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MILITARY CONSUMPTION OF PETROLEUM PRODUCTS

SINO-SOVIET BLOC
1956-1957

EIC-PSC-WP 2

(Limited Distribution)

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FOREWORD

This report provides estimates of the consumption of petroleum products by the military and paramilitary Services of the countries of the Sino-Soviet Bloc for the years 1956 and 1957. It is an updating of EIC-PSC-WP1, dated 1 April 1956, which provided estimates for the years 1950 through 1955. No attempt has been made to revise the estimates contained in the earlier report.

The report was prepared under the sponsorship of the Economic Intelligence Committee Subcommittee on Petroleum to meet a designated research deficiency. It is intended that the report serve members of the intelligence community in petroleum supply/demand studies for countries of the Sino-Soviet Bloc.

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1. Introduction.

The estimates of military consumption included in this report were developed independently by the appropriate intelligence authorities of the U.S. Departments of Army, Navy, and Air Forces. The particular responsibilities for the preparation of consumption estimates for similar consumers in the Sino-Soviet Bloc are as follows:

Army - Appendix A. Sino-Soviet Bloc ground forces; militarized security forces.

Navy - Appendix B. Sino-Soviet Bloc naval forces ashore and afloat.

Air Force - Appendix C. Sino-Soviet Bloc air forces; naval air forces; civil aviation; aircraft engine testing.

Since consumption data, per se, was not available, the estimates represent calculations based on probable numbers and types of equipment, the estimated use thereof, and the petroleum product consumption per unit time or distance. The margin of error is estimated to be \pm 15 percent for all consumption estimates.

2. Estimates of Consumption. a/

The estimates of consumption of petroleum products by the Army, Navy, and Air Forces of the countries of the Sino-Soviet Bloc for the years 1956 and 1957 are summarized in Table 1. Military consumption by product and by location of forces is summarized in Table 2.

The supporting data and methodology for Tables 1 and 2 are included in the appropriate appendixes.

a. The estimates of consumption represent the best available information as of December 1957.

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Table 1

Estimated Annual Consumption of Petroleum Products Sino-Soviet Bloc Military Forces

(Thousand Metric Tons)												
Consumer ^{a/b/}	USSR ^{c/}	Albania	Bulgaria	Czecho.	E.Germ.	Hungary	Poland	Rumania	China ^{c/}	North Korea	North Vietnam	Total
1956												
Ground Forces	1,064.4	7.5	41.3	64.0	52.6	38.0	60.9	51.5	124.1	36.4	10.1	1,550.8
Naval Forces	3,381.2	4.3	24.7	0	28.3	0	31.3	33.7	214.0	6.1	.0	3,723.6
Air Forces	6,867.0	3.4	50.8	155.6	11.5	48.0	142.5	48.9	373.9	67.5	.0	7,769.1
Total	<u>11,312.6</u>	<u>15.2</u>	<u>116.8</u>	<u>219.6</u>	<u>92.4</u>	<u>86.0</u>	<u>234.7</u>	<u>134.1</u>	<u>712.0</u>	<u>110.0</u>	<u>10.1</u>	<u>13,043.5</u>
1957												
Ground Forces	1,107.4	8.0	45.6	67.6	58.8	7.4	64.3	57.2	124.1	36.4	10.1	1,586.9
Naval Forces	3,681.1	4.7	27.4	0	41.9	0	34.4	33.7	247.9	6.1	.0	4,077.2
Air Forces	11,144.4	8.6	57.6	207.4	17.8	51.2	192.2	59.7	573.1	111.3	.0	12,423.3
Total	<u>15,932.9</u>	<u>21.3</u>	<u>130.6</u>	<u>275.0</u>	<u>118.5</u>	<u>58.6</u>	<u>290.9</u>	<u>150.6</u>	<u>945.1</u>	<u>153.8</u>	<u>10.1</u>	<u>18,087.4</u>

a. Quantities shown for USSR Ground Forces includes consumption by militarized security forces.

b. Quantities shown for Air Forces includes consumption by Civil Aviation.

c. See appendices for quantities consumed by national forces outside national boundaries.

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Table 2

Estimated Annual Consumption of Petroleum Products
Sino-Soviet Bloc Military Forces

