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If the tank force is to be improved along these lines, consideration should be given to furnishing additional recovery vehicles to the Koreans. Allocating one M-88 (at \$200,000) per tank company of seventeen tanks, results in costs ranging from \$6.42 million for 14 divisions to \$10.510 million for 23 divisions. If two M88s were allocated per tank battalion, the costs would range from \$4.80 to \$7.20 million respectively. In view of the high cost of recovery vehicles, the latter level is more realistic. In either case, the vehicle would not be available to the Koreans until FY 72 because the M-88 production line is inactive now.

Several anti-tank systems also bear consideration for the Koreans -- the LAW for close-in protection and the TOW or additional 106 mm rifles for mid-range fires. The LAW costs \$48 a piece and could be allocated at a rate of 300/division, supplementing the 3.5 inch rocket launchers. Costs for 14 to 23 divisions would range from about \$200,000 to \$360,000. The TOW anti-tank missile is less expensive than the current 106 rifle, which it would replace or supplement (\$6,300⁴ versus \$6,800); however, training costs easily make up the difference, and for Korea, where great numbers of tank targets are not that likely, the 106 has the added advantage of being useful against other targets. It may be appropriate to consider equipping ROK maneuver units with additional 106 mm recoilless rifles in view of the great number of assault guns NKA or CFR forces might possess. Costs for equipping ROK maneuver units with two additional 106 mm rifles per battalion range from \$3.36 million for 14 divisions to \$5.52 million for 23 divisions. These costs include a $\frac{1}{2}$ ton carrier vehicle. This would give a 14 division ROK force a 2 to 1 numerical advantage in anti-tank guns against the North Korean Army and comparability with a NKA/CFR initial assault force.

6.5 Artillery Improvement Program for the ROK

At the present the ROK field artillery capability barely matches that of the North Koreans, even taking into consideration ROK deployment and ammunition supply advantages (see Table 5-5 and 5-10, Section 5, and Table 6-11 below). The North Koreans could offset these factors by pre-stocking ammunition and forward deploying artillery units now assigned to the reserve. To improve the ROK counter-battery and artillery mobility capabilities, several artillery modernization programs have been designed (see Table 6-12 on page 108). The costs would range from \$13.8 million for NKA defense, in which case the ROK is furnished the equivalent of the US artillery now in the two US divisions, to \$26.4 million for defense against a combined CFR/NKA defense.

* Item is not yet standard; cost is based on experimental data.

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TABLE 6-11

ROK-NKA ARTILLERY STRENGTHS

	<u>ROK</u>	<u>NKA</u>
<u>Light Artillery</u>		
76 mm	-- 1/	1242
105 mm	1098 1/	-- 2/
120 mortars	--	978 2/
<u>Medium Artillery</u>		
122 mm	--	510
152 mm	--	66
155 mm	534 1/	--
160 mortars	--	96 2/
<u>Heavy Artillery</u>		
8 in/175 mm	72	

1/ At 20 division level.

2/ In artillery units.

6.6 Combat Mobility

Along lines of increasing ROK ability to respond to an unexpected surprise attack, it may be useful to increase combat mobility, perhaps by mechanizing the combat elements and/or by furnishing the ROKs a limited airmobile capability so that one ROK division can be rapidly redeployed. The principal improvements involved would be armored personnel, cargo carriers for the mechanized units and UH-1H and AH1G helicopters for the air mobile units. The basis of allocation and costs are summarized on the following page:

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TABLE 6 - 12

ALTERNATIVE ROK ARTILLERY IMPROVEMENT PROGRAMS

Weapon	Unit Cost ^{1/} (\$US)	Present Program		Offset US Arty in Korea		Increase Arty Mobility Offset US Arty in Korea ^{2/}		Improve Corps Arty, Arty mobility, and Offset US ^{2/}		Major Increase Corps Arty, Improve Mobility ^{2/}	
		Tubes	Cost (\$US) ('000)	Tubes	Cost (\$US) ('000)	Tubes	Cost (\$US) ('000)	Tubes	Cost (\$US) ('000)	Tubes	Cost (\$US) ('000)
105 mm	21,164	24	508	132	2,794	132	2,794	189	4,000	189	4,000
155 mm (TOW)	30,618							30	919	30	919
155 mm (SP)	119,055			36	4,286	36	4,286	36	4,286	18	2,143
8" (SP)	140,135	12	1,682	48	6,726	72	10,090	72	10,090	108	15,135
175 mm (SP)	160,780					12	1,929	12	1,929	48	7,717
TOTAL			2,190		13,806		19,099		21,224		29,914

^{1/} Does not include ammunition. For these costs see Section 7, Table 7-3.

^{2/} Program designed for initial defense against a combined CPB/NKA attack, 18 ROK division reinforced defending.

