiry into undisclosed commercials in recorded "interview" programs.

(See Legislation section for notation of Congressional actions since June 30, 1960 on matters relating to programing and other broadcast matters.)

COMPLAINTS AND COMPLIANCE DIVISION CREATED

As of June 1, 1960, the Commission established a separate Complaints and Compliance Division in its Broadcast Bureau. Its purpose is to unify the handling of complaints, including field investigations, and compliance of broadcast stations with statutes, international agreements, and Commission policies and rules. It is responsible for ascertaining facts, in response to specific complaints or on its own initiative, and keeping the Commission informed of the results of its check of violations.

LICENSE TERMS AND SUSPENSIONS

On March 2, 1960, the Commission proposed rule changes looking toward a shorter-term license to any broadcast station which does not merit the regular 3-year renewal.

The following April 12, it recommended to Congress that the Communications Act be amended to authorize the Commission to suspend broadcast licenses or impose forfeitures, and to issue temporary restraining orders, in cases which do not warrant revocation proceedings.

Both of these proposals were approved by Congress with the exception of the license suspension recommendation (see Legislation). On September 28, 1960, the Commission amended its rules to provide shorter-term licenses in special cases.

POLITICAL BROADCASTS

Congress amended section 315(a) of the act, effective September 14, 1959, to exempt from the "equal opportunities" requirement appearances by legally qualified candidates on bona fide newscasts, news interviews, news documentaries, or on-the-spot coverage of news events. In addition, the Commission is required to include in each annual report it makes to Congress "a statement setting forth (1) the information and data used by it in determining questions arising from or

connected with such amendment, and (2) such recommendations as it deems necessary in the public interest."

The procedure generally followed by the Commission with respect to section 315 complaints is as follows: Immediately upon receipt a complaint is acknowledged and the complainant is informed that the Commission is communicating with the licensee. At the same time, the licensee is advised of the complaint and directed to reply within a given time. Such advice is given by telegram, letter or telephone depending on the date of the election. Where necessary, and depending upon the issues to be resolved, the licensee is informed of the specific factual data required to reach a determination.

For example, in connection with the West Virginia case, described hereafter, and before the Commission reached a decision in the matter, the licensee was requested to submit the following information:

"Whether Mr. Cox is a legally qualified candidate for public office and, if so, the office for which he seeks nomination.

"The format and content of the program 'A Thought for the Day'.

"Whether the program is regularly scheduled or specially scheduled. If regularly scheduled, the times of day and week.

"When the program was first initiated and when Mr. Whiston commenced his appearances thereon.

"Whether controversial issues were discussed and, if so, whether opportunity is afforded to present opposing viewpoints.

"The total amount of free time Mr. Whiston has received since becoming a legally qualified candidate for the nomination for the office he seeks.

"A copy of the script of the program in question.

"The basis for your denial of the request of Mr. Cox for equal time."

All section 315 matters are given priority consideration. When a determination is reached, both the licensee and the complainant are advised by telegram, letter or phone, as may be required by the circumstances.

The Commission is giving careful consideration to all matters arising under section 315 of the act and cases coming within the 1959 amendment. In the light of the experience gained therefrom, the Commission will make, when appropriate, such recommendations as it deems necessary in the public interest.

Between September 1959 and the termination of the fiscal year, the Commission issued the following rulings relating to the 1959 amendment:

Station WCLG broadcast a program at noon-time (Monday through Friday) on which the sheriff of Morgantown, W. Va., reported on the activities of his office coupled with a "Thought for the Day." The sheriff was a candidate for nomination for Congress in the Republican primary. His opponent for the same nomination in the same party's primary demanded equal time. The Commission ascertained, among other things, that the program had been regularly scheduled since 1958; that the sheriff had appeared thereon since

that time; and that the format and content of the program were determined by the sheriff and not by the station. The Commission ruled that the program was not the type which Congress intended to be exempt from the equal opportunities requirement.

A local weathercaster who was a candidate for re-election to the Texas legislature was regularly employed by an AM and TV station in Texas. His weathercasts contained no reference to political matters. He was identified over the air while a candidate as "TX Weatherman" and not by his name. His opponent demanded equal time. The Commission ruled that, on the basis of the facts before it, the appearance of the weathercaster on the stations while a candidate was not a "use" under section 315 of the facilities of the stations. On appeal, the United States Court of Appeals (Fifth Circuit) affirmed the Commission's rulings on the following grounds: (a) The weathercaster's appearance on the stations did not involve anything but a bona fide effort to present the news; (b) the weathercaster's employment was not something arising out of the election campaign; and (c) the facts in the case did not real any favoritism on the part of the stations or intent to discriminate among candidates.

NBC had presented over its facilities certain candidates for the Democratic nomination for President on the program "Meet the Press." A candidate for like nomination in the Maryland primary election demanded equal time. The Commission ruled that the program was of the type which Congress intended to exempt from the equal opportunities requirement.

Lar Daly was a candidate for the Democratic nomination for President in the Maryland primary election. He complained to the Commission that the 3 networks had refused his requests for time on the programs "Meet the Press," "Face the Nation" and "College News Conference" equal to that afforded Mr. Daly's competing candidates. The Commission held that the programs were regularly scheduled bona fide news interviews exempt from the equal time requirement.

A Philadelphia TV station had presented a weekly program entitled "Eye on Philadelphia." Three candidates for mayor, who represented established political parties, appeared on it. A write-in candidate for mayor demanded equal time. The Commission ascertained that the appearances of the 3 mayoralty candidates were on a regularly scheduled news interview program; and that such appearances were determined by the station's news director on the basis of newsworthiness. The Commission held that in the absence of evidence that the program was not a bona fide news interview it could not reach a determination as to whether the write-in candidate was entitled to equal time.

As of August 10, 1959, the Commission's political broadcast rules were amended to require that a request for equal opportunity be submitted to a broadcast station within 1 week from the day on which the prior use occurred, and that the candidate requesting equal opportunity or complaining of noncompliance by a station has the burden of proving that he and his opponents are legally qualified candidates for the same office.

At the request of the Senate Interstate and Foreign Commerce Subcommittee on Communications, the Commission in May of 1960 sent a questionnaire to all TV stations inquiring into their policy

with respect to political broadcasts in general and to the 1960 presidential campaign in particular. Another questionnaire was sent to all AM, FM and TV stations and networks in August requesting them to supply information about their practices in handling political broadcasts during the 1960 campaign.

Effective August 24, 1960, Congress suspended the equal-time requirement for broadcast appearances by Presidential and Vice Presidential nominees during the 1960 campaign in order to obtain information for considering permanent change. The Commission is to report to Congress on the effect, with any recommendations, by March 1, 1961.

LICENSE RENEWALS

Deferment of action on license renewal applications reached a new high as of June 30, 1960, due largely to considerations of "quiz" and "payola" practices and an increase in engineering deficiencies. Pending resolution of questions relating to programming, technical operations, financial and legal problems and other matters affecting the qualifications of the applicants, nearly 500 AM, FM and TV broadcast station license renewals (exclusive of auxiliaries) were deferred. Of this number, almost half involved "payola" or other sponsorship identification questions alone or with other matters. It should be pointed out that consideration of the renewal of any station in question includes other facilities of the same licensee which may also be up for renewal.

On September 21, 1959, the Secretary of the Army protested the license renewal of KSAY, San Francisco, alleging that radiation from the station's transmitter had induced electical currents in the loading cranes at a nearby Army terminal, resulting in burns to personnel and the creation of a fire hazard. The Commission notified the licensee that a hearing was indicated and, later, was advised that the Government had instituted court action to enjoin the station and to collect $150,000 damages. The case was pending at the close of the year.

DISCIPLINARY ACTIONS

The Commission and the Department of Justice, on April 29, 1960, obtained a Federal court order enjoining KLEM, LeMars, Iowa, from further unlicensed operation. The licensee had failed to file an application for license renewal despite repeated requests by the Commission, had ignored Commission correspondence during the last license term, and had failed to file required reports and information. The station was warned to cease operation after its license expired. Upon failure to reply, the Department of Justice was requested to take action. As a result of the court order, the station went off the air May 20.

On December 8, 1959, the Commission ordered KIMN, Denver, to show cause why its license should not be revoked for broadcasting "vulgar, indecent, ribald, offensive, in bad taste with double meaning, and/or obscene language". The matter was also brought to the attention of the Department of Justice which advised the Commission that the broadcasts in question did not violate the Federal obscenity statute. In view of the fact that the announcer responsible for the broadcasts had been discharged by the station and the latter's assurance that the objectionable language would not be repeated, the Commission on June 23 issued a cease-and-desist order. It also warned the former announcer, who held a radio operator permit.

During the year the Commission advised several additional stations that their failure to make the required sponsorship announcement while televising kinescope summaries of the Senate Kohler strike hearings in 1958, and failure of others to make an adequate effort to present opposing views on the controversial subject of subscription TV, either were violations of law or the Commission's rules and policies.

TRANSFERS AND ASSIGNMENTS

Applications involving changes in broadcast station ownership totaled nearly 1,500 for the fiscal year, a slight increase over the figure for 1959.

The Commission completed a legislative, administrative and judicial history of broadcast station transfers and assignments under the Radio Acts of 1912 and 1927 and the Communications Act of 1934. It was prepared for the House Legislative Oversight Subcommittee pursuant to the latter's report of January 3, 1959.

An increase was noted in the prices paid for FM stations in fiscal 1960 over the year previous, evincing the continued interest in FM.

On September 9, 1959, the Commission reaffirmed its policy of prohibiting a party from holding an interest, direct or indirect, in competing stations in the same broadcast service. One of the directors of an insurance company which was the licensee of a station in Virginia desired to serve also on the board of directors of a bank in the same city which had an interest in another station serving substantially the same area. In answer to a request for an interpretive opinion, the Commission advised the insurance company that such dual service under these circumstances would contravene the long standing policy of the Commission promulgated under its duopoly rules.

In the area of international broadcast facilities, 2 out of the 5 authorized international broadcast facilities—KGEI, Belmont, Calif., and WRUL, Scituate, Mass.—filed applications to change ownership during the year.

The fiscal year saw the entry into broadcasting of large corporations hitherto not engaged in that field. Twentieth Century-Fox Television, Inc., owned by Twentieth Century-Fox Film Corp., purchased control of United Television, Inc., licensee of KMSP–TV, Minneapolis, and Columbia Pictures Electronics, Inc., owned by Columbia Pictures Corp., bought International Broadcasting and Television Corp., licensee of KDYL AM and FM and KTVT–TV, Salt Lake City.

Problems are presented by proposed acquisition and disposition of broadcast facilities by RKO General, Inc., and National Broadcasting Co. In 1955 the Commission granted assignment of licenses of WTAM AM and FM and WNBK(TV), Cleveland, from NBC to Westinghouse Broadcasting Co., Inc., and the assignment of licenses of KYW and WPTZ(TV), Philadelphia (together with a $3,000,000 cash payment), from Westinghouse to NBC.

In 1956 the Department of Justice brought an anti-trust suit against NBC and its parent RCA charging that the Philadelphia-Cleveland exchange resulted from unlawful pressures by NBC on Westinghouse, and on September 22, 1959 NBC entered into a consent decree which provided that it dispose of its Philadelphia stations prior to December 31, 1962. The decree also required that any NBC acquisitions in any of the top 8 markets be cleared by the Department of Justice before submission to the FCC.

The previously mentioned Philadelphia station, WPTZ (changed to WRCV–TV), was originally licensed to The Philco Corp. which sold it to Westinghouse in 1953. On August 14, 1957, Philco protested the granted renewal of license of that station because of the alleged anti-trust violations. The Commission denied the protest upon a finding that Philco was not a party in interest. The Court of Appeals for the District of Columbia overruled that finding and remanded the case to the Commission. Oral argument on the protest was held by the Commission in October of 1959 and on July 12, 1960 it dismissed the protest upon a finding that Philco was legally insufficient to warrant the hearing requested. The license's expiration date being August 1, 1960, NBC filed, on May 2, 1960, a second renewal application for WRCV–TV. Shortly thereafter Philco filed an application for that station's channel in competition with the renewal application, charging that the station had disregarded its local responsibilities in order to promote the interests of NBC's parent, RCA.

There were further complications when, on June 3, 1960, applications were filed for (a) NBC to assign WRCV AM and TV to RKO in exchange for RKO's WNAC AM, FM and TV in Boston being assigned to NBC; (b) NBC to assign its Washington, D.C., station

WRC AM and TV to RKO for $11.5 million; (c) RKO to sell its Washington, D.C., station WGMS AM and FM to Crowell Collier Publishing Co. for $1.5 million; and (d) NBC to purchase KTVU (TV), San Francisco, for $7.5 million, contingent upon grant of the NBC–RKO sales. KRON–TV, the NBC affiliate in San Francisco owned by the San Francisco Chronicle, is opposing the latter sale. The Chronicle has also filed an application for Channel 4 in Washington, D.C., vying with the WRC–TV renewal application.

TELEVISION (TV) BROADCAST SERVICE

General

Since adoption of the present TV rules, engineering standards and nationwide table of assignments in 1952, TV broadcasting has grown at a tremendous rate.

As of June 30, 1960, there were 447 VHF and 76 UHF commercial TV stations operating in 275 markets; 56 other stations held operating authority but were not actually on the air; and 74 more were under construction. About 52 million TV receivers were in the hands of the public. This is about one-third the number of aural sets. A census survey showed that 88 percent of all households had TV sets and that 11 percent had 2 or more receivers.

TV Allocation Problems

Long-range program.—In spite of its phenomenal growth, TV continues to have major problems. They stem primarily from the fact that the VHF band is insufficient to provide a truly nationwide TV service. Failure of UHF to take its competitive place has resulted in almost complete saturation of the 12 channels in the VHF band. The result has been that many of the larger markets have a shortage of outlets and many other communities, both large and small, are without any local TV service.

Of the top 100 TV markets, 42 have less than 3 VHF or 3 UHF stations. These markets contain the country's big population centers where the need for competitive services exists and where there is economic support for multiple TV services. Outside of these top markets UHF is operating in 53 communities where little VHF service is available.

As soon as the TV allocations problem developed, consideration was given to its solution by the Commission, the Congress and the industry. An extensive rulemaking proceeding was conducted in 1955–56 in which this subject was considered. However, due to the legal, technical and policy complexities involved, no simple solution was then found. However, a program of study was started to explore various possible approaches—such as shifting all TV to the UHF

band. Separate proceedings were also initiated to relieve the competitive situation in a number of markets by deintermixture of VHF and UHF assignments. In cases where UHF could not succeed due to the operation of VHF stations in the same or nearby markets, additional VHF channels were proposed. In some markets where UHF stations predominated, consideration was given to deleting VHF assignments.

To aid it in collecting technical data which would be useful to the general study, the Commission requested the industry to cooperate. In January 1957 the Television Allocations Study Organization (TASO) was formed and in March of 1958 it issued a report of its findings.

Most recent Commission considerations have included studies of a 50-channel system retaining the present 12 VHF channels, a 50-channel system retaining Channels 7–13, a 25-channel system retaining Channels 7–13, a 70-channel UHF system, and retention of the present 82-channel VHF–UHF system.

The first of these approaches involved the need of obtaining additional VHF channels from the Government. However, on August 15, 1960, the Office of Civil and Defense Mobilization advised the Commission that this is precluded by national defense, security and expense consideration.

The Commission must now consider rearrangement of existing VHF and UHF channels and the feasibility of moving TV, in whole or major part, into UHF. Pending a long range solution to the TV allocations problem, the Commission has taken certain interim measures to alleviate the shortage of channels in the larger and more critical markets and to make the situation more competitive in a number of intermixed markets.

At FCC request, Congress appropriated $2 million for an extensive project to be conducted in New York to determine the effectiveness of UHF operation in metropolitan areas (see Research). The result will have an important bearing on the future of UHF–TV.

Short-range program.—On January 7, 1960, the Commission announced a rulemaking proceeding (docket 13340) to consider an interim policy for VHF channel assignments. This proposal looks toward the waiver of present minimum assignment separations in exceptional cases and under certain limited conditions. The purpose is to solve the shortage of channels in important markets which already have 1 or 2 VHF stations. The considerations are that there is a need for the additional service which outweighs any service lost as a result of the addition of the channel, that the new VHF service will not have a substantial adverse effect on established UHF service, and that the new assignment would not require an excessive number of channel

changes of existing stations. The basic framework of the present rules and standards would be retained but with more up-to-date propagation curves.

During the year, and within the framework of the present table, some additional assignments were made in a number of communities for commercial or educational purposes. These included Columbus, Ga.; Corpus Christi, Texas; Fargo, N. Dak., and Lander, Wyo. Additional assignments in Birmingham or Montgomery, Ala., were being considered and, in July 1960, Fresno, Calif., was made an all UHF market and deintermixture of the Bakersfield, Calif area was proposed. Proceedings under way involve specific assignments to the Providence, R.I., and Grand Rapids, Mich., areas.

Pending petitions requested additional assignments in such markets as Rochester and Syracuse, N.Y.; Toledo, Ohio, and Waco, Texas. However, these must await either completion of negotiations with Canada or the adoption of the interim policy.

While a permanent and more satisfactory solution of the TV problem depends on the longer range consideration, it was felt that the interim or short range program would help to develop a more competitive situation in a number of important areas. The failure to obtain more VHF channels will require a reevaluation of the interim plan.

National Spot Sales Representation by Networks

In October 1959 the Commission adopted a new rule prohibiting TV stations other than those licensed to a network from being represented in national spot sales by an organization which operates the network with which the station is affiliated. This proceeding grew out of a recommendation made by the Commission's special network study staff in its 1957 "Report on Network Broadcasting," which was published by the Government Printing Office in the form of a report of the House Committee on Interstate and Foreign Commerce (H. Rept. No. 1297, 85th Cong., 2d Sess.), and out of the public hearings held by the Commission in 1958 to give interested parties an opportunity to comment. After considering the extensive pleadings, the Commission concluded that participation in the national spot sales field gives the networks the power to curb competition for the representation of stations, that representation of affiliates creates within the networks an inherent conflict of interest which, in turn, provides an incentive to subordinate the representation function to the major network interests, and that there was a likelihood that full and effective competition between network and national spot television might not prevail.

Stations which were affiliated with and represented by a network at the time the rule was adopted have until December 31, 1961 to

comply. The rule does not bar a network from representing those stations which it owns and operates or stations which are not affiliated with it. The Commission determined, because of the significantly different characteristics of the radio industry, not to institute proceedings to adopt a similar rule for radio stations at this time, but left it open for further consideration.

Option Time

On April 23, 1959, the Commission proposed to amend its existing rules governing "option time" in TV, i.e., the term used to designate certain hours of the broadcast day which network affiliated stations contract to carry sponsored network programs. This, too, grew out of the staff "Report on Network Broadcasting" and the Commission's hearings in 1958.

The Commission concluded that optioning of time by affiliated stations to their networks is reasonably necessary for successful network operation and is in the public interest and, in 1959, submitted its findings to the Attorney General for his views on the applicability of the anti-trust laws to the practice. In reply, the Commission was informed by the Assistant Attorney General in charge of the Anti-Trust Division of the Department of Justice that, in his opinion, the option time practice "runs afoul" of the Sherman Anti-Trust Law.

On September 14, 1960, the Commission amended its chain broadcasting rules to reduce from 3 to 2½ hours the time within each segment of the broadcast day that a TV station may option to networks; require TV "straddle" programs to be treated outside option time, and give TV stations more say in rejecting or substituting network programs (docket 12859).

These changes are designed to maintain the essential features of the option time practice, which the Commission has found to be reasonably necessary in the public interest, while at the same time improving the competitive position of non-network elements of the TV broadcast industry and the freedom of individual stations to select their programs.

Noncommercial Educational TV

Authorizations and allocation.—Of 64 educational authorizations outstanding at the end of fiscal 1960, 47 held operating authority. In addition, 4 stations were operating noncommercially on commercial channels. These stations represented 28 States and Puerto Rico, and reached an estimated 70 million people. Two cities each had 2 operating educational TV stations—Oklahoma City, Okla. (one on a commercial channel), and Pittsburgh, Pa.

The Commission's final TV report in 1952 reserved 242 assignments for noncommercial educational use. By June 30, 1960 the number of such reservations had risen to 267, of which 90 were on VHF channels and 177 were on UHF channels.

During the year an additional educational VHF channel assignment was reserved in Appleton, Minn.; Lubbock, Texas; Fargo, N. Dak., and Reno, Nev. In the last 3 named cities the VHF channel was substituted for prior UHF reservations. In addition, 9 UHF educational reservations were made—1 in Mount Pleasant, Mich., and 8 in Alabama (Andalusia, Birmingham, Demopolis, Dothan, Florence, Munford, Opelika and Tuscaloosa).

Networks.—A significant development in educational TV has been the establishment of several educational TV networks. In addition to the National Educational TV Network operated by the Educational TV and Radio Center in New York City, which is actually a tape and film network to which the majority of educational stations subscribe, there are several State and regional networks, involving stations interconnected by cable or microwave relay, which are in operation or in the planning stage.

Notable among these is the Florida Educational TV Network, which has 4 operating stations with a fifth to be added. This network, which now reaches 3 million viewers including approximately 150,000 students of all levels, can serve classrooms in 3 State universities, 12 community junior colleges and classrooms and homes in at least 33 of Florida's 67 counties.

The Alabama Educational TV Network operates on 3 VHF channels in Birmingham, Munford and Andalusia which are connected by microwave relay with each other and with additional studios in Tuscaloosa and Auburn. The network now reaches 80 percent of the State's population, or approximately 800,000 TV sets. The 8 UHF reservations made this year will be used to augment this network.

Under the direction of WGBH-TV, Boston, the Northeast Educational TV Network is in early stages of development, presently consisting of the 2 New England educational stations operating in Boston and Durham, N.H. The project contemplates a network of interconnected stations in 12 New England and Middle Atlantic States. Pending before the Commission is a petition by the University of Maine requesting reservation of 3 additional VHF channels at Presque Isle, Calais and Augusta for expansion of the Northeast Educational TV Network.

On March 31, 1960, there was completed a survey of the feasibility of a 6-State educational TV network which would cover Iowa, Minnesota, Nebraska, North and South Dakota and Wisconsin.

Airborne educational TV.—On December 22, 1959, the Commission granted several applications by Purdue University to experiment in airborne UHF TV transmission and instruction. The aerial stations will provide educational programming to elementary and secondary schools, colleges and universities located within a 200-mile radius of Montpelier, Ind.

A DC–6B aircraft flying in a 10 mile circle at an altitude of 23,000 feet over north central Indiana will broadcast, via airborne video tape recorders, on a proposed schedule of 6 hours per day 4 days a week. The potential benefits of this program are illustrated by the fact that within a radius of 200 miles of north central Indiana there are more than 5,000,000 students in over 13,000 separate school locations. About one-third of these are in school systems of less than 2,000 pupils. Some 18 institutions of higher learning within this educational target area will aid schools interested in participating in the program. The program staff will work with noncommercial educational TV stations in the 6-State area to extend the coverage of the courses. Over 600 schools have indicated an interest in participating in the program.

Airborne equipment tests for the first aircraft were expected to begin in October 1960, and for the second aircraft in November. Demonstration telecasts are planned to start in February 1961 and run through June. Twenty-eight courses have been approved. The first full academic year for the air telecasts is scheduled for September 1961 through June 1962.

This operation is purely experimental. Consideration would have to be given in a rulemaking proceeding to the many technical and policy problems involved before any regular operation could be authorized along these lines.

VHF Translators and Repeaters

Numerous small communities, particularly in the mountainous areas of the West, continued to employ unlicensed devices popularly called "boosters" or "repeaters" for the reception, amplification and retransmission, on VHF channels, of signals from distant TV stations which could not be otherwise received. On July 7, 1960, amendments to sections 318 and 319 of the Communications Act, for the first time, empowered the Commission to arrange for licensing these devices, which previously had been barred by the statutory ban on licensing transmitting devices whose construction had not been first authorized.

On July 27, 1960, the Commission adopted rules for interim authorization of VHF repeaters constructed on or before July 7, 1960. Simultaneously, also in docket 12116, the Commission established procedures and requirements governing the licensing of new repeater devices in the VHF band, which are referred to as "VHF translators" because they are required to use an output channel different from

the channel on which incoming signals are received. Most of the unlicensed repeaters so convert the incoming signals.

Subject to filing certain minimal information, preexisting repeaters will be permitted to operate until October 31, 1961. They will, however, be required to modify their installations by that date so as to comply with the new VHF translator rules. Those requirements include limitation of power to 1 watt, providing on-off controls accessible at all times, automatic cutoff when the parent station is not in operation, and preventing interference to regular TV broadcast service and resolving their own interference problems.

In this manner the Commission, with the assistance of Congress, has been able to establish a workable basis for resolution of the long-standing problems associated with unauthorized VHF repeaters, and thus make it possible to regularize the important service which these devices render in bringing TV to many persons in remote areas.

UHF Translators

To help extend TV service to new areas, the Commission has since 1956 authorized UHF translator stations. These stations pick up the signals of regular TV stations and rebroadcast them on the 14 highest UHF TV frequencies (Channels 70–83). Using relatively inexpensive and low-power equipment, their average cost of installation is now under $5,000.

Until recently, translators were limited to a maximum power output of 10 watts with which they provided, on the average, good reception to a distance of 15 or 20 miles. In June of 1958 they were permitted to increase maximum power to 100 watts. The average cost of transmitting equipment for a 100-watt station is approximately $7,000.

UHF and VHF translators may not originate broadcast material and must obtain the consent of the stations whose signals they retransmit. Typically, they are built and operated by nonprofit corporations or groups, or by local governmental bodies. Most translators are in the West.

The Commission revised its application form to construct translators and considerably reduced the detail required in the older form.

UHF Boosters

On May 25, 1960, the Commission adopted rules, effective July 5 thereafter, permitting UHF broadcast stations to use boosters to fill in "shadows" within their normal service areas but not to extend their coverage (docket 11331).

Such a booster merely amplifies and retransmits the programs of the parent station on the latter's channel. It does not have an individual call signal and its maximum effective radiated power is limited to

5 kw. UHF stations operating boosters are required to satisfy claims of interference from their boosters. The booster is turned on and off by means of a cue signal transmitted by the parent station.

The purpose of such a booster operation is to enable a UHF station to provide reasonably uniform coverage, particularly where there is rugged terrain, without resorting to extremely high power.

Idle UHF Permittees

Commission broadcast station construction permits require that construction start within 2 months of the grant and be completed 6 months thereafter (or 8 months in all to build) unless good cause is shown for extending that time. Many holders of such UHF TV permits have—some of them for years—delayed starting to build their stations while waiting solution of UHF or other problems.

The Commission does not feel that idle grantees should continue to "sit" on channels which might be used by others to augment TV service to the public. Accordingly, on February 17, 1960, it acted to halt repeated requests for extensions by warning some 50 long-idle UHF permittees that unless they exercised their permits the latter would be cancelled. As a result, a score of such permits were turned in and oral argument was scheduled for the others.

Subscription TV

In March 1959 the Commission announced revised conditions under which it would consider applications for limited trial subscription TV operations employing the facilities of TV broadcast stations (docket 11279).

A trial would be limited to a maximum period of 3 years. Only stations in cities receiving at least 3 "free" TV services would be eligible. Each system of encoding or decoding signals (or other device for limiting programs to paying subscribers) could be tested in only 1 city; and not more than 1 system could be tried in any 1 city. Other conditions are designed to preserve the responsibility of participating stations for making judgments affecting the public in the matter of program selection, charges and other matters. While installation and maintenance charges would be permitted, the equipment would have to be furnished without requiring investment by the public in devices needed to decode signals. Any systems employed must be engineered so as not to create interference to the reception of free broadcasts or to deteriorate the technical quality of subscription programs.

When the year closed only 1 such application had been received. On June 22, 1960, WHCT, Channel 18, Hartford, Conn., filed for authorization to conduct a trial in that city. Protests were made by groups opposing toll-TV and a hearing was held before the Commission in October 1960.

FREQUENCY MODULATION (FM) BROADCAST SERVICE

Commercial FM

FM broadcast continued to show increased growth and interest. A total of 165 new stations were authorized during the year while 22 were deleted, resulting in a net gain of 143. At the year end, 912 authorizations were outstanding, of which number 741 were operating. The number of licensed FM stations was at an all-time high of 700 although total authorizations were still below the peak of 1,020 reached in 1948.

The increased competition for commercial FM facilities was reflected in the fact that at the close of the year 114 applications for new FM stations were pending, of which number 40 were in hearing.

Several applications were received for directional FM antenna systems. Two were submitted in order to limit radiation toward existing stations to prevent objectionable interference. The others were to limit radiation over the ocean and increase land coverage. A few directional antenna systems had been previously authorized for directing coverage into valleys and over populated areas.

The Commission's rules state that it shall be standard to employ horizontal polarization; however, circular or elliptical polarization may be used if desired. Several authorizations were issued for antennas producing both horizontal and vertical polarization, or elliptical polarization. The vertical polarization permits better reception on auto FM installations with the use of a vertical whip antenna. One antenna manufacturer is making an antenna which provides vertical as well as horizontal polarization.

Subsidiary FM

Since 1955 the Commission has permitted FM stations to engage in limited types of subsidiary services, such as background music and storecasting furnished on a subscription basis to retail and other commercial establishments. At the close of the year, over 200 FM stations held Subsidiary Communications Authorizations (SCAs) to conduct this type of supplemental service.

The Commission amended its rules, effective May 16, 1960, to expand the permissible scope of FM multiplexing by commercial FM broadcasters (docket 12517). They may now engage in certain types of subsidiary operation in addition to the news, music, time, and weather format. With Commission approval of appropriate applications, they can use their authorized multiplex sub-channels to transmit program material expressly designed and intended for business, professional, educational, religious, trade, labor, agricultural and other special groups of subscribers engaged in any lawful activity. This type of

service is typified by "doctor-casting" authorizations issued to various FM stations.

Authorized sub-channels were also made available for the transmission of signals directly related to the operation of FM stations, such as relaying broadcast material to FM and AM stations, remote cueing and order circuits, and remote control telemetering functions associated with authorized studio-transmitter-link operation.

