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ECONOMIC INTELLIGENCE REPORT

POST AND TELECOMMUNICATIONS SERVICES IN HUNGARY 1949-58

CIA/RR 59-14
May 1959

CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

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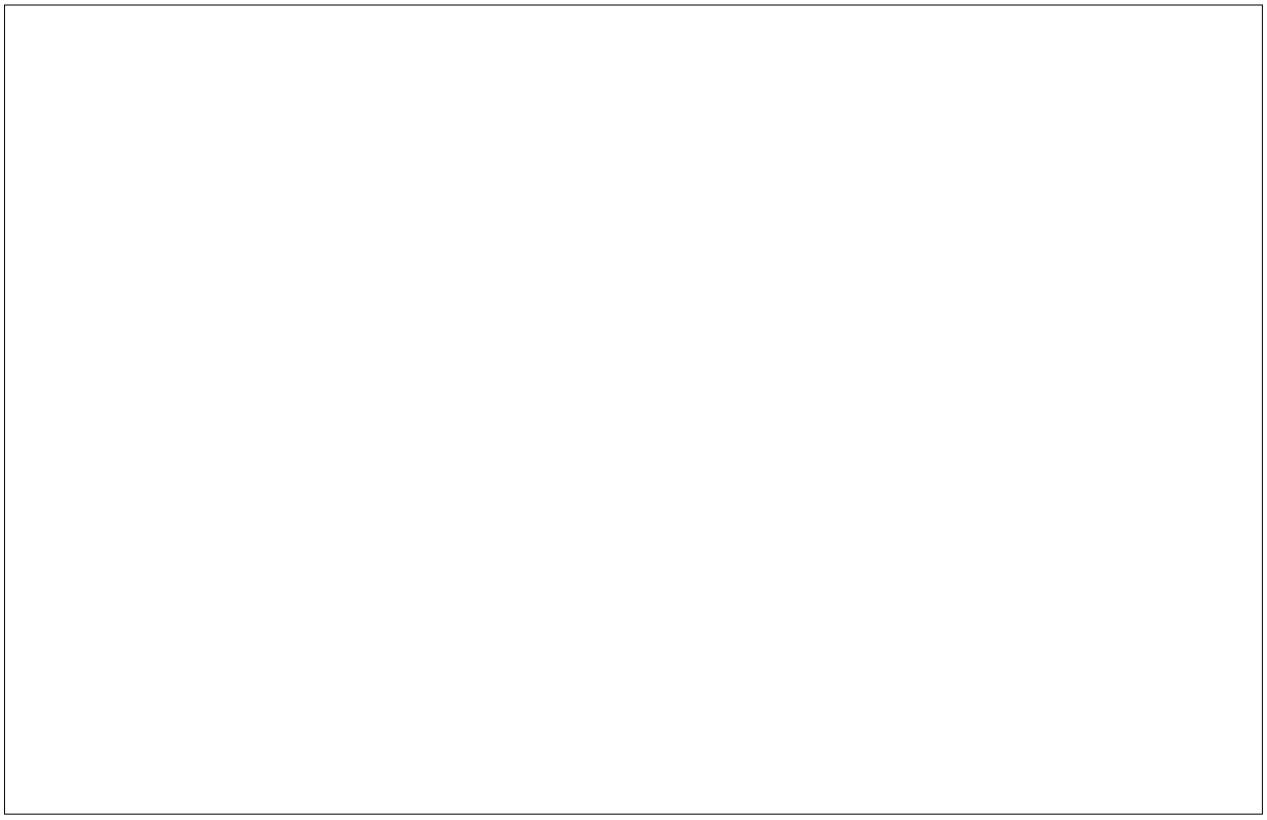
FOREWORD

This report is concerned with those public post and telecommunications facilities and services in Hungary operated and controlled by the Postal Division of the Ministry of Transportation and Postal Affairs. This Ministry and others operate functional post and telecommunications systems such as those serving the armed forces, aviation, and transportation. These functional post and telecommunications systems are not covered in this report. It must be pointed out, however, that although the facilities and services covered here are confined to those under the jurisdiction of the Postal Division of the Ministry of Transportation and Postal Affairs, their use is not so restricted. The armed forces make use of this system, as do all other ministries. 50X1



CONTENTS

Appendixes

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Tables

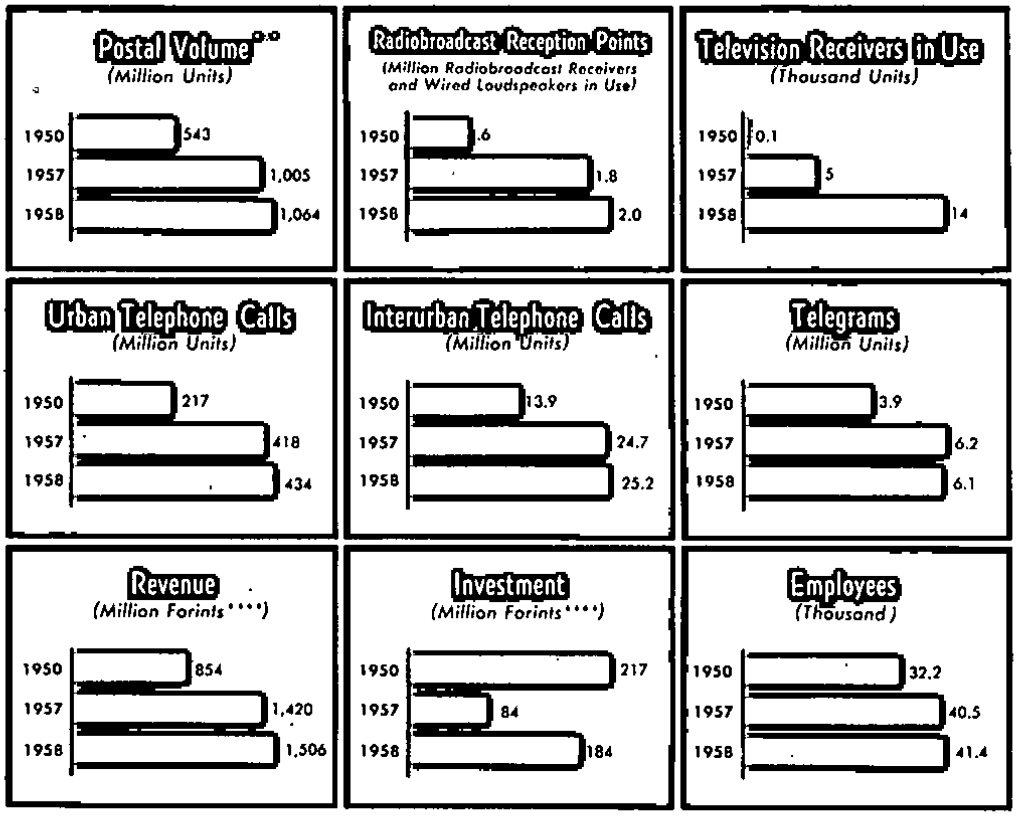
Illustrations

Following Page

POST AND TELECOMMUNICATIONS SERVICES IN HUNGARY*
1949-58

Summary and Conclusions

Public post and telecommunications facilities and services** in Hungary are operated and controlled by the Ministry of Transportation and Postal Affairs (Kozlekedesi es Postaugyi Miniszterium). A summary of the present status and recent developments in the public post and telecommunications sector of the Hungarian economy follows:



* The estimates and conclusions in this report represent the best judgment of this Office as of 1 March 1959. Technical terms are defined in Appendix A, Glossary of Technical Terms.

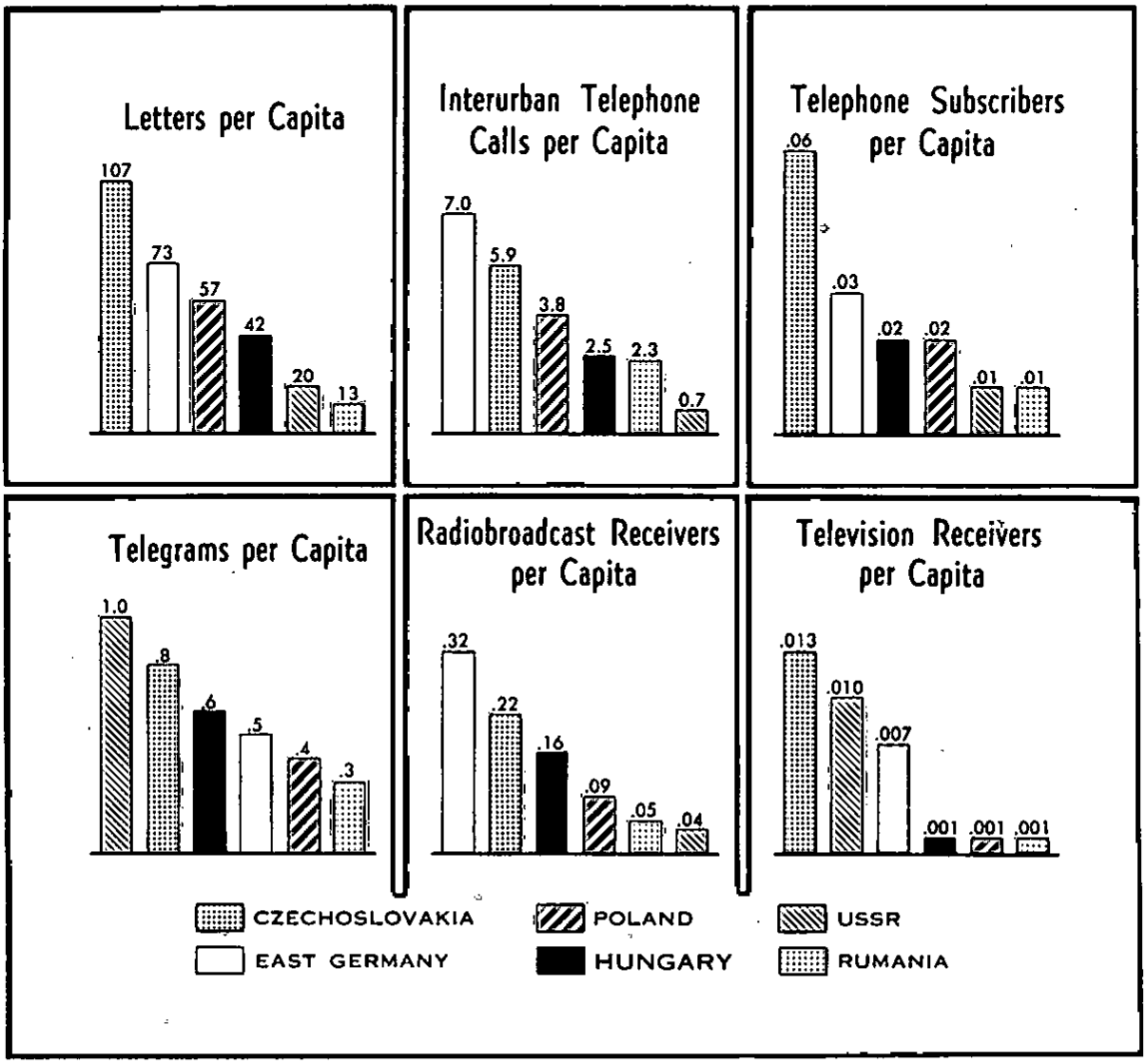
** The term public in this report refers to the facilities and services under the control of and operated by the Postal Division of the Ministry of Transportation and Postal Affairs. It does not refer to functional systems such as those serving the armed forces, aviation, or other divisions of the Ministry of Transportation and Postal Affairs.

*** Excluding incoming foreign letters and parcels.

**** Except where otherwise indicated, forint values in this report are expressed in terms of 1956 forints and may be converted to US dollars at the official rate of exchange of 11.4 forints to US $1. This rate of exchange, however, does not necessarily reflect the true dollar value.

With the exception of broadcasting, growths in service volumes have been relatively proportionate. The unusually large growth in broadcasting primarily reflects the small base that existed in 1950 for radiobroadcasting and wire diffusion and in 1954 for television. Total post and telecommunications revenue from 1950 to 1958 increased at an average annual rate of about 7 percent.* During the same period, employment increased at an average annual rate of about 3 percent, yielding an average annual rate of increase in labor productivity of about 4 percent.

In volumes of service rendered, as shown below, Hungary in 1957 ranked on a par with Poland, was far behind East Germany and Czechoslovakia, and was far ahead of the USSR. The equivalence of service



* All average annual rates of growth expressed in this report were computed on a compound interest basis.

volumes per capita between countries does not necessarily prove the equivalence of facilities, efficiency, or quality of service. For example, the volume of telephone and telegraph service per capita handled by interurban facilities in Hungary corresponds with that of most other Soviet Bloc countries, even though its wireline system lacks adequate capacity in many areas.

Investment performance has been the most unstable aspect of the post and telecommunications sector of the Hungarian economy. From 1949 through 1953 the average level of investment was high, but it fluctuated violently from year to year. In 1954, general economic retrenchment reduced this investment approximately 60 percent. In contrast, aggregate state investment for the economy as a whole declined about 30 percent. Post and telecommunications investment remained at a low and relatively stable level during 1954-57. A move initiated by the USSR in 1958 to integrate and improve the post and telecommunications systems of all Sino-Soviet Bloc countries influenced Hungary to revise its investment policies. The revised policy, which gave post and telecommunications a higher priority than previously, substantially increased allocations to this sector in 1958. It is expected that this higher priority, attended by increasing amounts of investment, will continue in the sector for some years to come.

The Hungarian uprising in 1956 apparently had no serious, long-run effect on the public post and telecommunications system. Service disruptions were restricted to relatively short periods, and damage to facilities was not severe. Some loss in personnel occurred through defection, but it was not sufficient to impair the long-run development of post and telecommunications in Hungary.

If implemented, plans for further development of the post and telecommunications sector of the Hungarian economy will eliminate many serious shortcomings. The establishment of a national and an international microwave radio relay network and the automation of interurban telephone exchanges will be major improvements. The new impetus given to post and telecommunications development in Hungary by the intention of all the Sino-Soviet Bloc contries to improve Bloc facilities should effect sufficient priorities to meet plan goals.

I. Introduction.

The purpose of this report is to discuss the status, operation, and development of public post and telecommunications facilities and services provided by the Ministry of Transportation and Postal Affairs of Hungary. Quantitative data are limited generally to the period 1949-58, but some qualitative references to historical aspects of the subject are included.

The public post and telecommunications system in Hungary is used more to serve the needs of the government, governmental enterprises, and the armed forces than to serve private consumers. Private consumer usage varies among services. There is relatively more consumer use of postal and broadcasting services than of telephone and telegraph services. The absolute share of service consumed by each of the various users is not known, and no distribution of usage is reflected in the statistical data presented in this report.

