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# **North-South Korea: The Artillery Race**



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**An Intelligence Assessment**

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*EA 87-10032  
July 1987*

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# **North-South Korea: The Artillery Race**



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**An Intelligence Assessment**

This paper was prepared by   
, Office of East Asian Analysis.  
Comments and queries are welcome and may be  
directed to the Chief, Northeast Asia Division, OEA,



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**North-South Korea:  
The Artillery Race** [Redacted] 25X1

**Scope Note**  
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[Redacted] the paper addresses the 25X1  
important estimate that North Korean long-range artillery and multiple-rocket fire could have a devastating effect on South Korean defenders. Range, one of the most critical aspects of the firepower equation, is a key area where South Korea is just beginning to make gains. We also assess the South's growing capability to manufacture modern artillery in terms of the potential for friction with the United States over arms sales. Other papers in the series will look at armor and at progress in Seoul's Force Improvement Program. [Redacted] 25X1

North Korea is an extremely difficult target, but we [Redacted] 25X1  
[Redacted] maintain a fairly 25X1  
accurate picture of force and equipment levels, particularly with regard to major weapons. We have a much higher degree of confidence in the accuracy of similar data for the South, although some gaps remain—largely concerning weapons developed without US assistance and the status of artillery in the reserve forces. Projecting equipment levels beyond the next several years is problematic. [Redacted] 25X1

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**North-South Korea:  
The Artillery Race** [redacted] 25X1

**Key Judgments**  
*Information available  
as of 15 July 1987  
was used in this report.*

South Korea is cutting into the North's longstanding lead in artillery firepower. As Seoul fields its indigenously designed howitzer—the KH-179, with a maximum range of 30 kilometers—most of P'yongyang's long-range guns will lose one of their key advantages: the capability to fire on South Korea's artillery positions while remaining out of range of nearly all of Seoul's guns. The South has deployed over 300 KH-179s and plans a total force of 640 by 1989. [redacted] 25X1

Over the next few years, Seoul plans to acquire artillery-locating radars that should provide a step-up in technology over the North. These US-designed radar systems can track incoming rounds and immediately provide locations of enemy firing sites so that counterfire can occur quickly. [redacted] 25X1

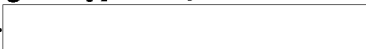
Nevertheless, we expect North Korea will retain its substantial advantage in artillery throughout this decade:

- Current trends in acquisitions indicate that the South will not cut into the North's 2 to 1 lead in numbers of artillery weapons. Neither side is expanding the number of weapons in the regular forces to any significant degree.
- The North Koreans also are adding long-range artillery. They recently fielded three battalions of the M-1978, a large, self-propelled cannon with an estimated maximum range of over 40 kilometers, raising the total to 72 guns. The North is also developing a heavy multiple rocket launcher that probably has a similar range.
- P'yongyang's program to convert most artillery to self-propelled will enable it to maintain a sizable edge in mobility, which also increases survivability. The South is coproducing some self-propelled howitzers, but will not mimic the North's efforts because its use of fixed defensive lines does not require a similar degree of mechanization.
- The North will keep its substantial edge in explosives delivery capability by artillery, because the South is not attempting to field large numbers of rocket launchers as North Korea does and will remain dependent on tactical air to compensate for any shortfalls.


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- P'yongyang could counter Seoul's gains in long-range artillery by producing and deploying considerably more 130-mm guns. The production capacity for towed versions of these guns apparently exceeds the number known to be fielded or exported. 

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We believe, however, that Seoul's economic and technological advantages and its investment in a relatively modern production base for military hardware are paying dividends. Combined with production of modern tanks, the manufacture of infantry fighting vehicles, and acquisition of modern fighter aircraft that the North cannot match, improvements in artillery are another step in what we see as the South's inexorable march toward parity. If current trends continue, the South's forces may be strong enough by the mid-1990s to withstand a North Korean attack without massive US reinforcement during the first few days of the war 



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The reserve forces of both sides are increasingly capable of contributing in combat, as a result of the artillery modernization in the regular forces. As older weapons are replaced in the regulars, they are passed to the reserves, significantly increasing their firepower. 

