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Components, Production, and Deployment of the Soviet BIG BACK Radar (S)

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COMPONENTS, PRODUCTION, AND DEPLOYMENT OF THE SOVIET BIG BACK RADAR (S)

INTRODUCTION

1. This is the first NPIC report that summarizes imagery-derived information on the production and deployment of the Soviet BIG BACK radar system (formerly GER-EL-01) and its support equipment. The BIG BACK is a large, new type Soviet three-dimensional—range, height, and azimuth—long-range, early warning radar system. It is the first Soviet land-based, three-dimensional radar to be deployed. As of August 1983, it has supplemented or replaced TALL KING radars in at least 15 radar facilities (Figure 1 and Table 1) in the Soviet Union and Mongolia since June 1980. The BIG BACK may eliminate the need to use a separate height-finder radar with the TALL KING and could offer improved performance over the older radar. This report names and describes the radar components and includes one map, one table, a conceptual drawing, and seven annotated photographs. (S/WN)

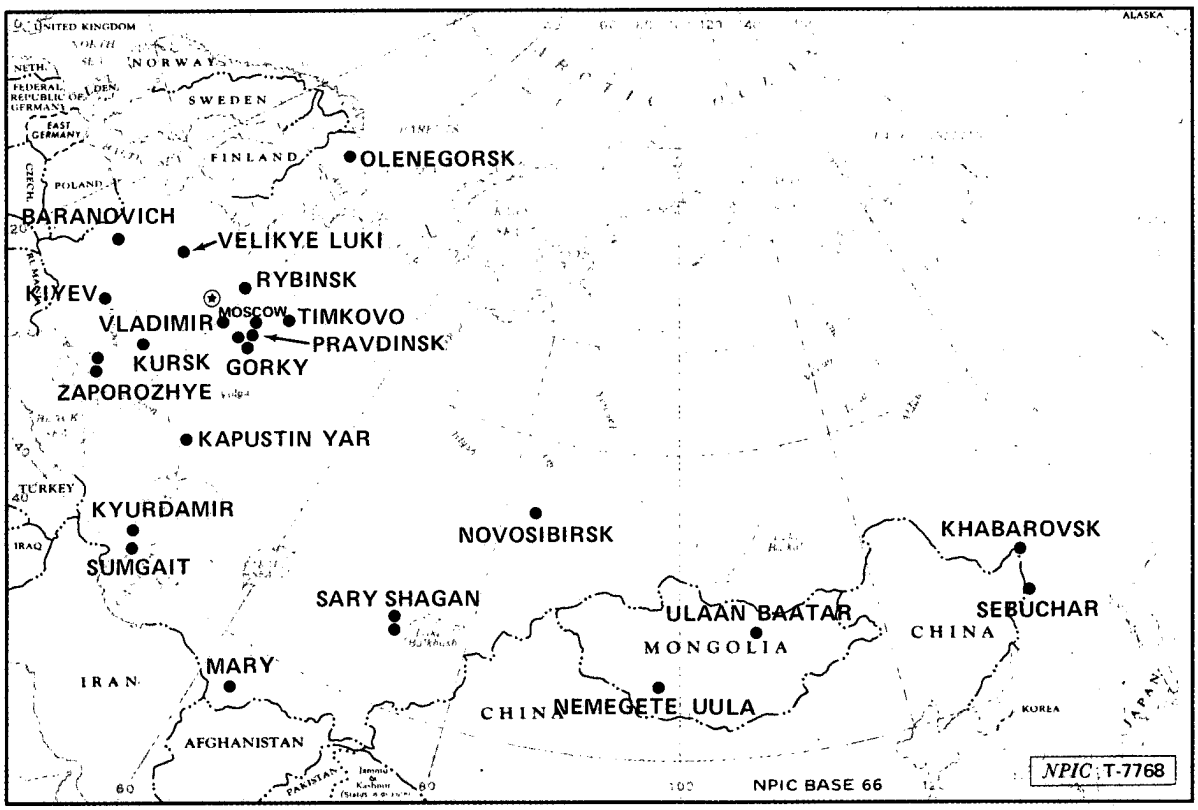

TABLE 1. LOCATIONS OF BIG BACK RADAR TESTS, PRODUCTION, AND DEPLOYMENT

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Table 1.
Locations of BIG BACK Radar Tests, Production, and Deployments