As an example of program relaying, temporary authority was granted to KDKA–FM, Pittsburgh, to originate play-by-play descriptions of baseball games and transmit them to numerous FM and AM broadcast stations within its primary service area without disturbing the programing on its main channel.

At the same time, the Commission rejected a suggestion that remote pickup facsimile be allowed on a multiplex basis and also declined to adopt, at this time, changes in existing engineering standards applicable to subsidiary operations. Existing provisions concerning subchannel leasing arrangements and the ban on sub-carrier operation during periods of main channel inactivity were continued.

In approving this modest expansion of permissible subsidiary operations, the Commission weighed and rejected, as a matter of sound allocations principle, suggestions that FM broadcasters be allowed to undertake signaling, control, telemetering or communication activities basically unrelated to broadcast operation, thereby reaffirming the concept of SCA operation as an adjunct to regular FM broadcasting.

A few FM broadcast stations are still rendering background music and related services on a simplex (main channel) basis as a result of the 1958 decision of the United States Court of Appeals, District of Columbia Circuit, in *Functional Music, Inc.* v. *USA and FCC*. This matter will be dealt with in a separate rulemaking proceeding to be instituted in the near future.

Stereophonic FM

On May 4, 1960, the Commission invited comments on 8 systems of FM stereophonic transmission then under consideration (docket 13506). The time for filing these comments extended beyond the fiscal year end. Comments concerning stereophonic broadcasting which were filed previously in docket 12517 will also be considered in the new proceeding.

The Commission is desirous that FM "stereo" standards be adopted prior to considering such standards for AM and TV use. Various stations have engaged in experimental stereophonic operation under FCC authorizations and a National Stereophonic Committee has studied FM stereophonic systems under the auspices of the Electronic Industries Association.

Stereophonic broadcasting, in brief, involves dual transmission and reception of sound, picked up at different positions on the broadcasting stage, to give the listener the impression that the orchestra, choral group, etc., are "spread out" before him. Aside from enhancing the reception of live broadcasts such systems will accommodate the many stereophonic tapes and phonograph records being manufactured.

Noncommercial Educational FM

This service, which annually shows a slow but steady growth, added 20 new stations during the year to bring its total authorizations to 181. Of this number, 165 were on the air.

Schools and educational groups which can't afford TV operation find FM an economical and effective way to augment their curricula. For an outlay of a few thousand dollars, they can start with low power (10 watts) which will extend a radius of 2 to 5 miles and operate by remote control. Higher power can be added for extended coverage as additional funds become available.

On July 28, 1960, the Commission invited comments to proposed rulemaking looking toward permitting noncommercial educational FM stations to engage in multiplex subsidiary operations for educational purposes only (docket 13575).

STANDARD (AM) BROADCAST SERVICE

Authorizations

As of June 30, 1960, there were 3,581 AM broadcast authorizations, or 81 more than at the close of fiscal 1959. Those holding operating authority numbered 3,483, which was a gain of 106 for the year.

There is no separate category for educational AM operation. However, of the some 35 educational organizations holding AM grants, about a score of them operate on a voluntary nonprofit basis.

Application Backlog

Because of the mounting backlog of applications for new and major changes in AM broadcast facilities, the Commission, on April 8, 1959 (effective May 16 thereafter), amended its rules relating to the filing and consideration of new applications with earlier-filed applications. Under the new procedure, the Commission periodically publishes in the Federal Register a list of 50 applications which are at the top of the processing line and announces a date (not less than 30 days after publication) by which additional applications must be on file if they are to be considered with any on the list.

Prior to the adoption of these rules, one of the major delays in the disposition of applications on the processing line was due to the necessity of reprocessing the same applications many times because

of amendments changing the engineering proposals. Because of this, the rules were also changed to provide for the assignment of a new file number to an application amended to change its engineering proposal other than with respect to the type of equipment specified, such application to be returned to the processing line to await study in its normal turn pursuant to the newly assigned number. Since the institution of this cut-off procedure, the Commission has published 13 lists in the Federal Register, totaling 750 applications.

As of March 1960, the Commission, under the new procedure, had been able to speed its consideration and to dispose of, insofar as the processing line is concerned, more than 550 applications. In particular, the problem of moving from the processing line the large groups of applications which were required to be considered together had been reduced greatly and there were few, if any, groups on which study had not been virtually completed.

Accordingly, on March 28, 1960, the Commission relaxed the restrictions placed upon the acceptance of engineering amendments to permit certain types of amendments without the assignment of a new file number when it is shown that they would not create new or increased interference problems with other proposals or existing stations. It is anticipated that this rule change will facilitate processing by removing conflicts which would otherwise result in chain reaction considerations.

The Commission also concluded that processing time could be reduced substantially if the engineering data submitted with applications were prepared on a more uniform basis, and in a form which could better serve the required study by the Commission's staff. Accordingly, effective April 25, 1960, it revised section V–A of FCC Form 301, "Application for Authority To Construct a New Broadcast Station or Make Changes in an Existing Broadcast Station." The revisions were made to secure uniformity in the engineering showing of the required interference study in support of an application for an AM facility. They should aid in the processing and, therefore, be of advantage to applicants.

During the period May 16, 1959 to June 30, 1960, approximately 186 applications for new or major changes in AM stations were granted, 150 dismissed for noncompliance with the acts or rules, and 431 designated for hearing.

The Commission faces a special problem with respect to Class IV stations. On April 13, 1959, it adopted an order to permit action on applications by such stations for power increases up to 1 kw on local channels in all areas except within 62 miles of the Mexican border or within a specified area in southern Florida. By July 1, 1960, almost 500 applications by Class IV stations to increase power over 250 watts

had been filed. Many of them involve interlinking interference problems which invite multiparty proceedings. To help resolve these complex matters, the Commission on July 27, 1960, proposed amending the rules to make less restrictive the engineering provisions with respect to Class IV stations.

NARBA and Other Agreements

After a hiatus of some 10 years in which the United States has, with one exception, been without effective treaties with neighboring countries to govern the joint use of the AM broadcast band (535–1605 kc), the North American Regional Broadcasting Agreement of 1950 was ratified by the Senate on March 10, 1960, and entered into force on the following April 19, between the United States, Canada and Cuba. Its effectiveness with respect to the Dominican Republic, the United Kingdom (for Bahama Islands and Jamaica) and Haiti awaits ratification by those administrations or, with regard to Haiti, notification of intent to adhere. Mexico was not signatory to the 1950 NARBA, but concluded a separate bilateral agreement with this country on January 29, 1957. Although ratified by the United States simultaneously with NARBA, this agreement has not yet been ratified by Mexico and is, therefore, not in force.

From March 29, 1949, when the last NARBA expired, and April 1960, when the present NARBA entered into force, the only international agreement concerned with AM broadcasting in North America remaining effective was the so-called "Gentlemen's Agreement" of 1941 with Mexico on the use of 10 of the 107 AM broadcast channels. Only tacit agreement of the countries concerned to preserve the assignment structure has prevented utter chaos. Nevertheless, deterioration in AM broadcast service was progressive and, insofar as interference from Cuban assignments, was, and still is, of serious proportions.

During the approximate 18-month period between the expiration of the previous NARBA and the signing of the new NARBA, Cuba assigned stations on specific channels and under conditions not in accordance with previous agreements. This resulted in serious interference to many stations in the United States, particularly to the rural coverage of Class I stations on clear channels. On the other hand, pending entry of the new treaty into force, the United States took no action contrary to its provisions.

The new NARBA provides for removal of the majority of the Cuban stations which were assigned to United States clear channels since expiration of the previous agreement and, on those few channels where it was necessary to accept Cuban assignments, it provides that such Cuban assignments must operate with directional antennas to minimize interference to United States Class I stations.

The absence of an effective agreement with Mexico did not have the adverse effects that have accrued due to the absence of a treaty with Cuba, primarily because of Mexican adherence generally to the engineering standards for protecting United States stations set forth in previous agreements. Nevertheless, a large number of comparatively minor conflicts occurred because of lack of mutually agreed upon modern engineering standards for station assignments. The United States-Mexican bilateral agreement will, upon entry into force, establish a system of standards under which such disputes may be largely avoided.

Clear Channels

The clear channel proceeding (docket 6741) is concerned with the basic question of what changes, if any, should be made in the use of the clear channel frequencies of the AM broadcast band. These are channels on which the dominant Class I–A and Class I–B (clear channel) stations are given sufficient protection from co-channel and adjacent channel interference to enable them to render wide area nighttime service to remote communities and rural areas not reached by other AM stations.

Comments previously received discussed the relative merits of the use of higher power by clear channel stations versus permitting additional stations to operate on clear channels. The scope of the proceeding has since been narrowed to focus upon areas where desired improvement in service might reasonably be expected if one or another alternative were selected. The latest move was further rulemaking in September 1959 which invited comments on a proposal to permit a Class II (secondary clear channel) station assignment in selected geographic areas on each of 23 Class I–A frequencies (excluding 660 and 770 kc which already have two-station operation). The Class I stations would continue to use 50 kw power while the new Class II stations would have a minimum of 10 kw. Class II stations would also be required to install directional antenna for nighttime operation. Parties were also permitted, if they desired, to bring the record up to date on proposals that clear channel stations be authorized power in excess of the present 50 kw maximum.

About 100 comments were received. Some wholeheartedly supported the proposal that Class II stations be permitted to share clear channel frequencies at night. Some agreed in principle but contended that the Class II station should be located in different geographic areas than those proposed. Others suggested multiple assignments of new stations on clear channels. Still others espoused higher power for clear channel stations. Evaluation of this proceeding is being given a high priority.

On September 18, 1959, the Commission adopted radiation curves to protect Class I clear channel stations from future daytime or limited-time stations authorized to operate on those channels. It increased to 8 the number of clear channels on which limited time or daytime stations could operate, but retained its "freeze" on the other clear channels pending the outcome of the clear channel proceeding.

Daytime Broadcast Hours

Commission decisions on 2 proposals to extend the operating hours of daytime AM stations were discussed in the 1959 annual report. In the first of these (docket 12274) the Commission decided against a proposal of the Daytime Broadcasters Association to extend the operating time from the present sunrise-to-sunset limitation to a broadcast day beginning at 5 a.m. or local sunrise (whichever is earlier) and ending at 7 p.m. or local sunset (whichever is later). In the second proceeding (docket 12729) the Commission decided against a proposal for a more limited extension of time—from 6 a.m. to 6 p.m. In both cases it determined that the loss of service through increased interference, both in terms of area and population, would far outweigh any increase in service.

Five substantially identical bills (H.R. 6676, 6868, 8286, 9627 and 10275) introduced in Congress embodied the 6 a.m. to 6 p.m. extension proposal. In opposing this legislation, the Commission on June 13, 1960, analyzed the nighttime skywave interference problem and noted, again, that the proposed blanket extension would seriously disrupt AM broadcast service and would therefore not be in the public interest.

On July 21, 1960, the Commission amended its rules to enable daytime-only AM stations, for economy reasons, to sign off the air at 6 p.m. in seasons when local sunset is later and relieved them of notifying the Commission of temporary operation stoppages of short-durations, both subject to meeting the minimum operating time requirements.

Maximum Power for Class III Stations

Class III (regional) AM stations are limited to operating powers of up to 5 kw and are intended to render service primarily to a metropolitan district and its contiguous rural area.

The Commission is considering a proposal to increase the maximum power for Class III stations to 25 kw to give them better coverage.

Single Sideband Modulation

On June 15, 1960, the Commission asked for comments (docket 13596) on problems raised by a petition for rulemaking to permit AM stations to operate with single sideband modulation of their main carriers. Though the petitioner claims that this would give better

reception, with less interference, set owners would have to tune in on the sideband instead of the main carrier.

INTERNATIONAL BROADCAST STATIONS

Two new international broadcast stations were authorized during the year, bringing the total of those licensed by the Commission to 5. On February 10, 1960, a grant was made to Globe Broadcasting Co. for a new station (KFRN) at Forney, Tex., to beam programs to Central and South America. On May 18 thereafter the Rev. John M. Norris received a permit for a station (WINB) at Red Lion, Pa., to broadcast to Africa and the Middle East.

The other international broadcast stations under FCC jurisdiction are World Wide Broadcasting Co.'s WRUL, Scituate, Mass.; Far East Broadcasting Co.'s KGEI, Belmont, Calif., and Crosley Broadcasting Co.'s experimental station, KQ2XAU, Cincinnati, Ohio, which operates on an international frequency to provide a continuous signal used in propagation studies by the National Bureau of Standards.

Other international broadcast facilities in the United States are operated by the United States Information Agency in connection with its "Voice of America" program.

EXPERIMENTAL BROADCAST SERVICES

These services provide the means for research and experimentation to develop new and improved equipment, new broadcasting techniques, and compilation of technical data.

Experimental TV

Several licensees were active in research looking toward the improvement of TV reception. One program involves investigation of the feasibility of employing an on-channel satellite transmitter to provide satisfactory signals to areas which do not presently receive dependable service. Another licensee is seeking the same result by use of an on-channel booster.

A recently authorized experimental UHF airborne TV is noted elsewhere in this chapter. Manufacturers continue to carry on experimentation and development in connection with translator stations, TV relay apparatus, tubes, etc.

Experimental Aural

Although formal application for a 1-year program of experimentation is normally required, temporary authorizations may be granted for periods of up to 90 days for short-term research programs on the basis of informal application, provided the applicant holds a

valid license for another type of broadcast station. Nineteen such temporary authorizations were granted during the past year, most of which concerned stereophonic experimentation. Investigation continues with respect to the technique known as compatible single sideband transmission in connection with AM broadcasting.

STATISTICS

Current Broadcast Authorizations

The 11,179 broadcast authorizations outstanding at the close of fiscal 1960 represented a net gain of 1,059 collectively for the year.

Authorizations for the different classes of broadcast services at the year end were:

Class	June 30, 1959	June 30 1960	Increase or (decrease)
Commercial AM	3,500	3,581	81
Commercial TV	667	653	(14)
Educational TV	59	64	5
TV translator	245	302	57
Auxiliary TV	991	1,093	102
Experimental TV	20	24	4
Commercial FM	769	912	143
Educational FM	165	181	16
International	3	5	2
Remote pickup	3,630	4,279	649
Studio-transmitter-link	59	65	6
Developmental	0	4	4
Low-power auxiliary (cueing)	12	16	4
Total	10,120	11,179	1,059

Status of Broadcast Authorizations

There were 5,493 AM, TV and FM broadcast stations authorized at the close of fiscal 1960, of which 5,048 had authorizations to go on the air and 445 others held construction permits. A breakdown follows:

Class	Operating authorizations	Construction permits
Commercial AM	3,483	98
Commercial TV	579	74
Educational TV	47	17
TV translators	233	69
Commercial FM	741	171
Educational FM	165	16
Total	5,048	445

The TV translator stations then authorized were all UHF. Also, 203 FM stations held subsidiary communications authorizations to engage in functional (background) music and other multiplexed operations.

Broadcasting Since 1949

Until 1949 Commission reports of broadcast totals did not give figures for stations actually on the air.

The following table shows the number of authorized, licensed, and operating broadcast stations, and pending applications at the close of the past 12 fiscal years; also the number of stations deleted during those years:

Year	Grants	Deletions	Pending applications	Licensed	CPs on air	Total on air	CPs not on air	Total authorized
COMMERCIAL AM								
1949	200	55	382	1,063	43	2,006	173	2,179
1950	194	70	277	2,118	26	2,144	159	2,303
1951	116	35	270	2,248	33	2,281	104	2,385
1952	60	25	323	2,333	22	2,355	65	2,420
1953	187	23	250	2,439	19	2,458	126	2,584
1954	148	29	226	2,565	18	2,583	114	2,697
1955	161	18	304	2,719	13	2,732	108	2,840
1956	197	18	389	2,871	25	2,896	124	3,020
1957	232	14	431	3,044	35	3,079	159	3,238
1958	132	17	536	3,218	35	3,253	100	3,353
1959	159	12	679	3,328	49	3,377	123	3,500
1960	92	11	822	3,442	41	3,483	98	3,581
COMMERCIAL FM								
1949	57	212	65	377	360	737	128	865
1950	35	169	17	493	198	691	41	732
1951	15	91	10	534	115	649	10	659
1952	24	36	9	582	47	629	19	648
1953	29	79	8	551	29	580	21	601
1954	27	54	5	529	24	553	16	569
1955	27	44	6	525	15	540	12	552
1956	31	37	10	519	11	530	16	546
1957	40	26	24	519	11	530	31	560
1958	98	24	57	526	22	548	86	634
1959	153	18	71	578	44	622	147	769
1960	165	22	114	700	41	741	171	912
EDUCATIONAL FM								
1949	18	7	9	31	3	34	24	58
1950	25	4	3	61	1	62	20	82
1951	19	6	2	82	1	83	12	95
1952	12	2	2	91	1	92	12	104
1953	13	1	3	106	0	106	10	116
1954	9	2	1	117	0	117	6	123
1955	7	3	1	121	3	124	3	127
1956	13	4	5	126	0	126	10	136
1957	17	5	2	135	0	135	13	148
1958	11	3	6	144	3	147	10	157
1959	16	8	2	150	4	154	11	165
1960	20	4	11	161	4	165	16	181

Year	Grants	Deletions	Pending applications	Licensed	CPs on air	Total on air	CPs not on air	Total authorized
COMMERCIAL TV								
1949	15	7	338	13	56	69	48	117
1950	0	8	351	47	57	104	5	109
1951	0	0	415	81	26	107	2	109
1952	0	1	716	96	12	108	0	108
1953	381	6	572	101	97	198	285	483
1954	174	81	200	104	298	402	171	573
1955	67	58	127	137	321	458	124	582
1956	80	25	128	186	310	496	113	609
1957	55	13	129	344	175	519	132	651
1958	35	21	125	427	129	556	109	665
1959	24	22	114	475	91	566	101	667
1960	22	36	106	481	98	579	74	653
TV TRANSLATER								
1957	74	0	48	17	24	41	33	74
1958	88	6	34	92	0	92	64	156
1959	96	7	27	158	0	158	87	245
1960	60	3	19	233	0	233	69	302
EDUCATIONAL TV								
1952	0	0	1	0	0	0	0	0
1953	17	0	29	0	1	1	16	17
1954	13	0	17	0	6	6	24	30
1955	5	1	14	1	10	11	23	34
1956	7	0	11	1	19	20	21	41
1957	8	0	8	14	12	26	23	49
1958	4	0	9	29	3	32	21	53
1959	6	0	7	37	6	43	16	59
1960	6	[1] 1	7	40	7	47	17	64

[1] Was actually deleted March 3, 1957 but just taken off books March 24, 1960.

Reinstatement of some deleted authorizations and other considerations not detailed in this table account for any seeming discrepancy in the relation of grants and deletions during the year to the total year-end authorizations.

Stations actually operating or holding authorizations to operate are covered by the term "on the air." "CPs" indicate construction permit status.

Broadcast Applications

Broadcast applications received during the year totaled 12,613, or 611 more than the year previous. The following is a breakdown of broadcast applications in nonhearing status at the end of the fiscal year (for docket statistics see General chapter):

Class	On hand June 30, 1959	Received	Granted	Dismissed, denied, or returned	Designated for hearing	On hand June 30, 1960
AM						
New stations	516	399	47	76	176	628
Major changes	649	401	113	67	224	656
Transfers	96	821	712	81	1	125
Renewals	453	1,292	1,074	65	16	597
Licenses	149	484	399	31	1	206
All others	184	1,128	1,027	99	1	186
AM total	2,047	4,525	3,372	419	419	2,398
FM						
New stations	51	292	183	42	37	85
Major changes	43	254	223	21	15	41
Transfers	11	159	124	17	1	29
Renewals	62	376	228	19	4	188
Licenses	63	254	231	15	0	71
All others	66	455	439	15	0	67
FM total	296	1,790	1,428	129	57	481
TV						
New stations	58	59	22	24	32	46
Major changes	41	101	91	9	8	41
Transfers	11	122	102	8	1	24
Renewals	84	216	200	3	1	97
Licenses	70	110	33	3	0	144
All others	138	184	168	38	30	87
TV total	402	792	616	85	72	439
TV Translators						
New stations	27	82	73	17	0	19
Major changes	9	46	42	5	0	8
Transfers	0	7	5	2	0	0
Renewals	47	161	150	4	0	55
Licenses	29	104	89	15	0	29
All others	9	33	31	4	0	7
TV translator total	121	433	390	47	0	118
Auxiliary						
New stations	134	1,281	1,134	108	0	173
Major changes	36	399	343	32	0	60
Transfers	23	355	325	6	0	47
Renewals	548	1,565	1,422	44	8	649
Licenses	294	1,356	1,133	75	0	442
All others	5	117	103	3	0	16
Auxiliary total	1,040	5,073	4,460	268	8	1,387
Total non-hearing applications	3,906	12,613	10,266	948	556	4,823

FM and TV figures include noncommercial educational stations.

Broadcast Industry Financial Data

In the calendar year 1959, the radio and television industry's total revenues (which are derived from the sale of time, talent, and program materials to advertisers) were reported at $1,723.9 million.

Total radio revenues increased by 7.1 percent to $560 million while TV revenues rose to $1,163.9 million, or 13 percent above 1958.

Total radio and TV profits of $264.7 million were 26.5 percent above 1958. Television broadcast profits of $222.3 million were 29.3 percent

higher and radio profits of $42.4 million were 13.7 percent higher than 1958.

The following tables show the comparative calendar 1958–59 financial data for the radio and television broadcast industries:

Broadcast Revenues, Expenses and Income of Networks and Stations of Radio [1] and Television Broadcast Services, 1958–59

Service	1958 (millions)	1959 (millions)	Percent increase or (decrease)
	Total broadcast revenues		
Radio	$523.1	$560.0	7.1
Television	1,030.0	1,163.9	13.0
Industry total	1,553.1	1,723.9	11.0
	Total broadcast expenses		
Radio	$485.8	$517.6	6.5
Television	858.1	941.6	9.7
Industry total	1,343.9	1,459.2	8.6
	Broadcast income (before Federal income tax)		
Radio	$37.3	$42.4	13.7
Television	171.9	222.3	29.3
Industry total	209.2	264.7	26.5

[1] Includes AM and FM broadcasting.

Note: 1959 radio data cover the operations of 4 nationwide networks, 3,380 AM and AM-FM and 148 independent FM stations. Excluded are 38 AM and AM-FM stations and 9 independent FM stations whose reports were filed too late for tabulation. 1958 data are for 4 nationwide networks, 3 regional networks, 3,197 AM and AM-FM and 93 independent FM stations. 1959 TV data cover the operations of 3 networks and 519 stations. 1958 TV data cover the operations of 3 networks and 514 stations.

Nationwide Networks Only, 1958–59

[Including owned and operated stations]

Item	1958 (millions)	1959 (millions)	Percent increase or (decrease)
Total broadcast revenues	$581.2	$636.5	9.5
Radio	64.5	60.4	(6.4)
Television	516.7	576.1	11.5
Total broadcast expenses	509.1	553.1	8.6
Radio	69.4	64.9	(6.5)
Television	439.7	488.2	11.0
Broadcast income (before Federal income tax)	72.1	83.4	15.7
Radio	(4.9)	(4.5)	
Television	77.0	87.9	14.2

NOTE 1: Radio data include the operations of 19 nationwide network-owned AM stations in 1958 and 1959.

NOTE 2: Television data include the operations of 19 network-owned stations in 1958 and 17 in 1959.

Investment in Tangible Broadcast Property of 4 Nationwide Networks, Their 19 Owned and Operated Stations and 3,361 Other Radio[1] Stations, 1959

Item	Investment in tangible broadcast property	
	Original cost (thousands)	Depreciated cost (thousands)
4 nationwide networks	$8,291	$3,534
19 network owned and operated stations	8,975	4,233
3,361 other stations	356,092	193,184
Total	373,358	200,751

[1] Includes AM and FM broadcasting.

Comparative Financial Data of 4 Nationwide AM Radio Networks and 3,380 Stations, 1958–59

[In thousands]

Item	4 nationwide networks	19 owned and operated stations	3,361 stations	Amount 1959 total 4 nationwide networks and 3,380 stations	Percent of increase or (decrease)
Revenues from the sale of time:					
Network time sales:					
Sale of network time to advertisers	$32,659				
Total network time sales	32,659				
Deductions from network's revenue from sale of time to advertiser:					
Paid to owned and operated stations	796				
Paid to affiliated stations	5,124				
Total participation by others (excluding commissions) in revenue from sale of network time	5,920				
Total retentions from sale of network time	26,739	$796	$8,098	$35,633	(23.4)
Non-network time sales:					
National and regional advertisers		23,035	165,108	188,143	9.4
Local advertisers		10,551	348,587	359,138	11.1
Total *non-network time sales*		33,586	513,695	547,281	10.5
Total time sales	26,739	34,382	521,793	582,914	7.6
Deduct—Commissions to agencies, representatives, etc	4,897	6,665	51,303	62,865	5.4
Net time sales	21,842	27,717	470,490	520,049	7.9
Revenues from incidental broadcast activities:					
Talent	6,709	2,045	13,525	22,279	(9.9)
Sundry broadcast revenues	1,477	601	11,326	13,404	(3.1)
Total incidental broadcast activities	8,186	2,646	24,851	35,683	(7.4)
Total broadcast revenues	30,028	30,363	495,341	555,732	6.7
Total broadcast expenses	39,931	24,952	446,860	511,743	6.0
Broadcast income (before Federal income tax)	(9,903)	5,411	48,481	43,989	15.8

NOTE: Data for 1958 also cover the operations of 4 nationwide networks and their 19 owned and operated stations.

FM Broadcast Revenues, Expenses and Income, 1958–59

Item	1958		1959	
	Number of stations	*Amount* (millions)	*Number of* stations	*Amount* (millions)
TOTAL FM BROADCAST REVENUES				
FM stations operated by:				
AM licensees:				
Reporting no FM revenues	309		361	
Reporting FM revenues	131	$1.5	153	$1.4
Non-AM licensees	93	2.5	148	4.3
Total FM stations	533	4.0	662	5.7
TOTAL FM BROADCAST EXPENSES				
FM stations operated by non-AM licensees	93	3.2	148	5.9
Industry total		(1)		(1)
FM BROADCAST INCOME (before Federal income tax)				
FM stations operated by non-AM licensees	93	(0.7)	148	(1.6)
Industry total		(1)		(1)

[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 licensees, however, were requested to report separately the revenues, if any, attributable to FM station operation.

( ) Denotes loss.

Investment in Tangible Broadcast Property of Television Networks and Stations, 1959

Item	Number of stations	Investment in tangible broadcast property	
		Original cost (thousands)	Depreciated cost (thousands)
Three networks and their owned and operated stations	[1] 15	$140,101	$80,216
Pre-freeze stations	93	155,081	70,716
Total pre-freeze	[1] 108	295,182	150,932
Post-freeze stations:			
VHF	334	233,310	135,313
UHF	77	34,694	17,782
Total post-freeze stations	411	268,004	153,095
Grand total	519	563,186	304,027

[1] Includes 1 post-freeze VHF station owned and operated by a network. Excludes data for 2 network owned and operated UHF stations that were sold prior to Dec. 31, 1959.

TV Broadcast Revenues, Expenses and Income, 1959

[In millions]

Item	3 networks	17 network owned and operated TV stations [1]	502 other TV stations	Total 3 networks and 519 TV stations
Revenues from the sale of time:				
Network time sales:				
Sale of network time to advertisers	$443.3			
Total network time sales	443.3			
Deductions from network's revenue from sale of time to advertisers				
Paid to owned and operated stations	30.5			
Paid to affiliated stations	125.0			
Total participation by others (excluding commissions) in revenue from sale of network time	155.5			
Total retentions from sale of network time	287.8	$30.5	[2] $127.5	$445.8
Non-network time sales:				
National and regional advertisers		92.6	331.6	424.2
Local advertisers		27.3	173.3	200.6
Total non-network time sales		119.9	504.9	624.8
Total time sales	287.8	150.4	632.4	1,070.6
Deduct—Commissions to agencies, representatives, etc	66.7	21.9	91.6	180.2
Net time sales	221.1	128.5	540.8	890.4
Revenues from incidental broadcast activities:				
Talent	181.7	4.4	10.9	197.0
Sundry broadcast revenues	35.7	4.7	36.1	76.5
Total incidental broadcast activities	217.4	9.1	47.0	273.5
Total broadcast revenues	438.5	137.6	587.8	1,163.9
Total broadcast expenses	406.5	81.7	453.4	941.6
Broadcast income (before Federal income tax)	32.0	55.9	134.4	222.3

[1] Includes data for 2 network owned and operated UHF stations that were sold prior to Dec. 31, 1959.
[2] Total retentions from sale of network time of $127.5 million by 502 other TV stations includes revenues received from miscellaneous TV networks in addition to receipts from the 3 national TV networks.

Safety and Special Radio Services

GENERAL

Because they include practically all types of radio stations except those used for broadcast and common carrier operations, the Safety and Special Radio Services constitute by far the largest group of radio users. Also, because of the varied interests represented, this group includes the fastest growing classes of radio operation.

The more than 40 categories of services embrace radio utilization by ships and aircraft; by police, fire and other public safety bodies; by local governments and forestry and other conservation authorities; by business to the inclusion of manufacturers and distributors; by railroads, passenger buses, taxicabs and trucks; and by individuals such as amateurs and citizens who employ radio for a wide variety of private purposes.

The total number of stations in these services rose to nearly 652,000 during the year, which was 145,000 more than in 1959. This is almost 60 times the figure for all broadcast authorizations to the inclusion of auxiliaries. However, this is not a complete indication of the magnitude of these nonbroadcast operations, since one safety and special services license can cover many transmitters. A better yardstick is the fact that the close of 1960 saw more than 2,184,000 fixed, portable and mobile transmitters in such operation, as compared with about 1.7 million for the year previous.

LEGAL AND REGULATORY PROBLEMS

Microwave Inquiry

The Commission in July 1959 concluded its inquiry involving the allocation of frequencies in the so-called microwave portion of the radio spectrum (above 890 Mc) and adopted policies which would liberalize the basis for authorizing private point-to-point communication systems (docket 11866). Under those policies, practically all private and public users of radio may receive grants regardless of the availability of common carrier communication services.

