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COMMUNICATIONS CABLE REQUIREMENTS OF THE MINISTRY OF COMMUNICATIONS OF THE USSR

1959-65

NIC-NTSC-WP-[illegible]
May 1964

NAVAL INTELLIGENCE COMMAND

NAVY COMMITTEE ON ELECTRONICS AND TELECOMMUNICATIONS

CONTENTS

COMMUNICATIONS CABLE REQUIREMENTS OF THE MINISTRY OF COMMUNICATIONS OF THE USSR 1959-65

I. Introduction

This paper is the result of a research effort that was undertaken to provide intelligence support to members of the Economic Defense Advisory Committee in their 1963-64 review of the international list of embargoed items. The findings of this paper and the supporting methodology are being made available at this time as an EIC Working Paper because of the continuing intelligence interest in communications cables in the USSR.

II. Findings

The basic data used for estimating cable requirements of the Ministry of Communications of the USSR were derived from intelligence information on planned and realized goals of the Ministry for the expansion of its communications system during the Seven Year Plan (SYP), 1959-65. These data, which varied in form and detail, were viewed in relation to US practices and adjusted to reflect known differences in the USSR.

Table 1* presents the findings of this study in aggregate measures of billion conductor feet (BCF) and tons of copper. The methodology and data used in arriving at these findings are contained in Appendixes A through D.**

* Table 1 follows on p. 2.

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Table 1

USSR: Communications Cable Requirements of the Ministry of Communications a/

1959-65

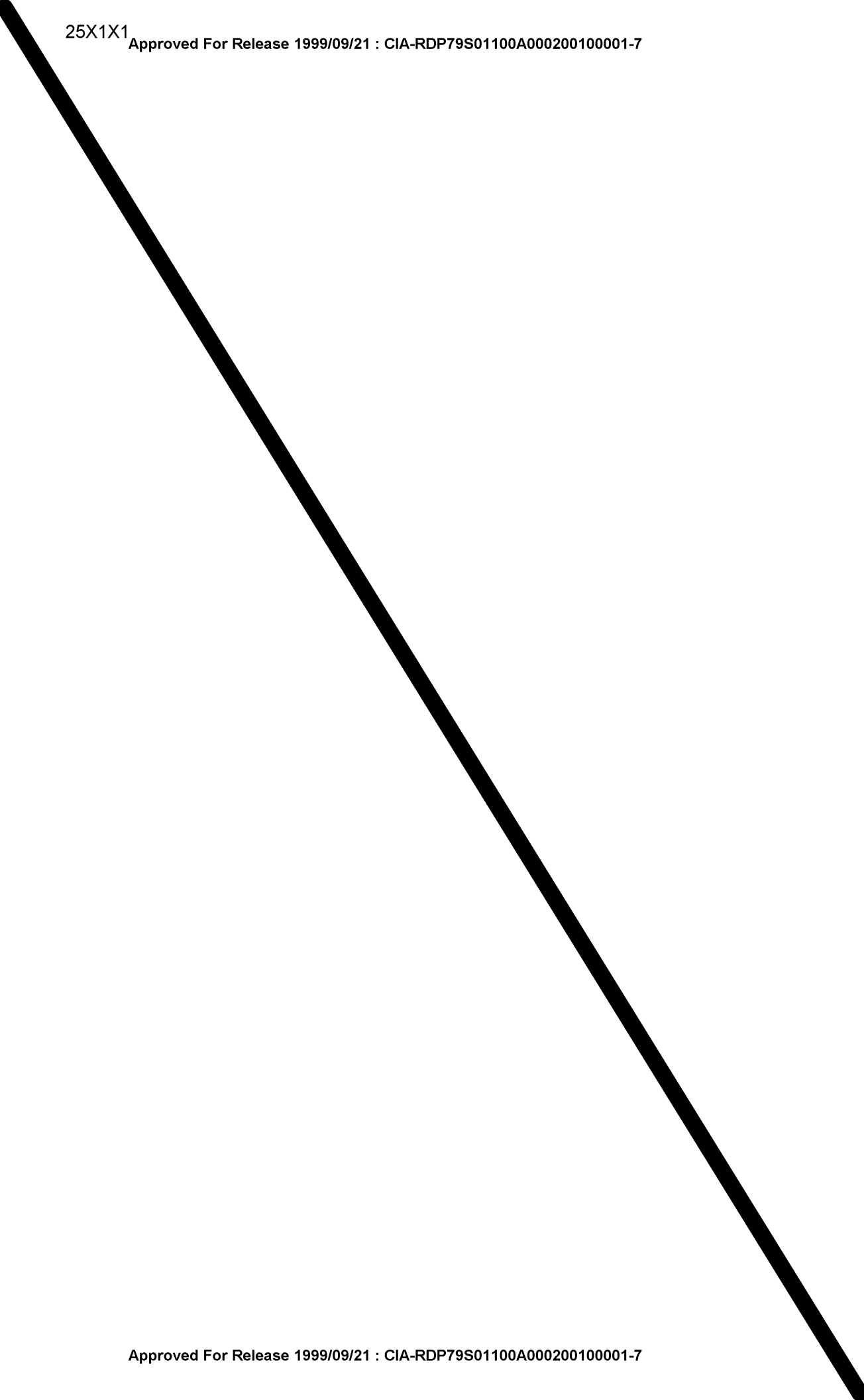
	1959	1960	1961	1962	1963	1964	1965	Total
Billion Conductor Feet								
Main and secondary long-distance cable	0.4(15) b/	0.4(19)	0.5(21)	0.5(23)	0.6(23)	0.6(23)	0. c/	3.1(124)
Urban trunking cable	0.5	0.5	0.6	0.6	0.7	0.8	1.0	4.5
Urban distribution cable	2.2	3.0	3.8	3.8	4.4	5.2	6.0	29.0
Rural trunking cable	3.6	3.6	3.6	3.6	3.6	3.6	3.6	25.0
Rural distribution cable	2.5	1.8	2.0	2.1	2.3	2.9	3.4	17.0
Total	9.1	9.4	10.0	11.0	12.0	13.0	14.0	78.0(124)
Tons of Copper d/								
Main and secondary long-distance cable	1,700	2,200	2,500	2,700	2,900	3,000	0 c/	15,100
Urban trunking cable	500	500	600	600	700	900	1,000	4,800
Urban distribution cable	2,100	2,900	3,600	3,600	4,200	5,000	5,700	27,100
Rural trunking cable	12,300	12,300	12,300	12,300	12,300	12,300	12,300	85,800
Rural distribution cable	3,100	2,300	2,500	2,600	2,800	3,600	4,300	21,100
Total	19,600	20,100	21,500	21,800	22,900	24,700	23,300	154,000