		(Thousand Metric Tons)						
Year	Consuming Forces a/	Aviation Gasoline	Motor Gasoline	Jet Fuel	Diesel Fuel	Fuel Oil	Lubricants	Total
1956	USSR	1,202.1	1,029.7	5,439.3	956.6	2,561.3	123.6	11,312.6
	Albania	.8	7.5	2.3	4.1	0	.5	15.2
	Bulgaria	21.1	37.7	26.3	21.3	7.5	2.9	116.8
	Czechoslovakia	41.1	39.2	108.9	26.5	0	3.9	219.6
	East Germany	7.3	23.0	3.2	55.6	0	3.3	92.4
	Hungary	18.0	24.9	27.2	13.7	0	2.2	86.0
	Poland	42.8	50.6	93.3	27.2	16.6	4.2	234.7
	Rumania	18.5	40.5	27.9	17.8	26.1	3.3	134.1
	China	75.8	152.9	289.0	115.0	67.0	12.3	712.0
	North Korea	5.7	35.9	60.1	6.1	0	2.2	110.0
	North Vietnam	0	9.6	0	0	0	.5	10.1
	Total	<u>1,433.2</u>	<u>1,451.5</u>	<u>6,077.5</u>	<u>1,243.9</u>	<u>2,678.5</u>	<u>158.9</u>	<u>13,043.5</u>
1957	USSR	1,508.3	1,090.6	9,337.4	1,078.8	2,775.1	142.7	15,932.9
	Albania	1.4	8.0	6.7	4.6	0	.6	21.3
	Bulgaria	24.7	40.7	29.6	22.4	10.0	3.2	130.6
	Czechoslovakia	60.4	41.6	139.7	28.8	0	4.5	275.0
	East Germany	7.8	26.9	8.2	61.8	10.0	3.8	118.5
	Hungary	26.6	6.7	21.5	3.0	0	.8	58.6
	Poland	50.9	53.4	133.7	31.1	17.1	4.7	290.9
	Rumania	27.0	44.4	29.6	19.9	26.1	3.6	150.6
	China	97.6	157.5	467.3	135.9	73.1	13.7	945.1
	North Korea	7.5	35.6	102.3	6.1	0	2.3	153.8
	North Vietnam	0	9.6	0	0	0	.5	10.1
	Total	<u>1,812.2</u>	<u>1,515.0</u>	<u>10,276.0</u>	<u>1,392.4</u>	<u>2,911.4</u>	<u>180.4</u>	<u>18,087.4</u>

a. Includes USSR and Communist China forces outside national boundaries.

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Appendix A

GROUND FORCES

1. Soviet and European Satellites.

A. Assumptions.

(1) Ground units of the Soviet Army were at authorized Table of Organization and Equipment (TO/E) strengths in tanks, assault guns, and other vehicles during 1956-57.

(2) The performance of any given type of vehicle is uniform, regardless of role. For example, the consumption rate for a truck used to transport heavy cargo is the same as the rate achieved in transporting troops.

(3) All tractors in Soviet units burn diesel fuel (although a few may use gasoline).

(4) The vehicle strength of the militarized security forces is allocated on the basis of one average truck per 15 troops. The vehicle strength of the signal troops is the same as that of comparable signal units in the Soviet Army.

(5) Vehicles employed in transport use are allocated gasoline for 7,200 miles of annual operation. Vehicles employed for non-transport use, i.e., primarily combat, are allocated gasoline for 2,100 miles of annual operation.

(6) All vehicles in the Soviet border troops are considered to be transport as opposed to combat. For the remaining security forces only 25 percent are transport vehicles.

(7) Consumption of petroleum products by the European Satellite ground forces was based on estimated vehicle strengths, unit strengths, and recent reports of annual consumption in two of the Satellites. Satellite security forces were allocated one average truck per 20 troops.

B. Methodology.

(1) Annual gasoline consumption by the Soviet Army ground forces was calculated on the basis of the estimated total number of authorized gasoline burning vehicles in divisional and non-divisional units, military schools, and depot installations. In all instances, vehicles were divided into "transport" and "other" vehicles. Transport vehicles were allocated gasoline for 7,200 miles annually; "other" vehicles were allocated 2,100 miles. Such mileage was obtained from the most recent Soviet documents and reports. Consumption was calculated at the rate of eight miles per gallon.

(2) The fragmentary information available on Soviet tank and assault gun training indicates that most of the armor assigned to troops is kept in storage for most of the year. It is believed that about 10 percent of the tanks and assault guns in units is used throughout the year for training and that another 10 percent is added from the tank park during summer field training. The remaining 80 percent is used during relatively short term maneuvers and in short moves to and from rail stations. The following rates of operation were used:

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10 percent, year-round training	400 hours
10 percent, summer training	150 hours
80 percent, maneuver training	50 hours

These rates were applied to the approximate 40,000 tanks and assault guns in the hands of Soviet troops. Fifty percent of the armor in reserve storage was allocated fuel for 8 hours of maintenance operation per year. Consumption was calculated at the rate of 10.3 gallons per hour for medium tanks and 20.7 gallons per hour for heavy tanks. Fuel consumption for tractors was allocated on the basis of 800 miles per vehicle per year, and calculated at the rate of 1 mile per gallon. Tank recovery vehicles, which are converted tanks, were allocated 50 hours annually per vehicle.

