PROVISIONAL INTELLIGENCE REPORT

FOREIGN RADIOBROADCASTING RECEPTION POTENTIAL IN THE USSR

CIA/RR PR-82
21 October 1954

CENTRAL INTELLIGENCE AGENCY

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CIA/RR PR-82

(ORR Project 40.295)

NOTICE

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FOREIGN RADIOBROADCASTING RECEPTION POTENTIAL IN THE USSR*

Summary and Conclusions

Slightly more than one-half of the total foreign radiobroadcasts beamed into the USSR are in the Great Russian language. Radio Liberation leads the field in terms of total transmission hours per week, but the Voice of America (VOA) employs six times as many frequencies, and its total potential audience is greater insofar as radio-wave propagation is concerned.

The combined total of VOA and Radio Liberation broadcast time represents 85 percent of total foreign radiobroadcasts into the USSR.

Many radio transmissions not specifically designed for or beamed to the USSR are receivable there, both technically and linguistically. These broadcasts have not been included in this report because they lack directness.

The physical facilities of the radiobroadcasting transmitting system in the USSR are quite extensive, with a total of 167 transmitters operating on low-, medium-, and high-frequencies in the domestic and international services. After 1947, coordination of important stations of the Satellite countries into the USSR radiobroadcasting system has resulted in 13 additional transmitters carrying Moscow programs in the international service. The stabilization in the growth of radio stations in the USSR indicated since 1950 is misleading for it is known that use is being made of Satellite transmitting stations in the international service of the USSR. The total power output of USSR transmitters has increased steadily since World War II. The stabilization in growth of the number of transmitters is not to be taken as an indication that the Soviets are relaxing their efforts to propagandize the Western world. The constantly increasing power output of transmitters,

* The estimates and conclusions contained in this report represent the best judgment of the responsible analyst as of 1 June 1954. However, some material of a later date has been included.

the improved technical efficiency of transmitting facilities, and the use of transmitters more advantageously located in Satellite countries, have resulted in a noticeably improved reception in Europe and North America of Soviet radiobroadcasts, an expanded coverage of Soviet originated programs to include the Satellite countries, through the use of the domestic systems in the countries, and a domestic system which is estimated to have achieved fairly good coverage over the USSR through the use of a complex of transmitters and wire-diffusion* networks. While perhaps some few additional transmitters may be added to the radiobroadcasting-transmitting base in the near future, it is believed that the Soviets will probably concentrate on the improvement of the system through the use of increased total power outputs, technical improvements in transmitting facilities, and in the selection of more advantageous transmitting locations.

The Soviet Radiobroadcasting System is administered by the Main Administration for Radio Information which is subordinate to the Ministry of Culture, USSR. The Ministry of Communications provides technical services to the broadcasting system by providing and maintaining the radio transmitters and wire-lines necessary for the operation of the transmitting system, plus operation and maintenance of some of the wire-diffusion networks. In addition there is coordination between the Ministry of Culture, Ministry of Communications, and the Ministry of Radio-Technical Industry on matters pertaining to research, development, and production of technical equipment, and on means for improving the system. Programming policies are under the control of the Main Administration for Radio Information, but are closely supervised by the Department of Propaganda and Agitation of the Central Committee of the Communist Party. Supervisory responsibility over local programming content and quality is placed on local organs of the Communist Party. The subordination of the Soviet radiobroadcasting system under the Ministry of Culture in 1953 accomplished the centralization of all

* Wire-diffusion radio is a system of loudspeakers which are connected to a central program distribution point by either telephone circuits or by specially strung wire lines. The program distribution points are, in turn, connected to the broadcasting station by either wire lines, or, in the case of small places and remote areas, by radio receiving units. In effect it is State control of program and station selection.

propaganda-information functions under a single head, thus facilitating the dissemination of the current "party line" through all media, and making it possible to more efficiently and effectively place responsibility for various functions on other appropriate ministries.

The development, quality, and use of television in the USSR is believed to be in the developmental stage. Technical and economic problems of its expansion, including also expansion of transmitters and receivers, will probably continue to occupy the attention of those responsible for television in the USSR. It is doubtful that television for the general public of the USSR will be realized except in a few large cities, for some years to come.

The use of frequency modulation for broadcasting in the USSR will probably be delayed for some time in view of economic factors involved in inaugurating a system which is somewhat competitive with the existing aural system, and possibly also with television, which probably has higher priority.

The estimated number of radiobroadcasting reception facilities in the USSR increased from 1 million independent receivers in 1946 to approximately 5.5 million in 1953, and from 6.7 million loudspeakers in 1946 to 11.4 million in 1953. (The actual increase of receivers and loudspeakers over these 7 years was approximately the same.) The number of receivers in use in 1953 was 5.5 times as many as in 1946, while the number of loudspeakers in use in 1953 was 1.7 times the number used in 1946. It is probable that the present aural reception base of the USSR will continue to expand into rural areas and that independent tube receivers, crystal receivers, and wire-diffusion loudspeakers will be employed, as appropriate to a given circumstance. Notwithstanding the current drive to radiofy the countryside by use of wire-diffusion systems, the over-all proportion of loudspeakers to receivers is decreasing. It is expected that this trend will continue.

The plan to increase the reception base to 20 million units in the USSR by 1954 and to 30 million units by 1955 is fantastic. The possibility of increasing the reception base to 30 million units by 1960 would appear more reasonable. The inadequacy of wire-line facilities, especially in rural areas, will probably delay completion

of radiofication* of the USSR for some years to come.

The estimated total production of class 1, 2, and 3 receivers (those with high-frequency reception capabilities) in the USSR since World War II is around 3 million units; class 4 receivers (those with low- and medium-frequency reception capabilities only) about 2 million units; and crystal receivers, about 4 million units. During the early postwar years the annual production of class 1, 2, and 3 receivers constituted more than 90 percent of the very modest total production, but by 1951 their production had decreased to 10 percent of the total. The production pattern again changed in 1952 and for the years 1953 and 1954 the total estimated annual production was 1.6 and 2.3 million of this class receiver respectively -- amounting to approximately 30 percent or more of the total annual production. It is probable that the rate of production of small independent tube receivers will continue to increase, but that production of receivers with high-frequency reception capabilities will not increase substantially above the present rate, and for this type of receiver the rate may level off to as low as 25 percent of total receiver production. It is believed that the annual rate of production of crystal receivers will continually decrease over the years.

The potential reception base of the USSR as a target for foreign radiobroadcasts should increase somewhat during the next few years. The employment of battery-powered tube receivers in rural areas, where police supervision is more difficult than in urban areas, may afford some increased possibility of listening to foreign broadcasts without detection.

Conditions of listening in the USSR are considerably different from those in the free world. The majority of the USSR radio audience must listen over wire-diffusion system loudspeakers. The content of programs and the installation and operation of the systems are strictly controlled by trusted Communist Party members. It is quite evident that the authorities intend to keep the wire-diffusion system as the core of the USSR reception base, and to take other measures to build up a "captive" audience, forced to listen to

* Radiofikatsiya (Radiofication) is a general Russian term meaning the development of radio on the consumer side, thus it includes the manufacture and distribution of radio receivers and loudspeakers as well as the organization of listening.

only Communist programs. This situation, combined with the increase in jamming facilities and techniques, especially in urban and industrial areas, indicates a decreasing reception potential for foreign broadcasts.

Group listening to Soviet broadcasts is encouraged by having listening points in factories, schools, recreational centers, squares, and other public areas.

Listening to Western broadcasts is usually done surreptitiously. Home listening within the family circle seems to be a normal practice. By various techniques the listeners can be assured of not having to listen in a hurried or furtive manner. Those who do listen to foreign broadcasts appear to do so daily or several times a week, conditions permitting.

USSR jamming of foreign broadcasts varies according to time of day, time of year, program, frequency, and location. Jamming is systematically and regularly applied against Russian language programs directed into the USSR. In the Moscow area foreign broadcasts in the English language are not subject to such intensive jamming as are broadcasts in the Russian language. Jamming in urban areas appears to be more effective than in rural areas.

In the USSR as of January 1954, there is estimated to be one receiver for every 39 persons. However, the number of receivers with high-frequency reception capabilities is estimated to range from one receiver for every 82 to 128 persons. The largest potential audience is concentrated in the urban and industrial centers of the European USSR. It is believed that the better classes of receivers are in the hands of the intelligentsia, the ruling class, and the armed forces personnel.

Radiobroadcasts of all Western countries directed into the USSR are listened to by the Soviet people. The programs of the Voice of America (VOA) and the British Broadcasting Corporation (BBC) are considered the most popular.

The severe attacks made by press and radio upon foreign radiobroadcasts subsided in 1953 but were resumed again in 1954. From these attacks and through word-of-mouth dissemination of information a very large proportion of the Soviet population at least becomes aware that foreign radiobroadcasts to the USSR are being made.

This awareness should tend to increase the size of the listening audience. As more persons learn of the validity of foreign radiobroadcasts this too should increase the audience.

The effects of foreign radiobroadcasting can be judged by the number of defectors from the USSR, the thought and discussion provoked among the Soviet populace, and the dissatisfaction with the present working conditions.

Monetarily, the broadcasts serve as a continual drain on the Soviet economy. It is estimated that the Soviet jamming network employs roughly 10,000 technicians and costs approximately 5 times more than the total costs of US broadcasts to the whole Orbit.

It is also believed that the foreign broadcasts have been one of the prime factors causing the Russians to intensify their radiofication programs.

I. Transmission Facilities of Foreign Broadcasters into the USSR (Aural).

It has been necessary to treat the radiobroadcasting reception* potential of the USSR in a somewhat different manner than was the case with the other papers in this series. 1/**

Among the many factors involved here are: the vastness of the land mass, which creates complication in the reception of radio waves; the relatively high incidence of bilingual and multilingual people, even in the lower "strata" of that "classless society"; the sharp urban/rural dichotomy of reception facilities; and the many ethnic groups (see Table 1) and the variety of native languages.

Table 1 lists the sizes of the most important ethnic groups.

Table 1

Estimated Sizes of Major Groups in the Soviet Population 2/
1940

Group	Millions	Group	Millions
Great Russians	100.0	Georgians	2.3
Ukrainians	36.0	Estonians	2.3
White Russians	8.5	Lithuanians	2.2
Jews	5.0	Armenians	2.2
Uzbeks	5.0	Latvians	1.6
Tatars	4.5	Mordovians	1.5
Kazakhs	3.2	Chavashi	1.4
Moldavians	2.5	Tadzhiks	1.3
Azerbajdzhans	2.4		

Of the dozens of languages spoken daily in the USSR, this report is concerned with those which are specifically beamed to the USSR. The most widely used of these, of course, is Great Russian, commonly referred to as the Russian language.

* Hereafter, the expression "radiobroadcasting reception" will be in most cases shortened to "reception."
** Footnote references in Arabic numerals are to sources listed in Appendix M.

There are many programs* on the air waves which, though not specifically beamed to the USSR, are nonetheless physically and linguistically receivable there. An outstanding example is programs in the Polish language, which is understood not only by the millions of native Poles who are now situated within the confines of the USSR due to territorial acquisitions of the World War II period, but also by many other Soviet citizens.

Another important language is Hebrew, which is not beamed into the USSR although there are many Jews scattered throughout the country.**

These peripheral linguistic phenomena have been lightly treated or ignored in this report, because it is felt that the line must be drawn somewhere and there is a common denominator in the programming hours compiled in this study, viz. deliberate propaganda. For example, the programs broadcast by the Iranian government in the Azerbaydzhani language are designed for the northern Iranian peoples, not for the southern Soviet peoples. Thus although the people of Soviet Azerbaydzhan can receive these foreign broadcasts, and may well be affected by them, still the programs were not designed for Soviet consumption, and therefore do not represent a deliberate attempt on the part of a foreign country to propagandize the Russians.

Although Polish is much more widely understood in the USSR than any other language except Russian and Ukrainian, and although many hours of Polish language broadcasts beamed to Poland are technically receivable in the USSR, still these broadcasts have not been included in Table 2***, because it is felt that inclusion of such transmission in the over-all figures would distort the picture. Indeed, the reception of Polish language VOA broadcasts by Russians might induce a negative reaction, since Poles have for centuries been anti-Russian. Thus a program designed to stir the heart of the Pole might well be repugnant to the Great Russian, the Lithuanian, or the Ukrainian.

Many other languages, such as Arabic, Armenian, German, Greek,

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* The term "program," unless specifically stated otherwise, means a radiobroadcast program.

** See Table 1.

*** Table 2 follows on p. 9.

Table 2

Foreign Radiobroadcasting in Russian and Other Soviet Languages a/ b/ 3/
May 1954

Hours per week

Broadcaster	Original Programming			Rebroadcast			Grand Total			Frequencies
	Russian	Other Soviet Languages	Total	Russian	Other Soviet Languages	Total	Russian	Other Soviet Languages	Total	
VOA	17.50	28.00	45.50	108.50	73.50	182.00	126.00	101.50	227.50	77
BBC (excluding relay of VOA)	12.25		12.25				12.25		12.25	10
Italy (excluding Radio Vatican)	7.00	4.67	11.67				7.00	4.67	11.67	5
Vatican Radio	0.75	2.75	3.50				0.75	2.75	3.50	6
Canada	7.00	3.25	10.25				7.00	3.25	10.25	2
Ecuador	8.00	1.50	9.50				8.00	1.50	9.50	2
Philippines	5.00		5.00				5.00		5.00	4
Spain	3.00	0.75	3.75				3.00	0.75	3.75	1
Greece	2.50		2.50				2.50		2.50	2
UN Radio	2.50		2.50				2.50		2.50	1
Iran	1.75		1.75				1.75		1.75	3
Lebanon		1.00	1.00					1.00	1.00	2
Total Western (except clandestine)	67.25	41.92	109.17	108.50	73.50	182.00	175.75	115.42	291.17	
RFR	18.00		18.00				18.00		18.00	2
Radio Liberation	17.50	14.00	31.50	178.50	175.00	353.50	196.00	189.00	385.00	9
Total Non-Communist	102.75	55.92	158.67	287.00	248.50	535.50	389.75	304.42	694.17	
Bulgaria	2.50		2.50				2.50		2.50	2
Czechoslovakia	2.50		2.50				2.50		2.50	1
Hungary	4.00		4.00				4.00		4.00	2
Poland	1.75		1.75				1.75		1.75	4
Rumania	7.00		7.00				7.00		7.00	7
Yugoslavia	7.00		7.00				7.00		7.00	3
Total Communist	24.75		24.75				24.75		24.75	
Total Foreign Broadcasts	127.50	55.92	183.42	287.00	248.50	535.50	414.50	304.42	718.92	

a. For a breakdown of the non-Russian Soviet languages, see Table 3.
b. Entertainment omitted.

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Hindi, Kannadian, Kurdish, Ladino, Persian, Pushtu, Telugi, Turkish, Urdu, and Yiddish, broadcast regularly by the Home and/or Regional Services of countries contiguous to or near the USSR, would be understood by at least a small segment of the Soviet population. All such programming has been disregarded in this study, not because it lacks effectiveness, but because it lacks directness. This section is concerned with broadcasts beamed to the Soviet people by foreign countries, both Communist and non-Communist. The most significant broadcasters, in terms of total hours of programming per week and total hours of transmissions by the various languages, are shown in Table 3.

Table 3

Foreign Radiobroadcasting to the USSR, by Language* a/ 4/
May 1954

Broadcaster	Hours per week								
	Russian	Armenian	Belorussian	Estonian	Georgian	Latvian	Lithuanian	Ukrainian	Total
VOA	17.50	3.50		5.25	3.50	3.50	5.25	7.00	45.50
BBC	12.25								12.25
United Nations	2.50								2.50
Italy (Rome)	7.00						2.33	2.33	11.66
Vatican	0.75		0.25			0.50	1.00	1.00	3.50
Spain	3.00							0.75	3.75
Philippines	5.00								5.00
Canada	7.00							3.25	10.25
Ecuador	8.00							1.50	9.50
Greece	2.50 b/								2.50
Iran	1.75								1.75
Lebanon		1.00							1.00
Yugoslavia	7.00								7.00
Rumania	7.00								7.00
Hungary	4.00								4.00
Bulgaria	2.50								2.50
Czechoslovakia	2.50								2.50

* Footnotes for Table 3 follow on p. 11.

Table 3

Foreign Radiobroadcasting to the USSR, by Language a/ 4/
May 1954
(Continued)

Hours per week

Broadcaster	Russian	Armenian	Belo-Russian	Estonian	Georgian	Latvian	Lithuanian	Ukranian	Total
Poland	1.75								1.75
RFR	18.00								18.00
Radio Liberation	17.50	3.50	1.75		3.50				31.50 c/
Total	127.50	8.00	2.00	5.25	7.00	4.00	8.58	15.83	183.41

a. Original programs only; that is, no repeat broadcasts are included. Radio Liberation programs in Caucasian and Middle Asian languages are not shown.
b. 45 minutes of this time is comprised of a 15-minute program broadcast 3 times a week by the Central Greece Armed Forces Services.
c. Includes languages not specified in the table.

A. Voice of America (VOA).

The VOA programs are the most significant Western World broadcasting effort in Soviet languages, at least in terms of total weekly programming and number of frequencies employed. VOA uses 77 frequencies to originate and repeat a total of 227.5 transmission hours* to the USSR. Of this, 126 hours are in Russian and the remainder is divided among 7 other Soviet languages.**

Table 4 shows the number of frequencies in each frequency range employed by VOA.*** It includes transmitters in the US and in Munich, Germany, the two points from which all VOA programs emanate, and also the relay transmitters in Tangier, Salonika, and Stuttgart.

* Transmission hours, as used in this report, refers to original program time plus all rebroadcast time.
** See Table 3.
*** Table 4 follows on p. 12.

Also included are the 5 frequencies of the US Coast Guard cutter "Courier," as well as the BBC frequencies used to relay VOA scheduling.*

Table 4

Frequencies Used by VOA in the US and Abroad 5/

	Band	Number
VHF a/	none	none
HF b/	17 mc	5
	15 mc	15
	11 mc	16
	9 mc	16
	7 mc	9
	6 mc	8
	5 mc	2
	3 mc	1
Subtotal		72
MF c/		4
LF d/		1
Total		77

a. Very-high frequencies (VHF) extend from 30 to 300 megacycles (mc) and are often referred to as "very short waves."
b. High frequencies extend from 3,000 to 30,000 kilocycles (3 to 30 mc) and are often referred to as "short waves."
c. Medium frequencies extent from 300 to 3,000 kilocycles (kc) and are often referred to as "medium waves."
d. Low frequencies extend from 30 to 300 kilocycles and are often referred to as "long waves."

Much of the total transmission time of VOA consists of

* For more detailed listing of frequencies, see Appendix A.

repeats of previous broadcasts; the total of original VOA New York and VOA Munich programming is only 45.5 hours, for Russian and non-Russian Soviet languages combined. The Great Russian language is used for 17.5 hours of these programs, and the other 28 hours are divided as shown in Table 5.

Table 5

VOA Weekly Programming, Original and Repeat 6/

Language	Original Program Hours	Repeats	Total
Russian	17.50	108.50	126.00
Armenian	3.50	14.00	17.50
Estonian	5.25	12.25	17.50
Georgian	3.50	17.50	21.00
Latvian	3.50	8.75	12.25
Lithuanian	5.25	14.00	19.25
Ukrainian	7.00	7.00	14.00
Total	45.50	182.00	227.50

During 126 of the 168 hours in a week, a Soviet citizen with a suitable receiver can receive a VOA broadcast in the Russian language. Of the remaining 42 hours in the week, 17.5 hours are blanketed by VOA broadcasts in other Soviet languages. Figure 1 shows a 24 hour VOA schedule, by language as of 16 May 1954.* All but one of the original programs are clustered in the late evening and early morning hours, Moscow time.

Most of the programs originated by VOA are carried simultaneously on a great number of frequencies; one program, for example, is transmitted on 1 low and 35 high frequencies.

Although all program and frequency assignments are subject

* Following p.13. Appendix B shows the same schedule in table form.

to change from day to day, it is considered doubtful that these changes would substantially alter the general impression to be gained from this presentation.

B. British Broadcasting Company (BBC).

The British Broadcasting Company (BBC) initiated its Russian language service on 24 March 1946, 7/ and by 1954 was beaming 12.25 weekly hours to the Soviet Union, all in Great Russian. In addition to this original programming, BBC relays most of the VOA schedule, amounting to another 35 hours of transmission time. Since the relays by BBC occur simultaneously with the original VOA broadcasts, this transmission does not appear in Table 2. 8/

BBC transmits its Russian-language programs on 1 low frequency, 3 medium frequencies, and 6 high frequencies. The high-frequency transmissions are in the 3, 6, 7, 9, 11, and 17 megacycle bands, and the exact frequency within each band varies from day to day in order to minimize the effect of Soviet jamming. * 9/

C. Italy: Rome Overseas Service and Radio Vatican.

The combined Italian radiobroadcasting (Overseas Service and Radio Vatican) into the Soviet Union amounts to about 15 hours a week of original programming, with no repeat transmissions. Vatican Radio concentrates mainly on the non-Russian languages -- Lithuanian, Ukrainian, Latvian, and Belorussian -- with only 45 minutes a week in Russian. Rome Overseas Service transmits 7 hours a week in Russian and 2.33 hours each in Lithuanian and Ukrainian. 10/

D. Clandestine and Quasi-Clandestine Broadcasters.

A "clandestine" broadcasting station is one which operates, usually without overt legal registration, from an unannounced location, with the principal intent of subverting the target audience. It usually speaks for an illegal or exiled group, and typically attempts to conceal its true location and sponsorship.

A "quasi-clandestine" broadcasting station is one which has some, but not all, of the attributes of a clandestine station.

* For a discussion of jamming, see Section IV, C, p. 108.

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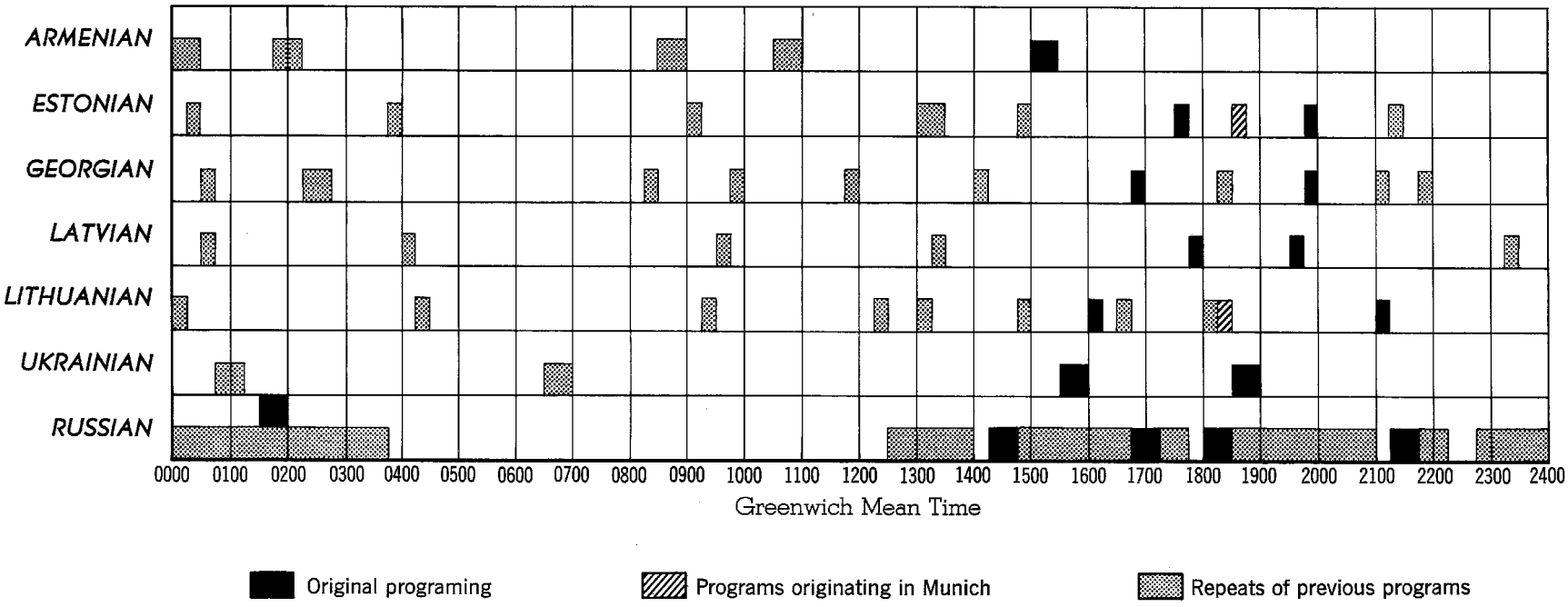
SECRET

VOA TWENTY-FOUR HOUR SCHEDULE

By Language

(As of 16 May 1954)



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SECRET

1. Radio Free Russia (RFR).

Radio Free Russia is operated by the Natsionalnoy Trudovoy Soyuz (National Worker's Union -- NST), an anti-Communist group with headquarters in West Germany.

RFR beams 18 hours a week of Russian language broadcasts into the USSR, using two mobile transmitters; one operates in the 6 megacycle band, while the other uses 11-12 megacycles. The frequencies vary widely within these bands to prevent jamming, and BBC reported in 1951 that its signal was receivable, in June of that year, about 75 percent of the time. 11/

2. Radio Liberation.

Radio Liberation is a quasi-clandestine anti-Communist station, with headquarters in Munich, West Germany. It is supported, at least in part, by the American Committee for Liberation from Bolshevism, Inc. 12/

Although the Russian language scheduling of Radio Liberation has been fairly consistent since its inception in March 1953, the Caucasian and Soviet Middle Asian programs have been sporadic. 13/ The Foreign Broadcast Information Service (FBIS) reported on 2 July 1953 that "broadcasts in languages other than Russian" by Radio Liberation had "not been heard recently." 14/ The same source reported on 14 July 1953 that "from 1800 to 2200 /GMT/ programs in Azerbaydzhani are heard on the hour, in Armenian at 15 minutes past the hour, and in Avar at 45 minutes past the hour." 15/ By late 1953, Radio Liberation had apparently settled down to a fairly consistent scheduling in its non-Russian language broadcasts, using five frequencies in the 6, 7, 9, and 11 megacycle bands beamed to Soviet Middle Asia, and two frequencies in the 9 and 11 megacycle bands beamed to the Caucasus area.

In mid-1954 a major schedule change was effected by Radio Liberation which resulted in a substantial increase in total transmission time. The number of frequencies employed also increased. It now uses 13 high frequencies, three each in the 11, 9, 7, and 6 megacycle bands, and one in the 3 megacycle band. Ten of these frequencies are used for the major Russian language broadcasts, which are beamed to East Germany and Austria as well as to the USSR. This beaming operates around the clock, with two daily hours of

basic programming repeated continuously. Thus the weekly total of original (basic) programming is 14, and total weekly transmission time, on this beaming, is 168. 16/

Another half-hour Russian-language program is carried on the Caucasus beaming, and is repeated 7 times for a daily total of 4 transmission hours. Thus the total of Russian-language broadcasts by Radio Liberation amounts to 196 hours a week, of which 17½ hours are original programs, and 178½ are repeat broadcasts.*

It will be noted in Table 2 that the Radio Liberation schedule is heavier than that of VOA in terms of total transmission time. It should be pointed out, however, that VOA employs 77 frequencies, many of which are in higher bands -- 15 and 17 megacycle bands -- which greatly increases the area of coverage. Thus the reception potential would appear to be greater for VOA than for Radio Liberation.

Radio Liberation now has a significant schedule in other Soviet languages. Armenian, Azerbaydzhani, Georgian, and one of the North Caucasian languages (Avar, Chechen-Ingus, Cherkess, Karach-Balher, or Osetian) are carried daily on the Caucasus beaming in addition to the Russian-language program mentioned above. Belorussian is broadcast on a special beaming to East Germany and the USSR. The fourth beaming -- to Soviet Central Asia -- is also a very significant broadcasting effort. The Bashkir language is carried daily on this beaming, in addition to one of the Turkic languages (Kazakh, Turkmen, or Uzbek). 17/

The total weekly transmission time of Radio Liberation, as shown in Table 2, is 385 weekly hours -- more than half of the total foreign radiobroadcasting transmission time beamed to the USSR. VOA is second with 227.5 total transmission hours, and all other broadcasters combined represent a total of 106.5 hours.

E. Other Non-Communist Broadcasters.

Seven other non-Communist countries and the US employ 15 frequencies to broadcast a total of 36.25 weekly hours in Soviet languages. Most of this time, 30.75, is in Great Russian.

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* See Table 2.

France does not originate any Soviet-language broadcasts, but uses one high frequency to relay the UN Russian-language program.

Canada and Ecuador are the only countries in the Western hemisphere, except the US, which carry Soviet language material in their international service. These two countries broadcast 8 and 7 hours a week, respectively, in Great Russian. Each country has a Ukrainian program as well.*

F. Foreign Communist Broadcasters.

Communist countries, including Yugoslavia, use 20 frequencies to broadcast a total of 25 weekly hours in the Russian language to the Soviet Union. None of these broadcasts are repeated. 18/

Almost one-third (7 hours) of this broadcast time is comprised of Yugoslav programs, and an equal amount is transmitted by Rumania. Approximately one-half of the Satellite broadcasts consist of press reviews for Radio Moscow. No Soviet language is used for these broadcasts except Great Russian.

Communist China inaugurated Russian-language broadcasts in November 1952 to commemorate the Sino-Soviet Friendship Month, but these broadcasts were discontinued early in December of the same year, 19/ and have not been noted since that time. Therefore it is not included in the tables.

* See Table 3, p. 10, above.

II. Radiobroadcasting System of the USSR.

A. Development of the System.

1. Early History.

Prior to the Russian Revolution of 1917 there had been no practical radiobroadcasting* of voice and music as we know it today. There had been, as a result of the newly discovered vacuum tube, voice modulation tests of radio waves prior to and during the First World War. But although its practicability was established, organized broadcasting to the public did not develop until after 1918. Similarly, the practical value of organized propaganda as a tool of governmental policy had not been recognized until the experiences of World War I and the Bolshevik Revolution were assimilated into political thought. 20/ The coincidence in time of these three events; the development of broadcasting to the practical state, the confirmed usefulness of propaganda as a political tool, and the seizure of power by a hardened group of revolutionaries, had important consequences in the development of broadcasting methods and techniques in the USSR.

a. Special Circumstances Which Faced the USSR in Radiobroadcasting.

The USSR presented problems in broadcasting which differed greatly from those of the more advanced industrial nations of the West, and these problems restricted the development of broadcasting. The Bolshevik inheritance of basic needs, facilities, and resources in the field of radio, together with their generally over-ambitious plans for industrial development created a complex of problems in priority allocation for broadcasting.

The vast physical extent of the USSR plus the great variability in population density, developed resources, climate, topography, and radio wave propagation characteristics, created problems in the choice of equipment to be produced, frequency allocations, transmitters, powers, and locations, and connecting facilities between transmitters and studios. These factors were

* Hereafter, the expression "radiobroadcasting" is most cases will be shortened to broadcasting.

conditioned by yet another unique feature, the linguistic and cultural diversity of the population of the USSR. Whereas many of these problems could have been resolved by the utilization of different types of equipment according to location, and by local stations serving areas according to population density and national origin, these solutions were not acceptable by those in power. The Communist viewpoint was oriented strongly toward strict control from the center, and toward standardization of equipment for economic reasons.

An important decision was called for concerning priorities of development, and hence allocations of resources between communications facilities and other industrial investment, and between broadcasting and the creation of the basic telecommunications network. The USSR had an extensive overhead telegraph and telephone system, but it was mainly concentrated in the Western areas, and threaded very thinly eastward toward the Pacific. Many radio facilities existed to overcome wireline deficiencies. In general, telecommunications equipment was neither adequate nor up-to-date, and heavy investment was necessary. 21/ The resources of the country in technical manpower were scarce, and production facilities apparently were insufficient to meet the needs of a nation becoming industrialized, The distribution of electric power, upon which radio normally depends, had not been extended by Czarist Russia to any great extent beyond a few large cities. 22/

The immediate over-riding inheritance of the Bolsheviks, however, was the political, social, and economic chaos stemming from the War and Revolution and the period of War Communism. This chaos, together with the immensity of the other problems, effectively precluded any early, concerted effort to attack the problem of radiobroadcasting other than in the densely populated urban-industrial areas, and even this was on a small scale.

As a result of all these circumstances Soviet broadcasting remained considerably behind the development of Western broadcasting. Nevertheless, efforts were being made to overcome the deficiencies in material, technical personnel, and industry, to the point where greater quantities of resources could be diverted from basic economic and military needs and toward the development of a broadcasting system.

b. Soviet Concepts of the Functions and Qualities of Radiobroadcasting.

Perhaps the most important factor in the determination of the role to be played by Soviet radio and its organization is the Bolshevik view that no social service to the population can be disassociated from strict government control and supervision. Radio is important in the USSR as a solidifying link and a "transmission belt" by which the party can mobilize the population for the attainment of the Kremlin's goals. From the beginning the Soviet leaders had a deep practical awareness of the potential of broadcasting as an administrative tool and as a means of Communist indoctrination and agitation of the populace. From this concept of radio the Soviet leaders have designed and redesigned the broadcasting apparatus to give it maximum effectiveness in much the same manner as they have developed other mechanisms of control and supervision. Included in this idea of state monopoly is the desire to expand the mass audience to the full limit of the population and to prevent penetration by foreign broadcasting services into the USSR.

c. Early Soviet Planning.

As has been mentioned earlier, because of the chaotic economic and social situation and the special problems faced, progress of radiobroadcasting was slow in the first few years of Communist rule. It was not until 1924 that systematic broadcasting was begun and an organization set up to administer the system. Detailed information of early Soviet planning for the development of broadcasting is not available. During this period it seems that the development of broadcasting was given a priority relatively below the demands for capital investment in heavy industry and the needs of the basic communication nets. Nevertheless, of the 80 kilowatts of transmitting power reportedly radiated over Europe in 1925, the USSR may have accounted for about half of it. 23/ By 1924 plans had apparently progressed to the point where a mechanism to administer broadcasting became desirable. To this end, in October 1924, the Council of People's Commissars established a "Joint-Stock Company for Radiobroadcasting," known as "Radioperedacha," which stock was held jointly by the Moscow Council of Trade Unions and the Public Education authorities. During the same month the "Sokolnicheskaya" radio station, operated by the Moscow Council of Trade Unions, went on the air. 24/ This marked the beginning of systematic

broadcasting in the Soviet Union.

2. Development of Facilities.

The first major broadcast in the USSR was transmitted on 17 September 1922 by a 12 kilowatt medium frequency station at Moscow alleged to be the most powerful station in the world at that time. (US stations began transmissions officially in 1921 but broadcasting was carried on experimentally several years before.) Lenin, recognizing the value of broadcasting as a part of the Soviet plan to control the minds of the masses, quickly set about to take over this powerful medium of agitation and propaganda.

In 1925-26 the Soviet radio system made great strides, setting up more than 30 broadcasting stations of one or two kilowatts each and inaugurating wire-diffusion exchanges in Moscow, Leningrad, and several other large cities.

Although the development of broadcasting was given a lower priority than, for example, heavy industry, the USSR is believed to have had a total broadcasting output of about 40 kilowatts in 1953, or half of the broadcasting power output reportedly radiated by European transmitters.

By 1927 the number of transmitters in use in the USSR was at least 23 (including a new 45 kw transmitter at Moscow) with a total power output of 126.5 kilowatts.

By 1929 the USSR was operating over 40 principal broadcasting transmitters in some 40 cities, averaging over 5 kilowatts each in power output, and providing, except in a few cases, coverage in the immediate area of the respective transmitters.

It is interesting to note that in 1929 the Radio-Electric Conference of Prague was held to deal, among other things, with the allocation of frequencies to all European broadcasting stations. At this conference it became clear that the Russians intended to continue the illegal operation of broadcasting stations in frequency bands which had been reserved by the Washington Conference of 1927 for maritime, aeronautical, and other special services. The Conference proposed a 60 kilowatt maximum power output for the future but it was not accepted as binding, and within a year the All-Union Central Council of Trade Unions opened a 100 kilowatt

station in a suburb of Moscow.

By the end of the First Five Year Plan, in 1932, the USSR reportedly had 57 broadcasting stations in operation, with a total power output of 1503 kilowatts as compared to 23 stations and a total output of 126.5 kilowatts at the beginning of the Plan in 1928. According to information from the Soviet Radio itself, more than 50 dialects or languages were used in "broadcasting" by the end of 1932. Part of the total power increase during the First Five Year Plan can be attributed to the installation of the 100 kilowatt station of the All-Union Central Council of Trade Unions in a Moscow suburb in 1929, and to the conversion of the Moscow, Leningrad, and Novosibirsk stations to 100 kilowatt output between 1930 and 1932. The following year saw the inauguration of the gigantic 500 kilowatt low-frequency "Comintern" transmitter at Moscow, the largest in the world at that time. No high-frequency stations of any consequence were as yet in operation. In fact, in 1930 there were only three such transmitters in use in all of Europe.

When Nazi Germany entered the field of international high-frequency broadcasting in 1933 the Soviet broadcasting service began transmissions in German and other European languages on the new 500 kilowatt Comintern transmitter. No details are available as to the extent of this first international broadcasting service. To counteract German high-frequency propaganda broadcasts, the USSR, France, and the UK hurriedly entered the field. Italy was already broadcasting propaganda in Arabic to North Africa and the Near East at this time via the powerful Bari radio station.