II. Unification of Post and Telecommunications Systems of the Sino-Soviet Bloc.

The public post and telecommunications system of Hungary is subject to external as well as domestic considerations. Foremost among the external considerations is a recent move on the part of all Sino-Soviet Bloc countries, initiated by the USSR, to overcome the lack of a unified post and telecommunications system within the Bloc.

Eleven Sino-Soviet Bloc conferences on post and telecommunications held since 1956 demonstrate the desire of the USSR to overcome this lack of unification. A new body known as the Organization for Cooperation Among the Socialist Countries in the Fields of Post and Communications (OSS) has been formed. This new mechanism is apparently associated with but is probably not a part of the Council for Mutual Economic Assistance (CEMA), because it includes Communist China, North Korea, and North Vietnam as full members.

Under a specific plan prepared by the new organization at the March 1958 CEMA conference in Moscow, all Sino-Soviet Bloc countries are to make their telecommunications networks partly automatic by 1965 and fully so by 1975. All participating countries were required to make available immediately the required funds for this program and to report their requirements for telecommunications and their production capacity for telecommunications equipment to the proper committee of CEMA by June 1958. Telegraphic traffic between countries is to be accelerated, and relay stations for an eastern television network (OIR-Vision) are to be established in 1965.

The priority of this program may be indicated by the fact that the Hungarian economic plan for 1958 was altered to provide funds for the fulfillment of the country's obligations under OSS. It therefore appears that each country is expected to finance its share of the program without aid from the USSR.

A major buildup of main line telecommunications structures within and between Sino-Soviet Bloc countries will increase Soviet control in these areas markedly. The program will also strengthen Bloc military potential, because these facilities are used jointly by the armed forces in peacetime, and in wartime they could be wholly commandeered to meet the requirements of military traffic.

The ultimate status of OSS is not yet clear. East Germany, Communist China, and North Vietnam have pressed for its establishment as a Sino-Soviet Bloc counterpart of the Universal Postal Union (UPU) and the International Telecommunications Union (ITU) -- both specialized agencies of the Economic and Social Council of the UN -- because they have consistently been denied membership in those two organizations. Other Bloc countries, including Hungary, are opposed, however, for fear of jeopardizing their standing in the UPU and the ITU.

III. Ministry of Transportation and Postal Affairs.

A. Organization.

Public post and telecommunications services in Hungary are provided by the Postal Division of the Ministry of Transportation and Postal Affairs. The present Minister is Istvan Kossa, and the Chief Deputy Minister is Gryorgy Csanadi. Within the Postal Division, postal, telephone, and telegraph services are provided by the Postal Department, and radiobroadcasting, television, and wire-diffusion services are provided by the Radio and Television Stations Department. The organizational structure of that portion of the Ministry of Transportation and Postal Affairs concerned with public post and telecommunications activity is shown in the accompanying chart, Figure 1.* 1/**

Postal, telephone, and telegraph services are made available through a nationwide network of post offices. As the chart shows, authority flows from Postal Department headquarters in Budapest through regional and district postal units to local post offices. In contrast, broadcasting services are provided by radiobroadcasting,

* Following p. 6.

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television, and wire-diffusion stations which are controlled directly by the Radio and Television Stations Department in Budapest.

A division of authority in broadcasting activity in Hungary exists between the Ministry of Transportation and Postal Affairs and the Ministry of the Arts. The former is responsible for the technical operation of broadcasting facilities, whereas the latter is responsible for the programming and the scheduling of broadcasts as well as for the operation of studios. 2/

In a manner similar to the division of authority in broadcasting activity, the Ministry of Transportation and Postal Affairs and the Ministry of the Interior are believed to share responsibility in jamming activities.

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B. Revenue.

Revenue from public post and telecommunications services in Hungary, shown in Table 1,* has increased steadily since 1950 at an average annual rate of about 7 percent, but there has been a decline in this trend since 1955. The change in trend that occurred in 1955 is related to the change in investment that occurred in 1954. This relationship between revenue and investment, allowing a lag of 1 year for changes in investment to influence revenue, can be seen from a comparison of the growth curves presented in Figure 2.**

Except for broadcasting services, the shift in trend in the growth of total post and telecommunications revenue is reflected in corresponding shifts in trends in the growth of revenues from individual post and telecommunications services. The lack of change in broadcasting revenue corresponding to changes in total revenue is explained by the nature of broadcasting revenue.

* Table 1 follows on p. 8.
** Following p. 6.

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Figure 1

Hungary: Organization of the Postal Division of the Ministry of Transportation and Postal Affairs, 1958

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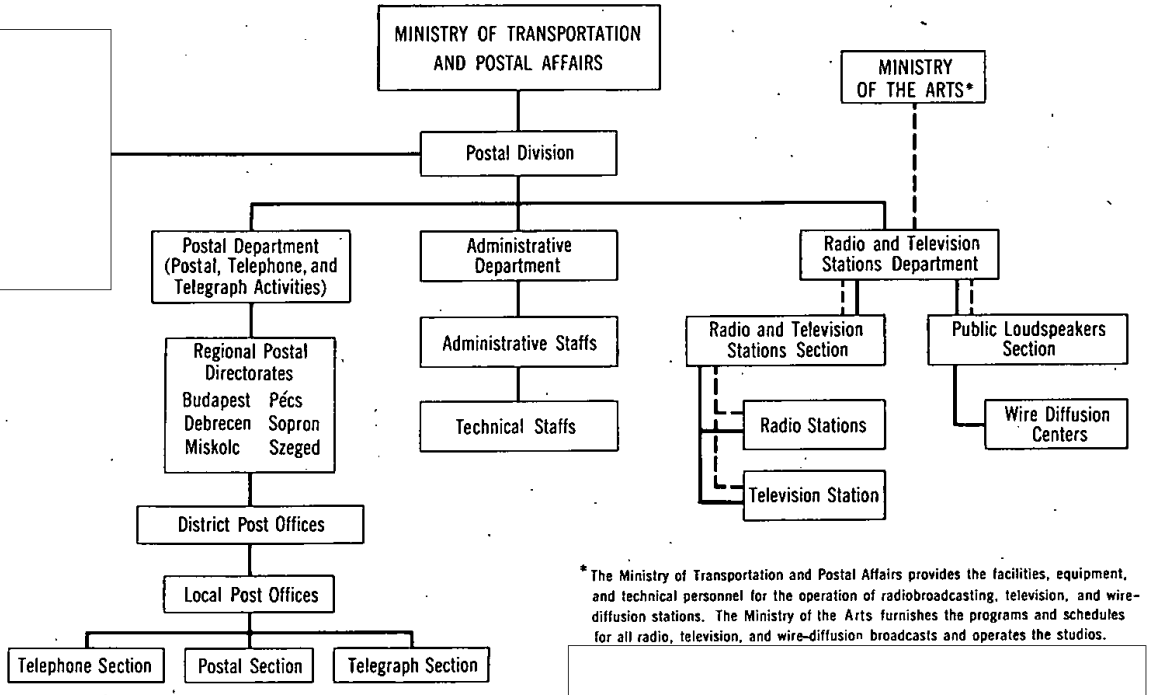

*The Ministry of Transportation and Postal Affairs provides the facilities, equipment, and technical personnel for the operation of radiobroadcasting, television, and wire-diffusion stations. The Ministry of the Arts furnishes the programs and schedules for all radio, television, and wire-diffusion broadcasts and operates the studios.

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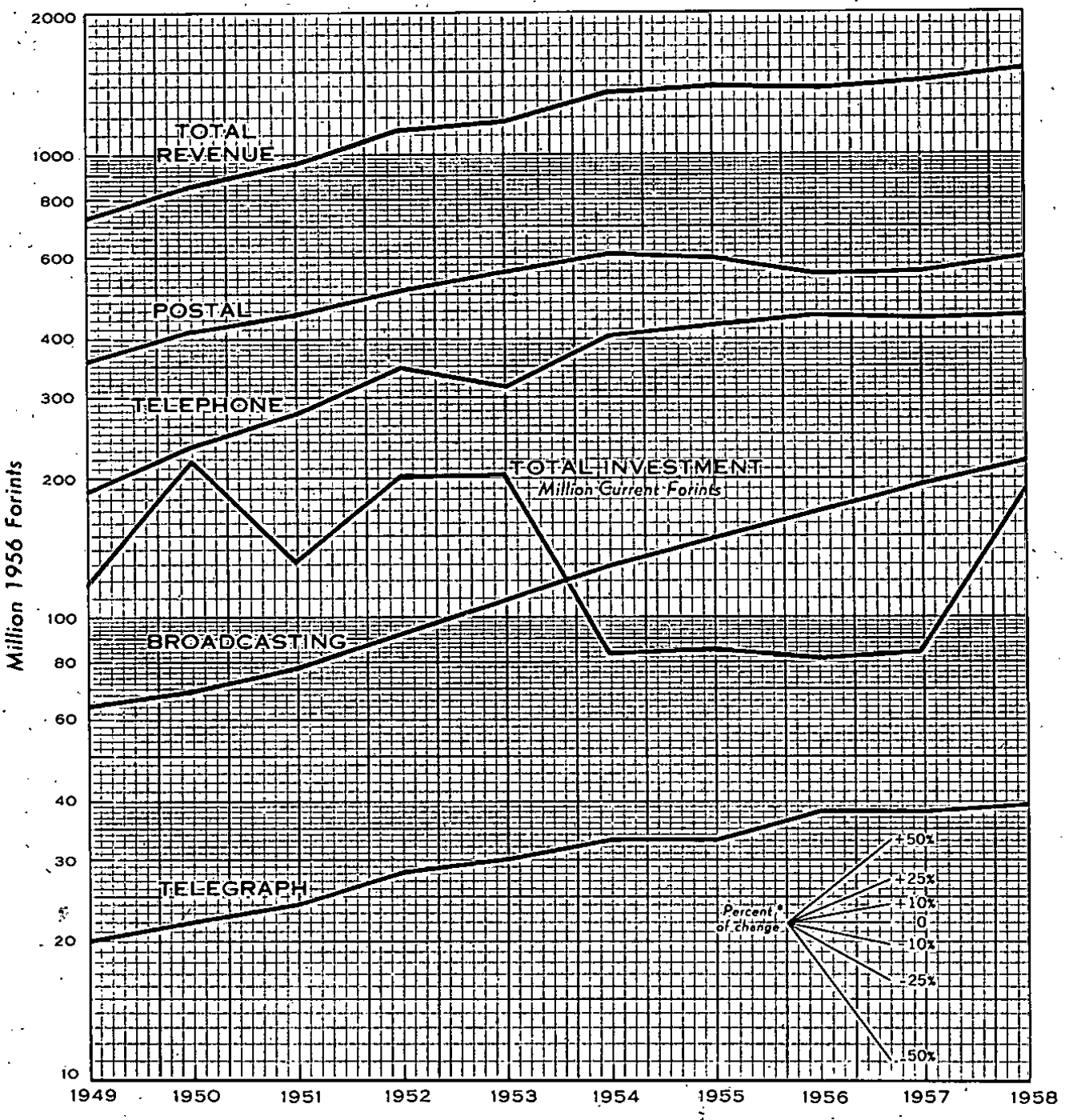
Figure 2 50X1

Hungary: Estimated Revenue and Investment for Public Post and Telecommunications, 1949-58

Postal Division of the Ministry of Transportation and Postal Affairs



*The slope of the lines of the graph, when related to this scale, gives an approximation of the percentage change from one year to another.

27566 4-59

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is derived from subscription fees charged for the use of radiobroadcast receivers, wired loudspeakers, and television receivers. As the production of receivers and loudspeakers is not dependent upon investment funds from the Ministry of Transportation and Postal Affairs, increases in broadcasting revenue are not related directly to post and telecommunications investment.

The relative shares of total revenue generated by various post and telecommunications services have remained relatively constant since 1949. This situation is expected to change in the future, when services such as television, now in the initial stages of development, are expanded. Changes in national income can also be expected to change the relative shares of revenue derived from the various post and telecommunications services. As income rises, the relative share of revenue derived from telephone service should increase while that from postal service declines.

C. Investment.

The amount of investment allocated for the development of public post and telecommunications in Hungary has varied considerably since 1949, as shown in Table 2.* It has experienced two distinct but opposite changes in trend. During 1949-53, investment in public post and telecommunications, although fluctuating from year to year, remained at a relatively high level. In 1954, investment declined to about half of its former amount and remained at this low level through 1957. In 1958, however, such investment increased to a level comparable to that in 1949-53.

The change in the trend of post and telecommunications investment that occurred in 1954, shown in Figure 3,** coincided with the change in the trend of aggregate state investment in the Hungarian economy. The "new course" adopted in Hungary in 1954 resulted in a decline of about 30 percent in aggregate state investment for the economy. Post and telecommunications investment, however, declined by about 60 percent in 1954, indicating a relatively greater deemphasis on the development of post and telecommunications compared with the development of most other sectors of the economy. This condition prevailed through 1957. 5/

The reemphasis on public post and telecommunications investment in 1958 is indicative of the Hungarian response to a new Sino-Soviet Bloc decision to expand and integrate the post and telecommunications systems of all Bloc countries. Under the leadership and

* Table 2 follows on p. 9.
** Following p. 8.