(3) Gasoline consumption by the Soviet militarized security forces was calculated in the basis of 7,200 miles per truck for the Border Troops. For the other security troops, only 25 percent of the vehicles were considered on the "transport" category. The remaining vehicles of these troops were allocated 2,100 miles. The Interior Troops were also allocated 2,500 tons of diesel fuel annually for whatever artillery, tractors, and tanks they have.

(4) Available intelligence does not permit the development of valid estimates for petroleum products consumed in space heating, cleaning, and lighting.

C. The Estimates.

The consumption estimates for the Soviet and European Satellite ground forces and militarized security forces are shown in Tables A-1 through A-4.

2. Communist China and the Asiatic Satellites.A. Assumptions.

(1) Vehicle consumption per day in gallons is assumed as follows:

	<u>Trucks</u>	<u>Self Propelled Guns</u>	<u>Tanks</u>
North Korea	3.6	6.9	8.4
Communist Chinese in Korea	3.6	6.9	8.4
Communist Chinese in China	1.25	2.0	2.0 Heavy 1.0 Light
North Vietnam	3.75	-	-

Trucks operating in Korea are assumed to travel 850 miles per month; in Communist China, 300; and in North Vietnam, 900. These consumption rates allow for a vehicle deadline factor of about one-third. Consumption rates are higher in Korea and North Vietnam than in Communist China because of greater utilization of vehicles; vehicle operation in Communist China is believed to be sharply restricted.

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B. Methodology.

The estimated number of vehicles for each year was based on an analyses of TO/E authorizations, reports of the numbers of vehicles on hand, and imports. The number of vehicles was multiplied by the daily consumption factor. The quantities so developed were multiplied by 365 to obtain a yearly figure.

C. The Estimates.

The consumption estimates for Communist China and Asiatic Satellite ground forces are shown in Table A-5.

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Table A-1

Estimated Annual Consumption of Petroleum Products
Soviet Army Ground Forces

					(Metric Tons)
Year	Location of Units	Motor Gasoline	Diesel Fuel	Lubricants	Total
1956	USSR	636,000	156,975	39,650	832,625
	East Germany	107,000	31,500	6,925	145,425
	Hungary	11,500	6,450	900	18,850
	Poland	9,000	3,000	600	12,600
	Rumania	8,100	2,850	550	11,500
	Total	<u>771,600</u>	<u>200,775</u>	<u>48,625</u>	<u>1,021,000</u>
1957	USSR	645,000	170,000	40,750	855,750
	East Germany	110,500	34,800	7,265	152,565
	Hungary	21,500	7,200	1,435	30,135
	Poland	9,500	3,300	640	13,440
	Rumania	8,500	3,100	580	12,180
	Total	<u>795,000</u>	<u>218,400</u>	<u>50,670</u>	<u>1,064,070</u>

Table A-2

Estimated Annual Consumption of Petroleum Products
Soviet Army Ground Forces
1956 a/

Type of Unit	(Metric Tons)			
	Motor Gasoline	Diesel Fuel	Lubricants b/	Total
<u>Line Divisions</u>				
100 Rifle	205,490	39,150	12,233	256,873
55 Mech	156,985	67,800	11,240	236,025
20 Tank	56,915	34,710	4,582	96,207
Total	<u>419,390</u>	<u>141,660</u>	<u>28,055</u>	<u>589,105</u>
<u>Non-Divisional</u>				
Corps Troops	27,990	5,000	1,650	34,640
Army Troops	115,060	22,690	6,888	144,638
GRQ Troops	139,860	21,950	8,092	169,902
Total	<u>282,910</u>	<u>49,640</u>	<u>16,630</u>	<u>349,180</u>
<u>Miscellaneous</u>	69,300	9,475	3,940	82,715
Total Soviet Army Ground Forces	<u>771,600</u>	<u>200,775</u>	<u>48,625</u>	<u>1,021,000</u>

a. The same information is applicable for 1957, with minor increases. See Table A-1.
b. Calculated at 5 percent of total fuel.

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Table A-2a

Estimated Annual Consumption of Motor Gasoline
Soviet Army Ground Forces
1956 a/

Type of Unit	Transport Vehicles		Other Vehicles		Total	
	No. of Vehicles (Units)	Fuel Consumed b/ (Metric tons)	No. of Vehicles (Units)	Fuel Consumed c/ (Metric tons)	No. of Vehicles (Units)	Fuel Consumed (Metric tons)
<u>Line Divisions</u>						
100 Rifle	41,865	101,660	126,035	100,830	167,900	205,490
55 Mech	27,455	68,640	110,430	88,315	137,885	156,985
20 Tank	11,295	28,240	35,845	28,675	47,140	56,915
Total	80,615	201,540	272,310	217,850	352,925	419,390
<u>Non-Divisional</u>						
Corps Troops	5,080	12,700	19,110	15,290	24,190	27,990
Army Troops	24,385	60,960	67,630	54,100	92,015	115,060
GRQ Troops	34,280	86,625	66,545	53,235	100,825	139,860
Total	63,745	160,285	153,285	122,625	217,030	282,910
<u>Miscellaneous d/</u>	N.A.	N.A.	N.A.	N.A.	N.A.	69,300
<u>Total Soviet Army Ground Forces</u>	<u>144,360</u>	<u>361,825</u>	<u>425,595</u>	<u>340,475</u>	<u>569,955</u>	<u>771,600</u>

a. The same information is applicable for 1957, with minor increases. See Table A-1.

b. Calculated at 7,200 miles per vehicle per year and 8 miles per gallon.

c. Calculated at 2,100 miles per vehicle per year and 8 miles per gallon.

d. Radar, motorboats, and outboard motors.