The Commission was, however, requested to reconsider that decision, mainly by the common carriers. The latter claimed, among other things, that such a policy would have adverse economic effect

upon the common carrier industry and the general public. They also contended that the Commission did not provide microwave frequencies for non-Government space communication needs.

Toward the end of the fiscal year, the Commission reopened the record in this proceeding for the limited purpose of receiving current information as to the microwave needs for space communication. Simultaneously, the Commission initiated a separate inquiry (docket 13122) as to the longer range frequency needs for space communication to assist the Commission in preparing the United States position for future international conferences on the subject.

With the issuance of its decision in docket 11866 on July 29, 1959, the Commission instituted rulemaking looking toward interim technical standards to govern the grant of applications for private microwave systems until rules and standards are adopted for the use of microwave frequencies on a regular basis in the safety and special radio services. Shortly after the close of the fiscal year, the Commission specified standards, effective January 1, 1961. These standards will not be applicable to existing equipment or systems, or equipment and systems in applications filed prior to that date. Existing private microwave systems can continue to operate subject to their remedying any interference they may cause. All applicants filing after January 1, 1961, will be required to comply with the adopted standards.

Applications Involving Bell Contracts

The Commission is continuing to police those aspects of the consent decree which prohibit AT&T and its subsidiaries from leasing and maintaining equipment for private radio communication systems. No applications to operate radio stations with equipment obtained from telephone companies under contracts executed after March 9, 1956 are granted, and licenses to operate stations for which equipment was rented prior to that date are renewed until January 24, 1961. No license for such stations will be granted after that date.

AT&T has reported that it intends to discontinue its radio equipment lease maintenance activities as of the 1961 date. Indications are that many radio licensees are either purchasing the leased equipment or are making lease arrangements with others.

One unresolved problem involves interpretation of the restrictions imposed on the Bell telephone companies by section V of the consent decree when a jurisdiction declares these lease-maintenance activities to be a common carrier service subject to public regulation. The California Public Utilities Commission has done so in the case of The Pacific Telephone and Telegraph Co.

MARINE RADIO SERVICES

Safety at Sea

Safety of Life at Sea Conference, 1960.—An international conference was held in London from May 16 to June 17, 1960 for revision of the 1948 safety convention. FCC Commissioner Robert T. Bartley was United States spokesman on the Radio Committee which was responsible for revising radio requirements contained primarily in chapter IV of the safety convention.

The new convention extends application of compulsory radio installation requirements to cargo ships of tonnages as low as 300 (now 500) gross tons. In addition, the new convention will raise the international standards applying to radio installations, operators, listening watches and auto-alarms required for safety purposes. It will come into force 12 months after at least 15 countries, 7 of which have not less than 1 million gross tons of shipping, have accepted it.

Some of the important changes with regard to radio installations and listening watches are:

The minimum daily listening watch requirement for a cargo ship of more than 1600 gross tons was established at 8 hours per day. (Two hours per day is permitted in the case of a vessel between 1600 and 5500 gross tons by the 1948 convention.) A continuous radiotelephone listening watch was established for ships required to carry radiotelephone installations. (The 1948 convention specifies no minimum hours of *radiotelephone listening.*)

Radiotelegraph auto-alarms installed after the 1960 convention comes into force and all radiotelegraph auto-alarms in use 4 years thereafter are required to comply with specified convention standards. Under the 1948 convention only newly approved types of auto-alarms are required to meet these standards and, as a consequence, very few vessels are equipped with improved modern types of auto-alarms. The 1960 convention will correct this situation and improve the reliability of auto-alarms on ships to alert operators to receive distress calls.

Vessels *required to* be equipped with radiotelephone installations must have an automatic device meeting specified standards for sending the radiotelephone alarm signal. The requirement is subject to a delay clause allowing 3 years from the date of coming in force of the convention to install the devices. The radiotelephone alarm signal was internationally established by the 1959 International Radio Conference. The signal precedes transmission of a radiotelephone distress call and message.

Proposed safety at sea legislation.—A bill (S. 3496), introduced May 5, 1960, would amend section 362(b) of the Communications Act which now provides that radio equipment and apparatus required to be installed on board vessels subject to title III, part II of the act be inspected at least once a year. The bill would make this requirement more flexible by allowing the time lapse between inspections to

be extended by the Commission in certain circumstances. The Commission, in its comments, did not object to the element of flexibility but suggested that the bill define more clearly the conditions under which the time lapse between inspections could be extended.

Exemptions from compulsory radio requirements.—The Commission is authorized to grant exemption from compulsory ship radio requirements. Exemption applications handled during fiscal 1960 were:

	Pending from fiscal 1959	Received during fiscal 1960	Granted	Denied	Dismissed
From compulsory radio telegraph requirements	[1] 1	51	[2] 42	4	6
From compulsory radio telephone requirements	[3] 35	75	59	25	26

[1] Not included in this table are 15 temporary radiotelegraph exemptions granted.
[2] Of these, 37 were granted on condition that specified radiotelephone requirements are met.
[3] Not included in this table are 23 temporary radiotelephone exemptions granted.

Distress studies.—The Commission conducts a continuing study of distress communications as a basis for modification of its rules to promote safety of life and property. During the fiscal year, the radiotelegraph distress signal was used on behalf of 188 vessels and aircraft. These calls for help were intercepted by 714 ships and coast stations, also by Coast Guard ships and shore stations.

There also were reports of 95 radiotelegraph auto-alarms being actuated to alert off-duty radio operators. The Commission does not require reports of distress calls from vessels equipped with radiotelephony only. The few reports received are the result of special disaster inspections made by FCC field engineers. There were 19 such reports of radiotelephone distress calls, with reports of radiotelegraph relay of radiotelephone distress calls in 35 additional cases.

In many of the United States radiotelephone distress cases, a need for improvement in operating procedures was indicated in that the distress call was transmitted on intership working frequencies, not the prescribed distress frequency.

Very few cases were reported of malfunctioning of radio equipment under distress conditions. However, several boats sank so rapidly there was no time to use the radio equipment.

Interference to distress calls at the local scene does not appear to be a problem; however, there is considerable background noise from long distance skywave signals at night on both the radiotelegraph and the radiotelephone frequencies. Distress communication generally functioned well and no modification of the Commission's rules or international regulations is indicated.

Technical Developments and Studies

Radio Technical Commission for Marine Services.—During the fiscal year, 4 special committees of the Radio Technical Commission for Marine Services were established and are presently working on reports dealing with modernization of shipboard radio antennae; present and future communications requirements for voluntarily-equipped noncommercial vessels; introduction of radiotelephone alarm signal usage in the United States; and study of the use of 9300–9500 Mc radar band.

Single sideband.—Additional ship and coast stations have been authorized to test single sideband radiotelephone transmitters. Recommendations by the Geneva 1959 conference and continued domestic interest indicate the desirability of establishing rules for use of single sideband on a regular basis.

Marine Radio Communication Systems

Proposed rule changes.—A pending Commission proposal would make the frequency 2003 kc available, until January 1, 1961, to ship stations for communication with Government coast stations concerning the passage of vessels on the St. Lawrence Seaway and St. Mary's River. The frequency 156.6 Mc would become available for communication with Government coast stations concerning passage of vessels through controlled waterways. The frequency 156.7 Mc is proposed for communication with Government coast stations for passage of vessels through controlled locks and waterways. The proposed usage would be in addition to present uses of the frequencies.

Under the Commission's present rules, ship radiotelephone stations must initially call other ships on the calling frequency 2182 kc. A pending Commission proposal would allow initial calling on intership working frequencies under certain circumstances. The same rulemaking would amend the rules to reduce the maximum duration of a communication from 5 minutes to 3 minutes and would increase the time interval from 5 minutes to 10 minutes before the channel may be used again for communication between the same 2 stations. The proposal would also simplify ship radiotelephone log-keeping requirements.

Other rulemaking would make the frequency pair 2466 kc (coast)—2382 kc (ship) available for public ship-shore use in the Los Angeles-San Diego area on a 24-hour basis. Implementation of this frequency pair had not been initiated prior to this time because the use of the frequency 2466 kc by police has only now been discontinued.

Geneva conference maritime requirements.—To implement provisions of the new radio regulations applicable to marine stations, the Commission must, prior to May 1, 1961, revise its rules and regula-

tions concerning, among other matters: establishment of an international maritime mobile VHF service using FM emission; standardize radio frequencies and operating procedures; radiotelephone calling and single sideband frequencies in the 4, 6, 8, 12, 16, and 22 Mc bands; and more detailed procedures for radiotelephone communication to include an international radiotelephone alarm signal which was provided for in the Commission's rules on a domestic basis prior to the conference.

VHF radiotelephony for navigational communication.—Since August of 1959, 36 ship radio stations have been licensed, on a developmental basis, for "bridge-to-bridge" communication on United States ocean-going vessels to provide navigating officers a direct communication system for safety at sea. Among the licensees engaged in this project are Atlantic Refining Co., Sun Oil Co., Keystone Tankship Corp., Cities Service Oil Co., RCA Communications, Inc., and the Pilots Association of the Bay and River Delaware, the last named holding licenses for 100 units.

Coast stations.—As of June 30, 1960, the number of public coast and limited coast stations (other than those in Alaska) providing communication service to ship telephone and telegraph stations was as follows:

Frequency band and range	Public	Limited
Telephony, 2-3 Mc band (medium range)	57	6
VHF telephony (short range)	40	278
HF telephony (long range)	4	0
Telegraphy, LF, MF, HF (medium to long range)	28	1

A new public coast station was established during the year to provide service for the Delcambre, La., area.

Shore radiolocation-training station (developmental).—The New York State Maritime College is licensed to operate shore-radar on a developmental basis to train students in the theory and operation of radar. Since inauguration of the program, 376 persons have received training. The graduates sail in the United States Merchant Marine and Navy as deck officers. All marine science majors must complete the radar course to obtain a Bachelor of Science degree.

Radio communication in Alaska.—The demand for radio communication within Alaska increases each year. The influx of oil exploration and producing companies and industrial organizations has added to the congestion on the frequencies. Alaska communities depend largely on radio for safety and business purposes because landline telephones are usually not available. Because of the scarcity of frequencies between 2 and 8 Mc, their expansion has not been possible.

The Alaska Communication System (ACS) operates the main trunk lines in that State which connect all communication facilities therein with the rest of the United States and other parts of the world. When Alaska acquired statehood some facilities previously Federally operated came under FCC jurisdiction. Proposed sale of the ACS, if it materializes, will present frequency problems by converting frequencies from Government to non-Government use.

AVIATION SERVICES

General

The Commission exercises administrative control over those portions of the radio spectrum which have been allocated for non-Government use in aviation radio communication, aeronautical radio navigation, and to satisfy other safety and operational communications requirements of the aviation industry. After making the necessary frequency bands available, the Commission prescribes the manner in which they shall be used; develops methods for better frequency utilization; prepares for, attends and follows up on international and domestic aeronautical and radio telecommunications conferences; reviews and revises its rules governing the use of radio for civil aviation; and processes all applications covering non-Government radio facilities.

The Aviation Services include both aircraft and ground stations. By classes these are: air carrier aircraft, private aircraft, aeronautical enroute, aeronautical fixed, operational fixed, aeronautical advisory, aeronautical utility mobile, airdrome control, flight test, flying school, radio navigation, aeronautical public service aircraft, aeronautical search and rescue mobile, and civil air patrol. Their total number now exceeds 91,000.

Aviation Organizations and Conferences

In administering the non-Government aviation services, coordination was maintained by the Commission throughout the year with such technical and policy making groups as the Radio Technical Commission for Aeronautics (RTCA), the Air Coordinating Committee (ACC) and, internationally, through the International Civil Aviation Organization (ICAO) and the International Telecommunication Union (ITU). A brief description of these organizations and the work accomplished in each is as follows:

Air Coordinating Committee is responsible to the President for coordinating Federal policy in the field of aviation. Aviation problems affecting more than one agency are examined and the recommended actions are developed. Many of the problems considered relate to aeronautical telecommunications and therefore are of vital concern to the Commission. The Commission participates as a full member of

ACC and is represented on subordinate components. During the year the Airspace Panel made recommendations to the Commission on the aeronautical aspects of 1,043 proposed antenna tower installations. Another consideration was the development of policy relative to the proposed use of automatic beacons to be carried by aircraft as an aid to search and rescue operations. (An Executive Order terminated the ACC as of October 10, 1960, with the supplanting mechanism to be determined.)

Radio Technical Commission for Aeronautics is a nonprofit cooperative association comprised of Government and industry organizations concerned with aeronautical telecommunications matters. Its membership is composed of more than 100 agencies and organizations. Although the findings of RTCA are submitted to responsible agencies in the form of recommendations, they are frequently used by regulatory bodies as the basis for proposing regulatory measures which affect the entire aviation industry. The Commission is represented on the RTCA executive committee and on many of its special committees. During the year special committees dealt with the following subjects: minimum performance standards for both airborne radio communication receiving and transmitting equipment operating within the radio frequency range 117.975–136.000 Mc; frequency requirements and utilization for common system air traffic control in the frequency band 108–136 Mc; investigation of interference to aircraft electronic equipment by devices carried aboard aircraft; and development of revised environmental test procedures for airborne electronic equipment.

International Civil Aviation Organization is a specialized agency of the United Nations. Its task is to formulate standards and recommend practices relative to international aviation matters, one of which is the use of radio. FCC representatives participated in the work of groups which furnished guidance to the Department of State in the preparation of United States positions for ICAO meetings.

Current and Future Problems

During the year, a major reallocation of aviation frequencies resulted in 5 Mc of radio spectrum being relinquished by non-Government and military users for Government air traffic control. In consequence, about 800 non-Government ground stations are being reassigned frequencies and relicensed. The change has required close coordination with licensees and the Federal Aviation Agency nationally, as well as the Canadian Department of Transport, internationally, in order to avoid interference in congested areas along the border.

One problem becoming imminent is based on the announced require-

ments of the FAA that the frequencies currently available for operation of the air route structure will soon become saturated and that by 1963 there will be a definite shortage of available radio channels. This indicates that extensive effort will be needed to fulfill the demands for additional air traffic communication capabilities. The solution to this problem may involve more extensive frequency sharing or the reallocation of frequencies currently in use by other services, or both.

Rule Amendments

A major project in this area was the reallocation of the spectrum space in the band 108–132 Mc. This reallocation provided additional frequencies for air traffic facilities believed necessary for flight safety. It required the redeployment of more than 800 aeronautical en route stations. Beginning July 1, 1960, the frequencies in the band 126.825–128.825 Mc, which had been exclusively available for aeronautical en route operations, became available for air traffic control as they are vacated by aeronautical en route communications. After September 1960, this entire band of frequencies will be exclusively air traffic control.

The frequencies between 132.05 and 134.95 Mc inclusive became available exclusively for air traffic control after July 1, 1960, with the exception of the single frequency 133.20 Mc which is available to aircraft for communication with Air Force radar facilities for the purpose of obtaining weather advisory service.

Another significant rule change was implementation of a recent amendment to the Communications Act whereby certain qualified alien pilots may obtain aircraft radio station licenses (see also Legislation).

PUBLIC SAFETY RADIO SERVICES

General

The public safety services furnish radio communication in emergencies endangering life or property and assist in discharging other functions benefiting the public. They contribute to police, fire, forestry-conservation, highway maintenance, special emergency, State Guard, and local government operations. Radio authorizations for these purposes now total nearly 33,000 representing the use of almost 372,000 transmitters.

Developments and Rule Changes

It was hoped in 1958 that the Commission's channel-splitting procedures would help to relieve spectrum congestion in these services. However, the ever-increasing demand of new as well as existing licensees has again created a frequency shortage, particularly in congested areas. The situation should improve by 2 steps—(1) after

August 1, 1960, when wide-band licensees must reduce their frequency deviation, and (2) after November 1, 1963, when all licensees will have to comply fully with narrow-band technical standards.

In light of the limited number of frequencies available, there have been numerous requests to make additional split channels available to the public safety services. In response to these petitions, the Commission proposed the specific assignment of 75 additional split channels in the 42–50 and 152–162 Mc bands to such users. It also contemplates "splitting" still other frequencies for assignment to the local government service.

An initial action by the Commission on July 20, 1960, concerning assignment of split channels to the safety and special services (docket 13273) made additional frequencies available to the police and fire services. Later 5 frequencies were made available to hospitals and ambulances on an exclusive basis.

Several amendments to part 10 were made during the year. One provided that highway maintenance and forestry-conservation stations could be authorized for continued operation in the 46.6–47 Mc band until December 31, 1960. The frequencies therein were reallocated to the Government 3 years ago. Another amendment relaxed the conditions under which mobile relay stations might be authorized. As a corollary, control stations were permitted to operate on the frequency of the associated mobile station. These changes were made to add needed range. The definition of a repeater station was modified to spell out more clearly that it could be used to attain expanded base to mobile communication. To facilitate identification procedures in large public safety systems, mobile units were given the option of using unit identifiers in lieu of call letters.

The Commission is developing procedures whereby frequency coordination for split-channel frequencies can be simplified. The present requirement that each individual applicant must carry out its own frequency coordination has proved burdensome and, in some cases, has limited split-channel utilization. It is hoped that in the near future frequency coordination committees will be able to aid applicants to comply with the frequency coordination requirements.

Growth

The older safety and special services have continued to grow at a fairly steady rate. The rate of increase in the number of stations ranged from 270 percent in the new local government service to less than 1 percent in the older forestry-conservation service. Although the average increase in the number of authorized stations in all these services was over 11 percent, the number of applications received during the year was nearly 33 percent greater than in 1959. This apparent discrepancy is due partially to the fact that many existing stations

underwent modifications during the year. These modifications consisted largely of changes in frequency brought about by the channel-splitting rules.

Many systems moved from the 30 or 40 Mc bands to the 150 Mc band. Conducive to such moves is the provision of matching Federal funds to governmental entities for acquiring new narrow-band equipment to replace obsolete gear. In the local government service, the problem of selecting a suitable split channel often resulted in the filing of several applications before a grant could be made. Some relief from the split-channel frequency selection problem may be expected as the older systems reduce deviation and acquire new equipment.

Police Radio Service

Licenses in this service are issued only to States, possessions, and other governmental subdivisions including counties, cities, and towns. Such stations may be used only to transmit communication essential to official police activities, except that until October 31, 1963, they may also handle messages needed for official fire activities of a licensee. This restriction on the scope of permissible communications, along with the creation of the local government service, has resulted in a more efficient police radio usage.

The Commission adopted a rule which exempts until November 1, 1963, police licensees from having to operate narrow-band equipment while on the 2 frequencies especially allocated for intercommunication with neighboring police systems. This should aid an orderly transition to narrow-band equipment without immediate financial burden and without impairment of efficiency in the meantime.

Fire Radio Service

Eligibility in this group is limited to the same public entities, except that volunteer fire departments may obtain a license by demonstrating a specific public responsibility for fire protection. As the Commission anticipated, this service has begun to show a rise in the number of licensees. This is due to the Commission's requirement that after November 1, 1963, fire departments will no longer be able to operate as part of police radio systems. To meet this increase, the Commission has proposed that additional frequencies be assigned to this service, 2 of them to be designated for intersystem use.

Fire departments, forewarned that they can no longer be served by police systems after 1963, will either become part of a local government system or will obtain their own authorizations; hence, the Commission anticipates a decided growth in the number of licensees in this service. The Commission also expects that certain frequencies will be provided for intersystem use to enable neighboring fire departments to coordinate their activities, similar to the practice in the police service.

Forestry-Conservation Radio Service

This service provides radio communication to help combat forest fires and implement conservation projects such as water control, soil conservation, animal preservation, and conservation of other natural resources. Besides governmental entities, authorizations are issued to persons or organizations charged with specific forestry-conservation activities.

Forest fire protection is usually accomplished by establishing a network of radio-equipped fire towers. When the location of a fire is reported by a tower observer, fire fighters and equipment are dispatched by aircraft, automobile, trailers and bulldozers to the scene. The men and equipment transported by aircraft are dropped on location to fight the blaze. In the event further aid is needed, portable radio sets are used at the scene.

The unique flexibility inherent in radio communication has enabled many cooperative arrangements to be made between adjoining States. It is not uncommon for those with a common forest area to jointly patrol and protect the timber. For example, Florida, Georgia and South Carolina have expanded their radio facilities to enable each State to interchange fire fighting equipment as needed and to change the operating frequencies of the radio equipment accordingly.

Highway Maintenance Radio Service

Stations in this service are also limited to governmental entities. Communications are restricted to transmissions essential to the official highway activities of the licensee. While this service was formerly used almost exclusively by States, there has been an increase in the number of counties and cities which have established radio systems to assist the maintenance and development of their roads.

Special Emergency Radio Service

This service provides emergency radio facilities for a number of user groups, including physicians, veterinarians and schools of medicine; ambulance operators; rescue organizations; beach lifesaving patrols; school bus operators; persons in isolated areas where public communication facilities are not available; communication common carriers desiring to provide standby facilities or make emergency repairs; and disaster relief organizations.

On October 20, 1960, the rules were amended to give hospitals and ambulances 5 exclusive frequencies and to extend emergency eligibility to urban medical services (previously limited to such rural activities).

Local Government Radio Service

Local government radio stations transmit communications essential to their official activities including those which concern civil defense. This covers all types of administrative messages, as well as

any type of emergency communication, as long as it is required by an official activity of the licensee.

The major problem in this service has been in attempting to accommodate all applicants seeking authorizations on the relatively limited number of available frequencies. The stringent frequency coordination requirements have further hampered some governmental entities desiring to establish such systems. The Commission contemplates proposing additional frequencies for this service which will partially alleviate the situation.

State Guard Radio Service

Authorizations in this service are issued only to the State Guard or comparable organization of a State or possession, and only where such organization has been created by law and is completely subject to the control of the Governor or highest official of the governmental entity. This service is virtually dormant because the State Guard usually is inactive until such time as the State National Guard is mobilized.

DISASTER COMMUNICATIONS SERVICE

This service supplies communication facilities in the event of emergencies such as war, storm, flood, etc. Its stations may transmit any communication necessary to civil defense or relief work during a disaster. Drills and tests may also be conducted for the training of personnel and to assure efficient functioning of equipment.

Over 85 percent of the disaster service licensees are civil defense organizations and of these 75 percent are also using the Radio Amateur Civil Emergency Service (RACES) for their civil defense communications. There are 46 approved disaster communications plans and over 400 station authorizations.

LAND TRANSPORTATION RADIO SERVICES

General

These services encompass use of radio as adjuncts to rail and highway transportation, to the inclusion of taxicabs, passenger buses and trucks. Collectively, this group has more than 11,000 stations with nearly 259,000 associated fixed, mobile and portable transmitters.

Motor Carrier Radio Service

Although the Commission's rule neither specifically permitted nor prohibited the 2-frequency method of operation by motor carriers in the 43–44 Mc band, it had been the practice to make such frequency assignments primarily on the basis of the single frequency type of operation and make assignments involving the 2-frequency use only upon a showing of need. Since there was no specified pairing of fre-

quencies for stations using the 2-frequency system, severe mutual interference developed in some areas where both methods were employed.

Because of this, the Commission proposed to limit the use of frequencies in the 43–44 Mc band by stations in this service to single frequency use, but the trucking industry and other interested parties requested that provision be made for some measure of 2-frequency operation. In the light of the comments received, the Commission revised its original proposal and adopted rules which provided for a limited amount of 2-frequency operation by motor carriers and paired certain frequencies for this purpose so as to require the least amount of frequency shifts by existing licensees.

Fiscal 1960 witnessed a substantial increase in the use of motor carrier frequencies in the 150–160 Mc band, formerly available to railroads, following the expansion of the eligibility provisions to include common or contract carriers of property operating within a single urban area and not necessarily engaged in intercity, interstate, or international shipment. The increase indicates that in some instances management may be less reluctant to invest in 150–160 Mc equipment as compared to 450–460 Mc systems for both economical and operational reasons.

March 15 witnessed the termination of all operations in the former highway truck service. As of that date, those licensees who were ineligible for an authorization in the new motor carrier service and who wished to continue the use of radio, found it necessary to obtain authorizations in the business, citizens, or other services.

Railroad Radio Service

Railroad radio facilities in connection with contract services or operations performed by persons other than the licensee continued to expand. This was particularly true in terminal areas involving the pickup and delivery of freight. The industry, in its efforts to make increased use of the limited spectrum space now available to it, continues to expand its use of the tertiary (or 15 kc) frequencies, except in areas along the Canadian border where international frequency coordination is required.

An important rule change during the year which stemmed from railroad requirements concerns the use of mobile stations as repeater stations. In order to meet the need for extended range communication between hand or pack-carried sets and other mobile units or associated base station (under operational conditions where no station at a fixed location was available), the Commission provided for the use of a mobile station in this service to act as a (mobile) repeater for the direct retransmission of signals directed to or from the associated low power sets.

A number of railroads took steps to expand their microwave facilities. One railroad contemplates an additional 800 miles of such circuit involving 49 stations. This system will be used in part for the transmission of telemetering data received from 33 track-side hotbox detectors and for direct communication to trains on which hotboxes are detected, using 65 base stations activated from a central observation point. Another railroad, it is reported, has budgeted over $3 million to cover the installation, over the next 2 years, of approximately 1,200 miles of microwave system. An additional railroad, at an estimated cost of $4 to $5 million, is engaged in installing 600 miles of microwave system to which it proposes to add 1,200 miles next year. Two other railroads have scheduled a total of 1,200 miles of microwave system to cost in excess of $3 million.

Taxicab Radio Service

The taxicab industry continued to concentrate its operations on frequencies in the 150–160 Mc band, including the 3 additional secondary frequencies in this band available to areas of 50,000 or more population Notwithstanding these additional frequencies, channel loading in the more densly populated areas continues to increase. There appears to have been little if any increase of use in the 450–460 Mc band mainly because the taxicab industry believes the 150–160 Mc band to be the more suitable from an economic and operational viewpoint. As a result of the increased channel loading, an increasing number of informal protests are being received from licensees opposing frequency assignments which might result in interference to existing systems.

Requests continue to be received for waivers of the frequency deviation reduction requirement. Those granted during fiscal 1960 were for periods of 1 year generally, but in no event beyond October 31, 1963, on condition that such broad-band operation does not cause harmful interference to radio systems using narrow-band equipment or transmitters which have had their deviation reduced in compliance with the rule requirements.

Automobile Emergency Radio Service

The availability of frequencies in the 150–162 Mc band continues to serve as an incentive to the increased use of radio for this activity. Public garages which were previously restricted to the use of frequencies in the 25–50 Mc band that were subject to severe long-range skip interference are now able to substantially increase the efficiency of their operations on higher frequencies. Another contribution to the growth of this service, particularly in the case of clubs or associations rendering auto emergency road service to their members, is the expansion of existing communication systems employing a number of the

available frequencies in the 150–162 Mc band (and as well additional frequencies in the 450–460 Mc band in some cases) by the use of a number of base stations located so as to increase service coverage.

In the light of increasing requirements for emergency road service of heavy tractors, trucks and specialized hauling equipment, persons now rendering such service and who at present may not be eligible for the automobile emergency service, may be able to show a substantial need in seeking a review of the eligibility requirements.

INDUSTRIAL RADIO SERVICES

General

The industrial radio category comprises 10 individual services representing wide and diversified segments of industry, as follows: power, petroleum, forest products, motion picture, relay press, special industrial, business, industrial radiolocation, manufacturers, and telephone maintenance.

The service names are indicative of the nature of the using industries with the exception, perhaps, of the special industrial and the industrial radiolocation services. The former provides for farming; ranching; the rendition of agricultural services such as plowing, seeding, crop spraying and harvesting; mining; heavy construction; concrete and asphalt delivery; patrol and repair services for pipe lines, storage tanks and distribution systems of public utilities; fuel delivery to consumers; oil well service and certain supporting activities to the petroleum industry. The industrial radiolocation service is for precise determinations of position in activities such as location of drilling sites for off-shore oil wells, some surveys, and for weather radar observations by private concerns. The greater majority of radio use in the industrial services involves communication from a headquarters to mobile vehicles and between mobile vehicles.

The power and petroleum services, however, also utilize rather extensive systems for communication between fixed points such as a microwave relay system along the entire length of a petroleum gas or oil transmission pipe line.

Growth

The keynote of FCC activity in the industrial field is to keep abreast of the flood of applications. There were some 37,000 in fiscal 1960. In the short period of 3 years this application workload has increased by over 100 percent. Notwithstanding, the applications backlog was held to a reasonable level through increased efficiency, revised processing procedures, and some staff increases.

The business service has shown the greatest proportionate growth. That is because any person engaged in a commercial activity, educa-

tional and ecclesiastical institutions, hospitals, clinics, and medical associations are eligible to operate business radio facilities. At the close of fiscal 1959, when the business service was less than a year old, it had attracted 10,000 applications. Last year the number rose to more than 15,000.

During the year overall authorizations in the industrial services mounted to nearly 65,000, an increase of about 30 percent over the 1959 figure. These authorizations cover the use of more than 640,000 transmitters. This growth is due in no small part to the ever-increasing recognition by persons engaged in normal commercial activities of the essential aid which a radio system can be to the safety, convenience, economy and efficiency of business operations.

Developments and Studies

Much of the progress and expedition of industrial radio is due to the Commission's continuing study of the increasing need and the means of accommodating it within the framework of the present and immediately foreseeable frequency availability picture.

The critical shortage of desirable spectrum space may be alleviated shortly, in certain measure, by a proposal (docket 13616) to return to the special industrial service some frequencies in the 49 Mc band which had previously been reallocated for international communication circuits utilizing ionospheric scatter techniques. A change in planning will satisfy this international requirement by ocean cable.

Presently under consideration are proposals which would provide for an expanded usage of tone-signaling devices and methods in certain services. Tone-signaling, as has been proposed, would be a step forward in augmenting the efficiency and economy of certain designated industrial functions and, in some instances, could add to efficient use of the radio spectrum. Signaling of this type is desired primarily for automatically indicating abnormal operating conditions at various points in a power system or in a petroleum production operation and, in some cases, for automatically correcting these conditions without the need for manual attention. The results would be a saving of manpower and a reduction in the amount of radio communication that would otherwise be required if personnel had to be dispatched to correct the fault. Such signaling, however, poses a number of problems for the Commission from technical, administrative and supervisory standpoints. The matter will receive further study and opened for comment as proposed rulemaking.

