

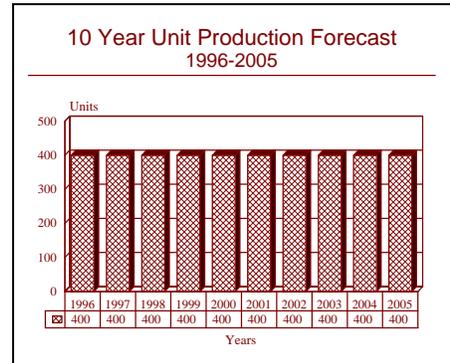
ARCHIVED REPORT

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MPN-60K - Archived 7/97

Outlook

- A basic, low-cost Russian system
- Large commercial export market among paramilitary type organizations
- Poor photo-optics give fuzzy, low-quality image



Orientation

Description. Image intensifying night sight used for weapons aiming, surveillance and night-time photography.

Sponsor

Diaprojector Plant Rogachev
142, Lenin Street
Gomel District
Republic of Belarus
Tel: +7 2339 22063
Fax: +7 2339 22969

Contractors

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142, Lenin Street
Gomel District
Republic of Belarus
Tel: +7 2339 22063
Fax: +7 2339 22969

Electrointorg Ltd
24/2 Usievich Street
Moscow 125315
Russia
Tel: +7 95 155 4026
Fax: +7 95 151 5441

Licensee. No production licenses have been granted. In accordance with the now-dismantled Soviet industrial system, production was distributed across the various republics. Producers other than the two primary sites

listed above, are more than likely. The MPN-60K is available to commercial purchasers, including police forces and private citizens, from:

Moonlight Products

5965 Pacific Center Boulevard Suite 711
San Diego
California CA 92121
United States of America
Tel: +1 619 625 0300
Fax: +1 619 625 0199

Status. Production and service.

Total Produced. Figures are extremely imprecise but force analysis suggests that a tentative total in excess of 49,000 MPN-60K systems have been produced.

Application. The MPN-60K was originally designed for infantry use with particular emphasis on nighttime sentry, guard and surveillance duties. The system was also designed to be mounted on standard Soviet infantry individual and crew-served weapons.

Price Range. The current price to a private citizen in the US is US\$1,200. Substantial discounts are available for bulk purchases.

Technical Data

Characteristics

Image intensification:	35,000 - 60,000
Visual magnification:	X5.2
Field of view:	12 degrees
Resolving power:	Not greater than 10 arc seconds
Objective lens aperture:	F 1.2
Focal length:	85 mm
Focus:	2.0 ft to infinity
Eyepiece adjustment:	4 diopters
Operating temperature:	-20 deg C to +45 deg C

Dimensions.

	Metric	US
Length:	2775 mm	11.0 in
Width:	88 mm	3.5 in
Height:	102 mm	4.0 in
Weight:	2.1 kg	4.7 lb

Design Features. The MPN-60K is a Soviet Army standard image intensifying monocular viewing device, providing light amplification by up to 60,000X and image magnification up to 5.2X. It is constructed from a series of modules which include a fully independent electro-optical image converter tube with a highly sensitive pinhole plate. The optical section consists of a monocular unit with high-quality lenses that provide uniform resolution over the entire field of view. An automatic gain control is provided to permit viewing in any appropriate light level environment.

A brightness control switch permits the user to adjust the level of light amplification to suit the environment. In theory, an automatic cutout prevents the light amplification tube being overloaded by sudden amplification. This feature is reported to be only partially effective.

Operational Characteristics. Due to the contradictory nature of reports on the operational characteristics of the MPN-60K and other Russian-designed night vision equipment, Forecast International obtained its own example of the MPN-60K and the following comments represent our own opinions following a long period of use.

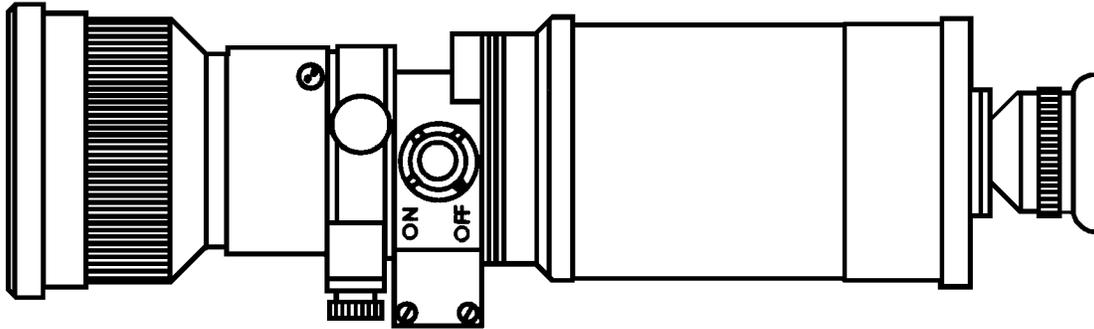
The MPN-60K is a crudely engineered piece of equipment with very poor tolerances on its moving parts. The focusing mechanism is coarse and slips easily out of alignment, making continuous refocusing essential. The depth of focus is limited. These characteristics make using the MPN-60K tiring on the eyes. The switches on the equipment are easily flipped from the off to the on position

by accident. Overall, the equipment is heavy by comparison with Western equivalents.