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Table A-2b

Estimated Annual Consumption of Diesel Fuel
Soviet Army Ground Forces
1956a/

Type of Unit	Vehicles			Total	Consumption (metric tons)
	Medium Tanks & Aslt Guns	Heavy Tanks & Aslt Guns	Tank Retrievers & Tractors		
<u>Line Divisions</u>					
100 Rifle	12,000	0	400	12,400	39,150
55 Mecz	12,265	5,170	880	18,315	67,800
20 Tank	7,600	1,880	320	9,800	34,710
Total	<u>31,865</u>	<u>7,050</u>	<u>1,600</u>	<u>40,515</u>	<u>141,660</u>
<u>Non-Divisional</u>					
Corps Troops	0	0	3,855	3,855	5,000
Army Troops	350	1,585	8,885	10,820	22,690
GHQ Troops	0	0	14,630	14,630	21,950
Total	<u>350</u>	<u>1,585</u>	<u>27,370</u>	<u>29,305</u>	<u>49,640</u>
<u>Miscellaneous b/</u>	N.A.	N.A.	N.A.	N.A.	9,475
<u>Total Soviet Army Ground Forces</u>	<u>32,215</u>	<u>8,635</u>	<u>28,970</u>	<u>69,820</u>	<u>200,775</u>

a. The same information is applicable for 1957, with minor increases. See Table A-1.

b. Maintenance checks of tanks and assault guns in storage for an estimated 50 percent of total armor in reserve storage.

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Table A-3

Estimated Annual Consumption of Petroleum Products
Soviet Militarized Security Forces
1956 - 1957

Type of Unit	Number of Trucks	Consumption			(Metric Tons)
		Motor Gasoline	Diesel Fuel	Lubricants	Total
Border Troops	3,500	9,000	0	625	9,625
Interior Troops	20,000	23,000	2,500	1,275	26,775
Convoy Troops	1,000	2,500	0	175	2,675
Signal Troops	1,600	4,000	0	280	4,280
Total	<u>26,100</u>	<u>38,500</u>	<u>2,500</u>	<u>2,355</u>	<u>43,355</u>

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Table A -4

Estimated Annual Consumption of Petroleum Products
European Satellite Ground Forces

					(Metric Tons)
Year	Location of Units	Motor Gasoline	Diesel Fuel	Lubricants	Total
1956	Albania	5,000	2,110	355	7,465
	Bulgaria	30,475	8,865	1,965	41,305
	Czechoslovakia	35,500	25,500	3,050	64,050
	East Germany	20,600	29,500	2,505	52,605
	Hungary	23,200	13,000	1,810	38,010
	Poland	43,800	14,200	2,900	60,900
	Rumania	37,000	12,000	2,450	51,450
	Total	<u>195,575</u>	<u>105,175</u>	<u>15,035</u>	<u>315,785</u>
1957	Albania	5,500	2,125	380	8,005
	Bulgaria	33,800	9,600	2,170	45,570
	Czechoslovakia	37,400	27,000	3,220	67,620
	East Germany	24,000	32,000	2,800	58,800
	Hungary a/	5,000	2,000	350	7,350
	Poland	45,200	16,000	3,060	64,260
	Rumania	40,700	13,800	2,725	57,225
	Total	<u>191,600</u>	<u>102,525</u>	<u>14,705</u>	<u>308,830</u>

a. Military activity by the Hungarian Armed Forces was greatly curtailed in 1957 because of the internal uprising in the fall of 1956.

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Table A-5

Estimated Annual Consumption of Petroleum Products
Communist China and Asiatic Satellite Ground Forces
1956 - 1957

				(Metric Tons)
Location of Units	Motor Gasoline	Diesel Fuel	Lubricants	Total
Chinese Communist Forces in China	68,000	970	3,450	72,420
Chinese Communist Forces in Korea	45,640	3,580	2,460	51,680
North Korea	31,000	3,700	1,735	36,435
North Vietnam	9,600	0	480	10,080
Total	<u>154,240</u>	<u>8,250</u>	<u>8,125</u>	<u>170,615</u>

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Appendix B

NAVAL FORCES*

1. Sino-Soviet Bloc Naval Forces.

A. Methodology.

These estimates were developed by the following method:

- (1) Order of Battle was taken from Strength and Disposition of Foreign Navies (ONI-30-S/D) as revised for each year.
- (2) An operational schedule (number of days at sea, in port and in shipyards) of each vessel type was developed on the basis of the best available intelligence, filled in and expanded by the use of USN experience.
- (3) Fuel consumption for each vessel type for each day at sea, in port and in yards was estimated on the basis of the best available intelligence or the most comparable USN type, modified as required.
- (4) The fuel consumed per vessel year was estimated using data developed in steps 2 and 3 and multiplied by the number of vessels of that type on 1 July of each year to give annual consumption per type.
- (5) Annual consumption of all vessels in each type was totaled to give total consumption for the naval forces afloat.
- (6) Consumption of Naval Forces ashore is estimated on the basis of a per man requirement. The result is considered as all gasoline, although a small, probably insignificant, part of this total would be kerosene and diesel.
- (7) Requirements for lubricants are estimated at 1 percent for fuel oil data, 2 percent for diesel oil data and 5 percent for gasoline data.
- (8) These estimates include units attached to para-military organizations.

B. The estimates.

The consumption estimates for Sino-Soviet Bloc naval forces are shown in Tables B-1 and B-2 .

* Naval Air Forces consumption is included with Air Forces in Appendix C.

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Table B-1

Estimated Annual Consumption of Petroleum Products
Soviet Bloc Naval Forces

(Metric Tons)								
Year	Location of Units	Motor Gasoline		Diesel Fuel	Fuel Oil	Lubricants		Total
		Ashore	Afloat	Afloat	Afloat	Ashore	Afloat	
1956	USSR							
	Baltic Fleet	17,060	14,820	346,620	771,150	900	13,490	1,164,040
	Pacific Fleet	15,825	2,280	120,685	744,145	835	9,910	893,680
	Northern Fleet	7,355	950	107,570	489,930	385	7,040	613,230
	Black Sea Fleet	8,750	2,740	135,030	556,015	460	7,230	710,225
	Total USSR	<u>48,990</u>	<u>20,790</u>	<u>709,905</u>	<u>2,561,240</u>	<u>2,580</u>	<u>37,670</u>	<u>3,381,175</u>
	Albania	65	2,165	1,945	0	5	155	4,335
	Bulgaria	450	4,335	11,840	7,535	25	545	24,730
	East Germany	1,040	775	25,840	0	55	570	28,280
	Poland	1,040	1,240	11,840	16,615	55	475	31,265
	Rumania	870	930	5,295	26,095	45	425	33,660
	Total Soviet Bloc	<u>52,455</u>	<u>30,235</u>	<u>766,665</u>	<u>2,611,485</u>	<u>2,765</u>	<u>39,840</u>	<u>3,503,445</u>
1957	USSR							
	Baltic Fleet	17,060	21,660	363,780	876,910	900	16,710	1,297,020
	Pacific Fleet	15,825	2,280	127,530	783,745	835	10,430	939,765
	Northern Fleet	7,355	2,850	127,290	529,930	385	7,990	675,800
	Black Sea Fleet	8,750	3,420	163,050	584,525	460	8,320	768,525
	Total USSR	<u>48,990</u>	<u>30,210</u>	<u>781,650</u>	<u>2,775,110</u>	<u>2,580</u>	<u>42,570</u>	<u>3,681,110</u>
	Albania	65	2,165	2,315	0	5	160	4,710
	Bulgaria	690	4,080	12,020	10,030	40	560	27,420
	East Germany	1,040	775	29,330	9,960	55	740	41,900
	Poland	1,040	2,400	13,190	17,110	55	570	34,365
	Rumania	870	930	5,295	26,095	45	425	33,660
	Total Soviet Bloc	<u>52,495</u>	<u>40,560</u>	<u>842,890</u>	<u>2,838,205</u>	<u>2,780</u>	<u>45,025</u>	<u>3,823,165</u>

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Table B-2

Estimated Annual Consumption of Petroleum Products
Communist China and Asiatic Satellite Naval Forces

(Metric Tons)								
Year	Location of Units	Motor gasoline		Diesel fuel Afloat	Fuel oil Afloat	Lubricants		Total
		Ashore	Afloat			Ashore	Afloat	
1956	China	3,465	29,885	108,910	67,065	185	4,475	213,985
	North Korea	515	3,295	2,040	0	30	215	6,095
	Total	<u>3,980</u>	<u>33,180</u>	<u>110,950</u>	<u>67,065</u>	<u>215</u>	<u>4,690</u>	<u>220,080</u>
1957	China	4,855	34,840	129,615	73,115	255	5,220	247,900
	North Korea	515	3,295	2,040	0	30	215	6,095
	Total	<u>5,370</u>	<u>38,135</u>	<u>131,655</u>	<u>73,115</u>	<u>285</u>	<u>5,435</u>	<u>253,995</u>

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Appendix C

AIR FORCES

1. Sino-Soviet Bloc Air Forces.

A. Assumptions and methodology.

(1) Aircraft fuels and lubricants.