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TABLE 6-13

MECHANIZED/AIRMOBILE MODERNIZATION

<u>Vehicle</u>	<u>Cost</u>	<u>Nbr per Battalion</u>	<u>Mech/Avn Bns</u>	<u>Total^{1/}</u>	<u>Total Cost</u>
Carrier, APC, M113	36,000	42	7	294	10,584,000
Carrier, Cargo, M548	33,243	14	7	98	465,402
Carrier, Command Post, M577A1	46,304	7	7	49	324,128
Recovery Vehicle, M578	93,255	4	7	28	373,020
Sub-Total					11,746,550
Helicopter, UH-1H	268,860	25 ^{2/3}	5	133	35,758,380
Helicopter, AH1G	467,000	20 ^{3/4}		20	9,340,000
Sub-Total					45,098,380
TOTAL					<u>56,844,930</u>

- 1/ Seven battalions mechanized and five battalions airmobile.
- 2/ Twenty-five helicopters per company with another 8 helicopters/company needed for maintenance float. Furnishes lift for one ROKA battalion.
- 3/ One escort company.

6-7 Air Defense

There is also ROK concern about the possible NEAF air attacks on ground forces. As was suggested in Chap.III,Sec. 4, this threat is relatively small; in terms of the land-air trade-off, the NKA close air threat is so limited that its presence increases ROK land requirements by about 1/3 a division.* Nevertheless, to reduce the probability that specific important land targets are not destroyed, e. g., command posts, etc., certain improvements to the ROK air defense posture have been considered. Accordingly, and taking air defense of the 7th Army area as a guide, it could make sense to furnish REDWY, additional MA2 (dusters), and improved HAWK to the Koreans. If US air defense units in Korea are reduced, additional HAWK units would probably be needed. The trade-off involved in this latter case and overall air defense planning factors are discussed in greater detail in Chapter 3, Section 4. In the context of ROK Army modernization, these alternatives could cost from \$10.2 million for defense of the ROK ground units and airbases to \$59.2 million if US HAWK and HERCULES units are withdrawn from Korea and their role assumed by ROK units equipped with the improved HAWK. The alternatives are set forth in more detail on the following page:

* Based on NK air capability alone.

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TABLE 6-14
ALTERNATIVE AIR DEFENSE IMPROVEMENTS ^{1/}
FOR THE ROK ARMY
(INVESTMENT COST IN \$US MILLIONS) ^{2/}

Weapon System	Present (FY70-74) MAP Program (Cost)	ALTERNATIVES					
		Air Defense Ground Forces (II) ^{4/}		Air Defense Ground Forces/Airbases-Ports (III) ^{5/}		ROK Only Air Defense-NKA (IV) ^{6/}	
		Nbr	Cost	Nbr	Cost	Nbr	Cost
REDEYE Missile ^{3/}	--	120	5.4	--	--	--	--
M-42 (40 mm)/M-55 (50 cal) Battery (16/8 guns)	--	17 3/4	44.1	17 3/4	44.1	17 3/4	44.1
Improved HAWK Bn	--	--	--	12	55.4	20	94.0
HAWK/HERCULES Missiles/Spare	13.2	--	--	--	--	--	--
TOTAL	13.2	--	49.5	--	99.5	--	128.1

^{1/} For details, see Section 4, Chapter III.

^{2/} Includes Investment and Operating Costs.

^{3/} When releasable to Foreign Governments.

^{4/} ROK improved with guns and REDEYE; US Forces remain at current level.

^{5/} ROK improved with guns and improved HAWK; US HAWK reduced to two battalions.

^{6/} ROK improved with guns and improved HAWK; ROK HERCULES phased out; US HERCULES and HAWK withdrawn.

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6.8 Communication and Command and Control Improvements

On the basis of numerical comparisons, ROK forces are superior in communications equipment to the NKA forces (Section 5). Nevertheless, most of the ROK radios are old, and because of limited range, are only a marginal supplement to wire communications for the more remote outposts. To improve this situation, replacement of the present man carried and vehicular mounted radios in the combat forces is suggested. For ROK divisions along the DMZ, helicopters to be used by regimental and division commanders and radar sets for frontline troops also bear consideration. The ROK forces could be furnished US models of the radios and radar sets, which would entail costs ranging from \$42 million to \$50.6 for 16 to 23 divisions respectively, (see Table 6-15 below). Alternatively, local radio assembly facilities could be established in Korea, perhaps jointly with Japanese interests, and the Koreans could then be furnished radios of a local design, locally produced, and considerably less expensive. Investigation of this possibility should probably be pursued prior to any decision on communication improvements.