During the year the National Association of Manufacturers contended that certain operating restrictions within the manufacturers service were unduly hampering the efficient utilization of licensee radio communication systems. In particular, it singled out the 60-

watt power limitation on most of the frequencies available to that service and the parochial limitations placed on base station locations. The Commission, after studying the matter, amended its rules to allow for an increase in power and more flexibility in locating base stations. Its action did not, however, encompass frequencies within the 152–162 Mc band because these are shared with the heavily used petroleum and forest products services. This was left for future disposition.

Developmental grants were made for a few "offset" frequency operations in the industrial services and the submitted operational reports are now being studied. Offset operation involves the use of a frequency at less than full channel separation. The basic questions to be determined from the developmental operation are whether an increase in the efficiency of frequency spectrum utilization can be obtained and, if so, whether it justifies the increased engineering work which must be applied in this type of frequency assignment.

On July 27, 1960, the Commission, on petition of the petroleum industry, relaxed certain license record keeping and reporting requirements in the industrial service, effective August 9 thereafter. These relate to log entries for stations at temporary locations and reporting the move of such stations from one temporary location to another.

Rules revised during the year provide for the assignment of station call letters in a routine alphabetical-numerical sequence in lieu of the previous assignment pattern by districts. Assignment procedures have been revised to take advantage of the increased efficiency this provides.

CITIZENS RADIO SERVICE

The mushrooming citizens service accounted for most of the special radio group's workload and headaches during the year. Its authorizations rose from slightly more than 49,000 stations and 206,000 transmitters in 1959 to over 126,000 stations with 441,000 transmitters at the end of fiscal 1960.

The citizens service is, in effect, a reservoir for all radio uses not provided for in other services. This means that many of the individuals who have flocked to it do not understand, or ignore, the Commission's rules governing operation in this service. Many of them are teenagers (the minimum age limit is 12 years for one class of license) who do not seem to know what they can or cannot do. Some others of varying ages have mistakenly thought the citizens service was an easier way to engage in distance "chit-chat" than attempting to qualify for an amateur license. And there have been cases where people have purchased and used a citizen station "kit" on a salesman's say-so that no license is needed for its operation. Still others have

tried to use citizens stations for various unauthorized purposes. Together this misconception or willful disregard of the rules has caused much policing trouble and made it necessary for the Commission to tighten its citizens regulations, take action against flagrant violators and warn users in general about the necessity for abiding by the rules.

During fiscal 1960 the citizens rules were amended to redefine permissible communications and to limit the time length of such conversation. The Commission denied a petition for reconsideration. Thus, effective March 15, 1960, communications between citizens stations are limited to those necessary for the licensee's business activities and personal affairs. Additionally, except in emergency, conversation between such stations must not exceed 5 consecutive minutes followed by a silent period of at least 2 minutes to give other stations an opportunity to use the frequency.

Another petition, which has not at this time been acted upon, requests among other things that the rules be amended to permit the use of power inputs up to 25 watts by Class D stations rather than 5 watts as now.

The Commission has conducted an educational program to clarify the rules governing this service. Additionally, authors who submitted magazine articles about the citizens service prior to publication were given assistance in checking facts with the result that they helped to correct misleading statements made in other and previous articles on the subject.

Of particular importance to citizen licensees is the rule requirement that all adjustments which might affect the proper operation of a transmitter must be made by a person holding an appropriate grade of operator license. Provision was made during the year for limited exception to the operator requirements in those cases where factory-assembled equipment certified by the manufacturer to meet certain criteria is used by Class C and D stations. Limited exceptions were also made in cases of kits sold by a manufacturer who certifies that the equipment for home assembly meets certain criteria. This limited exception in no way relieves the licensee of his responsibility for proper operation of the equipment in accordance with the terms of his authorization and the applicable rules.

The task of administering this service was further intensified by the rapid increase in the rate at which applications were filed. Approximately 11,000 applications were received during the last month of fiscal 1960 as compared to some 6,700 during the first month. Even so, the processing time was reduced from about 80 to 35 days. This was made possible, in part, by added personnel at Gettysburg, Pa., where most Class B, C and D citizens applications are now handled.

AMATEUR RADIO SERVICE

General

Amateur radio is carried on by licensed individuals interested in radio techniques without pecuniary return. The popularity of this service is reflected in its rapid and steady growth. In January of this year the number of licensed amateur operators passed the 200,000 mark rising to some 206,000 at the year end. The number of amateur stations exceeded 217,000.

During each of the past 3 years, the number of applications received in this service has exceeded 100,000. This not only places a heavy burden on application processing but, in addition, the increasing number of stations is crowding the available amateur frequencies. Continuing efforts are being made to achieve more efficient usage of this frequency space so as to accommodate all who wish to participate in amateur radio.

Developments

Two feats of long-distance communication which demonstrate the importance of amateur radio in the experimental field were accomplished during the year. The first of these was achievement of 2-way communication over a 2,540-mile path on the 220 Mc band. The second was the successful transmission of pictures across the Atlantic using TV techniques.

Among rulemaking actions completed during the year was one which opened the 14,300–14,350 kc band to radiotelephone operation, and another which restricted the lower 100 kc of the 50–54 Mc band and the upper 100 kc of the 144–148 Mc band to radiotelegraph (A1 emission). These actions, which were taken in response to petitions by the American Radio Relay League, were designed to enhance the usefulness of the amateur bands involved. In the first instance, the benefit accrued to amateurs using radiotelephony by giving them more space and, in the second instance, to those interested in long-distance experimentation.

At year end, there was pending an inquiry relative to possible extra privileges that may be accorded holders of amateur Extra Class licenses. This inquiry has evoked much interest in the amateur fraternity and many conflicting opinions have been received. Because of all the factors to be taken into consideration, proposed rulemaking will be initiated during the coming year.

Administration

The Commission continues to receive requests for special consideration in the matter of specific call assignments, expedited issuance of licenses, and waiver of rule requirements. In the interest of processing applications as expeditiously as possible, continuing efforts are

made to impress all amateurs and groups with the fact that, in order to be fair to all, the Commission must adhere to the letter of its rules.

The Commission is constantly striving to adopt procedures which will enable applicants to obtain more expeditious action. In this regard, the method of grading amateur examinations was revised and a new format developed which will enable examination papers to be graded more rapidly. The Commission is also in the process of amending the forms used by applicants to make them simpler to fill out and easier to process. This revision will affect renewals and modifications as well as requests for new authorizations.

ENFORCEMENT

General Problems

Unlicensed radio operation.—The failure of persons desiring to utilize radio in conjunction with their business activities to obtain station licenses continued to require much time and attention. Many cases arose from operation of radio apparatus subsequent to license expiration and others were the result of ignorance or misunderstanding. However, a substantial increase in unlicensed operation was noted as a result of misleading advice by salesmen of radio equipment, especially in the citizens and business services. Additionally, there were a few cases of construction of antenna towers other than those specified in the station license, thus creating interference and possible aeronautical hazard.

Most cases of unauthorized operation were disposed of by written warnings and supplying application forms. Before the application was granted, the applicant was required to explain his unlicensed operation and indicate the measures taken to prevent a recurrence.

A continuing program of making the public aware of the necessity for obtaining approval for radio operation is being undertaken with a view toward eliminating, or at least reducing, premature and other illegal uses.

Activities of radio equipment salesmen.—During the year 1 revocation and cease and desist proceeding was brought against a radio equipment manufacturer who, as an inducement to increased sales, told his customers that they could operate the radio equipment and use his radio station call sign until they obtained a license from the Commission. Several cases of a similar nature were halted in their incipiency by informal methods, such as correspondence and visits by the Commission's field engineers.

The lack of technical knowledge and unfamiliarity with radio laws and regulations often makes the layman desiring the benefits of radio communication easy prey to the unscrupulous radio equipment dealer who, in order to make a sale, does not hesitate to advise that immediate

operation of radio equipment may be undertaken prior to the grant of a license.

Proceedings against licensees.—During the year, there were 54 station license revocation and 21 amateur operator license suspension proceedings. A total of 23 licenses were revoked, most of these for failure to reply to Commission correspondence and violation notices. In order to avoid undue hardship, the Commission has, in appropriate cases, waived the rule provision which prohibits favorable action on applications filed within 1 year after revocation. Hearings were conducted in the field at the request of licensees involved in 3 cases.

The vigor of the Commission's enforcement program against licensees failing to heed warning letters, particularly in the maritime mobile field, has resulted in a diminishing number of cases. The Commission recognizes that revocation of a license in most cases constitutes a penalty far in excess of that warranted by the violation involved and considers that small fines and forfeitures would permit it to fit the sanction to the offense.

Criminal sanctions.—During the year 3 cases were referred to the Department of Justice for consideration as to whether the institution of criminal proceedings was warranted on the basis of allegedly false statements made in connection with applications. One of these was brought to trial and resulted in acquittal.

Enforcement of maritime compulsory usage of radio.—Assessment of forfeitures against Great Lakes vessels during the previous year resulted in only a few cases involving failure to obtain the required certificate in 1960.

The Commission continued its policy of mitigating to nominal sums the amounts of forfeitures incurred by all classes of vessels where the infraction involved a first offense failure to have the required inspection of the radio installation. Larger amounts were imposed and collected in cases where wilfullness or serious negligence was present. Several cases were referred to the Attorney General for legal proceedings to collect forfeitures and 2 were settled as the result of action taken.

STATISTICS

Stations in Safety and Special Radio Services

The 1960 fiscal year closed with 651,993 stations authorized in the Safety and Special Radio Services, or 144,822 more than the 507,171 in 1959. For these purposes, separate license, construction permit or combination construction permit and license have been counted as one station. Therefore, in many cases, a station includes a base transmitter and various mobile units. The following table compares station authorizations at the close of fiscal years 1959 and 1960:

Stations in safety and special radio services

Class of station	June 30, 1959	June 30, 1960	Increase or (decrease)
Amateur and disaster services:			
Amateur	195,776	217,102	21,326
Disaster	390	404	14
R.A.C.E.S	9,422	10,700	1,278
Total	205,588	228,206	22,618
Citizens	49,269	126,034	76,765
Aviation services:			
Aeronautical and fixed group	3,554	3,942	388
Aircraft	61,441	72,017	10,576
Aviation auxiliary group	318	420	102
Aviation radionavigation land	363	369	6
Civil Air Patrol	12,006	14,432	2,426
Total	77,682	91,180	13,498
Industrial services:			
Business	8,861	19,161	10,300
Forest products	1,792	1,876	84
Industrial radiolocation	255	256	1
Manufacturers	90	277	187
Motion picture	67	48	(19)
Petroleum	7,341	8,591	1,250
Power	11,878	12,427	549
Relay press	142	138	(4)
Special industrial	19,246	21,901	2,655
Telephone maintenance	25	129	104
Total	49,697	64,804	15,107
Land transportation services:			
Automobile emergency	1,052	1,188	136
Interurban passenger	46	49	3
Interurban property	1,606	1,861	255
Highway truck	349	0	(349)
Railroad	2,449	3,065	616
Taxicab	4,827	4,935	108
Urban passenger	116	123	7
Urban property	180	231	51
Total	10,625	11,452	827
Marine services:			
Alaskan group	1,132	1,240	108
Coastal group	393	412	19
Marine auxiliary group	95	98	3
Marine radiolocation land	31	35	4
Ship group	83,296	95,626	12,330
Total	84,947	97,411	12,464
Public safety services:			
Fire	5,283	5,935	652
Forestry conservation	3,618	3,667	49
Highway maintenance	3,068	3,582	514
Local government	502	1,678	1,176
Police	13,103	14,039	936
Special emergency	3,631	3,994	363
State guard	10	11	1
Public safety (combined)	148	0	(148)
Total	29,363	32,906	3,543
Grand total	507,171	651,993	144,822

Transmitters in Safety and Special Radio Services

More than 2,184,500 transmitters were authorized in the Safety and Special Radio Services at the end of fiscal 1960. This was an increase of 455,579 over the 1959 figure reported in last year's annual report. A breakdown of land or fixed transmitters and mobile station transmitters, by class of station, follows:

Transmitters in safety and special radio services

	Land or fixed	Mobile	Total transmitters
Amateur and disaster services:			
Amateur	210,258		210,258
Disaster	404		404
R.A.C.E.S.	10,700		10,700
Total	221,362		221,362
Citizens	10,000	431,000	441,000
Aviation services:			
Aeronautical and Fixed Group	6,276		6,267
Aircraft Group		117,210	117,210
Aviation Auxiliary Group	46	1,966	2,012
Aviation Radionavigation Land	478		478
Civil Air Patrol	6,702	11,576	18,278
Total	13,502	130,752	144,254
Industrial services:			
Business	12,288	136,870	149,158
Forest Products	1,876	16,884	18,760
Industrial Radiolocation	147	471	618
Manufacturers	357	6,760	7,117
Motion Picture	55	683	738
Petroleum	20,876	56,443	77,319
Power	10,439	138,685	149,124
Relay Press	123	1,823	1,946
Special Industrial	20,522	210,711	231,233
Telephone Maintenance	112	4,065	4,177
Total	66,795	573,395	640,190
Land Transportation services:			
Automobile Emergency	1,112	9,509	10,621
Interurban Passenger	34	422	456
Interurban Property	1,862	31,457	33,319
Highway Truck			
Railroad	3,271	97,874	101,145
Taxicab	5,348	98,287	103,635
Urban Passenger	98	2,983	3,081
Urban Property	188	6,403	6,591
Total	11,913	246,935	258,848
Marine services:			
Alaskan Group	2,538		2,538
Coastal Group	642		642
Marine Auxiliary	643	7	650
Marine Radiolocation Land	55		55
Ship Group		103,000	103,000
Total	3,878	103,007	106,885
Public Safety services:			
Fire	5,340	66,411	71,751
Forestry Conservation	7,386	31,665	39,051
Highway Maintenance	3,173	33,721	36,894
Local Government	6,983	16,495	23,478
Police	12,138	171,773	183,911
Special Emergency	3,830	12,610	16,440
State Guard	197	265	462
Total	39,047	332,940	371,987
Grand Total	366,497	1,818,029	2,184,526

Applications in Safety and Special Radio Services

During fiscal 1960, more than 350,000 applications for stations in the Safety and Special Radio Services were received, which was an increase of 100,057 from the corresponding figure in 1959. A comparison of the number of applications received in each service during the past 2 years follows:

Applications in Safety and Special Radio Services

Class of station	Received 1959	Received 1960	Increase or (decrease)
Amateur and disaster services:			
Amateur	102,942	105,498	2,556
Disaster	49	19	(30)
R.A.C.E.S.	2,277	1,615	(662)
Total	105,268	107,132	1,864
Citizens	25,346	106,530	81,184
Aviation services:			
Aeronautical and Fixed Group	2,236	2,983	747
Aircraft Group	30,527	29,462	(1,065)
Aviation Auxiliary Group	219	237	18
Aviation Radionavigation Land	175	184	9
Civil Air Patrol	4,770	3,720	(1,050)
Total	37,927	36,586	(1,341)
Industrial services:			
Business	10,261	15,118	4,857
Forest Products	859	931	72
Industrial Radiolocation	221	227	6
Manufacturers	367	474	107
Motion Picture	22	18	(4)
Petroleum	3,909	4,567	658
Power	5,258	5,266	8
Relay Press	74	72	(2)
Special Industrial	8,878	10,143	1,265
Telephone Maintenance	61	171	110
Total	29,910	36,987	7,077
Land Transportation services:			
Automobile Emergency	433	487	54
Interurban Passenger	17	26	9
Interurban Property	832	1,250	418
Highway Truck	111	172	61
Railroad	1,448	1,740	292
Taxicab	3,201	2,846	(355)
Urban Passenger	33	78	45
Urban Property	204	107	(97)
Total	6,279	6,706	427
Marine services:			
Alaskan Group	364	402	38
Coastal Group	432	229	(203)
Marine Auxiliary Group	30	108	78
Marine Radiolocation Land	20	52	32
Ship Group	29,753	36,087	6,334
Total	30,599	36,878	6,279
Public Safety services:			
Fire	2,157	3,323	1,166
Forestry Conservation	2,045	2,215	170
Highway Maintenance	2,132	2,440	308
Local Government	1,159	2,177	1,018
Police	5,780	7,693	1,913
Special Emergency	1,516	1,507	(9)
State Guard	2	3	1
Total	14,791	19,358	4,567
Grand Total	250,120	350,177	100,057

Common Carrier Services

DOMESTIC TELEPHONE

Highlights

The past year witnessed a continued high rate of expansion for most segments of the telephone industry. Over $8 billion was spent by the public, industry and Government on services furnished by the telephone industry. The Bell System in calendar 1959 passed the $1.1 billion mark in net income applicable to American Telephone and Telegraph stock, and General Telephone had net earnings of more than $71 million.

A $50 million annual reduction in interstate long-distance rates became effective in September 1959 following negotiations initiated by the Commission with AT&T.

The Commission concluded hearings in its extended investigation into the rates of AT&T and Western Union for private line services and a decision was in preparation.

General

The telephone industry, consisting of the Bell System and more than 3,500 independent telephone companies, handled more business in calendar 1959 than in any previous year. At the close of the year, the industry was furnishing service to about 70 million telephones, employing a plant having a gross investment exceeding $26 billion.

To meet the ever-increasing demands of the public, industry, and Government for new and additional services, the Bell System, which owns about 85 percent of the nation's telephones, reported construction expenditures during the year totaling $2¼ billion. The General Telephone System, the largest group of independent telephone companies commonly owned by General Telephone and Electronics Corporation, and serving some 3.8 million telephones, expended on construction more than $198 million.

During calendar 1959, revenues of the telephone industry approximated $8.5 billion—an increase of about 9.6 percent over 1958. On the average, the public each day made some 258 million local telephone calls and 11.3 million long-distance or toll calls. Private-line telephone and telegraph services showed exceptional growth in 1959 as indicated by an increase of 23 percent in the Bell System's revenues from such services compared to 1958.

For calendar 1959, American Telephone and Telegraph Co. [AT&T], the parent company of the Bell System, reported consolidated net income applicable to its capital stock of more than $1.1 billion, representing earnings per share of $5.22, compared to $4.67 for the previous year (restated on basis of 3 for 1 split in outstanding shares authorized in April 1959). Consolidated net income applicable to capital stock of General Telephone was reported at $71,294,000, representing earnings per share of $3.40 in 1959 compared to $3.07 in 1958.

Interstate Facilities

The Bell System, which provides the bulk of the Nation's interstate facilities, continued an accelerated toll-construction program. Substantial circuit additions were required by the steady increases in toll telephone calls, the rapid increases in private line services, particularly for the "SAGE" system of the Air Force, and other important Government services, and the rearrangement and growth in circuity to handle operator and customer-dialed toll calls. A new radio relay system, Type TH, providing 3 times the capacity of the microwave radio systems now in service throughout the country, is being constructed from the East Coast to the West Coast on an express route to avoid major metropolitan areas and military targets in order that ample facilities will be available for defense requirements in event of national emergencies. Also, twin 8-tube coaxial cables or a 12-tube coaxial cable are being installed on a remote transcontinental route at a depth of 40 inches underground with all associated repeater stations to provide protection against unusual pressures caused by nuclear explosions.

During fiscal 1960 the Commission authorized construction projects totaling about $148 million. Included was about $84 million for new radio relay systems or the addition of channels on existing systems totaling about 66,000 radio relay channel miles. The new major radio relay systems cost about $43 million. New cable and open wire construction, and the installation of carrier equipment for use in conjunction with cable, open wire, and radio relay routes, totaled about $64 million.

During fiscal 1960, independent telephone companies also expanded the use of microwave systems to provide additional toll telephone circuits. The Commission granted authorizations to independent company systems for more than 4,000 channel miles of radio facilities at an estimated cost of $4.5 million.

By the close of the fiscal year, the Bell System had over 236,000 channel miles of radio relay in service, of which about 75,000 miles were being used for nationwide TV program networking. An addi-

tional 12,200 TV program-miles were being provided by coaxial cable. These facilities interconnected directly some 365 TV broadcast stations. An additional 17 TV stations were linked to the network by Bell off-air pickup and microwave relay, while other stations received network programs by picking up the signals of the connected stations.

Interstate Message Toll Telephone Rates

As reported in FCC's 25th annual report, the Bell System companies, following discussions initiated by the Commission in light of the continued upward trend in their level of earnings from interstate services, agreed to reduce interstate message toll telephone rates by about $50 million annually. Accordingly, effective September 19, 1959, the Bell System filed reduced rates for station-to-station calls for distances in excess of 675 miles and for additional minutes on both station-to-station and person-to-person calls over 468 miles. This resulted in an estimated annual saving to users of approximately $47 million.

To complete the $50 million annual reduction, the company instituted on February 7, 1960, a new system of mileage measurement between toll service points which resulted in a rate reduction of $5.7 million annually. This was partially offset by an increase in rates for message toll service between points in the United States and Canada amounting to $5,600,000 of which $2,700,000 is the United States carriers' share, leaving a net decrease of $3,000,000. This was the first revision in United States-Canadian rates since 1946.

Notwithstanding these rate reductions, the Bell System's earnings from interstate services have tended to maintain a higher level than was anticipated. However, as of the close of the fiscal year, no determination had been made by the Commission as to what further action, if any, might be warranted looking toward additional rate reductions.

One noteworthy factor that is currently involved in the regulation of interstate long-distance telephone rates and earnings is the disparity which exists between the interstate rate schedules and the rates for intrastate services for comparable distances which are subject to the jurisdiction of the several States. It has been urged by the various State commissions that this disparity is largely attributable to inequities in the so-called telephone separation procedures. These procedures, which have been developed jointly over the years by the FCC and the State commissions, are employed in the Bell System to allocate investment and expenses associated with telephone plant used in common to render both intrastate and interstate services. It is urged by the State commissions that the procedures do not produce a sufficient allocation of the joint costs to the interstate service. At the close of the fiscal year, further studies of the procedures were in progress.

The National Association of Railroad and Utilities Commissioners

has urged that before any action is taken by the FCC to reduce further interstate rates, consideration first be given to modifying the separation procedures. Should a reasonable modification be accomplished, it could result in a material reduction in the level of interstate earnings as currently computed under the existing procedures. It could likewise relieve the State rate-making jurisdictions of substantial revenue requirements and thereby provide the means to mitigate rate disparities by intrastate long-distance rate reductions.

The independent telephone companies, through the United States Independent Telephone Association, have also made representations to the Commission against effecting further reductions in interstate rates without taking measures to safeguard the independent companies against loss of revenue. The latter companies participate in furnishing interstate service jointly with the Bell System and their share of revenue from such service is affected by interstate rate adjustments.

Private Line Telephone and Telegraph Rates

Hearings were concluded in the Commission's comprehensive investigation instituted in 1956 into the rates for private line services of American Telephone and Telegraph Co. and The Western Union Telegraph Co. (dockets 11645 and 11646). At the end of the fiscal year, the Commission was preparing its initial decision. The Commission's investigation of the Bell System's rates for data transmission channels provided to the Air Force for use in its SAGE system (docket 12194) proceeded during the year.

The Commission instituted 6 other investigations to determine the reasonableness of specific charges in connection with certain new private-line service offerings by various telephone companies. All of these private-line services are being provided to the U.S. Air Force. Two of the proceedings were dismissed without hearing following negotiated rate reductions. The others were pending at the close of the year.

Connection of Customer-Owned Facilities With Telephone Systems

On July 14, 1959, the Commission ordered a general investigation to determine the reasonableness of revisions of certain AT&T tariff provisions permitting certain classes of customers to connect their privately owned communications facilities with the Bell System private line, exchange and message toll facilities. The new tariff filing specifically exempted the railroads, power and pipe line companies from the general prohibition against such connections in cases involving emergencies, remote or hazardous locations, and also where connection had been contractually permitted prior to July 15, 1959. There were 41 days of hearing and the record was closed on May 10, 1960.

Tariff Filings

At the year end there were on file 953 telephone tariffs and concurrences of 511 telephone carriers. During the year, 12,000 new or revised tariff publications were received, as well as 26 applications requesting special permission to file tariffs on less than the period of statutory notice.

Field Studies and Reviews

Periodic reviews are made by the 3 Common Carrier Bureau field offices and by the headquarters' staff of the accounts, records and accounting practices of the telephone carriers to assure compliance with the Commission's accounting rules and regulations. These studies are also directed to determining the adequacy and propriety of the accounting performed to assure the reliability of the data used in rate proceedings and depreciation and other rate studies.

Special studies were made during fiscal 1960 of certain accounts, records and accounting procedures of 6 Bell companies and 2 independent companies. These studies related to such matters as plant accounting, including the accounting for station apparatus and station connections, the distribution of certain engineering expenses, the microfilming of records, the establishment and maintenance of continuing property records, and the costs associated with the SAGE system. Deficiencies disclosed were brought to the attention of the carriers involved and corrective action taken.

Other Regulatory Matters

Depreciation.—During fiscal 1960, the necessary studies were completed and depreciation rate revisions ordered for 7 Bell companies. By the close of the year, studies were in progress with respect to 8 additional Bell companies. The revised rates reflect both upward and downward adjustments with respect to the individual classes of property; however, their overall effect was a net increase averaging approximately 3 percent in annual depreciation expenses.

The importance of keeping the prescribed depreciation rates in line with current conditions is apparent from the magnitude of the amounts involved. For example, the total depreciable plant of the 23 Bell companies increased during calendar 1959 from $20.6 billion to approximately $22.2 billion, or about 7.7 percent. The depreciation expenses for the same period increased 9.9 percent, from $898 million to $987 million. Depreciation expenses for the year ending December 31, 1959, represented over one-fifth of the total Bell operating expenses.

Original cost accounting.—Approval was given to several original cost entries in cases of telephone plant acquisitions during the year. In a few instances approval is still pending chiefly because of ques-

tions as to the propriety of the procedures used in estimating the original cost of these properties.

Since July 1954, the Commission has permitted the recording of purchases from electric utilities of certain poles (isolated poles or interests in pole lines) on the basis of acquisition cost. Studies are in progress to determine the effect upon the plant accounts, retirement unit costs and depreciation rates of this departure from original cost accounting.

Discontinuance of service, acquisitions and consolidations.—The Commission granted 9 applications to discontinue telephone service during fiscal 1960. It received 21 applications from telephone companies to acquire the property of other telephone companies. Seventeen of these, together with 4 held over from 1959, were granted without public hearing.

Pensions and relief.—As reported in 1958, the Bell companies authorized the trustee of their pension funds to invest up to 10 percent of such funds in common stocks. A review of the diversification of investments of these pension trust funds as of December 31, 1959 showed that common stocks amount to 4.2 percent of these funds. Earnings of the Bell companies pension funds were 3.34 percent in 1959 as compared with 3.33 percent in 1958. The interest rate assumed for actuarial purposes remained at 3 percent with the exception of 1 company which increased the rate from 3¼ to 3½ percent.

Domestic Common Carrier Radio Facilities

The year showed a marked acceleration in the rate of growth of the number of stations licensed in the domestic public radio services.

Radio control stations.—In attempting to provide relief for common carrier licensees, who were adversely affected by the withdrawal of frequencies in the 890–942 Mc band, the Commission made available frequencies in the 450–460 Mc band for control stations. Frequencies above 942 Mc were generally not acceptable for such use because of the greater cost of equipment. The 450–460 Mc frequencies were made available only on a shared basis with other radio services, and it was expected that such arrangement would provide only partial relief, as an interim measure, pending consideration of the requirements for such facilities made known to the Commission in connection with docket 11997.

Air-ground radiotelephone.—In order to develop further information necessary precedent to the establishment of a public air-ground two-way radiotelephone service, the Commission authorized new radio facilities to be established on a developmental basis at Pittsburgh, New York, and Washington, D.C. This is in addition to the facil-

ities previously authorized to Bell on a developmental basis at Chicago and Detroit.

By its Third Report and Order, the Commission closed docket 11995 by denying AT&T's petition to reallocate the frequency bands 455–456 Mc and 460–461 Mc to an air-ground radiotelephone service and concurrently withdrew its rulemaking proposal which would have made those frequencies available for domestic public land mobile service. However, the Commission subsequently, by its Sixth Memorandum Report and Order in docket 11959, modified its table of frequency allocations so as to permit public air-ground radiotelephone service on the frequencies presently allocated for telephone company public land mobile operations in the 450–460 Mc band. In doing this, the Commission made no determination as to the adequacy, for air-ground service, of such frequency sharing with common carrier land mobile operations. The Commission will give consideration to finding adequate space for both the domestic public land mobile service and the air-ground radiotelephone service in connection with its deliberation in docket 11997.

In June 1960, AT&T petitioned for amendment of part 21 of the rules so as to provide the frequencies 454.70–454.95 Mc and 459.70–459.95 Mc for exclusive assignment to radio stations for rendition of a public air-ground radiotelephone service. Action was pending.

Interconnection.—At the close of fiscal 1960 the Bell System agreed to negotiate contracts for the interconnection of its public wireline telephone exchange system with the land mobile radio facilities of miscellaneous common carriers. Heretofore, Bell, through its tariffs on file with the several States, has maintained a firm policy against such interconnection. It is not yet known to what extent this change in Bell policy will affect an earlier miscellaneous common carrier proposal to permit subscribers to communicate directly with their own vehicles via radio dispatch stations in lieu of doing so via leased wire lines.

TV microwave relay.—The Commission's inquiry (docket 12443) initiated May 22, 1958 into the impact of community antenna TV systems, translators, "satellites" and "repeaters" on the orderly development of video broadcasting, together with the petition for reconsideration of the Commission's determination disclaiming jurisdiction over CATV systems, was disposed of by action of April 13, 1959. A second petition for reconsideration on reopening this record is now pending, the first such petition having been denied.

Policies and considerations relative to permitting point-to-point microwave common carriers to serve CATV systems will continue to be a major consideration in fiscal 1961. A petition to amend part 21 of the rules to include restrictions on the granting of common car-

rier station licenses for the use of microwave frequencies to transmit TV programs to CATV systems was denied by the Commission without prejudice to further action. Problems are also presented by 10 protests filed, under section 309(c) of the act, against applications for such microwave facilities.