The picture quality generated by the MPN-60K is poor by contrast with US or British-made equipment. It is grainy and much of the definition is lost. The Forecast International MPN-60K was loaned to officers of the British police for surveillance prior to a raid for drugs on a house in the UK. On its return (with flat batteries), the officers remarked that it had been most useful for surveillance since their budget did not run to the purchase of Western hardware. They also stated that the picture quality was too poor for photographs taken with the MPN-60K to be admissible as evidence in a British court.

The overload protection of the MPN-60K is extremely poor. The unit must never be switched on in a lighted room; ignoring this precaution burns out the photo-multiplier tube in very short order. We know of one MPN-60K which was ruined when it was illuminated by the undimmed headlights of an approaching truck.

Other than the sensitivity of the electronics, the MPN-60K is robust. An interesting feature can be found in the battery compartment. Russian 9v batteries are circular, NATO equivalents are rectangular. The battery compartment on the MPN-60K is a combination of both shapes, allowing either Russian or NATO batteries to be used.



MPN-60K Image Intensifier

Source: Forecast International

Variants/Upgrades

The MPN-60K can be fitted with an ALP-1 infrared illuminator which substantially improves the quality of the picture and the surveillance range.

Program Review

Background. The Russian Army developed an acute interest in the development of nightfighting equipment very soon after the end of the Second World War. They appreciated that the Western air forces would quickly overwhelm their own, and that movement of large armored forces in daylight would attract massive air attack. Discussions in professional Soviet Army journals quickly started to debate the importance of night operations and the equipment needed to undertake such missions.

The initial steps involved the exploitation of German infrared technology. By 1945, German units, particularly those of the Waffen SS had started to receive both active and passive infrared night vision aids. The active equipment involved the use of an infrared searchlight mounted to one side of a tank gun barrel. The passive component was an infrared viewer mounted on the other side of the gun that could pick up the reflected infrared light and use it for gun aiming purposes. The infrared viewer in question was called Spanner and had originally been designed for Luftwaffe nightfighters.

Many examples of this equipment were captured by the Russians around Budapest following the destruction of the 6th SS Panzer Army. Much more was captured from the two SS divisions destroyed during the Battle of Berlin. More significantly, the factories making the equipment had been sited in the areas now occupied by the Russian

Army. Between 1945 and 1950, the Russian Army started the widescale introduction of infrared nightfighting equipment on selected examples of their armored vehicles. In parallel, research was accelerated on man-portable versions of the equipment that could be used for personal and crew-served infantry weapons.

The experience of the Korean War demonstrated to the Russians that their assessments of the devastating effects of US air power were correct. The ever-present US fighter bombers decimated any North Korean or Chinese formations attempting to move in daylight. Yet, when the sun went down, the Thunderjets, Shooting Stars and Mustangs had to return to base and the ground units could then move with relative impunity.

The first-generation, German-designed, equipment was crude and only of limited value. By 1955, this equipment was standard on all T-54 tanks intended for Russian use, although the equipment was not fitted to tanks exported or those likely to be seen by Western eyes. As development continued, much more efficient systems became available and lighter equipment was made available to the infantry. This was originally tripod-mounted but, by the late 1960s, was small enough and light enough to be fitted to individual weapons.

Development of the third-generation Russian night vision equipment started in the early 1970s and exploited equipment captured from US forces in Vietnam. This was

substantially superior to the equipment then available from Russian/Warsaw Pact sources. As a result of technical evaluations of this equipment, image intensification technology started to supplement infrared. The MPN-60 was designed as a part of this new generation. The current designation, MPN-60K, indicates an improved (popravyati) version of an original design.

The MPN-60K is representative of the third generation of Russian night vision equipment. A very wide range of such systems were produced including binoculars, weapons sights of varying powers and capabilities, surveillance systems and other variants. The scale of issue appears to have been at least equal to that of the US Army and may have been greater. However, the technical quality of the systems available was, and remains, inferior to Western equivalents.