a. Data have been rounded to 2 or 3 significant figures. Because of rounding, components may not add to the totals shown.

b. Figures in parentheses represent million conductor feet of coaxial tubes in coaxial cables and are not included in the billion conductor feet totals shown.

c. Because of the lag between shipment and installation, cable shipments for main and secondary long-distance cable lines will be completed by the end of 1964. Shipments in 1965 would be part of a new plan beginning in 1966.

d. Tonnages are given in short tons (2,000 pounds).



Statistical data on conductor feet and pounds of copper per sheath mile for each of the cable types described above are given in Table 4.* The data contained in Tables 3 and 4, plus the assumptions made in the paragraph above, were the basis for estimating the conductor feet and tons of copper required for all long-distance cable lines of the Ministry of Communications for 1959-65 as shown in Table 5.**

* Table 4 follows on p. 7.
** Table 5 follows on p. 8.

Table 2

USSR: Estimated Program of the Ministry of Communications for Main and Secondary Long-Distance Cable 1959-65

Route Miles of Cable

Status	Total Cable	Multiconductor Cable a/	Coaxial Cable
Main Cable			
In operation (1959-61)	5,150	4,150	1,000
Under construction (end 1961)	1,250	150	1,100
Planned (1962-65)	8,100	4,300	3,800
Secondary Cable			
In operation (1951-61)	4,450	4,450 b/	0
Planned (1962-65)	4,450	4,450 b/	0
Total	23,400	17,500	5,900

a. Twin sheath, unless otherwise indicated.

b. Single sheath.

Table 3

USSR: Estimated Shipments of Long-Distance Cable for the Ministry of Communications 1959-65

Route Miles of Cable

Year	Total Cable	Multiconductor Cable		Coaxial Cable
		Twin Sheath	Single Sheath	
1959	2,700	1,000	1,000	700
1960	3,300	1,200	1,200	900
1961	3,800	1,400	1,400	1,000
1962	4,200	1,500	1,600	1,100
1963	4,600	1,700	1,800	1,100
1964	4,800	1,800	1,900	1,100
1965	0 a/	0 a/	0 a/	0 a/
Total	23,400	8,600	8,900	5,900

a. Cable shipments for the 1959-65 cable program will be completed by the end of the sixth year, 1964, because of the lag between shipment and installation. Shipments made in 1965 would be part of a new plan beginning in 1966.