Table 1

Estimated Revenue from Post and Telecommunications Services
Provided by the Postal Division of the Ministry of Transportation and Postal Affairs of Hungary a/
1949-58

Million 1956 Forints

Services	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Postal	357	416	450	505	556	603	599	547	559	598
Telephone	188	233	274	346	317	404	429	447	442	449
Telegraph	20	22	24	28	30	33	33	38	38	39
Broadcasting b/	62	69	78	92	109	129	148	169	192	219
Other c/	96	114	127	149	156	180	186	185	189	201
Total	723	854	953	1,120	1,168	1,349	1,395 d/	1,386	1,420	1,506

a. All data are rounded to the nearest million forints. Revenue was derived by applying price data [redacted] to service volume data taken from Tables 4, 5, 6, and 9, pp. 16, 18, 21, and 29, respectively, below. 50X1 50X1

b. The figures given here are the total revenue received from radio and television receiver subscriptions before this revenue is divided equally between the Ministry of Transportation and Postal Affairs and the Ministry of the Arts. 7/

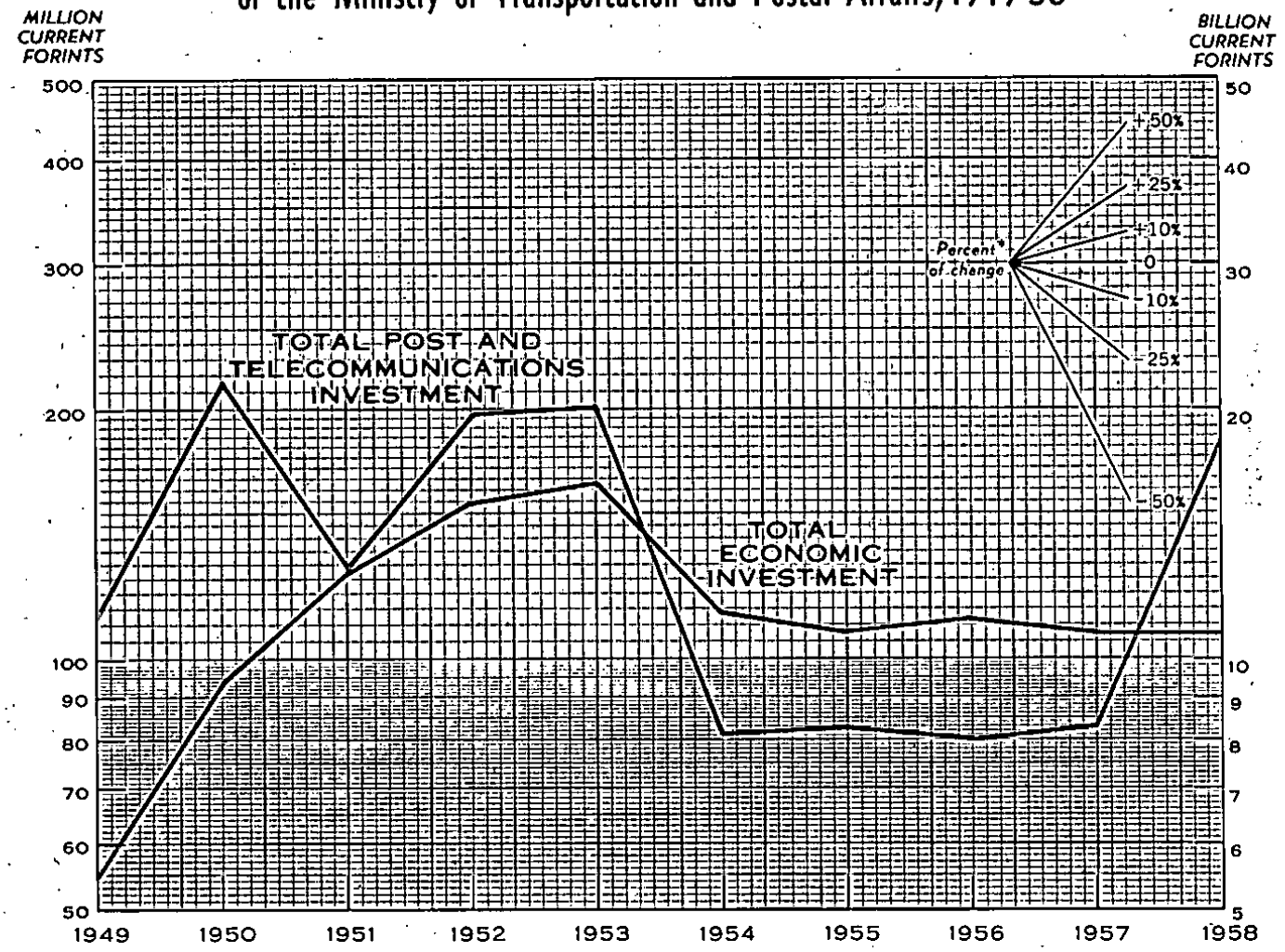
c. These figures represent an allowance for items not reflected in services listed above. The following are examples of sources of income that have not been reflected in the above data, because of insufficient information on quantities and prices: insurance charges for mail; auxiliary telephone equipment; fines for late payment of bills; moving of telephones from one room or house to another; listing of names, addresses, and the like in telephone books; original subscription fees when applying for radio or television receiver license; and leasing of facilities. Estimated revenue was 13.3 percent less than actual revenue in 1955, which difference appears to be reasonable for these and other unaccounted-for sources of revenue. Total revenue was derived by assuming that the 13.3 percent was applicable to all years.

d. 8/

[redacted]

Figure 3 50X1

Hungary: Estimated Total Economic Investment in Hungary and Investment in Public Post and Telecommunications by the Postal Division of the Ministry of Transportation and Postal Affairs, 1949-58



*The slope of the lines of the graph, when related to this scale, gives an approximation of the percentage change from one year to another.

27567 4-59

[redacted]

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guidance of OSS, the Hungarian Council of Ministers is reported to have adopted a new attitude toward the priority of post and telecommunications development in Hungary. As a result, investment plans for the economy as a whole were revised in 1958 so that additional funds could be made available for investment in public post and telecommunications. 9/

Table 2

Estimated Investment in Post and Telecommunications by the Postal Division of the Ministry of Transportation and Postal Affairs of Hungary a/ 1949-58

Million Current Forints

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Total investment	115 b/	217	130	199	202	82	84	81	84 b/	184 c/

50X1

b. Post and telecommunications investment during 1950-55 averaged about 9.6 percent of total investment of the Ministry of Transportation and Postal Affairs. The 9.6 percent was applied to 1949 and 1957 data to derive the estimated investment for these years. 11/

c. It is estimated that in 1958 investment expenditures increased approximately 100 million forints above the level of investment expenditures in 1957 as a result of a Sino-Soviet Bloc program to expand and integrate telecommunications facilities. 12/

D. Manpower.

The labor force employed in public post and telecommunications in Hungary appears to be adequate in both numbers and skill to meet current service demand. Shortages of higher level technical personnel may, if advanced training is not emphasized, present problems for the future. Earnings of post and telecommunications employees are below the level of the average wage paid to employees in the Ministry of Transportation and Postal Affairs, reflecting the relatively large proportion of unskilled employees engaged in postal activities. Labor productivity has increased substantially since 1949. It is expected to continue to increase as additional modern facilities are added to the post and telecommunications resource base.

1. Labor Force.

The number of public post and telecommunications employees in Hungary increased during 1950-58 at an average annual rate of about 3 percent. Little growth has occurred, however, since 1952 (see Table 3*). It is believed, therefore, that the level of the labor force equates with the level of current service demand. Future increases in number of employees will probably be small because future increases in service volumes should be achieved primarily through the introduction of modern, labor-saving equipment.

Defection of employees during the Hungarian uprising explains the slightly below-average growth that occurred in the number of employees in 1956, and was the major cause for absence of growth in 1957. It is estimated that the growth in 1958 approximated the trend in growth established between 1952 and 1956.

The following tabulation indicates the composition of public postal employees, by type of activity:

	Percent
Traffic employees	65
Laborers	21
Technical employees	7
Administrative employees	7
Total	100

This percentage distribution has probably remained relatively constant over the past 5 years. Mail carriers are classified as traffic employees, thus accounting for the large percentage in this category. Except for an expected growth in technical employees at the expense of other categories, these percentages should not change substantially in the future.

2. Earnings.

Average earnings of public post and telecommunications employees in Hungary in 1958 were about 10 percent lower than average earnings of all employees in the Ministry of Transportation and Postal Affairs. This lower level of earnings primarily reflects the large number of relatively unskilled postal workers, whose earnings are commensurate with technical ability.

* Table 3 follows on p. 12.

As an indirect result of the Hungarian uprising, earnings of workers in all sectors of the Hungarian economy were appreciably increased in 1957. For post and telecommunications employees, this increase amounted to about 30 percent. Wages for this group increased little in 1958, and no significant increase is expected during the next few years (see Table 3*).

Since 1949, earnings of post and telecommunications employees have increased at a more rapid rate than has labor productivity, as shown in Figure 4.** It is expected that future increases in earnings, however, will more nearly reflect productivity gains.

3. Training.

Practical training in post and telecommunications in Hungary is acquired through apprenticeship or through attendance at technical high schools, supplemented by one-the-job training during and after normal work hours. The Institute of Technology provides higher academic training in the post and telecommunications field, including day and night courses offered in 5-year undergraduate and 4-year postgraduate programs. Similar degrees can probably be obtained from the University of Budapest and other large universities.

There is apparently a need for a greater number of people in public post and telecommunications who possess higher academic degrees: in 1956, only 150 employees out of a total labor force of 40,500 engaged in this activity held graduate engineering degrees. It can be expected, therefore, that greater emphasis will be placed in the future on higher academic training.

4. Productivity.

Labor productivity of employees engaged in post and telecommunications in the Ministry of Transportation and Postal Affairs of Hungary increased about 37 percent from 1950 through 1958 at an average annual rate of increase of about 4 percent, as shown in Table. 3* This increase has not been steady, however, as shown in Figure 4,** as absolute decreases in productivity were experienced in 1951 and 1956. With the introduction of more modern equipment and facilities planned for the future, labor productivity should continue to rise.

E. Equipment.

Hungary has an electronics equipment industry that ranks behind those of the USSR and East Germany and is generally on a par with that

* Table 3 follows on p. 12.
** Following p. 12.

Table 3

Estimated Average Number of Employees, Total Wage Bill, Average Annual Earnings, and Productivity of Post and Telecommunications Employees in the Postal Division of the Ministry of Transportation and Postal Affairs of Hungary a/
1949-58

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Number of employees (thousand)	30.8	32.2	36.1	38.4	38.6	39.3	40.0	40.5	40.5	41.4 b/
Total wage bill (million current forints) c/	234	240	276	385	396	434	505	504	592	642
Average annual earnings (current forints) d/	7,600	7,450	7,660	10,000	10,200	11,000	12,600	12,500	14,600	15,500 e/
Average revenue per employee (current forints) f/	23,500	26,500	26,400	29,200	30,300	34,300	34,900	34,200	35,100	36,400

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a. All data are rounded to three significant digits.
b. Derived by using the average number of employees during the first half of 1958 [redacted] as a base and by assuming the same average annual rate of increase during the last half of 1958 as was shown from 1953 to 1955. 50X1
c. Derived by multiplying the unrounded average annual earnings by the estimated annual number of employees.
d. Derived by multiplying the average monthly earnings from source 15/ by 12, unless otherwise indicated.
e. Derived by multiplying the average monthly earnings for the first half of the year [redacted] by 12. 50X1
f. Derived by dividing the total revenue from Table 1, p. 8, above, by total number of employees.

Figure 4

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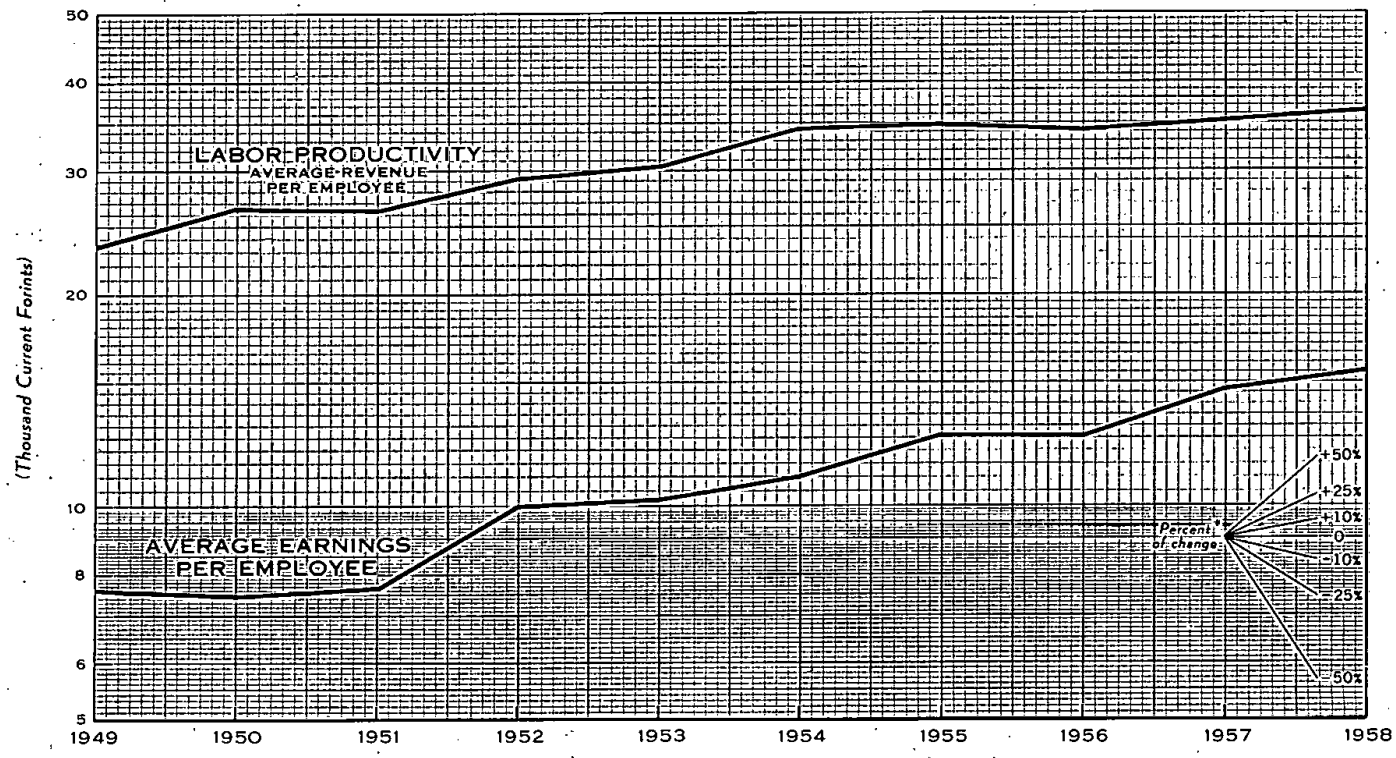
Hungary: Estimated Average Earnings and Labor Productivity of Post and Telecommunications Employees, 1949-58

Postal Division of the Ministry of Transportation and Postal Affairs



*The slope of the lines of the graph, when related to this scale, gives an approximation of the percentage change from one year to another.

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of Czechoslovakia. This industry produces telephone, telegraph, radio, and television equipment for domestic use and for export.

1. Production.

Before World War II, Hungary had a well-developed telecommunications equipment industry. Factories producing such equipment were usually subsidiaries of large Western European firms. These factories were nationalized following World War II and formed the basis for the existing telecommunications equipment industry.

Four large enterprises, the Beloiannisz Telecommunications Plant, the United Incandescent Lamp Plant, the Telephone Plant, and the Orion Radio and Electrical Appliance Plant, account for about 80 percent of all telecommunications equipment manufactured in Hungary. They produce telephone instruments, telephone and telegraph multiplex equipment, microwave radio relay apparatus, automatic and manual telephone and telegraph switching devices, high-powered radio transmitters, radio and television broadcast receiving sets, and vacuum tubes. Smaller enterprises produce telecommunications wire and cable and small electronic components, including resistors and capacitors.

Although the industry is capable of producing sufficient quantities of equipment to meet most domestic needs, heavy export commitments, together with raw material shortages, have limited the quantities of equipment available for domestic use. To meet domestic needs without curtailing exports, efforts are being made to expand the production base and to specialize in the production of selected telecommunications products in coordination with other Soviet Bloc countries. With the recent impetus being given to these two programs, it is possible that domestic needs for telecommunications equipment will be met within the next few years. 17/

2. Imports.

Hungarian imports of finished telecommunications equipment include mainly test instruments, models for prototyping, and television equipment. Electronic components and raw materials needed for domestic manufacture of finished telecommunications equipment are also imported. Raw materials in short supply in Hungary include steel, copper, bronze, plastics, and moisture-absorbing material. These materials are imported from both Bloc and non-Bloc countries through the state trading companies known as Metalimpex and Chemolimex.