Point-to-point microwave radio.—Point-to-point microwave radio service continued to exhibit a healthy growth during fiscal 1960, providing facilities for telephone, telegraph, and video transmission.

As in the case of Western Union (see Telegraph), a considerable segment of the microwave radio expansion by the Bell System and independent telephone companies also involves rendition of communication service for national defense requirements.

In Alaska, microwave radio applications by Trans-Alaska Telephone Co. resulted in an objection being filed by the Secretary of the Army contending that the proposed construction would result in an unnecessary duplication of facilities provided by the Alaska Communication System. This matter was being reviewed by the Commission.

During the year, the Bell Telephone Laboratories, Inc., participated in transmission tests utilizing huge aluminized mylar film spheres launched into the stratosphere by the National Aeronautics and Space Administration from Wallops Island, Va.

To afford partial relief to common carriers who were adversely affected by the Commission's earlier reallocation of the 890–942 Mc band from non-Government to Government radio services, the Commission gave common carriers access to the 2110–2200 Mc band on a shared basis with private radio services. However, the non-materialization of the relief anticipated is believed due to the failure of equipment manufacturers to have transmitters type-accepted for operation in that band. The Commission's rules prohibit the use of such frequencies for video transmission and restrict the transmission to a bandwidth of 5 Mc. A petition filed May 17, 1960 by Adler Electronics, Inc., requesting the Commission to amend part 21 to increase the permissible bandwidth to 8 Mc and to permit the use of video transmission in the band was subsequently denied.

DOMESTIC TELEGRAPH

Highlights

The Western Union Telegraph Co. reported record gross revenue and net income for calendar 1959. Gross landline operating revenue of $260,849,098 in 1959 was $20,120,528 higher than in 1958 (an increase of 8 percent). Message telegraph volume declined from 131,867,000 messages in 1958 to 130,993,000 messages in 1959. Western

Union's net income from all of its operations amounted to $16,685,000 in 1959, compared with $12,660,000 in 1958.

The telegraph company was authorized to begin construction of a new transcontinental microwave radio relay system which, when completed, will be available to provide broadband circuits to the military and other Government agencies and a variety of private-wire services to the general public. Direct Western Union office representation in small communities continued to decline during the year as the result of closure of many railroad and other agency operated telegraph offices.

New two-year labor contracts, effective June 1, 1960, were negotiated with the unions representing Western Union landline employees, which the company estimates will add about $14.5 million a year to its operating expenses. In consequence, Western Union filed increased rates for most of its message services at the close of fiscal 1960.

General

Western Union's nationwide communications system consists of nearly 5 million miles of telegraph circuits, 20,000 telegraph offices and agencies, and 56,000 teleprinter and facsimile customer tielines. Its landline plant represents an investment of some $380 million.

The company's domestic public message service, the only nationwide telegraph message service and the company's principal source of revenue, accounted for 64 percent of the total landline revenues as compared with 66 percent in 1958. Public message gross revenue in calendar 1959 was $166 million compared with $160 million the previous year. Gross private-wire revenues increased $10.6 million in 1959, reaching a record high of $51.4 million. Private-line telegraph services accounted for 20 percent of Western Union's total revenue in 1959 as compared with 17 percent in the previous year. The company competes directly for leased wire business with the Bell Telephone System, which handles the major part of the Nation's private-line telegraph business. The Bell System also operates the competitive teletypewriter (TWX) exchange service.

Services and Facilities

Modernization and plant improvements.—Western Union expended nearly $5 million in calendar 1959 for continued mechanization and plant improvement. Additional capital expenditures of about $51 million are projected for calendar 1960 and $105 million for 1961, primarily for expansion of microwave radio relay systems and other facilities to meet the increasing demands of industry and Government for private-wire and other direct customer-to-customer services.

During fiscal 1960 Western Union was authorized to begin construction of a new $41 million transcontinental microwave radio relay

system which upon completion, scheduled from October 1961, will extend from Boston to Los Angeles via Syracuse, St. Louis, Kansas City, Denver, Salt Lake City, Oakland, San Francisco, and a number of Air Force service points. The new system is designed to provide broadband circuits essential to national defense and to meet the increasing demands of the public for rapid communication facilities, particularly for such services as alternate record-voice, facsimile, digitalized television, and other high-speed data transmission requirements which are not currently available on existing plant. The first part of the new radio beam program, involving construction at 9 sites between Vandenberg and Sunnyvale, Calif., for Air Force service, has been completed.

Private wire systems.—Western Union domestic private-wire systems, leased to industry and Government, continued to grow, and in calendar 1959 produced record revenues of $51,424,000, which was 26.2 percent above 1958. At the end of fiscal 1960, such revenues were running at an annual rate of $54 million and constituted about 20 percent of total landline revenues. Although large networks are provided for Government and defense uses, 75 percent of the telegraph company's private-wire revenues comes from approximately 2,000 systems leased to business firms and manufacturing companies.

During 1960, Western Union completed and placed in service a 5,500,000-mile high-speed communications network for the U.S. Air Force linking more than 350 air bases around the globe, a nationwide bomb alarm system for the Office of Civil and Defense Mobilization, and placed orders for a high-speed facsimile recording network for the U.S. Weather Bureau. Other major private-wire and facsimile networks were furnished by Western Union during the year to large commercial and industrial firms.

The demand by industry and Government for private-wire systems suitable for data transmisison continued to grow, and substantial progress was made in the design and development of facilities and equipment capable of accepting data from and transmitting data to a wide variety of business machines and computers.

Wirefax.—On December 1, 1959 a public facsimile service, called "wirefax," was established by Western Union between Chicago, Los Angeles, New York, San Francisco and Washington, D.C. This service offers facilities for transmitting any type of material that can be satisfactorily reproduced, including handwritten, typed or printed copy, line drawings, advertising layouts of sketches, charts or other graphic material, legal or financial documents or forms.

Telex.—Western Union's customer-to-customer teleprinter exchange service, called "telex", was extended to Los Angeles and San Fran-

cisco. This service, which permits users to dial other subscribers direct, now links New York, Chicago, Los Angeles, San Francisco and 37 Canadian cities. Its extension to 19 additional cities in the United States and to Mexico City is underway. Western Union estimates that 45 major cities will be so served by the end of calendar 1961 and 160 cities by the end of 1965.

Extension of facilities and curtailment of service.—The Commission approved 69 Western Union applications for the supplementation and extension of wire facilities to meet the rapidly increasing needs of customers for private-wire telegraph services and for extension of lines and improvement of message telegraph service. The request involved the leasing of approximately 350,000 telegraph channel miles and 8,000 facsimile channel miles.

The Commission granted 992 applications for closure of public telegraph offices or reduction in hours of service and denied 4 such applications. Nine were withdrawn. There were 91 pending applications for authority to curtail telegraph service. The 621 closure applications granted involved a total of 1,543 railroad-operated or other agency-operated offices in small communities where a negligible traffic volume did not warrant continuation of local representation. During the same period, the Commission authorized the replacement of company-operated offices in 24 communities by agency offices and permitted the closure of 20 public branch offices. The remaining applications were for reduction of hours of service at company operated main and branch offices.

Speed of service.—Western Union is required to submit reports to the Commission relating to the speed and quality of telegraph service at 75 key cities. Reports submitted during 1959 and Commission staff investigations revealed a progressive deterioration in the quality of telegraph service through September, and the Commission requested the company to take remedial action.

Indications are that the company is making substantial progress toward its ultimate goal of having all offices complete the handling of messages delivered by telephone or tieline within 60 minutes from filing time to delivery time and all business messages delivered by messenger within 75 minutes. Service at certain cities, however, was substandard at the end of fiscal 1960. Technological changes in methods of operation which were made in 1960 at New York, Chicago and Washington, and at a number of smaller cities are expected to help the company attain its speed-of-service objectives.

Domestic telegraph rates.—On June 1, 1960 Western Union concluded new wage agreements which will add, in the aggregate, approximately $14.5 million to its operating expenses on an annual basis. On July 18, 1960, and subsequently the company filed revised

tariff schedules increasing rates for interstate message telegraph, press, money order, and miscellaneous services. It estimates that revised rates, when fully effectuated for intrastate, interstate and foreign services, will produce about $12.6 million additional revenue a year and will offset, approximately, the cost of the new wage agreements. The overall average effect is an increase of about 8 percent in the cost of these telegraph services to the public.

Investigation into the lawfulness of the charges, classifications, regulations and practices in connection with the leased-facilities services of Western Union, which began in 1956 (docket 11646), was concluded and the record closed on September 17, 1959, and certified to the Commission by the hearing examiner on January 27, 1960. Since that time the staff has been analyzing the voluminous data and testimony and preparing its recommendation to the Commission.

Hearings on 2 formal complaints (dockets 12710 and 12748) filed against Western Union by the Board of Trade of the City of Chicago and Commodity News Services, Inc., requesting damages for alleged overcharges for certain private-wire services, were held in early 1960 and the hearing examiner has issued an initial decision, finding against Western Union. Further proceedings were scheduled for the fall to ascertain the amount of damages due complainants.

Another formal complaint, filed by the General Services Administration, alleging that the rates and charges for Plan 55 services and equipment furnished the U.S. Air Force were excessive (docket 12937), is pending.

The formula, pursuant to section 222 of the Communications Act, governing the distribution by Western Union between the Canadian National Railway and Canadian Pacific Railway Company of telegraph traffic destined to points in Canada and for the division of charges for such traffic, expired on October 1, 1959. The Commission has ordered an investigation concerning the distribution of such traffic and the division of charges therefor (docket 13187).

Tariff schedules.—During the year, carriers filed 792 pages of domestic telegraph material and 29 applications for permission to file tariff schedules effective on less than statutory notice.

INTERNATIONAL TELEGRAPH AND TELEPHONE

Highlights

The international telegraph carriers reported record-high revenues for calendar 1959, with leased channels and "telex" services showing revenue increases of almost 30 percent. Several carriers were authorized to supplement their overseas facilities by leasing channels in the high-capacity submarine cables of AT&T. A proposal by Western Union for the divestment of its international telegraph operations, as

required by section 222 of the Communications Act, was under consideration.

General

Telegraph service between the continental United States and overseas points is furnished by the operating subsidiaries of the American Cable & Radio Corp., RCA Communications, Inc., The Western Union Telegraph Co. (International Department), and 4 smaller carriers. Overseas telephone service is provided principally by AT&T. Most of these companies offer telegraph or telephone service to ships at sea and aircraft.

In calendar 1959, total revenues of the international telegraph carriers reached a new high of over $84 million, an increase of 9.2 percent over the previous year. At the same time, revenue from leased channel and "telex" services increased 29.8 percent to over $14 million. Overseas telephone revenues grew to over $32 million, an increase of 24.4 percent.

Congestion in Frequency Bands

The high-frequency bands allocated internationally to the fixed radio services are shared by all countries for public and Government (including military) communication services. Because of present congestion, it is difficult to make new frequency assignments without the probability of interference to or from existing worldwide operations. However, by means of new techniques and improved equipment it has been possible to provide some additional channels and new circuits on frequencies presently assigned to the international radio carriers.

At the 1959 Geneva Administrative Radio Conference there were foreign proposals to reduce the frequency space allocated to the fixed service which, if adopted, would have aggravated the over-crowding in the fixed bands. Fortunately, the United States delegation was able to obtain sufficient support to maintain status quo with respect to the high-frequency fixed-service bands. The crowding in these bands may be alleviated at some future time when adequate additional high-capacity submarine cable systems and, possibly, communications via satellites are placed in operation. However, for the time being, radio systems are essential to maintain existing services, to reach points not served by the new high-capacity cables, to provide direct service to inland countries and to assure continuity of service during cable interruptions, several of which occurred during the year.

Ocean Telephone Cables

AT&T is operating 2 transatlantic telephone cables (Newfoundland to England and France) and plans a third such cable between the

United States and Great Britain—the first Atlantic telephone cable to the United States direct. It also has ocean telephone cables to Alaska, Hawaii and Puerto Rico, and is authorized to lay another to Bermuda.

Threatened Loss of Telegraph Traffic

The defense agencies require broadband channels to handle both voice and record transmission in connection with their complex international telecommuncations operations. To enable the telephone company to satisfy such demands the Commission, in the interests of national defense, authorized AT&T to provide telephone cable facilities to the defense agencies for alternate or simultaneous voice and record uses.

Shortly thereafter the defense agencies cancelled some of their leases for telegraph circuits in existing transatlantic telegraph cables and, as a consequence, certain of the international telegraph carriers suffered substantial losses in their leased channel revenues. In addition, the threat of possible loss of traffic in the overnight category (letter telegram services) looms in the Post Office Department research in use of jet and missile aircraft to speed up mail transportation over long distances.

Use of Telephone Cables by Telegraph Carriers

At the same time that the Commission authorized AT&T to lease its cable facilities to the defense agencies for alternate or simultaneous voice and record use, it also authorized lease of like facilities to the telegraph carriers to provide non-voice services to customers and, in addition, to furnish alternate or simultaneous voice and non-voice channels to the defense agencies.

Subsequently, after the telegraph carriers had made appropriate arrangements with their foreign correspondents, the Commission authorized 4 of them to supplement their service by leasing channels in AT&T's transatlantic cables for telegraph use. At present, such services are being provided by one or more of the telegraph carriers to England, France and Germany. Negotiations are in progress for extensions to other European countries.

In connection with these leases, it was necessary for the cable telegraph carriers to decrease drastically charges heretofore in effect for leased-telegraph facilities in their own cables. It is too early to determine the net effect upon the revenues of the international telegraph carriers, but indications are that, unless substantial additional traffic is generated, there will be a decline in overall net revenues because of (a) the loss of Government contracts; (b) the downward revision of leased-cable charges, and (c) the relatively high-fixed costs of leasing, subdividing and maintaining telegraph circuits in the telephone cables.

In addition, AT&T has been authorized to provide non-voice services alternately over its cable to Puerto Rico and to lease channels therein to the telegraph carriers to provide non-voice services as well as alternate voice and non-voice services. At present, 3 of these channels are leased by 2 telegraph carriers for such purposes.

Reevaluation of Rate Structure of International Telegraph Carriers

With the trend toward more use of "telex" and leased circuits by telegraph users, the revenues from these services now account for about 30 percent of its total revenues of 1 international carrier. Rate investigations by the Commission in the international telegraph field in recent years have been mainly confined to point-to-point message services. It will now be necessary for the Commission to undertake the complex problems involved in examining the rates for these new services to determine their reasonableness. At the close of the fiscal year, this investigation was in the preliminary stages.

International Telegraph Merger

In 1959 the Commission indorsed, in principle, a bill to permit merger of international telegraph and marine carriers. The Commission during the past year submitted later information and data on this subject to the Congressional committee concerned.

Globe-AC&R Merger

On May 25, 1960 the Commission granted an application of Globe Wireless Ltd. and American Cable & Radio Corp. for transfer of control of Globe to AC&R. Globe, whose radiotelegraph services are to points in the Pacific area and to Cuba, experienced deficits since it resumed operations following World War II which prevented it from improving its plant to meet modern telecommunications needs. It will be retained and modernized as AC&R's fourth United States operating subsidiary.

International Formula

Section 222 of the act requires that Western Union distribute telegraph traffic destined to points outside the continental United States among the various international telegraph carriers in accordance with a formula prescribed by the Commission in 1943 when Western Union merged with Postal Telegraph. The last of a number of hearing cases resulting from this formula was resolved during the year when successful negotiations between the parties (American Cable & Radio Corp., RCA Communications and Western Union) in the matter of certain Western Union practices under the formula (dockets 9369 and 11298) were reported to the Commission.

A proposed contract of sale of Western Union's international telegraph operations calls for a revision of the international formula.

This matter will be taken up by the Commission as part of divestment proceedings in docket 6517 next described.

Western Union Divestment

On January 29, 1960, Western Union submitted a proposal for sale of its international telegraph cable operations to Barnes Investing Corp., Chicago. Following a petition submitted February 1, 1960, the Commission ordered the matter set for hearing.

In the course of a prehearing conference on March 16, 1960, it developed that Barnes did not have its financing arrangements finalized, and the start of the hearing was postponed from March 22 to April 20, 1960, and thereafter to June 8, 1960, in order to give Barnes time to complete such arrangements. When on June 8 the financing arrangements still were not finalized the hearing examiner closed the record and certified it to the Commission for whatever action it deemed appropriate.

On June 22, 1960 the Commission, after oral argument, ordered the proceeding terminated insofar as Barnes was concerned unless Barnes completed its financing arrangements by August 2 thereafter and, further, ordered Western Union, if Barnes did not do so, to file an alternate plan of divestment by September 1, 1960. Barnes failed to complete its financing by that date so Western Union, on September 15, filed an alternate plan in the form of an agreement with American Security Corp. looking toward establishment of a separate operating company to be known as Western Union International, Inc.

Duplicate Circuits to Switzerland and Austria

On February 24, 1960, the Commission granted application of Mackay Radio to add Berne, Switzerland, as a new point of communication, a point to which RCA Communications, which had objected, was already licensed to communicate. On July 27, 1960, RCAC application was granted for a competing direct radiotelegraph circuit to Vienna, Austria, with which Mackay is presently licensed to communicate.

Tropospheric Scatter

In December 1959, the American Telephone and Telegraph Co. opened a circuit from Florida City, Fla., station to Nassau, Bahamas, using "tropospheric scatter" transmission on frequencies in the 2110 to 2200 Mc range. This system has a capability of 72 voice channels and will serve to relieve the load on present circuits to the Bahamas now operated on frequencies in the medium and high frequency ranges.

To meet the need for additional telegraph channels, principally for an airways communication system, the Radio Corp. of Puerto

Rico, a telephone carrier, was authorized to lease a voice channel in its tropospheric scatter radiotelephone system between Puerto Rico and the Dominican Republic to a radiotelegraph carrier, All America Cables and Radio, Inc., which, in turn, was authorized to subdivide the voice channel into telegraph channels to provide the desired telegraph services.

Docket Cases

Far East traffic.—Oral argument was held on the exceptions of RCA Communications, Inc., to an initial decision which upheld the legality of Western Union handling traffic to various far eastern points over its cable system via London (dockets 11364 and 11663). Thereafter, the Commission dismissed the RCAC complaint.

Western Union practices under international formula.—The Commission granted motions by RCA Communications, Inc. and the American Cable & Radio Corp. to approve a settlement agreement and to dismiss without prejudice their request for rulings on the lawfulnesses of certain Western Union practices under section 222 of the Communications Act and the international formula (dockets 9369 and 11298).

Delays in handling international press traffic.—On March 25, 1960, the Commission issued a final decision on the complaint of Press Wireless, Inc. alleging excessive delays in the transfer by Western Union to Press Wireless of international press traffic specifically routed by the sender via Press Wireless (docket 11871). It found Western Union had engaged in practices unfavorable to Press Wireless and ordered them stopped.

Telegraph service with Hawaii.—On September 2, 1959, the Commission adopted a notice of inquiry into the question of what changes, if any, it should recommend that Congress make in section 222 of the act in view of the desire of Western Union to serve the new State of Hawaii as part of its domestic telegraph operations (docket 13188). The Commission concluded that it should make no recommendations and accordingly, on May 11, 1960, terminated the inquiry. On September 7, 1960, a Western Union petition for reconsideration was denied.

Press Wireless license modification.—An initial decision was issued November 13, 1959, with respect to the proceedings involving applications of Press Wireless for modification of its licenses to permit it to handle non-press material in connection with its "telecon" service (dockets 12539 and 12540). After oral argument on July 28, 1960, the Commission directed preparation of a document affirming the initial decision insofar as it denied the applications, but reversing

that portion which interpreted section 6.2 of the rules to allow Press Wireless to provide the service at issue.

Circuits to Turkey and Israel.—At the request of the parties, consolidated proceedings involving applications of Mackay and RCAC to communicate with Ankara, Turkey, and application of Mackay to communicate with Istanbul, Turkey (dockets 10360 and 10489), and proceeding on application of RCAC to communicate with Tel Aviv, Israel (docket 8990), were dismissed.

Alternate voice and data transmission service for U.S. Air Force.—At the request of the parties, the proceedings involving a protest against the grant of applications of AT&T for modification of its point-to-point microwave radio station licenses for facilities between Portland, Maine, and the Canadian border connecting with the transatlantic telephone cable systems, so as to authorize the furnishing of an alternate voice and data transmission service to the U.S. Air Force (docket 12569), were dismissed.

ACA complaint against AC&R and Western Union.—On March 23, 1960, the Commission dismissed complaint (docket 13271) of American Communications Association against American Cable and Radio Corp. and Western Union alleging it was improper, in the absence of an appropriate authorization under section 214 of the act, for Western Union to substitute an automatic relay in lieu of manual processing at its New York office for handling between that city and Atlanta, certain AC&R international radiotelegraph traffic.

Participation under international formula.—Mobile Marine Radio again asked that no action be taken on its petition, filed in January 1957, for participation in the distribution of outbound marine traffic from Western Union while the former negotiates with other international telegraph carriers to obtain such participation.

Other Regulatory Matters

Relief and pensions.—General reviews were made of the international telegraph carriers' pension and benefit plans to ascertain for rate-making purposes the reasonableness of the costs to maintain these plans. The carriers' pension plans were continued in effect during fiscal 1960 without major changes.

Depreciation.—Studies were continued to evaluate the reasonableness and propriety of the annual depreciation charges, the book depreciation reserves, and the depreciation accounting practices of the international telegraph carriers. Plans were made to initiate studies for the review of existing rates and possible prescription of new rates.

Continuing property records.—At the close of fiscal 1960 a final review was being made of an international telegraph carrier's proposed property record which had not yet been approved. Advice and assistance were given all carriers in this regard, and studies were pursued to verify the form and content of, and to evaluate the regulatory purposes served by, these records. Substantial compliance with the Commission's rules has been accomplished. These property records have served a useful purpose in the Commission's efforts to effectuate proper regulation.

Accounting compliance.—With the view of further implementing effective regulation, and to assure proper accounting and reporting in compliance with the Commission's rules, limited studies were made of the carriers' accounts, records, and accounting practices. They disclosed several improper practices to which exceptions were taken and concerning which corrective action was required.

Tariff schedules.—During the year, carriers filed 2,402 pages of international tariff material and 57 applications for permission to file tariff schedules on less than statutory notice.

STATISTICS

General

Annual reports were filed by 533 common carriers and 6 controlling companies for the calendar year 1959. Considerable financial and operating data taken principally from these reports are published annually in a volume entitled "Statistics of Communications Common Carriers." 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

Annual reports were filed by 524 telephone carriers, including 115 carriers engaged in general landline telephone service and 409 miscellaneous common carriers, engaged only in providing land mobile radiotelephone service. Sixty-one of the 115 telephone carriers were subject to the comprehensive landline telephone reporting requirements of the Commission and the remaining 54 were required to report on the more limited basis applicable to mobile radio carrier licensees.

Selected financial and operating data concerning 53 general telephone carriers whose annual operating revenues exceed $250,000 are shown in the following table for the year 1959 as compared to 1958.

Telephone carriers [1]

Item	1958	1959	Percent of increase or (decrease)
Number of carriers	53	53	
Book cost of plant (as of Dec. 31)	$21, 998, 473, 853	$23, 692, 805, 199	7. 70
Depreciation and amortization reserves	4, 898, 318, 412	5, 239, 801, 173	6. 97
Net book cost of plant	17, 100, 155, 441	18, 453, 004, 026	7. 91
Local service revenues	4, 178, 551, 133	4, 503, 748, 627	7. 78
Toll service revenues	2, 614, 891, 776	2, 923, 586, 415	11. 81
Total operating revenues	7, 142, 942, 217	7, 798, 579, 328	9. 18
Operating expenses and operating taxes	5, 057, 587, 955	5, 393, 908, 773	6. 65
Provision for Federal income taxes	963. 073, 448	1, 107, 201, 872	14. 97
Net operating income after all taxes	1, 122, 280, 814	1, 297, 468, 683	15. 61
Net income	1, 001, 792, 064	1, 159, 377, 400	15. 73
Dividends declared	670, 136, 909	754, 343, 623	12. 57
Company telephones:			
Business	15, 730, 185	16, 529, 807	5. 08
Coin	1, 147, 594	1, 189, 607	3. 66
Residence	41, 669, 686	44, 318, 073	6. 36
Number of calls originating during the year:			
Local [3]	91, 709, 071, 298	96, 542, 724, 886	(3)
Toll [2]	3, 348, 760, 655	3, 664, 584, 152	(3)
Number of employees at end of October	637, 025	627, 127	(1. 55)
Male	265, 707	265, 077	(. 24)
Female	371, 318	362, 050	(2. 50)
Total compensation for the year	$3, 116, 255, 692	$3, 229, 968, 423	3. 65

[1] Data shown relate to telephone carriers whose annual operating revenues exceed $250,000.00. 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 1959, due to enlargement of numerous local calling areas.

Landline companies filing reports with the Commission include most of the larger companies (accounting for over 90 percent of the industry revenues) but exclude the great majority of the 3,500 telephone companies in the United States. There are also additional thousands of connecting rural or farmer lines and systems. Telephone industry estimates are that its operating revenues in 1959 totaled $8.5 billion, with book cost of plant at December 31, 1959 of $26.5 billion, and 697,000 employees.

Land mobile radiotelephone service is offered by 30 of the 61 telephone carriers reporting to the Commission as "fully subject" carriers. This service is also offered by 54 other carriers engaged in general landline telephone service. In addition, 409 miscellaneous common carriers offer land mobile radiotelephone service. Reports filed by the latter group show that their operating revenues for 1959 totaled $3.8 million. More than half of these carriers reported operating losses for 1959.

Domestic Telegraph Carrier

The following table sets forth financial and operating data relating to the domestic landline operations of The Western Union Telegraph Company for the calendar year 1959 as compared to 1958. The data pertaining to its cable operations are included in tables showing data of international telegraph carriers.

The Western Union Telegraph Company [1]

Item	1958	1959	Percent of increase or (decrease)
Book cost of plant (as of Dec. 31)	$364,497,783	$380,215,771	4.31
Depreciation and amortization reserves	149,692,282	157,381,787	5.14
Net book cost of plant	214,805,501	222,833,984	3.74
Message revenues	185,155,970	194,012,149	4.78
Total operating revenues	240,728,570	260,849,098	8.36
Operating expenses, depreciation and other operating revenue deductions	225,145,413	235,762,335	4.72
Net operating revenues	15,583,157	25,086,763	60.99
Provision for Federal income taxes [2]	4,975,000	11,000,000	121.11
Net income	11,061,731	14,755,185	33.39
Net income (land line and cable systems)	12,660,209	16,685,145	31.79
Dividends (land line and cable systems)	7,505,206	7,941,024	5.81
Number of revenue messages handled [3]	131,866,816	130,992,717	(.66)
Number of employees at end of October	33,620	33,151	(1.40)
Total compensation for the year	$154,032,171	$159,841,768	3.77

[1] Represents data for land line operations. Figures covering cable operations are included in tables below showing data of international telegraph carriers.

[2] Reflects estimated net reductions in Federal income tax liability of $2,132,000 and $2,184,000 in 1958 and 1959, respectively, arising from the utilization, for income tax purposes but not for accounting purposes, of a liberalized depreciation method recognized by Section 167 of the Internal Revenue Code of 1954. Also reflects an estimated net increase of $13,000 and $145,000 in 1958 and 1959, respectively, in Federal income tax liability arising from the use in prior years of five-year amortization authorized under Section 168 of the Internal Revenue Code of 1954.

[3] Includes domestic transmission of transoceanic and marine messages (about 9,544,000 in 1958 and about 10,238,000 in 1959).

International Telegraph Carriers

Financial and operating statistics relating to the United States international telegraph carriers for the calendar year 1959 are shown below as compared to similar figures for 1958. Statistics pertaining to radiotelegraph and ocean cable carriers are also shown separately.

International telegraph carriers

Item	1958	1959	Percent of increase or (decrease)
Number of carriers	9	9	
Book cost of plant (as of Dec. 31)	$154,438,536	$157,557,232	2.02
Depreciation and amortization reserves	82,018,352	83,679,191	2.02
Net book cost of plant	72,420,184	73,878,041	2.01
Message revenues:			
Domestic [1]	2,547,355	3,051,884	19.81
Transoceanic	50,302,692	55,116,246	9.57
Marine	1,781,143	1,782,284	.06
Total operating revenues	77,281,294	84,376,718	9.18
Operating expenses, depreciation and other operating revenue deductions	67,044,376	71,725,467	6.98
Net operating revenues	10,236,918	12,651,251	23.58
Provision for Federal income taxes	4,868,445	5,815,215	19.45
Net income	6,605,154	8,328,258	26.09
Dividends declared [2]	2,120,202	2,013,468	(5.03)
Number of revenue messages handled:			
Domestic [3]	137,272	122,983	(10.41)
Transoceanic	23,348,028	24,493,862	4.91
Marine	1,104,771	1,061,348	(3.93)
Number of employees at end of October	11,182	11,239	.51
Total compensation for the year	$42,855,263	$44,530,765	3.91

Radiotelegraph carriers

Item	1958	1959	Percent of increase or (decrease)
Number of carriers	6	6	
Book cost of plant (as of Dec. 31)	$56,923,518	$58,234,372	2.30
Depreciation and amortization reserves	22,821,079	23,318,432	2.18
Net book cost of plant	34,102,439	34,915,940	2.39
Message revenues:			
Domestic [1]	2,330,961	2,814,912	20.76
Transoceanic	26,705,538	28,680,259	7.39
Marine	1,781,143	1,782,284	.06
Total operating revenues	42,216,032	47,777,980	13.17
Operating expenses, depreciation and other operating revenue deductions	35,240,210	38,138,853	8.23
Net operating revenues	6,975,822	9,639,127	38.18
Provision for Federal income taxes	3,693,445	4,705,215	27.39
Net income	4,569,908	5,707,102	24.88
Dividends declared	1,590,000	1,660,000	4.40
Number of revenue messages handled:			
Domestic [3]	52,542	52,428	(.22)
Transoceanic	13,102,992	13,842,854	5.65
Marine	1,104,771	1,061,348	(3.93)
Number of employees at end of October	5,270	5,371	1.92
Total compensation for the year	$25,127,406	$26,677,489	6.17

Ocean cable carriers (including Western Union cable operations)

Item	1958	1959	Percent of increase or (decrease)
Number of carriers	3	3	
Book cost of plant (as of Dec. 31)	$97,515,018	$99,322,860	1.85
Depreciation and amortization reserves	59,197,273	60,360,759	1.97
Net book cost of plant	38,317,745	38,962,101	1.68
Message revenues:			
Domestic [1]	216,394	236,972	9.51
Transoceanic	23,597,154	26,435,987	12.03
Total operating revenues	35,065,262	36,598,738	4.37
Operating expenses, depreciation and other operating revenue deductions	31,804,166	33,586,614	5.60
Net operating revenues	3,261,096	3,012,124	(7.63)
Provision for Federal income taxes	1,175,000	1,110,000	(5.53)
Net income	2,035,246	2,621,156	28.79
Dividends declared [2]	530,202	353,468	(33.33)
Number of revenue messages handled:			
Domestic [3]	84,730	70,555	(16.73)
Transoceanic	10,245,036	10,651,698	3.96
Number of employees at end of October	[4] 5,912	[4] 5,868	(.74)
Total compensation for the year	$17,727,857	$17,853,276	.71

[1] Includes revenues of 2 ocean cable carriers and the radiotelegraph carriers from the domestic transmission of transoceanic and marine messages outside of points of entry or departure in the United States, and revenues from domestic-classification messages (primarily Canadian and Mexican).