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Although the improvements in South Korea's artillery are a response to US pressure on Seoul to increase its independent defense capability, we see a potential downside for US interests. In addition to producing more and better artillery for domestic use, South Korea's manufacturers will probably attempt to sell guns abroad as part of a continuing effort to boost an underused defense industry. 

 the South might continue manufacturing some version of the US-designed M109, a self-propelled howitzer, both for the South Korean Army and for export after the coproduction agreement with a US firm expires in 1988. Such a move could add to bilateral friction over requirements for prior approval from Washington for third-country sales of equipment incorporating US parts and technology. 

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### North-South Korea: The Artillery Race




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Both Koreas have been expanding and improving their arsenals of artillery at a substantial rate since the early 1970s. North Korea had a headstart, however, with a larger force and a capability to produce armaments. The United States helped the South Koreans build their own artillery production base in the early 1970s, but gun manufacture began slowly. To cut into P'yongyang's edge in combat capability, the South launched its first Force Improvement Plan in 1975. With US and South Korean estimates indicating that the North had about twice as many artillery weapons as the South and a substantial edge in firing range, artillery improvements were a major goal. 

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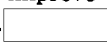

During the late 1970s the South was able to increase its inventory of artillery by a third, but the numbers gap widened as the North expanded its own artillery force at an even greater rate. Numbers were only part of the story. The North increased its advantage in range by deploying additional long-range guns and multiple rocket launchers (MRLs). Moreover, P'yongyang's edge in the mobility of artillery rose markedly—through domestic production the North built up its inventory of tracked artillery pieces to 12 times that of the South. 

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Aware that it was losing ground, Seoul again emphasized artillery improvement as part of its second-phase Force Improvement Plan (FIP II) introduced in 1982. Key programs included the production of long-range howitzers and the acquisition of self-propelled guns. 

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#### Range—A Critical Factor

In our view, Seoul has correctly identified its disadvantage in firing range as the major area for improvement to reduce the North's edge in artillery.   
 the North

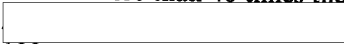
#### Current Artillery Forces

	North	South
<b>Total weapons<sup>a</sup></b>	<b>7,600</b>	<b>3,720</b>
Towed guns and howitzers	2,980	3,430
Self-propelled guns	2,750	250
Multiple rocket launchers	1,870	40

<sup>a</sup> Figures are derived from the *Ground Orders of Battle*, published by the US Defense Intelligence Agency in 1986 and 1987, and include artillery assigned to reserve forces. South Korean totals include artillery assigned to the Marines. Surface-to-surface missiles and large rockets like Honest John and FROG were not included; these weapons are not employed in one of the key roles for field artillery—providing fire support for the infantry. In recent years, differences in the roles and capabilities of howitzers and field guns have blurred; the terms are used interchangeably in this paper.



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Koreans had almost 1,700 weapons that could fire at ranges of over 18 kilometers—more than 40 times the number the South had 

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- P'yongyang had 350 130-mm guns with a maximum range of 27 kilometers; Seoul had only 12 175-mm guns that could meet or exceed that range.
- The South had only 30 other artillery weapons that could match the ranges of over 20 kilometers of the North's 900 BM-11 MRLs and 280 122-mm field guns.
- The standard medium howitzers (152 mm) of the North outranged the South's 155-mm howitzers by almost 3 kilometers.



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At that time, the range advantage would allow many gun batteries in the North to fire on those in the South, while remaining out of range of almost all of Seoul's artillery.<sup>2</sup> [redacted]

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South Korea has focused domestic production on long-range howitzers to remedy these range deficiencies. [redacted]

[redacted] is replacing many of its shorter range medium howitzers with the KH-179, a domestically designed and produced, 155-mm howitzer that can shoot to [redacted] with rocket-assisted projectiles (RAPs) (see figure 1). Without RAPs, the KH-179 can fire to a [redacted]. The South introduced this weapon in 1984 and had deployed 300 by late 1986. [redacted]