Electronic components, such as capacitors and resistors, are imported through the state trading company, known as Elektroimpex. Major

suppliers include West Germany, Switzerland, Czechoslovakia, and East Germany. Only a small quantity of electronic components are imported from the USSR, because of high prices and unreliable delivery dates.

3. Exports.

Hungarian exports of telecommunications equipment include telephone apparatus, AM radiobroadcasting transmitters, radiobroadcast receivers, and microwave radio relay equipment. Telecommunications equipment is exported through both Elektroimpex and an export company associated with the Beloiannisz Telecommunications Plant known as Budavox.

The greater part of Hungarian telecommunications exports are sent to other Sino-Soviet Bloc countries. Of these, Communist China and the USSR receive the largest shares. Although exports to non-Bloc countries are not as large in amount as those to the rest of the Bloc, often goods are sent to non-Bloc countries in preference to the Bloc in order to acquire badly needed foreign exchange or to further economic penetration of underdeveloped countries. Major non-Bloc recipients of Hungarian telecommunications exports include Argentina, Syria, Egypt, and India. When exported to non-Bloc countries, this equipment must compete with that of other producers, and it is sometimes sold at prices which are estimated to be less than production costs.

Lack of raw materials, machinery, and power needed for production has frustrated many export commitments. Concerted efforts are being made by various parts of the government to overcome this problem, but Hungary still does not have a reputation for meeting export obligations. 18/

4. Technology.

Research and development in support of the operational activities of public post and telecommunications in Hungary are conducted by the Post Office Research Institute of the Ministry of Transportation and Postal Affairs. Both the electronics and telecommunications equipment manufacturing industry and the military maintain their own research and development facilities. The Telecommunications Research Institute, subordinate to the Ministry of Metallurgy and Machine Industry, has the responsibility for coordinating all research and development in the electronics and telecommunications field in Hungary.

Besides the effort spent on original research and development work, a considerable amount of research and development effort

is spent on adapting Western telecommunications equipment for production in Hungary. Important work has been in progress on microwave radio relay and multichannel carrier frequency telephone equipment. This equipment, capable of handling up to 600 telephone channels, is to be ready for series production in 1959.

In consequence of the uprising in 1956, the telecommunications research and development program in Hungary has been hampered by the loss of qualified engineering and technical personnel. Other factors retarding progress have been the lack of adequate test equipment and the shortage of quality electronic components. There are no indications that these problems will be solved in the immediate future. 19/

IV. Postal Service.

Public postal service in Hungary is provided by a nationwide network of main post offices and branch post offices. The postal system appears to be adequate to meet domestic and inter-Bloc service demands. Service to non-Bloc countries, however, is restricted intentionally. The postal system also provides postal savings service and collects radiobroadcasting, wire-diffusion, and television subscription fees.

Growth in the number of post offices in Hungary from 1949 through 1955, including both main and branch offices, is shown in the following tabulation:

Year	Post Offices	Year	Post Offices
1949	2,828	1953	3,102
1950	2,897	1954	3,095
1951	3,053	1955	3,090
1952	3,094		

The decline in the total number that occurred in 1954 and 1955 resulted from consolidations of branch post offices with main post offices, in the interest of better service. The number of post offices in existence at the end of 1955 is believed to have been sufficient to meet the postal requirements of the country. It is estimated that no significant expansion in the number of post offices has occurred since 1955. 20/

Total postal volume in Hungary, as shown in Table 4,* is composed of letters, registered mail, express mail (delivered by express coach),

* Table 4 follows on p. 16.

Table 4

Estimated Volume of Postal Service of the Postal Division
of the Ministry of Transportation and Postal Affairs of Hungary a/
1949-58

Million Units

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Domestic letters	292	353	349	420	448	477	442	405	391 b/	425 b/
Registered mail	12.8	14.9	17.1	22.6	26.3	29.6	28.5	24.8	24.1 b/	26.2 b/
Express mail	2.7	3.9	5.0	6.1	9.4	9.1	8.1	6.1	5.9 c/	6.4 c/
International letters (outgoing)	17.1	14.6	10.2	7.8	7.2	10.3	15.0	13.8	17.1 d/	21.2 d/
International letters (incoming)	25.4	26.9	24.9	11.9	7.8	7.5	12.0	11.0	12.3 d/	13.8 d/
Domestic parcels	10.1	11.9	12.7	11.3	10.2	10.3	10.4	8.1 e/	8.9 e/	10.3 e/
International parcels (outgoing)	0.09	0.02	0.05	0.06	0.03	0.03	0.04	0.04 e/	0.06 e/	0.07 e/
International parcels (incoming)	0.24	0.20	0.20	0.11	0.06	0.16	0.30	0.30 e/	0.98 e/	0.71 e/
Newspapers mailed	133 f/	131	323	347	417	484	521	517	535 g/	553 g/
Money orders mailed	9.0	13.1	12.0	23.3	23.1	24.5	24.7	23.2	23.2 h/	23.2 h/

50X1

a. All data are rounded to three significant digits or less.

50X1

b. [redacted] This total was divided between the two groups in the same proportion that existed in 1956. The total for 1958 was derived by multiplying the average monthly volume for the first half of the year by 13 to allow for Christmas mail.

50X1

c. Assuming the same percentage rate of either increase or decrease that was shown for domestic letter volume.

d. Extrapolated by applying the average annual rate of increase from 1953-56.

e. 23/. The totals for 1958 were derived by multiplying the average monthly volume for the first half of the year by 13 to allow for Christmas mail.

f. Including newspapers mailed abroad.

g. Extrapolated by applying the average annual rate of increase from 1954 to 1956.

h. Assuming no change.

newspapers, parcels, and money orders. Newspapers have accounted for the largest share of postal volume since 1953. This increase is consistent with the emphasis given in recent years to the dissemination of propaganda.

The decline in volume of domestic letters during 1955-57 is considered to be temporary. Causes for the decline in 1955 are not known, but the Hungarian uprising undoubtedly caused the decline in 1956 and 1957. Letter volume is expected to increase in the future until the 1954 ration of letters mailed to total population has been reestablished, possibly by 1960.

Little is known of over-all plans for future development of the postal system of Hungary. Nevertheless, modernization of postal facilities should occur, and some emphasis is expected to be directed toward expansion of service in rural areas and toward improvement of speed of service throughout the country.

V. Telephone and Telegraph Services.

Public telephone and telegraph service is available in all parts of Hungary. An extensive wireline and cable network provides the basis for this service. Microwave radio relay facilities, a modern development, are now being introduced. Point-to-point radio facilities are used mainly to give international telecommunications service.

A. Telephone.

Public telephone service in Hungary, which is provided primarily through automatic telephone exchange equipment, is unevenly distributed over the country. The greater part of the total exchange capacity and the number of main subscriber lines in use in Hungary (as shown in Table 5*) are concentrated in the Budapest area. Although telephone facilities have been distributed somewhat more evenly in recent years, more than 50 percent of capacity and lines in use probably are still located in the Budapest area.

The Budapest area has reached a critical point in telephone exchange utilization. Telephone officials in Hungary have established 80 percent as the maximum for safe use of telephone exchange capacity. Usage of capacity in Budapest had reached 85 percent in 1956, and apparently the proportion has not changed substantially since that time. One of the critical aspects of this problem is the large amount of telephone traffic generated through many small subexchanges located in enterprises and government agencies. This overuse of available capacity in

* Table 5 follows on p. 18.

Table 5

Estimated Number of Main Telephone Exchange Subscriber Lines and Number of Telephone Calls over Facilities of the Postal Division of the Ministry of Transportation and Postal Affairs of Hungary a/
1949-58

	Main Telephone Exchange Subscriber Lines (Thousand) b/		Number of Telephone Calls (Million)	
Year	Total Capacity	In Use	Urban	Interurban
1949	163	91.1	177	10.4
1950	183	110	217	13.9
1951	196	132	247	17.6
1952	207	153	297	21.7
1953	220	159	358	24.0
1954	232	169	395	24.1
1955	245	183	417	25.2
1956	258	193	438	24.9
1957	273	204	418	24.7
1958	290	216	434	25.5 c/

a. All data are rounded to three significant digits. [redacted] 50X1

[redacted] 50X1

b. [redacted] Growth in Budapest during 1956 and 1957 is [redacted] slightly more than 5 percent in 1956 and about 6 percent in 1957. These percentages were used to compute the total capacity and the total in use for growth in 1956 and 1957. Growth in 1958 was assumed to be at the same rate as in 1957. 50X1 50X1

c. [redacted] The rate of growth for the succeeding quarters was assumed to be the same as the quarterly growths for 1957 [redacted] 50X1 50X1

Budapest recently forced a resort to party-line connections as a means of accommodating additional subscribers. Increased use of party-line connections, however, has not been sufficient to meet demand, so that a considerable backlog of orders persists. To overcome this backlog, substantial increases in exchange capacity must be made.

Plans provide for an increase in telephone exchange capacity in Budapest of 34 percent during 1956-60. Their fulfillment will require an annual growth of 15,500 lines. This is a modest growth

compared with the performance in 1956 and 1957, which suggests that the plans can be met. Even with the planned increase in capacity, the demand for service will not be completely satisfied. Hence telephone exchange utilization will continue to be a problem in Budapest in 1960. 29/

The volume of urban telephone calls increased steadily from 1949 through 1956, as shown in Table 5.* The decline in volume of urban telephone calls of about 5 percent in 1957 from the level of 1956 probably resulted from the Hungarian uprising. Some recovery undoubtedly occurred in 1958, but it was not sufficient to bring volume up to the former high level reached in 1956. As urban exchange capacity is increased in the future, the volume of urban telephone calls should also increase.

The number of interurban telephone calls decreased during 1956 and 1957 as a result of the uprising. It is estimated, as shown in Table 5,* that the total number of interurban calls in 1958 will exceed slightly the volume reached in 1955. The rate of growth in the number of such calls in the future should approximate the rate of growth experienced between the base year 1949 and 1955.

With the exception of semiautomatic (operator-to-operator dialing) interurban telephone service between Budapest and Vac and between Budapest and Szekesfehervar, interurban telephone calls in Hungary are handled through manually operated switchboards. These switchboards are located in the same buildings as are the urban telephone exchange facilities. Most international telephone calls are handled through one large manually operated telephone exchange located in Budapest.

Plans call for the expansion of semiautomatic, interurban telephone service between Budapest and each of the provinces in Hungary within the next few years. Automatic (subscriber-to-subscriber dialing) interurban telephone service is to be available throughout the country by 1975. This automatic service is to be provided by 70 interurban telephone exchanges. The automatization program is part of a 15-year plan to integrate the telecommunications networks of all Sino-Soviet Bloc countries.

If both urban and interurban telephone service is to be improved, modern automatic equipment in large quantities will be required. Much of the existing urban telephone-switching equipment is 20 or more years old. Replacement of a good portion of this equipment and additions of automatic switching equipment for interurban service will be

* P. 18, above.

needed. By November 1957, no decision had been reached on the type of automatic equipment to be installed.

Expansion and modernization of urban and interurban telephone exchange facilities in Hungary will require considerable investment. The revision of over-all investment plans in Hungary in 1958 in order to make more funds available for development of the public post and telecommunications sector of the economy suggests that adequate funds will be forthcoming for that purpose.

B. Telegraph.

The public telegraph network in Hungary supplies regular telegraph, subscriber telegraph (TELEX), and facsimile services. Telegraph service is given over the same interurban telecommunications facilities as those used to give telephone service. Regular telegraph service is the only post and telecommunications service in Hungary that has not increased in volume in recent years. A shift in usage from regular to TELEX service rather than a decline in telegraph usage on the whole accounts for this situation.

1. Regular Telegraph.

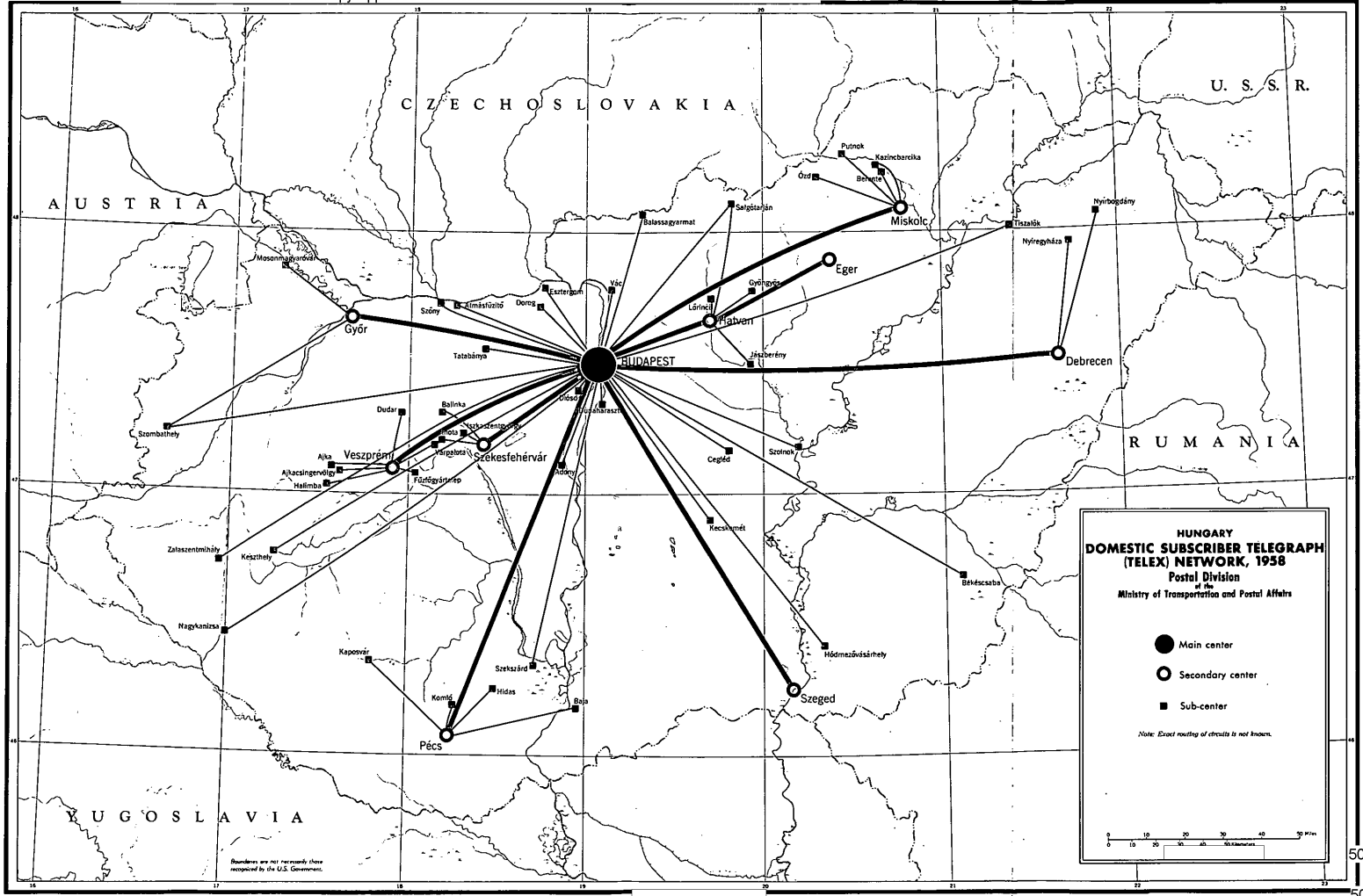
Regular telegraph service is available in all parts of Hungary. Telegraph offices are usually located in post offices in combination with telephone offices. The volume of telegrams sent, as shown in Table 6,* grew steadily from 1949 through 1956, but volume declined after 1956. This decline resulted from a shift in service, mainly by enterprises, from regular telegraph service to TELEX service. Other than equipment modernization and attempts to improve delivery time of telegrams, no substantial change is expected in regular telegraph service in the future.