[2] All dividends declared by Western Union Telegraph Co. have been reported in the table above relating to the domestic land line operations of that company and are excluded from this table.

[3] Represents domestic-classification messages (primarily Canadian and Mexican).

[4] Certain employees of 1 radiotelegraph carrier and 2 ocean cable carriers serve more than 1 of the companies. The amounts of compensation reported for each of these companies are after intercompany charges and credits. As a result, the number of employees and total compensation shown are not on the same basis.

Common Carrier Applications

Over 5,600 applications were filed with the Commission by common carriers during the fiscal year (exclusive of Alaskan and marine mobile). The following table shows the number of applications according to class of service:

Class	Pending June 30, 1959	Received	Disposed of	Pending June 30, 1960
Radio facilities				
Domestic:				
Pt/pt microwave radio stations	206	1,926	2,024	108
Local television transmission stations	2	33	35	
Rural radio stations	42	369	345	66
Domestic public land mobile radio stations	121	937	993	65
Developmental stations	3	72	70	5
Registration of Canadian radio station licensees		29	29	
International:				
Fixed public and fixed public press telegraph	1	134	125	10
Fixed public telephone		78	72	6
International control		4	4	
Subtotal	375	3,582	3,697	260
Wire facilities				
Telephone extensions	7	225	223	9
Telegraph extensions	2	101	98	5
Telephone reductions	4	6	10	
Telegraph reductions	107	1,000	1,013	94
Subtotal	120	1,332	1,344	108
Miscellaneous				
Interlocking directorates	1	7	8	
Jurisdictional determination				
Submarine cable landing licenses	1	1	1	1
Petitions or motions (nondocket)		9	9	
Renewals		681	617	64
Subtotal	2	698	635	65
Total	497	5,612	5,676	433

Field Engineering and Monitoring

GENERAL

Thirty-one enforcement offices, 18 monitoring stations and 2 TV mobile monitoring units bring the Field Engineering and Monitoring Bureau in close touch with the public, industry and governmental users of radio. This contact is necessary to enforce related provisions of the Communications Act, Commission rules and international treaties and enables the Commission to render service at the local level.

Twenty-four establishments in key cities are designated as district offices, 5 as sub-offices and 2 as marine offices. Ten primary monitoring stations provide 24-hour-a-day technical and noncensorship surveillance of the spectrum. Eight secondary or backup stations increase the monitoring range and coverage. The 2 TV mobile units bring precise measurement equipment to the "door" of video stations. The Commission's enforcement staff, employing 42 investigative, 9 test, and 2 microwave cars, makes specialized inspections, signal analysis, investigations of unlicensed stations, and solutions of interference cases. Over 50,000 personal contacts of home and industry installations were made during the year.

Since the number of radio stations increases at a greater rate than the Commission is able to add staff and equipment, there is a constant need to meet problems by means of improved procedures and cooperative arrangements. The result is that self-help organizations have become part of the field operations system. As a result, the number of interference cases handled has leveled off, no increase being noted this year.

The following illustrates the accomplishments of the field service and furnishes a cross section of its activities, especially those of general interest.

INSPECTION

Broadcast Station Inspections

New AM and FM broadcast stations are given a detailed technical inspection after construction has been completed but before issuance of license. This procedure not only insures that all engineering defects are remedied before the Commission grants a license but also provides an initial contact between the licensee and the field engineers. It resolves many problems which might otherwise develop into major

violations and improves the level of technical service to the public. During the year 345 inspections were conducted of new stations. Of this number 66 percent were found to be in technical compliance. The others were subsequently cleared after correcting discrepancies.

A 1960 analysis disclosed a gradual increase in the percentage of broadcast stations inspected which do not comply with the regulations. For example, in 1954, 34 percent of the stations inspected failed to meet some rule or license requirement whereas in 1960 this percentage had risen to 64.9 percent. It disclosed that the most frequent deficiencies concerned inaccurate or missing indicating instruments, failure of transmitters to meet construction and safety (high voltage) requirements, lack of acceptable performance measurements, inability to maintain operating power within tolerance and lack of minimum operator compliance. To combat this trend, field offices are making a concentrated effort to effect better compliance by stations in their equipment and operating practices.

Marine Station Inspections

Compulsorily equipped vessels.—The United States by law and treaty requires that an efficient radio system be installed aboard certain classes of vessels. This includes large ocean liners and small passenger ships carrying more than 6 passengers for hire. This means that more than 5,000 vessels must be inspected annually or biennially and issued certificates of compliance before they can be legally placed in service. Seasonal variations make this work difficult. This year intense activity began with the spring thaw on the Great Lakes in April and nearly 500 vessels had to be inspected during a very limited period. Likewise, small passenger boat operations increase during the summer months so that most inspections are requested during a 3-month period. A further problem results from the fact that many small boats operate in remote areas and may or may not be subject to the law depending on the number of passengers carried for hire.

As a party to the Safety of Life at Sea Convention, the United States inspects foreign vessels upon request of member governments. Some of these inspections could not be made because of the necessity of giving priority to domestic vessels. However, 90 foreign vessels were inspected.

Sea disasters are investigated by the field to evaluate the part that radio plays in promoting safety of navigation. During the year 38 such cases were reported on.

The Commission's marine enforcement efforts have been aided materially by voluntary groups such as the U.S. Coast Guard Auxiliary and U.S. Power Squadrons. The former conducts courtesy inspections and advises boatowners of the requirements of the Commission's

rules while the latter has adopted an educational program that requires members to demonstrate knowledge of the regulations and operating practices by qualifying for the radiotelephone third class operator permit.

As a consequence of the Commission's marine enforcement program, criminal convictions were obtained in 2 cases, with fines totaling $550, and 2 additional cases were pending before United States Attorneys. One of the cases referred to the Department of Justice for prosecution involved transmitting a false distress call on a distress frequency. This was a joint action by the Coast Guard and the FCC.

Twenty-four cases involving transmission of indecent language were investigated during the year. Five were sufficiently serious to refer to the Department of Justice and warning letters were issued in the others. In addition, about 25 licensees who failed to submit satisfactory answers to violation notices received warnings. Also, 276 owners of boats using unlicensed transmitting equipment were warned to file applications or face penalties.

Voluntarily equipped boats.—The annual increase in the number of small commercial transport, pleasure and fishing vessels operating in the 2–3 Mc band and the disregard of many licensees for the rights of others continue to be a major enforcement problem. At the end of 1960 there were 85,981 boats voluntarily radio-equipped. A campaign during the past several years resulted in some improvement; however, much more work remains to be done.

Misuse of the radiotelephone distress frequency of 2182 kc and transmission of superfluous communications with disregard for distress traffic or priority messages is a current major problem. One factor responsible for overcrowding of the radiotelephone frequencies is the illegal use of ship stations as fixed coastal stations. Inspections have disclosed an increasing use of radio-equipped barges which frequently have permanent wire telephone connections to shore. Special effort is being made to deal with this type of illegal operation.

Other Radio Services Inspections

Since it is impossible for the Commission's limited field staff to inspect all radio stations, it must limit this activity to problem areas. Continuing sampling determines services having serious enforcement difficulties.

The problems most frequently encountered were operation beyond the scope of the authorization, inconsiderate use of crowded channels to the detriment of other licensees resulting in serious interference problems, and carelessness in maintaining license status resulting in illegal operation. For example, many licensees in the public safety service allowed their authorizations to expire without filing renewal

applications. Similarly, a survey of 1,833 privately owned aircraft stations disclosed that 558 had failed to apply for a station authorization. In both instances enforcement action together with an educational drive were effective in improving compliance. In the case of the aircraft survey, 359, or 64 percent of the negligent ones, promptly filed applications and were issued licenses and applications have since been received from most of the remainder.

Implementation of the split-channel rules which made additional frequencies available to the nonbroadcast services required technical changes in the transmitting equipment of existing stations. Field offices were responsible for measuring the frequency and modulation to determine if operation was in accordance with the new regulations. A limited number of mobile frequency meters able to measure the frequency of split-channel stations and modulation monitors specially designed for measurement of the narrow-band FM emissions were used. Each set of equipment is shared by several offices so that maximum coverage of the Nation may be obtained with the limited measuring facilities available. An analysis of 223 measurements of frequency and modulation made by 4 district field offices disclosed that only 12 stations were failing to comply with the technical limitations governing split-channel operation. The fact that 95 percent of the stations measured were operating within allowable tolerances is indicative of the degree of success in added utilization of this portion of the spectrum.

ENGINEERING

Encroachment on Monitoring Stations

Fixed monitoring stations are the most economical way to cover the large portion of the radio spectrum occupied by long-range radio stations. Manmade obstructions (large buildings, power transmission lines, etc.) are detrimental to accuracy of long-range direction finders on which the Commission depends for the location of unlicensed and clandestine stations and sources of interference to authorized operations.

Although extreme care is taken in selecting new monitoring station sites, taking into account anticipated industrial or population growth in the area, a number of monitoring stations which were constructed before World War II are experiencing growing difficulty in coping with the effects of the population and industrial expansion of recent years. One of the new interstate highways is scheduled to cut through the Laurel, Md., monitoring station property, necessitating relocation of a number of facilities. Suburban expansion has resulted in the Portland, Oreg., monitoring station being completely surrounded by homes, highways and other potent electrical noise sources. However,

the most serious present problem is the Santa Ana, Calif., monitoring station which is in a rapidly expanding industrial area, with electrical noise extending to ever higher levels. Emphasis is being given the search for suitable excess Federal land to which the Santa Ana station can be relocated. Relocation is also planned for the Portland station.

Equipment Problems

The high cost of technical equipment has made it impossible to adequately equip field offices and stations for complete surveillance. Some types of more costly instruments must be shared by several offices.

Equipment to meet FCC's special needs often is not commercially available, and the cost of having such equipment designed and built to order would be prohibitive. Equipment available from excess Government property listings is not usually of the specialized types required. The bureau's Equipment Construction and Installation Branch at Powder Springs, Ga., provides a partial solution to this problem by designing and constructing some of the more urgently required specialized equipment, but the problem is still a major one. All primary monitoring stations are placing increased emphasis on devising improved engineering techniques and creating new equipment, or modifying existing equipment, to meet the challenge of the heavily increasing volume and complexity of technical observations.

Need is constantly arising for equipment capable of more precise or more complex measurements. However, it is not feasible to supply or provide all offices and stations with such equipment at the same time. Nevertheless, progress is being made. For example, all primary stations have been furnished modern spectrum analyzers to permit visual analysis of signals over a large portion of the spectrum. A start has been made in furnishing special oscilloscopes for analysis of pulse-modulated emissions; improvement and augmentation of directional monitoring antenna systems is in progress, and various programs are underway toward improvement and modernization of technical equipment and instrumentation essential to field engineering activities.

During the year a new improved direction-finder installation was made at the Searsport, Me., monitoring station and a similar installation is nearing completion at the new Canandaigua, N.Y., station (replacing the Millis, Mass., monitoring station), thus completing the 6-year program for furnishing FCC-designed and constructed automatic long-range direction finders to all monitoring stations.

TV and FM Broadcast Station Measurements

The number of TV and FM broadcast stations has grown to the point where it is not possible for the 2 mobile TV enforcement units to

make a once-per-license-term check. In the interest of providing the public with good interference-free TV and FM broadcast reception it is desirable that thorough on-the-air technical checks be made by each station at least once during its license period. However, because of the time required for such a check at each station, plus the great distances which must be traveled by the equipment-laden units to cover all parts of the country, only about one-fifth of the stations in operation can be covered each year. Even with a third unit, about 3 years would elapse between checks.

Experience with the 2 present mobile TV enforcement units points up the benefits derived from active enforcement of the technical provisions of the rules. Actual on-the-air checking of TV and FM emissions is necesary in order that specific technical deficiencies, not otherwise detectable, can be brought to attention for appropriate action. For example, transmission of defective "sync" pulses by a TV station means that the picture will be unstable on receivers; transmission of spurious off-channel radiation can cause interference to other TV stations or to important radio communication services.

INVESTIGATION

Industrial Heaters

Serious interference to air navigation radio aids, police, TV, and other radio services caused by plastic heaters in and around New York City and other industrialized areas has largely been eliminated, at least for the present. An intensive campaign by FCC field engineers supported by the Radio Interference Committee of the Society of the Plastics Industry, Inc., has impressed on heater users the dangers to safety services that can result from uncontrolled emissions. Most of the offending heaters that have come to the attention of FCC field engineers have been corrected, but there remains the problem of getting heaters certified. At the close of the year 32 plants investigated for interference had heaters still uncertified. The Commission proposed modified rules to expedite proper certification (docket 13511).

Low Power Communication Devices

Local interference problems are aggravated by persons who operate low-power communication devices which exceed the radiation limits prescribed in part 15 of the Commission's rules. Unlicensed use of wireless microphones, phonograph oscillators, electronic "baby sitters," home intercommunication systems, remote control of model airplanes, etc., is permitted on certain frequencies but under strict limitations as to power, antenna length and radiation.

But many of these operations exceed the limits and interfere with licensed radio services. This is especially true of juveniles using mail-

order kits of home-assembled equipment to "broadcast" voice and records to a neighborhood. Besides taking action against violators, the Commission continues to seek the cooperation of manufacturers, sellers, and users of such devices to see that they are certified as meeting technical requirements.

Carrier Current Broadcast Systems

There is continued interest on the part of colleges, churches, and individuals to establish carrier current broadcast systems or to increase the power of existing systems. However, to avoid interference to licensed broadcast stations, section 15.7 of the rules limits radiation so that associated receivers must either be connected directly to the distribution cable or in close proximity.

Sampling investigations over the years have consistently indicated a tendency to exceed the allowable radiation limits. Operators have been warned of the consequences that could result from excessive radiation, but there is particular difficulty with colleges because of changing student bodies in charge of so-called "campus" broadcast systems. Lack of personnel has made it impossible to investigate the carrier current systems at all colleges. The Commission is studying proposals in docket 9288 for possible amendments to the existing regulations.

CATV Systems

Community antenna television (CATV) systems are operating with little or no interference to authorized radio services. In a few instances, interference has been caused to direct reception of licensed TV stations due primarily to radiation from the cable distribution system, but in all instances prompt corrective action was taken by the CATV operators. Also, in a few instances, there have been reports of CATV systems interfering with unlicensed VHF translators.

Unlicensed Transmissions at Race Tracks

The apprehension of operators of illegal transmitters at race tracks for "beating the bookies" is becoming increasingly difficult because of the trend toward miniaturizing of transmitters and the fact that a concealed low-power transmitter may send a hundred feet or so to a confederate. Track officials cooperate by advising FCC investigators the most opportune times to cover the race tracks when illegal radio operation is suspected.

Interference

The number of interference complaints has reached a plateau from its upward trend of the past few years. While no statistics are available showing the number of interference cases solved by industry and radio users cooperative committees, these self-help groups have been

of great assistance in handling many minor complaints which otherwise would have been the Commission's responsibility.

Although electrical apparatus is the principal cause of manmade radio noise, equipment that uses radio-frequency energy often is the worst offender in producing harmful interference. For example, on the West Coast a fixed point-to-point radio station complained of severe interference to the Tokyo circuits. Upon investigation, FCC engineers found the trouble in the licensee's own transmitting station. In Baltimore, FCC engineers, responding to a complaint of TV interference, located the trouble in an antiquated TV set which was transmitting its own signal.

Interference caused by electrical apparatus generally is local in nature and is eliminated through the cooperative efforts of radio listeners and the operators of the faulty apparatus. Power companies are very cooperative in maintaining their lines and stations in good repair and in providing operating crews to hunt down interference.

Cooperative groups combating interference.—Industry and radio user groups cooperating with the FCC in curbing interference are:

Cooperative Interference Committees (CIC), 34 in operation, composed of engineers, industry executives, Government officials, and others interested in resolving mutual interference problems.

Television Interference Committees (TVIC), numbering 561, representative of amateur radio operators, radio and TV repairmen, and others interested in voluntarily contributing their skills in eliminating radio and TV interference in their communities.

Induction and Dielectric Heating Subcommittee of the Electric Heating Committee of the American Institute of Electrical Engineers, which studies problems of industrial heater installations with the view of developing improved methods of measuring radiation.

Radio Interference Committee of the Society of The Plastics Industry, Inc., which recommends to the users methods of reducing plastics heater interference.

Joint Industry Committee on High Frequency Stabilized Arc Welders of the National Electrical Manufacturers Association, which aids users of radio-frequency welding devices to control interference.

Marine user organizations called marine councils cooperate with the Commission in efforts to bring about a better degree of compliance with the regulations for operation by boats on the distress frequency 2182 kc. Examples of marine councils are the North Pacific Council, the Southern California Marine Radio Council, the National Party Boat Alliance and the Texas Shrimp Association.

Unlicensed Operation

Unlicensed operation of radio transmitters varies from deliberate, premeditated operation—such as the case of Cuban refugees who set up a transmitter on the Florida Keys to broadcast propaganda to the Cuban people—to the misguided teen-ager who never heard of the FCC or its regulations. Between these extremes lie the vast majority

of unlicensed operation, such as the overzealous salesman who installs equipment and advises the customer that it can be operated until a license is received from the FCC.

An article which appeared in a national youth magazine about a low-powered broadcast station operated by youths in California was responsible for an increase in unlicensed broadcast operation by youngsters. In one instance a young man was conducting a "man on the street" interview program over his unlicensed broadcast station and one of the curious on-lookers was an FCC engineer who promptly terminated the operation. A youth in New England interviewed on a weekend national network program was heard by an alert field engineer and his broadcast station was subsequently closed, only to have his irate father protest to his Senator.

The "hoax" type of radio transmission is the most serious. In the Pacific Northwest an inebriated owner of a small vessel transmitted the international radiotelephone distress call of "MAYDAY" and stated he was sinking though he was actually tied to a dock. Fortunately, before the U. S. Coast Guard attempted to launch a rescue boat in a 60-mile-an-hour gale, it was determined that the distress call was false. The case has been recommended for prosecution.

Investigation of TV-VHF Boosters

Until VHF translater rules were adopted (see Broadcast) unlicensed VHF repeaters (boosters) were a particular field investigation problem. Sixty-one such installations were found during the year as compared with 215 the previous year. This brought to about 500 the number that came to the Commission's attention. Most of them serve small communities in isolated mountainous country in the Western States. They now have opportunity to obtain temporary authorization to continue operation pending their compliance with the new translator requirements.

MONITORING

Marine Monitoring

Enforcement of regulations pertaining to small boat radio stations on the 2–3 Mc frequencies continued to be the most pressing marine monitoring problem. Considerable improvement has been noted but there are still too many unidentified radio transmissions being made in this service to avoid detection or through carelessness and ignorance. Several years ago recording of voices of serious violators was begun. This has led to the arrest and conviction of several operators who thought they could not be identified. Failure of small boat radio operators to comply with the rules creates unnecessary interference to conforming licensees. Additionally, such interference on the 2182 kc radiotelephone distress frequency has, in fact, hindered rescue opera-

tions. The Commission is continuing to meet this problem through educational talks by its field engineers to both commercial and pleasure boat groups, and by coordinating monitoring and ship inspections to detect serious violations.

Broadcast Monitoring

Although such abuses as "payola" and "plugola" cannot be detected by monitoring, technical surveillance of broadcast transmission was stepped up to check for such rule violations as lotteries, indecent or obscene language, failure to identify sponsorship of progams or station call letters, point-to-point communication, etc. Further measurements made of relative percentages of modulation during program and commercial announcements found no basis for complaints that "loudness" of commercials violates the rules; e.g., modulation in excess of 100 percent.

Examples of improper practices observed during broadcast monitoring surveillance were: A broadcast station continued operation after the expiration of its license in spite of repeated notices by the Commission that application for renewal of license had not been filed. A "disc jockey" played the same record continuously for more than 2 days even though he announced it by different names each time. Investigation disclosed no evidence of "payola" but a misguided effort to attract attention to the station. "Teaser" spot announcements in violation of the sponsor-identification requirement were detected, together with other instances of failure to properly identify the sponsor during "spot" announcements. A number of daytime-only broadcast stations were observed and cited for coming on the air too early or remaining on after the required sign-off time.

Monitoring the Citizens Radio Service

The opening of a Class D 27-megacycle band for communication in this service triggered a deluge of low-cost equipment into the hands of an eager public. Improper procedural operations by uninformed users contributed toward an increased monitoring workload; however, the inherent inadequacies of low-cost equipment in meeting technical requirements, particularly with respect to frequency control, were equally conspicuous. Off-frequency citations in this service outnumbered all other services combined.

Although new rule changes effective March 15, 1960 clarified the operating requirements, a concentrated monitoring effort was necessary to check a massive drift toward undesirable operations, particularly the desire of licensees to communicate with distant stations similar to amateur operation, that threatened to create bedlam on the band. This problem has been partly solved as regards long-distance communications but local "hamming" is up, if anything.

The service is still plagued by off-frequency violations requiring concentration of monitoring effort.

Monitoring Solution of Interference

The increased density of radio operation has resulted in many instances where Commission engineers are called upon to locate a source of serious interference only to find that it is being caused by the complainant's own equipment. Although this often occurs at multiple-transmitter installations, many cases of interference have been found to originate in receivers and even in totally unrelated equipment such as thermostats and similar electrical apparatus.

Licensees, the general public, other Government agencies and foreign countries continue to request FCC monitoring assistance in identifying and solving cases of radio-frequency interference. Typical cases handled were:

An electronic heater used for drying glue in a piano factory in Michigan was located as the source of strong interference extending over a considerable area in the Midwest and disrupting commercial airline radio operations.

The FCC monitoring network was twice called upon to identify transmissions causing interference to a frequency used by the President's plane. In one instance, the interfering signal was found to be originating in Africa. The appropriate agency was notified so that corrective action could be taken.

A steady signal interfering with marine operations was positioned as originating in the Philippine Sea. The Coast Guard later advised that the signal was actually from a vessel in distress in that area. In another case, a broadcast station harmonic was identified as an invader of a Coast Guard search and rescue radio channel.

Illustrative of long-range international cases worked on by the FCC monitoring network is the instance of a transmitter in India identified as the source of interference to reception in Switzerland of messages from the United States. In another such case, spurious emissions from a station in Hawaii were found to disrupt reception in New Zealand of communications from the United States.

Monitoring Search and Rescue Assistance

Safety of life at sea and in the air continued to receive high priority monitoring attention. The FCC long-range radio direction-finding network furnishes "fix" information for search and rescue missions.

Among representative cases was one in which transmissions were intercepted from a ship making urgent calls for a medical doctor. The direction-finding net furnished a fix to the Coast Guard enabling the latter to dispatch aid to the vessel in the Gulf of Mexico. Another case involved a Navy aircraft which had developed engine trouble over the Pacific forcing the pilot to ditch his plane in the ocean. FCC bearings were taken on the low-power liferaft transmitter, and the fix was radioed to the nearest surface ship. The vessel was enabled to rescue 10 men from 2 tossing liferafts.

Even surface craft occasionally find themselves in trouble. In response to a radio call for help, the position of a small vessel, disabled and helpless on the high seas west of Oregon, was determined by FCC direction-finder bearings. The necessity for a radio fix of high accuracy was imperative, for the ship was lost in fog which would critically hamper visual contact. The Coast Guard dispatched a rescue vessel to the fix area and towed the distressed craft to port.

Through cooperation with military services, lost time and wasted effort on false-alarm distress cases have been reduced to the point where this situation is no longer a problem. These cases usually arose through carelessness or inadequate electrical protection of distress circuits.

Cases of false distress have likewise diminished. Punishment inflicted by courts on the would-be hoaxers has been helpful. An example of such justice was one where the perpetrator of an attempted hoax was located by FCC mobile direction finders, although he had transmitted a fictitious location. He was convicted and, as part of the sentence, was required to reimburse the Coast Guard for expenses of rescue operations which resulted from his false distress signals.

Emergency Monitoring Operations

Within the limitation of available funds, steps are being taken to improve the protection of FCC monitoring facilities under emergency conditions. These measures are aimed primarily against hazards of fallout radiation and to bolster the emergency communication links between headquarters and the field network so as to preserve an effective, coordinated monitoring and direction-finding system during a national emergency. Rather than remaining static as an idle investment, the emergency facilities are, in general, designed to actively supplement regular operations and functions.

Microwave Monitoring

Propagation peculiarities of microwave signals, including their directivity somewhat like that of a searchlight beam, make extensive microwave coverage by fixed monitoring stations impracticable. Coverage by specially equipped mobile units is, therefore, necessary. Because of personnel limitations, these units can be manned for microwave monitoring only when other important work is dropped. However, they have proved indispensable for this purpose. For example, interference to a NIKE installation was traced by one microwave unit to radiations from a TV station several miles away.

Space Monitoring

The Commission's responsibilities in spectrum surveillance include those frequencies which are used or which may be assigned for com-

munication between the earth and vehicles in space. This aids in insuring that maximum use is made of the available frequencies and in locating and eliminating sources of interference.

When Sputnik I commenced its around-the-world "beep-beeping," the observations and radio bearings by FCC monitoring stations were the first organized United States attempt to track earth satellites. Later, more specialized tracking equipment was brought into play by other agencies. Commission functions do not involve precision tracking of satellites, and its space-monitoring equipment is by no means as elaborate as that of a space laboratory or space-tracking station. However, the available facilities at the monitoring stations, plus the specialized experience of monitoring station personnel in spectrum surveillance, has proved of value when interference problems arise.

Considerable progress was made during the past year in equipping certain monitoring stations with special instruments for monitoring transmissions from space. Highly directional antennas, low-noise amplifiers and automatic-surveillance devices were constructed and placed in service at the Powder Springs, Kingsville, Santa Ana, Portland, and Waipahu monitoring stations. It is planned to purchase additional equipment, including special instruments for space channels above 1000 Mc, during 1961. With these added facilities, FCC will be able to provide effective monitoring surveillance over any frequencies which are assigned for space-to-ground and ground-to-space operations.

Federal Contractual Services

The field bureau continued to furnish technical services to various Federal agencies on a reimbursable-cost basis. These services consisted of monitoring, direction finding, and field strength recording on weather balloons, airplanes, and floating buoys for the purpose of supplying scientific data for defense and research programs. The funds received have been expended mainly for personal services. However, equipment has been purchased where necessary to the projects.

Through this cooperation, other Federal agencies have been able to fulfill their requirement for expert monitoring and direction-finding services at lower cost than could be provided by similar facilities established and operated by the agencies themselves. Further, these agencies have expressed their appreciation for this Commission's assistance to the success of their defense and research projects.

The cost of FCC monitoring and direction-finding services furnished to other agencies for fiscal year 1960 approximated $200,000, for which the Commission was reimbursed by the agencies served for the manpower and work involved.

COMMERCIAL RADIO OPERATORS

Normally, the actual operation of all radio stations licensed by the Commission is required by law to be carried on by licensed operators. The Commission is authorized to waive the operator license in some circumstances and, for a number of years, has waived it for the "push-button" operation of most mobile stations on land, such as those installed in automobiles and locomotives, and most base and fixed stations in the railroad and citizens radio services.

Several years of regulatory experience with such stations indicated no serious difficulty resulting from the license waivers and the Commission, therefore, undertook through rule changes to extend the waiver to many additional base and fixed stations. These rule changes became effective during the year. They extend the waiver to base and fixed stations operating above 30 Mc (above 25 Mc in some cases) in the industrial, land transportation, and domestic public land mobile services. In waiving licensed operator requirements the Commission places full responsibility upon the station licensees for proper operation of the stations. Technical changes in transmitting equipment still must be made by qualified licensed operators.

This change in operator requirements should help to level off the growing operator license application load which this year reached the unprecedented figure of 329,000, or about 4 percent over the 1959 total.

The processing of operator applications is a burdensome task that the Commission is continually endeavoring to streamline. One method of increasing efficiency was the adoption of IBM grading for both commercial and amateur examinations. This has helped speed up the time required in the grading process.

Another step, initiated in 1960, was revision of all the elements of the commercial examinations. This will test an applicant's knowledge of basic radio theory, recent technical developments in communications equipment, and reflect changes in radio laws and treaties.

Pursuant to Public Law 85–817, the Commission amended its rules to provide for waiving the citizenship requirement for alien aircraft pilots and for licensing them to operate radio stations on aircraft. To be eligible, aliens must hold a United States pilot certificate and be lawfully in this country. Operator licenses issued to aliens have a term of 1 year. The Commission provides a special application form (FCC Form 755).

Radio operator candidates are examined at points throughout the United States and possessions at regular intervals. Examination time and the location of examination points are determined on the basis of area need. The frequency of examinations ranges from daily at offices in the larger metropolitan areas to quarterly, semiannually,

and annually at other places. During the year, the Commission established an annual examination point at Fairbanks, Alaska, and in Montana moved an annual examination point from Butte to Great Falls.