(a) Aircraft in operating regiments - The air order of battle for aircraft of each Satellite country, Soviet forces in each Satellite country, and the USSR, for the years 1950-1955, was established. Since Soviet aircraft strengths are normally stated as TO/E strengths, the percentage of TO/E for each type regiment was used to determine actual aircraft strength. Flying time per aircraft was based on the estimated pilot time per year for each type regiment. A factor for the ratio of aircraft to pilots was determined in order to get actual aircraft times per year. A handling factor loss of 3.04 percent for aviation fuel, and 3.57 percent for aviation lubricating oil was used. Oil consumption factors used are 1.62 percent of fuel consumed for piston engines, and .163 percent of fuel consumed for jet engines.

(b) Aircraft in training establishments - Aircraft assigned to the military training establishment and para-military organizations were determined for each year. Flying hours per aircraft in these training schools, as estimated in the current issue of AIS-26/1, "Sino-Soviet Bloc Air Planning Factors," were used in determining the consumption for all training aircraft.

(c) Aircraft in civil aviation - Civil aircraft include those assigned Civil Air Fleet, Polar Aviation, and civil training schools. Monthly flying hours for aircraft in the Civil Air Fleet, as shown in AIS 2-2, "Estimated Sino-Soviet Bloc Selected Air Order of Battle," were used to determine consumption.

(d) MAP Aircraft (testing) - Time factors were established for engine run-in and aviation industry testing prior to turning aircraft over to the military establishment, for aircraft and engine modifications and overhauls performed by MAP, and for aircraft permanently assigned to the MAP.

(2) Diesel fuel and motor gasoline.

(a) Based upon the current average daily consumption rate against regimental strengths as estimated in AIS 2-26 and current AOB publications.

(3) Kerosene and fuel oil.

(a) The requirements for heating and lighting are considered to be insignificant in comparison to other petroleum product requirements. No estimates have been made for kerosene and fuel oil used for this purpose.

B. The Estimates.

The estimated increased aircraft fuel consumption for 1956-1957 reflects the transition to jet aircraft, without any significant decrease in the number of conventional aircraft, the increased consumption of fuel per plane, and the increase in operational flying time.

The consumption estimates for Sino-Soviet Bloc Air Forces, including Naval Air Forces, are shown in Tables C-1, C-2, and C-3.

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Table C-1

Estimated Annual Consumption of Petroleum Products
Soviet Air Forces
1956

(Metric Tons)								
Location of Units	Aviation Gasoline			Jet Fuel	Motor Gasoline	Diesel Fuel	Lubricants	Total
	Grade 100	Grade 95	Less than					
			Grade 95					
USSR								
Soviet Air Force	305,263	47,216	0	3,621,411	55,226	15,266	14,160	4,158,542
Soviet Naval Aviation	21,376	16,320	0	312,614	12,998	3,628	2,098	869,034
Training	75,324	132,640	83,516	399,717	10,522	814	5,624	708,157
Civil Aviation	6,984	159,212	235,169	26,380	63,511	21,125	6,502	518,883
MAP Aircraft (testing)	1,033	2,365	732	262,113	1,101	463	3,120	270,927
Total	409,980	457,753	319,417	5,122,235	143,358	41,296	31,504	6,525,543
East Germany								
Soviet Air Force	0	7,214	0	157,212	3,135	922	189	168,972
Soviet Naval Aviation	0	267	0	10,334	222	80	37	10,940
Total	0	7,481	0	167,546	3,357	1,002	526	179,912
Hungary								
Soviet Air Force	0	738	0	48,157	795	288	92	50,070

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Table C-1

Estimated Annual Consumption of Petroleum Products
Soviet Air Forces
1956
(continued)

Location of Units	Aviation Gasoline			Jet Fuel	Motor Gasoline	Diesel Fuel	Lubricants	Total
	Grade 100	Grade 95	Less than					
			Grade 95					
<u>Poland</u>								
Soviet Air Force	0	4,562	0	78,143	1,431	537	165	84,838
Soviet Naval Aviation	0	1,134	0	5,329	240	64	35	6,802
Total	<u>0</u>	<u>5,696</u>	<u>0</u>	<u>83,472</u>	<u>1,671</u>	<u>601</u>	<u>200</u>	<u>91,640</u>
<u>Rumania</u>								
Soviet Air Force	0	1,073	0	17,871	616	195	52	19,807
Total Soviet Air Forces	<u>409,980</u>	<u>472,741</u>	<u>319,417</u>	<u>5,439,281</u>	<u>149,797</u>	<u>43,382</u>	<u>32,374</u>	<u>6,866,972</u>