TABLE 6-15

COMMUNICATION EQUIPMENT FOR ROK LAND FORCES

	<u>16 Div</u>	<u>18 Div</u>	<u>23 Div</u>
Radio, AN/PRC-25 ^{1/}	8.9	10.0	11.2
Radio, AN/VRC-12, 46, 47, & 49 ^{2/}	8.1	9.1	14.4
Radar, AN/PPS-3 ^{3/}	25.0	25.0	25.0
Helicopter, LOH ^{4/}	6.5	6.5	6.5
TOTAL	48.5	50.6	57.1

^{1/} 600 per division.

^{2/} 200 per division.

^{3/} 2 per company for 10 divisions on the DMZ (720)

^{4/} 5 per division for divisions on the DMZ.

^{5/} Includes 480 AN/GRC-106 for longer range communications.

6.9 ROK Force Structure Changes and Budget Increases Implicit in the Modernization Proposals

Most of the modernization proposals suggested above involve replacement of older equipment items with more current models. Lower operation costs associated with the newer equipment will undoubtedly occur, though inflation, learning costs, and other unexpected expenses may well offset them. With respect to artillery and aviation improvements, however, a number of force structure increases are entailed in the modernization proposals. The units, personnel spaces, and associated additional equipment and ROK budget costs are set forth in Table 6-16 on the next page.

TABLE 6-16
COMBAT FORCE IMPROVEMENTS
ROK ANNUAL COSTS AND MANPOWER INCREASES
(Millions of \$US)

Type Unit (Strength)	NKA Defense			NKA-CFR Initial Defense			NKA-CFR Defense		
	Unit(s)	Personnel	Cost ^{1/}	Unit(s)	Personnel	Cost ^{1/}	Unit(s)	Personnel	Cost ^{1/}
Artillery (Field)									
Arty Gp Hqs (135)	4	540		8	1080		10	1350	
155 How Bn. (638)	1	638		1	638		1	638	
8 in How Bn (548)	4	2192		6	3288		9	4932	
175 mm Gun Bn (548)	--	--		1	548		4	2192	
TOTAL		3370	2.0		5554	3.3		9112	5.4
Artillery (Air Defense)^{2/}									
HAWK Btry	--	--	--	12	--	9.3	20	--	15.5
AAA AW Battery (117)	17 3/4	--	22.1	17 3/4	--	22.1	17 3/4	--	22.1
NIKE-HERCULES (894)	--	--	--	--	--	--	--	--	--
TOTAL		--	22.1		--	31.4		--	37.6
Aviation									
Avn Bn, HHC (76)	2	152		2	152		2	152	
Avn Co, Air Mobile (147)	5	735		5	735		5	735	
Avn Co, Attack (222)	1	222		1	222		1	222	
Avn Gp Hqs (75)	1	75		1	75		1	75	
TOTAL		1184	7.2		1184	7.2		1184	7.2
OVERALL TOTAL		4554^{3/}	31.3		6738^{3/}	41.9		10296^{3/}	50.2

^{1/} Cost factors used are from COMUSKOREA Mag, 80908352 Aug. 68. Per man factors in \$US are as follows: artillery - 596; HERCULES - 1752; HAWK - 2488; Aviation - 6110. AAA/AW costs are from Section 5, Chapter III.

^{2/} See Section 4, Chapter III for details.

^{3/} Does not include Air Defense Artillery.

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6.10 Availability and Scheduling

An estimate of the availability from production of the main items in the modernization packages is shown in Table 6-17, page 81 . Only the main items for modernization were addressed in this estimate; full effectiveness from the newer systems could be delayed by supply shortages in lesser items. Most of the modernization has been phased over the four-year period FY 71-74, based on the availability schedule (see Table 6-18, page 82.). The investment costs would peak during FY 71 and 72, primarily because the majority of the equipment becomes available from production during that period.

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TABLE 6-17

AVAILABILITY OF EQUIPMENT (FY 70-74)