By 1934 the USSR's broadcasting service operated about 60 main transmitters averaging over 15 kilowatts each in power. Six of these were 100 kilowatts or more and one was 500 kilowatts. Of the 55 cities listed as having broadcast stations, only two, Moscow and Khabarovsk, appear to have had high-powered high-frequency transmitters. In addition, there were some low-powered high-frequency stations providing regional coverage. The number of listeners in the USSR was reported to be about 10 million, with 22.5 million in the remainder of Europe. In 1934 the total number of broadcast hours was estimated to be about 330,000 hours for the year, with over 60 languages represented.

The Second Five Year Plan (1932-37) resulted in an increase to 77 stations in 67 cities of which seven were 100 kilowatts

or more, having a total power output of 1765 kilowatts. Only four cities, Moscow, Novosibirsk, Tashkent, and Khabarovsk were listed as having high-frequency transmitters.

During the Third Five Year Plan (1938-42) the Russians apparently concentrated on expansion of the wired network facilities and improvement of existing transmitter facilities. By 1940 the number of broadcasting stations, according to the Berne List of Broadcasting Stations, numbered 81 in 69 cities, an increase of only 5 transmitters over 1937. According to Soviet statistics, broadcasting was conducted in 62 languages or dialects by 1940, either by radio or through the 11,000 wired exchanges then in existence, of which about one-third were under the operational or technical management of the Ministry of Communications. By June of 1941 the number of loudspeaker sets in the wired exchanges totaled 5 million according to the newspaper Izvestia.

3. Administrative and Planning Changes, 1924-40.

a. 1924-28.

With the establishment of Radioperedacha the Russians entered a period of concerted effort to plan economically and administratively for resolving their handicaps and goals. The comparatively slow tempo apparently decided upon permitted the next few years to be a period of experimentation both in equipment and organization. Economic resources were not invested in this program to a degree where commitment to a particular pattern of transmission or reception was unnecessary. Since there was no possibility of making radiobroadcasting receivers* or reception facilities available to the minority peoples of the USSR the problem of central control was not acute. Similarly, radiofication of the entire nation was out of the question. As a result there was concentration on the European part of the USSR, principally the urban-industrial region. Radioperedacha operated with the Sokolnicheskaya radio station as its base. The Cultural Section of the Moscow Council of Trade Unions directly operated the station. They in turn added to the active audience by instituting the first wire-diffusion exchange. 25/ The use of wire lines to distribute aural broadcasts was to become one of the most significant developments of the Soviet

* Hereafter, the expression "radiobroadcasting receivers" will be in most cases shortened to receivers.

system. This manner of broadcasting is known under different names and it fulfills different functions. In Eastern Europe radiofication is also known as telediffusion, radio-distribution, relay-exchanges, re-diffusion, etc. It is indirect reception, mostly from a small radio receiver, with an amplifier which feeds dozens, hundreds, or even thousands of small loudspeakers. This type of system usually serves as an intermediary, relaying programs from other points, but it can also be used to initiate broadcasts. The honest purpose of such wired indirect reception, and most likely the original purpose for its use in the USSR, is to overcome economic difficulties in equipment production, and technical difficulties such as electrical noise in industrial areas. The system recommends itself to poor countries where the majority of the people cannot afford an individual receiver but can acquire or hire a loudspeaker. There is also the obvious advantage for a totalitarian state in that the relay point is in complete control of the programs. The man who controls the relay point is in a position to determine just what will be broadcast. 26/ The continued and expanded use of this system in the USSR in undoubtedly due to the fortuitous combination of economic considerations and political advantages to the Communist Party.

b. 1928-40.

Changes in the administration of broadcasting occurred at the outset of the First Five Year Plan (1928-32), and again in the Second Plan (1933-37), reflecting the degree of change which had occurred in the technology, the economy, and the political administration of the country.

In July 1928, Radioperedacha was dissolved and the control of broadcasting was transferred to the Commissariat of Posts and Telegraphs. 27/ The transmission and reception base of the country, while still in its infancy, had expanded to the point where there was a need for administration on an All-Union level. Also the international development of radio had raised the need for a central authority to represent the USSR at international conferences dealing with frequency allocations, power regulations, and general radio procedure. The Commissariat of Posts and Telegraphs was a natural choice.

The administration of broadcasting and reception was apparently not satisfactory under these auspices however, and

with the aim of achieving more centralized control of radio work the All-Union Committee for Radiobroadcasting and Radiofication (VRK) was established under the Council of People's Commissars in January 1933. 28/ Nine months later the Council, in a regulation dated 27 November 1933, defined the authority and powers of the VRK, and charged it with the "organization, planning and operational direction of all radiobroadcasting in the USSR, including wire-diffusion by lower broadcasting exchanges in district centers, Machine Tractor Stations, etc." 29/ The subordination of the VRK directly under the Council of Ministers was apparently due to the realization that an activity with so many cultural, social, economic, technical, and political ramifications could not adequately be administered by a specialized technical and economic commissariat.

Thus it appears that by 1934 the format of the Soviet broadcasting system, its reception pattern, and its organization and management, had been firmly established. The description which follows will in general apply to the period from 1934 until the present, although in section II, paragraph B, the system will be explored in greater detail, in light of more recent knowledge.

c. Over-all Functioning.

Moscow was the central station with a complex of transmitters. On low- and medium-frequencies Moscow was serving radio receivers in the area by radio, and loudspeakers by wire. The Moscow distribution system served the so-called local (regional) stations in the various Republics and regions either by wire-line or by radio. These local stations relayed Moscow programs, and also originated their own local programs in the proper language or languages. The local stations served radio receivers in their own areas and also distributed programs by wire-line to loudspeakers in their own immediate areas and probably also to some more distant cities and villages. In this system all radio levels below Moscow relayed programs from the higher levels and could originate programs for wire transmission. 30/ This systematization gave Moscow a command channel down to the lower levels of social and economic activity.

The general outline of the present reception was also formed in the 1930's, and has continued essentially unchanged in the postwar period, except that certain changes in emphasis have occurred which will be discussed later. Chief among the steps

taken at various times to form the reception system are as follows: 31/

(1) The extensive use of wired radio nets.
(2) Prohibitive purchase prices for tunable receivers.
(3) Installation of loudspeakers and receivers for group listening.
(4) Registration and licensing fees for receiving equipment.
(5) Jamming foreign broadcasts beamed into the USSR.

B. Wartime System.*

Shortly after the outbreak of the war with Germany in 1941, the Soviet broadcasting system quickly began to show signs of decentralization due to the rapid German advance in the western USSR. Many of the large republic and local transmitters were destroyed or captured by early 1942 in the Baltic area, the Belorussian SSR, the Ukraine, and parts of the RSFSR. At the beginning of the war the principal Moscow high-frequency transmitters were: RV 96 of 100 kilowatts, RKI of 25 kilowatts, RNE of 20 kilowatts, RAN of 20 kilowatts, and RV59 of 20 kilowatts or more in power output. By October of 1941 these transmitters ceased to operate and the powerful low-frequency Comintern station likewise disappeared from the air waves. A number of emergency transmitters then appeared, mostly of extremely poor quality. All in all, broadcasting conditions for the western part of the USSR were poor during this period. The number of Russian broadcasts for home consumption decreased and the original division of the home service into four broadcasting zones was abandoned temporarily. This reorganization, in late 1941, involved a substantial decentralization of the Russian and foreign language broadcasting services. Radio Center Moscow lost much of its importance, and other centers, notably Kuybyshev, the temporary Soviet capital, came into the foreground. The services maintained by regional centers replaced programs previously broadcast by Moscow, especially those destined for the various national zones.

In January 1942 the USSR inaugurated three powerful high-frequency transmitters at Komsomol'sk in the Soviet Far East, which were constructed by RCA and known to have an output of 50 kilowatts each. These transmitters served, and still serve, purely as relay

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stations for Moscow and Khabarovsk programs, both national and international. Some of the programs were relayed from Moscow via the telephone line installed along the Trans-Siberian Railroad in 1939, while otherswere received by high-frequency radio for retransmission. Other high-frequency stations known to have been in operation during the early part of the war include: Khabarovsk, Vladivostok, Kuybyshev, Leningrad, Tbilisi, Alma Ata, Sverdlovsk, Magadan, Petropavlovsk, Novosibirsk, Yerevan, Kamchatka, and Tashkent.

By the beginning of 1942, Moscow had resumed some of its functions which were temporarily carried by regional centers. Greater attention was paid to the quality of transmitters and to necessary adjustments for good reception. The improved military position at that time made development toward centralization possible. The five Kuybyshev high-frequency stations abandoned the Soviet home program in favor of relays from Moscow. After one year of war Moscow again became the chief broadcasting center of the USSR. Transmissions were begun for German-occupied Soviet territories in eight languages.

In 1943, according to a 1947 Tass dispatch, the USSR completed construction "in the east of the country" of what they called the world's most powerful medium-frequency broadcasting station. (This presumably refers to the so-called "Stalin" transmitter, reportedly of one million watts and originally located in the Ural Mountains area. Its present disposition is unknown.)

Not much is known about the reconstruction of the Soviet broadcasting system from 1943 to 1946. Temporary transmitters were set up, however, in the larger recaptured cities in the Ukraine and Belorussian SSR. In 1944 there were about 20 high-frequency transmitters announcing as Moscow although some of them were actually located at other cities such as Sverdlovsk, Novosibirsk, and Kuybyshev. The number of radio transmitting stations rebuilt during this period was not great, but due to lend-lease aid and redistribution of transmitters the rehabilitation of the broadcasting system was accomplished, apparently without great difficulty.

In 1946 the Fourth Five Year Plan began with 27 new transmitters being put into operation, including a powerful medium-frequency station at Riga. Improved broadcast stations were built in Simferopol, Stalingrad, Moscow, Kiev, Kuybyshev, Kharkov, Novosibirsk, and Alma Ata. Many new telephone lines capable of relaying radio programs were put into use during this period.

According to a statement by Ivan T. Peresypkin, Marshal of Signal Troops, 5 million radio receivers survived the war and were in use as of 1 January 1946.

C. Postwar Developments.

1. Postwar Administration.

The previous section serves to indicate how the combined conditions of early Soviet economic development and the political perspective of the Communist Party have worked toward the formation of the present broadcasting system in the USSR. With this as background, and with the recent information available, this section will explore in considerably greater detail the recent developments in the system and the coordination of the activities of the various offices which have some authority and responsibility in the management of operations. Figure 2*, Soviet Organization and Administration of Radiobroadcasting, shows the breakdown of the various organs concerned with broadcasting, and their subordination within the hierarchy. An examination of this chart will suggest both the formal and informal relations between the organs of government and party. It also provides a basis for a study of the agents who guide the broadcasting endeavor within the USSR, and is a framework into which can be woven the various facts regarding the general atmosphere and specific conditions under which these agents operate.

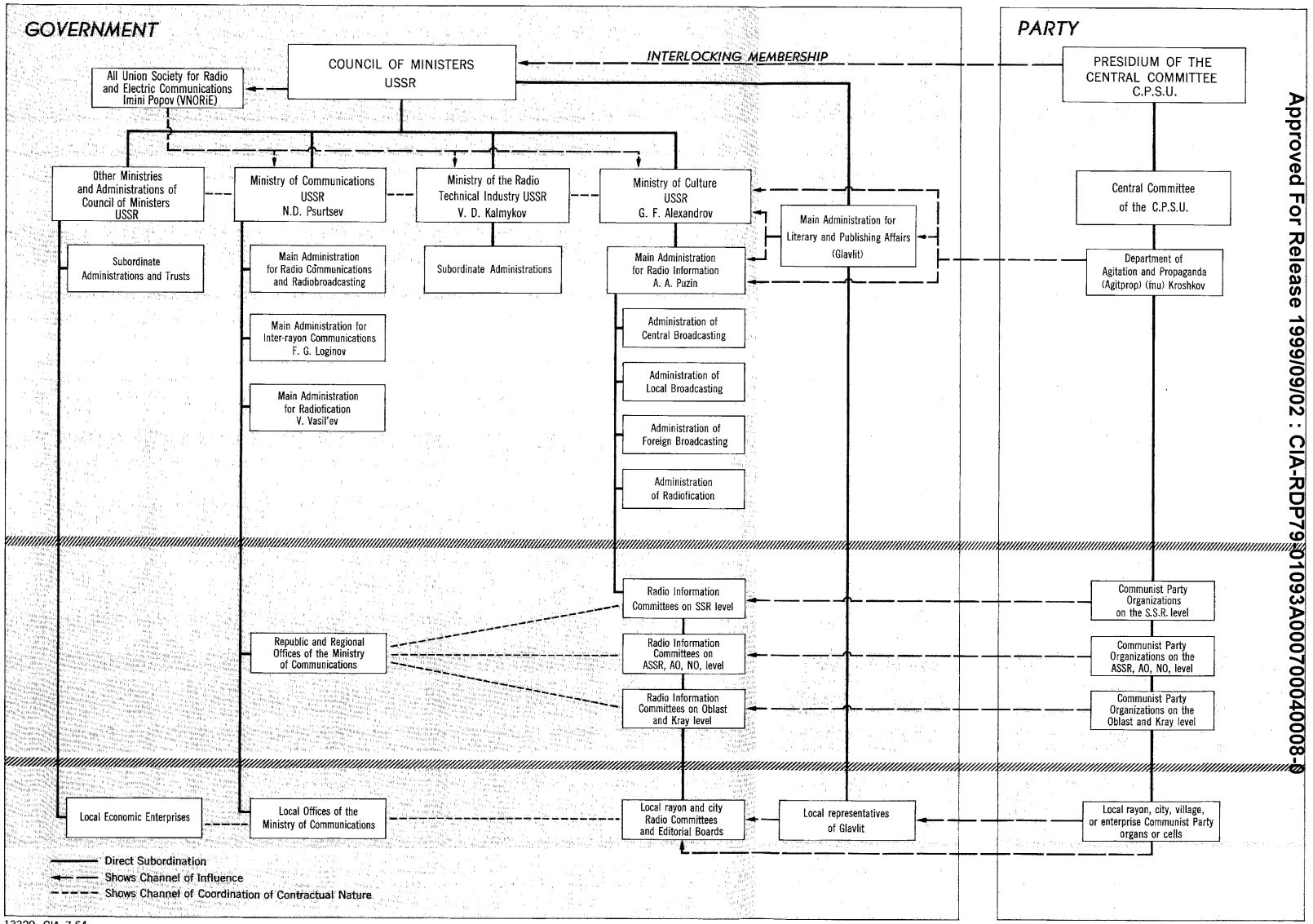
a. Over-all Administration.

The Soviet broadcasting system, until March 1953, was administered by the Radio Committee (VRK) attached directly to the Council of Ministers of the USSR. On that date the VRK was merged with other propaganda and information agencies into the newly created Ministry of Culture, USSR. 32/ Since then it has been referred to as the Main Administration for Radio Information of the Ministry of Culture, USSR. 33/ Alexi A. Puzin remained as chief of this body. There is no indication that the responsibilities or functions of the organization have changed to any great degree. In addition to serving as the All-Union authority on broadcasting matters, this body also serves as the authority within the RSFSR. Each of the remaining fifteen Union Republics has its own Radio Information Committee, which has become subordinate to the Republic

* See Figure 2 following p. 28.

USSR

ORGANIZATION AND ADMINISTRATION OF RADIOBROADCASTING



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Ministry of Culture and the Main Administration of the Soviet Ministry of Culture. 34/ Similarly, the Autonomous Republics, National Okrugs, Krays, Oblasts, and smaller territorial subdivisions each have their own Radio Information Committee whose membership and activities are controlled by the higher organs. As of 1953 there were, under the central direction of the parent administration, 163 local radio committees in Republics, Krays, and other districts, and up to 2000 editorial boards (redaktsii) operating the important wired-radio exchanges in district centers, major industrial enterprises, and elsewhere. 35/

The Main Administration for Radio Information has been put in charge of the problems of broadcasting. Within this body there are four separate administrations, as shown in the Figure. One body, the Administration of Radiofication, deals exclusively with technical matters. It has been stated that this board has the final word on plans for radiofication and the building of networks, and that it cooperates with other technical bodies. 36/ Its principal dealings would be with the Ministry of Communications and presumably with the New Ministry of the Radio Technical Industry. The Administration of Radiofication approves plans for releasing radio equipment, fixes the types of apparatus to be used for mass reception, and coordinates the plans with commercial and research activity in the field of radio. The other important subdivisions of the Main Administration are the Administration of Central Broadcasting, the Administration of Local Broadcasting, and the Administration of Foreign Broadcasting. The actual broadcasting and programming policies and actions are controlled by these organs. In addition there are lesser staff units such as the Planning, Financial and Accounting Section, a State Publishing House for Affairs of Radio, a Recording Plant, and a Technical Supplies Section. 37/

Transmitting equipment, radio lines for both short and long distances, and other technical equipment are under the control of the Soviet Ministry of Communications. This also includes many of the wired exchanges. Besides its responsibility in coordination of decisions and plans with the appropriate body of the Ministry of Culture, the Ministry of Communications has jurisdiction over the installation, maintenance, and much of the operation of the broadcasting equipment. Several Main Administrations of Communications are involved in this work as is

indicated in Figure 2.* 38/

b. Administration of Programming.

The use of mass media to sway public opinion is inherent in the Soviet theory of the administration of a state. It was a Lenin doctrine which was adopted -- that to perpetuate itself the Soviet State must maintain a balance between coercion and persuasion. Propaganda machinery was created to implement the tenet of persuasion. In the broadcasting sphere this activity is administered by the Main Administration for Radio Information of the Ministry of Culture, but it is closely supervised by the Section of Propaganda and Agitation (Agitprop) of the Party's Central Committee. Agitprop units at lower levels insure a relay through the Soviet system. A tight control over all media of information is centered in this section, which determines both the general line and the specific course of action in all matters affecting Soviet opinion. Agitprop procedures are based, of course, on the policy determinations of the Presidium of the Central Committee of the Party. 39/

Assistance in securing uniformity of facts and interpretations to be disseminated through the system is given by the Main Administration for Literary and Publishing Affairs (Glavlit) of the Council of Ministers and by responsible subdivisions of the Main Administration for Radio Information of the Ministry of Culture. For example, Glavlit, through Agitprop, insures that all broadcasts are in accord with the Party's political and ideological doctrines. Glavlit also is responsible for seeing that broadcasts do not divulge any economic or military secrets. The extent of this surveillance is apparent by the fact that Glavlit has representatives in local Soviet governmental units. 40/

c. The Soviet Domestic Radiobroadcasting System.**

The Soviet domestic broadcasting system operates at four distinct levels which are: the Central Broadcast Network or Home Service, emanating from Moscow; the larger republic or RSFSR regional networks emanating from cities such as Kiev, Alma Ata, and Khabarovsk, the important oblast centers; and the local broadcast systems which deal primarily with wired-radio exchanges extended

* See Figure 2 following p. 28.

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to the kolkhoz level. Figure 3* is a graphic presentation of this information.

In practice the domestic system appears to function as follows: the Home Service and National Programs originating at Radio Center Moscow are sent by wire or by high-frequency radio where necessary to all large radio centers, including all republic capitals and other important cities such as ASSR, Kray, and Oblast centers. Smaller and more isolated communities, especially those in the Arctic regions, receive Moscow by radio, low-, medium-, or high-frequency.

The Home Service and National Programs for Siberia and Central Asia originate at Radio Center Moscow. The Home Service is divided into three distinct programs: the Main Program, the Second Program, and the Third Program. The Main Program is broadcast 19 hours per day to the entire USSR by as many as 20 transmitters simultaneously, and is relayed, at least in part, by virtually all radio centers in the country. It contains all programs of vital interest to the whole nation such as news, domestic press reviews, and party talks. The Second Program, which is of lesser national importance, is transmitted 10 hours per day by as many as 7 stations, on low-, medium-, and high-frequency simultaneously and does not appear to be directed to the entire Soviet Union except on certain occasions. The Third Program, which consists entirely of entertainment features and concerts, is transmitted for 4½ hours each evening on one high-frequency and one medium-frequency channel, and is directed only to the European part of the USSR. No stations outside of Moscow have been observed carrying this program.

The USSR, because of its size and the variance of time zones, is actually divided into four radio zones as follows: the European USSR, including the Caucasus, Western Siberia, and the Central Asian Republics; Central Siberia and the Arctic regions; and the Soviet Far East. Because of the difference in time zones between parts of Siberia and European USSR, Moscow transmits "National Programs" to the afore-mentioned areas at times when the Home Services would either be unavailable or unsuitable for the areas east of the Urals. Radio centers in each of these radio zones relay all or part of these programs. The program for the Soviet Far East is the most extensive of the National Programs,

* See Figure 3 following p. 31.

totalling almost seven hours daily. This program is relayed by Khabarovsk and other cities in the Soviet Far East. As many as 16 transmitters at Moscow alone have been observed simultaneously carrying some of these national programs on low- and medium-frequencies.

In addition to the home and national broadcasts, Radio Center Moscow also transmits a regional service for Moscow Oblast and certain adjacent oblasts such as Bryansk, Smolensk, Ryazan, and Tula. The oblast capital studios in the surrounding area originate 1 or 2 broadcasts daily for retransmission by Moscow on low- or medium-frequencies. A city-wired network for loudspeaker sets in the Moscow Oblast is yet another service emanating from Radio Center Moscow.

Republican capitals and large RSFSR radio centers, while carrying a large proportion of the Moscow programs, also originate republic and regional programs designed for their respective political administrative areas.

Map No. 1, Soviet Domestic Regional Radiobroadcasting System,* represents graphically political subdivisions to the oblast level, the transmitting station and studio locations, and the design of area programs.

While most administrative areas rely on the services of one transmitting center with pick-ups in studios adjacent or in subordinate areas, some larger republic administrative subdivisions may have a number of regional networks or transmitting centers to afford adequate radio coverage in important populated parts. The most notable areas of this type are in the Ukrainian SSR, Kazakh SSR, and the Khabarovsk Kray.

The Ukrainian SSR, for example, in order to serve adequately the entire republic, has various subordinate regional broadcasting centers such as Kharkov, Lvov, and Odessa, in addition to the main station at Kiev. These regional centers in turn have several or more studios in adjoining oblasts which feed programs by wire to the regional center for rebroadcast back to the same oblast area from which the program originated. This unique arrangement, which is common throughout the USSR, is undoubtedly a natural out-

* Following p. 32.

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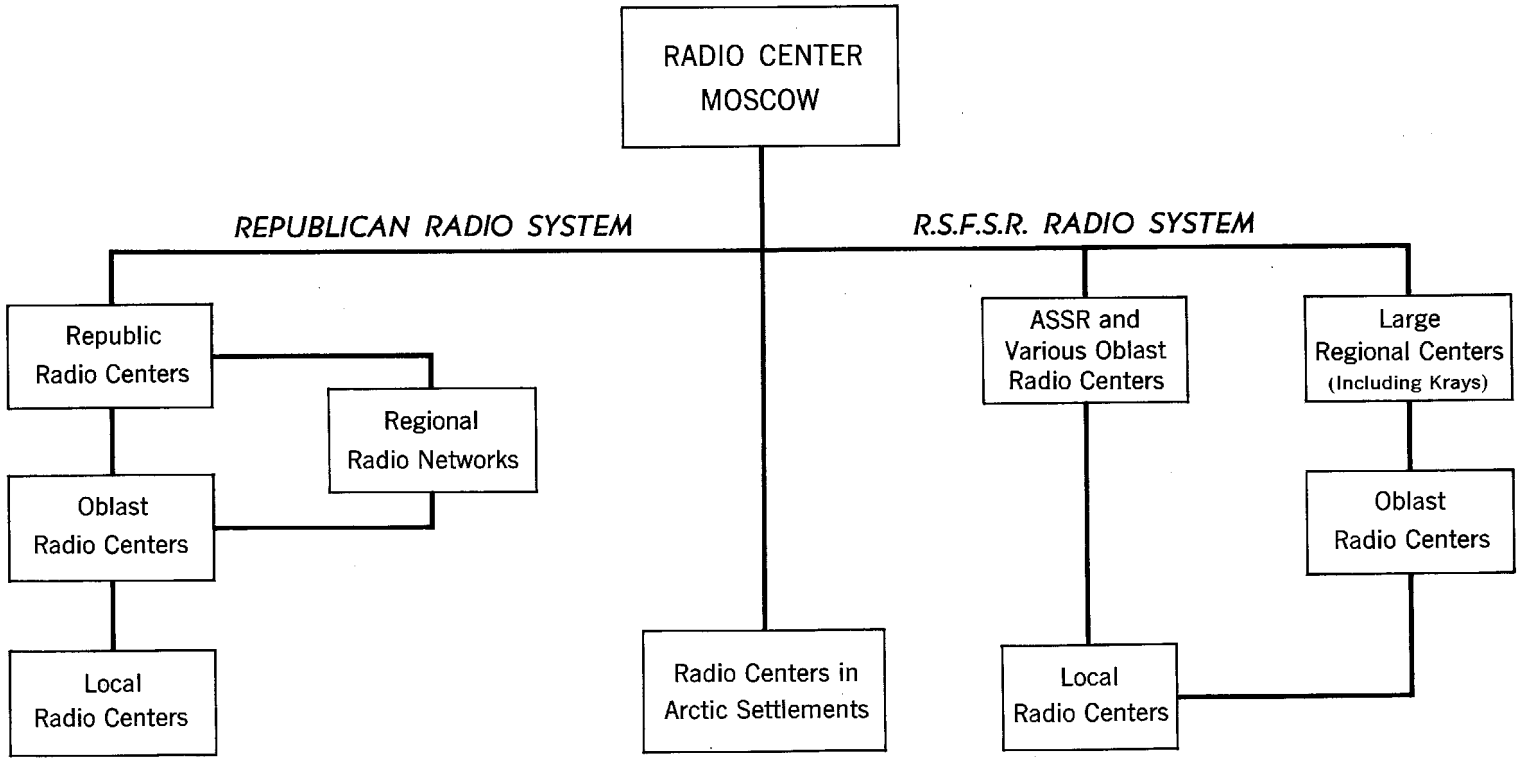
USSR

ORGANIZATION OF THE DOMESTIC RADIOBROADCASTING SYSTEM



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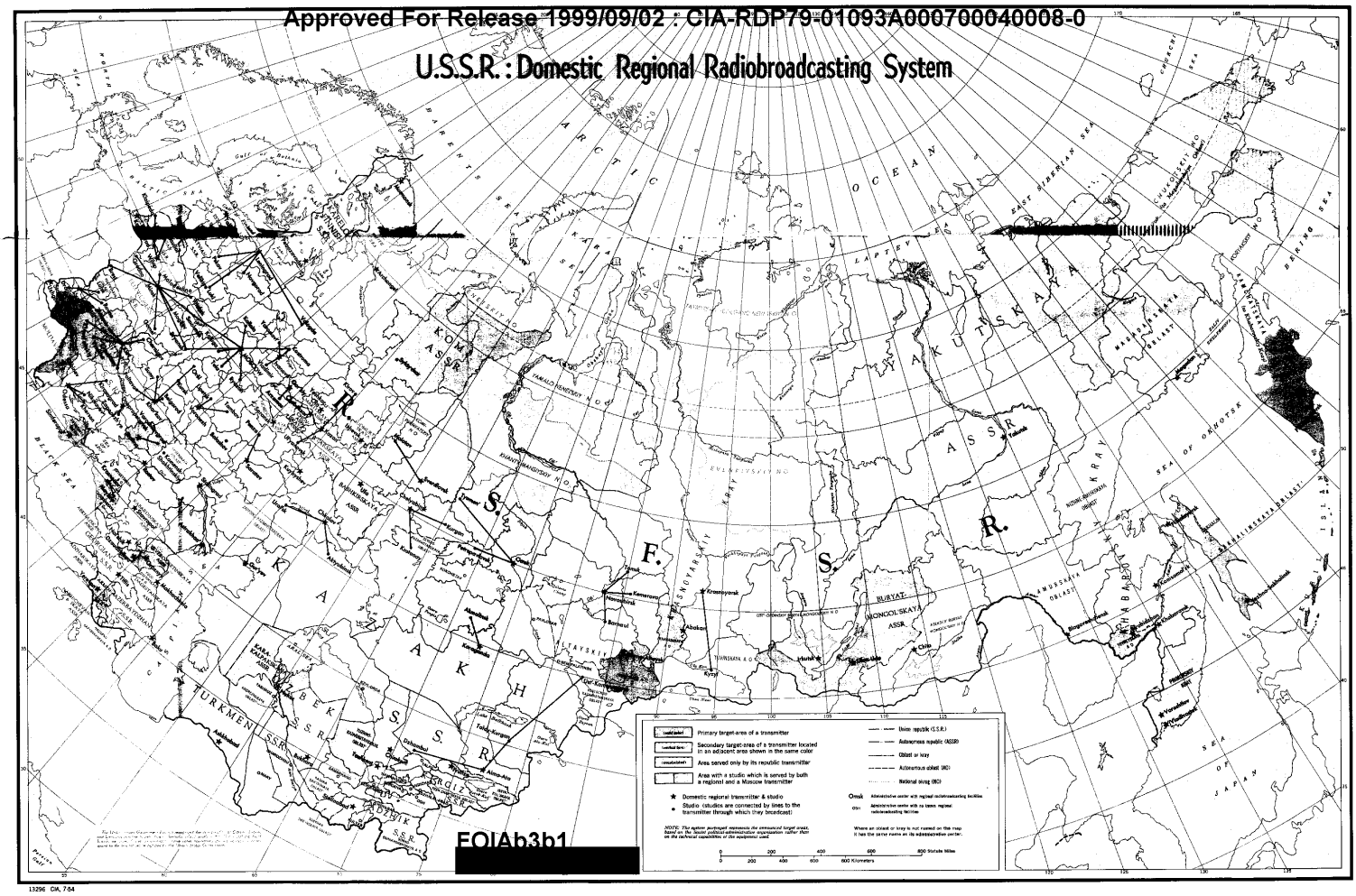
SECRET

U.S.S.R.: Domestic Regional Radiobroadcasting System



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growth of the lack of sufficient transmitting equipment to supply oblast and regional centers. It may be perpetuated by the centralization policy of the Soviet broadcasting authorities who apparently are desirous of maintaining strong echelon control in the organization without sacrificing the principle of oblast participation. A typical example of this arrangement on a republic scale may be seen in the composition of the Belorussian system wherein all oblasts of the Republic originate programs at the oblast center studios of Gomel, Vitebsk, Molodechno, Brest, Mogilev, and Grodno. These are transmitted by wire to the capital at Minsk for broadcast by a high-powered, low-frequency transmitter providing reception in the originating area. Wired radio exchanges in each oblast are respectively fed by radio from Minsk and undoubtedly, when practicable, by wire direct from the originating studios. It would seem that landlines are lacking for this service in most cases and radio must be relied on for the burden of intra-oblast dissemination, else this awkward procedure would not continue year after year. The method can be defended on the basis of several economic features, especially since the oblast studios generally do not originate enough local programming to warrant the use of separate high-powered transmitting facilities, but it is uneconomical in that it requires numerous reception centers for the various local distribution networks. This method of broadcasting is employed throughout the European part of the USSR, Western Siberia, and Central Asia, and to a lesser extent in the Soviet Far East where wire communications and distance factors inhibit the use of the system.

Although in political divisions such as the Belorussian SSR oblast studios are linked with the republic radio center, there are some cases where, due to geographic, linguistic, or other factors, a studio from one republic or RSFSR oblast may feed its local broadcasts by wire to the transmitting center of a neighboring area which is under a different administrative control. Examples of this are in the Kirov and Ulyanovsk oblasts of the RSFSR where the studio broadcasts from these oblast capitals are fed by wire to Kazan in the Tatar ASSR for retransmission to the originating areas, or in Kursk and Orel in the RSFSR transmitting through facilities of Kharkov in the Ukrainian SSR.

In most cases the theoretical primary coverage area of a transmitting center approximates the political administrative area for which the broadcasts are intended. The function of a republic or large regional center in almost every instance is to serve

its own administrative area. In the case of a large republic or kray this may result in the use of a high-powered high-frequency transmitter or in the division of the republic or region into as many as eight centers to ensure complete radio coverage. Such is the case in the Ukrainian SSR, which in addition to the republic center at Kiev, has large regional centers at Lvov, Kharkov, Chernovtsy, Odessa, Dnepropetrovsk, and Stalino-Donbas. Each of these centers in turn has two or more oblast studios which originate local broadcasts for retransmission to their respective areas. A glance at the domestic coverage map No. 1* of the USSR indicates that all oblasts of the Ukraine have either a transmitter or a broadcasting studio, thus assuring almost complete coverage by radio for the republic.

Some oblasts, and many sovkhozes, kolkhozes, and isolated settlements receive broadcasts either from Radio Center Moscow or from the center of their respective administrative areas. The signal is then fed from a central receiving location to the various loudspeaker units connected to the wire-diffusion exchanges. Populated areas near telephone trunk lines may receive the programs direct by wire from the originating point. Most large cities in the USSR have wire-diffusion exchanges which originate programs of local interest in addition to retransmitting programs from Moscow or other centers.

d. Administration at the Local Level.

(1) Programming.

Due to its unique physical structure, the wire-diffusion exchange is peculiarly suited to a program policy which can be adjusted to local needs. Because they are numerous, however, and because their programs do not go over the air, the exchanges present a difficult supervisory monitoring problem. Along with possible advantages, therefore, they run the risk of consistently putting on inferior programs, and, what is more serious to the regime, they may be used for non-party political purposes. A conflict between experimental local initiative and central control of the local exchange was experienced in the early development of exchanges. The conflict was resolved in favor of central control. Within two years of its establishment the VRK decided, in 1935, to

* See Map No. 1 following p. 32.

reconstruct completely the system of control of exchange broadcasting. The Committee found that many of the exchange originated programs were of the primitive "pot-boiler" variety. Others were for one reason or another unacceptable. Some were regarded as politically illiterate or even harmful, and cases of alleged nationalist diversions and of anti-state speeches were cited. Consequently, the right of exchanges to originate their own broadcasts was limited to a specified number of major exchanges, and these were permitted to do so only for as little on one-half hour or at the most 2 hours a day. Instructions were issued explaining how exchange-originated programs could be tied in more closely with the local party unit needs and for current propaganda and agitation purposes. The local party units are responsible for this being carried out. 41/ Just as the Main Administration for Radio Information is controlled by Agitprop, so the local radio committees and editorial boards are supervised by appropriate local Party organizations. 42/ Instructions to these local Party units state that they "should pay close attention to broadcasting and radiofication. They should deal firmly with all shortcomings in this field and should strengthen their control over the ideological content of broadcasts." 43/ This control, however, is apparently loose or shirked, judging by the occasions it is criticized by higher Party echelons. Several reports indicate that this shortcoming is being attacked by Soviet officials by strengthening the principle of interlocking membership of Party organs and Radio Committees, by special training of trusted Party members for work in the broadcasting field, and by organizing special teams for correcting laxity in local Party units. 44/

(2) Installation, Operation, and Maintenance of Radio and Wire-diffusion Networks.

Requests for installation of wired speakers may be initiated by individuals, organizations, or state enterprises. No installation of wired speakers is allowed except through regular procedures. Individual radio receivers may be purchased openly but they must be registered and licensed immediately. 45/ In general the procedure for the acquisition and installation of Radio Centers in populated places where no center exists is as follows: a request is initiated by the local enterprise (a kolkhoz or logging trust, for example), and directed to its appropriate local administration, such as the Oblast organ of the Ministry concerned. These local administrations then take action by making application for loans under the state funds which are for this purpose, and then

distributing the credits to the enterprises, with an order to the local Ministry of Communications office, which has the responsibility for allocating the equipment and seeing that it is installed. The local Communications office has continuing responsibility for servicing and maintaining the equipment, 46/ and in many cases the equipment itself is located within the local Communications office. Under this arrangement the technical operation is carried out by the Ministry of Communications' personnel. The present drive for extensive radiofication of the country has increased the need for this type of installation, and the combination of the equipment of electrical and radio systems in the same office for combined operation and maintenance has in recent years been emphasized by the Soviet Government and the Communist Party. This permits the development of radio relay networks in rural areas without an increase in personnel or electric generating systems. According to V. Vasil'ev, Chief of the Main Administration for Radiofication of the Ministry of Communications, "The number of combined radio and communications systems is steadily increasing.... Combination found its greatest application in cases where radio relay instruments were set up in one mutual place with commutators of city telephone systems and intra-regional communications systems, as well as with telegraph equipment.... The results of such measures have been a savings of thousands of rubles. The idling time of broadcasting systems was sharply reduced.... The incorporation of the maintenance of electro-communications and radiobroadcasting systems in the Ukrainian SSR was carried out in 198 regional offices and in 128 branches. The result, according to unofficial data, was a saving of about 100,000 rubles per month." 47/ In cases where a wired network already exists, requests for additional speakers by individuals are made at the Communications Office, or to the local Radio Committee. Assessments for the use of the speakers are paid at the Communications office, the radio committee office or at the local Inkasso office, where electric and other service bills are paid. 48/

Both technical operation and maintenance of the wire-diffusion networks, and the programming operation evidently vary widely in quality. Praise and criticism of local personnel are seen frequently in Soviet literature. The principal criticisms leveled against the system are: the local offices and employees of the Ministry of Communications are lax in the installation, and negligent and uncooperative in the maintenance and operation of the equipment, 49/ the local offices and employees of the Ministry of Culture exercise poor judgment in programming content and quality, 50/

the local Party organizations show lack of vigilance in that they do not see that inefficiencies and errors are corrected, 51/ and there are frequent interruptions of power, and a widespread lack of spare parts for servicing equipment failures. 52/

In attempts to correct the shortcomings of the reception system the Soviet hierarchy is making considerable efforts to popularize radiofication, train personnel, and agitate among the Party members for maintenance of strict vigilance over the system. The aid of the Komsomol groups is being demanded, and the DOSAAF, Voluntary Society for Cooperation with the Army, Airforce, and Navy, is urged to use its influence and technical ability to aid rural localities in the achievement of radiofication. 53/ To the extent that the shortcomings are resultant from some inadequacies at higher levels, criticisms are also directed against the Ministries directly concerned, and the onus of poor planning and inefficient administration is placed at their doorsteps. 54/

e. Administration of Soviet Radiobroadcasting.