Date	Name	BE No.	Function
Sep 73	Gorkiy Radar Plant Sormovo		Production Plant
Apr 75	Kapustin Yar Electronics Test Fac		Test
Apr 77	Novosibirsk Generator Plant		Production Plant
Mar 78	Gorkiy Electronics Research Fac		Test
Apr 78	Pravdinsk Radar Assembly		Production Plant
Apr 79	Kiyev Radar Troop Training		Field Test
Jun 79	Zaporozhye Radar Plant ZPE		Production Plant
Jul 79	Kursk Radio Vehicle Assembly Plant		Production Plant
Mar 80	Sary Shagan Missile Test Center Launch Complex A		Test
Jun 80	Timkovo Air Warning Radar Fac Tall King		Deployment
Jul 80	Sumgait Air Warning Radar Fac		Deployment
Aug 80	Zaporozhye Air Warning Radar Fac B13-5		Deployment
Oct 80	Vladimir Air Warning Radar Fac Tall King		Deployment
Sep 81	Khabarovsk Air Warning Radar Fac B08-5		Deployment
Feb 82	Ulaan Baatar Army Barracks AL-1		Deployment
Mar 82	Olenegorsk Air Warning Radar Fac Tall King		Deployment
Mar 82	Kyurdamir Airfield Air Warning Radar Tall King		Deployment
Mar 82	Sebuchar Air Warning Radar Fac Tall King		Deployment
May 82	Nemegete Uula Air Warning Radar Fac Tall King		Deployment
May 82	Velikye Luki Airfield Air Warning Radar Fac Tall King		Deployment
May 82	Sary Shagan Airfield Air Warning Radar Fac/HD TK		Deployment
Aug 82	Rybinsk Air Warning Radar Fac A27-5		Deployment
Apr 83	Baranovich Airfield Air Warning Radar Tall King		Deployment
May 83	Mary Air Warning Radar Fac/Bunkered		Deployment
Jul 83	Gorkiy Communications Equipment Plant Lenin 197 Frunze 32		Production Plant

This table in its entirety is classified SECRET/WNINTEL.

DESCRIPTION

Components

2. The BIG BACK (Figure 2) consists of two [redacted] parabolic cylinder antennas, mounted back-to-back on a mast. A vertical bar feed is offset to the left of center on each antenna. Several types of dual-axle semitrailers support BIG BACK deployment. Six flatbed antenna trailers carry the antenna elements and the mast. In the operational mode, four antenna trailers are parked in a cruciform configuration beneath the mast; the other two antenna trailers, sometimes used to anchor guy wires for the mast, are parked nearby. The BIG BACK set is completed by two or three each of operations vans, generator vans, and generator/support vans; three VP-series computer/electronics van trailers; and an arch-roofed generator van trailer. (S/WN)

3. The operations, generator, and generator/support van trailers (Figure 3) are similar in size and configuration. All are [redacted] meters. A [redacted] chamfered-roof section is at the rear, but the [redacted] forward section differs on each of the three types of vans. (S/WN)

4. The forward section of the operations van trailer has butterfly-type folding side panels. In the travel mode (Figure 2), the van appears to have a smooth, chamfered roof along its entire length. In the deployed mode, however, the butterfly panels are folded up and out. (S/WN)

5. The generator van, which NPIC has designated as the Kapustin Yar Generator Type 1, has a light-toned muffler at each corner of the rear section. The forward section (gooseneck portion) is an open framework, normally containing one box and four cylindrical objects. (S/WN)

6. The generator/support van, which NPIC has called the Kapustin Yar Generator Type 3, does not have any visible mufflers. The forward section of this van has an open framework (gooseneck section), on which various boxes and bundles may be carried. One generator/support van in each BIG BACK set has a box mounted on the forward edge of the rear section. The generator/support van has also been observed with FLAT TWIN, ODD GROUP, ODD PAIR, BACK TRAP, KY-EL-01, and KY-EL-02 radars at Soviet electronics test facilities. (S/WN) 25X1

7. VP-series computer/electronics van trailers, standard components at Soviet air defense radar sites and command posts, are used for air situation reporting and ground controlled intercept functions. With the BIG BACK, the VP-series vans could either serve in this capacity or provide additional space for the operation of the radar. The arch-roofed generator van, always deployed with the VP-series vans, is probably a 100 kilowatt type. (S/WN)

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Production and Deployment

8. BIG BACK radars or components have been identified at six Soviet electronics production plants, three test facilities, a field test/training site, and 15 radar sites (Figure 1 and Table 1). The BIG BACK was first observed at Kapustin Yar Electronics Test Facility in April 1975. Since March 1978, this radar has been observed undergoing tests at Gorkiy Electronics Research Facility. (S/WN)

9. Production of the BIG BACK radar involves at least five electronics plants, three concentrated in or near Gorkiy:

- Pravdinsk Radar Assembly,
- Gorkiy Radar Plant Sormovo,
- Gorkiy Communications Equipment Plant Lenin 197 Frunze 32,
- Novosibirsk Generator Plant, and
- Kursk Radio Vehicle Assembly Plant.