	PRIORITY REQUIREMENTS		Max Monthly Production (Present Facilities) ^{1/}	End 69 FDP	End 70 FDP	End 71 FDP (Projected) ^{2/}	End 72 FDP (Projected) ^{2/}	End 73 FDP (Projected)	End 74 FDP ^{2/} (Projected)	Availability for ROK ^{3/} Modernization ^{3/}	
	US	Prepositioned US Stock									RVNAF
Rifle, M16	1,482,752		39,138	50,000	767,732	1,250,865	2,350,865	3,450,865	4,550,865	5,650,865	FY 71
Machine Gun, M60	77,778		841	1,700	68,672	79,701	100,101	120,501	140,901	161,301	FY 71
LAW, Rocket 66mm	776,400		0	85,000/yr	723,400	760,400	845,400	930,400	1,115,400	1,200,400	FY 71
REDEYE	15,195			200	15,793	14,838	17,238	19,638	22,038	24,438	FY 71
Mortar, 4.2"	2,843			45	2,956	3,100	3,640	4,180	4,720	5,260	FY 70
Howitzer, 105mm, Towed	1,670		319	10	2,638	2,683	2,803	2,923	3,043	3,163	FY 69
Howitzer, 155mm, Towed	595		151	none	991	1,030					FY 69 ^{4/}
Howitzer, 8", SP, M110	783			none	703	774					FY 71 ^{4/}
Gun, 175mm SP, M107	199			none	244	199					FY 71 ^{4/}
Howitzer, 155mm, SP, M109	1,508										
APC, M113	9,872			400	12,398	11,935	16,735	21,535			FY 70
Carrier Cargo, M548	3,050			(incl above)	2,909	2,816	4,016	5,216	6,416	7,616	FY 71
Carrier, CP, M577	3,387			(incl above)	2,891	3,115	4,315	5,515	6,715	7,915	FY 71
Recovery Vehicle, M578	1,131	41		none	1,148	1,181					FY 71 ^{4/}
Recovery Vehicle, M58	994			none	924	924					FY 71 ^{4/}
Helicopter, UH-1H	5,753			150	4,381	4,354	6,154	7,654			FY 71
Helicopter, AH-1G	796			(incl above)	572	517	517	817			FY 72
Radar, AN/PPS-5	3,329			60	1,442	1,589	2,309	3,029	3,749	4,469	FY 73
Helicopter, Light Observation	3,288			50	2,119	2,078	2,678	3,278	3,878	4,478	FY 73 ^{4/}
Radio, AN/PXC-77	71,082		2,151	1,375	57,244	73,177	89,677	106,177	122,677	139,177	FY 71
Radio, AN/GRC-106	12,044			160	13,381	8,569	10,489	12,409	14,329		FY 71
Radio, AN/VRC-12	90,694			1,300	77,629	90,458	106,098	121,658			FY 71

1/ Production capability is shown at the maximum monthly level with no expansion of current facilities.

2/ Totals are projections of maximum production capabilities without consideration of possible drawdown for other than US or RVNAF priorities.

3/ Earliest possible Fiscal Year in which deliveries to ROK could be expected, assuming no change in current priorities.

4/ Production facilities would be reactivated to produce ROK requirements.

5/ Helicopters include production of OH-6A, OH-58, OH-13 and OH-23.

TABLE 6-18

ROK COMBAT FORCE MODERNIZATION ALTERNATIVES
INVESTMENT COST SCHEDULING
(millions of \$US)

Modernization Package	NKA Defense ^{1/}						NKA-CFR Initial Defense ^{2/}						NKA-CFR Sustained Defense ^{3/}					
	FY 70	FY 71	FY 72	FY 73	FY 74	Total	FY 70	FY 71	FY 72	FY 73	FY 74	Total	FY 70	FY 71	FY 72	FY 73	FY 74	Total
Maneuver Unit	5.6	11.2	23.2	7.0	7.0	5.6	11.2	26.7	7.5	7.9	5.6	11.3	28.6	21.2	15.4			
Artillery (Field)	--	13.8	--	--	--	--	15.5	5.7	--	--	--	13.3	10.8	3.8	2.0			
Mechanized Mobility	--	--	--	--	--	--	6.0	5.8	--	--	--	6.0	5.8	--	--			
Air Mobility	--	26.5	18.6	--	--	--	26.5	18.6	--	--	--	26.5	18.6	--	--			
Air Defense	--	44.1	--	--	5.4	--	44.1	20.0	30.0	5.4	--	44.1	30.0	32.0	32.0			
Communications, Command, and Control	--	13.5	11.9	23.1	--	--	13.5	13.0	24.1	--	--	13.5	14.2	29.4	--			
TOTAL	5.6	109.1	53.7	30.1	12.4	210.9	5.6	116.8	89.8	61.6	13.3	287.1	5.6	144.7	108.0	86.4	49.4	354.1

^{1/} 16 Divisions

^{2/} 18 Divisions

^{3/} 20 Divisions

^{4/} For basis, see Table 6-14 and Section 4, Chapter III.

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SECTION 7: LOGISTICS REQUIREMENTS

7.1 General

Because only a minimal quantity of war reserve supplies -- ammunition, spare parts and attrition replacement items, and petroleum oils and lubricants (POL) -- has been available for the ROK forces, their ability to fight effectively has been questioned. Furnishing these items involves a complex logistic system, additional units and capabilities: this subject is discussed in Section 8 to follow. Advance procurement and stockpiling of the supplies is also required. Of course, to the extent that ammunition and POL are stockpiled in Korea, there is a potential danger that the ROKs might pre-emptively attack North Korea. Therefore, a careful balance is needed so that in Korea supplies are adequate for initial defense but not large enough to permit a ROK attack north.