This aspect of Soviet broadcasting is operationally under the control of the International Bureau, or, as it is also called, the Administration of Foreign Broadcasting of the Main Administration of Radio Information, and the technical equipment is administered by the Ministry of Communications. 55/ During the past two years the Russians appear to have gradually eased the expansion of foreign radio operations and shifted attention to the improvement of the efficiency of broadcasts by using more powerful transmitters located, where possible, closer to the target areas. For this reason, and also because of Western efforts to penetrate the Iron Curtain by radio, there has been apparent acceleration of radio network integration between the USSR and its Satellites. Agreements for "cooperation" in the radio field were signed in 1949 and 1950 following a tour of Eastern Europe by A. A. Puzin, head of the VRK, now the Main Administration for Radio Information. The agreements apparently provide the legal basis for Soviet intervention. Little is known of the contents of these agreements aside from general provisions for exchange of information, the institution of reciprocal "music weeks," and similar measures. The known existence of landlines between Moscow and most of the Satellites, the reported presence of personnel with experience in Radio Center Moscow, and the whole apparatus of policy coordination evolved by the USSR, go far to ensure an integrated effort in the broadcasting field.

Moscow in 1946 apparently hoped to dominate international broadcasting by making the International Radio Broadcasting Organization (OIR), in which it has obtained votes for eight of its Union Republics, the recognized authority for international broadcasting. With the reorganization of the International Telecommunications Union (ITU) in 1947 the OIR was reduced to the status of a regional European radio agency. In 1949 virtually all of the Western members walked out of the OIR, restricting its competence to Eastern Europe. Yugoslavia and Syria were expelled in 1951, and Finland, the only remaining non-Communist member, has become inactive. This development enhanced rather than lessened the value of OIR to the USSR, which began to use it to integrate the orbit radio network. With the adherence of Communist China in 1951 and East Germany in 1952, the OIR became an important medium for coordinating the total Soviet radio effort. 56/

2. Postwar Transmitting Facilities.

a. Domestic Service.*

In 1947 there were 100 broadcasting stations known to be in operation in the USSR. This is equal to the prewar figure of approximately 100. By late 1947 approximately the same power output of 4000 kilowatts was reached. From this point the emphasis appeared to be on the expansion of the Soviet international broadcasting system, the improvement of technical facilities for all services, and the expansion of the Soviet radio system to include many full and part time relay transmitters in Satellite countries. At least three captured German high-frequency transmitters of up to 200 kilowatts were reportedly installed at three separate cities in the USSR.

As can be seen from Table 6** the number of transmitters in the USSR increased only slightly from 1950 to 1953. During 1950 and 1951 at least three high-frequency and several medium-frequency transmitters in the western USSR were put into operation, primarily in the international service. Other transmitters built during this period appear to be mainly supplementary stations for improved regional coverage. At the present time the total number of transmitters stands at 167 of which 110 are low- and medium-

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** Table 6 follows on p. 39.

Table 6

Expansion of the Soviet Radiobroadcasting System from Its Inception in 1922 57/

Year a/	Number of Transmitters	Low- and Medium-Frequency	High-Frequency	Total Power Output (In kilowatts)
1922	1	1	0	12
1924	2	2	0	N.A.
1925	N.A.	N.A.	0	40
1928	23	23	0	126.5
1929	41	41	0	200 b/
1930	52	52	0	395
1932	57	52	5	1503
1933	62	57	5	N.A.
1934	64	58	6	N.A.
1936	68	61	7	N.A.
1937	77	67	10	1765
1940	90	N.A.	N.A.	1898
1941	100 b/	N.A.	N.A.	4000 b/
1943	69	54	15	2000 b/
1944	80 b/	60 b/	20 b/	2200 b/
1946	85	65 b/	20 b/	3200 b/
1947	100	70	30 b/	4000 b/
1949	132	N.A.	N.A.	N.A.
1950	160	110	50	5000 b/
1953	167	110	57	5785 b/

a. All data are for 1 January, except from 1941 to 1953 when the figure applies to the second half of the year.

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[redacted] Total power output figures for period 1944-53 are probably accurate within 5 percent.

frequency stations, and 57 are high-frequency stations, with a combined power output of about 5785 kilowatts. Appendix C lists alphabetically the Soviet broadcasting stations, with notations on power and frequency. It is not possible to give a complete breakdown between foreign and domestic stations since there is evidence that some transmitters serve both purposes at different times.

The domestic radio coverage maps Nos. 2 and 3* show that the Soviet broadcasting system achieves fairly good coverage over a substantial area of the USSR through its complex of low- and medium-frequency transmitters. The hinterland and Arctic regions appear to be covered adequately by the use of powerful high-frequency transmitters, as shown on map No. 4.** Thus it is likely that in almost all parts of the USSR the listener is able to receive at least one program of the Soviet radio, depending of course on the type of receiver used. Appendix D contains a discussion of these broadcast coverage maps and outlines the general assumptions on which they were based.

In addition to the primary stations in the USSR there are reportedly in existence small rayon transmitters with a radius of 25 to 30 kilometers which broadcast such things as local government orders, warnings, discussions of work, and contests. 58/ The operation of these stations has not been confirmed by monitoring.

There are also reported to be small portable medium-frequency kolkhoz radio stations with a radius of five to eight kilometers which are supervised by the large collective farms or by the local executive committees. They serve a dual broadcast-communication function. The kolkhoz stations issue work orders to the kolkhozniki and advice on agricultural matters is given. One kolkhoz can also contact a nearby kolknoz by the use of these transmitters. It is reported that loudspeakers are set up in the fields at appropriate locations, and programs are transmitted through them at the beginning and end of work days as well as during rest periods. 59/

* See Maps 2 and 3 following p. 40.
** See Map 4 following p. 40.

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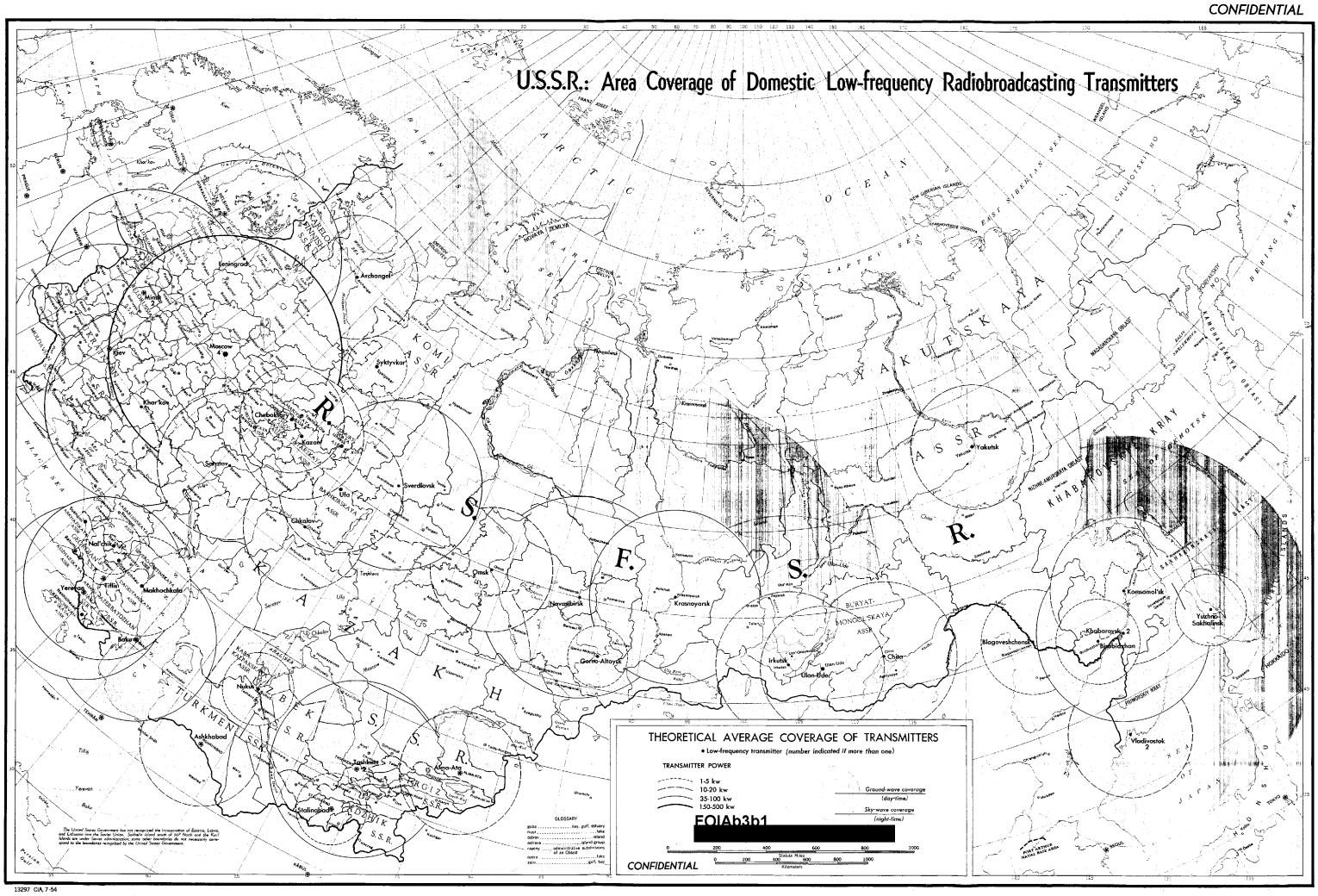

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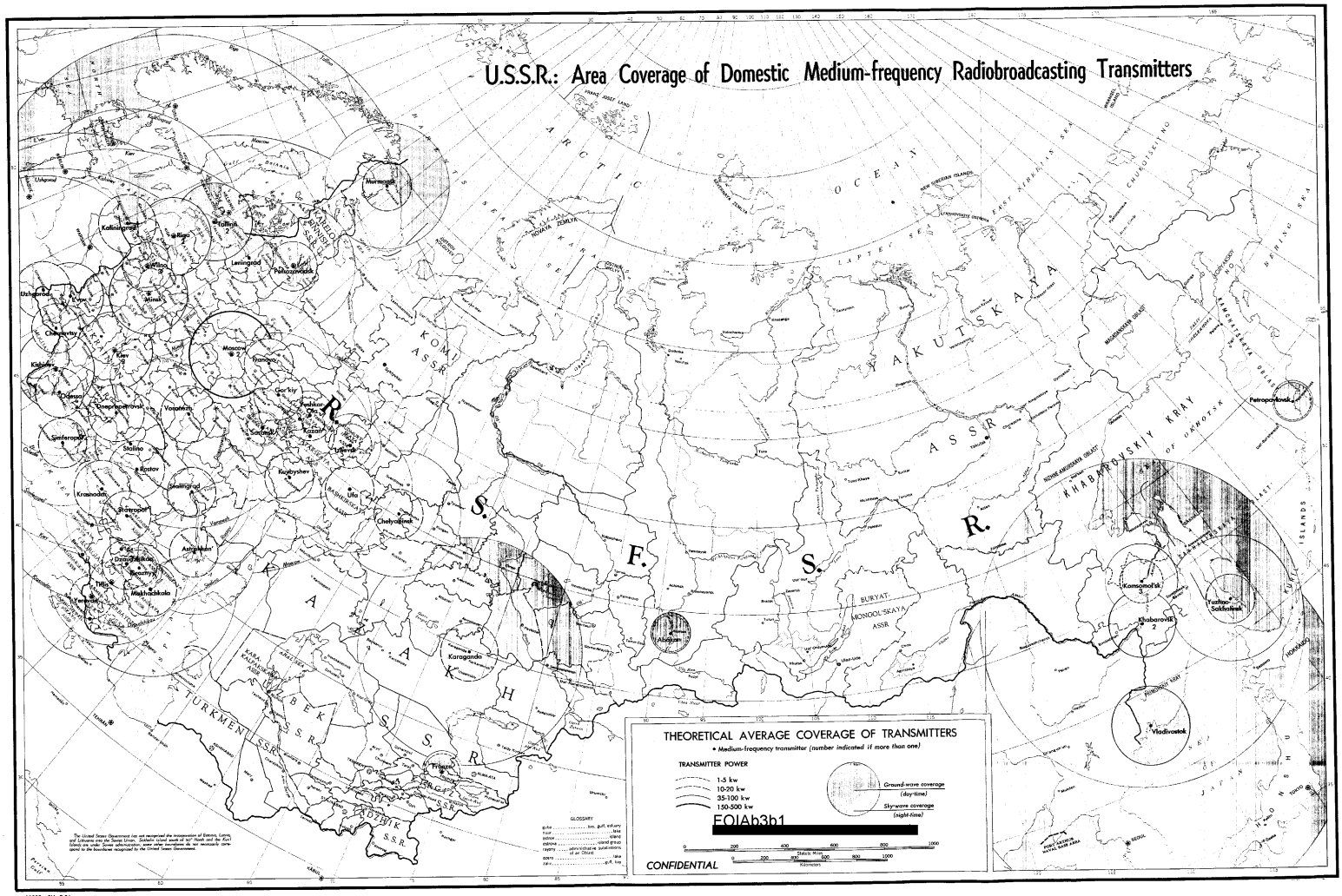

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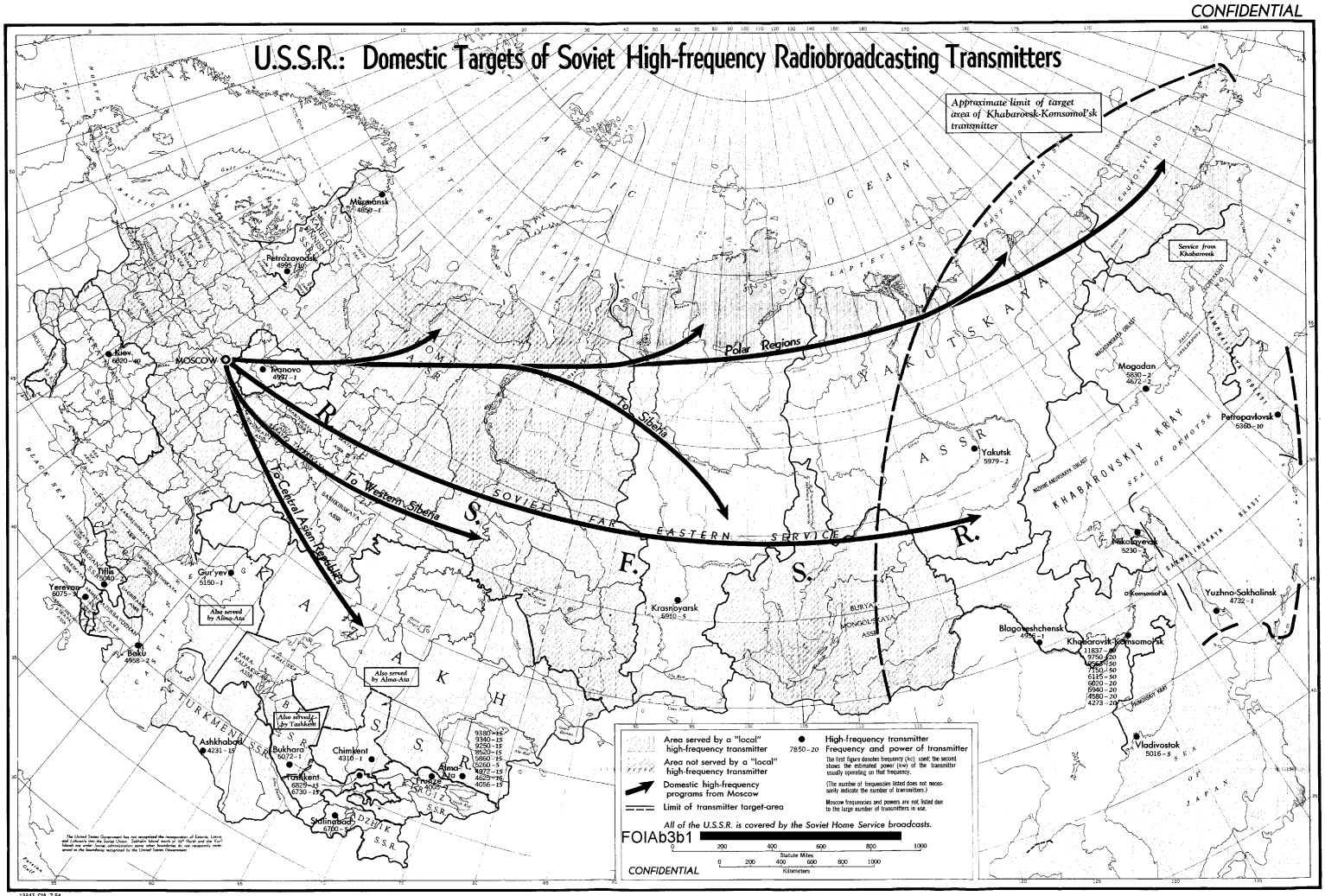

b. International Service.*

Information contained in Maps 5 and 6** and in Appendix E shows the extent of the Soviet International Broadcasting effort by transmitter location, target area, and language used.

The Soviet International Service is an extensive operation with a transmitter network stretching from Leipzig in East Germany to Petropavlovsk-in-Kamchatka in the Far East. It is controlled by the Main Administration for Radio Information of the Ministry of Culture, but operates more or less independently of the domestic broadcasting system except that it employs in many cases the same technical facilities. The Soviet International Service emanating programs from Radio Center Moscow has six distinct services, or target areas, which are the North American, Latin American, European, Near and Middle Eastern, Far Eastern, and the South and Southeast Asia Services. In addition to the above services, there are auxiliary radio centers mainly near the borders of the USSR, which are best suited for broadcasting to certain foreign areas due to geographical, cultural or linguistic factors. Such radio centers are: Vilnyus (for Lithuanians abroad), Baku (for Near and Middle East), Tashkent (for Middle East, Central and South Asia), Tallinn (for Finland), Kiev (for Ukrainians in Europe and North America), Yerevan (for Armenians in Near East), and Stalinabad (for Northeast Iran and Afghanistan).

Soviet international programs originate at Radio Center Moscow, except for the limited special transmissions emanating from the auxiliary radio centers mentioned above. At Moscow alone there are as many as 20 high-frequency transmitters employed at one time or other in the International Service (including those operating as the "clandestine" station "Espana Independiente" which purports to have a location in Spain). No Moscow low- or medium-frequency transmitters have been used in this service in recent years.

In addition to the Moscow transmitters, programs from Radio Center Moscow are relayed in part by the following network of transmitters located throughout the country:

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** See Maps 5 and 6 following p. 41.

Minsk	1 high-frequency
Kiev	1 medium-frequency, 3 high-frequency
Leningrad	1 medium-frequency, 1 high-frequency
Komsomol'sk	1 low-frequency, 3 high-frequency
Tallinn	1 medium-frequency
Riga	1 medium-frequency
Lvov	1 medium-frequency
Kishinev	1 medium-frequency
Chita	1 low-frequency
Khabarovsk	2 medium-frequency
Khabarovsk Area (locations uncertain)	3 medium-frequency
Birobidzhan	1 low- or medium-frequency
Kaunas	1 medium-frequency, 1 high-frequency
Vilnyus	1 medium-frequency
Vladivostok	1 medium-frequency, 1 high-frequency
Yerevan	1 medium-frequency, 1 high-frequency
Petropavlovsk (Kamchatka)	2 high-frequency
Baku	1 low-frequency (not used since 17 April 1954)
Ashkabad	1 high-frequency (not confirmed)

It is believed that several of the transmitters listed as being located at Moscow may be located elsewhere in the USSR, but this cannot be confirmed. In addition to the above listed relay stations, the Sverdlovsk and Novosibirsk transmitters relay small portions of the North American and Far Eastern Services as "feeder stations" for the Soviet Far East relay transmitters.

The Soviet International Service, in an effort to increase its coverage area and listening potential, began in 1950 to expand its use of Satellite relay transmitters to carry portions of its European and North American Services.

In a major step to increase effectiveness of its international broadcasts, the USSR in 1950/51 concluded technical agreements or protocols with Poland, Czechoslovakia, Hungary, Bulgaria, and Rumania, whereby the broadcasting systems of these Satellites were used to supplement Soviet facilities for international broadcasts to Western Europe and North America. As a result the reception of these Soviet transmissions, originally transmitted only by high-frequency stations at Moscow, Leningrad,

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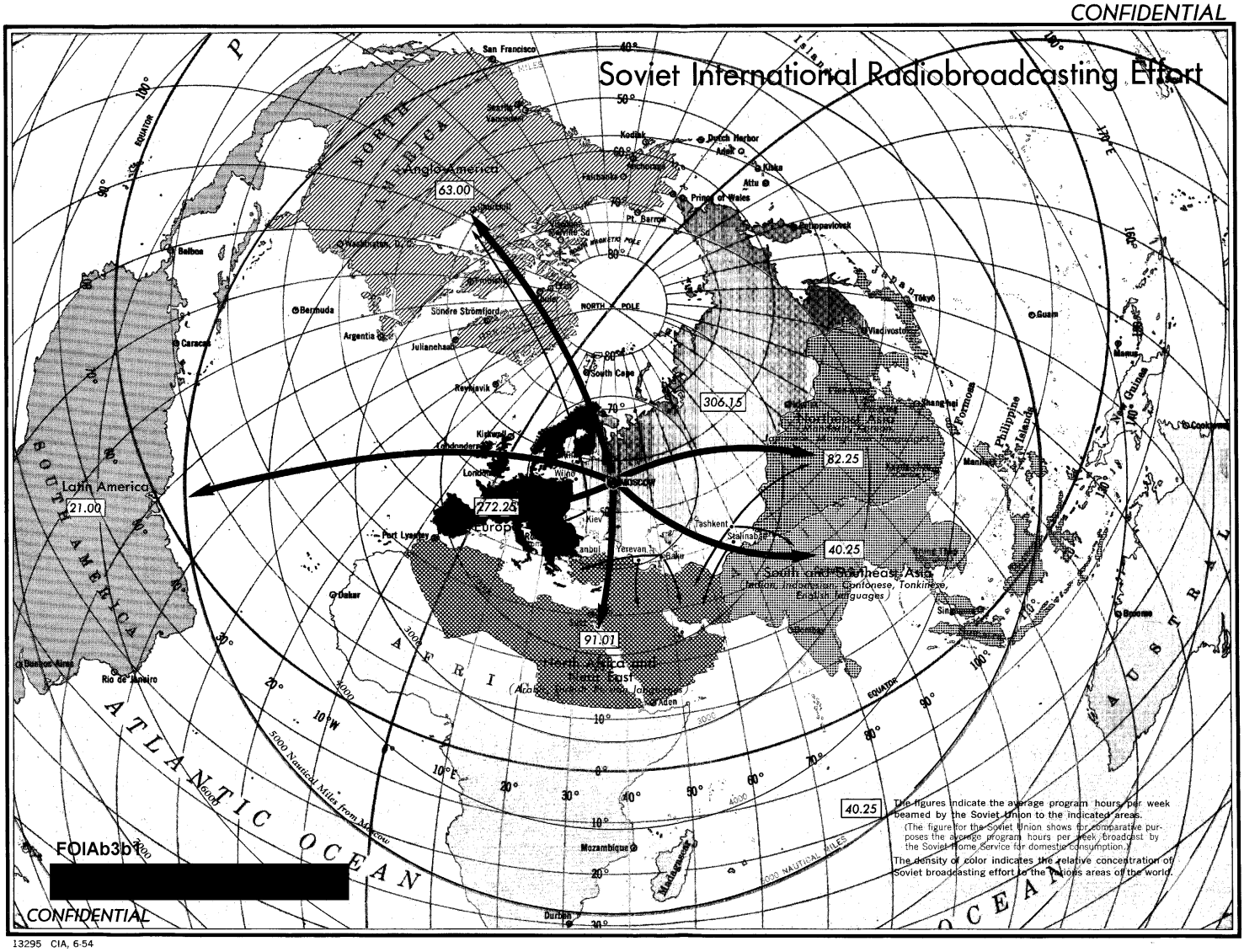

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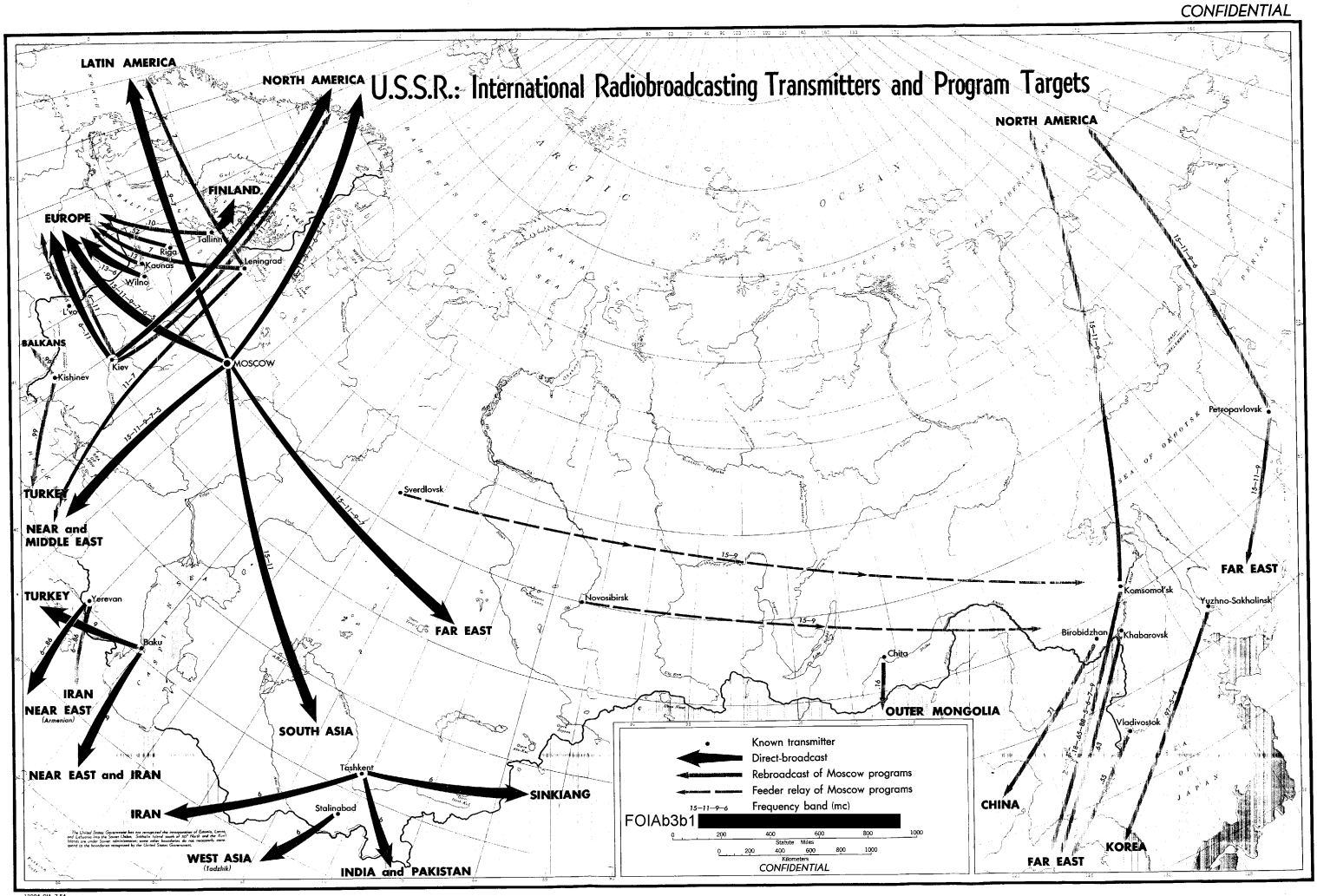

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Kiev, Komsomol'sk, and Petropavlovsk, and medium-frequency stations in the Western USSR and East Germany, improved tremendously in their respective target areas. In addition to the part time use of Satellite transmitters, it appears that from 1950 there were at least two Soviet-owned or controlled medium-frequency stations at Szombathely, Hungary, and Leipzig, East Germany, which were used almost exclusively for relaying Soviet broadcasts. In the latter part of 1949 some Satellite transmitters in the Balkan area relayed Moscow broadcasts beamed to Yugoslavia to step up the Soviet anti-Tito propaganda barrage.

Satellite transmitters, varying from 30 to 135 kilowatts power output carrying relays at the present time are:

Leipzig	1 medium-frequency
Szczcin	1 medium-frequency
Prague	1 high-frequency
Kosice	1 medium-frequency
Warsaw	1 high-frequency
Sofia	1 high-frequency, 1 medium-frequency
Timisoara	1 medium-frequency
Szombathely	1 medium-frequency
Budapest	3 high-frequency
Balatonszabadi	1 medium-frequency

In addition to the above relay transmitters, the domestic services of all Satellite countries, North Korea, and Outer Mongolia relay programs in their native languages from Moscow which are intended for internal consumption only.*

In the field of international broadcasting, statistics seem to indicate that the Soviet broadcasts would not be heard consistently in some of the target areas without the assistance of the Satellite transmitting facilities. Monitoring observations during the past four years have shown that reception of the Satellites relay stations has been more stable than that from the Moscow transmitters, particularly in the North American Programs.

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Programs originate at Moscow and are sent by wire or high-frequency radio to the various relay centers in the USSR and Satellite countries for retransmission to the primary target areas. The Moscow-Vladivostok overhead cable is used to transmit certain portions of the Far Eastern and North American Services to many of the Far East relay centers. With few exceptions the Satellites' relay centers receive the Moscow programs by wire or cable. By the use of these transmitters the reception of Soviet broadcasts to Europe and North America has improved noticeably, increasing the listening potential substantially. This is partly attributable to the proximity of these stations to the target area and also to the technical efficiency of some of these transmitters.

At the present time, Radio Center Moscow transmits programs in 35 foreign languages while the auxiliary radio centers broadcast in 9 languages, 5 of which do not appear on Moscow transmissions. These additional languages are Tadzhik, Lithuanian, Uighur, Armenian, and Ukrainian.

The International Service is emitted by as many as 61 transmitters in the USSR, located in approximately 20 different cities, and including the auxiliary international broadcasting centers. In addition, there are 13 Satellite transmitters in 9 different locations which relay portions of this service, bringing the total number of transmitters employed to 74. Exclusive of Satellite transmitters, the Soviet International Service broadcasts, as of November 1953, at the rate of 3138.75* transmitter-hours weekly, an average of 448.39* transmitter-hours daily. This amounts to an average of 18.67 transmitter-hours per hour. In addition, the total number of Satellite transmitter-hours per hour in November 1953 was approximately 340 hours weekly. The grand total, therefore, for Soviet international broadcasts was approximately 3479 transmitter-hours weekly.

The Soviet government is also known to operate a "clandestine" station, "Espana Independiente - Estacion Pirenaica" (Independent Spain - station Pyrenees), which is anti-Franco and purports to be in Spain. This station, which transmits on as many as five frequencies, has been closely linked with Radio Moscow both by DF bearings and other technical evidence. It broadcasts programs in Spanish and Catalan approximately 6 hours daily. Some

* See Appendix E.

transmissions feature talks by the famous Communist "La Pasionaria" (Dolores Ibarruri).

From 1947 to 1953, another clandestine station, "The Azerbaydzhan Democratic Party Radio," believed to be located at or near Baku, transmitted programs in Azerbaydzhani, Persian, and Kurdish on a medium-frequency of 788 kcs. This station left the air on 2 August 1953 and has not reappeared up to this time.

The USSR has consistently increased its international broadcasts from 1948 to early 1952. The weekly total of program hours decreased somewhat in the fall of 1953 due to the Soviet-Satellite supplementary radio agreements. Table 7 illustrates the comparative weekly output of international program hours from 1948 to 1953 for the Soviet Radio, BBC, Voice of America, and Radio Free Europe.

Table 7

Comparative Weekly Output of Program Hours

Hours

	August 1948	August 1949	September 1950	August 1951	December 1952	December 1953
USSR	334	434	516	670	695	611
BBC a/	664	634	636	554	561	566
VOA	186	198	210	349	302	196
RFE	---	---	---	---	---	424

a. Includes the General Overseas Service in English to listeners throughout the world, which averaged about 160 hours weekly from 1948 to 1953.

The weekly total output of the BBC, VOA, and RFE international for December 1953 was 1186 hours compared to 611 hours for the Soviet International Service. However, a great portion of the BBC and VOA transmissions are in English for areas not covered by the Soviet Radio.

The broadcast output statistics for 1951 to 1953 seem to indicate that the international broadcasting effort of the USSR has stabilized to a great extent both in programming and technical facilities. The present trend seems to be towards coordination of important stations of the Satellite countries into the Soviet international broadcasting system. Also, some of these Satellite countries, notably Poland, have greatly expanded their international services each year, thereby adding to the efficiency and output of the Soviet propaganda organs.

As far as can be ascertained, signs of Soviet-Satellite radio cooperation were first noted shortly after World War II on a minor scale. At least several Satellite or Communist-controlled countries prior to 1950 carried relays of Soviet international broadcasts. In the latter part of 1950, the international services of the Polish, Czech, and Hungarian Radios began to carry several hours each of Soviet international broadcasts directed to the Western countries. In 1951 the Bulgarian Radio also joined this group, having just completed the construction of a high-powered high-frequency transmitter for international broadcasting to Western Europe and North America. No details of radic agreements were announced by Communist Bloc countries at this time but they apparently were entered into and did provide for the inclusion of Satellite transmitters in the Soviet International Service transmitter network.

During the period 1946-50 Soviet foreign broadcasts were relayed, mainly for internal consumption, by domestic stations in North Korea, East Germany, and Outer Mongolia. It is not known, however, if formal radio agreements were actually entered into for this purpose.

In August and September of 1953, so-called "supplementary protocols" to previous radio agreements were signed between the USSR, represented by Alexei A. Puzin, Chairman of the Main Administration for Radio Information, and the heads of the radio systems in Poland, Czechoslovakia, Hungary, Bulgaria, and Rumania. The purpose of the supplementary radio protocols, according to Communist broadcasts is in general to extend cooperation between the radio administrations of the countries concerned and "to improve and enrich" Satellite broadcasts by preparing programs on life in the USSR and important international events. The Satellite radios, in turn, are to provide similar programs on happenings in their own respective countries, which are designed for internal

transmission in the Russian language in the USSR.

The main effect of these agreements has been that, although the number of Soviet broadcasts for these Satellite countries has decreased, the potential listening audience has been vastly increased due to the transmission of these programs on the domestic networks. This results in "semi-forced" listening as there are usually few other stations broadcasting in the local language on suitable channels for consistently clear reception. Before the implementation of the agreements the listening potential was probably not too great since the programs were transmitted by medium- or high-frequency radio from Moscow and other Soviet radio stations which probably did not provide consistently good reception for the average home radio set.

The Soviet-Satellite program exchanges, which began in mid-September 1953, are greatly weighted in favor of the USSR. The Soviet broadcasts for the Satellites' domestic radio services are transmitted daily, whereas Satellite-prepared programs for the USSR's domestic radio system are usually broadcast once a week or less. The Satellite programs are recorded in the Russian language and transmitted later over the facilities of the Soviet Home Service. Some of these recorded broadcasts, often entitled "International Topics," have been observed later on the Khabarovsk and Vladivostok regional transmitters for the listening audience in the Soviet Far East. It is possible that, with the appearance of these programs on two regional stations, they may eventually be broadcast on other large Soviet regional stations in order to make them available to the bulk of the Russian-speaking audience.

Observations of Moscow programs for the home services of Hungary, Czechoslovakia, and Poland indicate that they are recorded from a Soviet land line from Moscow to Budapest, Prague, and Warsaw. The Bulgarian and Rumanian Radios at the present time record the Soviet broadcast to their respective countries from a radio link in the USSR. Low- and medium-frequency stations at Minsk, Lvov, Kishinev, and Kiev have been employed during the early morning hours, East European Time, to transmit the Soviet broadcasts to Bucharest and Sofia.

In September 1953, the USSR and Outer Mongolia also signed a broadcasting cooperation agreement which provided for the systematic exchange of recorded cultural, socio-political, and enter-

tainment programs. The USSR also agreed to broadcast daily programs in Mongolian for listeners in Mongolia, although Ulan-Bator has been relaying Moscow broadcasts in Mongolian for at least five years.

Although there are no details available as to Soviet radio agreements with Albania and North Korea, direct relays of Moscow Albanian and Korean transmissions are carried by the domestic radio networks of the latter countries. In the case of East Germany there are no firm details as to radio cooperation agreements although a Soviet-controlled medium-frequency station at Leipzig has relayed most of the Moscow German-language transmissions for the past five years.