The Commission on 14 occasions took disciplinary action against licensed radio operators by suspending licenses. Suspension was for such matters as transmitting profane and obscene language, operating unlicensed transmitting apparatus, employing improper operating procedures, interfering with other radio stations, obtaining an operator license by fraud, and failing to carry out lawful orders.

ANTENNAS

Tall TV Towers

The frequency bands utilized by TV broadcast stations make their coverage normally limited to line-of-sight. Therefore, the areas served by a broadcaster depend to a great extent upon tower height. The utilization of tall towers permits an efficient use of the spectrum by enabling stations to serve broad areas without significantly increasing interference to other stations on the same channel.

During the year 11 additional TV transmitting towers over one thousand feet were placed in operation. In October 1960 the 1,676-foot tower of KFVS–TV, Cape Girardeau, Mo., became the world's present tallest manmade structure. Construction permits are outstanding for two other towers in excess of 1,500 feet in height. Applications proposing six other such towers are pending, of which, one for 1,760 feet at Columbus, Ga., will be used jointly by WRBL–TV and WTVM. A proposed 1,859-foot shaft for WHAS–TV, Louisville, Ky., was denied in an initial decision because of air hazard and other considerations.

Antenna Application Processing

Part 17 of the Commission's rules provides for the painting and lighting of antenna structures pursuant to provisions of the Communications Act which stipulates that the Commission require this when in its judgment such towers constitute a menace to air navigation. Part 17 contains criteria for determining whether proposals for new or modified antenna structures require special aeronautical study by regional airspace subcommittees of the Air Coordinating Committee (ACC). The ACC was created by Executive Order to coordinate and make recommendations on civil and military aviation matters that affect more than one agency of the Government. Antenna proposals that do not exceed the criteria are approved by the Commission subject to its requirement governing obstruction markings.

The number of antenna proposals processed by the Commission during fiscal 1960 for all radio services reached a record high of

22,940 due principally to the sharp increase in nonbroadcast applications which jumped from 14,615 in fiscal 1959 to 20,177. The backlog of pending applications for all services requiring antenna processing decreased during the year from 2,909 to 1,564.

FIELD ENGINEERING OFFICES AND MONITORING STATIONS

A list of field engineering district offices and monitoring stations follows:

1_____ 1600 Customhouse, Boston 9, Mass.
2_____ 748 Federal Bldg., New York 14, N.Y.
3_____ 1005 New U.S. Customhouse, Philadelphia 6, Pa.
4_____ 400 McCawley Bldg., Baltimore 2, Md.
5_____ 402 Federal Bldg., Norfolk 10, Va.
6_____ 718 Atlanta National Bldg., Atlanta 3, Ga.; (suboffice) 214 Post Office Bldg., Savannah, Ga.
7_____ 312 Federal Bldg., Miami 1, Fla.; (marine office) 201 Spradlin Bldg., Tampa 6, Fla.
8_____ 608 Federal Bldg., New Orleans 12, La.; (suboffice) 419 U.S. Courthouse and Customhouse, Mobile 10, Ala.
9_____ 326 U.S. Appraisers Bldg., Houston 11, Tex.; (suboffice) 301 Post Office Bldg., Beaumont, Tex.
10_____ Room 401, States General Life Insurance Bldg., Dallas 2, Tex.
11_____ 849 South Broadway, Los Angeles 14, Calif.; (suboffice) 1245 Seventh Ave., San Diego 1, Calif.; (marine office) 356 W. 5th St., San Pedro, Calif.
12_____ 323-A Customhouse, San Francisco 26, Calif.
13_____ 201 New U.S. Courthouse, Portland 5, Oreg.
14_____ 806 Federal Office Bldg., Seattle 4, Wash.
15_____ 521 New Customhouse, Denver 2, Colo.
16_____ 208 Federal Courts Bldg., St. Paul 2, Minn.
17_____ 3100 Federal Office Bldg., Kansas City 6, Mo.
18_____ 826 U.S. Courthouse, Chicago 4, Ill.
19_____ 1029 New Federal Bldg., Detroit 26, Mich.
20_____ 328 Post Office Bldg., Buffalo 3, N.Y.
21_____ 502 Federal Bldg., Honolulu 13, Hawaii
22_____ 322-323 Federal Bldg., San Juan 13, P. R.
23_____ 53 U.S. Post Office and Courthouse Bldg., Anchorage, Alaska; (suboffice) 6 Shattuck Bldg., Juneau, Alaska
24_____ Room 106, 718 Jackson Place, NW., Washington 25, D.C.

Primary Monitoring Station	*Secondary Monitoring Station*
Allegan, Mich.	Searsport, Maine
Grand Island, Nebr.	Spokane, Wash.
Kingsville, Tex.	Douglas, Ariz.
Canandaigua, N.Y.	Fort Lauderdale, Fla.
Santa Ana, Calif.	Ambrose, Tex.
Laurel, Md.	Chillicothe, Ohio
Livermore, Calif.	Anchorage, Alaska
Portland, Oreg.	Fairbanks, Alaska
Powder Springs, Ga.	
Waipahu, Hawaii	

STATISTICS

Field engineering statistics for fiscal 1960 in comparison with 1959 follow:

Field inspection statistics

Class of station or service	United States		Foreign	
	1959	1960	1959	1960
Compulsory ship stations				
Authorized stations	[1] 5,801	[2] 5,370		
Inspections made subject to—				
Title III, part II, of Communications Act	1,106	1,248	2	4
Title III, part III, of Communications Act	780	2,091		
Safety of Life at Sea Convention			76	90
Great Lakes agreement	535	465	5	0
Portable lifeboat equipment at Coast Guard request	1,025	729		
Total	3,446	4,533	83	94
Violation notices served	1,150	1,369	24	14
Violations corrected during inspection	2,791	2,648	98	88
Certificates of compliance issued	2,174	3,020	74	71
Voluntary ship stations				
Authorized stations	73,516	85,981		
Inspections made	1,675	1,657		
Violation notices served	924	621		
Notices of unlicensed operation	421	481		
Broadcast stations				
Authorized stations	10,120	11,179		
Inspections made	1,048	1,518		
Violation notices served	655	980		
Other radio stations (including aircraft but excluding ship and amateur service)				
Authorized stations	233,935	333,684		
Inspections made	6,172	6,592		
Violation notices served	1,509	1,780		
Notices of unlicensed operation	836	842		

[1] Includes estimated 4,000 title III, part III, vessels.
[2] Includes estimated 3,500 title III, part III, vessels.

Investigative statistics

	1959	1960	Increase or (decrease)
Interference complaints received by FCC:			
Interference to monochrome TV	20,018	19,049	(969)
Interference to color TV	56	56	0
Interference to aural broadcast	2,225	2,561	336
Interference to amateurs	343	436	93
Interference to other services	1,394	1,833	389
Total	24,036	23,985	(151)
Interference investigated by FCC	15,811	15,658	(153)
Other investigations by FCC	993	999	6
Total	16,804	16,657	(147)
Number of Cooperative Interference Committees	32	34	2
Number of TV Interference Committees	525	561	36
Total	557	595	38
Unlicensed TV boosters (found)	215	61	(154)
Other unlicensed operations	114	389	275
Total	329	450	121
Indecent language cases	24	40	16
Unauthorized divulgence of radio communications	6	16	10

Monitoring statistics

	1959	1960	Increase or (decrease)
Source and number of major interference complaints:			
U.S. Air Force	423	337	(86)
U.S. Army	71	58	(13)
U.S. Navy	75	52	(23)
U.S. Coast Guard	170	181	11
Federal Aviation Agency	59	78	19
Other Government agencies	64	25	(39)
Law enforcement agencies	34	19	(15)
Commercial air lines	57	43	(14)
Other commercial concerns	625	632	7
Foreign governments	9	4	(5)
Total	1,587	1,429	(158)
Cases monitored and developed:			
Major:			
Interference	2,342	2,103	(239)
Noninterference	1,668	1,358	(310)
Total	4,010	3,461	(549)
Minor:			
Interference	4,731	4,472	(259)
Noninterference	10,589	8,300	(2,289)
Total	15,320	12,772	(2,548)
Survey cases	52	21	(31)
Contractual cases for other Government agencies	7	6	(1)
Type of action:			
Monitoring net alerts	11,314	8,230	(3,084)
Direction finder bearings:			
Case bearings	80,324	50,128	(30,196)
Search and rescue	2,340	1,784	(556)
Calibration of equipment	55,015	42,655	(12,360)
Total bearings	137,679	94,567	(43,112)
Signals identified and indexed	96,801	96,482	(319)
Monitoring reports to International Frequency Registration Board:			
FCC	38,956	39,921	
Commercial companies (via FCC)	52,000	50,130	
Total	90,956	90,051	(905)
Monitoring observers participating in training program	117	101	(16)
Citations:			
Broadcasts (includes television)	331	338	7
Ships	2,362	2,458	96
Amateur	5,639	5,417	(222)
U.S. Government	827	657	(170)
Foreign governments	4,913	5,606	693
All others	665	3,479	2,814
Total	14,737	17,955	3,218

Commercial radio operator licenses

Class of license	Outstanding June 30, 1959	Outstanding June 30, 1960	Increase or (decrease)
Radiotelegraph:			
1st class	6,376	7,018	642
2d class	9,660	10,434	774
3d class	1,997	2,258	261
Temporary limited, 2d class [1]	1	0	[1] (1)
Radiotelephone:			
1st class	65,196	76,235	11,039
2d class	48,932	57,354	8,422
3d class	48,193	59,119	10,926
Restricted permits [2]	1,525,558	1,734,950	209,392
Totals	1,705,913	1,947,368	241,455

[1] Issuance of this class of license discontinued August 6, 1954.
[2] This class of license normally issued for the lifetime of operator, includes 169 permits issued for a term of one year or less to alien aircraft pilots.

Applications processed by Antenna Survey Branch

Services	Pending July 1, 1959	Received in ASB	Cleared by ASB	Pending June 30, 1960
Broadcast:				
AM	206	692	795	103
FM	39	354	376	17
TV	38	772	763	47
International	0	2	1	1
Experimental	0	39	39	0
Total broadcast	283	1,859	1,974	168
Common carrier	29	808	789	48
Safety and special radio services	2,597	18,928	20,177	1,348
Total	2,909	21,595	22,940	1,564

Proposals referred to Regional Airspace Subcommittee

Services	Pending at Airspace July 1, 1959	Sent to Airspace during year	Received from Airspace during year	Pending at Airspace June 30, 1960
Broadcast:				
AM	42	247	223	66
FM	5	56	57	4
TV	23	90	85	28
International	0	0	0	0
Experimental	0	1	1	0
Total broadcast	70	394	366	98
Common carrier	3	40	38	5
Safety and special radio services	67	652	639	80
Total	140	1,086	1,043	183

Research and Laboratory

NEW YORK UHF–TV STUDY

The Commission initiated and began preparations for a research project the results of which will be a major factor in determining the future role of UHF operation in TV broadcasting. This undertaking is especially pertinent in view of the fact that the Government, because of national defense considerations, is unable to relinquish any of its UHF space to augment the present 12 VHF channels which cannot accommodate a sufficient number of stations to give adequate video coverage on a nationwide basis.

It was at the urgent request of the Commission that Congress authorized a $2 million appropriation for the fiscal years 1961–1962 to study the technical and economic feasibility of using UHF channels to provide satisfactory TV coverage to a large metropolitan area, with New York City as the scene of the test.

The New York project is under the direction of the Commission's Chief Engineer, and for this purpose a special unit has been formed. An advisory committee representative of TV broadcasters, engineers and other concerned elements of the industry is cooperating. The work will be done principally on a contract basis.

Arrangements are being made to construct a high-powered UHF transmitter on the Empire State Building, where the towers of local TV stations are centered. Another transmitter will be located within an area of about 15 miles for operation on a separate channel to study any improvements which may be obtained with the simultaneous broadcast of the same test programs by 2 transmitters using 2 different frequencies. Transmissions with horizontal polarization will be used generally but, for a part of the time, it is planned that 1 station will employ circular polarization so that comparative observations and measurements can be made at separate locations.

An investigation will also be made into UHF improvements in TV receivers, and any practical changes which are immediately available will be incorporated in receivers to be installed at various points within the test service area. Measurements will be made in this area inside buildings, on roof tops, at street level and at other locations where TV reception may be desired. This data will be correlated with observation of picture quality on the test receivers.

OTHER TECHNICAL RESEARCH

Television

TASO.—The work of the Television Allocations Study Organization (TASO) was completed during the year and that organization furnished information on its activities subsequent to its final report which had been submitted in 1959. Its concluding activities dealt principally with directional antenna studies and analysis of signal propagation. The Commission is using the data developed by TASO in connection with its consideration of TV broadcast allocations matters.

New TV system.—Some consideration was given to the possibility that, since the present TV broadcast system has remained essentially unchanged for about 20 years, contemporary technological developments may be available which would enable the design of a new TV system offering substantial advantages to the public over the present system. At the request of the Commission, the Massachusetts Institute of Technology held conferences of experts in the electronics field to make tentative findings on this question. As a result, MIT concluded that adequate knowledge does not now exist upon which a new TV system could be designed and that such knowledge could be developed only by an extensive research program. In this connection, the National Bureau of Standards advocated research concerning a digital system for broadcasting.

Stereophonic Broadcasting

The National Stereophonic Radio Committee (NSRC) was organized in 1959 by the Electronic Industries Association (EIA) to provide information on all phases of stereophony. The NSRC has concluded its work including field testing several FM broadcast stereophonic systems. The NSRC report is expected to be of material assistance to the Commission in evaluating the relative merits of the various systems and selecting one for use in FM broadcasting. Following this the Commission expects to begin consideration of various systems which have been proposed for AM broadcast.

The relative merits of the various stereophonic systems are being evaluated on the basis of their performance quality as received with stereophonic and conventional (monophonic) receivers. The items on which performance data is being considered include: signal-to-noise ratio, vulnerability to interference, distortion, audio frequency response, ease of tuning, stereophonic separation, subjective evaluation and radio-frequency spectrum occupancy. Although some stereophonic systems have been designed to provide for simultaneous transmission of stereophonic programs and subsidiary program services, principal attention will be given to the merits of each system.

Radio Frequency Devices

In addition to its control of licensed transmitters, the Commission administers a program for the control of radio-frequency interference (RFI) from all other types of electrical and electronic equipment. These regulations are set forth in parts 15 and 18 of its rules.

Part 18 regulates the interfering energy radiated by industrial, scientific and medical (ISM) equipment, including medical diathermy machines, induction heating equipment used to heat treat steel and in brazing operations, dielectric heaters employed in the fabrication of plastic products, and radio-frequency stabilized arc welders for welding non-ferrous metals.

Part 15 regulates the interfering emissions from other equipment, including receiver radiation, operation of radio controlled toys, radiation from carrier current systems, and use of miniature communication devices.

Industrial, scientific and medical equipment.—The ISM regulations, promulgated in 1947, have been successful in eliminating medical diathermy equipment as a serious source of interference. With the cooperation of the American Medical Association, doctors depend upon Commission certification of all new radio-frequency medical equipment. Industrial heating equipment is still a major problem. To cope with it, the Commission instituted a rulemaking proceeding (docket 13511) which would fix the responsibility of the operator for certification of his equipment. At the same time, the Commission is cooperating with an industry committee in seeking a simpler and less expensive measurement procedure for industrial heating equipment.

The basic difficulty in dealing with interference by industrial heaters is economic. It can be solved readily by placing the heater in a screened enclosure. However, the cost of an effective enclosure is at least equal to and often several times the cost of the heater itself. Since many manufacturers are small businesses, the element of cost is a serious consideration.

The radio-frequency stabilized arc welder is another device whose interference problems have not yet been solved. The Commission initiated the study of a new design which has promise of being able to do a satisfactory welding job with less radiation than in the past.

Incidental radiation devices.—The part 15 regulations were originally promulgated in 1938 as the low power rules to regulate the use of certain radio-operated control devices. Their coverage was extended through the years to include other devices such as carrier current systems and receiver radiation. Today these rules embrace all devices which generate radio-frequency energy either deliberately, as in receiver oscillators, or fortuitously, as in automobile ignition systems. This group, known as incidental radiation devices also includes

such things as thermostatic controls, switches and commutator motors. FCC regulations merely require that these devices be operated so that no interference is caused. If interference results, the operator is required to take corrective action.

Interference-control program.—The part 15 regulations are gradually bringing interference from receiver radiation under control. Practically all United States manufacturers are voluntarily cooperating with the Commission in this program, are measuring receiver radiation, and certifying that their receivers are complying with the regulations.

Due to the increasing number of foreign receivers being imported, the Commission, through the Department of State, notifies foreign manufacturers of its receiver regulations, advising them of the need to measure radiation and certify receivers intended to be used in this country. This program is bearing fruit. Certificates have been received from 2 German and 2 Japanese manufacturers and inquiries have been received from a British and a Japanese manufacturing group. By forestalling the importation of a flood of noncomplying receivers whose radiations could cause serious interference, the Commission is easing its task of controlling interference.

The Commission acknowledges the excellent cooperation it has received from domestic industry in its interference-control program. Without such help the task would be immeasurably more difficult. As already noted, receiver manufacturers are reducing receiver radiation and certifying their sets. The Society of Automotive Engineers, the professional technical group of the automobile industry, has adopted a voluntary limit for radiation from automotive ignition systems. The Automobile Manufacturers Association has undertaken to implement this standard for all passenger vehicles, trucks, and buses. The American Institute of Electrical Engineers, The Society of the Plastics Industry, and the Institute of Radio Engineers are just a few of the industry and professional technical societies that have committees working closely with the Commission on aspects of the interference problem pertaining to their particular fields.

On the other hand, the Commission knows of cases where radio-frequency devices were developed in disregard to interference controls and national and international frequency allocations. Being unable to proceed against the manufacturer, the Commission finds itself in the difficult position of trying to control interference from devices in actual use rather than at the place of manufacture.

Radio Frequency Bandwidth and Spectrum Utilization

The Commission continues to encourage the use of all available techniques for efficient spectrum utilization. Such techniques include improved frequency stability, single sideband transmission, reduction

of spurious emissions and use of modulation systems giving improved spectrum efficiency.

Regulatory progress in this matter includes rule changes to provide more stringent requirements for reduction of spurious emissions in the aural broadcast services. The international radio regulations adopted at Geneva in 1959 will require greater frequency stability of transmitters than required by the Atlantic City, 1947, regulations and stress the use of single sideband as a spectrum-saving technique for radiotelephony in lieu of conventional double sideband amplitude modulation. The Commission also participates in interdepartmental activities to encourage and coordinate use of these spectrum-saving techniques by Government stations, which are not subject to Commission rules but are bound by international treaties.

Technical Committees

Technical committees constitute valuable contact and sources of information pertaining to contemporary technology of interest to the Commission. Consequently, its engineers participate in the work of such committees or attend their meetings as observers, or study the proceedings.

The Joint Technical Advisory Committee (JTAC) was requested to study the utilization of frequency diversity techniques in microwave communication. This question is of particular interest with regard to the spectrum utilization efficiency of frequency diversity systems and the improvement to be expected.

Commission personnel are participating in studies by the Telecommunications Planning Committee (TPC) and the International Radio Consultative Committee (CCIR) directed to evaluating and coordinating techniques for space communication. The peculiarities of space communication systems as to establishment of facilities, power supply, maintenance and reliability, as compared with conventional earth communications systems, require much new development and analysis to select optimum techniques.

Type Acceptance of Transmitters

The Commission's type-acceptance program is designed to evaluate the technical adequacy of transmitters used in most of the radio services. Type acceptance is based upon evaluation of descriptive and measurement data usually furnished by the manufacturer, or occasionally by the applicant for license. If such data show that the transmitter is capable of meeting the technical specifications of the rules governing the class of station for which the transmitter is designed, type acceptance is granted. If circumstances warrant, the Commission may require that type-accepted equipment be submitted to its

laboratory for inspection and test to substantiate its capability of compliance with applicable rules.

The Commission's type-acceptance data and other information on equipment filed for application reference purposes are not open to the public but are useful to the Commission in determining the technical characteristics and capability of transmitters. Applicants who have once filed such data can indicate on subsequent applications that the information is already "on file." Type-acceptance statistics follow:

Service	Equipments type accepted as of June 30, 1960	Increase since June 30, 1959	Total mfrs. as of June 30, 1960	Increase since June 30, 1959	Power range	Frequency range in megacycles
TV broadcast	48	9	5	0	0.05 to 100 kw	54 to 890.
Aural broadcast	291	30	18	0	0.01 to 50 kw	0.54 to 108.
Nonbroadcast	1,889	249	154	20	0.02 w to 40 kw	0.20 to 13,200.
Total	2,228	288	177	20	0.02 w to 100 kw	0.20 to 13,200.

Radio Signal Propagation

A considerable amount of time was spent during the fiscal year in studying large quantities of radio wave-propagation data submitted by the Television Allocations Study Organization (TASO). These studies related to problems involving other radio services as well as TV.

A reanalysis was made of the TASO Panel 6 data on the signal-to-interference ratios required for various qualities of service, giving results which are more useful for the description of TV service.

Several new sets of low VHF and high VHF curves were developed for TV and FM assignment usage. This was done in cooperation with the Radio Frequency Advisory Committee and organizations of engineers from industry and Government formed to advise the Commission on technical matters concerning radio wave propagation.

In cooperation with TASO, new technical data were developed on the operation of directional TV transmitting antennas on VHF, and new VHF propagation curves were prepared for the Commission's rules. These developments may indicate the conditions necessary for rearrangement of the Commission's assignment tables in order to accommodate additional TV stations. Certain types of measurements for comparing lower and higher VHF channels are needed.

Comprehensive studies are being continued toward predicting more accurately the broadcast service rendered to small areas where terrain conditions are known.

Investigations, research and studies on radio wave propagation are necessarily linked with the operation of broadcast stations. However, the information developed from these projects is continually and increasingly being used for the development of rules and standards in other types of radio services.

Through association with national and international technical and scientific organizations, the Commission is able to obtain additional information to help it answer various radio service and interference problems.

Experimental Radio Services

Part 5 of the rules provides for licensing experimental radio stations (other than broadcast) for (1) basic research in radio and electronics, and (2) the development of new techniques and equipment for use in both Government and non-Government services.

Many new devices to add to safety in modern high-speed travel are being developed. Among these are obstruction warning and anti-collision devices for use in the air and on the ground. An automatic electronic guidance system for high-speed automobile traffic has been installed and tested on at least 1 highway. Accident-free travel at speeds of 100 miles per hour or more may thereby become possible.

Rapid advances in space travel have brought demands for better communication, more flexible tracking devices, and highly reliable guidance systems. Radio signals are being bounced off the moon, the sun, the planets and satellites to the inclusion of balloons. Satellites give promise of more reliable worldwide communications.

High-speed data transmission is replacing slower methods. Faster and faster communication is demanded. Many of today's methods will be made obsolete by tomorrow's technological developments.

Rapid advancement in communication methods, as well as in surface transportation and space travel, has been made possible by intensive research and development. The Commission has issued licenses for this research and development, and at the same time provided for it on frequency space without endangering regular radio operation.

The majority of the radio research and development is being performed by large industrial laboratories and various colleges and universities. Most of it is under contractual agreements with Government agencies, and details are not public for security reasons.

The demand for radio frequencies on which to conduct this work has placed an ever-increasing burden on the Commission. In a crowded frequency spectrum where important radio services are already entrenched, it becomes more difficult to accommodate research projects. However, radio astronomy, cosmic ray research, and facilities for space travel must not be retarded by lack of appropriate fre-

quencies. In some cases, such as radio astronomy, the frequencies required are determined by basic physical laws which do not permit any compromise or substitution.

During fiscal 1960, the Commission received 1,319 formal and 299 informal applications for experimental authorizations. At the close of the year a total of 730 experimental stations held licenses.

LABORATORY

The Commission's laboratory is located near Laurel, Md., on land shared with the Laurel monitoring station. Its small staff tests communication systems and equipment in connection with various Commission programs.

Studies of New Systems and Devices

The laboratory during the year engaged in studies concerning the adverse effects of several types of interference to communication systems. These included the effects of the assignment of broadcast stations and Government stations to frequencies in the vicinity of the 500 kc allocation on which shipboard automatic alarm receivers operate, and the effects of electromagnetic interference from automotive ignition systems, both of the conventional type and of a newly developed electronic type, which may become a major source of interference.

There were continued studies of multiplex and stereophonic systems for AM and FM broadcasting. Tests of several FM receivers of recent manufacture indicated no significant improvements which might allow the use of closer spacings between FM broadcast stations using the same or nearby channels. The laboratory participated in a field survey to evaluate the possibilities of use of an on-channel booster to fill in areas of deficient TV signal reception, in an experimental operation by station WTEN, Channel 10, at Albany, N.Y.

Radio Propagation Measurements

The laboratory provides the equipment techniques and calibrates the field strength recorders located in several of the FCC monitoring stations, in addition to operating recorders on 2 channels at Laurel. These recorders are used in a continuing program in which the Commission is gathering radio propagation data for use in allocation of frequencies.

During the year the laboratory conducted experiments to test whether there are propagation effects which might preclude the ultimate use of "very precise" offset between the carrier frequencies of co-channel TV stations, if such use should be needed to permit the operation of more TV stations, or alternately, the increase of service areas of existing TV stations. "Very precise" operation would require

station frequency tolerances of the order of plus/minus 1 cycle. The preliminary studies on a 200-mile path at 67.25 megacycles indicate no serious difficulty. Studies to cover the higher VHF channels are anticipated.

Development and Calibration of Field Equipment

The laboratory also assisted in meeting field equipment requirements by developing a portable modulation meter for use in enforcement of the rules pertaining to small boats; making accuracy tests of several new types of equipment proposed to be purchased; making modifications in 2 spectrum analyzers and 4 receivers to be associated with these spectrum analyzers for use by the monitoring stations; completing the design and construction of 3 special automatic spectrum occupancy recorders; and developing a collapsible VHF–UHF directional antenna for field investigative automobiles. In continuing its routine calibration functions the laboratory repaired and calibrated for the field 7 standard signal generators and 11 field strength meters, in addition to the repair and calibration of 2 signal generators and 6 field strength meters used by the laboratory in its own operations.

Type Approval of Equipment

Certain classes of equipment are tested by the laboratory to determine eligibility for type approval by the Commission. The tests are conducted on prototype units submitted by the manufacturers. If these tests indicate that the Commission's requirements are met, the type approval will apply to all units manufactured identical to the sample submitted for test.

The type-approval procedure applies to certain classes of noncommunications electronic apparatus which, without special attention, would cause serious interference to radio and TV services. This apparatus includes medical diathermy and ultrasonic equipment, epilators, electronic neon signs, electronic ovens and commercial ultrasonic units. It also includes modulation and frequency measuring equipment used in aural and TV broadcast stations to assure maximum program quality and minimum interference to other stations. Also covered by the type-approval test procedures are shipboard telegraph transmitters, lifeboat transmitters and automatic alarm receivers required for safety of life at sea. These are tested from the standpoint of assuring maximum reliability of operation under adverse conditions.

Citizens radio transmitting equipment is a class for which type-approval testing is no longer required except for certain noncrystal controlled apparatus, because of the shift in emphasis from the 465 Mc band to the new band at 27 Mc. The laboratory tested 7 new types of 27 Mc band citizens radio units.

The laboratory also made tests of a low-power TV broadcast transmitter to develop data for the Commission in its consideration of an application for type acceptance.

A summary of type-approval testing activity during the fiscal year follows:

Class of equipment	Number of submissions for test	Number of type approvals granted	Class of equipment	Number of submissions for test	Number of type approvals granted
Shipboard radiotelegraph transmitter	1	1	AM broadcast monitor	4	3
Shipboard radar	13	10	Medical diathermy	5	4
TV broadcast translator	2	1	Medical ultrasonic	10	[1] 6
TV broadcast monitor	2	1	Epilator	6	[2] 3

[1] One additional unit still pending at end of year.
[2] Two additional units still pending at end of year.

Improvement and Coordination of Measuring Methods

The laboratory participated in activities of IRE committees looking toward (1) approved standards for receiver oscillator radiation measurements and correlation of the measurements made by the United States standard with those using the IEC international standard; (2) standards for measurement of vehicular ignition interference; and (3) general establishment of domestic radio standards.

Frequency Allocation and Use

NATIONAL FREQUENCY ALLOCATIONS

TV and Other Considerations

A considerable portion of the Commission's allocation activities was devoted to the continuing TV problem. To the uninitiated this may seem to be a simple matter of moving some radio users to another portion of the spectrum and permitting TV to expand into the space vacated. But it is more complex than that.

The United States is unquestionably the heaviest user of the radio spectrum in the world today, particularly in that portion best suited for VHF video operations. Because of this, it is virtually impossible to make a change in frequency allocations to benefit one group of users without adversely affecting another group. The degree of impact is emphasized by the fact that a single TV channel requires 6,000 kc of space. By comparison, VHF land mobile systems are now operating on the basis of 30-kc separation in the same area. Thus it can be seen that one TV channel is the equivalent of 200 land mobile "channels." With hundreds of millions of dollars invested in existing stations and electronic systems that would have to be displaced, it can be appreciated that a decision in this matter is indeed difficult to make.

Since, within the United States, the spectrum above 25 Mc is divided into exclusive Government, exclusive non-Government, and shared Government/non-Government segments, any radical change in the national distribution of spectrum space is of mutual concern. The Office of Civil and Defense Mobilization, which speaks for the Government users, made a study, at the Commission's request, and reported that the national safety would be jeopardized by broadscale exchanges of frequency space. Consequently, the Commission must consider other possible solutions to the TV problem (see Broadcast and Research chapters). The Commission has under consideration many frequency requirement requests for other services, both old and new. However, some of these allocation matters cannot be settled until the ultimate TV system can be provided for.