On the basis of the factors to be enumerated below, the currently programmed stockpiles of ammunition in Korea should be more than adequate for defense. However, two actions are in order: (1) The ROKA forces should be supplied at new ammunition supply rates, rather than those in SB 38-26; and (2) additional items should be funded to round out the stocks or to meet requirements for new weapon systems. A number of funding levels are discussed. With respect to spare parts, attrition items, and POL the situation is more complex. It is clear that provision should be made for ROKA needs in US logistic guidance planning: this had not been done in any great detail. The amount of funding needed is dependent on (1) the availability of current stocks and (2) the funding level.

In the broader context, there are basically three logistic supply alternatives. First, in order to avoid disturbing the status quo, present deployments and support concepts could be continued until the end of the Vietnam conflict. Accordingly, supplies costing an estimated \$589 million would continue to be set aside for the two US divisions. The ROKA would be furnished \$277 million for ammunition giving it 75 days for 18 divisions at ARPAC rates, and eventually, perhaps \$510 million of parts and attrition items (18 divisions for 90 days) would be stockpiled: a total of \$866 to 1376 million.

Second, as part of a program to pass responsibility for ground defense against NKA attacks to the ROK, their ammunition and supplies could be increased incrementally above the first alternative, while concurrently the US forces would be withdrawn from the frontline, one division being placed in a reserve role (perhaps regional), and the other inactivated. In this case, supplies costing \$148-295 million would be stockpiled for the US division, the variation depending on whether the costs are allocated to Korea or divided between SEA and Korea; \$18 million of ammunition and \$450-850 million for spare parts (8 to 12 divisions for 180 days) would be set aside for the ROK: a total of \$616-1163 million.

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Third, consistent with a policy that assigns to the ROK complete responsibility for conventional defense on the ground against both NKA and NKA/CCA attacks, ROKA ammunition and Class II and IV stocks would be increased incrementally still further. Ammunition stocks costing from \$154 to \$207 million would be appropriate, the higher amount if NKA-CCA combined operations were a realistic threat. (They are not now -- see page 2 SNIE 14.2-69, 30 January 1969.) Another \$650 million would be needed for spare parts and attrition replacements -- 23 divisions for 90 days. It is assumed that against the Chinese a 90 day conventional war policy would be adopted similar to the NATO strategy. Small additional costs would be required for the FRD FRD this is discussed below in Section 10. The total costs of this alternative would range from \$872 to \$925 million with FRD If 180 days of spares for 23 ROK divisions were to be furnished, the costs would range from \$1704 to \$1757 million. The principal costs are summarized below and discussed in more detail in succeeding paragraphs.

TABLE 7-1

ALTERNATIVE LOGISTIC SUPPORT REQUIREMENTS
(Incremental One-Time Costs in \$US Millions)

	<u>Ammunition</u> ^{1/}	<u>Spare Parts</u> ^{2/} (Class II & IV)	<u>TOTAL</u>
<u>Status Quo</u>			
ROKA	277	510 ^{3/}	787 (277) ^{4/}
US	<u>239</u>	<u>350</u>	<u>589</u>
Total	516	860	1376 (866) ^{4/}
<u>ROK Defense Against NKA</u>			
ROKA	18	450-850	468-868
US	<u>60-120</u>	<u>88-175</u>	<u>148-295</u>
Total	78-120	538-1025	616-1163
<u>ROK Defense Against NKA/CCA</u>			
ROKA	154-207	650(1704-1757) ^{5/}	804-1964
US	<u>24</u>	<u>44</u>	<u>68</u>
Total	178-231	694-1801	872-2032

1/ See Table 7-4 below. For US costs, current SVN data is used: One division force day costs \$670,000.

2/ See Table 7-7 below.

3/ To be furnished later.

4/ Parenthetical figures are initial costs minus spare parts for ROKA

5/ 180 days/spare for 23 divisions.

7.2 Ammunition

As mentioned above, it is important for the ROKs to have enough ammunition to defend until a supply line from the US and Japan is established. The quantity

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of ammunition needed is a function of the following: (1) the number of ROK divisions actually engaged; (2) the intensity of their combat; and (3) the number of days until resupply from outside Korea can be established. At the present time, authorized assets are based on the requirement for 18 divisions: Thirty days supply at US ASB rates is scheduled for Korea, and another 30 days supply at US rates would be stored offshore. On the basis of strategic mobility capability studies, it is believed that within 75 days a pipeline to Korea could be established and in-country supplies brought to a 30 day safety level.*

A lower level of supply might well be adequate primarily because (1) the ammunition expenditure rates may be lower than SB-38-26; and (3) fewer divisions than eighteen would probably be fighting at the outset of a renewed war. At the present, projections of ROK ammunition requirements are based on forecasted rates for US Army units stationed in the Pacific. On the basis of a selective sample, it appears that these rates (USARPAC Rates - SB-38-26) are considerably higher than US, ROK, and Communist consumption during the Korean War: They equal about 2.7 times a rate representative of past allied experience in Korea and over 15 times the Communist ammunition consumption rate even during the latter stages of the Korean War when NKA/CCA logistics support operations were functioning effectively.