2. Subscriber Telegraph (TELEX).

The TELEX network in Hungary offers domestic and international teletypewriter service. This network, using a combination of manual and semiautomatic switching equipment, was begun in 1952. The present TELEX network in Hungary is shown in Figure 5,** and growth in the number of exchanges and subscribers is shown in Table 7.*** 30/

* Table 6 follows on p. 21.
** Following p. 20.
*** Table 7 follows on p. 22.

Figure 5



HUNGARY

DOMESTIC SUBSCRIBER TELEGRAPH (TELEX) NETWORK, 1958

Postal Division of the Ministry of Transportation and Postal Affairs

- Main center
- Secondary center
- Sub-center

Note: Exact routing of circuits is not known.

0 10 20 30 40 50 Miles
0 10 20 30 40 50 Kilometers

27395 3-59

Table 6

Estimated Number of Telegrams
Transmitted over Facilities of the Postal Division
of the Ministry of Transportation and Postal Affairs of Hungary a/
1949-58

Thousand Units

Year	Domestic b/	International	Total
1949	3,198	542 c/	3,740
1950	3,392	575	3,967
1951	3,758	572	4,330
1952	4,376	570	4,946
1953	4,667	595	5,262
1954	5,163	647	5,810
1955	5,032	713	5,745
1956	5,113	1,130	6,243
1957	5,210	975	6,185
1958	5,166	967 c/	6,133 d/

[redacted] 50X1

b. Difference between total and international telegrams.
c. It is assumed that the ratio of international telegrams to total telegrams was the same in 1949 as in 1950 and was the same in 1958 as in 1957.

[redacted] 50X1

The Hungarian TELEX network is connected through Budapest with the international TELEX system. Service is available between Hungary and 28 foreign countries, as shown in Figure 6.*

Complete automatization of the TELEX network is planned, and initial steps toward this end were taken in 1958. When completed, Hungarian TELEX subscribers will be able to dial foreign TELEX subscribers directly, and the reverse. Automatization of the system not only will speed up international service but also will improve speed and efficiency of domestic service.

* Following p. 22.

3. Facsimile.

There is no information available indicating the extent of domestic facsimile service in Hungary. Because ordinary wirelines may be used for facsimile, this service is probably available between Budapest and most major cities in the country. International facsimile service, started in 1957, is available between Hungary and Austria, Belgium, East Germany, Finland, France, West Germany, Italy, the Netherlands, Poland, the USSR, Sweden, Switzerland, the UK, and Yugoslavia. 34/

Table 7

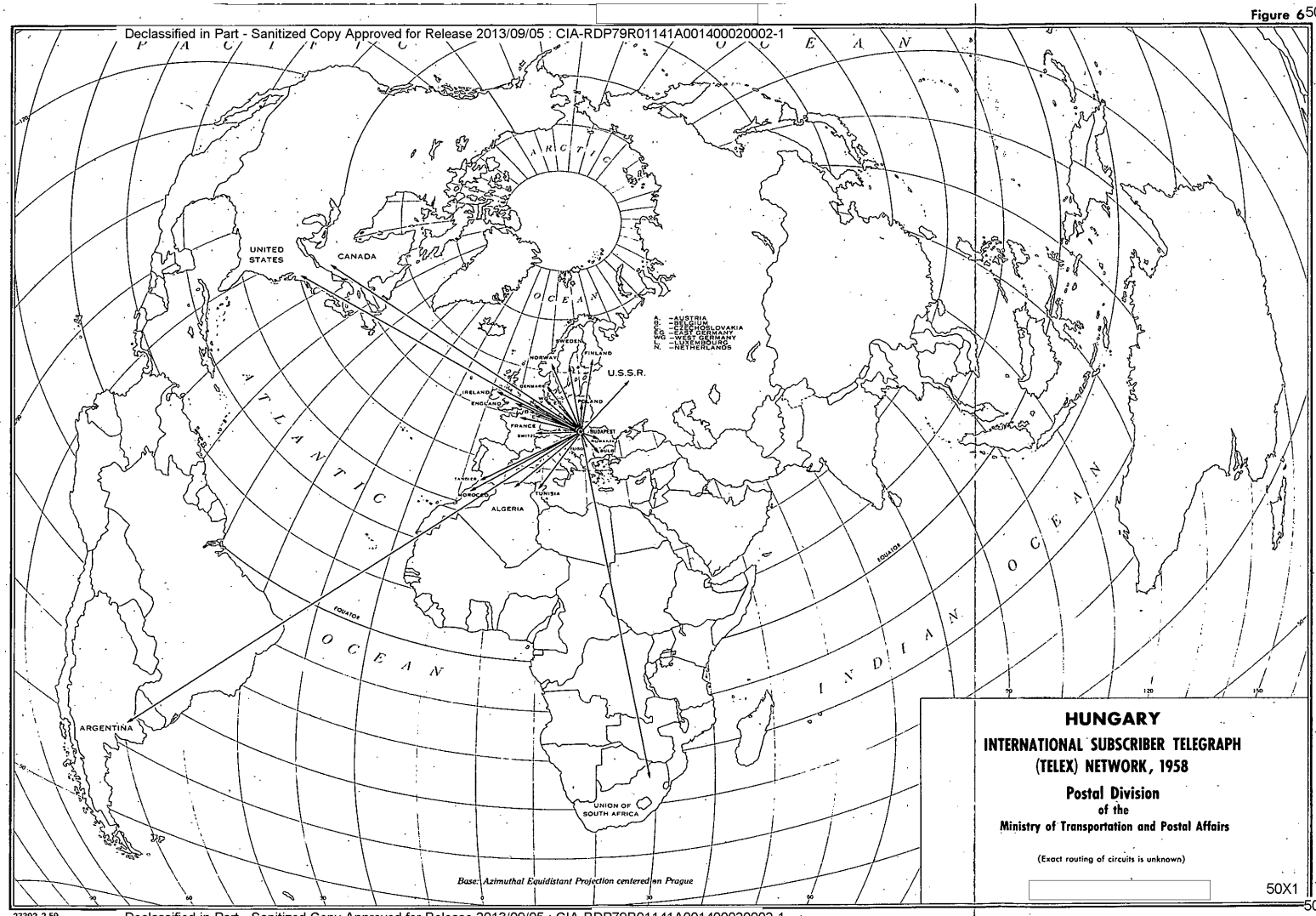
Estimated Number of Exchanges and Subscribers in the Subscriber Telegraph Network of the Postal Division of the Ministry of Transportation and Postal Affairs of Hungary 1952-58

Units

Year	Primary and Secondary Exchanges	Subscribers
1952	1 a/	84 a/
1953	7 b/	141 c/
1954	8 d/	198 e/
1955	8 f/	206 g/
1956	8 h/	213 h/
1957	8 i/	275 i/
1958	8 j/	337 k/

a. 35/
b. 36/
c. Interpolated, using arithmetic progression, between 1952 and 1954.
d. 37/
e. 38/
f. Assuming no change between 1954 and 1956.
g. Interpolated, using arithmetic progression, between 1954 and 1956.
h. 39/
i. 40/
j. Assuming no change since 1957.
k. Assuming the same absolute growth for 1957-58 as that shown for 1956-57.

Figure 6 50X1



HUNGARY

INTERNATIONAL SUBSCRIBER TELEGRAPH (TELEX) NETWORK, 1958

Postal Division
of the
Ministry of Transportation and Postal Affairs

(Exact routing of circuits is unknown)

50X1

27392 2-59

50X1

C. Common Telecommunications Facilities.

1. Wirelines.

The public wireline network in Hungary, which is composed of both open-wire and cable lines, gives adequate geographic coverage of the country, as shown in Figure 7.* The major strength of this wireline network lies in the limited but reportedly excellent network of multiconductor cable lines that connect all major economic areas of the country. Weaknesses in the system include low capacity of secondary and lateral open wirelines, lack of standardization of equipment, and inadequate maintenance and repair activity.

There is only one coaxial cable line in Hungary, which connects Budapest with L'vov, USSR, and also with Vienna, Austria, and Bratislava, Czechoslovakia. No significant additions of coaxial cable are planned. Instead, the need for high-capacity telecommunications will be met in the future by the establishment of microwave radio relay lines.

The well-developed multiconductor cable network in Hungary is composed chiefly of underground cable lines. They provide main arteries of relatively high capacity emanating from Budapest to all major economic areas of the country. Multiconductor cable lines provide international connections with Austria, Yugoslavia, Czechoslovakia, and the USSR. The over-all cable network in Hungary is reported to be excellent.

Most open-wireline facilities in Hungary follow existing railroad routes. Although the pole lines carry wirelines used mainly for public telecommunications purposes, they also accommodate wirelines used for railroad communications and for other economic activities. In addition, some military wirelines are strung on these same pole lines. The armed forces control and operate independent pole lines for their own exclusive use.

A major weakness in the open-wireline network in Hungary is the sparse use of carrier equipment on secondary and lateral lines. Even though capacities of existing lines can be increased somewhat by the introduction of carrier equipment, the extent of such increases is small. 41/

Lack of standardized equipment is another major weakness in the public wireline network of Hungary. The equipment presently

* Following p. 24.

employed was acquired from the US, East Germany, Italy, and Switzerland as well as from domestic sources. The variety of this equipment causes severe maintenance problems and reduces the efficiency of the wireline network. Modern equipment will be used to provide additional facilities and not as replacement for old equipment which is still serviceable. The lack of standardized equipment, therefore, will continue as a major weakness of the Hungarian wireline network. 42/

Telephone and telegraph service is given over the same wireline network in Hungary. Most wirelines are used exclusively for telephone service, as shown in Table 8,* but wirelines are also used for telegraph service. In addition, wireline facilities are used to relay radiobroadcast programs. No television programs are currently being carried over the wireline network in Hungary, but the coaxial cable line could be used for this purpose.

Hungarian military forces lease public wirelines to supplement their own facilities. They also pass traffic over the public wireline network. Although Soviet forces in Hungary operate their own wireline network, it is believed that they utilize the public system as well.

Some damage to the wireline network in Hungary occurred during the uprising in 1956. Both urban and interurban services were disrupted. Urban service, particularly in Budapest, was usually restored in a matter of hours, whereas interurban service was interrupted for much longer periods of time. Most of the damage to interurban facilities involved the cutting of open wirelines and the destroying of insulators rather than the destruction of poles and terminal facilities. No known damage was inflicted on cable lines. Such damage as was incurred probably did not significantly retard the growth or effectiveness of the wireline network in Hungary. 43/

2. Microwave.

In the use of microwave radio relay for interurban telecommunications purposes, Hungary lags behind most of the European Satellites. Only one public circuit is known to be in operation, connecting Budapest and Miskolc. This circuit has a capacity of only 24 voice-frequency, carrier, telephone channels; is about 100 kilometers (km) in length; and consists of 2 terminal stations and 2 relay stations. It is now carrying telephone and telegraph service. The circuit is not capable of relaying television programs or other types of broad-band signals. The original work on this circuit was started in 1951, but it was not working acceptably until 1956.

* Table 8 follows on p. 25.

Figure 7

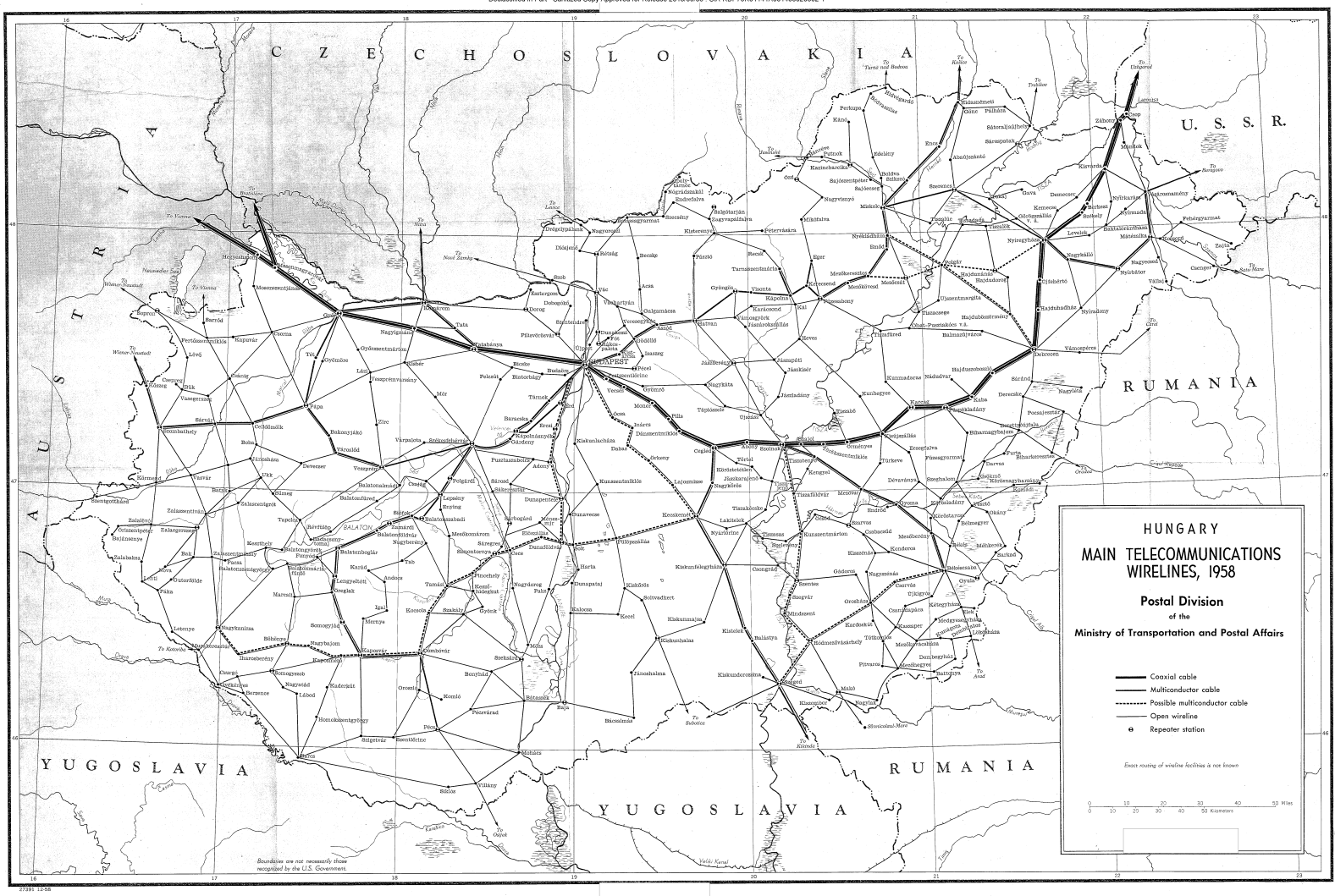


Table 8

Estimated Length of Telephone and Telegraph Wirelines of the Postal Division of the Ministry of Transportation and Postal Affairs of Hungary a/
1949-58