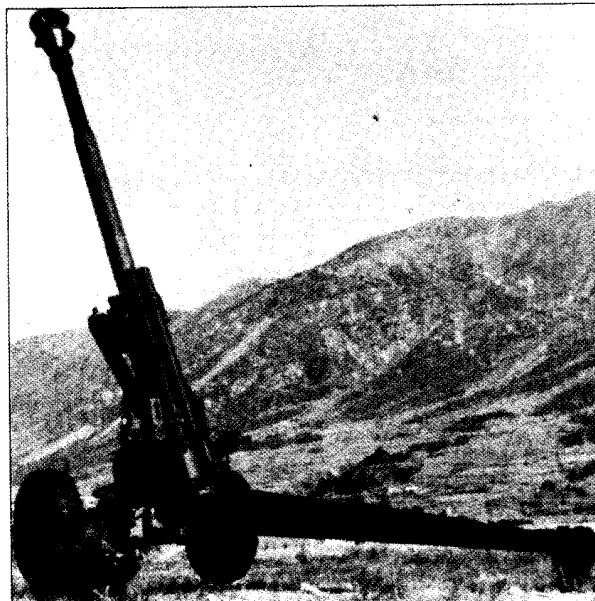


Figure 1. South Korean KH-179 howitzer [redacted]

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Seoul appears to have chosen well in assigning the first KH-179s off the production line. All have been deployed where we believe they are most needed—with the corps-level artillery battalions near the [redacted]

[redacted] Allocation to the infantry divisions has begun, and [redacted]

*P'yongyang Answers.* While the South has been playing catchup, North Korea has been deploying additional long-range weapons for its artillery forces. Since the late 1970s, the North has had three battalions (36 guns) of M-1978 long-range guns. [redacted] in late 1985 and early 1986 P'yongyang added three more 12-gun battalions of the indigenously designed self-propelled guns, bringing the total deployed to 72. Analysis of photography taken during a rare military parade in P'yongyang in 1985 indicates that the caliber of the extremely long-barreled M-1978 is 170 to 180 mm, and [redacted]

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In our view, the development and deployment of the KH-179 represents a significant milestone for the South and corrects one of its most critical weaknesses in firepower. Although P'yongyang retains a substantial lead in numbers of weapons that can fire to [redacted]—over 1,800 versus nearly 400—almost all of the North's artillery sites in the forward area are well within the maximum firing range of the South's new howitzers, and most fall within the [redacted] (see figure 2). [redacted]

(see figure 3).<sup>3</sup> Although all of the M-1978s are in the forward area, none is based close enough to the DMZ to take advantage of its extreme range and fire deeply into the South. All probably would move forward before a North Korean attack, however, as would a substantial number of 130-mm guns—most of which are in sites away from the DMZ. [redacted]

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<sup>2</sup> North Korea's divisional weapons that are deployed in forward positions consist of short-range, direct support artillery, as well as towed and self-propelled versions of the longer range, general support field pieces. [redacted]

[redacted] Both regularly fire to the ranges—15 and 20 kilometers, respectively—shown in figure 2. [redacted]

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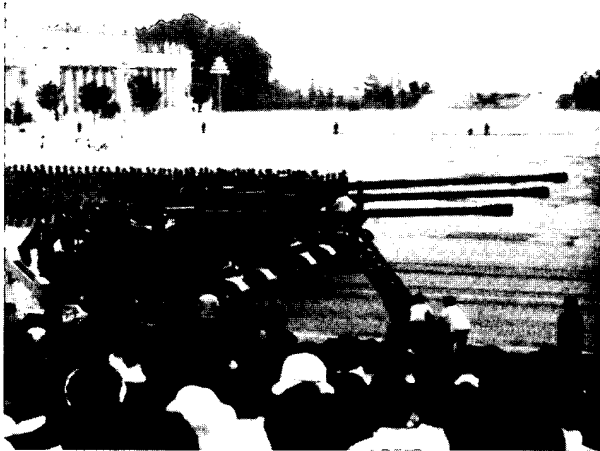


Figure 3. North Korean M-1978 self-propelled gun [redacted]



Figure 4. North Korean large-caliber multiple rocket launcher [redacted]

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North Korea also is developing an MRL with extended range. The North displayed a new, large MRL in the parade in P'yongyang, [redacted] it was in production later in 1985 (see figure 4). Although we have not detected the new MRL deployed with units in the field, [redacted]

launchers by 1988, a far cry from the nearly 1,000 truck-mounted launchers now in the North.<sup>4</sup> Rocket launchers are relatively inaccurate, but they can provide devastating rapid fire against fixed defenses. We believe Seoul prefers the more accurate fire that cannon provide, and that it will depend primarily on tactical air to saturate large areas with explosives in a manner similar to that of MRLs. [redacted]

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We believe that the large MRL is a companion piece of the M-1978 long-range gun, and that it also will be used to provide assault and counterbattery fire at extreme ranges [redacted]