The primary difference between the ARPAC rates which are currently used to forecast ROK requirements and the proposed rates is in the indirect fire weapons category as indicated in Table 7-2. For other weapons, the ARPAC and proposed rates are similar -- see Table 7-3 on the next page. As can be seen from Table 7-3, adopting the proposed rates for the ROK Army would reduce the cost of a ROK division force equivalent day of ammunition by \$171,000, from \$510,000 to \$329,000.

TABLE 7-2

COMPARISON OF DAILY SUPPLY RATES
(Rounds/Tube/Day)

	<u>ARPAC Rate</u>	<u>Proposed Rate^{2/}</u>
81 mm HE ^{1/}	21.5	6.1
105 mm HE	46.1	25.9

^{1/} HE represents 68% of daily requirements.

^{2/} Proposed rates are based on average Korean War consumption, but set sufficiently high so that there would be less than a 1% chance that they would be exceeded in 60 days.

* JCS, MOVECAP Study.

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TABLE 7-3

ROK LAND FORCE - AMMUNITION RATES

Weapon	Current Rates		Cost per ROK DFE day (\$US)	Currently Programmed Assets		Proposed Rates	
	Weapons per ROK/DFE	ARPAC Rate		FY 69 ROK DFE days	FY 70 ROK DFE days	Proposed Rates	Cost per ROK DFE day (\$US)
40mm HE 406		1.20	17			1.2	17
60mm HE	150	7.2	14264	495	165	2.0	4047
60mm IIX	150	.4	1208	495	165	.11	344
60mm WP	150	.4	838	495	165	.11	239
81mm HE w/o fuze	81	6.3	9203	555	185	1.8	2612
81 mm HE w/fuze	81	21.4	42502	555	185	6.1	12065
81mm WP	81	2.8	6316	581	194	.807	1792
81mm IIX	81	.9	2743	555	185	.269	778
4.2" HE w/fuze	29	8.6	5518	870	290	2.4	1567
4.2 HE w/o fuze	29	11.4	7457	687	229	3.2	2089
4.2" HE WP	29	5.4	5998	687	229	1.5	1803
4.2" HE IIX	29	.9	1532	687	229	.2	436
90mm HE-T	35.4	4.3	6150	918	306	35.4	6150
90mm HEAT	1	1.3	31	45102	15034	1	31
90mm AP-T	35.4	1.2	1984	919	306	35.4	1984
105mm HE	60.4	46.1	70557	864	288	19.8	30317
105mm IIX	60	.6	2795	723	241	.3	1201
106mm HEAT	28	2.2	2888	434	145	28	2888
106mm HRP-T	28	2.2	3629	434	145	28	3629
155mm HE	28	36.3	33487	904	301	15.6	14420
155mm IIX	28	1.5	3820	778	259	.6	1645
155mm Chg. WB	28	39.2	20756	817	272	169	8938
8" HE	4.9	35.1	9689	977	326	15.1	4174
8" Chg. WB	4.9	35.1	4217	1005	335	1817	2401
Grenade (Hand)			1510	810	270		1510
Mine AP (Claymore)			2649	810	270		2649
						TOTAL	109726

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The number of DFE days of ammunition needed for the ROKs also depends on their mobilization schedule and the amount of time it would take to establish ammunition resupply operations to Korea. In Sections 3, 4 and 5, it was indicated that 9-12 ROKA divisions could hold a NKA attack, if properly disposed and supported. Should the NKA be reinforced by the CCA, another seven divisions mobilized from reserves would be needed, bringing the total to 16-23. Unfortunately, there is no clear analytic path to determining the optimum supply level for Korea because: (1) SEA requirements dominate ARPAC requirements; and (2) at the present, the production base in the US is active -- this reduces the needed supply level. On the basis of past experience during the Korean War, it is felt that 45-75 days of ROKA ammunition stocks, beyond the needs for the SEA pipeline, would suffice provided that the SEA pipeline could be tapped for needed items in an emergency.* This 45-75 day level would permit all-out consumption simultaneously in SEA and Korea for 60-90 days while maintaining at least a 30-day reserve of ammunition in Korea and 90 day reserve in SEA. With respect to the Korea situation, alternative mobilization schedules, consumption rates, and supply levels have been projected: (See Table 7-4 on the next page).

Present stocks clearly meet the minimum requirements for a NKA operation -- 16 divisions, at either ARPAC or the proposed rates, fighting for 45 days (2g, Table 7-4). Raising the supply level to 75 days (16 divisions) would cost \$18 million in FY 70, using the proposed rates, and \$201 million if ARPAC rates are continued (1g, Table 7-4). The present stocks also meet the minimum requirements for full mobilization if the proposed rates are adopted; however, if ARPAC rates were continued, \$39 million for ammunition would be needed in FY 70, (2e, Table 7-4). Should CCA-NKA relations improve, it may be desirable to move to the 75-day level (1d, Table 7-4): FY 70 funding needed would be \$154 million at the proposed rates; \$394 million at ARPAC rates.