In accordance with requirements of the International Telecommunications Union, of which the USSR is a member, registration has been made of a large number of broadcasting stations in excess of those observed in operation and catalogued by the [redacted] FOIAb3b1
FOIAb3b1 [redacted]. A complete comparison has not been made, but a check of the registration in the frequency band from 3000 to 4600 kc revealed 21 notified stations, all between 3200 and 3400, which have not been observed in operation. It is not known whether this fact indicates that the stations have not been installed, or whether they operate on such a restricted basis -- low power and possibly daytime only -- [redacted] FOIAb3b1
FOIAb3b1 [redacted]

Figure 4* presents graphically the total channel hours of broadcasting daily by high-frequency for the year 1953. This information is broken down into two parts, summer and winter, which indicate the frequency shifts made necessary by seasonal radio wave propagation characteristics. This figure also shows the total of USSR high-frequency broadcasting efforts, as it combines the channel hours used in both the international and domestic services.

c. Television and Frequency Modulation.**

(1) Television Facilities.

According to Soviet doctrine their television (TV) activities date back to 1907 when B. L. Rozing was supposedly

* See Figure 4 following p. 48.
** This subsection prepared by OSI.

SECRET

USSR

DAILY CHANNEL HOURS OF HIGH-FREQUENCY RADIOBROADCASTING, 1953

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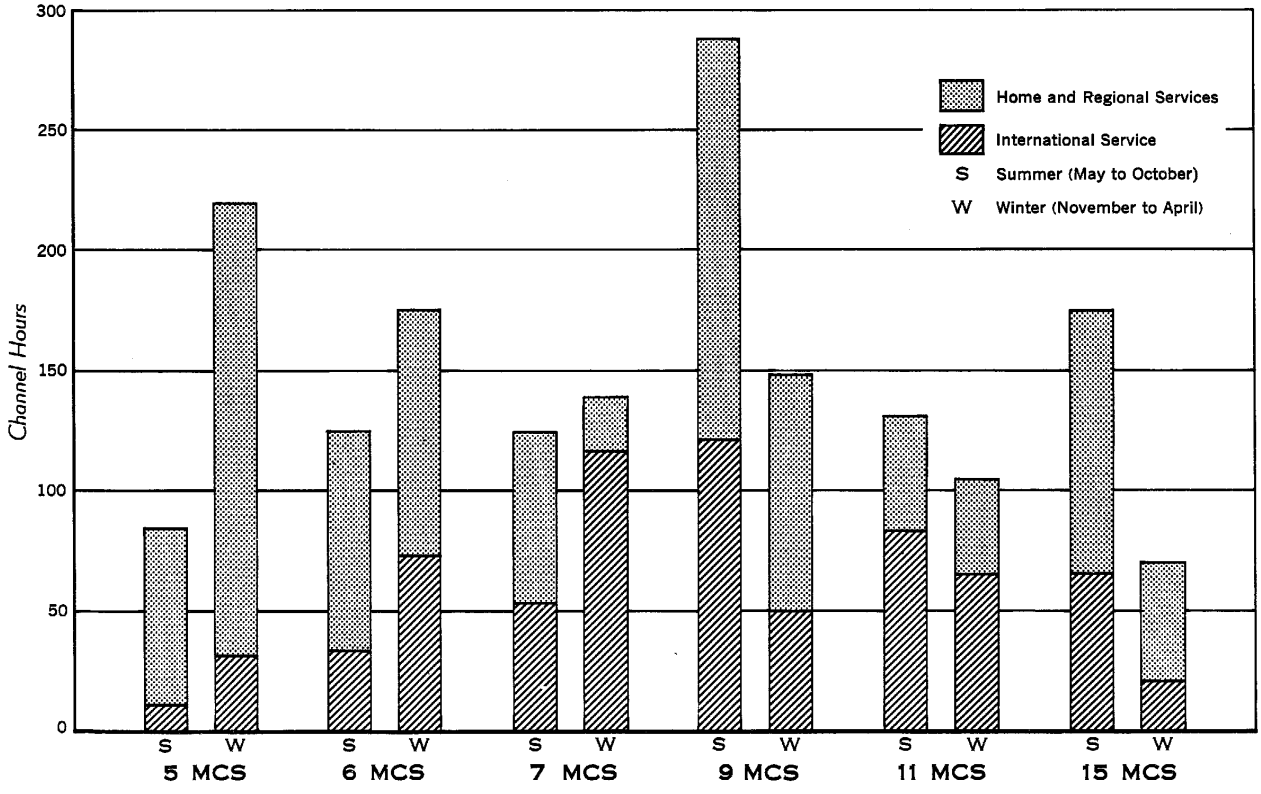

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awarded a patent for "Cathode telescopy." A 1951 broadcast of Radio Moscow's Home Service reports, "A meeting devoted to the fortieth anniversary of the world's first TV broadcast was held yesterday in Leningrad's Gorkiy House of Scientists... In May, 1911, Professor Rozing of the Petersburg Technological Institute demonstrated for the very first time the television of an object lit by an extraneous source of light." In 1907 Rozing had been granted a patent for his system of cathode telescopy which formed the beginnings of modern TV. 60/

Although there is evidence of Soviet experimenting during the early thirties, 61/ foreign equipment was obtained when actual broadcasting was undertaken. The first transmitter for the Moscow Television Center was obtained from RCA in 1936 and put into operation in 1938. 62/ This system, providing a 343-line picture, 63/ was put into experimental operation by RCA technicians and was later turned over to Soviet technicians who had been trained by RCA in the US, while the transmitter was being manufactured. Group viewing was predominant because of the scarcity of receivers.

Following interruption caused by the war, the first postwar TV transmission from Moscow was made on 7 May 1945. 64/ On November 4, 1948, it converted to the higher definition 625-line standard with the assistance of a group of German specialists. 65/ Programming six days a week began in 1951. 66/ The second transmitter to go into operation was in Leningrad, (using 441 lines at first) 67/ a German product (Telefunken). The third was in Kiev, another US transmitter (Dumont) made in 1948 and starting in operation in January 1952. 68/ The power of these video transmitters is reported as 5 to 10 kw. 69/ Additional stations are currently reported being installed at Stalingrad and Sverdlovsk. 70/

Quite recently, the Ministry of Communications has announced that transmitters are also operating in Gorkiy, Kharkov, and Tomsk. 71/ It is planned to build one in Vilnyus in 1955-56. 72/

In addition to the foregoing, low-power installations, built and operated by amateurs, have been claimed by the Soviets to be in operation in Gorkiy, Kharkov, Ryazan, Odessa, Saratov, Yaroslavl, Tomsk, Valdivostok, Sverdlovsk, Riga, and Tallinn. 73/ These are "not intended to give regular transmission of various programs." 74/ Appendix F shows these Soviet TV

stations.

An indication of the current state of Soviet capability to manufacture its own high-power TV transmitters may be inferred from the fact that the Soviets attempted in July 1952, and are believed to be still attempting in 1954, to purchase high-power (50 kw) TV transmitters and associated equipment from the British. Lvov and Sverdlovsk are reported among the cities for which these facilities are destined. 75/

The Soviets consider that the existing system of TV transmission does not permit a truly "mass" service to the population and therefore the extensive introduction of wire-diffusion TV broadcasting is necessary. 76/

As early as 1939, cable distribution was used in apartment houses. 77/ The Scientific Research Institute of the Ministry of Communications in 1953 developed a TV receiving antenna and amplifier system to serve 100 TV sets simultaneously, and installed an experimental 50-subscriber TV wire-diffusion system in a Moscow residential block. The former is presumed to permit supplying numerous regular TV receivers from a single antenna; the latter to send the picture and sound signals to simplified TV screens. 78/

Besides this wire-diffusion TV made necessary by crowded urban living, there is an active development, still in early stages, on distant transmission by cable. A wired TV center which regularly relays the transmissions of the Moscow TV center is operating in Kalinin some hundred-odd miles from Moscow, and was developed and built by the Moscow Municipal Wired Radio Network of the Ministry of Communications. The program is received from Moscow over a wide-band inter-urban cable line. Each of two amplifiers is designed to feed sixty TV screens. The picture quality is equivalent to only 250 lines, since the cable channel will pass "only 3 mc/s" and the installation is conceded to be experimental. 79/ A coaxial cable for TV between Moscow and Leningrad is reported. 80/

There is also some experimentation on low-powered mobile TV relay stations for improvement of the signal in the fringes of the service area. 81/

Returning German scientists report that some of them were employed in remodelling the television studio facilities

at the Moscow Television Center. 82/ This involved a change from the previous number of lines (343) to 625, the standard adopted by most countries. (See discussion of standards below.) On 4 November 1948, the first experimental transmission using 625 lines was made. Germans were also employed to remodel certain military TV equipment which they had developed during World War II, in order to provide cameras and relay transmitters for "remote pickup," and, as of May 1952, three of these portable equipments had been completed. In 1950, US attaches stationed in Moscow reported that the quality of "remote pickups" was poorer than that of the average station in the US. Two deficiencies are noted: equipment is usable only during the middle hours of the day when the sun is brightest and even then the rendition of various shades of gray is poor. 83/ The Soviet magazine Radio reported in 1953 that the All Union Scientific and Technical Society of Radio Engineering and Electrical Communications imeni A. S. Popov (VNORiE)* had recommended the PTS-52 mobile TV station for general use in TV centers. 84/

Standardization of the TV transmitters characteristics with receiver characteristics (number of lines per frame, number of frames per second, scanning sequence, sound-picture frequency separation, polarization of antenna) is necessary for them to work together. Unfortunately, different standards have been adopted in various parts of the world. The USSR and countries following the Soviet pattern of TV broadcasting have standards like those adopted in most of western Europe except for the frequency separation between the sound carrier and the picture carrier, so that receivers located near international borders adjusted for stations operating on one standard will not get satisfactory reception of stations across the border.

Popular interest in TV and its propaganda value, attested to by heavy advertising expenditures in the United States, have not been lost upon the Russians. There is an unconfirmed report of plans for a network of some 80 stations "which will cover large areas of the more heavily populated parts of the USSR." 85/ Theatre TV was demonstrated in December 1953 on a 12-square meter screen. Color TV was reported under development in 1947 and promised in 1952 for experimental broadcasting during 1953. 86/ Statements relative to three-dimensional TV have also been observed. However, it is probable that economic problems of

* See Appendix G for a discussion of this important body.

expansion of the black-and-white TV system, including both transmitters and receivers, will occupy the main attention of those responsible for television in the USSR for some time to come.

(2) Frequency Modulation (Ultra-High-Frequency) Broadcasting.

Soviet interest in the use of ultra-high-frequency (UHF) for communications began in the period between 1922 and 1928. Academician B. A. Vvedenskiy at this time was reported to have published the first formula for determining rules of VHF propagation over short distances for a plane surface. He also reportedly made the first experiments on the use of the UHF band for purposes of radio communication. 87/ In 1933 he experimented on wavelengths of 60 cm and was able to use them for communication to distances of 100 km. 88/

As early as 1935, the Soviets realized that the "ether" was becoming restricted even on high-frequency. At a meeting of the USSR People's Commissariat of Communications, now Ministry of Communications, the problem of the utilization of UHF was discussed and it was decided that this section of the radio spectrum could be used for short distance communications up to 10 kilometers 89/ although there was no indication of an intention to use FM at this time. (This was the year that Armstrong proposed it in the United States.)

Research on the theories of UHF communications apparently continued up to and during the World War II period. In 1946 the Section for the Scientific Solution of Problems of Electrocommunications of the Academy of Sciences, USSR, was continuing its work on these theories. 90/ Immediately following the war, coincidental with the period of emphasis on frequency modulation (FM) broadcasting in the US, a considerable number of articles on FM appeared in Soviet literature. In 1946 one article pointed out the virtues of FM in static reduction and predicted FM broadcasting in the 40-50 mc band. 91/

The Ministry of Communications, USSR, probably in late 1945 or early 1946, officially resolved to adopt FM for broadcasting and to use FM for the sound channel in television. 92/ Shortly thereafter the first application of FM to broadcasting in the USSR was made.

In June 1946 a broadcast from Moscow reported, "An experimental ultrashort-wave (UHF) radio transmitter with frequency modulation, set up by the Ministry of Communications in the Central Telegraph Building in Moscow, began functioning.' The transmitter broadcasts the central broadcasting alternative program from 5 p.m. to midnight daily, Sundays excepted, on a wave length of 6.52 meters, that is, 46.5 megacycles. 93/ As of May 1954, the Moscow FM broadcasting station was still in use of 465 mc. 94/ Its reported power in 1947 was 1000 watts. 95/

An article published in May 1948 described the tests conducted by the Leningrad Department of the Central Scientific Research Institute of Communications to determine the possibility of using UHF (45 mc) transmission for large city networks. At this time a UHF transmitter was established in Leningrad. 96/ The Leningrad station is at present broadcasting on 45.8 mc. 97/

Military communication equipment has appeared using frequency modulation (for example, the A-7-A and A-7-B one-man pack set). There has been a certain amount of amateur interest in FM transmitting evidenced by articles appearing in the Soviet radio experimenter's magazine Radio, describing equipment as well as theory. 98/ While these facts may have no direct bearing on the development of Soviet plans for FM broadcasting, they do not indicate any considerable degree of familiarity with this special technique among Soviet radio engineers and technicians.

While Moscow and Leningrad FM stations have been broadcasting for a number of years, there is to date no indication of any action to complete the system by any considerable production of receivers. The Fifth Five Year Plan had as one of its objectives the development of UHF broadcasting. 99/ At the International Telecommunications Union Conference (Stockholm 1952) assignments to the USSR provided for 81 specific radiobroadcasting stations between 57 and 68 mcs and 195 specific stations between 88 and 100 mcs. 100/ We have the recent "assurance" of the Deputy Minister of Communications, K. Y. Sergeichuk, that, along with the development of broadcasting on low-, medium-, and high-frequencies, the development of broadcasting on UHF is planned: "This will open an opportunity for improving the quality of broadcasting and will permit improvement of local broadcasting in oblasts and Union Republics, and an increase in the number of transmitted programs.' 101/

Whether this plan has enough priority with respect to all other aspects of Soviet broadcasting developments to make possible its implementation is not clear. There is the example of a number of other European countries where FM has developed since the war, or is receiving current impetus. FM has some advantages from the Soviet point of view which might serve to increase the likelihood of active official sponsorship. These are:

(a) It decreases the dependence of the audience of receivers having other frequency bands, which have long distance characteristics and which therefore can be reached by signals from outside the USSR. (Wired loudspeakers have the same effect.)

(b) To the extent that broadcasting on other bands can be decreased the intercept of the Soviet domestic programs by the West is made more difficult.

(c) To the extent that high-frequency broadcasting can be decreased, more transmitters suitable for jamming of other high-frequency uses of the spectrum will be available, and conversely their broadcasts would be correspondingly less subject to any possible jamming from outside the USSR.

However, it seems likely that the economic factor of the completion of radiofication and the further development of TV, which probably have higher priority than a new aural broadcasting system, will delay FM development for some time to come.

III. Receiving Equipment in the USSR.

Introduction.

In most countries of the western world, tunable receivers are found chiefly in private homes and private automobiles and in some public gathering places, such as restaurants. The popular concept of the radio audience is an audience of persons who listen of their own volition to programs of their own choice, usually from among several programs in competition to attract an audience.

This popular concept does not apply to radio reception in the USSR. While there are in the hands of a very small portion of the population, tunable, vacuum-tube receivers which may be used under circumstances comparable to those found in countries outside the Soviet Bloc, many independent receivers are employed for "group listening" in quasi-public places, such as club rooms, Communist Party centers, kolkhozes, sovkhoz and machine tractor station reading rooms. They are operated under some degree of supervision or surveillance. By far the major portion of the Soviet population, however, listens to radio programs through the Soviet-originated system called wire-diffusion. This is a system of transmission by wire, of programs directly from the originating studio, or by relay from a central radio receiver to loudspeakers located in private dwellings, public and semi-public gathering places, industrial enterprises, public conveyances such as ships and trains, and in streets of cities and towns. This system affords wire audience coverage with a minimum expenditure of scarce electronic equipment, especially radio tubes, of which the USSR had experienced chronic shortages, and of electric power.

The production and establishment of broadcast reception facilities both by means of independent receivers and wire-diffusion loudspeakers and the organization of radiobroadcast listening in the USSR is termed "radiofikatsiya" (radiofication).

Both independent receivers and wire-diffusion networks appear to have been employed in all areas of the USSR in radiofication. One reported exception to this condition is in Murmansk Oblast where one unconfirmed report states that there are no private radio receivers in the entire Oblast. Instead, the whole Oblast is linked with radio receiving points (radiotochki) in Murmansk and local relay centers. 102/

A. Number, Characteristics, and Distribution of Radiofication Facilities (Aural).

1. Number.

Table 8 shows the estimated number of reception facilities in the USSR for the years 1940 and 1945-60.

This table reflects a marked increase in independent receivers through the acquisition of receivers "liberated" in the Soviet occupation of East Germany, the sizeable increase in production of independent receivers since 1949, and the increased emphasis on wire-diffusion since 1951. Projections to 1960 are based on an estimated total of 30 million units in service at that time.

Table 8

Estimated Number of Radiobroadcasting Reception Facilities in the USSR 1940 and 1945-60

Year	Exchanges	Loudspeakers (Thousands)	Receivers (Thousands)	Total Units (Thousands)
1940	11,000 103/	5,840 104/	760 105/	
1945 a/*	11,676 b/	6,200 106/	N.A.	
1946	12,951 c/	6,670 107/	1,000 108/	
1947	14,402 c/	7,417 109/	1,325 d/	
1948	15,066 c/	7,759 e/	1,619 f/	
1949	15,728 c/	8,100 110/	2,081 f/	
1950	16,699 c/	8,600 g/	2,794 f/	
1951	17,669 c/	9,100 111/	3,591 f/	
1952	20,360 h/	10,180 i/	4,430 f/	
1953	22,760 h/	11,380 j/	5,521 f/	
1954	27,560-30,882 h/	13,780-15,441 k/	6,220-4,559 l/	20,000 116/
1955	29,631-33,232 h/	14,816-16,617 e/	6,850-5,049 e/	21,666
1956	31,704-35,586 h/	15,852-17,793 e/	7,480-5,539 e/	23,332
1957	33,776-37,938 h/	16,888-18,969 e/	8,110-6,029 e/	24,998
1958	35,848-40,290 h/	17,924-20,145 e/	8,740-6,519 e/	26,664

* Footnotes for Table 8 follow on p. 57.

Table 8

Estimated Number of Radiobroadcasting Reception Facilities in the USSR
1940 and 1945-60
(Continued)

Year	Exchanges	Loudspeakers (Thousands)	Receivers (Thousands)	Total Units (Thousands)
1959	37,920-42,640 h/	18,960-21,321 e/	9,370-7,009 e/	28,330
1960	40,000-45,000 h/	20,000-22,500 h/	10,000-7,500 m/	30,000 117/

a. At the beginning of the Fourth Five Year Plan.
b. Estimated increase, based on proportion of centers to loudspeakers in 1940.
c. Estimated, based on an average of 515 loudspeakers per center.
d. Estimated. Based on estimate of production (I/EE) and allowing for increase in total receivers because of confiscations in those areas occupied by Soviet military forces in middle Europe (for example, Germany and Hungary) of receivers which were brought back to the USSR.
e. Interpolated.
f. Estimated, in proportion to the estimated production of receivers for the preceding year.
g. Estimated, on basis of 60 percent fulfillment of the Fourth Five Year Plan (1946-50) for installation of loudspeakers.
h. Estimated, on basis of 500 loudspeakers per center.
i. Extrapolated, based on estimated increase of 900,000 during first 10 months of 1952. 112/
j. Estimated, on basis of Soviet statements of installation of 1 million loudspeakers in rural areas 113/ and on the assumption that rural installations represented 5/6 of total installations.
k. Extrapolated. The lower figure is based on announced Soviet plan 114/ to install 2 million loudspeakers in rural areas during 1954 and on the assumption that rural installations will represent 5/6 of total installations. The upper figure is based on Soviet statement that on 7 May 1954, 13,841,000 loudspeaker radio points had been installed, extrapolated to the end of the year at a rate of installation of 200,000 units monthly.

Table 8

Estimated Number of Radiobroadcasting Reception Facilities in the USSR
1940, 1945, and 1946-60
(continued)

1. Figure obtained by substraction of number of loudspeakers from announced plan total of 20 million reception facilities 115/ at the end of 1954.
m. Estimate of 30 million units at the end of the year 1960 is based on reference 118/. Loudspeakers are estimated at from 2 to 3 times the number of independent receivers. The ranges shown indicate the upper and lower limits for estimated number of loudspeakers and receivers to be in service. Any estimate within the range for one must be matched with an estimate for the other which will result in the total shown in Column 4.

Radiofication of the USSR was begun by the joint use of independent receivers and wire-diffusion nets in 1924-25. The Soviet claim to the origination of the wire-diffusion system is probably valid; at least in no other country was it so widely utilized. These wire-diffusion nets served to bridge the gap of a lack of broadcast receiving sets, which Soviet industry was not prepared to fill by production of individual receivers. The first installations were made by radio amateurs, under the direction of the labor unions. The first central radio (relay) station feeding 6 lines was constructed in the House of Soviets (Moscow) with loudspeakers set up in three Moscow factories. 119/

In 1929 there are reported to have been 630 relay exchanges serving approximately 102,000 loudspeakers, and 370,000 independent receivers. The ease with which propaganda could be expanded and extended through the media of radiofication apparently became obvious to the authorities, and greater impetus was given to this activity. In 1929, the installation of wire-diffusion systems became a joint responsibility of the People's Commissariat for Communications (NKS) and the Central Union of Consumer's Societies (Tsentro-Soyuz'), and by the end of 1930 the radiobroadcast reception base had grown to 2,280 relay centers serving 658,600 loudspeakers, and 412,000 independent receivers. The NKS carried the basic task with large installations averaging about 400 loudspeakers per center. The role of the Tsentro-Soyuz' was to serve the needs

of a specific enterprise, mainly at the local level. 120/

At the outbreak of the war with Germany in 1941, the number of wire-diffusion relay centers is estimated to have been 11,000, serving 5.8 million loudspeakers; the number of independent receivers in service is estimated to have been 870,000. 121/ All independent receivers in the hands of the public were confiscated, but wire-diffusion nets played an important role in civil defense. Some measure of its importance is indicated by the report that in the enemy-occupied area, the Germans systematically destroyed every kind of wireless equipment, including 1200 wired relay centers. Upon the retreat of the German army, a special service was set up by the Soviet Government to follow closely behind the army and restore the wire-diffusion net to operation with dispatch; the relay service was said to have been put in order "immediately" after the departure of the Germans. 122/

At the end of 1945, there are estimated to have been 1 million independent receivers, 11,766 relay exchanges, and 6.2 million loudspeakers installed in the USSR. The Fourth Five Year Plan (1946-50) called for an increase of 75 percent in the radiofication network, and, specifically, for the annual production of 925,000 receivers and a total of 4 million loudspeakers to be installed. 123/

Notwithstanding the increased production of independent receivers, the wire-diffusion system was intended to remain as the core of the reception base of the USSR. In 1947, wire-diffusion relays are reported to have served approximately 90 percent of the listening installations and it was the announced plan of the Soviet government in 1950, that such relays would serve 75 percent of all receiver installations. 124/

These statements appear to be somewhat in conflict, or at least to afford some basis for conjecture. If the concrete figures for loudspeaker installation are accepted as factual, 10.2 million loudspeakers were planned to be installed throughout the USSR at the close of the Five Year Plan. If this total represents 3/4 of radiofication facilities in terms of physical units of equipment, then, by simple arithmetic, it appears that 3.4 million independent receivers were planned by the end of the Five Year Plan. If the annual production of radio receivers was planned at 925,000 and if it is assumed that the majority of these were broadcasting receivers

destined for distribution within the USSR, total Plan production would have been 4.625 million to be added to the 1 million believed to have been in service at the end of 1945, for a total of 5.625 million. This total, less retirements, would have placed approximately 5 million or more in service, approximately 1/2 the planned total number of loudspeakers. It would appear, therefore, that the annual production of 925,000 radio receivers included either broadcast receivers intended for home use and for export, or receivers for all types of radio service including broadcasting, or both. Small quantities of USSR broadcast receivers have been reported to be for sale in several of the Satellite countries of the Soviet Bloc. 125/

Conflicting Soviet press and radio claims of fulfillment, overfulfillment, and underfulfillment present a confusing picture concerning postwar radiofication in relation to both the Fourth and Fifth Five Year Plans.

The statement of the Chief, Main Administration of Radiofication, Ministry of Communications in September 1950 -- near the close of the Fourth Five Year Plan -- that the reception network had been doubled as compared with 1945 and increased 75 percent as compared with the prewar level, if considered in terms of units of reception facilities, would suggest that the Plan had been substantially fulfilled. Other statements in various USSR radio technical journals, however, do not support this. These include such statistics as in 1946, the number of wired radio speakers grew 10.7 percent (approximately 620,000 units); during 1947, the number of wired radio speakers grew by 700,000 units; that 1 million loudspeakers were to be added to the networks each year during the years 1949 and 1950; and that from 1950 to 1951, the plan for wired speakers was fulfilled by only 50 percent. 126/

If these figures may be considered reliable, approximately 1.82 million loudspeakers were installed during the years 1946, 1947, and 1950. It appears doubtful that the remaining 2.18 million of the 4 million called for in the Plans were installed during 1948 and 1949, for this would have required an annual installation of 1.09 million loudspeakers -- more than twice the number reported to have been installed in the two next succeeding years, 1950 and 1951.

Further doubt that the Fourth Five Year Plan was fulfilled on schedule is cast by the announcement in a Soviet trade journal for November 1952, that over 10 million wired speakers had been installed. 127/ If this statement is correct, it may be assumed that the goal of 10.2 million, set for the Fourth Five Year Plan, was not actually reached until late 1952.

There is no indication that the Russians specifically claim fulfillment of the radiofication plan of the Fourth Five Year Plan. Probably around 60 percent fulfillment (in terms of reception units) was attained.

During this Plan period, the groundwork for further and more rapid expansion of rural radiofication appears to have been laid. At the February 1947 Plenum of the Central Committee of the Great Communist Party (Bolshevik), the importance of rural radiofication was stressed as an instrument of education for fulfillment of the Stalin plan "of struggling for plentiful supplies for the populations and ores for industry." 128/

This action by the 1947 Plenum of the Central Committee of the Party was followed in 1949 by the issuance of a decree "On Measures for the Improvement of Radiofication in the USSR" (copy not available), which is said to have defined "concrete measures for completing radiofication in the next few years." The Chief of the Main Administration of Radiofication, V. Vasil'yev, in an article in the Soviet technical journal Radio of September 1950, pointed up the particular importance of this decree, "now that Communist education of the laboring masses has become our primary goal." 129/

During 1950, USSR technical publications for radio contained many articles on ways and means of developing rural radiofication, including the use of small 2- and 3-tube battery-powered receivers, crystal receivers, self-contained power supplies and existing telephone lines in non-electrical areas; for the technical improvement of receivers, relay centers, and loudspeakers and for the use of underground cable in wire-diffusion nets; for increase in production and improvement in distribution of equipment; for the establishment of local repair shops; the publication of simplified texts for radiofication instruction and the production of a motion picture for visual instruction in the training of the necessary technical personnel. 130/

Also, during 1950, DOSARM (Volunteer Society for Cooperation with the Army, which later became DOSAAF, Volunteer Society for Cooperation with the Army, Navy, and Air Force) amateur radio clubs were called upon to play a leading role in rural radiofication, both in the training of personnel and in the installation of equipment. A Socialist competition was set up among the clubs with six prizes in the form of radio apparatus in values from 25,000 rubles down to 2,000 rubles. During 1950, DOSARM amateurs are reported to have built and installed about 65,000 receivers, 472 wired radio centers, and 30,000 loudspeakers, and to have repaired 10,000 receivers, 163 wired radio centers, and 6,500 centers.* 131/

Early publicity on the Fifth Five Year Plan (1951-55) did not give exact figures for the extension of radiofication. An article by Deputy Minister of Communications, Topuriya, in Radio No. 1, January 1950, entitled "Progress in Radiofication of the USSR" summarizes the extensive administrative and technical steps to be taken to develop radiofication on the scale envisaged by governmental decree, and closes with the statement that "by full cooperation of all concerned, our country should approach (underscoring supplied) the final state of radiofication." 132/

In 1952, further writings in the Soviet press state that radiofication must be completed "within the next few years" and that by 1955 the number of wired radio speakers in the USSR in 1949 must be tripled. 133/ Some indication of the extent of the plan is given by the following statement of an official of the Kamchatka Oblast Radio Rebroadcasting Network Administration on Radio Day (May 7), 1952:

> "Our Party and Government adopted the decision to increase the network of radio facilities threefold during the 5-year period 1949-54, In practice this will represent completion of the total radiofication of the Soviet Union." 134/

A. Puzin, Chief of the Main Administration of Radio Information, Soviet Ministry of Culture, in a statement in Izvestiya on 7 May (Radio Day) 1953 claimed that the radio network was almost double the prewar year of 1940, which in terms of total units would be nearly 13.3 million units (1.52 million independent receivers

* The type of "centers" is not understood.

and 11.78 million loudspeakers, if proportionate) and that by the end of 1955, there would be more than 30 million radio receiving installations in the USSR. To more than double the total reception facilities in the USSR in a period of 2½ years appears as unrealistic as the radiofication plan of the First Five Year Plan (1929-33), which called for a total of 14 million receiving units, including 9.5 million wired loudspeakers, 2.5 million vacuum-tube receivers and 2 million crystal receivers -- a goal which probably was not attained until after the end of the Fourth Five Year Plan, (1946-50). Furthermore, statements of officials of the Ministry of Communications on this same date in Izvestiya and Pravda and also in radiobroadcasts are critical of the slow rate of progress of radiofication, placing blame on lack of production of equipment, chiefly loudspeakers, and on the local construction and installation directorates, which were charged with working poorly. Of 76 construction and installation directorates, only 29 were said to have fulfilled the plan for the first half of 1953. As a result of this, the plan for construction and installation work in radiofication was fulfilled by only 83.6 percent. 135/

In startling contrast, therefore, is the Radio Day, 1954 statement of the USSR Minister of Communications, Psurtsev, that:

> "...the number of radio receiving points /loudspeakers/ has increased from 5,800,000 /in 1940/ to 13,841,000. Furthermore, our radio listeners have millions of independent (efirniye) sets. The main attention is devoted to the radiofication of the countryside...however...the level of radiofication of the collective farm villages is still definitely unsatisfactory. At present, only 18 percent of collective farm homes are radiofied....The plan for this year envisages a large volume of work in the field of rural radiofication. About 2 million radio points must be set up in the countryside -- that is, double the number of 1953." 136/

On the same day, the USSR Minister of Culture, Alexandrov, in a speech honoring Radio Day, stated:

> "The Soviet Government is exerting every effort in improving radio service to the

> population. By the end of the year, there will be over 20 million radio receivers and relay points in our country." 137/

The USSR Deputy Minister of Communications, K. Y. Sergeichuk, interviewed by Tass on 6 May 1954 is reported to have made a statement which is quoted in part:

> "In our country broadcasting has been widely developed. The main task of communication bodies, as given by the Party and the Government, are the intensification of radio relay service by every means, particularly in villages. The scale of this work can be judged by the figures of last year, when in rural localities over 2,400 collective farm radio centers were built and over one million radio receiving points were installed. This year this work will be increased more than twofold.
>
> . . . . . .
>
> "Despite the existing achievements in the development of radiofication, there are many shortcomings particularly in the towns. First of all, one should point out that radiofication of rural communities is slow. Industries must supply more necessary materials and equipment in order that in the next five to six years /underscoring supplied/ one can carry out an extensive radiofication of the country. It is necessary to draw the attention of local Party and Soviet organizations to the solution of this task." 138/

The completion of radiofication, which the Soviets claim would encompass a reception base of about 30 million reception units, by the close of 1955 would entail an increase in total facilities by 50 percent during a single year. In consideration of past performance, this goal appears impractical in terms of installation of facilities -- especially in rural areas, where the tempo of wire-diffusion installation is necessarily somewhat slower than in urban areas. The attainment of a goal of 30 million reception units by 1960 appears the more logical.

The estimate of 20 million reception facility units at the close of 1954 will provide, for an estimated total population of 217.6 million, approximately 1 unit for each 11 persons. Thirty million reception units at the end of 1960, for an estimated total population of 234.7 million, would provide one reception unit for each 8 persons.

When compared with recent estimates for other countries of the Soviet Bloc 139/ a density of 1 unit for each 8 persons would raise the coverage to a level comparable with that of Hungary at the present time. For other Soviet Bloc countries, the density of broadcast reception facilities is estimated as follows: East Germany, 1 unit to 6 persons; Czechoslovakia, 1 unit to 5 persons; Poland, 1 unit to 11 persons; Bulgaria, 1 unit to 20 persons; Rumania, 1 unit to 37 persons; and Albania, 1 unit to 63 persons.

To increase the ratio of receivers in the USSR to 1 unit for each 7 persons by 1960 would require a total of 33.5 million reception units; to 1 unit for each 6 persons would require approximately 39.1 million reception units; to 1 unit for each 5 persons (comparable to Czechoslovakia), nearly 47 million units. No goal figure of a total of more than 30 million units has been disclosed in available Soviet press and radio materials.

The number of receivers in the USSR for reception of very-high-frequency (FM) broadcasts is not known. It is presumed, however, to be very small.

2. Characteristics.

a. Independent Radiobroadcasting Receivers.

Receivers presently in operation in the USSR consist of many varieties and types ranging from elaborate superheterodyne, multi-frequency, 11- to 14-tube, radio-phonograph combination console models with a high reception sensitivity to simple crystal receivers capable of reception of a limited number of frequencies, usually from nearby transmitting stations. A CIA Scientific Research Aid, "Study of USSR Broadcast Receivers," 140/ covers in great detail the characteristics of these receivers. In general, it is applicable currently. In consideration of the extensive coverage of this Research Aid, it is deemed sufficient to discuss the characteristics of Soviet broadcast receivers in general terms only.

Under the "State All-Union Standard (GOST) No. 5651-51, Vacuum-Tube Radio Receivers; Classification; General Parameters," all types of tube receivers are divided into four classes from the standpoint of their electrical and acoustic characteristics.

The general characteristics of Soviet manufactured tube type broadcast receivers are given in Table 9.* This table is designed to aid the individual in determining the class designation of receivers.

(1) Superheterodyne Receivers.

From an examination of receivers made in the USSR, the large mass of tube-receivers fall into the class of superheterodyne receivers referred to as "supers" in the USSR.

The classification for the superheterodyne receivers are by class numbers one through four as follows:

Class one receivers usually have seven or more tubes with low-, medium-, and high-frequency bands. The frequency bands are 150-420 kc.; 520-1500 kc.; and 6, 7, 9, 11, 15 and 17 Mc. Electric power for these receivers are always line supplied, whereas all other classes may be either battery or line supplied.

Class two receivers generally have six or seven tubes with low-, and medium-frequency bands, 150-415 kc., and 520-1500 kc. They also have high-frequency reception capability from 3.95-12.1 Mc. and sometimes up to 15 Mc.

Class three receivers generally have four to five tubes with low-, and medium-frequency bands, 150-415 kc., and 520-1600 kc. This type of receiver may also have high-frequency reception capability from 3.95-12.1 Mc. The most popular class three receiver, the Rekord, has a high-frequency band 4.28-12.3 Mc.

Class four receivers represent a category that is in a considerable state of flux. These receivers are designed for selection of frequencies between 150-1600 kc. This class receiver may be of the fixed tuned type, but very few of the production models are of this type.

* Table 9 follows on p. 67.

Table 9

Characteristics of Vacuum Tube Receivers Manufactured in the USSR 141/

Type Receiver	Number of Tubes	Super	TRF	KC 150-415	KC 520-1600	MC 3.95-12.1	Other HF Bands a/
Class 1	7 or more	X		X	X	X	All
Class 2	6-7	X		X	X	X	One optional
Class 3	4-5	X	Optional	X	X	Optional	No
Class 4	3-4	X	Optional	X	X	No	No

a. Other high frequency bands allocated for the broadcasting service include frequencies of the order of 15, 17 and 21 Mc.

(2) Tuned Radio-Frequency Receivers (TRF).

Little is known about TRF receivers other than that class three and four receivers may be either TRF or superheterodyne.

(3) Fixed Tuned Receivers.

There is some information that a few fixed tuned receivers have been made in the USSR; the type has been discussed under the type receivers, either super or TRF. Very few of these receivers are made in USSR, and there is practically no data to support the view that they are in use there.

(4) Crystal Receivers.

The most common crystal receivers incorporate the use of lead sulphide, germanium, graphite, or carborundum crystals. Type and characteristics of crystals are covered elsewhere in intelligence literature. These sets are usually capable of receiving the low- and medium-frequency broadcast bands. 142/

b. Wire-Diffusion. 143/

(1) General Account of Development of Wire-Diffusion.

(a) In Large Cities.

The wire broadcasting movement began in the USSR in 1925, when the first wired radio center was constructed in Moscow by the labor unions under the direction of A. V. Vinogradov. In the following year, wire broadcasting spread to Leningrad and other large cities of the Soviet Union. The first systems were centralized, i.e., only one amplifying station was used, and many did not even have special distribution networks. In the latter systems, the subscriber's telephone line was used, and programs could be heard only when the lines were free from telephone conversations.