Thousand Kilometers

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Telephone wirelines	28.1	29.4	30.8	31.9	33.9	37.3	39.1	39.5	41.5 b/	43.6 b/
Open wirelines	23.8	24.9	25.9	26.5	27.9	29.1	30.2	30.1	30.9 c/	31.7 c/
Cable	4.3	4.4	4.9	5.4	6.1	8.2	8.9	9.4	10.6 d/	11.9 d/
Urban and nontrunk cables	3.2	3.3	3.3	3.6	4.0	5.8	6.8	7.3	8.2 e/	9.2 e/
Trunk cables	1.1	1.1	1.6	1.8	2.1	2.4	2.1	2.1	2.4 f/	2.7 f/
Telegraph wirelines g/	7.1	6.4	6.3	6.3	6.0	5.9	5.9	5.9	5.8 h/	5.7 h/
Open wirelines	7.0	6.3	6.2	6.2	5.9	5.8	5.8	5.8	5.7 h/	5.6 h/
Cables	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1 i/	0.1 i/	0.1 i/

a. [redacted] All data are rounded to the nearest 100 kilometers. 50X1

b. Extrapolated by applying the average annual rate of growth of 5.0 percent between 1949 and 1956.

c. Extrapolated by applying the average annual rate of decrease of 1.8 percent of the percentage distribution of open wirelines to total telephone wirelines between 1950 and 1956.

d. Total telephone wirelines minus open wirelines.

e. Extrapolated by applying the average annual rate of growth of 12.5 percent between 1949 and 1956.

f. Total cable lines minus urban and nontrunk cables.

g. As telephone and telegraph service is usually carried over the same wireline facility, the major portion of telegraph wirelines are probably included in the total telephone wirelines shown above.

h. Extrapolated by applying the average annual absolute decrease of 0.08 between 1950 and 1956.

i. Total telegraph wirelines minus open wirelines.

Hungary has laid plans for a rather extensive microwave radio relay network. It will be multipurpose: to relay television programs over the country, to connect the planned television network of Hungary with television networks of other Sino-Soviet Bloc and non-Bloc countries, and to build up the capacity of the interurban telecommunications system of the country. This network, shown in Figure 8,* will extend to all major cities in Hungary. It will also provide international microwave radio relay connections with Austria, Czechoslovakia, the USSR, Rumania, and Yugoslavia. Connections between Budapest and other major cities in Hungary and between Budapest and Austria, Czechoslovakia, and the USSR are to be completed by 1960. An increase in capacity of the present Budapest-Miskolc circuit to 600 channels is also planned. Although not announced, it is assumed that the first few additional lines will be low capacity, possibly 24 channel, but that eventually at least the major trunks of the network will be high capacity, possibly 600 channel. 45/

The advantages of a national and international microwave radio relay network for Hungary are particularly attractive. The present cable network lacks adequate capacity. It cannot carry television signals or meet future military needs for advanced electronics services. Microwave radio relay can accommodate all these needs simultaneously, but the installation of this network will probably not be completed until after 1965.

Although the equipment in the Budapest-Miskolc circuit was supplied by Brown-Boveri of Switzerland, the telecommunications equipment industry in Hungary should be capable of supplying the equipment for the planned microwave radio relay network. Equipment produced domestically is limited at present to 24-channel capacity, but research is currently under way on equipment of 600-channel capacity. Unless export orders receive priority over domestic orders, the planned microwave network probably will be equipped with domestic products.

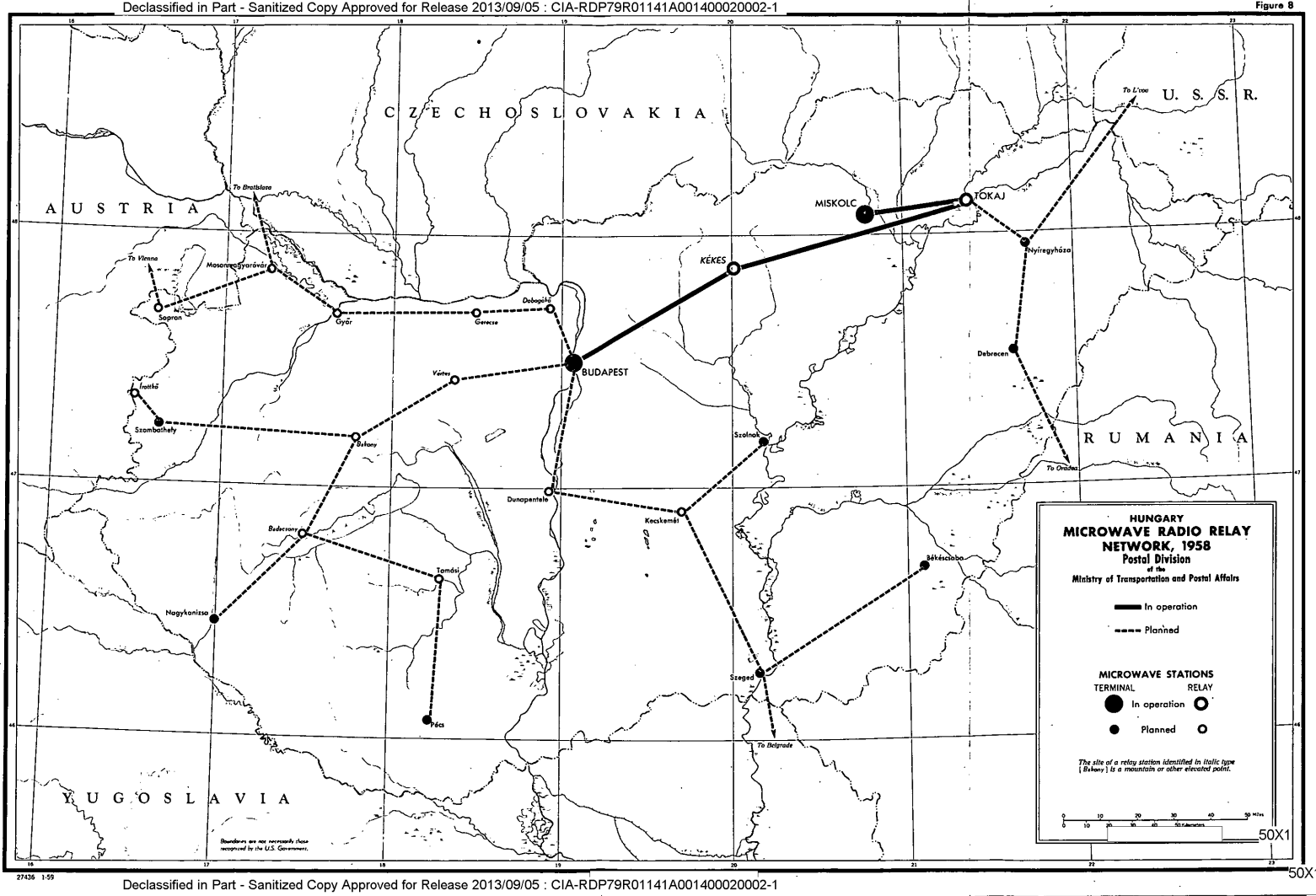
3. Point-to-Point Radio.

Hungary, having a reasonably well-developed wireline system, has little need for domestic point-to-point radio facilities for public telecommunications. Nevertheless, point-to-point radio stations are located in all major cities in the country. Although not actively engaged in passing public telecommunications traffic, these facilities can be used to furnish emergency service when required.

* Following p. 26.

50X1

Figure 8



50X1

27436 1-59

50X1

For international telecommunications, point-to-point radio facilities are used to provide telegraph service between Hungary and Europe, the Middle East, North Africa, South America, and the Far East, as shown on Figure 9.* The principal transmitting station is near Szekesfehervar, and the principal receiving station is near Tarnok. These stations are connected by wirelines with the main telegraph office in Budapest. Wireline facilities are used to provide international telephone service. Overseas telephone service is relayed through the principal telecommunications centers in Europe, such as Bern, Switzerland.

VI. Broadcasting Services.

The Hungarian broadcasting system offers radiobroadcasting, wire-diffusion, and television services. Domestic amplitude modulated (AM) radiobroadcast transmitting facilities are fairly well developed, but further development of the reception base is needed, particularly in rural areas. Frequency modulated (FM) and television broadcasting are in initial stages of development. Hungarian international radiobroadcasting facilities are outdated, and service is inefficient. The wire-diffusion system, which grew rapidly during 1950-53, has not expanded substantially since that time. It is expected that future emphasis will continue to be given to the expansion of FM and television transmission and reception bases.

A. Radiobroadcasting.**

Because of the damage incurred during World War II, only five domestic AM radiobroadcasting stations were in operation in Hungary in 1948. These stations had a combined power of 60.9 kilowatts (kw). By June 1958 the number domestic AM stations had increased to 11, and their combined power had increased to 416.2 kw. In the absence of any indications to the contrary, it is assumed that present transmitting facilities are considered to be adequate.

FM radiobroadcasting was initiated in Hungary in 1957, with the establishment of stations at Budapest and at Pecs. Originally experimental, both these stations now operate on regular schedules. Five more FM stations are planned. This is a reflection of the Sino-Soviet Bloc policy to expand facilities, such as FM -- a policy which more or less assures a "captive" audience by virtue of line-of-sight radio transmission paths.

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* Following p. 28.

50X1

The domestic radiobroadcasting network in Hungary offers two national programs, both originating at stations in Budapest. One, Radio Petofi, is relayed by nine stations located around the country, and the other, Radio Kossuth, makes a single transmission from its Budapest station. Of the 9 relay stations, 4 only rebroadcast Radio Petofi programs, and 5 originate regional programs as well.

Programming stresses doctrinal and cultural material. With the exception of German and Serbo-Croat language periods on the Pecs station, all domestic programs are rendered in the Hungarian language (Magyar). Locations, power, frequency, and type of service of radiobroadcasting stations in Hungary are shown in Figure 10.*

In 1958, as shown in Table 9,** there were 1,720,000 radiobroadcast receivers in use in Hungary. The majority of these were AM receivers, many of them old and of poor quality. FM receivers will likely account for most of the future growth in receivers in use.

International radiobroadcast programs are transmitted by 1 medium-frequency and 3 high-frequency transmitters, all used exclusively for international service. Programs are broadcast to the Americas and to Europe in nine different languages, as shown in Table 10.*** The decline in program hours per week in 1956 was caused by the Hungarian uprising.

The Hungarian effort in the international radiobroadcasting field has not been effective or efficient. In spite of its reputation as one of the foremost producers of high-frequency radiobroadcasting transmitters in the Sino-Soviet Bloc, Hungary employs obsolete equipment for its own radiobroadcasting service. Frequency changes, normally made several times a day by other countries broadcasting internationally, are made only twice a year by Hungary. Program schedules are inefficient, and the frequencies selected are often unsuitable. If Hungary is to operate efficiently and effectively in the international radiobroadcasting field, major modernization, both in equipment and in its utilization, is indicated.

Effects of the Hungarian uprising on radiobroadcasting were mixed. Although some damage to facilities and loss of personnel occurred, effects on programming appear to have been beneficial. As****

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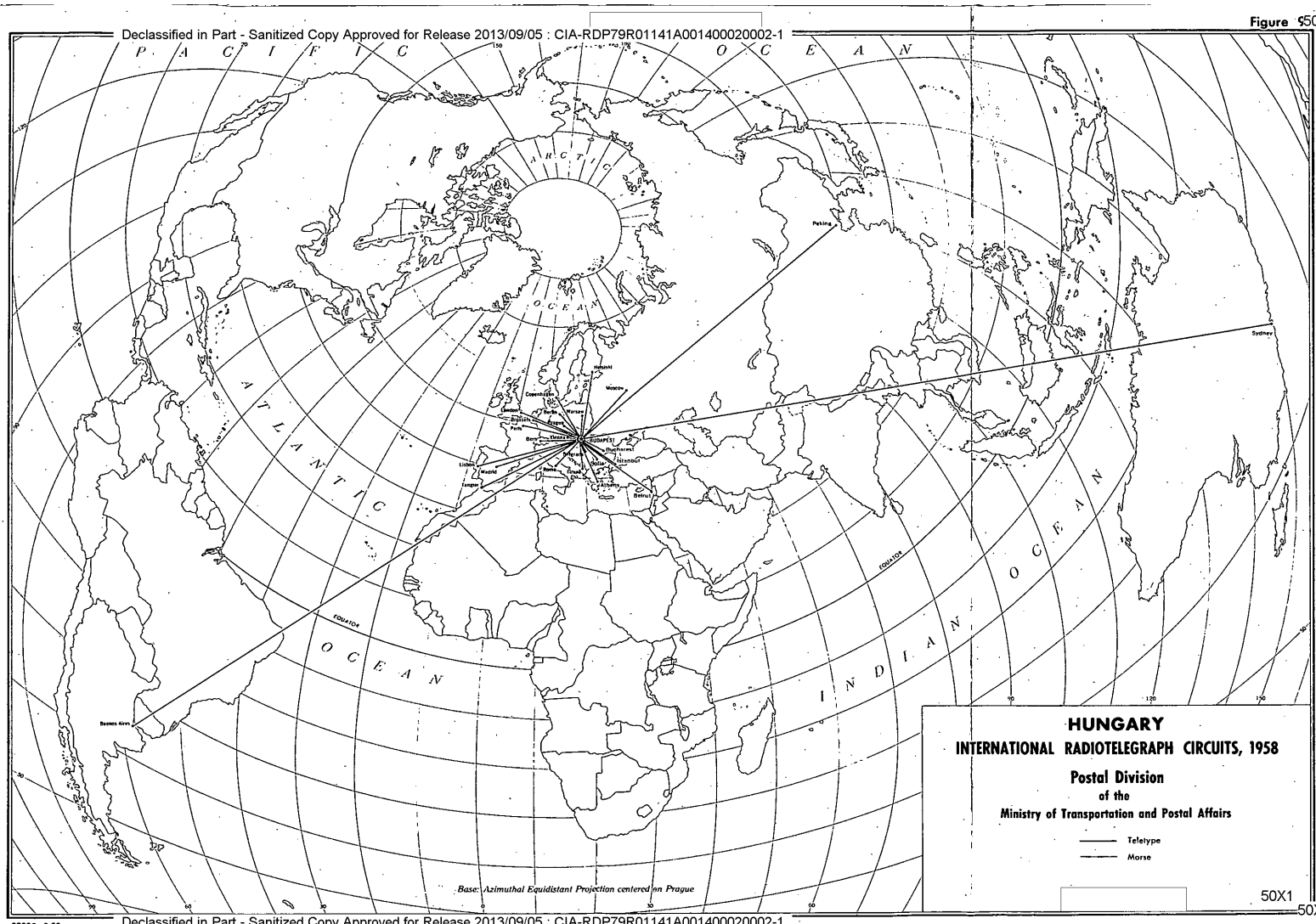
* Following p. 28.
** Table 9 follows on p. 29.
*** Table 10 follows on p. 30.
**** Text continued on p. 32.