These procurement requirements could be reduced if the US posture were changed. If the US were to reduce its Korea deployment by one division, possibly redeploying the remaining division to a regional reserve position, FRD FRD then some in-country stocks could be made available for transfer to the ROKA. Moreover, with such changes, Pacific ammunition reserves for US Asia forces might also be reduced. However, at the present, with the SEA pipeline dominating the CINCPAC ammunition situation no immediate savings in US ammunition requirements can be foreseen.

7.3 Fuel and Oil (POL)

Pacific fuel and oil pipeline and stockages planning are also dominated by the SEA war. Recent resource analysis shows that SEA stockages are sufficient to allow a rapid diversion of pipeline fuel and oil assets to Korea. Of course, supplies should be available in Korea to permit combat operations until the POL LOC is operating: With current and forecasted US mobility capabilities, putting in the POL resupply LOC should not take more than 8-15 days. Less time could be needed once the

* pp. 33ff, ORO-TP-18, December 1960

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TABLE 7-4

COST OF VARIOUS LOGISTIC GUIDANCE PROPOSALS
(In Millions)

<u>Alternative</u>	<u>No. Div Days</u>	<u>Cost ARPAC Rates (Selective Items)^{1/}</u>	<u>Cost ARPAC Rates (All Items)</u>	<u>Net Cost ARPAC Rates^{2/}</u>	<u>Cost Proposed Rates^{3/}</u>	<u>Net Cost Proposal Rates</u>				
1. ROKs Furnished 75 Day Level										
	<u>Active Divs.</u>	<u>Forces Days</u>	<u>Reserve Divs.</u>	<u>Forces Days</u>						
a.	23	75		60	1,725	451	888	470	625	207
b.	18	75	5	60	1,650	432	851	433	600	182
c.	18	75	5	45	1,575	412	812	433	572	154
d.	16	75	4	60						
			3	45	1,575	412	812	394	572	154
e.	20	75			1,500	392	772	354	543	125
f.	18	75			1,350	353	695	277	489	71
g.	16	75			1,200	314	619	201	436	18
2. ROKs Furnished 45 Day Level										
	<u>Active Divs.</u>	<u>Forces Days</u>	<u>Reserve Divs.</u>	<u>Forces Days</u>						
a.	23	45		30	1,035	271	534	116	376	0
b.	18	45	5	30	960	251	494	76	347	0
c.	20	45			900	235	463	45	326	0
d.	18	45	5	15	885	232	457	39	322	0
e.	16	45	4	30						
			3	15	885	232	457	39	322	0
f.	18	45			810	212	418	0	294	0
g.	16	45			720	202	388	370	260	0

- ^{1/} Estimated cost of total division day requirements. Variations in the cost are caused by changes in requirements and costs for 26 selected items which account for 50.6% of total costs. ARPAC rates used throughout.
- ^{2/} After the present assets (now in Korea or being delivered as part of the FY 69 program) have been applied to the requirement, the expected purchase cost would be as indicated here. ARPAC rates used throughout.
- ^{3/} Calculated by taking the difference between the total ARPAC division day cost and the proposed division day cost (calculated only for mortars and artillery) and subtracting this difference from the total ARPAC division day cost (see Table I-4). All direct fire weapons are continued at ARPAC rates.

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Seoul-Pusan oil line is in place. Partly for this reason, relatively low levels of POL supplies have been authorized in country for the ROKs; eight days of gasoline and aviation fuel. At the present, the ROKs have 16 days of fuel and 13 days of aviation gasoline for eighteen divisions.

Two factors are relevant in considering changes to the ROK POL supply levels. First, if the ROK land mobility capability is improved as suggested in Section 6, additional POL products should be made available for the added vehicles. On the bases of the indices set forth below in Table 7-5, modernization would entail increasing the average POL consumption per division force by 32.6%.

TABLE 7-5

ESTIMATED POL REQUIREMENTS
PER ROK DIVISION FORCE EQUIVALENT DAY

<u>Vehicle</u>	<u>Tons/</u>	<u>Veh/DFE</u>	<u>Veh/DFE</u>	<u>Current</u> ^{2/}	<u>Modernized</u> ^{3/}
	<u>Veh Day</u> ^{1/}			<u>Tons/</u>	<u>Tons/</u>
				<u>DFE1</u>	<u>DFE2</u>
<u>Armor</u>					
Tanks	.10	40	40	4	4
APC/Other	.06	--	42	--	3
<u>Trucks</u>					
1/4 ton	.02	390	630	8	13
3/4 ton	.04	400	450	16	18
2 1/2 ton	.06	900	920	54	55
5 ton	.06	70	240	4	14
Helicopters	.60	--	12	--	7
<u>TOTAL</u> ^{4/}				86 (133)	114 (164)

1/ Assumes 10-50 miles/day operation. Factors from Table 5-13, FM 101-10-1, but increased by 250% -- see pp. 17ff, RAC-R-62: Fuel and Oil Costs for Army Equipment, Nov. 68.