With the continuing increase in the operating radius of the stations and number of subscribers, it became impossible to supply the network from one point because of the high attenuation and distortion associated with long lines. This forced decentralization of the amplifying equipment and a reduction of the

load and operating radius of each amplifier. Thus, amplifying substations came into use. Also, separate telephone wires were used to feed the substations and special distribution networks were constructed to connect the subscribers' loudspeakers to the amplifying substation. Such simple decentralized systems are suitable for serving small areas with few subscribers, but they have obvious deficiencies from the standpoint of serving larger areas with more subscribers.

(b) Spread into Suburban Areas.

With the introduction of the "two-stage" wire broadcasting system in the mid 1930's, it became possible to extend wire broadcasting to suburban areas. In this system, distribution feeder lines are used in addition to the subscriber lines. These high-voltage (120v-240v) distribution feeders supply the subscribers' networks through step-down transformers. A variation of this system was frequently used in cities with many large apartment houses. Here, feeder lines with taps were used, and the subscriber lines were replaced by the apartment house distribution circuit. This system required the installation of step-down transformers in each apartment house. The transformer was connected either to the feeder itself or to the feeder tap.

One more basic improvement came about with the introduction of the "three-stage" system, which was put into experimental operation in 1939. This system was developed to reduce the number of amplifying substations to a minimum by replacing them with transformer substations wherever possible. This was desirable because it was difficult to ensure continuous operation of the amplifying substations with their decentralized supply system. In the three-stage system, each amplifying substation must supply not only a two-stage distribution system, but must also transmit the audio-frequency power to distant transformer substations, each of which feeds a similar two-stage distribution network. The amplifying substations are connected to the transformer stations by special trunk-line feeders (480 or 960 v). Reserve trunk-line feeders are used to ensure continuous operation of the amplifying or transformer substation in case the main trunk-line feeder or amplifying substation supplying it should break down.

The cabling setup in three-stage systems is quite complex. In most cases, the programs are fed from the

radiobroadcast station by cable to the central wire broadcasting station. The latter often contains equipment necessary for remote control of all the amplifying and transformer substations. The central wire broadcasting station feeds the program to all the amplifying substations of the system through suspension lines or unused cable pairs taken from the city telephone network. This transmission is maintained at a low level so as not to interfere with the telephone system. The amplifying substations feed the transformer substations through high-voltage (suspension or cable) trunk-line feeders. If these are of the suspension type, they are strung along pipes erected on the roofs of buildings. The distribution feeders of both amplifying substations and transformer substations are ordinarily suspension lines.

All of the systems described above, whether simple centralized, decentralized, two stage, or three stage, include a "zvukofikatsiya" (installation of loudspeakers in streets, squares, etc.) system, the lines of which feed powerful loudspeakers which are installed in streets, squares, parks, and other open spaces. Special programs, and also local air defense signals (in wartime), are transmitted on these lines.

The choice of a two- or three-stage wire broadcasting system depends on the size of the city and the number of subscribers. Two-stage networks, supplied from one or two amplifying substations, are used in most rayon centers and cities with populations of up to 50,000, with 8,000 to 10,000 subscribers. Either two-stage or three-stage systems may be used in cities having populations of 50,000-250,000. In either case, several amplifying substations are generally used. Three-stage systems with trunk-line feeders are generally employed in cities with over 250,000 residents. Such systems may include from 2 to 20 amplifying substations and up to 70-80 transformer substations. The three-stage system ordinarily has each transformer substation supplied from two amplifying substations, and the transformer substation switches automatically from one to the other when necessary.

(c) In Rural Areas.

Wire broadcasting is accomplished in rural areas by three basic methods, that is, by a feeder network supplied from wire broadcasting amplifying substations in large cities, by interkolkhoz wired radio centers, or by small kolkhoz wired radio

centers. If the first method is employed, one or several local feeder lines similar to the city distribution feeder, are constructed. Each supplies the subscriber lines of several populated points (occasionally several dozen) and may be quite long. A step-up feeder transformer is installed at the input of each feeder line and the subscribers' lines are connected to the feeder through step-down transformers located at the subscriber's home.

Although the first-named method is the predominate one in the introduction of wire broadcasting into rural areas, economic factors are taken into account before a certain rural area is radiofied from the feeder network. For example, in regions of Moscow Oblast which are within a radius of 12-13 km from a rayon center, the kolkhozes are radiofied from the network of the Ministry of Communications. But if a kolkhoz having only 20-30 homes is located more than 3 km from the feeder line, it is radiofied by receivers.

A typical example of the use of inter-kolkhoz wired radio centers is found in the Znamya Revolyutsii Kolkhoz, Lgov Rayon, Kursk Oblast, where a wired radio center with a 500-w amplifier drives approximately 300 speakers in each of the seven kolkhozes it serves.

The third method of bringing wire broadcasting to rural areas, and one that has proved increasingly popular, is the installation in kolkhozes of small economical centers with powers up to 5 w, which supply 30-50 speakers. This method is considerably cheaper from the equipment and power supply standpoint than that of using individual receivers, and it eliminates the need for constructing long feeder lines from a central amplifying substation.

(2) Equipment Used in Wire-Diffusion Systems.

(a) Equipment Used in City Systems.

The equipment of a large city wire broadcasting system includes the central wire broadcasting station, the amplifying substations, the transformer substations, and the distribution network, including trunk-line feeders, distribution feeders, and subscribers' lines.

The central wire broadcasting station

includes all the equipment required for transmitting the audio power to the amplifying substations and for controlling all elements of the system. The entire Moscow Wire Broadcasting System is remotely controlled from the central station, which is operated by three technicians per shift. The power of the amplifiers in the central wire broadcasting station is determined basically by the number of amplifying substations which it supplies.

The amplifying substations in large cities are usually installed in special buildings. They are supplied from their own internal step-down transformer unit. The equipment includes the amplifiers and the switching and control equipment. The power of the amplifying substation is calculated on the basis of 0.5 w per subscriber loudspeaker. Thus, with the continuing increase in the number of subscribers served and the introduction of two- and three-stage systems, the power of amplifying substations had increased correspondingly. The first amplifying substations had power of 2 or 3 watts. Then units for 30 watts and 200 watts were constructed, and later the power of units increased to 500; 1,300; 3,000; and 6,000 watts. A 36-kilowatt station was equipped in Moscow in 1944-45, a 50-kw wire broadcasting station was put into operation in Kiev in 1946, and a 30-kw station was constructed in Khar'kov in 1947. In addition, powerful wire broadcasting stations have been constructed in Rostov-on-Don, Tbilisi, and many other cities. In 1949, 60-kw substations were put into operation in Moscow; each such substation can supply audio energy to 100,000 subscriber loudspeakers.

The transformer substations have two step-down transformers rated at 5-10 kw (one at the end of each high-voltage trunk-line feeder, that is, main and reserve feeders) and units for switching, signaling, and protection. The protective elements of the transformer substation operate together with those of the amplifying substation and disconnect the high-voltage from the trunk-line feeders if the conductors break or short circuit, or if the quality of the insulation deteriorates sharply.

The subscriber's loudspeaker unit commonly includes the loudspeaker itself, a transformer, a volume control, and a limiter /current-limiting resistor/ or fuse. The loudspeaker most commonly used is the Rekord. Piezoelectric loudspeakers were used for a time during the war, but it was found that they were not sufficiently durable. In city wire broadcasting networks, limiters

are often connected in both sides of the line. For radiofication of streets and squares the R-10 loudspeaker is most frequently used.

(b) Equipment Used in Rural Systems.

In areas which cannot be radiofied from networks of the Ministry of Communications (that is, by the use of rural feeder lines), wire broadcasting is accomplished by the use of kolkhoz or interkolkhoz wired radio centers having powers ranging from 2 to 1,000 w. The wire broadcasting equipment described is not classified as kolkhoz or interkolkhoz center equipment, because most of it is suitable for use as either. All of these units can be used to transmit either from the local studio (by microphones or phonograph), from the receiver, or from the feeder line, if there is one in that particular location.

Some of the equipment used in rural wire broadcasting systems is described below. This list is not complete, but it is intended to give a general idea of the types and sizes of wired radio centers used. Many wired radio centers are built by radio amateurs, and thus have no type designations. They may also have odd power ratings.

The largest center ordinarily used in rural wire broadcasting is a 500-w unit. The commercial type number of this unit is unknown, but examples of its use are quite numerous. The output power can be increased quite readily, however, and amplifiers of different ratings may be used occasionally, depending on the needs of the community. For example, a 1000-w interkolkhoz wired radio center has been built in the village of Rozhdestvenno of Molotov Rayon.

Another unit frequently used as an interkolkhoz center is the KTU-100. This 100-w unit is supplied from a 110-, 127-, or 220-v line and drives up to 400 Rekord loudspeakers and two R-10 street loudspeakers. The TUB-100 is similar to the KTU-100, except that it is designed for nonelectrified regions and operates on storage batteries.

Other units in operation are: the line-operated UK-50, which includes a Vostok receiver, and drives 200-250 Rekord loudspeakers and one R-10 street loudspeaker; and finally, two 20-w units -- the VTU-20 for nonelectrified regions and the

UTS-48 for electrified regions. The former has its own wind-driven generator (type of receiver is unknown). The UTS-48 is supplied from the electric power line and includes a 10-tube all-wave PTS-47 receiver which has 4 high-frequency bands. Both the VTU-20 and the UTS-48 can drive approximately 120-150 Rekord loudspeakers.

In November 1950, it was announced that wired radio units of the "MGSRTU" (small, stationary, wired radio equipment) series with output powers of 50 and 100 watts had been developed to replace the UK-50 and KTU-100. These units can be operated on a 110-, 127-, or 220-v line and include a "PTS-47-S" receiver. In June 1951, it was announced that the Institute of Radio Broadcasting, Reception, and Acoustics (IRPA) had developed a 2-watt radio center, already in production, which could be operated from the line, from storage batteries charged by a wind-driven generator, or from dry batteries. The description of this equipment states that it can drive up to 50 of the new economical SG-1 electrodynamic loudspeakers. The receiving-amplifying section of the KRU-2 has low-, medium-, and high-frequency (to 12 Mc) reception capability.

The subscriber's unit in rural areas is the same as in city wire broadcasting networks, except that limiters are ordinarily connected in only one side of the line. In addition, only 0.15 w is allowed per speaker in rural networks, whereas city networks are calculated on the basis of 0.5 w per speaker.

(3) Recent Developments in Wire Broadcasting.

Recent developments in wire broadcasting techniques include attempts to provide multiprogram broadcasting to subscribers, the use of telephone lines for remote power supply and control of local kolkhoz centers, the use of cable instead of overhead lines for subscriber's networks, and incorporation of wired radio centers into telephone exchanges.

The main difficulty in the wire broadcasting systems used at present is that the subscriber cannot select his program, but most listen to the one selected at the Central Wire Broadcasting Station (in the case of city networks) or at the wired radio center (in the case of local networks). In 1940-41, experiments in multiprogram broadcasting were carried out by the Leningrad Branch of the Central Scientific Research Institute of Communications (wire broadcasting networks) and by the Moscow

Institute of Communications Engineers (lighting networks). In this system, a separate transmitter and filter is used for each program. The subscriber's unit must include a preselector filter unit, a detector, and an audio-frequency amplifier. Further development of this circuit in 1948, as applied to rural electrification conditions, made possible the initiation of experimental operation in one of the kolkhozes of Moscow Oblast. An experimental unit for high-frequency multi-program broadcasting using the wired broadcasting network was put into operation in Leningrad in 1949.

Low-power rural wired radio centers which are supplied from a kolkhoz electric power station often have to discontinue operation during periods of heavy load. On the other hand, many kolkhozes having low-power battery-operated wired radio centers do not have charging units since their cost is comparable to that of the center; consequently, difficulty is encountered in finding suitable power sources to charge the batteries. Thus, to ensure continuous operation of these centers, experiments have been conducted since 1949 on the use of intrarayon telephone lines for simultaneously supplying direct current and the high-frequency program transmission to the low-power centers. In June 1950, it was reported that such a system had been developed and was under test in an experimental section.

In May 1951, work was continued on the use of intrarayon telephone lines for transmitting broadcast programs to low-power wired radio centers, but no mention was made of remote power supply. According to this report, the Design Bureau of the Ministry of Communications had developed the equipment needed in this system, which includes the transmitter installed in the rayon center and several receiving units. One of the plants of the Ministry of Communications was to produce an experimental set of this equipment in 1951.

Late in 1951, a general system was described for remote power supply and program transmission to low-power rural radio centers. It requires the installation of a battery in the rayon center, and transmission of the 250 v supplied by the battery through the mid-point of the transformer and along the telephone line to the rural radio center. The telephone line is also used for transmission of central broadcast and local broadcast programs to the rural center. The equipment required in the rayon center includes a receiving unit, a wire broadcasting transmitter, and a

filter. The rural radio center must be equipped with a transformer, a filter, and a receiver-amplifier unit. The latter unit permits reception of programs either from the telephone line or independently by radio.

Since 1950, great stress had been laid on the use of underground cables for the wire broadcasting networks of unforested areas. Conductors and cables with polyvinyl chloride insulation are generally used for this work, and the cost per kilometer of such a line is only about one third that of an overhead line. Special cable-laying machines have also been developed to speed up the work and cut down the man-hours required. In 1949, more than 1,000 km of underground lines were laid. The rapid introduction of the method is shown by the fact that more than 10,000 km of underground lines were laid in 1950.

In connection with the fact that the wages for operating personnel of wired radio centers up to 100 w in power constitute half the operating costs of the center, an attempt was made in the Latvian SSR to reduce these costs by incorporating the wired radio centers in telephone exchanges. Technical maintenance of the center and wire broadcasting lines was combined with maintenance of the telephone switchboards and telephone lines. Operational responsibility for both the telephone exchange and the wired radio center was vested in one person. Successful operation with small centers led to experiments with the incorporation of larger centers, and in 1949, 1,000-w wired radio centers were installed in telephone exchanges of Yelgava, Yekabpils, and Ogra. Experiments with this system have also been conducted in the Estonian and Lithuanian SSR's and in some republics and oblasts of the USSR.

While the total power of radio relay centers is reported to have increased by three and one-half times during the period of 1945-50, 144/ the average number of speakers per center decreased from 531 to 500 in 1952. Although many more powerful and improved exchanges had been installed, the increased power in many instances had been utilized to improve the quality of reception. The average number of speakers per relay center in rural areas may be assumed to be considerably less than the over-all average. As the radiofication of the rural areas progresses, it is probable that there will be a further decrease in the over-all average number of loudspeakers per center.

3. Distribution.

Radiofication of the USSR which began with the focal city of Moscow, first spread to the other SSR capitals and major cities of European and Asiatic USSR. These were the areas of highest population density; they also possessed reasonably stable, line-supply sources of electric current. Before World War II, independent radio-broadcast receivers numbered less than 1 million sets and may be considered as having been available only as super-luxury items, in the hands of the political and industrial hierarchy, normally located in key cities. The rank and file population of those cities were served by the loudspeakers of the wire-diffusion network. During the 1930's, radiofication was further extended by part-time employment of the receiving section of the transmitting-receiving equipment of the radio dispatching equipment in Machine Tractor Stations for the reception of broadcast programs either for relay to loudspeakers or for group listenings. 145/

In the postwar period, stress has been laid on "total radiofication" and great emphasis has been placed on production of relatively insensitive crystal receivers and small battery-powered tube receivers as one of the means of extending radiofication to rural and other nonelectrified areas. At the end of the Fourth Five Year Plan (1946-50), the radiofication of cities was said to have been completed. 146/ Less than 20 percent of the total number of radio reception units were said to be in rural areas, however. Also during the period of the Fourth Five Year Plan, the radiofication of railroads appears to have begun. Installations are reported to have been made on the Turkestan-Siberian Railroad in 1948 and to have been completed on the Stalingrad Railroad in 1949. The radiofication of railroads appears to include the installation of loudspeakers in passenger and mail cars, the cabs of engines, the warehouses, workshops, and offices of the railroads, and the living quarters of the railroad workers. Relay exchanges are located either in the railroad stations or in suitable nearby buildings and (for trains) in a special compartment of one of the cars. In addition to broadcasting programs for the general public, these systems appear to be employed for such uses as transmitting air raid alarms, safety instructions, and work instructions and directives. There is no indication that they are presently used for routine yard-shunting and train-dispatching operations. During 1952-53, great progress has been reported in radiofication of long-distance trains of the Asiatic as well as the European USSR,

and on some lines the radiofication of local trains also has been begun.

In May 1953 (on Radio Day), the Soviets claimed that the radiofication of towns, on the whole, had been completed.

In May 1954, in a speech honoring Radio Day, the Minister of Communications, Psurtsev, admitted that only 18 percent of kolkhoz homes are radiofied and announced further intensification of the activity to extend rural radiofication. 149/

It appears that radiofication has been fanned out from the major cities to the oblast centers, to the rayon centers, and at present is being extended further to the rural areas.

Considerable publicity has been given to the fulfillment of the radiofication plans in the postwar Five Year plans, and from time to time partial statistics have been announced at all political levels from republic to rayon. In a few instances these accounts have included statistics on total units installed, but more often have been given for units installed during a given period of time, or for units installed in a subordinate agricultural or industrial area, or for total accomplishments in terms of percentages. It is quite probable that the main reason for the publication of any statistics whatever is for their value as promotional propaganda to accelerate the program in the spirit of Socialist competition. To serve this end, it is probable that total figures are published when the program is being carried out according to, or above plan, while partial or vague statistics, for areas where things are not going well, serve to cover the actual situation, either for the government or for those officials responsible for the radiofication program. This situation is suggested in light of the total number of radiofication facilities set out generally in Table 10* and accounted for in greater detail in Appendix H, which presents a recapitulation of these partial data and accounts for a total of nearly 1.75 million receivers and almost 8 million loudspeakers. The estimated national totals at the close of 1953 were approximately 5.5 million receivers and nearly 12 million loudspeakers. (See Table 8).

* Table 10 follows on p. 79.

Table 10

Partial Distribution of Radiofication Facilities in the USSR a/b/

	Radiobroadcast Receivers (Thousands)	Radio Relay (Units) Centers	Wirediffusion Loudspeakers (Thousands)
Baltic States	288.5	542	171.0
RSFSR			
European	485.8	1,586	3,222.1
Urals and Western Siberia	94.2	792	288.8
Central Siberia	N.A.	267	22.0
Far East	37.0	465	323.9
Belorussian SSR	54.0	387	236.0
Karelo-Finnish SSR	1.0	35	35.0
Moldavian SSR	27.0	167	120.0
Ukrainian SSR	500.0	13,650	2,500.0
Caucasus Republics	178.3	1,032	281.5
Central Asia Republics	102.5	1,201	594.0
Total USSR	1,768.3	20,124	7,794.3
USSR Receiving Facilities - Minimal figures			9,562.6

a. These figures represent minimal distribution and account for a total of approximately 9.5 million reception units of an estimated national total of 17.5 million.
b. The information in this table is based entirely on Soviet open sources -- newspapers, trade journals, and radiobroadcasts. It is possibly true.

Relatively recent data has been found on the Baltic States, Belorussian SSR, Moldavian SSR, Ukrainian SSR, the Caucasus Republics and the Central Asia Republics, except Turkmen SSR.

As regards the RSFSR, little or no information is available for much of its European area, including some parts with high population densities such as Bryansk, Ivanovo, Kaliningrad, Tula,

Vladimir and Yaroslavl Oblasts, and the Chuvash, Mordvinian and Tatar ASSR's, and no figures are available for loudspeakers in the city of Moscow since 1948. For the area of the Urals and Western Siberia, there is little or no information on such important areas as Chelyabinsk, Kemerovo, Kurgan, and Molotov Oblasts. In publicity honoring Radio Day in 1951, however, Omsk Oblast was singled out for its achievements in radiofication, and total figures, both for independent receivers and for loudspeakers, were published. For sparsely populated Central Siberia, practically no information is available. Oddly enough, proportionately more information is available on the Far East than on any other area of the RSFSR, with fairly recent figures for the Maritime Kray, and Chita and Sakhalin Oblasts.

These figures have not disclosed sufficient data to establish estimates of distribution for those areas for which information is not available. A reasonable assumption, however, is that radiofication facilities at the present time are available in most urban areas of the USSR.

B. Production, Import, and Export of Radiobroadcasting Equipment.

1. Production.

a. Radiobroadcasting Receivers.

The estimated production of receivers in the USSR from 1945 to 1954 is given in Table 11* and is expressed graphically in the accompanying Figure 5.** Total production of Class 1, 2, and 3 receivers is believed to total around 3 million units; Class 4 receivers, around 2 million units; and crystal receivers, about 4 million units.

The table and the chart reflect the acceleration of production of crystal receivers from 1948 through 1950 in the effort to fulfill more nearly the Fourth Five Year Plan. Under the Fifth Five Year Plan -- while the annual production of crystal receivers is estimated to have continued to increase -- the percentage of the total annual production began to decline, beginning in 1952.

The production of Class 1, 2, and 3 receivers is estimated to have constituted more than 90 percent of the very modest total production in the years 1945, 1946, and 1947.

* Table 11 follows on p. 81.
** Figure 5 follows p. 80.

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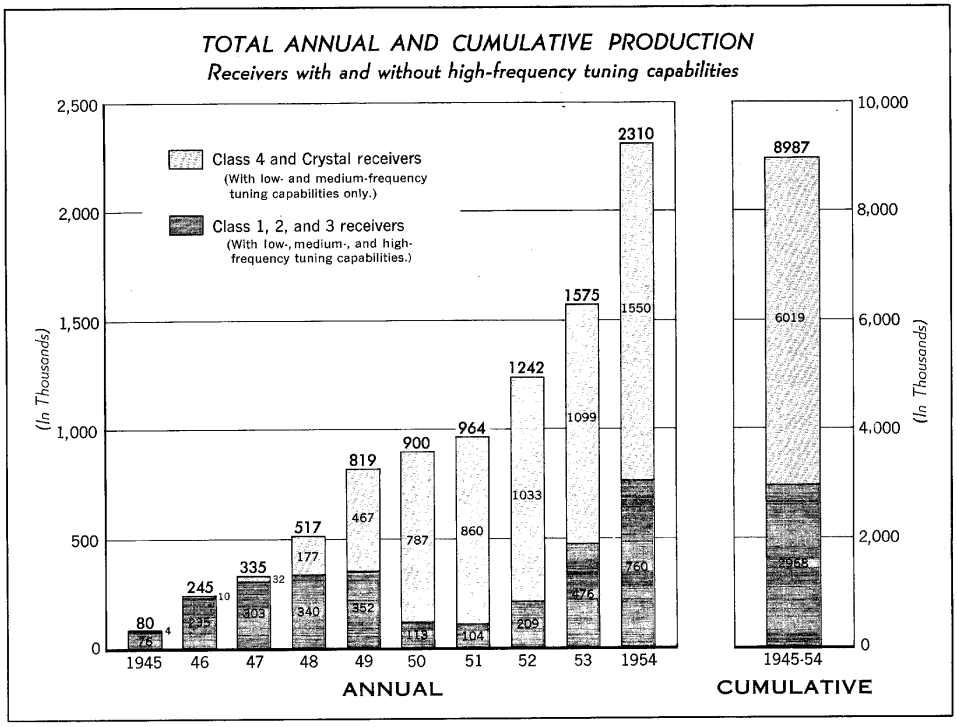
USSR

ESTIMATED PRODUCTION OF RADIOBROADCASTING RECEIVERS, 1945-54



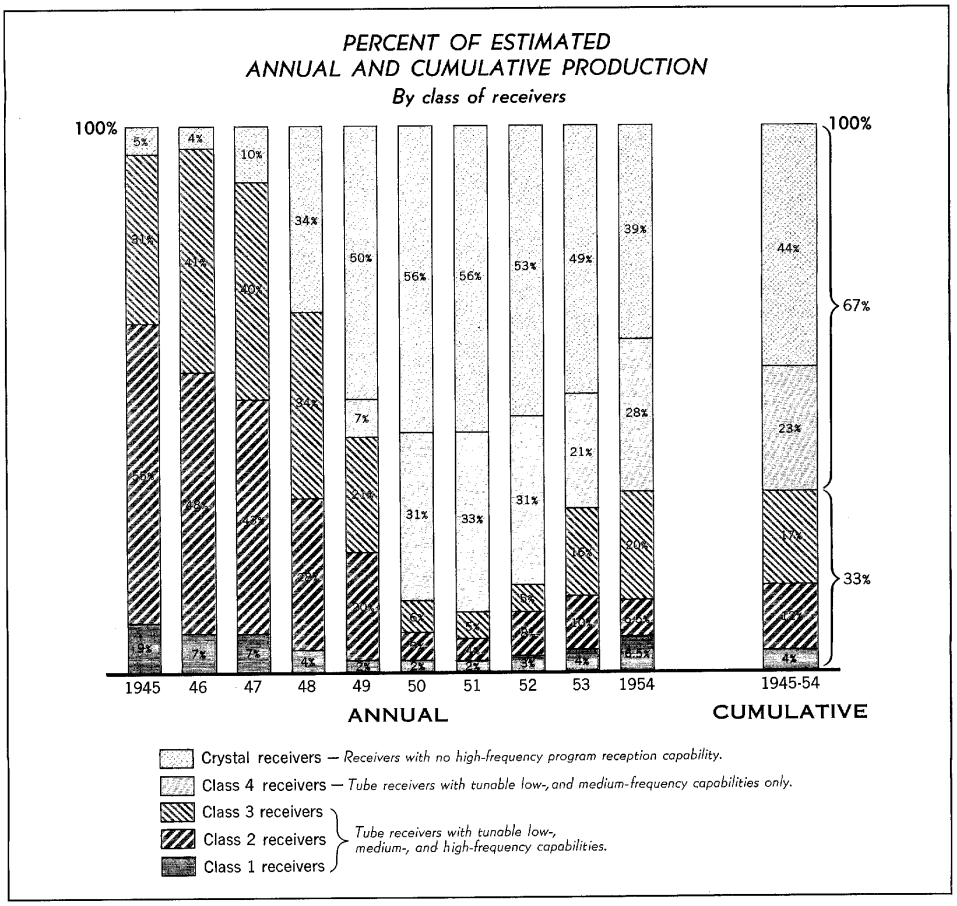


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Table 11

Estimated Production of Radiobroadcasting Receivers 150/
1945-54

Thousands

	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	Cumulative Total	Percent of Cumulative Total
Tube Receivers												
Class 1	7	17	25	18	17	14	17	42	61	150	368	4
Class 2	44	118	143	145	165	46	35	104	160	150	1,110	12
Class 3	25	100	135	177	170	53	52	63	255	460	1,490	17
Class 4	Negligible	Negligible	Negligible	Negligible	58	280	320	380	333	650	2,021	23
Total (Tube)	76	235	303	340	410	393	424	589	809	1,410	4,989	56
Crystal Receivers	4	10	32	177	409	507	540	653	766	900	3,998	44
Total - All Types	80	245	335	517	819	900	964	1,242	1,575	2,310	8,987	100

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Beginning with 1948, the annual production of Class 1 receivers declined noticeably both in numbers and in percentage of total production until 1952 when the production again increased. Production of Class 2 and Class 3 receivers generally increased in total numbers through 1949 but decreased substantially in percentages of total annual production. After 1951 the annual production on both of these classes also increased again.

In 1949, the production of the relatively insensitive 3- and 4-tube Class 4 receivers was begun, and during 1950, 1951, and 1952, around 85 percent of total production of receivers was believed to be of Class 4 tube receivers and crystal receivers.

In 1952 the production pattern again changed. Of the total estimated production for the years 1953 and 1954 of 1 575 and 2.310 million receivers, respectively, approximately 30 percent or more were of Class 1, 2, and 3 types and only 70 percent were of Class 4 and crystal types.

Any trend in the Soviet production pattern is usually based upon a combination of several factors, both political and economic. The average citizen is satisfied with a medium-priced, medium-performance receiver, preferably possessing some high-frequency reception capability. Those officials responsible for plan fulfillment evidently are satisfied with production of whatever types of receivers will satisfy plan requirements. From its various public utterances since 1947, it can be concluded that the Soviet hierarchy has determined that the radio reception base of the USSR is to be extended to the rural areas.

Production in the early postwar years stressed the better-quality receivers. The increase in production by mass-production of crystal receivers in 1948 and of Class 4 tube receivers in 1949 served the Soviet policies to increase consumer goods, to extend radiofication into the countryside, and to boost lagging production. The shift in emphasis after 1952 apparently reflects the recent Soviet policy of increased quantity and better quality of consumer goods.

The present trend in Soviet receiver production is to produce more of all types of receivers and to make a greater effort to satisfy consumer desires. The most popular of the Class

2 receivers, the "Rodina," is said to be in mass production, and it has been announced that plans are being made for the mass production of Class 1 receivers. It is also probable that the production of a high percentage of crystal receivers, which are not satisfactory for group listening, will give way to production of more Class 3 and Class 4 tube receivers. 151/

Table 12 shows the estimated total production of receivers by classes in the USSR for the years 1945-53, inclusive.

Table 12

Estimated Total Production of Radiobroadcasting Receivers in the USSR by Classes 152/
1945-53

	Total (Thousands)	Percentage Distribution
Tube		
Class 1	218	3
Class 2	960	14
Class 3	1,030	16
Class 4	1,371	20
Crystal	3,098	47
Total	6,677	100

There is no indication that there is any significant production of independent very-high-frequency (VHF) receivers in the USSR. Although there has been some Soviet publicity or development of AM receivers to include FM-VHF reception. 153/

b. Loudspeakers.

The estimated production of loudspeakers in the USSR during the years 1946 to 1954 is given in Table 13.* This table does not represent a use pattern and does not imply that this number

* Table 13 follows on p. 84.

Table 13

Estimated Production of Loudspeakers in the USSR 156/
1946-54

Thousand Units

	1946	1947	1948	1949	1950	1951	1952	1953	1954
Production of Mass Produced Loudspeakers for Civilian Home Use	1000	1000	1250	1000	500	600	1000	800	1300
Cumulative Total	1000	2000	3250	4250	4750	5350	6350	7150	8450

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of loudspeakers is installed in the wire-diffusion nets of the USSR. It is intended to represent the number of loudspeakers produced in the USSR for use in wire-diffusion nets. However, it should be noted that many of the loudspeakers in wire-diffusion nets in Bulgaria, Rumania, and China, probably were of Soviet origin. There are few Soviet press claims of physical production of loudspeakers. The estimates in Table 13, therefore, are tenuous, and are based on plant capacities, percentage plan figures, and interpretations of production mix in several large plants. 154/ During 1953, there was alleged to have been a shortage of about 750 thousand loudspeakers in the USSR, causing failure to complete the radiofication plan in many areas. 155/

The Soviet radio production industry is capable of, and does, produce radiobroadcasting receivers of all ranges of quality. Increased production to whatever level is determined by the authorities, therefore, becomes a matter of priority determinations for the industry, in competition with other Soviet electronic requirements and their related priorities. It is probable that all civilian consumption of electronic equipment becomes secondary to military consumption. There is also an ever-present conflict between component manufacturers and radio assemblers. The radio assemblers suffer in any shortage created by increased demands for military electronic equipment. The recent creation of the Ministry of Radio Technical Industry may be an effort to smooth out supply and production difficulties. 157/

2. Imports.

There is no indication from the types of receivers on sale in the USSR, that broadcast receivers are imported in any significant quantity, except for the influx of those of German manufacture, which occurred shortly after the close of World War II. If complete receivers are being imported from the Satellites, then they have been manufactured to Soviet specifications and bear Soviet name plates. It is more likely, however, that imports (if any) from the Satellites consist mainly of component parts for receivers.

3. Exports.

Soviet makes of broadcast receivers have been reported for sale in other countries of the Soviet Bloc -- especially in those

countries where electronics equipment is scarce, such as Albania, Bulgaria, China, and Rumania. The USSR is also believed to have supplied loudspeakers when wire-diffusion systems were introduced in those countries. No information is available as to quantities either of receivers or of loudspeakers which have been exported.

C. Availability.

Availability of reception facilities to the general public may be considered as subject to the physical availability of the requisite equipment, with complemental repair and maintenance facilities, legal ownership restrictions, and economic limitations.

1. Availability of Receiving Equipment.

Tube receivers of all classes are believed to be available for purchase by the general public in varying quantity and quality in the cities of the European area of the USSR. Comparable information is not available as to the situation in cities of Asiatic USSR. In the larger cities and the major Republic and Oblast capitals there appear to be plentiful stocks of all types. In other cities, while volume and types of receivers appear to vary, usually a few models are available. Supplies are said to have been plentiful in the early postwar years, somewhat scarce around 1950, but now again in reasonable supply. There is no information available as to the stocks of crystal receivers. Whether crystal receivers are available in the cities or their distribution is limited to rural areas on which no information is available, is unknown. 159/

From time to time, various articles in the Soviet press condemn the lack of loudspeakers as one of the chief factors in delaying radiofication of the entire country. Whether this is a part of the government's official campaign for the installation of wire-diffusion nets rather than a reflection of consumer demand is a matter for conjecture.

2. Maintenance and Repair Facilities.

Supplies of spare parts and the availability of radio shops for independent receivers appear generally to follow the geographic pattern of availability of receivers. According to Soviet press and technical literature, there appears to be, continually, shortages of something, somewhere. In rural areas,

batteries are most often cited as the scarce item.

Maintenance of the wire-diffusion nets has developed into one of the USSR's major radiofication problems. Lack of qualified personnel for day-to-day operation and maintenance of the wire-diffusion centers, after their installation, appears to be the chief difficulty. As examples, the following are cited from Soviet press and radio sources:

In the Altay Kray, one-fourth of the 206 wire-diffusion centers were said to be operating only intermittently and 20 not at all, in January 1953. 160/

In Gorkiy and Kursk Oblasts, the Oblast Party Committees (obkoms) were reprimanded for not giving attention to the inactive radio centers. 161/

In Moscow Oblast, 20 percent of the kolkhoz wire-diffusion centers were reported as inoperative in November, 1953, because of lack of technical help from local communications organizations. 162/

3. Legal Restrictions.

Legally, independent receivers are available for purchase by anyone who can afford to pay the price.

With the purchase of every receiver the new owner is given a set of instructions describing maintenance and conditions for best operation. Contained in this booklet in a Memorandum for Owners of Radio Receivers, that may be summarized as follows:

a. The owner must register the radio receiver at the closest post office. Several days are allowed;
b. The owner must register all radio receivers in his possession;
c. Evasion of registration is subject to fine and/or summary criminal liability;
d. Registration certificates are nontransferable, and are a right of use in the area in which they are issued;
e. The registration certificate together with the receipt of subscriber's fee must be kept with the receiver;
f. At the time of registration the owner must pay his

subscription fee which entitles him to listen to his receiver;

g. Subscription payments may be paid in advance at any time and in not less than half-yearly installments. Lapse of payment subjects the owner to an extra charge or fine by summary order;

h. When the owner moves he must notify the post office of former registration if in the same city or, in the case of moving to another locale, he must procure a new registration at the new address;

i. No action is required for owners of receivers who take them on summer vacations;

j. Receivers that do not function and are in useless condition shall be reported to the post office where the receiver is registered. Collection of subscribers' fees stop upon posting of the declaration of uselessness;

k. Nonuse of a serviceable receiver does not free the owner from paying subscription fees. 163/

4. Economic Factors.

a. Cost.

Under a state-controlled economy, the availability of reception units can be very closely regulated by controlling their cost to the public. At the close of World War II, receivers were in very short supply and prices were prohibitive to the general public. In the fall of 1946, a five-tube receiver of good quality which could receive low-, medium-, and high-frequencies is reported to have cost 3,000 rubles in Soviet state shops. By the middle of 1947, its price is said to have been lowered to 2,200 rubles. 164/

In Azerbaydzhan, in 1947, a 5-tube 3-frequency band (presumably low-, medium-, and high-frequencies) receiver is reported to have cost 500 rubles. This price is said to have been lowered, at an unspecified date, to 450 rubles, and, in 1949, it was again reduced to 380 rubles. 165/

In 1948, the Rekord, a Class 3 receiver, is reported to have sold for 700 or 800 rubles. 166/

In February 1949, the following receivers were reported to be available in Moscow stores: 167/

Type	Price (Rubles)
Salute	1900
Ural-47	1900
VEF-M557	1600
Vostok	1600
VV-661	1500
Elektrosignal	1400
M-648	1350
Rodina	675
Rekord-47	540

In November 1949, prices for the Vostok are reported to have dropped to 1,000 rubles, for the Rodina and the Rekord to 400-500 rubles, and the Class-4 Arz was then available for 300 rubles. 168/

In 1950, the price of the Vostok is reported to have been further lowered to 850 rubles. 169/

Around 1950, prices on most types of receivers apparently were lowered substantially, to within the price ranges believed in effect currently. These prices are set out in Table 14.