**Mobility**

Neither has the South chosen to mimic the North's emphasis on force mobility [redacted] P'yongyang has armed most of its forces in the forward area with self-propelled artillery and is converting almost all of the artillery in its maneuver and fire-support units. The mechanization effort in infantry, artillery, and armor gives P'yongyang a powerful, mobile, and flexible force for both offense and defense. [redacted]

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[redacted] the 12 launch tubes appear large enough to house rockets with a caliber in excess of 200 mm. [redacted]

[redacted] the new MRL has a maximum range of over 40 km. [redacted]

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Although South Korea has developed its own truck-mounted MRL, Seoul apparently has no intention of fielding large numbers of these weapons as the North has done. Since 1984 the South has deployed only three dozen of its 36-round, 130-mm MRLs—with a [redacted]—and may add 36 more

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South Korea has chosen a less flexible course, positioning the bulk of its Army in a series of fortified defensive lines between Seoul and the DMZ. The mobility of artillery is not as critical in this deployment scheme, and towed artillery is much cheaper to produce, simpler to operate, and easier to maintain. Large-scale deployment of the towed KH-179 indicates that Seoul is not making mobility its highest priority.

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Mobilization Reserve Divisions will be much more capable of supporting the regular forces at the front now that they are being armed with medium howitzers. In fact, a few reserve artillery battalions equipped with 155-mm howitzers have been activated and are reinforcing the forward area as part of the regular Army.

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**Future Developments**

For the near term, we expect major trends to continue, with the North maintaining its program to mechanize its artillery. In addition, we expect North Korea to field its long-range MRL as a corps-level weapon. Initial deployment probably will be in small numbers, with perhaps two regiments (72 multiple launchers) fielded by the end of 1989.

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Even so, the South has not ignored mobility altogether. According to the US Embassy in Seoul, current plans call for fielding 270 of the US-designed M109A2 self-propelled howitzers by 1989. We believe the South will deploy the M109s with its few mechanized divisions and armor brigades, where the mobility is most necessary to provide fire support for fast-moving tanks and tracked personnel carriers.

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The ability to provide mobile fire support is not the only advantage of self-propelled artillery—survivability is another. Although like towed artillery, P'yongyang's self-propelled guns lack crew protection because the vehicles are not turreted, they can shoot and move quickly to another position before being located and fired on—a valuable safety factor.

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**Reserves**

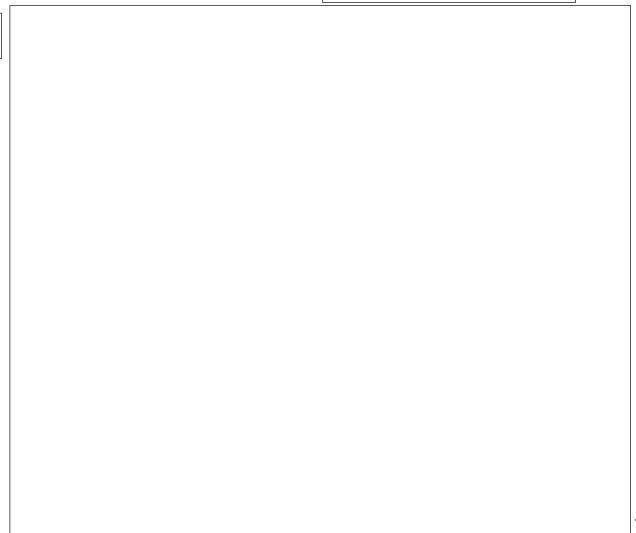
Neither side appears to be adding significant numbers of artillery weapons to the regular forces, but the reserve units on both sides are considerably increasing their firepower as a result of the weapons modernization in the regulars.

as self-propelled guns replace older models in the North Korean Army, the quantity of towed artillery where reserve units are organized has increased.

transfers M114 medium howitzers to the reserves as the M114s are replaced by the long-range KH-179s.

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We believe the added weaponry will improve the reserves' combat performance. The North's reserve units should now be more capable of providing homeland defense, thus freeing more regular forces for an offensive role. In addition, we believe that some of the North's reserves have the firepower to serve as regular forces to augment the attack echelons. The South's



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Figure 5. North Korean-produced 130-mm gun [redacted]



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[redacted]

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- P'yongyang could take a more expensive route that would be in line with its mechanization effort and increase the rate of manufacture of self-propelled 130-mm guns. These could replace the shorter range, less effective 122-mm field guns now in the infantry divisions.