2/ See breakout of ROK forces in Section 5, Table 5-2.

3/ See proposed modernization forces, Section 6.

4/ POL requirements determined on the basis of WW II and Korean War experience shown in parenthesis: Figure 5-5, FM 101-10-1 provides a factor of 20.9#/day; strengths from Table 5-10; (Table 5-56, FM 101-10-1 gives a lower rate of 12.6#/day not including heating fuel). The lower rate was used.

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Along with this modernization, a reduction in active ROK forces of two divisions would be in order as a minimum; thus setting the total theater increase in POL consumption at about 12.7%. If the ROKs had on hand 15 days of supply, some additional stockpiling above current assets would be in order (at least 200 tons).

In the event that more responsibility for the initial defense in a future Korean crisis is given the ROK, then the supply level should be increased. Using the minimum rates set forth in the following table, minimum requirements for various mobilization schedules and supply levels have been projected (see Table 7-6 on the next page). These are minimum requirements and do not take into consideration errors in distribution, or losses due to accidents or ensuing action. To allow for these factors, another 50% increase in tonnage might be in order.

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TABLE 7-6

MINIMUM POL REQUIREMENTS

<u>Alternative</u>					<u>Number Div Days</u>	<u>Requirement</u>	
	<u>Active Div</u>	<u>Forces Days</u>	<u>Reserve Divs</u>	<u>Forces Days</u>		<u>Current DFE</u>	<u>Modernized DFE</u>
1) ROKs Furnished 75 Day Level							
a. 23	75	--	--	1725	148,000	196,500	
b. 16	75	4	60	1575	135,000	179,500	
		3	45				
c. 16	75	--	--	1200	104,000	137,000	
2) ROKs Furnished 45 Day Level							
a. 23	45	--	--	1035	89,000	118,000	
b. 16	45	4	30	885	75,000	102,000	
		3	15				
c. 16	45	--	--	720	61,900	82,100	

7.4 Spare Parts and Attrition Items

Little information is available on the size of spare parts stocks in Korea. Thousands of items are involved with the non-availability of some items critical enough to prevent a vehicle from being returned to operation. A rough measure of the parts and maintenance situation is given by current estimates of ROK unit readiness. These indicate that 15% of the ROK material, on average, is non-operational. Such an operational level suggests that the parts inventory is substantial, perhaps 30 days or more (disregarding the index number problem).

In event of a war, requirements for spare parts and attrition replacements would increase. To be prepared for such an eventuality, a higher (up to six months) supply level would be in order. This high level (considerably greater than POL and ammunition) would be needed because to handle the great number of items involved efficiently a large and expensive supply operation would have to be established as a trade-off for greater stockpiling.

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This would cost \$470,000/div/day on average, assuming that these items average \$13/man/day. If we were to increase ROK capabilities, placing aside 90 to 180 days of Class II and IV for the active forces, an estimated \$395 million to \$1625 million for logistic guidance stock piles, in rough terms, would be required as indicated below. This could be partly offset by savings in the cost of such items for US troops.

TABLE 7-7

CLASS II AND IV REQUIREMENTS:
(Cost in \$US Millions)

<u>Size Force</u> ^{1/}	<u>Supply Level-90 Days</u> ^{2/}		<u>Supply Level - 180 Days</u>	
	<u>Total</u> <u>Cost</u>	<u>Required</u> <u>Procurement</u> ^{3/}	<u>Total</u> <u>Cost</u>	<u>Required</u> <u>Procurement</u> ^{3/}
<u>ROKA Force</u>				
14 Div	592	395	1184	987
16 Div	686	450	1372	1136
18 Div	761	510	1522	1271
20 Div	835	555	1670	1390
23 Div	974	650	1948	1624
<u>US Force</u> ^{4/}				
1 Div	--	--	175 ^{5/}	--
2 Div	--	--	350	--

- 1/ See Table 5-10 for basic strength. Approximately 9000 additional ROK combat troops are added -- see Section 6.
- 2/ Computed using 9 pounds per man day and \$2 per pound. See Figure 5-4, FM 101-10-1: construction material is obtained locally at no cost.
- 3/ Assumes 30 days on hand now, valued at \$250-325 million.
- 4/ US division force of 44,000 US and 7000 KATUSA.
- 5/ At the present, US logistics guidance furnishes 180 days for Korean troops.

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