Table 14

Average Retail Prices of Soviet Radiobroadcasting Reception Facilities 170/

Type	Number of Tubes	Price Range (Rubles)
Class 1	7 or more	1200-1600
Class 2	6-7	600-700
Class 3	4-5	220-400
Class 4	3-4	180-250
Crystal	0	30-60
Loudspeakers	0	30

Notwithstanding the reported plentiful stocks of receivers in cities in the European USSR, it does not necessarily follow that turnover of these stocks was rapid. It is estimated that in February 1949 only persons in the higher-pay brackets could afford to pay 1350 rubles, which would purchase only the cheapest receiver equipped for high-frequency reception offered for sale in Moscow. Moscow radio shops were reported as being crowded but people were merely looking -- not buying. 171/

On the other hand, the stock of receivers in Krasnogorsk was reported to have been considerably lower after 1949, when prices were reduced, and local stores were reported to have sold out shipments on the date of arrival. 172/

In June 1951, a survey of radio stores in Dzaudzhikau, Severo-Osetian Oblast, revealed that 6-tube sets were in plentiful supply (a total of about 20 in 6 different stores) but that none were in working condition; they had apparently been injured in transit and the demand for them was not so pressing as to justify the effort or cost to replace broken tubes or make other types of repair. In Stalingrad, at around the same time, no receivers with high-frequency reception capability were seen on display, although salesman said that normally 3 or 4 of the standard types were available. 173/

In December 1951, the one radio store in Vinnitsa was reported to have an ample stock of all types of receivers. 174/

In May 1952 in Rubezhnoye, in the Ukraine, 4 types of receivers of Soviet manufacture were available to the public at prices ranging between 300 and 1500 rubles. The price of 500 rubles for the Rekord type receiver was said to be a reasonable price in comparison with the wage of Soviet workers in that city. 175/

In March 1952, the number of radio shops in Voronezh was said to be quite noticeable and the variety of tubes on display far exceeded similar displays in Moscow, and equalled the displays of the larger shops in Leningrad. 176/

As of March 1952, the supply of receivers in Kherson, was said to be very poor, expecially of the better makes. 177/

In light of the estimate that only 1 million receivers were in use in the USSR at the beginning of 1946, and that less than

a total of 1 million tube receivers were produced during 1946, 1947, and 1948, it is quite probable that much of the stocks on retail display represented window dressing up to 1949, when production of tube receivers increased sharply.

With the lowering of prices and the increase in supply, more receivers became available so that, generally speaking, independent tube receivers have recently become available, economically, to those of the political and industrial hierarchy downward to the professional level of scientists, teachers, engineers, and army officers and to plant and enterprise officials of the upper and middle levels.

Economic attraction appears to be one of the government's chief methods of convincing the populace of the desirability of possession of a wire-diffusion loudspeaker over an independent receiver. The cheapest independent tube receiver costs from 6 to 8 times more than a loudspeaker, which costs 30 rubles. The loudspeakers used in the Soviet wire-diffusion system are comparable to those installed in medium-priced receivers. At a cost of from 30 to 60 rubles each for crystal receivers, the loudspeaker would appear to be a much more attractive means of listening to Radio Moscow in electrified areas than the crystal receiver, which, in most instances, would necessitate earphone listening. In most cities and other electrified areas, loudspeaker installations are included in new housing, automatically, as well as in industrial plants, public and quasi-public gathering places and public transportation vehicles.

b. Licensing Fees.

The schedule of subscriber fees for broadcast receivers in the USSR is shown in Table 15.*

The effective date of these registration charges for tube receivers is unknown. The rate for loudspeakers, however, was reduced from 10 rubles to the current rate of 5 rubles (4 rubles for certain kolkhoz installations) as of 1 April 1953. 179/

* Table 15 follows on p. 92.

Table 15

Schedule of Subscriber Fees for Broadcast Receivers in the USSR 178/

	Annual Fee (Rubles)
For Tube Receivers	
Category I - for individual use	36
Category II - for use in village reading rooms, "Red Corners," and radio auditoriums	54
Category III - for use in trading, productive and entertainment enterprises, in training institutes, on ships, airplanes, trains, and automobiles.	75
For Crystal Receivers	
All usage	5
For Loudspeakers a/	
Those connected to wired centers of the Ministry of Communications, except	5
Those in kolkhozes connected to Ministry of Communications centers	4

a. No information is available on the subscriber fees for loudspeakers not connected to Ministry of Communications relay centers.

This decree constitutes the first tangible evidence of a direct monetary benefit to the consumer in the field of communications as a result of the new economic course adopted by the Soviet government after the death of Stalin. It directly reduced the subscription rate of at least 80 percent 180/ of the loudspeakers (around 8 million of the 10 million in service) in the USSR at that time. Also, at that time, there were several million tube receivers in service on which subscriptions rates were from 3 to 7 times

higher. If the intent of this Soviet decree had been primarily a consumer benefit, it is quite probable that there would have been similar reductions in subscription rates for tube receivers, as well. This reduction in subscription for loudspeakers, therefore, appears to be an economic inducement to aid the drive towards radiofication of the rural areas, which was said to be lagging. 181/ The preference of the slightly lower rate for rural areas over urban areas gives further support to this theory.

The more recent, "The Seventh Annual Soviet Price Reduction Decree," which went into effect on 1 April 1954, affected 11 categories of foodstuffs. It is estimated that this decree would actually have no significant effect on the food bill of an average Russian family of four. The monthly savings resulting from the reduction are estimated to be only 5 rubles or 1 percent of the old cost. The 1954 annual drop in the index was too small to be registered. 182/ Even with the substantial reductions made in prices of receivers in recent years the 1954 price reduction decree, following maturation of the "1953 new course of solicitude for the consumer," will probably result in the ownership of a very few more broadcasting receivers by the average Russian.

D. Television.

1. Number, Characteristics, and Distribution of Television Receivers.

a. Number.

Estimated numbers of television receivers in the USSR for the years 1951 to 1956 are set out in Table 16.*

Those figures for 1954, 1955, and 1956 are based solely on Soviet public pronouncements of production plans. These figures appear to be in the same tenor as recent announcements concerning aural radiofication and are believed to be grandiose and unrealistic.

* Table 16 follows on p. 94.

Table 16

Estimated Number of Television Receivers in the USSR a/
1951-56

Year	Number
1951	40,000
1952	95,000 b/
1953	150,000
1954	500,000
1955	1,270,000
1956	2,270,000

a. Source 183/ except for 1952.
b. Interpolation. 184/

b. Characteristics.

Thus far, Soviet television receivers have been characterized as obsolete, by Western standards, and very expensive. Their chief weakness appears to be the short life of the tubes. The characteristics of these receivers are given in Appendix I. This appendix contains a summary of available information on announced models. It is doubtful that all of these have reached the production stage.

The KVN-49, the Moskvich T-1, and the Leningrad T-2 are the models mainly in use. These have small screens, not much larger than the size of a postal card. The larger screen of the T-4 model which is presently coming into service, mainly for group viewing, is believed to be achieved by the use of reflecting mirrors rather than by direct scanning. This method was studied in the USA and abandoned in favor of direct view large-size cathode ray tubes. The technique of the manufacture of the large-size cathode ray tubes, however, is well known, and there appears to be no reason for its nonuse in the USSR, except for economic considerations. It appears, therefore, that the Soviet authorities have chosen to provide television receivers to at least a part of the population in the simplest and most economic manner. 185/

c. Distribution.

Distribution of television receivers, naturally, is limited to the service area of television transmitters. Theoretically, this limits their operation to a radius of not more than 100 kilometers from the transmitter; in practice -- in the USSR to about 50-60 kilometers. 186/

Although the USSR claims to have several new television transmitters in service, in such cities as Sverdlovsk, Gorkiy, Odessa, Kharkov, there is no information on receivers except in the areas around Moscow, Leningrad, and Kiev. There are estimated to be approximately 100,000 in the area of Moscow, 40,000 in the area of Leningrad and about 10,000 in the area of Kiev. 187/ It is probable that distribution of television receivers in the other areas is negligible.

2. Production and Import of Television Receivers.

The Soviet domestic production of television receivers has been minor. Less than 100,000 are estimated to have been produced in the USSR up to the close of 1953.

Up to 1953, there was no indication that the USSR had successfully mastered the necessary techniques to mass-produce any type of cathode ray tube for television purposes. Of course, there is the possibility that, if such capability does exist within the USSR, it has been diverted to other purposes, especially military ones. For whatever reason, since the beginning of 1951, about 3/4 of the television receivers destined for use in the USSR are believed to have been produced in USSR-owned plants located in East Germany.

Table 17* shows the estimated production of television receivers in the USSR and in USSR-owned plants in East Germany for 1940, and from 1947 to 1953.

Total production (both in the USSR and USSR-owned plants located in East Germany) for 1953 is estimated at about 74,000 units. The production plan for 1954 is said to be 325,000 receivers; for 1955, 760,000 receivers; and for 1956, 1 million receivers.

* Table 17 follows on p. 96.

What proportions of these totals are to be produced in East Germany and in the USSR are not known. The main factor which may limit the production of television receivers in the USSR is the shortage of cathode ray picture tubes. One means of overcoming this deficiency may be to import these tubes from Hungary or East Germany.

The trend in Soviet television receivers appears to be following 4 or 5 years behind the US. Television receivers are becoming simpler and cheaper while the picture tubes are becoming larger. Examples are the recently announced types Sever-3, Avangard, and Svet. (See Appendix I).

Table 17

Estimated Production of Television Receivers in the USSR and USSR-Owned Plants in East Germany 188/ 1940 and 1947-53

Units

	1940	1947	1948	1949	1950	1951	1952	1953
Production in the USSR	100	1,000	3,000	5,000	9,000	11,000	15,000	34,000
Production in USSR-owned Plants in East Germany.						30,600	34,500	40,100
Total	100	1,000	3,000	5,000	9,000	41,600	49,500	74,100

If these types prove to be acceptable in usage, they could provide one means of boosting unit production since their assembly should be less complex than the Leningrad T-2 and T-4 models. Another factor in increasing production of electronics equipment may be the recent creation of the Ministry of Radio Technical Industry.

Nevertheless, in order to achieve presently announced goals, the Soviets would have to quadruple 1953 production during 1954, to more than double the 1954 production during 1955, and to again increase 1955 production by about 1/2 in 1956. This appears to be a very ambitious undertaking particularly in consideration of

the parallel radiofication goal. No doubt television receiver production will increase substantially in the USSR and in East Germany, but it probably will fall far short of the announced goals.

3. Television Wire-Diffusion.

Soviet technical literature for the past several years has indicated that the television reception base in the USSR is intended to follow the pattern of aural broadcasting in that wire-diffusion of television will be employed as well as the use of independent receivers.

In the one wire-diffusion television receiver for which details are available (the Pioneer) only 9 tubes, plus the picture tube are used. (See Appendix I). Other Soviet technical literature indicates that the goal of development for television wire-diffusion is a receiver with as few as four or five tubes. In consideration of the employment of from 20 to 35 tubes in independent television receivers, this would represent an appreciable saving in radio tubes. 189/

Extensive experiments in wire-diffusion of television are reported being conducted by the laboratory of the Moscow Municipal Wired Radio Network at Kalinin, on the route of the coaxial cable from Moscow to Leningrad. As of September 1953, according to an article in the Soviet technical journal Radio,

> "The quality of the picture at the subscriber points of the Kalinin center cannot be adjudged satisfactory. Since the inter-urban television channel will not pass a band wider than 3 megacycles, the picture definition corresponds to about 250 lines. Therefore, the construction of the existing Kalinin Wired Television Center can be considered only as an interesting experiment in the transmission of television by cable over considerable distances." 190/

On a local basis, it was announced in August 1953 that an experimental wired television center to supply 50 subscribers would be installed in a Moscow apartment house in 1953. 191/ No information is available as to whether or not this was carried out.

To date, insufficient information is available as to what progress has been made regarding wire-diffusion television. It should be pointed out, however, that even on a local, urban basis a wired-diffusion television system would require the use of coaxial cable between the relay center and the subscriber points instead of ordinary wire as employed in the aural wire-diffusion system. While wire-diffusion television would effect a considerable saving in terms of electronics equipment and in the complex assembly of that equipment, it would also require a considerable outlay of coaxial cable, which is also believed to be in short supply.

4. Availability and Maintenance of Television Receivers.

a. Cost.

Until July 1949, the Moskvich T-1 and the Leningrad T-1 were reported to have cost approximately 3,000 rubles. At that time, they were reduced to 1,500 and 2,000 rubles, respectively. 192/ Recent reports indicate that the most popular television receiver presently available, the Leningrad T-2, is priced at 2200 rubles; the less-satisfactory KVN-49, costs about 1300 rubles. 193/

Prices of from 1300 to 2200 rubles have the effect of placing individual ownership of television receivers beyond the economic means of all except those in the upper income brackets. One highly reliable source reported that the largest radio and television store in Leningrad, in October 1952, was thronged with people, but apparently few were buying, as the Leningrad T-2 receiver was available for immediate delivery. 194/

Most television receivers are purchased by social and political organizations for group use in such places as reading rooms, libraries, and "Agitpunkts." 195/

The license fee for use of a television receiver is said to be 120 rubles per year. 196/

b. Repair.

According to the Moscow press, in January 1952, a radio trust had been set up with 3 television workshops in Moscow and 1 in Kiev, for the installation and repair of television receivers. 197/ (It is probable that similar plans had been made for

Leningrad, but no information is available on that area). In March 1952, 45 installation and repair personnel are reported to have been factory-trained, and 40 additional personnel were enrolled in a six-months' course. From these cadres, training of additional installation and repair personnel was planned to be conducted on an on-the-job basis in the television workshops. Initial plans called for the training of 120 persons in this manner. 198/

As of September 1953, however, there appears to have been only one television service bureau in Moscow and it was two months behind on repair orders alone, with a backlog of 4,000 requests. 199/

On the basis of intermittently published articles in the Soviet press, USSR television receivers require frequent repair service. This is probably due to the inferior quality of Soviet radio tubes, particularly the picture tubes. The instability and fluctuation of the electric current supply in many parts of the USSR, including areas of the city of Moscow, is probably a contributing factor in tube failures. Spare parts are said to be often "temporarily" unavailable and obtainable only after long delay.

IV. Regulations and Conditions of Listening.

A. Regulations.

In addition to the regulations and laws in the USSR affecting radio receiver ownership and listening on an All-Union basis there are other relative regulations and laws instituted and enforced in certain local areas. These are discussed below.

1. All-Union Laws.

It is a generally accepted principle in the western world that, excepting national security secrets, the widest possible exchange of information not only contributes to international understanding and cooperation but also works to the advantage of individuals as well. It is also a generally accepted rule that a totalitarian state prohibits the dissemination to its citizens types of information undesirable to the regime.

The Soviet government exercises strict control over all types of communications media in the hands of its citizens. Radio is no exception. It is the policy of the USSR to prevent the acquisition by its populace of any information of whatever nature which might be construed as contrary to their propaganda line. As a result the regime expends considerable time, money, and effort to keep foreign radiobroadcasts from its populace.

Before World War II there were apparently few if any regulations in the USSR affecting either the ownership of radio receivers or listening to foreign radio programs. The only existing regulation at that time required radio owners to pay subscription fees. Shortly after the war broke out, however, a decree was issued by the government that all receivers had to be given over by a certain date to the government for the period of the war or the owners were subject to a severe penalty for non-compliance. 200/ The people obtained receipts for their receivers and those who lived in regions not subject to the German occupation or adjacent to those regions, as a rule got their receivers back shortly after the end of the war. 201/

Since the end of World War II security measures have tightened considerably. Pursuing this path, the Supreme Soviet of the Union of Soviet Socialist Republics promulgated the decree on

"Law for the Defense of Peace" on March 12, 1951. This decree does not prohibit listening to foreign broadcast programs but it makes the oral dissemination of information heard over such programs a crime against the State. The law in part states "persons guilty of war propaganda should be arraigned and tried as major war criminals." (See Appendix J.)

To obtain further control over receivers there is another law that makes it obligatory for every citizen who owns a receiver to register it with the local branch of the Soviet Ministry of Communications. Once this registration has taken place a listening fee or radio tax becomes automatic. 202/ Fees range from 4 rubles per year for loudspeakers in kolkhozes to 75 rubles per year for receivers located in public places, automobiles, etc.* These fees must be paid regardless of whether the receiver is in working condition or not. 203/

2. Local Area Laws.

a. Moscow.

In the Moscow area on September 14, 1945 a decree was passed by the Moscow Radio Committee informing owners than in order to have unlimited use of their receivers it was necessary to register them at the nearest post office and pay a subscription fee as per existing tariff. 204/ Furthermore, the registration certificate has to be kept with the receiver, together with the receipt of payment, and must be presented at the first request of a radio committee inspector.

In February 1953 the newspaper Evening Moscow carried announcements from the Moscow City Relay Network reminding owners that all radio and television receivers "without exception" were subject to obligatory registration and payment of taxes. 205/ After a receiver was purchased it had to be registered within three days. To make sure the registration occurred within this period a fine was imposed for late registration and the money was compulsorily withheld from one's pay.

* See Table 15 on p. 92.

b. Belorussia.

Due probably to its geographic location, Belorussia appears to have more stringent regulations. At Bobruysk, until 1949, it was necessary to have a permit in order to buy a radio receiver. Penalties are also reportedly existing for those caught listening to foreign broadcasts. 206/ The only information on the actual penalty imposed is in the vicinity of Lida. On 1 July 1952 emergency measures of the early postwar era were supposedly re-introduced. Persons found listening to the foreign radio programs were now liable for punishment of 1 to 5 years imprisonment. 207/

c. Ukraine.

The Kievan newspaper, Pravda Ukrainu, announced on 29 August 1951 the obligatory registration of receivers in accordance with Ukaze (law) No. 2078 of the Ministry of Communications. Failure to do so would be treated in accordance with existing statutes. 208/

d. Caucasus.

The usual regulations exist for listeners in the Caucasus area. "Persons evading the registration of radio receivers shall be held criminally responsible in accordance with article 481 of 14 March 1945, Decree of the Council of People's Commissars USSR." 209/

e. Central Asia, Far East, and Siberia.

No special regulations other than the All-Union regulations appear to be in effect in these areas. 210/

f. Baltic Republics.

The subscription fees in the Baltic area had to be paid half a year in advance. 211/ Although there is apparently no law governing foreign radio reception, a person caught listening to foreign broadcasts is reportedly prosecuted as performing ar act hostile to the regime. 212/ A person who fails to register his radio will be subject to a fine 213/ in accordance with decision No. 1593 of the Council of Peoples Commissars of 29 September 1939. Furthermore, the transfer of wired radio speakers, their installations and inclusion in a wired network, the taking down of radio wiring,

and the fitting of radio speakers, is prohibited to unauthorized persons. 214/

3. Reasons for Registration of Receivers.

Persons registering receivers are required to give the full capabilities of the receiver. If the receiver contains high-frequency bands, the authorities would then have a record of those persons who could listen to such foreign broadcasts. Besides this, the registration not only serves the purpose of collecting an additional state tax but also could serve to facilitate the impounding of all receivers in case of an unfavorable political development or a war.

4. Official Attitude Toward Listening to Foreign Broadcasts.

While receivers in the USSR have not been confiscated on a mass scale as they were during World War II, some confiscation of special types, however, has been reported in certain sections of the country. 215/ Although listening to foreign broadcasts has not been officially prohibited throughout the Soviet Union, it is forbidden de facto. Listening to foreign broadcasts has been made increasingly difficult by the Russians' liberal interpretation of the "Law for the Defense of Peace." In August 1952, for instance, it was reported that 6 people in Liepaya (Latvia) were arrested and charged with listening to foreign broadcasts. 216/

Certain areas, such as Moldavia, Estonia, and other peripheral areas maintain a more strict attitude toward listening to foreign broadcasts. 217/ On 1 January 1952 the Radio Committee of the Moldavian Communist Party ordered Komsomol organizations in the frontier regions to form "flying squads" to control local radio use. These squads worked in shifts at night checking houses and kolkhozes which might possess private receivers both registered and unregistered with the local communications center. These squads were escorted by armed agents of the MVD (Ministry of Internal Affairs) or militia. 218/

The following year in Lithuania and Kirghiz the Komsomol radio clubs were subjected to more strict control. All radio clubs in the Kliapeda Oblast received orders to submit to the military authorities all data pertaining to the already operating or newly purchased receivers. 219/

In addition, the local security organs in the Kaunas and Vil'nyus areas (Lithuania) were ordered by the commanding officers of the security police on 1 April 1952, to confiscate all receivers operated on batteries. The local party secretaries were instructed to check and report such receivers to the security police immediately. 220/

In addition to these immediate measures, the local party organizations were ordered in May 1951 to observe and to report all known radio listeners in their respective areas, as well as all radio mechanics, radio amateurs, and persons who knew foreign languages and owned receivers. 221/ The regime apparently attempted, in such a manner, to eliminate clandestine listening to foreign broadcasts.

Communist Party cells in local areas launched a vigorous campaign warning people at every opportunity that legal proceedings would be instituted against those who were caught listening to foreign broadcasts. These warnings were issued by the Rayon Communist Party Committees at collective farm meetings, factory party committee meetings, etc. These party committees were also called "sekretye Sotrudniki," better known as "Seksets" (secret police indicators). To their normal functions was added the duty of discovering the listeners to foreign broadcasts and reporting their names to the police. 222/

In the Minsk Oblast in Belorussia, early in 1952, it is reported that every week, at special meetings of local party cells in factories and kolkhozes, the question of listening to radio programs was discussed. At such meetings it was openly said that listening to foreign broadcasts was forbidden, 223/ if not by law, then certainly de facto.

At another meeting early in 1952 in the Minsk Oblast, an engineer lecturing to a political-technical team of a combine said: "The workers must be subdued to a military discipline---- /He/ who listens to any enemy's propaganda, /and he/ who does not report to the authorities those who are listening, is himself an American spy." 224/

Tube receivers are under more strict surveillance than crystal receivers or loudspeakers. During 1951 there were checked intermittently by employees of the radio center. These employees checked to see whether the serial numbers on the receiver corres-

ponded with the number in the central file, whether the receiver had an indoor or outdoor antenna, and the length of the antenna. 225/ This was done presumably to find out if either the receiver or the antenna had been altered to improve listening conditions.

5. Effectiveness of Listening Regulations.

In spite of continued warnings, threats, and punitive measures by the Soviets, listening to foreign radiobroadcasts seem to continue, when circumstances permit.

By and large, after the intensified attack on foreign broadcasting in 1951 by Soviet press, radio, and jamming stations the residents had little inclination to buy receivers in Soviet owned stores. Given the opportunity to purchase a receiver unbeknown to Soviet officials, such as from a departing German specialist, the Soviet people expressed great desire in purchasing if the receiver was capable of receiving high-frequency programs. 226/

Some Russians insisted the receiver be capable of receiving foreign broadcasts before they were interested in purchasing. Still others who brought radios in to be fixed by German specialists specifically told the specialists they would like to improve the high-frequency reception because they wished to listen to foreign broadcasts. 227/

B. Conditions of Listening.

1. Controlled.

Listening in the USSR today differs considerably from that in the free world where individually owned receivers capable of receiving a large number of transmitting stations predominate. In the USSR a majority of the radio audience must depend on loudspeakers wired into receiving relay stations. The wire-diffusion loudspeakers are located not only in public areas and factories but also in private dwellings. Some loudspeakers have no knobs and as a result are on at all times. 228/ Others have only one knob which is the on-off switch and controls only the volume. This speaker must also be left on. 229/ These loudspeakers are strictly controlled by a trusted party member. The party is, therefore, in complete control over all information which reaches the public through wire-diffusion systems. In Moldavia, the propaganda and agitation instructor of the Party

provides for the appointment of three members, local secretaries of the Party in each club or canteen in the towns and villages, who are responsible to the Party authorities for the proper use of receivers in the various establishments. These three-man control teams must see to it that, apart from the Soviet programs broadcast through the relaying centers, no foreign broadcasts are allowed to be heard. When there is no program from the Soviet stations, the receivers must be kept under lock and key under the supervision of one of the members of the Control Team. Furthermore this Control Team has to submit every week a written report to the local Communist Party Secretariat on its work in controlling the reception of the radio programs. 230/

The prevailing conditions of listening to internal Russian broadcasts can best be described by looking at the ratio of loudspeakers in the wire-diffusion system as compared to the independent receivers. It is estimated that in 1953 in the USSR there were 11.38 million loudspeakers, and 5.521 million independent receivers* or 2 loudspeakers to each receiver.

2. Public.

Listening to internal Soviet broadcasts may be done in a group or alone, in private or in public, over the wired loudspeakers and/or privately owned receivers without any fear of molestation. The Soviets have encouraged group listening through the installation of group listening points in factories, kolkhozes, schools, recreational centers, squares and other public areas, using either loudspeakers or independent broadcasting receivers. Listening to foreign broadcasts, however, presents an entirely different picture. Due to the official and quasi-official measures exercised by the Soviet officials, any listening to foreign broadcasts must be carried on with extreme caution. As a result, listening to Western foreign broadcasts in public places is not practiced.

3. Private Listening.

Due to existing conditions, those who listen to Western broadcasts must develop a certain degree of ingenuity to keep from being detected. By various techniques the listeners can be assured of not having to listen in a hurried or furtive manner. 231/

* See Table 8.

According to available information, listening to foreign broadcasts by the Soviet populace is generally done on the sly and while the individuals are alone. 232/ Home listening, within the strict family circle also seems to be a normal practice. Not knowing who can be trusted or who is sufficiently reliable, the families are careful not to create suspicion among their neighbors.

Occasionally group listening is practiced. Even then the groups are limited to eight or ten closely trusted friends who exercise precautions and at times go beyond the regular precautions by placing guards at the doors to warn if a stranger approaches. 234/

Listening to foreign broadcasts in secret groups, however, is not the common practice. It is always risky to rely on the discretion of many people and moreover regular group listening could too easily attract the attention of informers or the MVD.

Those who do listen to Western broadcasts appear to do so with regularity, daily or at least three times weekly, conditions permitting. 235/

C. Jamming.*

1. History.

The present era of Soviet jamming of broadcast transmissions can be considered as having started with the jamming of Russian-language programs from Madrid in 1946. From then until February 1948 no deliberate jamming of either the VOA or the BBC could be discerned. American broadcasts in Russian were first jammed in the Far East USSR in March 1948 and in Western USSR in April 1948. The Vatican broadcasts to the USSR were jammed shortly afterwards, the BBC relays of the VOA were attacked from 25 July 1948. Following this, Russian bulletins from Athens, Ottawa, Belgrade and other sources became targets for the jamming. Beginning on 24 April 1949, a new period of particularly intensive jamming of VOA Russian-language frequencies began and was later extended to cover BBC Russian programs.

In May 1950, VOA broadcasts in Soviet Bloc languages began to suffer, and in the fall of 1951 VOA broadcasts in Finnish

* This subsection prepared by OSI.

were attacked by Russian jammers. BBC bulletins in Rumanian, Bulgarian, and Albanian were attacked in April 1952, and jamming has since been extended to other transmissions in Cominform languages from European and Middle East countries. 236/

2. Jammer Locations.

The location of jammers has been determined for only a small percentage of jamming transmitters. Most jammers transmit at intervals on "ident" or code designator, which apparently is associated with the particular stations. To date some 634 idents have been recorded. 237/ It is not known whether more than one ident originates at the same station, but it seems possible that jamming does occur from this number of different stations. (A particular ident is often observed on several frequencies simultaneously, indicating the use of more than one transmitter at the station -- see section 6 below).

The USSR Radio Jamming Stations Map 7* shows the approximate location of those idents which have been located by monitoring observations.

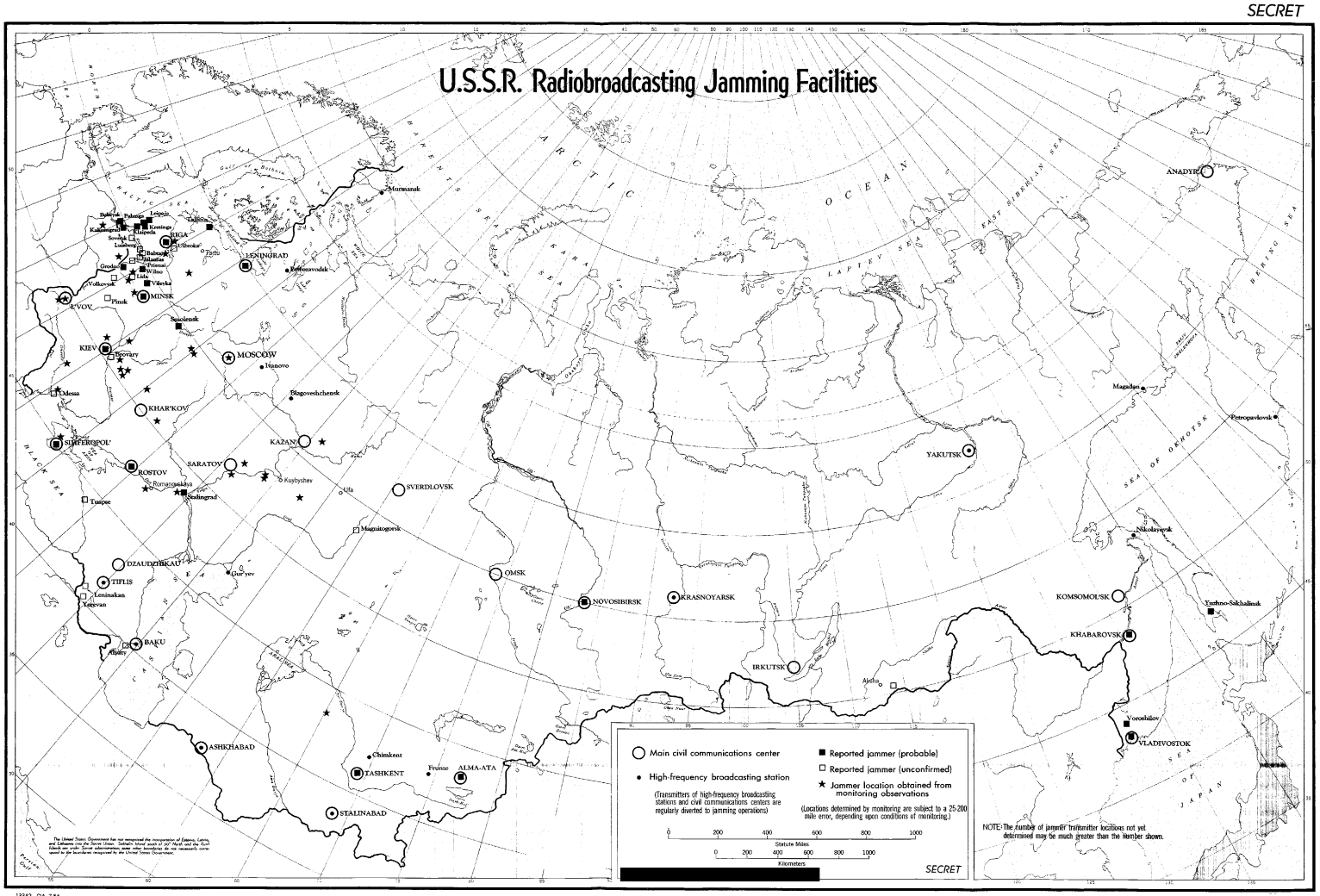
The accuracy of the determination is different in different cases but it is generally thought to be within 50 to 100 miles. Since it is known that nigh-frequency broadcast stations and stations in the civil communications service are regularly diverted to jamming operations whenever needed, the cities at which such stations are located are also indicated. A certain number of collateral reports of jammer locations have been received from defectors. However, most of these are unconfirmed and the validity of the information is unknown, particularly since the external appearance of a jamming station is generally not different from any other radio station. The locations thus reported are also indicated on the map. Although the map cannot be used for pinpoint locations and it probably shows only a small portion of the total, it serves to give a general impression of the distribution of jamming stations.

3. Frequency Coverage.

The Bloc jamming signals cover all portions of the radio spectrum usually used for broadcast activities -- Low-Frequency

* See Map following p. 108.

SECRET



13342 CIA, 7-54

(LF), Medium-Frequency (MF), and High-Frequency (HF). Signals have been reported as low as 173 kc and as high as 21.7 mc. 238/ Jamming transmissions have been reported in the 455 to 470 kc frequency band, which is the "intermediate frequency" used in most European receivers. These jamming signals are apparently intended to "break through" into a receiver regardless of its tuned frequency. 239/

The signal frequency jammers appear to be divisible into three groups: those operating on low- or medium-frequencies on the target broadcasts, using ground-wave propagation to reach the target areas, those operating on high-frequencies on the target broadcast, using sky-wave propagation to reach the target areas, and those operating on high-frequencies on the target broadcasts, but designed to supplement sky-wave propagation by ground-wave coverage in the larger towns and cities. 240/

Most of the jamming signals intercepted have been in the high-frequency portion of the spectrum where the Western broadcasting is concentrated. All broadcast bands have been jammed, although the higher ones (17 and 21 mc) seem to be less intensely jammed, due possibly to the fact that most Soviet high-frequency receivers are not capable of receiving these frequencies. 241/

4. Jammer Power.

It is not possible to determine accurately the power of a transmitter by observation of its signals received at a long distance. However, the jammers apparently have very wide variations in power output, depending upon the frequency of operation and the type of coverage intended--ground-wave or sky-wave. Transmitter outputs are believed to range up to 200 kw on high-frequency and up to 500 kw on medium-frequency and low-frequency. 242/ During severe ionospheric disturbances, it has been observed that a number of jammers have been heard in the US when all other transmitters, both jammers and communications stations faded out, which indicates that the jammers heard were of very nigh power. 243/ It is possible that high-frequency jammers with powers of one kilowatt or less are used for ground-wave coverage in densely populated centers.

5. Jammer Modulation.

From all indications the jammer transmitters are amplitude modulated, although in many cases the AM has rhythmic

variations of frequency.

Many types of audio frequency signals are used for the jammer modulation. Some jammers appear to combine two or more types of modulation at times, and to apply one of several types separately at other times. More than a dozen descriptive terms have been applied to the various types of amplitude modulation which have been used.

The band of audio frequencies which make up the various types of jamming modulation is usually between 40 cps* and 4000 cps, with certain types limited to less than 3000 cps at the high end, and certain others extending perhaps to 5000 cps or more. 244/ Since this frequency range includes the frequencies of normal speech, it constitutes an efficient jamming signal.

6. Number of Jammers.

To count the number of jammers on a frequency in any given period of time is very difficult. The stronger jammers tend to mask the presence of weaker ones and a count is thus likely to be an under-estimate.

Conversely, although there is no evidence of this, a jammer heard on one frequency and time may be the same jammer using a different ident on another frequency and time, and a count could thus be an over-estimate. Recently, a world-wide "number count" was made of jammers in simultaneous operation, and more than 900 jammers were logged. 245/ How many of these jammers are in the USSR and how many are in the Satellites is not accurately known.

It is probable that, if necessary to meet an increased broadcasting effort, the number of jammers could be increased by the use of reserve transmitters, releasing communications transmitters for jamming by more efficient use of facilities and services, and by diverting traffic to alternative media. Many lightly loaded services which do not require the use of transmitters on a 24-hour stand-by basis could be made available for jamming during part of the day. The USSR has at various times diverted transmitters from domestic program service to jamming, and has jammed even at the cost of interfering with its own domestic programs. 246/

* Cycles per second.

7. Jamming Procedures.

In the past it appeared that perhaps 70 percent of the jammers operated at definite times and on definite frequencies with little or no control exercised over them for instantaneous action, while the remainder of the jammers followed a flexible procedure, being controlled quite effectively and rapidly to jam any new programs which appeared. 247/ More recently it appears that the majority of the jammers are in the latter category and are quite flexible.

In order to cover each broadcast effectively, a number of jammers are frequently used on each channel to be jammed. Often two, three, or four jammers can be distinguished on a single channel, and occasionally as many as nine or ten have been observed.

Many of the roving jammers are closely controlled from monitoring stations so that immediate action can be taken to jam any new programs, or programs which undergo unannounced frequency changes. Under some conditions the jamming follows the broadcast frequency changes as though the jammer and a monitoring receiver were being operated by one individual. 248/

8. Jamming Organization.

The organization responsible for the control of the jamming has not been positively determined. However, responsibility for basic policy probably is assigned to the Ministry of Internal Affairs (MVD), 249/ with the Ministry of Communications generally being responsible for the operation. 250/

The belief that jamming is controlled by the MVD is further substantiated by the reported fact that the Department of Counter-Intelligence (OKR) of the MVD is responsible for direction of the jamming performed by the Soviet Army in East Germany for the purpose of protecting itself from foreign broadcasts. The jamming equipment is operated by a sub-unit of the Army signals regiment. 251/

It is known that the jamming organization is well integrated, with the USSR and the Satellites cooperating fully in the jamming of western broadcasts to the USSR and the Satellites. Apparently part of the organization is in rapid communication with

a listening station or stations from which the jamming activity is controlled, while other jammers receive their instructions either in writing or by some form of communication that is subject to a variable delay of several days' duration. 252/ It is probable that instructions pass between the principle control center, possibly Moscow, and the provincial cities, and Satellite capitals.

The major portion of the rapid control communications is assumed to be carried on by wire or micro-wave circuits. 253/ There is a report of a direct telephone link between MVD headquarters and one of the larger jamming centers. 254/

A majority of the jammers use idents which are transmitted in International Morse code. These idents are usually repeated periodically, with intervals varying from 20 seconds to one minute or more, 255/ with 58 second intervals most frequently observed. It is believed at present that an ident is limited in use to a definite geographical location and its main purpose seems to be to facilitate a check of the performance of the jammers by the control net.