Outside of the TV area, there has been little activity in national frequency allocation matters—on the surface. This is directly attributable to the Administrative Radio Conference of the International Telecommunication Union held in Geneva, Switzerland,

August 17 to December 21, 1959. The fundamental purpose of this session was to amend the international table of frequency allocations to meet the world's needs for the immediate future. During the 2-year period preceding the conference, the United States took considerable effort to get its own house in order, allocation-wise, and to prepare its position for the conference. The Commission withheld action on petitions for national allocation changes it received pending the outcome of the conference. Subsequent national allocation changes have been minimized pending United States ratification of the conference results. However, extensive preparatory work has been carried on, in collaboration with the OCDM, in anticipation of ratification, in order to meet the date of May 1, 1961, when the Geneva regulations are scheduled to come into force.

While few in number, allocation actions taken by the Commission during fiscal 1960 dealt with such diverse subjects as international fixed public operations between 952 and 960 Mc in Puerto Rico and the Virgin Islands, provision for petroleum exploration in the band 1,750–1,800 kc off the coast of California, withdrawal of earlier proposals in the bands 10–14 and 90–110 kc inconsistent with the Geneva regulations, present and future planning for space communication, and an expansion of VHF spectrum space available for air traffic control functions.

INTERNATIONAL FREQUENCY ALLOCATIONS

International Radio Conference, Geneva, 1959

As the radio regulatory agency of the United States, the Commission must be aware of and competent in interpreting international treaties and agreements to which the United States is a party which deal with telecommunication matters. Consequently, Commission participation in international radio conferences and meetings is an important function, particularly where its licensees are concerned, since the use of radio and international rights of radio stations are directly affected by the outcome of such international sessions.

The Commission participated in the 1959 ITU conference as both a United States regulatory agency and as the general representative of a large number of non-Government users of radio. Information developed in public hearings on allocations below 890 Mc (docket 11997) and on allocations above 890 Mc (docket 11866) assisted the Commission in this preparatory work. These hearings were in the form of general inquiries into the future frequency requirements of all services using or planning on using frequencies in these ranges. During the Geneva conference the Commission collaborated with the United States delegation, on which it had membership, in deciding the national position to be taken on the many problems presented.

The Commission's extensive preparatory work was rewarding in view of the number of actions taken at Geneva which reflect proposals in whole or in part made by the United States. Since the Geneva session offered the first revision of the international radio regulations since 1947, many changes in the use of frequencies and in services will be necessary throughout the world. These will have to be reflected in changes to the Commission's rules and regulations. Accordingly, rulemaking procedures are being drafted to advise licensees of changes which will be necessary.

Included in the Geneva-adopted regulations is extension of the upper limit of the usable radio spectrum to 40,000 Mc or 40 "gigacycles" in more up-to-date terminology. Specific allocations have been made for radio astronomy and space research. The new allocations table format is such that one can tell at a glance the relative priorities of the various services to which a band is allocated.

There were actually 2 concurrent Geneva sessions. FCC Commissioner T. A. M. Craven was Chairman of the United States delegation to the one dealing with radio administrative matters, and FCC Commissioner Rosel H. Hyde was Vice Chairman of the United States delegation to the session concerned with related treaty matters.

In essence, the frequency allocations table adopted at Geneva is the United States proposal with modifications. Although it is impossible to apply a specific percentage figure to the degree of acceptance achieved, it can be said that it was considerably greater than could be reasonably expected at a get-together of some 90 different countries trying to satisfy their respective frequency-allocation requirements.

United States success at Geneva is, in large measure, the result of the worldwide distribution given to this country's planning well in advance of the conference. In this way, many areas of disagreement were resolved prior to the conference. In effect, United States planning gave guidance to a number of other countries which did not have the facilities, time, or manpower to make independent, detailed studies of frequency-allocation requirements.

Space communication.—At the time of the Geneva conference too little was known of the eventual requirements for space and earth-space communication to warrant an allocation of spectrum space for such purposes other than research. Recognizing, however, the importance of this subject, the conference provided for the convening of an Extraordinary Administrative Radio Conference in the latter part of 1963 to deal with the matter in the event that such a session appears justified.

In order to keep abreast of developments in this area, the Commission, for its part, reopened the record in its statutory inquiry into the use of frequencies above 890 Mc (docket 11866) for the specific pur-

pose of collecting information on the now-known spectrum space requirements for space communications. Simultaneously, it opened an inquiry (docket 13522), on a continuing basis, to develop the same requirements for the foreseeable future. The information gained will serve as the basis for the United States position to be presented at any future international conferences on the subject.

Many questions as to the frequency requirements for satellites are yet to be answered. If international communication by means of space objects proves feasible and economical, this could have an important impact upon frequency allocations in general. Some scientists and engineers are of the opinion that satellite communication may share bands now used for conventional-communication systems without causing or receiving interference. Others believe that exclusive allocations may be required. Present and future experimentation in the now-allocated space bands should do much to answer some of these questions, and the Commission proceedings should help materially to develop the information needed.

Other International Conferences

During the fiscal year, the Commission participated in a total of 18 international conferences, including 14 multilateral sessions, and began preliminary work for 25 future conferences. For those conferences held in fiscal 1960, it furnished 6 chairmen, 1 vice chairman, and 49 other representatives to United States delegations.

Its international participation is under Department of State sponsorship; other related activities, including certain governmental bilateral negotiations, are initiated and carried out by the Commission's representatives with the concurrence of the Department of State.

INTERNATIONAL FREQUENCY COORDINATION

The increase in the use of radio throughout the world has been enormous during the past several years, especially as more and more of the new and developing countries utilize it to meet their domestic and international needs. Also, a considerable increase in usage results from expansion of the services of existing stations to satisfy current and anticipated requirements. The resultant demands on the radio spectrum make it increasingly difficult to find frequencies which may be used without harmful interference either being caused or received. Under such circumstances, users of radio must coordinate their proposals in the interest of orderly radio use.

The Geneva conference recognized the seriousness of this problem and adopted both a resolution and a recommendation relating to a study by a panel of experts of measures to reduce congestion in the bands between 4 and 27.5 Mc. In addition, the new Geneva radio

regulations provide for the elimination of many detailed notifications to the International Frequency Registration Board (IFRB) of stations, such as those of the land mobile service, except for entries indicating a typical operation for each frequency. It will become, therefore, more important than ever before to coordinate the assignments of these stations with administrations whose current assignments may either cause or receive harmful interference.

The Geneva conference adopted regional plans for frequencies below 4000 kc, and the aeronautical and maritime mobile assignment plans for frequencies between 2850–23,000 kc and 4000–23,000 kc, respectively, which originally were agreements reached at the 1951 Geneva Extraordinary Administrative Conference. As adopted, the maritime mobile plan is somewhat more flexible in that, in the case of coast telegraph stations, 1951 international status will be afforded only those assignments of the plan actually in operation on May 1, 1961. Accordingly, assignments not provided for in the 1951 plans may be worked into the bands without the obligation of having to protect assignments of the plan activated subsequent to May 1, 1961.

However, many of these new assignments may be capable of causing harmful interference to stations already in operation. Consequently, the frequencies of the new assignments will have to be chosen carefully and, in many instances, may need to be coordinated with foreign administrations. The necessity for coordination applies also whenever changes to existing assignments of the plans are necessary. This is particularly true in ITU Region 2 (which includes North and South America, Greenland, and portions of the Atlantic and Pacific Oceans) where changes could seriously affect United States stations, regardless of the frequency band, below 23,000 kc.

The importance of international frequency coordination by the Commission is probably emphasized most in the case of mobile and fixed operations in the common carrier, industrial, land transportation, public safety, and other similar services along the Canadian borders in the 25–30, 150–174, 450–460 and 4000 Mc bands. Unfortunately, the concentration of Canada's population in a somewhat narrow strip along portions of its southern border results in a great number of international operations being in close proximity, a situation which is growing more complex as new stations are added. To avoid wholesale interference problems to such services in the bands mentioned, the Commission and the Canadian Department of Transport have been following, since 1951, an informal frequency-coordination procedure which requires the comments of the neighbor country to be obtained before a new assignment is made in specified geographical areas along the border.

This informal coordination procedure was expanded in 1957 to include the 162–174 Mc band which is used in the United States principally by Government stations. It is anticipated that another revision will be necessary to make provision for coordinating and protecting assignments above 28 Mc which are no longer being reported to the IFRB. In addition, this procedure has provided a basis, although informal, for coordinating other proposed frequency assignments which may affect assignments of either country.

While the procedure is not a cure for all problems it is significant that, during fiscal 1960, only 6 cases of harmful interference were reported and only 1 United States operation was required to shift frequency. The work involved in this coordination is reflected in the fact that the Commission exchanged 2,500 letters and telegrams with Canada during fiscal 1960, all of which directly affected domestic licensees.

The Commission also exchanged comments with the United Kingdom, Mexico, Denmark, Spain, and other foreign countries for the purpose of eliminating objections to new United States HF frequency assignments or to avoid interference resulting from changes in frequency assignments of foreign radio stations.

INTERNATIONAL INTERFERENCE AND INFRACTIONS

The Geneva conference stressed the importance of resolving harmful interference between radio stations of different countries, and made a major revision of that part of the radio regulations prescribing the procedures to be followed. The Commission has a responsibility to foreign administrations and to its own licensees in the orderly expansion of radio use.

The international interference procedures are concerned with the channels which should be followed and the relative rights of individual radio stations depend upon many circumstances. The outcome of correspondence with foreign administrations as to what action should be taken, and by whom, varies with each case. Each case has its own complexities and peculiarities so that the required action must be carefully evaluated to avoid any infringement on the licensee's right to operate. Therefore, these cases cannot be handled on a general production-line basis.

During the year, the Commission handled 385 cases of harmful interference on behalf of its licensees and foreign governments. Of these, 352 were resolved satisfactorily and correspondence continues on the remainder. The Commission also served as contact point for 125 foreign complaints of interference caused by United States Government radio stations. The Commission originated over 1,600 pieces

of correspondence in these matters, an increase of about 20 percent over the previous year. Approximately 92 percent of all cases handled during the year were resolved satisfactorily, as compared to 85 percent in 1959.

The Commission participates in another international effort carried out through the exchange of information among administrations concerning technical and operational deficiencies of observed emissions. This, too, is pursuant to the international radio regulations. In this way, many potential cases of harmful interference are avoided, thus contributing to the safety of life and property on the sea and in the air and to greater efficiency and related benefits on the part of private agencies operating in the international fixed service.

During the year, over 5,000 reports (an increase of 20 percent over 1959) made by the Commission's monitoring stations of improper technical and operating characteristics of foreign stations were evaluated and transmitted to the countries concerned.

INTERNATIONAL FREQUENCY USAGE DATA

Participation by the Commission continued in the international monitoring program. The purpose is to have administrations with reliable monitoring facilities log and compile data on frequency occupancy in the band 2,850 to 27,500 kc so that studies may be made as to how congestion in that portion of the radio spectrum might be relieved.

During the year, over 90,000 monitoring observations were submitted by the FCC to the International Frequency Registration Board (IFRB) for examination and subsequent publication in the IFRB Summary of Monitoring Information. In addition to the 18 FCC monitoring stations, 16 private monitoring stations furnished these monitoring observations.

The IFRB summary is published on a monthly basis and contains radio-spectrum occupancy data of value to users of the radio spectrum. For example, it shows current use of that portion between 2,850 and 27,500 kc which can be used to determine if stations listed in international ITU frequency documents are actually using certain of their assigned frequencies or using them part-time or only seasonally.

About 24 nations are participating in this cooperative effort, which keeps the cost to any one government quite small, considering the results. The success of this international program is, to a large degree, due to the Commission's efforts in providing data for the IFRB. In fact, FCC monitoring stations furnished about 60 percent of all data received for the first 2 or 3 years. Now the combined United States effort accounts for about 25 percent of the total.

CALL LETTERS

The Commission assigns the call letters of all United States stations, except mobile stations of the United States Army, pursuant to the Communications Act and international apportionment of call letters for identification purposes.

Accordingly, the Commission maintains the only official record of the actual identities of those call letters of Government radio stations since they are not made public as in the case, generally, of call letters designated for use by Commission licensees. This requires constant communication with the various agencies to insure that their records agree with those of the Commission and record the addition or deletion of call letters so as to make new assignments possible and avoid inadvertent "hoarding" of call letters.

Because of the classified nature of many of the call letters used by Government stations, the Commission has the dual responsibility of protecting their identity and, at the same time, identifying the source of any harmful interference.

Of special interest this year, the Department of the Army returned over 1,200 four-letter "W" calls to the Commission, which are now available for reassignment. In the past, the Commission was frequently requested by broadcast station licensees to negotiate the return of Government individual call signs for assignment to broadcast stations. In the future, the Commission will continue to negotiate, upon request, the return of call letters from other Federal agencies for use by broadcast stations.

The Commission's file of call letters of Government radio stations contains many thousands of entries, over 70,000 of which were added during the past year.

NATIONAL FREQUENCY COORDINATION

The heavy, steady demand for frequency space by both Government and non-Government users necessitated formation during the year of special ad hoc groups which studied the joint problem and recommended means to strengthen coordination and streamline procedures.

This is because there is dual responsibility for use of domestic radio facilities. The President delegates authority to the Interdepartment Radio Advisory Committee (IRAC) for assignments to Government stations while the Communications Act makes the FCC responsible for licensing non-Government operations. Consequently, efficient frequency management requires close coordination of assignments between the Commission and other Government agencies.

Due to the large number of Federal agencies utilizing the radio spectrum, this coordination is extremely time-consuming. With the

steady increase of proposals, the point was finally reached during the year where use of the telephone for as many as 100 or more calls daily was no longer practical. As an alternative, a private-line teletype was investigated but the cost was found prohibitive. So a written form of coordination was adopted wherein proposals are now mailed to agencies and comments are by telephone. This has eliminated half of the previously required telephone calls and the necessity of taking copious notes.

Since any frequency proposal given favorable consideration informally results in an application to the IRAC Frequency Assignment Sub-Committee (FAS), an increase in informal coordination is necessarily reflected at the joint FAS–FCC meetings. Various steps were taken during the year in an effort to reduce the length of these meetings. However, 3 full days of meeting time each month are still required, and other time-saving possibilities are being explored.

The decrease in number of interference problems between Government stations and Commission licensees amounted to 22 percent. The total of 140 cases as compared with 178 cases in 1959 appears to be a result of better frequency management in addition to improvement in transmission and reception techniques.

NATIONAL FREQUENCY LISTS

The procedure for recording, maintaining and preparing lists of FCC frequency assignments has been systematized to the extent that 30 percent more such authorizations are being handled without an increase in personnel. This has been accomplished largely through the use of mechanical means.

The need for current frequency-assignment records is based upon the following considerations:

(a) Since international notifications are based on national records, the loss of frequency rights might be jeopardized if these records are not current.

(b) FCC frequency assignment records are used by industry as a tool in requesting assignment of frequencies best suited to its usage. Without such records intelligent choices of frequency assignments could not be made.

(c) Frequency coordination between the FCC and foreign countries, as well as with other U.S. Government agencies, requires up-to-the-minute records in order to avoid making assignments that may cause harmful interference.

(d) Efficient frequency allocations and management requires that the Commission be able to analyze usage being made of the spectrum on the basis of current records.

With the ever-growing use being made of the spectrum, it appears that much of the hand processing now being done by the Commission will have to be converted to mechanical methods.

STATISTICS

National frequency coordination

	Fiscal 1959	Fiscal 1960	Percentage increase or (decrease)
Formal coordination	6,800	6,350	(6.6)
Experimental	1,504	1,451	(3.5)
Informal coordination	2,350	2,726	(11.6)
Broadcast	135	141	(4.5)

International notification and frequency records

	Fiscal 1959	Fiscal 1960	Percentage
Authorizations processed	50,741	73,252	30.7
International notifications [1]	33,189	23,522	----------
Ship notifications [2]	21,601	14,472	----------

[1] Discontinued notifying above 28 Mc January 1, 1960.
[2] Discontinued in March 1960.

Appendix

FCC LOG HIGHLIGHTS OF 1960 FISCAL YEAR

The following capsule summary is based primarily upon releases of the Federal Communications Commission during the 1960 fiscal year period—July 1, 1959, to June 30, 1960. The dates shown are largely those of the covering releases and do not necessarily indicate the dates of the initiating formal approval. All actions are by the Commission unless otherwise indicated.

1959

July 8 Terminates inquiry into extending hours for daytime-only AM broadcast stations; sees no present need for rulemaking (docket 12729).

July 9 Commissioner Hyde statement to Senate subcommittee concerning North American Regional Broadcasting Agreement.

July 13 Citizens radio authorizations pass 50,000 mark.

July 16 Chairman Doerfer statement to Senate subcommittee concerning auxiliary TV services.

Commissioner Lee statement to Senate committee concerning personal views on UHF TV situation.

FCC comments on S. 2303 to place community antenna systems under its jurisdiction.

July 22 Proposes two types of rulemaking procedures concerning off-the-record representations with respect to matters under adjudication (docket 12947).

July 24 Announces reduction of $50,000,000 annually in long-distance telephone rates.

Staff members to visit Western States to study community antenna TV systems.

July 29 Comments on S. 616 and 886 relating to broadcast of sports events.

July 30 Makes progress report on joint OCDM–FCC long-range frequency allocation planning.

Amends political broadcast rules to require equal-time request be submitted within 1 week of prior use, and requestee to prove that he and opponent are qualified candidates.

Reports on frequency allocations above 890 Mc (docket 11866).

Proposes interim technical standards for private microwave systems (excluding broadcasters) above 890 Mc (docket 13083).

Aug. 6 Warns Citizens Radio Service violators.

Notice to shipping interests about bridge-to-bridge radiotelephone communication.

Aug. 7 Additional comments to Senate subcommittee concerning auxiliary TV systems.

Aug. 13 Issues final TV broadcast financial data for 1958.

1959

Aug. 17 Reminds aviation industry that type acceptance requirements for transmitters in those services became effective July 1, 1959.
International Radio Conference opens at Geneva. (Continues to Dec. 21. FCC Commissioner Craven is chairman of U.S. delegation at radio administrative session and Commissioner Hyde vice chairman of U.S. delegation at plenipotentiary session.)

Aug. 20 Announces appointments to National Defense Executive Reserve FCC unit.

Aug. 24 Issues release, "Amateur Radio Interests All Ages; Boon to Physically Handicapped."

Aug. 28 Commissioner Ford addresses West Virginia Broadcasters Association on "The Role of the FCC in Programming".

Sept. 9 Proposes legislation to include FCC field employees under law provision which makes it a crime to assault Federal employees performing inspection duties.

Sept. 10 Denies Lar Daly claim to double equal political time.
Denies NAB petition for AM broadcast station use of "teaser" announcement without sponsor identification.

Sept. 14 President signs Communications Act amendment exempting from political broadcast equal-time provision candidates appearing on "bona fide" news programs but not relieving broadcasters from responsibility to afford reasonable opportunity for discussion of conflicting view on important public issues.

Sept. 21 Chairman Doerfer addresses Public Service Programming Conference on FCC relation to broadcasting.
Third proposal in AM clear channel proceeding (docket 6741) would open 23 clear channels to new Class II assignments.
Report terminates AM daytime skywave proceeding (docket 8333) by adopting permissible radiation curves. (Supplemental report Oct. 22.)
Issues final AM–FM financial data for 1958.

Oct. 1 Takes steps to authorize alien pilots to use radio in domestic flights in interest of air safety.
Sets Jan. 1, 1960 as deadline for painting antenna towers to meet new requirement.

Oct. 6 FCC offers Government engineering careers.

Oct. 7 To ban national spot representation of affiliates by TV networks after Dec. 31, 1961 (docket 12746). (Amended Oct. 30.)

Oct. 10 Chairman Doerfer statement before House subcommittee concerning "quiz" shows.

Oct. 13 Chairman Doerfer addresses NARUC convention on "Legislation Affecting the Federal Regulatory Process."

Oct. 14 Chairman Doerfer addresses Radio TV News Directors Association on "The FCC and Broadcast News."

Oct. 22 Proposes additional frequencies for air traffic control and space communication (docket 13256).

Oct. 29 Stays ban on multiplexed FM functional music operations pending action on petition to review Nov. 7, 1958 court decision voiding rules requiring multiplexing only.

Oct. 30 Issues revised "A Short History of Electrical Communication."

Nov. 10 Enlarges network inquiry (docket 12782) to consider extent of FCC authority in programming and commercial practices in general.

Nov. 13 Post Office Department to test closed-circuit facsimile operation for possible mail transmittal.

1959

Nov. 15 Issues revised "A–B–C of the FCC."

Nov. 16 Announces that public spokesmen will be heard in broadcast programming inquiry starting Dec. 7.
Uncovers hidden radio directed to Cuba.

Nov. 19 Proposes certain split-channels for public safety services; contemplates new Medical Emergency Radio Service (docket 13273).
Chairman Doerfer statement on S. 600 to establish an Office of Federal Administrative Practices; also on S. 2374 to set up standards for conduct of agency hearings.

Nov. 20 Issues interim guide for CONELRAD State Industry Advisory Committees.
Chairman Doerfer addresses TV Bureau of Advertising on "Mass Communications Media at the Crossroads."

Dec. 2 Proposes rules for low-power VHF TV translator operation (docket 12116); extends grace period for existing VHF boosters.

Dec. 3 Asks broadcasters to supply information concerning nonannounced advertising matter aired since Nov. 1, 1958 and what controls they have established to prevent this in the future.

Dec. 7 Public proceeding opens on inquiry into broadcast programming (docket 12782). (Results in 19 days of testimony by nearly 100 group spokesmen which almost fills 5,000 pages.)

Dec. 16 Proposes legislation relieving FCC from monthly backlog reporting.

Dec. 18 Proposes legislation requiring painting and lighting of abandoned radio towers.

Dec. 23 Authorizes Purdue University to test educational UHF TV airborne operation.

Dec. 29 Commissioner Ford addresses WICE Broadcast Career Seminar on "Careers with the FCC."

Dec. 30 Attorney General reports to President on "Deceptive Practices in Broadcasting Media."

Dec. 31 Chairman Doerfer issues year-end statement.

1960

Jan. 4 Proposes limited number of interim shorter-spaced VHF TV stations (docket 13340).

Jan. 8 Chairman Doerfer addresses Federal Communications Bar Association on FCC role in broadcast programming.

Jan. 14 Chairman Doerfer addresses Radio and TV Executive Society on major problems facing the Commission.

Jan. 18 Telephone company links United States with the Bahamas by microwave.

Jan. 19 Editorially revised statement to Senate committee by Commissioner Lee concerning his views on UHF TV problem.

Jan. 21 Takes further actions regarding "payola" and related broadcast programming matters.

Jan. 25 Commissioner Hyde statement to Senate subcommittee regarding the North American Regional Broadcasting Agreement.
Proposes legislation relieving FCC from annual personnel reporting.

Jan. 28 Western Union files cable divestment plan.
Writes Electronic Industries Association about study of stereophonic broadcasting.

1960

Feb. 2 Chairman Doerfer statement to Senate subcommittee on TV allocation problem.
Commissioner Ford statement to same subcommittee concerning joint OCDM–FCC long-range frequency allocations planning.

Feb. 3 Amends rules to permit radio licensing of aliens holding U.S. pilot certificates (docket 13216).

Feb. 4 Drafting proposed legislation and rules to curb payola and quiz broadcast program practices. (Rule texts (dockets 13389 and 13380) announced Feb. 5; legislative proposals Feb. 11.)
Amends rules to give additional frequencies for air traffic control (docket 13256).

Feb. 5 Chairman Doerfer addresses Advertising Federation of America on broadcast advertising practices.

Feb. 11 Commissioner Ford addresses Philadelphia TV and Radio Club on "Programming—the Commission and Its Broadcast Licensees."

Feb. 12 Amends rules to redefine scope of permissible communications by citizen radio users (docket 12987). (Reaffirmed May 5.)

Feb. 15 Proposes legislation giving FCC authority to curb interference from TV receivers.

Feb. 17 Amateur licenses increase 285 percent in 12 years.

Feb. 18 President renominated Commissioner Lee for another term.
Announces further liaison between FCC and FTC on unannounced sponsorship of broadcast matters.
Provides for regular aircraft-ground public radio communication service and reallocates certain citizens radio frequencies to industrial services (docket 11959).

Feb. 19 Requires 54 TV UHF permittees to explain why they have delayed station construction.

Feb. 23 AT&T revises tariffs on one-way message recording regulations for interstate phone calls without "beep" signal under specific conditions.

Feb. 25 Chairman Doerfer addresses Conference of State Broadcast Association Presidents on broadcast programming problems.

Feb. 26 Notifies broadcast station of May 3 CONELRAD daytime drill requirements.

Mar. 1 Issues revised "Broadcast Application Procedure" factsheet.

Mar. 2 Proposes shorter license periods to aid broadcast enforcement.

Mar. 4 Chairman Doerfer statement to House subcommittee on steps taken by FCC to control broadcast programming abuses.

Mar. 10 Chairman Doerfer resigns; President names Commissioner Ford as Chairman. (Latter assumes Chairmanship Mar. 15.)
Senate ratifies North American Broadcasting Agreement. (Effective April 19.)

Mar. 15 Comments on H.R. 4800, to strengthen Federal regulatory agencies; H.R. 6774, to establish conduct standards for agency hearing proceedings; S. 1735, to repeal honorarium provision for FCC Commissioners; H.R. 6127 and S. 1736, to eliminate oath requirement on some FCC forms; H.R. 6573 and S. 1738, to redefine duties of FCC review staff; and S. 1965, to standardize terms of office of heads of Federal regulatory agencies.

Mar. 17 Issues interpretations of section 317 requirements concerning sponsorship identification of broadcast material. (On Apr. 1 afforded opportunity for comments.)

1960

Mar. 24 President nominates Edward K. Mills, Jr., to be a Commissioner. (Withdrawn May 16 at Mills' request.)
Relaxes "cut-off" procedure in processing AM broadcast applications to permit certain engineering amendments.

Mar. 28 Proposes legislation to give FCC control over installation, height, and location of receiving antenna towers.

Apr. 1 Issues revised "Safety and Special Radio Services Primer."

Apr. 5 Tabulates broadcast station responses to "payola" questionnaire.
Chairman Ford addresses NAB.

Apr. 8 Enables telephone companies to provide free interconnection between broadcast stations and networks in CONELRAD program.

Apr. 12 Comments on H.R. 11341, to hold public hearings before granting broadcast licenses; H.R. 10241, to prohibit broadcast of deceptive material; H.R. 10242, to provide for conditional broadcast renewals, suspension of licenses, etc.; H.R. 11397, to ban payment for broadcasting musical works; H.R. 11398, to limit broadcast renewals to stations operating in public interest; and H.R. 7017 and S. 1898, to substitute pre-grant procedure for protest.

Apr. 19 Proposes legislation to enable FCC to issue temporary restraining orders, suspend licenses, or impose forfeitures in appropriate cases.

Apr. 20 Invites comments on proposal to permit AM daytime broadcast stations to sign off at 6 p.m. local time instead of local sunset (docket 13477).

Apr. 21 Orders Western Union to further negotiate for cable divestment.
Proposes limited subscriber radio dispatching in public land mobile service (docket 13478).

Apr. 29 Reminds broadcast stations of need for compliance with FCC technical and engineering requirements.

May 1 Issues revised "Regulation of Wire and Radio Communication" fact-sheet.

May 3 Proposes legislation to distinguish adjudicatory from other rulemaking procedures.

May 4 Expands permissible types of FM multiplexed subsidiary operations (docket 12517); invites comments on 8 systems of FM stereophonic transmission (docket 13506).
Proposes revised propagation curves for contemplated interim short-spaced VHF TV assignments (docket 13340).

May 5 Chairman Ford addresses Institute for Education by Radio-TV on "Freedom and Responsibility—Laws, Codes or Czars."

May 6 Chairman Ford addresses American Women in Radio and TV on "Challenge and Change."

May 12 Authorizes first phase of Western Union's proposed transcontinental microwave relay system.
Institutes inquiry into hidden commercials in recorded broadcast "interview" programs.

May 16 Commissioner Hyde addresses Brigham Young University fraternity on regulatory functions of the FCC.
Comments on H.R. 11340, to place limitations on transfer of broadcast stations and to license national networks.
Comments on S. 3171, to require TV networks and TV stations to make 1 hour of time available to each major party presidential candidate each week during 8 weeks preceding election.

1960

May 17 International Conference on Safety of Life at Sea opens in London. (Continues to June 17. FCC Commissioner Bartley member of U.S. delegation.)

May 18 Comments on H.R. 11041, to give FCC jurisdiction over community antenna TV systems.

Grants protests by TV stations to extent of designating for hearing various applications for grants for microwave relay systems which had been stayed because of Court of Appeals remand.

May 19 Reopens proceeding on allocations above 890 Mc (docket 11866) to receive information about current space communication requirements; initiates separate inquiry into future space communication needs (docket 13522).

Queries TV broadcast stations about their general and current policies concerning political broadcasts.

May 20 Announces establishment of Complaints and Compliance Division in Broadcast Bureau; related statement to Senate Appropriations Committee. (New division activated June 2.)

May 25 Chairman Ford reports to Senate Appropriations Committee on broadcast complaints for last 3 months in 1959.

Authorizes use of TV boosters by UHF stations, effective July 5 (docket 11331).

May 26 Authorizes merger of Globe Wireless, Ltd., with American Cable & Radio Corp.

Deletes geographic assignment of nonbroadcast call signs.

June 3 Sets 31 "idle" UHF TV permits for oral argument; 21 other permits cancelled since Feb. 11 notice to those who have not constructed.

June 6 Comments on S. 1886, to enable FCC to deal with VHF TV booster problem.

June 8 Testimony on S. 1965 to unify law's provisions with respect to terms of office of members of regulatory agencies.

June 13 Comments on H.R. 6676, 6868, 8286, 9627 and 10275 to authorize daytime AM stations to operate from 6 a.m. to 6 p.m.

June 15 Eleven more FM "doctor-casting" grants bring total to 14.

June 23 Further steps in Western Union cable divestment (docket 6517).

Proposes to make Bakersfield, Calif., TV all UHF.

Office of Defense Coordination transferred to Office of Administration.

June 29 Revised field strength charts for TV Channels 7–13 placed in shorter-spaced VHF assignment proceeding (docket 13340).

○