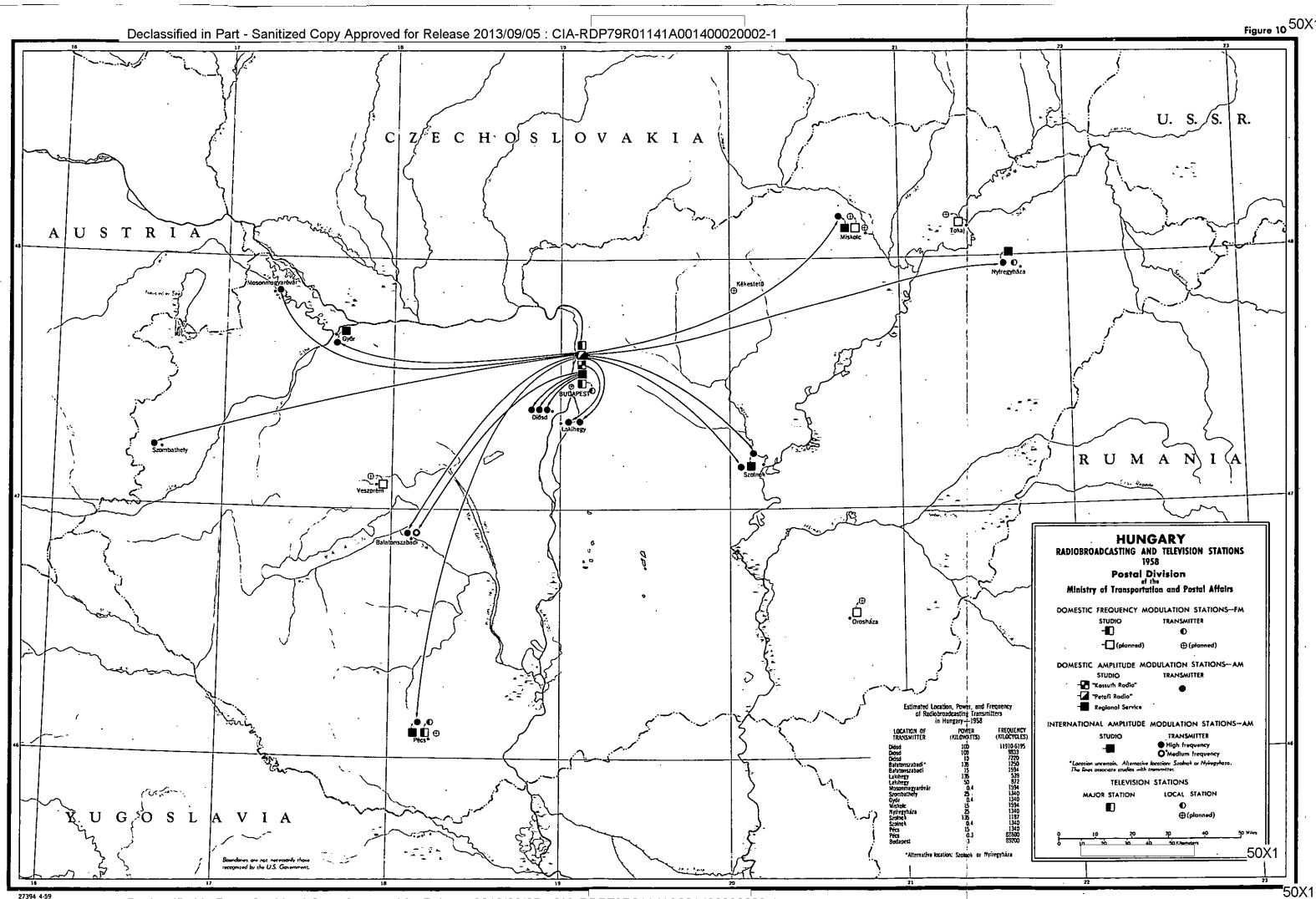
Figure 9 50X1



50X1

27393 2-59

Figure 10 50X1



50X1

27394 4-59

50X1

Table 9

Estimated Number of Radiobroadcast Receivers, Wired Loudspeakers, and Television Receivers in Use in Hungary a/
1949-58

Thousand Units

Year	Radiobroadcast Receivers in Use	Wired Loudspeakers in Use	Television Receivers in Use
1949	539	0	0
1950	618	1.6	0
1951	667	34	0
1952	766	121	0
1953	858	222	0
1954	1,020	235	0.1 b/
1955	1,170	241	0.2 c/
1956	1,340 d/	250 e/	0.8 f/
1957	1,520 g/	258 h/	5 i/
1958	1,720 j/	266 h/	14 k/

a. All data are rounded to three significant digits or less.

[redacted] 50X1

b. 48/
c. 49/
d. 50/
e. 51/
f. 52/
g. Derived by subtracting the estimated number of wire-diffusion loudspeaker subscribers from the number of subscribers for all radio receivers [redacted] 50X1
h. Assuming the same average annual rate of increase (3.1 percent) from 1956 to 1958 as was shown from 1954 to 1956.
i. 54/
j. Extrapolated by applying the average annual rate of increase from 1955 to 1957.
k. There are estimated to have been 8,000 television receivers in use in June 1958, an increase of 3,000 above the level of 1957. This increase is expected to have been doubled in the second half of 1958 because of the increase in television transmitters. 55/

Table 10

Estimated Total Weekly Output
of Hungarian International Radiobroadcasting Service to Foreign Audiences a/*
1950-57

Area and Language	Total Program Hours per Week							
	1950 b/	1951	1952	1953	1954	1955	1956	1957
To North America								
English	7:00	7:00	10:30	7:00	7:00	7:00	3:30	10:30
Hungarian	7:00	7:00	7:00	7:00	7:00	7:00	3:30	7:00
To North America and Europe								
Hungarian	0	0	0	0	0	10:30	3:30	7:30
To South America								
Hungarian	0	0	0	0	0	0	0	3:30
Spanish	0	2:55	2:55	3:30	3:30	3:30	3:30	3:30
To Europe								
English	5:20	6:10	7:30	7:15	8:20	8:30	7:00	7:00
Finnish	1:45	2:20	2:20	2:20	10:30	7:00	3:30	7:00
French	2:40	7:20	7:30	3:30	3:50	7:30	3:30	7:00
German	0	0	0	0	0	0	0	7:00
To Austria	2:20	2:20	2:20	2:20	14:00	7:00	3:30	0
To Germany	2:20	3:30	7:00	7:00	7:20	7:30	3:30	0
Greek	4:40	7:00	7:35	7:35	14:00	7:00	3:30	7:00

* Footnotes for Table 10 follow on p. 31.

Table 10

Estimated Total Weekly Output
of Hungarian International Radiobroadcasting Service to Foreign Audiences a/
1950-57
(Continued)

Area and Language	Total Program Hours per Week							
	1950 b/	1951	1952	1953	1954	1955	1956	1957
To Europe (Continued)								
Italian	0	4:40	4:40	4:40	7:20	7:30	3:30	7:00
Russian	3:30	2:20	4:05	4:05	1:00	0	0	0
Serbo-Croat	11:35	11:00	13:25	9:15	3:30	0	0	0
Slovene	5:30	7:00	6:05	4:50	2:20	0	0	0
Spanish	0	2:55	2:55	3:30	3:50	7:30	3:30	7:00
Turkish	0	2:20	2:20	2:20	7:00	7:00	3:30	7:00
To South East Asia c/								
English	0	0	0	0	0	0	0	7:00
Total language transmissions	53:40	75:50	88:10	76:10	100:30	94:30	49:00	95:00
Concert Transmissions								
To North America	0	0	0	0	0	1:45	0	2:00
To South America	0	0	0	0	1:45	1:45	0	0:30
To Europe	25:15	4:35	0:45	3:30	0:40	8:00	0	10:30
Total concert transmissions	25:15	4:35	0:45	3:30	2:25	11:30	0	13:00
Grand total	78:55	80:25	88:55	79:40	102:55	106:00	49:00	108:00

a. 56/
b. Program schedule for September.
c. Discontinued in August 1958.

examples of the latter, the uprising permitted the elimination of special Hungarian language programs prepared by Radio Moscow for Hungarian domestic broadcasting and the elimination of Hungarian relaying of Radio Moscow programs in the Hungarian international service.

B. Wire Diffusion.

As in other modern industrialized countries of the Soviet Bloc, wire diffusion as a mass medium of broadcasting in Hungary was a post-World War II development. Before that time the Hungarian people had grown accustomed to the use of the popular, conventional radiobroadcast receiver. In 1950, when Communist control of the country was complete, the government commenced the development of a wire-diffusion network. The network grew rapidly, and, by the end of 1953, there were about 222,000 wired loudspeakers in service in the country. Thereafter the rate of growth fell sharply, so that by the end of 1958 only 44,000 additional wired loudspeakers were in service. The total figure of 266,000 wired loudspeakers falls far short of the implied objectives (see Table 9*).

The rapid initial rise and the subsequent sharp fall in the rate of development of wire-diffusion service is explainable. In 1950, radiobroadcast receivers and wired loudspeakers were in short supply in the whole Sino-Soviet Bloc. Taking advantage of this circumstance, the Communist government, partial to the "captive audience" advantages of wire diffusion for propaganda and education, favored development of wire diffusion as against the production of radiobroadcast receivers, which the people preferred. Faced with a choice between wire-diffusion service and no service at all, some people chose to subscribe to wire diffusion. But in 1953, after this service had been in use for 3 years, it was meeting growing resistance. Coincidentally, the supply of radiobroadcast receivers has increased, and FM and television broadcasting services were in prospect. The over-all effect of these circumstances was that between 1953 and the end of 1958 the number of wired loudspeakers increased by less than 50,000 units while, over the same period, the number of radiobroadcast receivers in use increased by almost 900,000 sets. It is expected that wire-diffusion service will continue to grow at this relatively low rate. 57/

C. Television.

Television in Hungary is in the initial stages of development. Officially started in Budapest in 1955 on an experimental basis,

* P. 29, above.

regularly scheduled telecasts were not inaugurated until 1958. An experimental station is now in operation in Nyiregyhaza, and additional stations are being constructed in Pecs and in Miskolc. By the end of 1962, at least 10 stations located in major industrial centers are to be in operation. The reception base for television, shown in Table 9,* is expected to expand as transmission facilities increase.

In the international field, Hungary is planning to participate in a Sino-Soviet Bloc television network, OIR-Vision, currently in the formative stages. This network may include such non-Bloc countries as Yugoslavia, Finland, and the United Arab Republic. Live programs are to be exchanged between Hungary and the USSR, East Germany, Czechoslovakia, and Poland by 1962. In addition, Hungary plans to participate in the Western European television network, Eurovision, by 1960. Programs may be exchanged between Hungary and Western European countries before 1960, using temporary relay facilities, but permanent relay facilities are not expected to be ready before 1960. Exchange of programs between Hungary and other countries will probably be done by microwave radio relay facilities.

VII. Future Trends.

The major factor which will influence the future development of the public post and telecommunications system in Hungary is the new plan to expand and integrate the post and telecommunications systems of all Sino-Soviet Bloc countries. The impetus behind this plan comes from the USSR and is being expressed through the recently formed organization, OSS.

The OSS organization has formulated long-term objectives, some of which have already been reflected in Hungarian plans for development. The most important of these are the establishment of a domestic and international microwave radio relay network and the complete automatization of interurban telephone facilities. The microwave radio relay network is to be completed by 1965 and telephone automatization by 1975.

Completion of these plans will improve not only interurban telecommunications in Hungary but also international telecommunications, particularly those with other Communist countries. The exchange of television programs among all Bloc countries has been given great publicity, but it is believed that expansion of Sino-Soviet Bloc military communications -- particularly the air-defense telecommunications system -- is a fundamental objective of OSS. When Hungary completes

* P. 29, above.

its microwave network and telephone automatization, it will be able to participate more fully in this integrated Bloc telecommunications system. At the same time, domestic telecommunications will have been given an improved interurban network that should satisfy both military and civil needs.

Plans also mention continued development of other telecommunications facilities and services, including the following:

1. An increase in the number of telephone subscribers.

2. An expansion of FM and television broadcast transmission and reception facilities.

3. The establishment of a fully automatic TELEX network.

Development of still other parts of the post and telecommunications system, including general improvement of service and more efficient operation of facilities, has also been targeted by the Ministry of Transportation and Postal Affairs. The need for over-all improvement in these aspects of the system is clearly indicated if the economy is to be more fully served.

The recent revision of total national investment plans in Hungary had for its purpose the allocation of more investment funds for greater expansion of the post and telecommunications sector of the economy. This rather unusual action strongly suggests that higher priorities for this sector will be sustained for some years at least. If, between now and 1975, post and telecommunications investment requires curtailment for any reason, such curtailment probably will not disturb plans for the development of interurban and international facilities to meet OSS requirements.

The over-all effect of this integrated buildup in Hungary and similar buildups indicated for all other Sino-Soviet Bloc countries will be to aid in the further coordination of Bloc activities -- military, economic, and social -- principally for the benefit of the USSR.

APPENDIX A

GLOSSARY OF TECHNICAL TERMS

Amplitude modulation (AM): The process by which a selected carrier frequency is varied in magnitude (amplitude) by other frequencies that contain the information to be transmitted in telecommunications. (See Frequency modulation.)