9. Jamming Effectiveness.

The effectiveness of the USSR jamming program varies according to time of day and time of year, program, frequency, and location, which makes it extremely difficult to determine effectiveness except as observed in a specific location at a specific time. However, in general, the following conclusions can be drawn: jamming is systematic and regularly applied against Russian language programs directed to the USSR, despite the fact that these programs have at times been broadcast simultaneously on as many as 40 different frequencies. Jamming in the urban areas is probably more effective and thorough than in the rural areas, which may be due to the dependence, in rural areas, on sky wave signals instead of on ground wave signals. Evidence of this is contained in Embassy reports for the period between 24 March and 23 April 1954. Out of a total of 568 observations of Russian language broadcasts monitored in Moscow only 17 were intelligible. [redacted] 25X1X6

25X1X6 [redacted] /

A defector reports that reception of VOA broadcasts in Tbilisi was almost always poor, but in an area from 60 to 100 km. outside

Tbilisi, the reception of Russian language VOA broadcasts was quite clear. 257/ Another report states that in May 1953 it was almost impossible to understand VOA in the vicinity of Riga because of heavy jamming. 258/ Reception in the Moscow area, of English language broadcasts is not subject to intensive jamming as are Russian language programs. For example, the VOA reception summary for the last six months of 1953 indicates that of 41 reports from Moscow of Russian language high-frequency programs, on only four occasions was at least one frequency found to be intelligible. On the other hand, during the same period, out of 14 reports from Moscow of English language high-frequency programs, on six occasions at least one frequency was intelligible. 259/ This is verified in general by the [redacted] mentioned above. It is possible that broadcasts in some Satellite languages can also be heard. For instance, it is reported that prior to 1952 BBC broadcasts in Polish, Czech, and Serb were not interfered with in Moscow. 260/

25X1X6

10. Atmospheric Conditions.

In addition to jamming other conditions adversely effect radio reception. Atmospheric conditions, both natural and manmade, vary considerably throughout the USSR from day to day, and even from hour to hour. In the large cities and industrial areas radio reception will be poor because of noises and power shortages from the use of electrical equipment. Similarly, natural atmospheric interference in the mountains and the northern Taiga and Tundra Auroral zones of the USSR always render themselves to adverse radio reception conditions.

V. Effectiveness of Foreign Broadcasts.

A. Size of the Audience.

1. Direct Listening Audience.

There are no "hard facts" available on the size of the listening audience for Western broadcasts. Most defectors decline to make any estimate as to the number of people who listen to such broadcasts. 261/

The effectiveness of Western broadcasts is mainly inferred from fragmentary direct and indirect evidence. It is estimated that on 1 January 1954 there were in the USSR approximately 5.5 million independent receivers. Of this number some 3.125 million* were tube receivers, of which 2.175 million* were believed to have had high-frequency tuning capabilities. The remaining receivers were of the crystal type, some of which, in the fringe areas of the USSR could receive certain foreign broadcasts. At least half a million of these tube receivers must be written off because they are for group listening in places like trade unions, factories, recreational areas and other public places, and relay centers of wire-diffusion systems, where they are under control of the authorities and therefore not available for listening to non-approved sources. 262/ This leaves a range from 1.675 to 2.625 million receivers with high-frequency tuning capability which are capable of receiving some foreign broadcasts. Based on an estimated population of 214 million persons** this leaves a range of one receiver for every 82 to 128 persons.

If the reports are true that "virtually everyone who owns a radio" 263/ listens to Western broadcasts, this would still leave only a relatively small segment of the total audience potential that would be capable of receiving the broadcasts directly by radio.

The largest portion of the potential audience is situated

* These quantities were determined on the assumption that 750,000 of the 1 million receivers in the USSR after World War II have high-frequency tuning capability and are still in use, and on the percentage of such receivers to the total receivers produced in the USSR since the War (see Section III).

** Information obtained from ORR/S/OM.

in the European part of the USSR and in the peripheral areas. They also appear to be concentrated in urban and industrial areas rather than in rural areas. 264/

2. Indirect Audience.

The size of the total audience should not be judged entirely by the number of available receivers capable of receiving Western broadcasts. Despite official sanctions to inhibit word-of-mouth communications there is every evidence that there exists in the Soviet Union an important unofficial oral communication system which is inextricably interwoven into the controlled official media. Even though refugees, returnees, and defectors continually state the dangers of talking with another person about foreign broadcasts, they also say that rumors circulate very quickly. 265/ The Intelligence Research division of the Human Resources Institute made a study of some 2700 returnees, defectors, and refugees from the USSR and found that unofficial word-of-mouth communication provides a major news source for all strata of the Soviet population. 266/ Pertinent extracts from this study are shown in Table 18.

Table 18

Percentages of Interviewees Citing Word-of-Mouth Media as Regular and as Most Important Sources of Information in the USSR 267/ a/

	Percentage for Total Group	Percentage by Occupational Group			
		Professional	Employee	Worker	Peasant
A. Regular Source	50	53	44	48	62
B. Most Important Source	33	32	22	22	69

a. Based on oral interviews.

More siginficant than the over-all importance of oral dissemination is the question of group difference in the use of this medium. According to the above study the better educated, or intelligentsia, reported receiving word-of-mouth communications more frequently than did the lower classes, but, in relation to other sources, oral dissemination is relatively less important. For the lower class, oral dissemination plays a relatively more important role as a source of information.

Even though this study was not made for the purpose of discovering a pattern for oral dissemination of foreign broadcasts, the evidence at hand indicates no change in the basic pattern. 268/

B. Nature of the Audience.

On the basis of presently available information the Soviet listening audience cannot be divided into the standard social categories by age, sex, class, occupation, etc. Ordinarily the official differentiation of the population in the USSR along the class lines is distinguished by the intelligentsia, the working class, and the peasantry. Actually, however, the limits on the accessibility of these distinct groups makes it currently inadvisable to make such a fine dividing line between the various classes. The most feasible approach is to adopt a gross differentiation into two groups: the ruling class and the intelligentsia on one hand and the peasants and workers on the other.

Two other groups, the military and prisoners of war, do not fall within the above categories and as a result are treated individually.

1. Military.

There are reportedly large numbers of radio sets in the hands of armed forces personnel. 269/ This military group appears to enjoy the most freedom of listening to foreign broadcasts, especially radio operators and officers. 270/ Even among these groups the individuals exercise a degree of caution because there exists an elaborate network of informers and bureaus in the Soviet Army for disciplining their personnel who break the rules. 271/

Severe warnings were issued by certain officials to those caught listening to foreign broadcasts, but these same officials

seemed to exercise a greater degree of tolerance among military personnel than comparable officials dealing with civilians. 272/

2. Prisoner-of-War and Labor Camps.

Direct listening by internees of labor camps presents a relatively small problem since there are very few receivers in these camps and these, unknown to the officials, are used for clandestine listening. 273/ Oral dissemination plays an important role among internees. News of happenings in the West is obtained through civilian drivers of vehicles and administrative personnel having authorized access to the prisoner compounds. 274/

3. Civilian Population.

Among the remaining Soviet population the independent receivers capable of receiving Western broadcasts appear to be concentrated largely in the hands of members of the intelligentsia and the ruling class. This was especially true until receivers became more abundant and less expensive in 1949. Until that time only field officers, MVD, Party members, certain industrial key personalities, and a few people who were completely above suspicion, could either afford or be entitled to buy receivers capable of receiving foreign broadcasts. 275/ Even Komsomol members were not permitted to own receivers for fear they would become disloyal. 276/ In 1949 the picture began to change. More receivers were available although the better ones, capable of receiving foreign broadcasts, were still too high-priced for the average individual to purchase. 277/ Even though independent receivers became more abundant, evidence indicates they are not all capable of receiving foreign broadcasts* and the better receivers remain concentrated in the hands of the intelligentsia and the ruling class. 278/

Further evidence indicates that at least some Communist Party officials listen to foreign broadcasts, although to what degree is not known. 279/ It is known, however, that some strong pro-Communist Party members do listen regularly to Western broadcasts purportedly for professional reasons. They reported it was one of their party duties to be prepared to answer all questions at the

* It is estimated that 33 percent of all independent receivers produced in the USSR since World War II are capable of receiving low-, medium-, and high-frequency broadcasts. See Figure 5 following p.

frequent group discussions in the party organizations. In order to refute the "monstrous falsehoods" at these group discussions they had to keep up with Western broadcast information. 280/

In view of the fact that there is a large degree of listening among military personnel who have at their finger-tips a much more expensive receiver than is used by the general public, and because it is known that the Russians do have a large number of transmitting stations, it can be assumed that there are also considerable numbers of receivers for commercial use. Therefore, in addition to these persons who listen to Western programs by means of broadcast receivers, there are also those who listen by means of radio receiving facilities not intended for radiobroadcast reception. This portion of the population may be comparatively small but it is composed of active adults who would normally be interested in keeping abreast of world activities. These persons are operators of stations other than radiobroadcast stations, namely, those of maritime, amateur, point-to-point, police, meteorological, aviation, and railroad units. It is also known that most of these units use high-frequency radio equipment with receivers better and more capable of accurately receiving Western broadcasts. If this is combined with the better skill of the radio operator in avoiding jamming, it will be found that this audience could represent an important group of the total population with respect to listening to foreign broadcasts.

C. Popular Stations, Languages, Times, and Frequencies for Listening.

1. Popular Stations and Languages.

The popularity of foreign broadcasts emanating from the different Western countries varies in different sections of the USSR. VOA and BBC appear to be the preferred stations by the largest percentage of returnees, refugees, and defectors. 281/

Sufficient information is not available to rate other foreign broadcasts according to a descending line of popularity. Other broadcasts reported to have been received include: Radio Madrid, 282/ Radio Free Russia, Radio Liberation, 283/ Vatican Radio, 284/ Iranian programs, 285/ Yugoslav and Italian broadcasts, 286/ and Sidney, Australia. 287/

The most popular language for listening is the Great Russian language in which all the above stations broadcast.

Those listening for foreign broadcasts attempt to locate programs being broadcast in their own native language. 288/ Thus the Baltic people usually listen to VOA and BBC not only in the Russian language but they also seek to locate the programs being broadcast in their own language, which is more understandable to them. 289/ Evidence also indicates that Lithuanians listened to Lithuanian language programs being broadcast from Radio Rome and the Vatican Radio. 290/

The German language was also popular among the listeners. This language was not only understood among the German people living in the various regions but was also understood by many Russians who had a limited amount of German language in their early education. 291/ Thus German language programs listened to include Radio Ankara, 292/ "Southwest" and Nord West Deutscher Rundfund (NWDR) 293/ and RIAS. 294/

Still other languages listened to include English from Switzerland, Italian, Spanish, 295/ Iranian, and Turkish. 296/

The reasons for the popularity of the stations vary from individual to individual depending upon such things as the person's likes or dislikes, education, background, and language, and from one section of the USSR to the other depending upon the strength of the station, effectiveness of jamming, and language preference.

Over-all, however, as stated above, VOA and BBC are rated the most popular stations.* The main reasons for VOA's popularity, at least among refugees and defectors, are: it is usually considered as having the best international news service; it takes a stronger line against the Soviet regime and its leaders 297/; the Russians feel more deeply toward the Americans than toward the British; they look upon America as the nucleus and moving force in the world outside the Iron Curtain. 298/

BBC's popularity came from the highly educated respondents, whose tendency was to prefer BBC news because of its

* Lack of sufficient information did not permit a choice to be made between the two. According to State, IBS/E, VOA Evaluation Reports, VOA was referred to more often in the press and radio.

objective and reasoned quality and excellence of political commentary. 299/ Other refugees prefer BBC because it is broadcast at a more suitable time in relation to their working hours and was not jammed as heavily as the VOA programs. 300/

2. Best Listening Times.

Ideally the most convenient time for listening would be early in the evenings and mornings, in order to conform to the working hours of the Russians. Most Western broadcasts, however, are severely jammed particularly during these periods. Because of the severe jamming it is relatively fruitless to listen for foreign broadcasts from 1800 to 2400 hours local time, unless one has a relatively sensitive receiver or lives outside the urban and industrial centers. 301/ Even though these hours are more suitable to the individuals concerned, those who listened to foreign broadcasts regularly, without interference, usually listened for short periods between the hours of 2400-0600 depending on the local conditions. 302/

This is not to say that all listening is carried on during these hours. It is sometimes possible on some frequencies to hear fairly well at the edge of the frequency, so those who choose to listen at other times do so in this manner, 303/ although none too successfully.

3. Popular Frequencies.

The most popular frequency for listening varies with the time of day. During the day the 10.3 mc and 9.7 mc are most popular. In the evenings the reception is best on 15 mc, 12 mc, and 7330 kc. 304/ Radio Madrid is received best on 7500 kc and Yugoslav broadcasts are heard on 1200-1225 kc. 305/

More important than the popular stations, times, and frequencies for listening, from the standpoint of this study, is the reaction to foreign broadcasts by both the individuals and the regime on an international and national scale.

D. Reactions to Western Broadcasts.

1. Official.

a. International.

Moscow apparently hoped in 1946 to dominate international broadcasting by making the Soviet-controlled International Radio Broadcasting Organization (OIR) the recognized radio frequency agency for controlling international broadcasting. In 1947, however, the OIR was reduced to the status of a regional European radio agency. From its control center in Prague, OIR observes the implementation of the Copenhagen Plan allocating medium and high frequencies to Europe. Both the OIR and the European Broadcasting Union (EBU), which replaced OIR as regional radio representative for Western Europe, inform the interested governments of variations from the Copenhagen Plan.

The USSR has also obstructed an agreement on new frequency allocations to the West and has refused to cooperate with the efforts of the International Telecommunication Union (ITU) to put into operation the frequency allocation system agreed upon at the Atlantic City Telecommunications Conference in 1947. Instead, the USSR insists on keeping the inordinate number of frequencies reserved under the 1938 Cairo Convention 306/ and can claim interference with its broadcasts.

OIR has consequently accused the US, UK, and France of being guilty of using 123 transmitters on 78 channels in violation of the Copenhagen Plan. 307/

b. National.

Due to the violent attacks by Soviet press and radio, virtually everyone in the USSR knows about Western broadcasts. In an effort to combat these broadcasts the Russians launched an intensive radiofication plan, making available at a much lower cost loudspeakers wired to a central diffusion system and radios suitable for receiving local stations only, and increased their jamming efforts. Both of these tactics are discussed elsewhere in this report.

Western broadcasting was under particularly heavy attack in 1950 by Soviet radio commentator Lapin who devoted a series of talks to this subject, wrote an article in Izvestia and summarized his charges against VOA on Soviet Radio Day, 7 May 1950. In the 7 May 1950 issue of the Soviet monthly magazine Radio, the official organ of the Radio Information Committee, Western broadcasts were attacked. Another article in the June 1950 issue was devoted to "The Radio of the War Instigators"; it accused VOA and other Western broad-

casts of using spies and traitors, and an accompanying cartoon ridiculed these "guest speakers" of VOA.

In June of the same year, the Soviet Weekly, New Times revived a controversy with VOA over the living standards in the US and the USSR. This article accused VOA of distorting facts and "impudent and unscrupulous" lying.

Any reference to Western broadcasts in Pravda and Izvestia editorials or Tass bulletins gets the widest distribution in the provincial press and regional stations. An example is a dispatch by Pravda's New York correspondents which was broadcast by Radio Moscow 25 times in 15 languages on Soviet Radio Day, 7 May 1951. 308/

Similarly, an article, "Voice of America" by Boris Efimov, in Krokodil of 30 October 1951, said that voices calling for peace would eventually drown out VOA.

Still another article in Izvestia, 26 October 1951, "The Ideological Expansion of American Imperialists" by B. Vronskiy depicts foreign broadcasts as the hope and support of Western imperialists.

The foregoing are typical examples of Soviet media depicting foreign broadcasts as the voice, mouthpiece, megaphone, bugle and trumpet of monopolies, capitalists, and Wall Street -- controlled by business men and capitalists, and not the true voice of the people.

Beginning February and March 1953 (immediately preceding and shortly after the death of Stalin) there was an obvious change in Soviet reactions to foreign broadcasts. The Soviet press exercised unusual restraint in mentioning foreign broadcasts in that there was a virtual absence of any reference to foreign broadcasts in press as well as in radio sources. Apparently Moscow was trying new ways of fighting the foreign broadcast infiltration. It is possible that Moscow decided the more vigorously they renounced foreign broadcasts the more curiosity it would arouse in their populace and in turn give the Soviet people a greater desire for listening. Although the Soviets limited the open attacks on foreign broadcasts, they carried on the fight indirectly in the context of slogans coined at the party congress which call for

greater alertness to dangers of "foreign views, ideas, and sentiments." 309/

In January 1954, there began to be more stern calls for greater vigilence in every branch of Communist construction. Articles beamed to ships at sea and echoed at home service broadcasts warned that "intelligence services of imperialist states are feverishly looking for all sorts of degenerate people" 310/ for their subversive aims. Apparently the Soviets have again reversed their tactics in fighting the effects of foreign broadcasts.

2. Individual.

a. Reasons for Listening.

Curiosity seems to be the most important motive for listening to foreign broadcasts: curiosity about the life in America, about how ordinary Western people really live and how the Western standards compare with their own standards of living. 311/ Many of the listeners indicated they did not believe in the truthfulness of the Soviet news sources and as a result they sought to listen in order to check the validity of their own news sources. 312/ Still others indicated that the constant Soviet propaganda against the US produced a fear that war was imminent and they were curious to listen and discover if there were any indications to confirm these fears. 313/

b. Programs Listened For.

In view of the reasons for listening, news programs stood in first place as the type of program listened for. Nearly every person interviewed who listened to foreign broadcasts indicated news as the main program for which he listened -- news of all types. The Russians are only moderately interested in news of conferences, 314/ or on the straight reporting of conditions in the USSR. 315/ A type of relatively low interest content was news pertaining to free world events which were of no consequence to the listener. 316/

The more important news consisted of that which was obviously pertinent to the East-West conflict, particularly the US position, 317/ replies from Western politicians to the accusations raised by Soviet diplomats, 318/ the Western point of view on the possibility of a new world war, 319/ information on

world events that could affect the USSR, 320/ and news relating to or affecting neighboring countries or areas. 321/

After straight news programs the next in importance was other information about the West, 322/ the attitude of the West toward the USSR, 323/ truth on the real strength of foreign Communist movements, 324/ and the strength and activities of the West. 325/

In the peripheral areas, especially in the Baltics, the occupants not only watched for the above but also sought further indications of opposition to Communism, changes in the Soviet government which might not otherwise receive publicity, 326/ and encouragements which give them hope and indicate that they are not forgotten. 327/

Music and entertainment programs were of insignificant value to most people, 328/ or were not of sufficient consequence to risk detection of listening.

The above information pertains to all strata of the Soviet population. Evidence indicates, however, that the better educated groups usually listen to the programs more objectively to discover if the US interests are founded on purely selfish motives. 329/ It has also been indicated that the "Bourgeoisie," meaning the beneficiaries of the regime among the Russian civilian population, were more interested in entertainment programs than foreign political information. 330/

c. Opinions of Foreign Broadcasts.

Some of the more strongly pro-Communist, while in the presence of fellow party members, declare the information of foreign broadcasts to be absolutely unworthy and "monstrous falsehoods." 331/ In general, however, the programs impressed the listening audience favorably. From the many remarks made by refugees and defectors, it was indicated that the broadcasts could become more effective if more time and space were devoted to programs with the following characteristics:

(1) Truth about the Communist movement and its aim;
(2) Programs carefully checked so as not to include outdated expressions;

(3) Particular emphasis on the failure of Communist diplomacy or propaganda;

(4) Information about parliamentary and democratic institutions in the Western meaning of the word, and a comparison with the Communist system;

(5) Exposure of Communist methods of dealing;

(6) Selection of topics to coincide closer with those on which Soviet propaganda concentrates at the given time;

(7) More programs about the fate of escapees, such as discussions of their well being, how they were received, their adjustment and settlement;

(8) Aid and advice to Soviet listeners in combatting the pressure of Soviet ideology and propaganda;

(9) Use of facts and figures to refute the claims and tenets of the Marxist doctrine in particular and Soviet propaganda in general;

(10) Absence of demogoguery or blatant propaganda in attempting to win over the audience;

(11) Statements which are demonstrated slowly and persistently with facts, figures, and eye-witness accounts;

(12) More differentiation between the Soviet people and the Soviet state, with no blame on the people for the excesses of the regime;

(13) Subjects not limited to political conditions in the USSR. All aspects of the Soviet society and the Soviet system should be under attack;

(14) The programs should attempt to give the people new ideas which would raise them out of their state of apathy and indifference caused by work and continual pressure from the regime.

At the same time, this must all be exercised with great skill and care because the people are touchy on any item that could possibly be construed as indicative of lacking appreciation of Russia. The commentaries, therefore, should not be too sharp or anti-Russian in form, and allowances should be made so as not to create a feeling among the Russians that Western transmitters are adopting exactly the same method as the Communist propaganda.

E. Economic Effects of Foreign Broadcasts.

There is no real way of measuring the economic effects of foreign broadcasting. The effects that can be judged have to be gained through inference. Since many defectors from the USSR

indicated that listening to foreign broadcasts gave them the courage to defect, it can be assumed that, even though the effectiveness cannot be measured, the broadcasts do provoke some thought and discussion among the Soviet populace. Encouragement from the outside world and dissatisfaction with the present working conditions could create unrest among the Soviet populace. Such unrest, if instituted, would probably adversely affect labor's propensity to produce in quantity and quality and might even incite acts of industrial subversion.

It is increasingly evident that the Soviet regime is becoming more concerned over the effectiveness of foreign broadcasts. It is reported that the Russians are busily organizing courses for students to familiarize themselves with the techniques of foreign broadcasts and ways of counteracting them. 332/

In the Caucasus the local party in the rayon districts reportedly set up special "radio discussion circles" in order to combat foreign broadcasts. 333/

Monetarily, the broadcasts serve as a continual drain on the Soviet economy. It is estimated that the Soviet jamming network employs roughly 10,000 technicians and costs approximately five times more than the total costs of US broadcasts to the whole Orbit. 334/

It is believed that the foreign broadcasts have been one of the prime factors for causing the Russians to intensify their radiofication programs.

VI. Trends.

Following World War I and the Bolshevik Revolution, the USSR was in a state of political, social, and economic chaos and was faced with many problems requiring important decisions relative to control, development, and growth. These problems and decisions, which differed greatly from the norm, placed restrictions on the development of radiobroadcasting. Nevertheless the efforts made to overcome deficiencies in material, industry, and technical personnel resulted in greater quantities of resources available for diversion from the basic economic and military needs to the development of a broadcasting system.

It is estimated that in 1941, prior to World War II, the Russians had 100 broadcasting transmitters with a total power output of 4000 kilowatts. Almost 1/3 of the transmitters and 1/2 of the power output were lost as a result of the war. By late 1947, however, the growth in terms of numbers of stations and total power output had again reached the prewar level of physical facilities. The rate of growth in numbers of broadcasting transmitters in the USSR remained relatively constant until 1950. From 1950-53, the number of transmitters increased only slightly, indicating stabilization to a great extent. The total power output, however, continued to increase at a constant rate.

Since 1947 the trend seems to be toward the improvement of technical quality and efficiency in the domestic service and toward coordination of important stations of the Satellite countries into the Soviet international broadcasting system with a view toward improvement of reception of Soviet programs both in the USSR and in the international target areas without a correspondingly great expansion of the transmitter power base. It is believed that this trend will continue.

With the subordination of the broadcasting system under the Ministry of Culture in 1953, it appears that the USSR is attempting to centralize all propaganda-information functions under a single responsibility and thus achieve the dual function of relieving the Council of Ministers of direct administrative responsibility and facilitating the dissemination of the current "party line" uniformly through all media. This further strengthens the supervisory ability of the Communist Party over the "education and enlightenment of the masses." At the same time the move maintains the Ministry of

Communications in a relationship to broadcasting which is of a strictly service nature, to provide technical facilities, advice, and maintenance assistance to the Ministry of Culture.

The progress made in the development, quality, and use of television in the USSR appears still to be in the developmental stage. Technical and economic problems of expansion, including transmitters and receivers, will probably occupy the main attention of those responsible for television in the USSR for some time to come.

While two radiobroadcasting stations in the USSR have been using Frequency Modulation in the UHF band for a number of years it seems likely that the economic factor of the competition of radiofication and the further development of TV, which probably have higher priority than a new aural broadcasting system, may delay FM development for some time to come.

The reception base of the USSR is being extended from the urban areas to cover the rural areas. Independent tube receivers, crystal receivers, and wire-diffusion systems are being employed as appropriate to a given circumstance. The use of small independent tube receivers is increasing. The over-all proportion of wire-diffusion loudspeakers to independent receivers is decreasing somewhat, notwithstanding the current drive to radiofy the countryside by use of wire-diffusion systems. From 1951 to 1954 the annual estimated production of the better classes of receivers, those having low-, medium-, and high-frequency reception capabilities, has increased from approximately 11 percent per year to 33 percent per year. The estimated annual production of loudspeakers during the postwar years (1946-54), with some slight fluctuations, has remained quite constant -- at one million loudspeakers.

The Soviets exercise strict control over all types of communications media in the hands of its citizens. In carrying out its policy of preventing the populace from acquiring information which might be construed as contrary to the propaganda line, considerable time, money, and effort is expended to keep foreign radiobroadcasting from the people. Legal restrictions affecting the ownership of receivers relate only to the compulsory registration of them and to the payment of a subscription fee which entitles one to listen on them. Specific laws which prohibit listening to foreign radio programs apparently do not exist. In 1951, however, a decree was promulgated, "Law for the Defense of Peace" which prohibits oral

dissemination of information heard over such programs. This law is subject to wide interpretation and persons guilty of it are to be arraigned and tried as major war criminals. Information is not available to indicate a trend either in the number or severity of such laws, restrictions, or any consistent effort to enforce them.

As regards the conditions of listening, the general trend appears to continue toward an increase in the measures taken by authorities to build up a "captive" audience which will be forced to listen to the Communist programs. This, combined with the increase in jamming facilities and techniques, especially in urban and industrial areas, indicates a decreasing reception potential for foreign broadcasts.

Nevertheless, the severe attacks by the Soviet press and radio on foreign broadcasts indicate that the regime is becoming more concerned over the effectiveness of such broadcasts as may get through. From these attacks and through word-of-mouth dissemination of information, an important medium of communication in the USSR, a very large proportion of the Soviet population at least becomes aware that foreign broadcasts to the USSR are being made. This awareness should tend to increase the size of the audience as more persons learn of the validity of foreign broadcasts.

With the lowering of prices and increases in supply, tube receivers have recently become available, economically, to those of the political and industrial hierarchy downward to the professional level of scientists, teachers, engineers, and army officers and to plant and enterprise officials of the upper and middle levels of this "classless society."

APPENDIX A

FREQUENCIES USED TO BROADCAST VOA PROGRAMS TO THE USSR 335/
May 1954 a/

	High Frequency b/									
	17 Meg	15 Meg	11 Meg	9 Meg	7 Meg	6 Meg	5 Meg	3 Meg	Medium Frequency	Low Frequency
Net A	17780	15270 15250 15165 15230	11890 11870 11790 11710	9700 9650						
L		15160		9210						
B	17830 17795	15165 15130	11890 11710	9650						
Net C	17830 17795 17760 17795	15330 15270 15250 15130 15200	11900 11830 11890 11790	9615 9520 9650 9545		6170 6060 6040 6155				
BBC		15230 15210 15300	11860 11770 11700 11750 11840	9675 9700 9690 9660	7250 7110		5990			
MUN		15410	11830 11890	9540	7115	6140 6080 6185		3980	1195	173
SAL			11845 11735	9530 9635	7265 7215	6040	5960			
TAN	17770	15440 15130 15345 15295 15240	11940 11710 11760 11805 11770 11830	9635 9500 9615 9555 9665	7100 7235 7160 7115 7250	6140 6080				
USCG			11805	9685	7200	6015			1260	
AFN									548 1108	

a. VOA schedules and frequency assignments are subject to change from day to day and from season to season.
b. For explanation of frequency bands, see Table 4.

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APPENDIX B

SCHEDULE OF VOA BROADCASTS TO THE USSR a/* 336/

Time GMT	Program Content	Transmitting Location	Frequencies (kc)
0130-0200	Daily: News - Political	USA	11890, 11790, 9650, 9545, 6170, 6060, 6040
0315-0345	(This is a repeat of the 0130-0200 GMT program)	USA	11790, 9650, 9545, 6170, 6155, 6060, 6040
		Tangier (Relay)	11940, 11830, 9665, 9635, 9615, 7250, 7115, 7160, 6140, 6080
1415-1445	Daily: News - Political or News Commentary	USA	17830, 17795, 17760, 15330, 15270, 15250, 15200, 15130
		BBC (Relay)	15230, 15210, 11860, 11770, 9675
		Munich (Relay)	15410, 11830, 9540, 7115, 6140, 6080, 173
		Salonica (Relay)	11845, 11735, 9530, 7265
		Tangier (Relay)	17770, 15440, 15345, 15295, 15240, 11940, 11760, 9635, 9500
		US Coast Guard Cutter "Courier" (Relay)	11805, 9685

* Footnotes to Appendix B follow on p. 137.

Time GMT	Program Content	Transmitting Location	Frequencies (kc)
		Leopoldville (Relay)	15160
1645-1715	Round-up of International News; News & Comments; Inside Russia & Other Areas Behind Curtain; Interviews with Escapees; Quick Rebuttals of Soviet Line as Monitored on Internal Russian Broadcasts and Press.	Munich	
		BBC (Relay)	11700, 9700
		Munich (Relay)	15410, 9540, 6185, 6140, 3980, 173
		Tangier (Relay)	15295, 9635
1800-1830	Daily: News - Political or News Commentary	USA	15330, 15200, 11900, 11830, 9615
		BBC (Relay)	11750, 9690
		Munich (Relay)	15410, 6185, 6140, 3980, 173
		Tangier (Relay)	15440, 15295, 11760, 9555
2115-2145	Daily: News - Political or News Commentary	USA	15270, 15250, 15165, 11890, 11870, 11790, 11710, 9700, 9650, 15330, 11900, 11830, 9615, 9520
		BBC (Relay)	9690, 9660, 7250, 7110, 5990
		Munich (Relay)	9540, 7115, 6185, 6140, 6080, 3980, 173
		Salonica (Relay)	7265, 7215, 6040, 5960

Time GMT	Program Content	Transmitting Location	Frequencies (kc)
		Tangier (Relay)	15345, 11940, 11770, 9635, 7160
		US Coast Guard Cutter "Courier" (Relay)	7200, 6015, 1260
		Leopoldville (Relay)	9210
0015-0045	Repeat of 2115-2145 program	Tangier	7115
0045-0115	Repeat of 2115-2145 program	Tangier	7115
0115-0145	Repeat of 2115-2145 program	US Coast Guard Cutter "Courier"	7200, 6015, 1260
0115-0145	Repeat of 1645-1715 program	Tangier	11940, 9635, 9615, 7235, 7160, 7115, 6140, 6080
	Repeat of 1645-1715 program	Armed Forces Net (Munich)	548
	Repeat of 1645-1715 program	Armed Forces Net (Stuttgart)	1108
0145-0215	Repeat of 2115-2145 program	Tangier	7115
0215-0245	Repeat of 2115-2145 program	Tangier	7115
0245-0315	Repeat of 2115-2145 program	Tangier	7115
0345-0415	Repeat of 0130-0200 program	Tangier	7115

Time GMT	Program Content	Transmitting Location	Frequencies (kc)
0415-0445	Repeat of 0130-0200 program	Tangier	7115
0445-0515	Repeat of 0130-0200 program	Tangier	7115
0515-0545	Repeat of 0130-0200 program	Tangier	7115
0600-0630	Repeat of 0130-0200 program	Tangier	15130, 11830, 9635, 7250, 6080
1230-1300	Repeat of 1645-1715 program	Munich	15410, 11890, 11830, 9540, 7115, 6140, 6080, 173
1230-1300	Repeat of 0130-0200 program	Tangier	17770, 15440, 15345, 15295, 15130, 11940, 11760, 9635, 9500
1300-1330	Repeat of 0130-0200 program	Munich	15410, 11830
1330-1400	Repeat of 0130-0200 program	Munich	15410, 11830
		Tangier	17770, 15440, 15345, 15295, 15130, 11940, 11760, 9635, 9500
1445-1500 b/	Repeat of 1645-1715 program	Munich	15410, 11830, 173
1500-1530	Repeat of 1415-1445 program	Munich	173
1530-1545 b/	Repeat of 1645-1715 program	Munich	173
1545-1615	Repeat of 1415-1445 program	Munich	173

Time GMT	Program Content	Transmitting Location	Frequencies (kc)
1615-1645	Repeat of 1415-1445 program	Munich	15410
1715-1745	Repeat of 1415-1445 program	Munich	15410
1830-1845 b/	Repeat of 1645-1715 program	Munich	173
1900-1930	Repeat of 1800-1830 program	Munich	15410, 6185
1930-2000	Repeat of 1800-1830 program	Munich	15410, 6185
2000-2030	Repeat of 1800-1830 program	Munich	6185
2030-2045 b/	Repeat of 1645-1715 program	Munich	6185
2145-2215	Repeat of 1645-1715 program	Munich	9540, 7115, 6185, 173, 1195
	Repeat of 1645-1715 program	Tangier	15345, 11940, 9500, 7100
2245-2315	Repeat of 2115-2145 program	Tangier	7115
2315-2345	Repeat of 2115-2145 program	Tangier	7115
2345-2415	Repeat of 2115-2145 program	Tangier	7115

a. VOA schedules and frequency assignments are subject to change from day to day and season to season.
b. 15-minute element.

APPENDIX C

USSR RADIOBROADCASTING TRANSMISSION DATA a/* 337/
(1 January 1954)

Low Frequency - Medium Frequency - High Frequency

Location	Call	Power - kw	Frequency - kc	Symbol**
Abakan, RSFSR	RV68	2.5	617	A
Alma Ata, Kazakh	RV90	10	132	
	RWJ	5	5310	
		15	5860	
		15	5900	
		15	6220	A
		15	9250	
		15	9340	
		15	9380	
		15	9451	A
		15	15000	A
Arkhangelsk, RSFSR	RV36	10	356	
Ashkhabad, Turkmen	RV19	10	380	
		15	6179	
		15	9600	A
		15	9680	
		15	11839	A
Astrakhan, RSFSR	RV35	10	791	
Baku, Azerbadzhan	RV8	35	218	
		2	4958	
		2	6195	A
		2	9840	
Birobidzhan, RSFSR	RV22	2	710	V
Blagoveshchensk	RV122	5	227	
		1	4956	
Bukhara, Uzbek			6072	
Cheboksary, RSFSR	RV74	5	319	
Chelyabinsk, RSFSR	RV72	10	737	
Chernovtsy, Ukraine			674	

* Footnotes to Appendix C follow on p. 153.
** See special notes at end of tabulation.