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Table C-1

Estimated Annual Consumption of Petroleum Products
Soviet Air Forces
1957

	Aviation Gasoline			(Metric Tons)				
Location of Units	Grade 100	Grade 95	Less than	Jet Fuel	Motor Gasoline	Diesel Fuel	Lubricants	Total
			Grade 95					
USSR								
Soviet Air Force	488,925	143,722	0	6,540,032	61,266	26,257	20,951	7,281,153
Soviet Naval Aviation	42,515	12,498	0	1,435,617	13,448	5,764	3,131	1,512,973
Training	73,000	129,940	162,060	516,407	4,158	1,782	6,751	894,098
Civil Aviation	9,484	179,211	234,003	69,238	89,470	38,344	6,848	626,598
MAP Aircraft (testing)	1,460	3,754	0	345,694	2,703	1,150	5,682	360,443
Total	615,384	469,125	396,063	8,906,988	171,045	73,297	43,363	10,675,265
East Germany								
Soviet Air Force	0	15,556	0	187,925	2,837	1,216	544	208,078
Soviet Naval Aviation	0	819	0	20,881	315	135	60	22,210
Total	0	16,375	0	208,806	3,152	1,351	604	230,288
Hungary								
Soviet Air Force	0	1,380	0	62,314	931	410	123	65,158

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Table C-1

Estimated Annual Consumption of Petroleum Products
Soviet Air Forces
1957
(continued)

(Metric Tons)								
Location of Units	Aviation Gasoline			Jet Fuel	Motor Gasoline	Diesel Fuel	Lubricants	Total
	Grade 100	Grade 95	Less than Grade 95					
<u>Poland</u>								
Soviet Air Force	0	8,179	0	119,708	1,932	828	320	130,967
Soviet Naval Aviation	0	431	0	13,301	214	92	35	14,073
Total	0	8,610	0	133,009	2,146	920	355	145,040
<u>Rumania</u>								
Soviet Air Force	0	1,380	0	26,237	671	287	65	28,640
Total Soviet Air Forces	<u>615,384</u>	<u>496,870</u>	<u>396,063</u>	<u>2,337,354</u>	<u>177,945</u>	<u>76,265</u>	<u>44,510</u>	<u>11,144,391</u>

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Table C-2

Estimated Annual Consumption of Petroleum Products
European Satellite Air Forces
1956

(Metric Tons)

Location of Units	Aviation Gasoline			Jet Fuel	Motor Gasoline	Diesel Fuel	Lubricants	Total
	Grade 100	Grade 95	Less than Grade 95					
Albania								
Air Force	0	816	0	2,332	184	68	21	3,421
Bulgaria								
Air Force	0	10,114	0	26,341	2,128	585	212	39,380
Training	0	4,877	4,218	0	273	0	114	9,482
Civil Aviation	0	1,925	0	0	0	0	26	1,951
Total	0	16,916	4,218	26,341	2,401	585	352	50,813
Czechoslovakia								
Air Force	0	15,866	0	96,772	3,020	934	395	116,987
Training	0	6,864	8,641	12,147	616	0	341	28,609
Civil Aviation	0	8,128	1,622	0	66	50	138	10,004
Total	0	30,858	10,263	108,919	3,702	984	874	155,600
East Germany								
Air Force	0	3,027	4,266	3,206	621	265	126	11,511
Hungary								
Air Force	0	7,705	0	27,213	1,480	433	200	37,031
Training	0	2,305	5,887	0	189	285	104	8,770
Civil Aviation	0	2,150	0	0	0	0	30	2,170
Total	0	12,160	5,887	27,213	1,669	718	334	47,971

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Table C-2

Estimated Annual Consumption of Petroleum Products
European Satellite Air Forces
1956
(continued)

(Metric Tons)

Location of Units	Aviation Gasoline			Jet Fuel	Motor Gasoline	Diesel Fuel	Lubricants	Total
	Grade 100	Grade 95	Less than Grade 95					
Poland								
Air Force	0	19,661	0	78,350	3,717	1,002	372	103,102
Naval Aviation	0	1,223	0	8,861	263	0	24	10,175
Training	0	6,434	10,304	6,073	530	0	283	23,714
Civil Aviation	0	4,279	854	0	35	27	72	5,267
Total	0	31,602	11,248	93,284	4,545	1,128	751	142,558
Rumania								
Air Force	0	9,086	0	27,884	1,526	461	232	39,189
Training	0	1,478	4,121	0	126	0	69	5,794
Civil Aviation	0	3,208	640	0	25	0	54	3,927
Total	0	13,772	4,761	27,884	1,677	461	355	48,910
Total European Satellites	0	109,141	40,643	289,179	14,799	4,209	2,813	460,784

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Table C-2

Estimated Annual Consumption of Petroleum Products
European Satellite Air Forces
1957

(Metric Tons)