Following the fall of the USSR and the implosion of the Russian military, much Russian equipment found its way to the West. Some of this was sold by the Russian personnel using it to fund their departure from the ranks of the military; much more was sold by the production companies desperately trying to earn enough money to feed their staff and their families. The MPN-60K found a ready market in the USA with hunters, wildlife enthusiasts, police and emergency forces and other groups. Available at a cost barely a quarter of Western-produced equivalents, the MPN-60K put night vision capability within the reach of groups whose budgets had previously prevented such acquisitions. Until recently, the Diaprojector Plant Rogachev in Belarus appeared the prime source of this equipment. This facility has now been joined by a number of Russian producers under the overall marketing group Electointorg. This grouping offers a wide range of electro-optical systems.

Funding

Development of the MPN-60K was funded by the Soviet Government and, subsequent to the fall of the USSR, by the Governments of the Russian Federation and of the Republic of Belarus. Sales in the USA are financed by private companies who have arranged export clearance for this equipment.

Recent Contracts

Contractor	Award (\$ millions)	Date/Description
Moonlight Products	0.0012	Dec 1993 - Sale of one MPN-60K night vision system to Forecast International

Timetable

1970s	MPN-60K development started
1980s	MPN-60K introduced into widescale service
1991	MPN-60K made available in the USA

Worldwide Distribution

The following numbers are a Forecast International estimate based on force analysis and known deployment levels:

Armenia 500
Azerbaijan 1000
Belarus 800
Bulgaria 1,500
Czech Republic 1,600
Georgia 500
Hungary 3,600

Moldova 300
Poland 3,800

production site and has taken the lead in offering the system on the international market. The MPN-60K is widely available from a number of distributors in the USA, although buyers should be aware that many of the systems offered are much older equipment, dug out from reserve stocks warehouses for sale to the West.

The MPN-60K is probably well worth considering by city and state police forces. These organizations can

take advantage of the low cost of the system to achieve a wider scale of issue than they could otherwise achieve by the purchase of the more expensive Western equivalents. British police statements that the image quality was too poor to be used as evidence should strike a cautionary note; if a British court would be reluctant to accept a photograph taken with the MPN-60K as evidence, an American Court would certainly not approve of the imagery. However, the MPN-60K will certainly fulfill the requirements of those who simply wish to observe and report rather than gather legally valid evidence.

Overall, the chance of the Russians selling the MPN-60K to a Western Army are extremely small. They may well achieve substantial success in equipping other countries experiencing extreme budget pressure. The real future in the US and Western Europe lies in the civilian, police and other arms of law enforcement where the market may prove very large. It will also be of great interest to other groups such as game wardens and beach lifeguards.

These are very poorly funded, often supported only by voluntary subscriptions, and cannot afford Western night vision equipment, yet have a continual need to maintain surveillance during pre-dawn and post-dusk periods for both safety and law enforcement reasons.

The MPN-60K is the standard Warsaw Pack night vision system for individual use. Reports from the

Russian Army suggest that it is issued on the basis of one system per squad. Heavy weapons crews and other support weapons do not use the MPN-60K. Force analysis on this basis was used to construct the Worldwide Distribution list above and also to develop an estimate of existing use and current production. From this analysis we believe that an annual production rate of around 2,000 MPN-60K units was established, spread over a number of production sites in the USSR. Russian military production has been cut by about 80 percent across the board.

We have applied this factor to the MPN-60K but the ready acceptance of the system in the West may support sales. In the medium and far term we expect the MPN-60K to be replaced by more advanced equipment so that the forecast represents a combination of existing and projected equipment in this general class.

Romania 3,000

Russia 27,000

Slovakia 600

Ukraine 5,400

In addition, a significant number, reportedly several hundred systems, have been sold to a mixture of private individuals, police forces and other organizations in the USA. Many of these systems probably come from the inventories above.

Forecast Rationale

The MPN-60K is a crude, not very efficient but low-cost and robust item of equipment. Our first-hand experience with the equipment reveals it to have many shortcomings in terms of the performance of its optical components and the mechanical operation of its engineered units.

However, it is available at very low cost and does provide good night vision in the absence of more desirable systems. The system remains in Russian production and is produced by a number of the now-independent republics that formed part of the former Soviet Union.

The Republic of Belarus appears to be the primary production site and has taken the lead in offering the system on the international market. The MPN-60K is widely available from a number of distributors in the USA, although buyers should be aware that many of the systems offered are much older equipment, dug out from reserve stocks warehouses for sale to the West.

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Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Designation	Application	thru 95	<u>High Confidence Level</u>				<u>Good Confidence Level</u>				<u>Speculative</u>		Total 96-05	
			96	97	98	99	00	01	02	03	04	05		
MPN-60K	INFANTRY (VARIOUS)	50000	400	400	400	400	400	400	400	400	400	400	400	4000