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[redacted]

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We are not sure how the North Koreans will react to the South's gains in artillery firing range, but we can see a few possibilities:

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North Korea probably would not attempt to produce and deploy large numbers of the M-1978 gun, which almost certainly outranges any on the peninsula. In our view, this weapon is cumbersome, and, because of its size and likely complexity, production and maintenance costs must be high. [redacted]

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[redacted]

Even if P'yongyang maintained or slightly increased the size of its lead in numbers of long-range artillery weapons by expanding production of either model of the 130-mm gun, it still would have lost a key advantage—the ability to lay heavy fire on the South's gun positions from sites that Seoul's artillery could not reach. Moreover, the South's acquisition of artillery-locating radars will enhance its ability to deliver accurate counterfire against the North. [redacted]

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[Redacted]

Seoul has made a substantial investment in production facilities. Although it will not match the North's emphasis on mobility, the South probably sees an increasing need for further mechanization of artillery to match its growing force of infantry fighting vehicles and tanks. As new tank and mechanized infantry units are formed, more self-propelled artillery will be required for mobile fire support.

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Trends in Seoul's artillery mirror other advances in the South, such as production of modern medium tanks and the acquisition of infantry fighting vehicles, testifying to the payoffs of Seoul's investment in a relatively modern production capability for military hardware. Additionally, South Korea is purchasing F-16 fighters, Harpoon antiship missiles, and other technically advanced weapons. In our judgment, if trends continue, South Korea may be able to withstand a North Korean attack without massive US reinforcement during the first few days of combat by the middle of the next decade.

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**Implications for the United States**

Improvements in the South's artillery force are a plus for the United States from a military perspective. Washington has long encouraged Seoul to become more self-sufficient in defense, as a way of cutting the costs of US assistance and the presence of US forces. If South Korea continues to gain in artillery vis-a-vis the North, we believe the need for immediate tactical air support—in the event of conflict on the peninsula—from the US forces based outside Korea might be reduced.

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On the downside, Seoul's plans for artillery development could increase friction between South Korea and the United States over third-country sales (see inset).

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[Redacted]

**Sales Potential**

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Both Koreas have engaged in arms sales, the North having started much earlier and having achieved a far greater volume. P'yongyang's newest artillery weapons—the long-range, self-propelled gun and the heavy MRL—probably will not be big sellers. Both are likely to be expensive, and the market for large-caliber weapons is small. To our knowledge, North Korea has not attempted to sell any of its wide variety of tracked artillery. We believe that sporadic sales of the more standard items, such as towed 130-mm guns and the 122-mm BM-11 MRL, will continue.

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The South Koreans might view the KH-179 towed howitzer as a bright prospect for third-country sales, but it is entering an extremely crowded field—many Western nations are promoting 155-mm artillery with long-range capabilities. The South's gun may be competitive if the selling price is kept low. We believe that the M109 self-propelled gun also has a potential market overseas.

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Seoul has placed a priority on boosting military sales to aid an underused defense industry,

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Embassy Seoul reports that South Korean firms have marketed and sold US-designed munitions,

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Figure 6. US M109A2 self-propelled howitzer [redacted]



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last year a South Korean trading firm listed a wide variety of military items for export—many of which are produced under US license. [redacted]

Bilateral differences could arise if the South Koreans try to market the M109 self-propelled howitzer (see figure 6). [redacted] the South may continue to manufacture and eventually export the M109 after the coproduction agreement with a US firm runs out in 1988. Given the obvious US design and content of even a modified M109, the issue of US approval for third-country sales is certain to arise. Moreover, manufacture and export of a Korean-produced M109 could create competition for the US producer. [redacted] has commented that an attempt to export the M109 would be consistent with South Korea's efforts, once technology and production skills are acquired, to localize production and become free of US constraints on sales [redacted]

The South Korean producer of the KH-179 howitzer hopes to market it overseas after current manufacture for the Army is complete. [redacted]

[redacted] Such sales would be less troublesome, however, because the gun is almost entirely of South Korean design. [redacted]

[redacted] The KH-179 uses a carriage copied from the US M114, which was produced in the South under license, but key parts are of South Korean origin. [redacted]

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