Apparatus: Instruments, machines, appliances, and other assemblies used in providing a telecommunications facility.

Automatic (as an adjective): Of or pertaining to any process involved in producing telecommunications service which does not require direct, immediate human assistance.

Band (of frequencies): The entire range of frequencies between two numerically specified frequency limits. The magnitude of this range is a limiting factor on the amount of information that can be transmitted in telecommunications. With respect to frequencies of the radio spectrum as a whole, the International Telecommunication Union has for convenience divided the whole radio spectrum into eight major bands, as follows:

Frequency Bands		
Range	Type	Corresponding Wave* Band
30 kc** and below	Very low frequencies (VLF)	Myriametric waves
30 to 300 kc	Low frequencies (LF)	Kilometric waves
300 to 3,000 kc	Medium frequencies (MF)	Hectometric waves
3,000 to 30,000 kc	High frequencies (HF)	Decametric waves
30,000 kc to 300 mc***	Very high frequencies (VHF)	Metric waves
300 to 3,000 mc	Ultra high frequencies (UHF)	Decimetric waves****
3,000 to 30,000 mc	Super high frequencies (SHF)	Centimetric waves****
30,000 to 300,000 mc	Extremely high frequencies (EHF)	Millimetric waves****

* Waves are undulating disturbances: a sound wave is a disturbance in the air, which is an elastic medium, and an electric wave is a disturbance in any medium whatever. The number of waves per second is the frequency of a given wave. Because the speed of wave propagation is considered to be constant, the length of a given wave is in inverse relation to its frequency: the longer the wave length, the lower the frequency, and the shorter the wave length, [footnotes continued on p. 36]

Cable: A bundle of sheathed, insulated wires and/or coaxial tubes, used as a telecommunications medium. It is sometimes referred to as "multiconductor cable."

Carrier (as an adjective): Of or pertaining to a technique for dividing a circuit, lane, supergroup, group, or channel into portions which can be used independently of and simultaneously with all other portions. Different frequencies or different pulses are selected for each portion to "carry" the information to be transmitted, after alteration by the information frequencies. The carrier itself need not be transmitted.

Channel: A portion, electrical or physical, of a telecommunications circuit, lane, supergroup, or group which can be used to transmit information independently of and simultaneously with all other portions. A channel may be used to provide two or more subchannels.

Circuit: A telecommunications connection between two or more distant points by a wire, cable, or radio medium facility used to carry information. The circuit is the fundamental telecommunications connection between distant points. By the application of appropriate techniques, a circuit may be arranged in many different combinations to meet the need for various kinds and quantities of telecommunications service. In its simplest form a circuit may carry only single telecommunications units in sequence. In its most complex form it may by apportionment carry simultaneously thousands of telephone channels and telegraph subchannels; a number of television programs; and other specialized kinds of service, such as high-fidelity broadcast programs, radar signals, and data-processing signals.

For the most complex application, a circuit is often arranged into lanes, each of which can carry, in 1 direction, 1 television program or 600 telephone channels. In turn, these 600 telephone channels are subdivided into 10 supergroups of 60 telephone channels each. Each supergroup is subdivided into 5 groups of 12 telephone channels each. One or more telephone channels may be further subdivided into three to twenty 60-word-per-minute teletype subchannels. Other specialized kinds of service may be accommodated by combining two or more telephone channels.

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the higher the frequency. Wave length is usually measured in linear units of the metric system.

** Kilocycles per second, or 1,000 cycles per second.

*** Megacycles per second, or 1 million cycles per second.

**** It is becoming common usage to refer to waves (frequencies) in these three bands as "microwaves."

Coaxial (as an adjective): Of or pertaining to a modern telecommunications cable medium technique using one or more tubes (sometimes called "pipes"). Each metal tube surrounds a conducting wire supported concentrically by insulators. The space in the tube usually contains nitrogen gas under pressure. Generally, coaxial cable is used for the transmission of information in complex form, such as radar, computer data, or television signals, and/or for the transmission of telephone channels and telegraph subchannels. A single tube usually carries information in only one direction at a time. The capacity of a tube depends in part upon the distance between repeater stations. In the standard facility, which may have from 2 to 8 tubes in the cable, a single tube carries a lane of 600 telephone channels or 1 television lane, for which the repeater station spacing is about 7 statute miles. In a new developmental coaxial cable facility, a single tube may carry 3 lanes of a total of 1,800 telephone channels or 3 television lanes, for which the repeater station spacing is expected to be about 3 statute miles.

Electronics: A general term used to identify that branch of electrical science and technology that treats of the behavior of electrons in vacuums, gases, or solids. Today, telecommunications makes extensive use of electronic technology.

Facility: An association of apparatus, material, and electrical energy required to furnish telecommunications service.

Facsimile (as an adjective): Of or pertaining to a telecommunications (telegraph) service in which photographs, drawings, handwriting, and printed matter are transmitted for graphically recorded reception. In one method (Type A), images are built up of lines or dots of constant intensity. In another method (Type B), images are built up of lines or dots of varying intensity, sometimes referred to as "telephoto" and "photoradio."

Feeder (as an adjective): Of or pertaining to telecommunications facilities of relatively low capacity which join facilities of relatively high capacity. (See Main.)

Frequency: The rate in cycles per second at which an electric current, voltage, wave, or field alternates in amplitude and/or direction. (See Band.)

Frequency modulation (FM): The process by which a selected carrier frequency is varied in frequency by other frequencies that contain the information to be transmitted in telecommunications. (See Amplitude modulation.)

Functional (as an adjective): Of, pertaining to, or connected with special, unique, or particular telecommunications facilities managed and operated by a single agency, organization, company, department, committee, ministry, or other entity, in contrast to the facilities of a basic system.

Group: A number of channels (usually 12) or subchannels combined (multiplexed) electrically in building up the total capacity of a telecommunications circuit, lane, or supergroup.

Ionosphere: Those layers of the earth's atmosphere occupying the space about 210 statute miles in thickness extending from about 30 statute miles above the earth's surface to the outer reaches (exosphere) of the atmosphere. Reflection from these layers makes possible long-distance transmission of radio signals. The layers, however, are responsible for fading of signals, skip distance, and differences between daytime and nighttime radio reception. They are also used as a scattering reflector for ionosphere scatter-transmission techniques to transmit to distances of about 1,000 to 1,500 statute miles.

Joint facility: A telecommunications facility owned, controlled, or operated by two or more agencies, organizations, companies, departments, committees, ministries, or other entities.

Lane: A 1-way portion, electrical or physical, of a 2-way telecommunications circuit which can be used independently of and simultaneously with all other portions. The largest lane today can handle 600 telephone channels or 1 television program. In some applications the direction of a lane may be reversed.

Leased (as an adjective): Of or pertaining to the direct operation by a user of a telecommunications facility owned by another agency.

Line: A general term used to delineate a telecommunications circuit facility (wire, cable, or radio).

Main (as an adjective): Of or pertaining to telecommunications facilities at and between principal cities and centers which have relatively high capacity compared with feeder facilities. (See Feeder.)

Medium: Any substance or space that can be used practically to transmit a form of electrical energy for the purpose of providing telecommunications service.

Microwave radio relay (as an adjective): Of or pertaining to a radio medium technique in modern telecommunications employing radio

frequencies higher than 300 mc. These frequencies do not normally afford practical direct transmission to great distances, principally because they do not bend well around the earth's surface and because they do not reflect well from the ionosphere. They are, however, capable of reliable transmission from horizon to horizon (line-of-sight) by the use of special antennas which concentrate the radio energy and give it desired direction. Great distances can, in consequence, be reached by this technique by the interposition of relay stations along the route of the line with a spacing interval of from 25 to 40 statute miles, depending upon terrain conditions. This technique can be employed practically to carry from a small number of telephone channels and telegraph subchannels to thousands of such channels and subchannels through 2 or more lanes and to carry 1 or more television and other specialized lanes and channels. (See Band.)

Mobile (as an adjective): Of or pertaining to a telecommunications facility which is intended to be operational while in motion or during halts at unspecified points. (See Portable.)

Modulation: The process of altering a carrier frequency or carrier pulses by other frequencies or pulses representing the information being transmitted.

Multiplex (as an adjective): Of or pertaining to the combining of information signals, modulated or unmodulated, of two or more lanes, supergroups, groups, channels, or subchannels for transmission over the same circuit.

Network: An interconnection, electrical or physical, of two or more circuits or portions thereof for the purpose of facilitating telecommunications service.

Point-to-point (as an adjective): Generally, of or pertaining to telecommunications service between fixed points, using the radio medium.

Portable (as an adjective): Of or pertaining to a telecommunications facility which can be readily moved from place to place but is not normally operational while in motion. (See Mobile.)

Private (as an adjective): Belonging to or concerning an individual person, organization, institution, or activity; not public or common.

Pulse: A spurt of electrical energy of extremely short duration (usually measured in millionths of a second), yet capable of being used in telecommunications to transmit information.

Quad: In a multiconductor telecommunications cable, the physical association of a group of 4 conductors in any one of various arrangements for the purpose of providing 2-way multichannel operation.

Reception base: The aggregate telecommunications receiving facilities employed in providing a broadcast service.

Route: The geographical path followed by a wire, cable, or radio line.

Scatter (as an adjective): Of or pertaining to a radio medium technique in modern telecommunications by which energy in radio frequencies above 30 mc is deliberately scattered into one or the other of two reflecting portions of the atmosphere (troposphere and ionosphere) at a predetermined angle such that a usable portion of the energy arrives at the desired receiving location. This technique is especially applicable to regions in high latitudes (Arctic and Antarctic) where facilities of other media suffer from the rigors of weather and terrain and where the conventional long-distance radio media of the lower frequency bands (200 kc to 30 mc) are subject to serious disruptive propagational anomalies. (See Band.)

Subchannel: A portion, electrical or physical, of a telecommunications channel which can be used independently of and simultaneously with all other portions. An appreciable number of telephone channels can usually be subchanneled to carry from three to twenty 60-word-per-minute teletype subchannels on each telephone channel so employed.

Subscriber: Any customer who directly operates telecommunications apparatus in obtaining telecommunications service.

Supergroup: A number of groups (often five) combined (multiplexed) electrically in building up the total capacity of a telecommunications circuit or lane.

System: All of the facilities and networks managed by a single agency, organization, company, department, committee, ministry, or other entity in rendering either functional or basic telecommunications service.

Telecommunications: Transmission, reception, or exchange of information between distant points by electrical energy over a wire, cable, or radio medium facility to produce telephone, telegraph, facsimile, broadcast (aural and visual), and other similar services.

Teletype (as an adjective): Of or pertaining to a technique for effecting telegraph service by the use of an apparatus similar to a typewriter in which information is transmitted by keyboard and received by type printer on a roll of paper or a roll of tape, or by perforations on a roll of tape, or by both. (Sometimes called a "teleprinter" or "teletypewriter.")

Transmission base: The aggregate telecommunications transmitting facilities employed in providing broadcast service.

Transistor: A modern device which is capable of performing in a solid (germanium or silicon) many of the functions performed by the conventional electronic tube in a gas or vacuum.

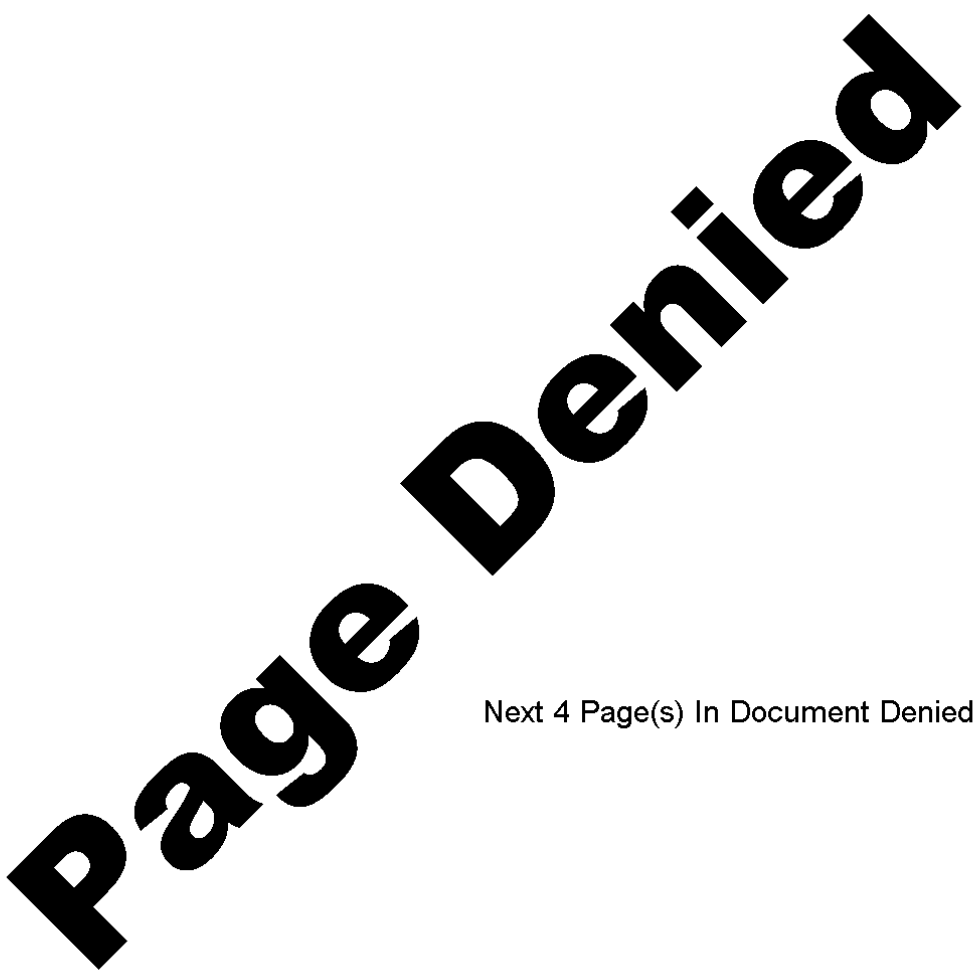
Troposphere: The layer of the earth's atmosphere occupying the space from the earth's surface to a height of about 6 statute miles. This layer is used as a scattering reflector for tropospheric scatter transmission techniques to distances of about 200 to 500 statute miles.

Wave guide (as an adjective): Of or pertaining to a telecommunications medium, now under development in several countries, which may be capable of transmitting extremely large amounts of conventional and complex information. It consists of a circular or rectangular hollow metallic tube in which electrical energy travels in the form of waves, much as do sound waves in a speaking tube.

Wire diffusion: Distribution of broadcast programs by a wire or cable medium to wired loudspeakers.

Wired loudspeaker: A telecommunications loudspeaker which receives from a distribution point one or more broadcast programs by a wire or cable medium.

Wireline: A general term used to identify a line consisting of either an aerial cable (and/or separate wires) or an underground cable, used as a telecommunications medium.



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