Location	Call	Power	Frequency	Symbol
Chimkent, Kazakh	RVL	1	4310	
Chita, RSFSR	RV52	20	164	
Chkalov, RSFSR	RV45	10	300	
Dnepropetrovsk, Ukraine	RV30	20	1070	
Dzaudzhkau, RSFSR	RV64	10	592	D
	RV64	10	881	N
Dzhambul			5310	
Frunze, Kirgiz	RV6	2.5	611	
		1	4049	
		1	5060	A
Gorkiy, RSFSR	RV42	10	620	
Gorno Altaysk, RSFSR	RV83	1	308	
Groznyy, RSFSR	RV23	1	656	
Guryev, Kazakh		1	5150	
Ioshkar Ola, RSFSR	RV61	10	845	
Irkutsk, RSFSR	RV14	20	200	
Ivano, RSFSR		1	4997	
	RV31	10	926	
Izhevsk, RSFSR	RV78	4	584	
Kaliningrad, RSFSR	RV129	20	1142	
Karaganda, Kazakh	RV46	20	728	
Kaunas, Lithuania		100	827	D
		100	1385	N
			9685	
			15430	
Kazan, RSFSR	RV17	10	254	
		10	566	
Khabarovsk, RSFSR	RV69	50	200	A
	RV54	50	340	
	RV69		629	
		10	760	
		20	4273	
			4581	
		20	5940	
		20	6019	
		20	6149	
		20	8820	A
		20	9378	
		20	9669	A
		20	11800	S
		20	15180	S

Location	Call	Power	Frequency	Symbol
Kharkov, Ukraine	RV4	100	385	
		100	647	A
Kiev, Ukraine	RV87	150	209	
	RV9	100	782	D
	RV9	100	1169	N
		40	6020	
		40	7290	
		40	9271	
		40	9593	
		40	9670	
		40	9804	
		40	11720	A
		40	11785	
Kishinev, Moldavia	RV95	100	998	
Klaypeda, Lithuania	See Kaunas			
Komsomol'sk, RSFSR			180	
			656	
	RV39		791	
			881	
		50	5965	
		50	6055	
		50	6115	A
		50	7280	
		50	9530	
		50	9565	
		50	9660	
		50	9725	A
		50	11710	
		50	11750	
		50	15230	
Krasnodar, RSFSR	RV33	20	611	
Krasnoyarsk, RSFSR	RV128	50	218	
			5910	A
Kuybyshev, RSFSR	RV16	10	809	
Leningrad, RSFSR	RV53	100	263	
	RV70	10	800	
		10	1124	
			7340	
			9600	
			9750	
			11630	

Location	Call	Power	Frequency	Symbol
Leningrad, RSFSR			11885	A
			15055	A
Lutsk, Ukraine		50	414	U
Lvov, Ukraine	RV149	50	935	
Madona, Latvia	RV126	20	1349	
Magadan, RSFSR			3970	A
			4160	A
			4679	
			5830	
			6967	
			11690	
Makhachkala, RSFSR	RV27	4	313	
	RV137	10	912	
Minsk, Belorussia	RV10	150	281	
		50	400	V
Mogilev, Belorussia		10	1106	
Molotov, RSFSR			5485	I
Moscow, RSFSR	RV2	100	155	
	RV1	500	173	
	RV71	150	200	
		100	236	
		100	548	
	RV86	150	872	
		15	4380	
		50		
		15	4465	
		50		
		15	4550	
		50		
		20	4634	
		15	4675	
		50		
		15	4890	
		50		
		15	5065	
		50		
		10	5080	
		20		
		15	5175	
		50		

Location	Call	Power	Frequency	Symbol
Moscow, RSFSR		10	5260	
		20		
		10	5380	
		20		
		15	5780	
		15	5912	
		50		
		10	5922	
		20		
		15	5930	
		50		
		15	5940	
		50		
		15	5957	
		50		
		15	5965	
		50		
		15	5970	
		50		
		15	5980	
		50		
		15	5990	
		50		
		15	6000	
		50		
		15	6010	
		50		
		15	6030	
		50		
		15	6035	
		50		
		15	6040	
		50		
		20	6046	
		15	6060	
		50		
		15	6070	
		50		
		15	6090	
		50		

Location	Call	Power	Frequency	Symbol
Moscow		15	6100	
		50		
		15	6115	
		50		
		15	6120	
		50		
		15	6130	
		50		
		15	6137	
		50		
		15	6145	
		50		
		15	6150	
		50		
		15	6160	
		50		
		15	6170	
		50		
		15	6185	
		50		
		15	6195	
		50		
		15	6200	
		50		
		15	6210	
		50		
		15	6405	
		50		
		15	6540	
		50		
		3	6660	
		15	6700	
		50		
		15	7100	
		50		
		15	7115	
		50		
		15	7155	
		50		
		15	7165	
		50		

Location	Call	Power	Frequency	Symbol
Moscow, RSFSR		15	7177	
		50		
		15	7180	
		50		
		15	7190	
		50		
		15	7200	
		50		
		15	7210	
		50		
		15	7215	
		50		
		15	7225	
		50		
		15	7235	
		50		
		100	7245	
		15	7255	
		50		
		15	7260	
		50		
		15	7265	
		50		
		15	7272	
		50		
		15	7280	
		50		
		100	7295	
		15	7300	
		50		
		15	7310	
		50		
		15	7320	
		50		
		10	7330	
		20		
		15	7340	
		50		
		15	7360	
		50		

Location	Call	Power	Frequency	Symbol
Moscow, RSFSR		15	7370	
		50		
		15	7375	
		50		
		15	7400	
		50		
		15	7420	
		50		
		20	7790	
		10	8345	
		20		
		10	8644	
		20		
		10	8760	
		20		
		10	8910	
		20		
		15	8915	
		50		
		10	9145	
		20		
		15	9230	
		50		
		15	9390	
		50		
		15	9430	
		50		
		15	9450	
		50		
		15	9470	
		50		
		15	9480	
		50		
		15	9490	
		50		
		15	9515	
		50		
		15	9530	
		50		
		15	9540	
		50		

Location	Call	Power	Frequency	Symbol
Moscow, RSFSR		15	9545	
		50		
		15	9550	
		50		
		15	9555	
		50		
		15	9565	
		50		
		15	9610	
		50		
		15	9620	
		50		
		15	9625	
		50		
		15	9640	
		50		
		15	9650	
		50		
		15	9655	
		50		
		15	9660	
		50		
		15	9675	
		50		
		15	9680	
		50		
		15	9690	
		50		
		15	9700	
		50		
		15	9710	
		50		
		15	9720	
		50		
		15	9740	
		50		
		15	9750	
		50		
		15	9765	
		50		

Location	Call	Power	Frequency	Symbol
Moscow, RSFSR		15	9770	
		50		
		15	9780	
		50		
		15	9790	
		50		
		15	9801	
		50		
		10	9850	
		20		
		10	9880	
		20		
		15	11645	
		50		
		15	11685	
		50		
		15	11690	
		50		
		15	11702	
		50		
		15	11710	
		50		
		15	11715	
		50		
		15	11720	
		50		
		15	11725	
		50		
		15	11740	
		50		
		15	11745	
		50		
		15	11755	
		50		
		15	11760	
		50		
		15	11765	
		50		
		15	11780	
		50		

Location	Call	Power	Frequency	Symbol
Moscow, RSFSR		15	11790	
		50		
		15	11805	
		15	11810	
		50		
		15	11815	
		50		
		100	11820	
		100	11825	
		100	11830	
		15	11840	
		50		
		15	11850	
		50		
		15	11860	
		50		
		15	11880	
		50		
		15	11890	
		50		
		15	11900	
		50		
		15	11910	
		50		
		15	11920	
		50		
		15	11930	
		50		
		15	11945	
		50		
		15	11954	
		50		
		15	11960	
		50		
		15	11970	
		50		
		15	11980	
		50		
		20	12020	
		20	12270	
		20	12300	

Location	Call	Power	Frequency	Symbol
Moscow, RSFSR		10	13400	
		20		
		10	14380	
		20		
		20	15040	
		15	15100	
		50		
		15	15110	
		50		
		15	15120	
		50		
		15	15130	
		50		
		15	15140	
		50		
		15	15170	
		50		
		100	15180	
		15	15200	
		50		
		15	15210	
		50		
		15	15220	
		50		
		15	15230	
		50		
		15	15250	
		50		
		15	15270	
		50		
		15	15280	
		50		
		15	15300	
		50		
		15	15310	
		50		
		10	15320	
		20		
		15	15325	
		50		

Location	Call	Power	Frequency	Symbol
Moscow, RSFSR		15	15340	
		50		
		15	15360	
		50		
		15	15370	
		50		
		15	15390	
		50		
		15	15400	
		50		
		15	15410	
		50		
		15	15430	
		50		
		15	15440	
		50		
		15	15450	
		50		
		15	15470	
		50		
		15	15540	
		50		
		15	17750	
		50		
		15	17810	
		50		
		15	17820	
		50		
		15	17830	
		50		
		15	17840	
		50		
Murmansk, RSFSR	RV79	10	656	
		1	4850	
Nalchik, RSFSR	RV51	1	350	U
Nikolayevsk, RSFSR		1	997	
		2	4364	A
		2	5230	
Novosibirsk, RSFSR		100	272	
			5225	I
			15310	

Location	Call	Power	Frequency	Symbol
Nukus, Uzbek	RV81	2	331	
Odessa, Ukraine	RV13	10	548	D
	RV13	10	1241	N
Omsk, RSFSR	RV49	10	390	
Petropavlovsk, RSFSR	RV102		566	
		50	5360	
		50	6070	V
		50	9530	
		50	9545	V
		50	11840	A
		50	11885	
		50	15110	
		50	15230	A
Petrozavodsk, Karelia	RV91	10	611	
			4995	
Riga, Latvia	RV140	100	575	
Rostov, RSFSR	RV12	20	764	
Saransk, RSFSR	RV65	1	1061	
Saratov, RSFSR	RV3	20	340	
Simferopol, RSFSR	RV73	10	647	
Stalinabad, Tadzhik	RV47	2	350	
			6702	
			7201	A
Stalingrad, RSFSR	RV34	10	557	D
	RV34	10	835	N
Stalino, Ukraine	RV26	50	710	
Stavropol, RSFSR	RV124		746	
Sverdlovsk, RSFSR	RV5	40	370	
			9470	
			15270	
Sykyvkar, RSFSR	RV41	1	218	
Tallinn, Estonia	RV151	100	1034	
Tartu, Estonia	RV150	20	710	N
	RV150	20	1214	D
Tashkent, Uzbek	RV11	50	254	
			400	
		15	6730	
		15	6824	
Tbilisi, Georgia	RV7	35	191	D
	RV7	35	200	N
			1182	

Location	Call	Power	Frequency	Symbol
Tbilisi, Georgia		2	5040	
		2	6050	A
Tiraspol, Moldavia	RV57	10	1241	I
Ufa, RSFSR	RV37	10	281	D
	RV37	10	692	N
Ukhta, Karelia	RV67	2	548	I
Ulan Ude, RSFSR	RV63	10	281	
Uzhgorod, Ukraine		20	890	
Vilnyus, Lithuania		10	665	
			1385	
Vladivostok, RSFSR	RV162	10	245	
		100	548	
		100	611	A
		5	5015	
		5	6080	A
		5	9480	A
Voronezh, RSFSR		20	566	
	RV25		944	
Voroshilov, RSFSR	RV77	10	380	
Yakutsk, RSFSR	RV62	10	263	
		2	5979	
Yerevan, Armenia	RV21	50	364	
		5	6075	
		5	7150	A
Yuzhno, Sakhalinsk		2	360	
	RV60		973	
		1	4732	
		1	5002	

SYMBOLS: A Alternate Frequency; D Daytime Operation; I Inactive; N Nightime Operation; S Seasonal; U Unverified Information; V Variable Frequency

Note regarding power: The listed figures are usually authorized power of the transmitter, but in some cases of known deviation the actual operating power has been substituted. When two powers are listed, the figures represent the lower and upper limits of power where a station uses more than one transmitter on the frequency at different times.

a. Each line entry does not necessarily represent a separate transmitter, as transmitters employ different frequencies at different times.

APPENDIX D

DISCUSSION OF THE RADIOBROADCASTING COVERAGE MAPS: NUMBERS 2-4.*

Maps of broadcast coverage, which are based on such technical considerations as signal strength, receiver sensitivity and atmospheric noise level, will give a general impression of the area where reception may be expected. They must not be considered as representing specific areas of coverage. While graphically it is necessary to draw a limit, the observer must recognize that all beyond this limit is not necessarily out of reach and everything within it is not necessarily covered.

Signals, in progressing outward from a transmitter, decrease more or less gradually into areas where the interference from other stations on the same channel, from atmospheric noise or from man-made noise will be significant. However, the latter will vary from place to place at any given time and from time to time to any given place. Moreover, the signal intensity of the station itself depends on a number of factors, some of which are unknown to us in the present case (such as efficiency or directivity of the transmitting antenna, and the earth conductivity, and atmospheric noise level in the vicinity). Some of these factors are subject to wide fluctuations (such as sky-wave transmission conditions). Another variable factor is the ratio of signal to interference which a listener will tolerate. This will vary widely with his attitude (is he earnestly seeking the intelligence in the communication or is he listening critically to be entertained?).

Thus it is recognized that close to a station the signals can be accepted as satisfactory most or all of the time and at some distant point they are unsatisfactory most of the time and that selection of some intermediate distance as the boundary of "service" will be arbitrary.

In the case of ground-wave coverage (the dark areas in circles shown on the maps, figures 2 and 3) variations in the arbitrary assumptions as to limit of signal strength would make an appreciable difference in the indicated areas, but the over-all impression of ground-wave coverage in the Soviet Union would be much the same as

* This Appendix prepared by OSI.

is shown. In the case of sky-wave coverage (the light areas shown in circles on the maps figures 2 and 3) applying to nighttime conditions on the low- and medium-frequency bands, the field intensity of the signal at points distant from the transmitter decreases comparatively slowly with distance so that a small change in the arbitrary assumptions (for example, the minimum acceptable field strength) would make a large change in the indicated coverage area. For this reason, it is especially pointed out that the areas of sky-wave coverage (light circles) on figures 2 and 3 should not under any circumstances by taken literally. It is likely that often areas not encircled will receive reasonably strong sky-wave signals and it is also likely that often areas encircled will not receive service from the particular station on which the circle is centered. The circles are intended merely to give an impression of the areas beyond the ground-wave services in which at night, broadcasts on the low- and medium-frequency bands frequently penetrate.

In the case of high-frequency, ground-wave coverage is restricted to a few miles and the main purpose is to render sky-wave coverage at great distances. Signal strength at distant points will vary widely with time of day, season, frequency, and antenna directivity, so that it is not practical to indicate coverage on a technical basis. The high-frequency coverage map (figure 4) therefore merely indicates the location of the transmitter and the direction and general area which it is intended to serve.

Technical assumptions used in the preparation of the low-frequency and medium-frequency coverage maps are as follows:

A minimum field intensity of 0.25 millivolts per meter (mv/m) ground-wave constitutes acceptable service on medium frequencies and 1.0 mv/m ground-wave on low frequencies.

A minimum nighttime sky-wave field intensity-median value based on standard propagation curves -- of 0.5 mv/m on medium frequencies and 1.0 mv/m on low frequencies constitutes acceptable service.

Ground-wave coverage on medium frequencies calculated for the center of the band (1000 kc/s) is representative of other frequencies in the band.

Ground conductivity is "good" in loamy or marshy areas,

coverage may be less than shown in rocky or arid areas, better than shown if over water.

Antennas are non-directional vertical radiators from 0.2 to 0.4 wavelengths high on medium frequencies and from 0.15 to 0.3 wavelengths high on low frequencies

There is no interference from another station operating on the same channel at the same time.

APPENDIX E

SOVIET INTERNATIONAL SERVICE a/* 338/

Weekly output in transmitter hours by language
(November 1953)

To Europe	
Albanian	26.00
Bulgarian	47.00
Czech and Slovak	19.00
Danish	21.00
Dutch	24.50
English	101.50
Finnish	46.25
French	70.00
German to Austria	28.00
German to Germany	143.50
Greek	49.00
Hungarian	17.00
Italian	63.00
Lithuanian	7.00
Macedonian	24.50
Norwegian	33.50
Polish	21.00
Portuguese	10.50
Rumanian	41.00
Serbo-Croat	52.50
Slovene	31.50
Spanish	56.00
Swedish	32.50
Ukrainian	7.00
Special Concerts	
Norwegian/Swedish	3.00
English/French/German	59.50
Italian	14.00
Total	1,049.25
To the Far East	
Japanese	238.00
Korean	241.50
Mandarin	329.00
Mongolian	75.25
Uighur	7.00
Total	890.75
To Western North America and Far East	
English	28.00
To North America	
English	686.00
Ukrainian	14.00
Total	700.00

* Footnote follows on p. 160.

To Latin America	
Portuguese	42.00
Spanish	84.00
Total	126.00
To Near and Middle East	
Arabic	39.67
Armenian	28.00
Persian	67.67
Tadzhik	7.00
Turkish	62.41
Total	204.75
To South and Southeast Asia	
Bengali	21.00
Cantonese	21.00
English	28.00
Hindustani	14.00
Indonesian	28.00
Tonkinese	28.00
Total	140.00
Total Transmitter Hours Per Week	
To all Areas	3,138.75 hours
Daily Average	448.39

a. Satellite transmitter hours are not included in these statistics.

APPENDIX F

TELEVISION STATIONS OF THE USSR a/
(1 May 1954)

Location	Picture Transmitter Power (kw)	Sound Transmitter Power (kw)	Picture Frequency (mc)	Sound Frequency (mc)	Symbol b/
Baku					C
Gorkiy					E c/
Kharkov			59.25	65.75	E c/
Kiev	5	2.5	77.25	83.75	
Leningrad			59.25	65.75	
Minsk					C
Moscow			49.75	56.25	
Odessa	.3	.5	49.75	56.25	E
Riga					E c/
Saratov					E
Stalingrad					C
Sverdlovsk					C
Tallinn					E
Tomsk					E
Vladivostok					E
Yaroslavl					E

a. Prepared by OSI.
b. Symbols: E Experimental
C Under construction
c. Gorkiy, Kharkov, and Riga are reported to have experimental stations and to have regular stations under construction.

APPENDIX G

THE ALL-UNION SCIENTIFIC TECHNICAL SOCIETY OF RADIO ENGINEERING AND ELECTRICAL COMMUNICATIONS IMENI A. S. POPOV (VNORiE) 339/

This organization is a central coordinating organization for Soviet scientific research and development in the various fields of radio engineering and electrical communications. It numbers among its members Ministers and Deputy Ministers, directors of many scientific research institutes and higher educational institutions, plus practically all the prominent scientists and technicians in the fields for which it is responsible. The functions are defined in its charter, the basic principles of which are as follows:

> VNORiE is a voluntary organization of scientists and engineers from all parts of the USSR, whose mutual activities are directed toward the constant improvement of Soviet radio engineering and electrical communications and toward the rapid fulfillment of I. V. Stalin's instructions to "surpass the achievements of science abroad."

In fulfillment of its duties as a coordinator of scientific research VNORiE allocates specific projects to its members. It also passes resolutions calling on a ministry, an institute, or sometimes an individual, to proceed with a particular project. It appears that these resolutions carry considerable weight due to the high level of the personnel which are party to them. The section "Organization of Radiobroadcasting" was established early in 1946. Its activities have been reported on in several sessions 1946-51. In the reports presented in these sessions the overwhelming majority were concerned with problems of wire-diffusion broadcasting. Several dealt with multi-channel wire-diffusion systems. Others which figured prominently in the discussions were reports concerned with standards for mass-produced receivers. Reports on VHF, FM, TV, and TV wire-diffusion have also been discussed. The implementation of such reports in research laboratories and factories of the USSR is likely to be carried out within enterprises of both the Ministry of Communications and the Ministry of the Radio Technical Industry, with some work carried on by the Administration of Radiofication of the Main Administration for Radio Information.

APPENDIX H

REPORTED DISTRIBUTION OF RADIOFICATION FACILITIES OF THE USSR a/ 340/*

	Radiobroadcast Receivers (Thousands)		Radio Relay Centers		Wire-diffusion Loudspeakers (Thousands)	
	Number	As of	Number	As of	Number	As of
USSR	1,768.3		20,124		7,794.3	
Baltic States	288.5		542		171.0	
Estonia	78.5	Jan 53	N.A.		N.A.	
Latvia	130.0	May 53	200	May 52	96.0	May 54
Lithuania	80.0	May 54	342	May 52	75.0	May 54
RSFSR						
1. European	485.8		1,586		3,222.1	
Krasnoday Kray	58.0	May 54	524	May 54	(50.0)	51
Stavropol Kray	15.0	May 53	N.A.		132.0	May 53
Arzamas Oblast b/	N.I.		N.I.		N.I.	
Arkhangel'sk Oblast	N.I.		(47)	51	(4.2)	51
Astrakhan Oblast	N.A.		N.I.		N.I.	
Balashov Oblast b/	N.I.		N.I.		N.I.	
Belgorod Oblast b/	N.A.		N.A.		N.A.	
Bryansk Oblast	N.A.		109	May 53	(4.0)	52
Crimea Oblast	N.A.		N.A.		95.0	May 54
Gor'kiy Oblast	(22.0)	53	(70)	49	(80.0)	49
Grozny Oblast	N.I.		N.I.		(7.7)	53
Ivanovo Oblast	N.I.		(12)	Apr 53	N.A.	
Kaliningrad Oblast	N.A.		N.A.		N.A.	
Kalinin Oblast	(0.3)	Nov 53	N.A.		(23.0)	Dec 53
Kaluga Oblast	N.A.		N.A.		N.A.	
Kamensk Oblast b/	30.0	May 54	N.A.		86.0	May 54

* Footnotes for Appendix H follow on p. 168.

	Radiobroadcast Receivers (Thousands)		Radio Relay Centers		Wire-diffusion Loudspeakers (Thousands)	
	Number	As of	Number	As of	Number	As of
Kirov Oblast			6	49	2.5	49
Kostroma Oblast	N.A.		N.A.		63.5	May 54
Kursk Oblast	7.0	52			(52.0)	52
Kuybyshev Oblast	N.A.		N.A.		(3.0)	51
Leningrad Oblast	(85.0)	Feb 53			(700.0)	Feb 53
Lipetsk Oblast	N.I.		N.I.		N.I.	
Moscow Oblast	230.0	May 54	N.A.		600.0	May 53
(City of Moscow)					1,000.0	48
Murmansk Oblast	N.I.		N.A.		N.A.	
Novgorod Oblast	N.A.		(30)	48	(35.5)	48
Orel Oblast	8.0	May 52	N.A.		47.0	May 52
Penza Oblast	(0.1)	49	(29)	49	N.A.	
Pskov Oblast			(20)	52	N.A.	
Rostov Oblast	N.A.		(124)	Nov 53	(60.0)	52
Ryazan Oblast	(0.2)		133	May 53	(0.2)	51
Saratov Oblast	N.I.		N.I.		(30.0)	53
Smolensk Oblast	(21.4)		90	52	(29.4)	50
Stalingrad Oblast	N.I.		132	48	56.0	48
Tambov Oblast	N.A.		(10)	53	(10.0)	53
Tula Oblast	N.A.		N.A.		N.A.	
Ul'yanovsk Oblast	N.I.		106	Mar 52	N.A.	
Velikiye Luki Oblast	8.5 b/	Jul 52	N.A.		26.5 c/	Jul 52
Vladimir	N.I.		N.A.		N.A.	
Vologda Oblast	N.I.		(17)	52	(4.0)	52
Voronezh Oblast	N.A.		(27)	49	(20.0)	49
Yaroslavl Oblast	(0.3)	48	N.A.		(0.6)	48
Chuvash ASSR	N.I.		N.I.		N.I.	
Dagestan ASSR	N.I.		N.A.		N.A.	
Kabardinian ASSR	N.I.		N.A.		N.A.	
Komi ASSR	N.I.		N.I.		N.I.	
Mari ASSR	N.I.		N.I.		N.I.	
Mordovinian ASSR	N.A.		100	Dec 52	N.A.	
North Ossetian ASSR	N.A.		N.I.		N.I.	
Tatar ASSR	N.I.		N.A.		N.A.	
Udmurt ASSR	N.I.		N.A.		N.A.	

		Radiobroadcast Receivers (Thousands)		Radio Relay Centers		Wire-Diffusion Loudspeakers (Thousands)	
		Number	As of	Number	As of	Number	As of
2.	Urals# and Western Siberia	94.2		792		288.8	
	Altai Kray	(1.4)	52	289	Dec 53	(19.3)	Dec 53
	#Chelyabinsk Oblast	N.A.		N.A.		N.A.	
	#Chkalov Oblast	(5.0)	51	(5)	Nov 53	N.A.	
	#Molotov Oblast	N.I.		N.I.		N.I.	
	Kemerovo Oblast	(1.2)	52	N.A.		(0.5)	52
	Kurgan Oblast	N.I.		N.I.		N.I.	
	Novosibirsk Oblast	10.0	49	(148)	May 54	(107.0)	Nov 53
	Omsk Oblast	74.6	May 51	N.A.		80.0	May 51
	#Sverdlovsk Oblast	(2.0)	May 52	234	May 51	17.0	Nov 51
	Tomsk Oblast	N.I.		(116)	Nov 52	N.A.	
	Tyumen Oblast	N.A.		N.A.		N.A.	
	Bashkir ASSR	N.I.		N.A.		65.0	47
3.	Central Siberia	N.A.		267		22.0	
	Krasnoyarsk Kray	N.I.		(132)	Dec 53	(18.0)	Dec 53
	Irkutsk Oblast	N.A.		105	May 53	(4.0)	May 54
	Tuva Autonomous Oblast	N.I.		N.I.		N.I.	
	Yakutsk ASSR	N.I.		30	May 52	N.A.	
4.	Far East	37.0		465		323.9	
	Khabarovsk Kray	N.A.		N.A.		90.0	Jul 49
	Maritime Kray	15.0	Aug 53	N.A.		100.0	May 54
	Amur Oblast	N.I.		N.A.		(1.2)	May 53
	Chita Oblast	13.0	May 53	(65)	May 54	66.0	May 53
	Magadan Oblast	N.A.		N.A.		N.A.	
	Sakhalin Oblast	9.0	May 53	100	Nov 53	47.6	Nov 53
	Buryat-Mongol ASSR	N.I.		(300)	52	19.1	46

	Radiobroadcast Receivers (Thousands)		Radio Relay Centers		Wire-Diffusion Loudspeakers (Thousands)	
	Number	As of	Number	As of	Number	As of
Belorussian SSR	(54.0)	53	(387)	Nov 53	(236.0)	Nov 53
Karelo-Finnish SSR	(1.0)	48	(35)	51	35.0	May 53
Moldavian SSR	27.0	Mar 54	167	Mar 54	120.0	Mar 54
Ukrainian SSR	500.0	May 53	(13,650)	53	2,500.0	May 54
Caucasus Republics	178.3		1,032		281.5	
Armenian SSR	(47.2)	May 54	(332)	May 54	(56.5)	May 54
Azerbaydzhan SSR	85.0	May 53	300	May 53	90.0	May 53
Georgian SSR	46.1	May 52	400	May 53	(135.0)	53
Central Asia Republics	102.5		1,201		594.0	
Kazakh SSR	(1.5)	May 54	1,000	May 53	300.0	May 52
Kirghiz SSR	19.0	53	133	May 51	60.0	53
Tadzhik SSR	(5.0)	48	68	48	(24.0)	50
Turkmen SSR	15.0	May 53	N.A.		53.0	May 53
Uzbek SSR	62.0	52	N.A.		157.0	52

a. These figures represent minimal distribution. They account for a total of approximately 9.5 million reception units, of an estimated national total of 17.5 million. Figures shown in parentheses are partial figures.
b. New oblast established in 1953.
c. Total facilities 35,000.

APPENDIX I

CHARACTERISTICS OF USSR TELEVISION RECEIVING FACILITIES
1950-54 a/*

Model	Description
KVN-49 341/	Size of Screen: 10.5 x 14 cm. (approximately 4" by 5.5") Channels: No. 1: 48.5-56.5 Mc (video 49.75 Mc, Audio 56.25 Mc) No. 2: 58-66 Mc (video 59.25 Mc, Audia 65.75 Mc) No. 3: 76-84 Mc (video 77.25 Mc, Audio 83.75 Mc) No. of Tubes: 16 plus picture tube. Comment: First exhibited in 1949, reportedly now considered obsolete, to be discontinued when feasible.
Moskvich T-1 342/	Size of Screen: 10 x 13 cm. (Approximately 4" by 5") Channel: No. 1: 48.5-56.5, also FM audio band. No. of Tubes: 20 Comment: This is reported to be a direct and almost unaltered copy of a German table model receiver.
Leningrad T-1 343/	Size of Screen: 10 x 13 cm. (Approximately 4" by 5") Channel: probably same as Moskvich T-1 No. of Tubes: 22 Comment: This model is similar to the Moskvich T-1, except that it is capable of reception of either 441 line images (used experimentally by the Soviets) and 625 line

* Footnote follows on p. 171.

CHARACTERISTICS OF USSR TELEVISION RECEIVING FACILITIES
(1950-54)
(continued)

Model	Description
	images, which standard has been adopted.
Leningrad T-2 344/	Size of Screen: 135 mm x 88 mm (approximately 5.3" by 7.4") Channels: Same as KVN-49, above. No. of Tubes: 32 plus picture tube. Comment: Combination AM FM, and TV. This receiver can also receive very high frequency FM transmissions in the 66-67.5 Mc band. Further, it provides reception of broadcast stations in the low-, medium-, and high-frequency bands by means of the radio frequency portion of the Leningradets receiver which is built into this receiver.
T2-A 345/	Size of Screen: 310 mm diamater (approximately 12"). Channels: Presumed to be the same as the Leningrad T-2. No. of Tubes: 26 Comment: This is presumed to be a modification of the Leningrad T-2.
T-4 346/	Size of Screen: 381 mm x 508 mm (approximately 15" by 20"). Channels: No information available, but presumed to be the same as the T-2. No. of Tubes: 35 Comment: It is believed that this receiver uses a five-inch type LK-100 projection cathode ray tube with a set of reflecting mirrors and correcting lense producing a picture 15.2" x 20.3" on a screen. This receiver is probably intended for group viewing.

CHARACTERISTICS OF USSR TELEVISION RECEIVING FACILITIES (1950-54) (continued)

Model	Description
Sever-3 347/	Size of Screen: 18 x 24 cm (approximately 7" by 9.5") Channels: Not available, but presumed to be the same as KVN-49. No. of Tubes: 17 Comment: Reports indicate that the first model of the Sever was deemed obsolete before it went into production. The second model is said to be either in production or scheduled for production during 1954. The Sever is reported to have UHF FM reception capabilities, also.
Pioneer 348/ (TL-2)	Size of Screen: 10 x 14 cm. (approximately 4 x 5.5") No. of Tubes: 9 plus picture tube. Comment: In consideration of the very small number of tubes, this model probably is not a complete television receiver, but a model to be used connected by wire to a central television relay center. This system is comparable to the wire-diffusion loudspeakers in aural radiofication.
Avangard 349/ (TL-1)	Size of Screen: 4 times the area of the KVN-49, (dimensions not available). No. lf Tubes: 16 Comment: No other information available.
Svet 350/	Size of Screen: 24 x 36 cm. (approximately 9.5" x 14") Comment: No other information available.
Temp 351/	No information available.

a. Most data for 1953.

APPENDIX J

LAW FOR THE DEFENSE OF PEACE, USSR SUPREME SOVIET, MARCH 12, 1951 352/

"The Supreme Soviet of the Union of Soviet Socialist Republics, guided by the high principles of the Soviet peace-loving policy, which pursues the goal of reinforcing the peace and friendly relations between peoples, recognizes that the conscience and sense of justice of peoples who have in the course of the lifetime of a single generation borne the misfortunes of two world wars cannot be reconciled with the impunity of war propaganda conducted by leading aggressive circles in certain states, and makes common cause with the challenge of the Second World Congress of Peace Partisans, which expressed the will of all progressive humanity in respect to forbidding and condemning criminal war propaganda.

"The Supreme Soviet of the Union of Soviet Socialist Republics decrees:

"1. That it should be recognized that war propaganda, in whatever form it is conducted, undermines the work of peace, creates a threat of a new war and is in view of this fact a most weighty crime against humanity.

"2. That persons guilty of war propaganda should be arraigned and tried as major criminals."

APPENDIX K

METHODOLOGY

The totals of foreign broadcasting hours transmitted in Russian and the other Soviet languages (Tables 2 and 3) were obtained from overtly published materials of the broadcasting agencies and from reports based on monitoring.

The expansion of the Soviet radiobroadcasting system (Table 6) and the comparative weekly output of international program hours are collated from monitoring observations, station lists, overt publications, and finished intelligence reports.

The methodology used in computing the statistical data in Table 8 -- the Estimated Number of Radiobroadcasting Reception Facilities in USSR (1940, 1946-60) -- accompanies the table. The number of reception facilities was based on overtly published materials from finished intelligence reports and from information in Soviet press, trade journals, and radio. The distribution of facilities as set forth in Table 10 and Appendix H was obtained entirely from USSR open sources -- newspapers, trade journals, and radiobroadcasts. The characteristics, average retail prices, schedule of subscriber fees, and estimated production of radiobroadcasting receivers, loudspeakers, and television receivers as shown in Tables 9, 11-15, and 17 were taken from CIA/RR/I/EE special paper for this report, 2 June 1954. The reported number of television receivers in the USSR was taken from a State Department review of internal developments in the Soviet Union, [redacted] and various overt news publications. FOIAb3b1

The information supporting the appendixes was taken from overtly published materials, monitoring observations, State Department and USIA dispatches and reports, and CIA reports. The sources are indicated on each appendix.

The information supporting the various charts was taken primarily from overtly published materials. Figures 1 and 5 are graphic presentations of the data shown in the table preceding the chart in the report. Figures 2, 3, and 4 are discussed where appropriate in the text.

The information for maps 1 through 6 was taken primarily from overtly published sources and monitoring observations. The information shown on map number 7 was collated from various surveys, CIA and USIA reports, and finished intelligence reports by OSI.

APPENDIX L

GAPS IN INTELLIGENCE

1. Gaps.

Soviet technical literature contains a wealth of generalized information concerning the radiofication of the USSR. Furthermore, a sufficient number of receivers have been obtained to give fairly good information as to technical capabilities and characteristics of Soviet equipment. These sources, however, are deficient in growth and distribution statistics of loudspeakers and receivers.

The voluminous outpourings of the Soviet press and radio and statements made by key and subordinate personalities are not only often contradictory, slanted, and misleading, but the comparisons are such that actual quantities are seldom revealed.

Information based on personal observations is from persons whose observations and experiences were limited geographically to the European areas of the USSR, and little or no information is available on the Siberian and Asiatic areas.

Much of the information for Sections IV and V of this report was obtained from refugees and escapees who were people basically opposed to the regime at home, and their response to anti-Communists was further colored by their escapee status. Consequently, one probably cannot assume that their reactions are highly representative of the population of the USSR.

The Soviet government is constantly making available to a large segment of the population receivers capable of receiving foreign programs and, at the same time, is carrying on a campaign against such listening. Information on the rationale of the Soviet government with respect to these apparently opposing policies would be of value.

Information is needed on exports and imports of receivers and receiver parts. Intelligence is needed relative to the correlation of production of plants located within the USSR and other Soviet-owned plants located in Satellite countries.

Intelligence is needed regarding the production and use of the better type receivers, and those having high-frequency reception capabilities, in contrast to the class 4 type receivers which does not have this capability.

Information indicating the relative production and use of the different models of class 3 receivers, specifying those which have high-frequency reception capability is needed.

Intelligence is needed relative to the wide differential in the estimated production of radiobroadcasting receivers in the USSR since 1945 and those estimated to be in use in 1953 (some three million more produced than in use).

Since there is no evidence of mass imports of Satellite or other foreign produced radiobroadcasting receivers, intelligence is needed relative to the receivers which producers in certain Satellite countries claim are taken by the USSR (20 to 40 percent of current production). /The Soviets may dispose of them for a profit in Satellite or foreign countries. There is some evidence that this has been done./

It is further evident that information after 1952 has been increasingly difficult to obtain, especially in the following cae categories:

a. Data on the effectiveness of foreign radiobroadcasting among smaller ethnic groups, especially in the peripheral areas.
b. Information on the sociological nature of the audience, such as age and sex.
c. Size of the audience listening to non-Russian language broadcasts from outside the USSR.
d. Information relative to non-listeners -- those who have sets but do not listen, and why.
e. Information as to the audience listening with commercial receivers other than military.
f. Statistical information relative to the number of families in the USSR by areas and the average size.
g. Effects of foreign radio programs upon the attitudes and behavior of Soviet listeners.

2. Filling Gaps.

Efforts to fill gaps have been proceeding on two broad fronts -- the general and the specific. As for the general, a Telecommunications Working Group of the EIC Subcommittee on Requirements and Facilities for Collation has completed and approved a "Catalogue of Requirements for Telecommunications Information." The purpose of the catalogue is to bring together all the items of information needed by the intelligence agencies. From this catalogue, it is expected that collection manuals geared to the capabilities of the various collection agencies will be prepared. Such manuals should serve as interrogation aids to reduce the need for spot requirements. In connection with this program, the EIC Subcommittee on Electronics and Telecommunications has reported on the Survey of Intelligence Deficiencies on Telecommunications Equipment Production and Facilities. These surveys establish priorities which can be incorporated in the collection manuals. This program, when implemented, should improve both the quantity and quality of raw materials and thus help fill many existing gaps.

As for specific efforts, advantage is taken of knowledgeable sources discovered in the daily reading process by the initiation of specific requirements geared to our known gaps and to the source's competence. Numerous requests for requirements are constantly being responded to in this field. Persons going abroad to work on ORR requirements are briefed in advance of departure with a view to pointing up the deficiencies of present information and directing specific attention to currently pertinent needs.

APPENDIX M

SOURCES AND EVALUATION OF SOURCES

1. Evaluation of Sources.

a. Transmission Facilities of Foreign Broadcasters to the USSR.

The information on foreign radiobroadcasting directed to the USSR audience was obtained in the main from [redacted] sources, based on monitoring and overt publications. It is considered reliable. FOIAb3b1

b. Radiobroadcasting System of the USSR.

The information on transmitting facilities and organization and administration of radiobroadcasting in the USSR was obtained from [redacted] reports, monitoring of radiobroadcasting programs, overtly published materials, and finished intelligence reports. These sources, generally, confirm each other and are considered as being of good reliability. FOIAb3b1

c. Receiving Equipment in the USSR.

On the premise that all outpourings of the Soviet press and radio have as their first objective to serve some purpose of the Communist Party and the Soviet Government, the voluminous but partial Soviet statistics on radiofication appear to be published chiefly for their value as promotional propaganda. In many instances they have been found to be slanted and misleading. By careful study of the volume of such outpourings on the subject of radiofication which have been published during the years 1946-53, the statistics in Section III have been produced. These figures and other information are believed to have fair reliability.

The information on receiver production and characteristics was obtained from CIA published and unpublished reports, trade catalogs, Armed Services, State Department, and USIA reports. This information is taken as having from fair to good reliability.

d. Regulations and Conditions of Listening.

The materials relating to regulations for the most part

come from overt and covert CIA reports confirmed by overt publications, Armed Services, State Department Despatches, finished intelligence reports and special studies. They are believed to be of good reliability.

e. Effectiveness of Foreign Broadcasts.

The effectiveness of foreign broadcasts is mainly inferred from fragmentary direct and indirect evidence. This evidence is from CIA overt and covert reports, Armed Services, State Department and USIA reports and despatches, and overt publications and information. This evidence is taken to have from fair to good reliability.

2. Sources.

Evaluations, following the classification entry and designated "Eval.," have the following significance:

Source of Information	Information
A - Completely reliable	1 - Confirmed by other sources
B - Usually reliable	2 - Probably true
C - Fairly reliable	3 - Possibly true
D - Not usually reliable	4 - Doubtful
E - Not reliable	5 - Probably false
F - Cannot be judged	6 - Cannot be judged
Doc. - Documentary	

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which will carry the field evaluation "Documentary" instead of a numerical grade.

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this report. No "RR" evaluation is given when the author agrees with the evaluation on the cited document. Evaluations designated "SI" are by OSI.

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