Location of Units	Aviation Gasoline			Jet Fuel	Motor Gasoline	Diesel Fuel	Lubricants	Total
	Grade 100	Grade 95	Less than Grade 95					
Albania								
Air Force	0	1,436	0	6,753	267	115	34	8,605
Bulgaria								
Air Force	0	9,696	0	29,565	1,878	805	238	42,752
Training	0	5,199	7,914	0	243	0	169	13,514
Civil Aviation	0	1,932	0	0	0	0	26	1,958
Total	0	16,826	7,914	29,565	2,121	805	403	57,624
Czechoslovakia								
Air Force	0	26,280	0	122,275	3,467	1,495	624	154,761
Training	0	7,302	16,215	17,400	519	261	523	42,250
Civil Aviation	0	8,157	2,470	0	163	75	115	11,010
Total	0	41,739	18,685	139,675	4,199	1,831	1,292	207,421
East Germany								
Air Force	0	4,514	3,285	8,213	1,073	460	212	17,757
Hungary								
Air Force	0	10,950	0	21,535	1,476	632	212	34,805
Training	0	2,453	11,048	0	168	400	178	14,247
Civil Aviation	0	2,147	0	0	0	0	28	2,175
Total	0	15,550	11,048	21,535	1,644	1,032	408	51,227

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Table C-2

Estimated Annual Consumption of Petroleum Products
European Satellite Air Forces
1957
(continued)

(Metric Tons)

Location of Units	Aviation Gasoline			Jet Fuel	Motor Gasoline	Diesel Fuel	Lubricants	Total
	Grade 100	Grade 95	Less than Grade 95					
Poland								
Air Force	0	17,082	0	112,513	3,742	1,604	458	135,399
Naval Aviation	0	1,898	0	12,500	416	178	51	15,043
Training	0	6,845	19,505	8,699	471	0	442	35,962
Civil Aviation	0	4,294	1,300	0	86	59	76	5,815
Total	0	30,219	20,805	133,712	4,715	1,841	1,027	192,219
Rumania								
Air Force	0	13,505	0	29,565	1,744	747	267	45,828
Training	0	1,572	7,733	0	113	0	119	9,537
Civil Aviation	0	3,220	975	0	64	0	57	4,316
Total	0	18,297	8,708	29,565	1,921	747	443	59,681
Total European Satellites	0	128,471	70,445	369,018	15,940	6,831	3,829	594,534

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Table C-3

Estimated Annual Consumption of Petroleum Products
Communist China and Asiatic Satellite Air Forces
1956

(Metric Tons)

Location of Units	Aviation Gasoline			Jet Fuel	Motor Gasoline	Diesel Fuel	Lubricants	Total
	Grade 100	Grade 95	Less than Grade 95					
China								
Air Force	12,510	28,622	0	201,522	4,812	1,216	1,077	249,759
Naval Aviation	0	3,180	0	67,301	618	171	105	71,375
Training	0	11,308	7,474	20,170	451	40	341	39,784
Civil Aviation	0	11,645	1,090	0	45	20	226	13,026
Total	12,510	54,755	8,564	288,993	5,926	1,447	1,749	372,944
North Korea								
Air Force	0	3,302	0	57,376	1,012	347	172	62,209
Training	0	1,690	740	2,751	62	0	47	5,290
Total	0	4,992	740	60,127	1,074	347	219	67,499
Total Communist China and Asiatic Satellites	12,510	59,747	9,304	349,120	7,000	1,794	1,968	440,443

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Table C-3

Estimated Annual Consumption of Petroleum Products
Communist China and Asiatic Satellite Air Forces
1957

(Metric Tons)

Location of Units	Aviation Gasoline			Jet Fuel	Motor Gasoline	Diesel Fuel	Lubricants	Total
	Grade 100	Grade 95	Less than Grade 95					
China								
Air Force	13,110	28,580	0	313,370	3,153	1,351	1,314	360,908
Naval Aviation	1,460	3,175	0	134,302	692	297	146	110,072
Training	0	15,878	14,615	19,593	196	96	521	50,899
Civil Aviation	0	18,250	2,555	0	90	38	337	21,270
Total	<u>14,600</u>	<u>65,883</u>	<u>17,170</u>	<u>467,265</u>	<u>4,131</u>	<u>1,782</u>	<u>2,318</u>	<u>573,119</u>
North Korea								
Air Force	0	3,650	0	99,645	805	345	220	104,665
Training	0	2,372	1,445	2,672	27	0	71	6,587
Total	<u>0</u>	<u>6,022</u>	<u>1,445</u>	<u>102,317</u>	<u>832</u>	<u>345</u>	<u>291</u>	<u>111,252</u>
Total Communist China and Asiatic Satellite	<u>14,600</u>	<u>71,905</u>	<u>18,615</u>	<u>569,582</u>	<u>4,963</u>	<u>2,127</u>	<u>2,609</u>	<u>684,401</u>