Table 4

Conductor Feet and Pounds of Copper for Selected Types of Cable in the USSR

Units

Cable Types and Specifications	Conductor Feet per Sheath Mile a/	Pounds of Copper per Sheath Mile b/
Multiconductor		
1-Quad (1 x 4 x 1.2 mm.)	21,120	143
4-Quad (4 x 4 x 1.2 mm.)	84,480	581
7-Quad (7 x 4 x 1.2 mm.)	147,840	1,019
Coaxial		
4 coaxial tubes plus 5-quad (4 x 2.5/9.4 mm. + 5 x 4 x 0.9 mm.)		2,263
4-Tubes	21,120 c/	
5-Quad	105,600	

a. Computed by multiplying the number of conductors times the number of feet in a mile (5,280).

b. 3/

c. Conductor feet of coaxial tubes in coaxial cables.

Table 5

USSR: Estimated Conductor Feet and Tons of Copper Required for Long-Distance Cable Lines of the Ministry of Communications a/

1959-65

	Multiconductor Cable									Coaxial Cable				Total		
	1-Quad			4-Quad			7-Quad									
	Sheath Miles	Million Conductor Feet	Tons of Copper	Sheath Miles	Million Conductor Feet	Tons of Copper	Sheath Miles	Million Conductor Feet	Tons of Copper	Sheath Miles	Million Conductor Feet	Million Tube Feet	Tons of Copper	Million Conductor Feet	Million Tube Feet	Tons of Copper
1959	500	11	36	1,500	127	440	1,000	148	510	700	74	15	730	359	15	1,700
1960	600	13	43	1,800	152	520	1,200	177	610	900	95	19	1,000	437	19	2,200
1961	700	15	50	2,100	177	610	1,400	207	710	1,000	106	21	1,100	505	21	2,500
1962	800	17	57	2,300	194	670	1,500	222	760	1,100	116	23	1,200	549	23	2,700
1963	900	19	64	2,600	220	760	1,700	251	870	1,100	116	23	1,200	606	23	2,900
1964	950	20	68	2,750	232	800	1,800	266	920	1,100	116	23	1,200	635	23	3,000
1965 b/	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

a. All data have been rounded to 2 or 3 significant figures. Because of rounding components may not add to the totals shown.

b. Cable procurement for the 1959-65 period would be completed by the end of 1964.

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Table 6

USSR: Estimated Rural Telephone Station Gain

1959-65

	Telephone Stations
1959	43,000
1960	32,000
1961	35,000
1962	36,000
1963	40,000
1964	50,000
1965	60,000
Total	296,000

The following assumptions were made to determine the average length of a rural distribution line:

	Average Length of Line	Percent of Total New Lines	Weighted Length of New Lines
Within rural Soviets	.5 miles	60%	0.3 miles
Rural Soviet to villages	6.0 miles	40%	2.4 miles

Average Length of Rural Distribution Lines = 2.7 miles

Based on US practice for rural distribution lines that average 3 miles in length, the following assumptions were made to estimate the average weight of distribution lines in the USSR:

American Wire Gauge	Wire Weight per 1000 feet	Percent of Total New Lines	Weight per 1000 feet of Subscriber Line
24 ga.	1.22 lbs.	50%	0.6 lbs.
19 ga.	3.90 lbs.	50%	1.9 lbs.

Average Line Weight per 1000 feet = 2.5 lbs. of copper

Sample computations for determining the BCF and tons of copper for rural distribution purposes are given below for 1960:

$$BCF = \frac{\text{telephone station gain} \times 2 \times \text{average length (miles) per line} \times 5280}{\text{fill factor}} \times 10^{-9}$$

$$BCF = \frac{32,000 \times 2 \times 2.7 \times 5280}{.50} \times 10^{-9}$$

$$BCF = 1.8$$

$$\text{Tons of copper} = \frac{BCF \times 10^{6} \times \text{average line weight per 1000 feet}}{2,000}$$

$$\text{Tons of copper} = \frac{1.8 \times 10^{6} \times 2.5}{2,000}$$

Tons of copper = 2,300

APPENDIX E

SOURCE REFERENCES

1. CIA. CIA/RR ER 62-12, Technology in Post and Telecommunications in the USSR, 1959-80, April 1962, p. 4. Secret.

2. CIA. Maps number: 26391 6-58, 29515 3-60, and 32240 2-62. Secret.

3. [redacted] FOIAb3b1

4. CIA. CIA/RR ER 62-12 (1, above) p. 4. Secret.

5. USSR. The USSR in Figures 1961, Moscow 1962, p. 616. U.

USSR. The USSR in Figures 1962, Moscow 1963, p. 230-232. U.

6. Ibid.