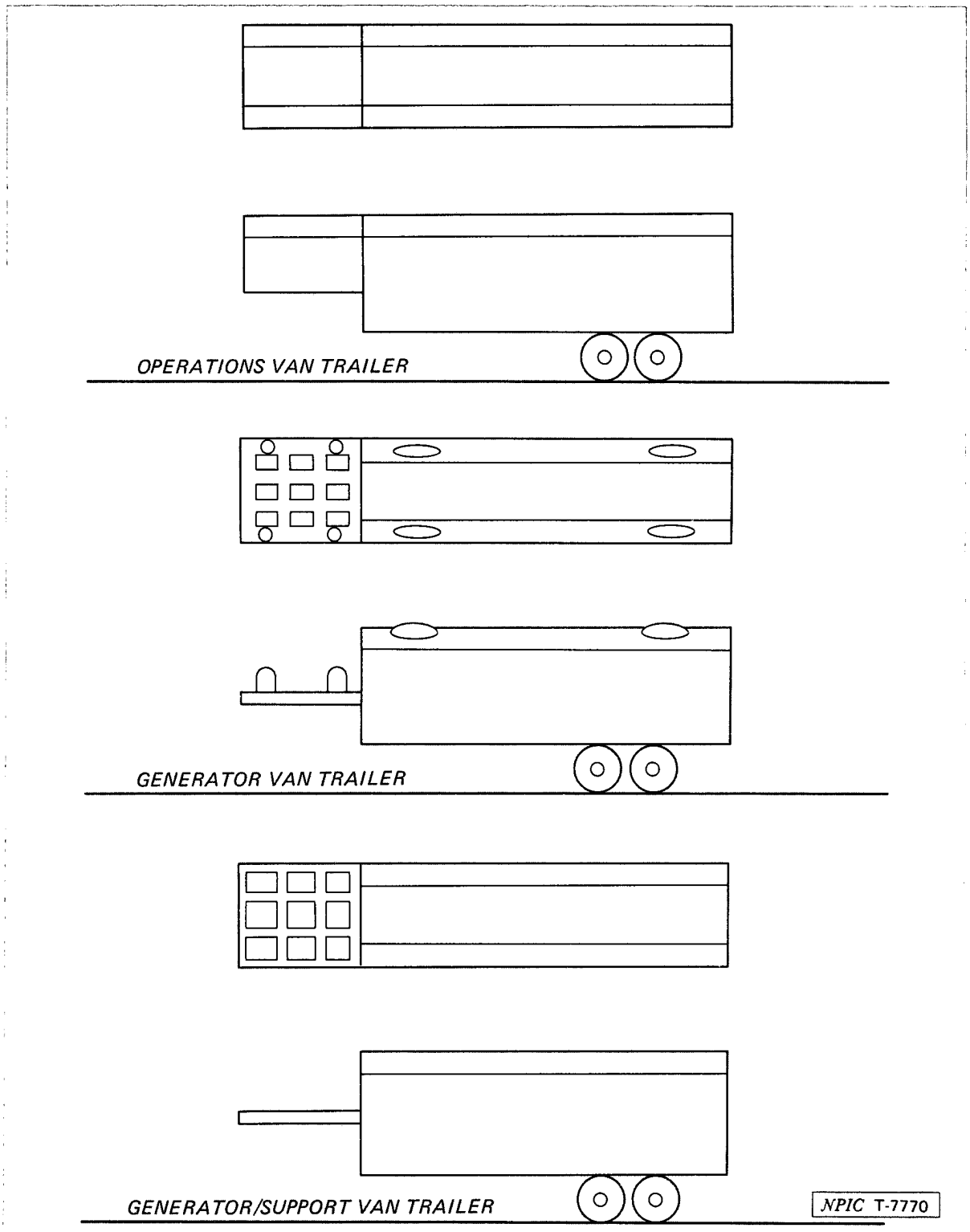

FIGURE 3. CONCEPTUAL DRAWING OF BIG BACK OPERATIONS, GENERATOR, AND GENERATOR/SUPPORT VAN TRAILERS

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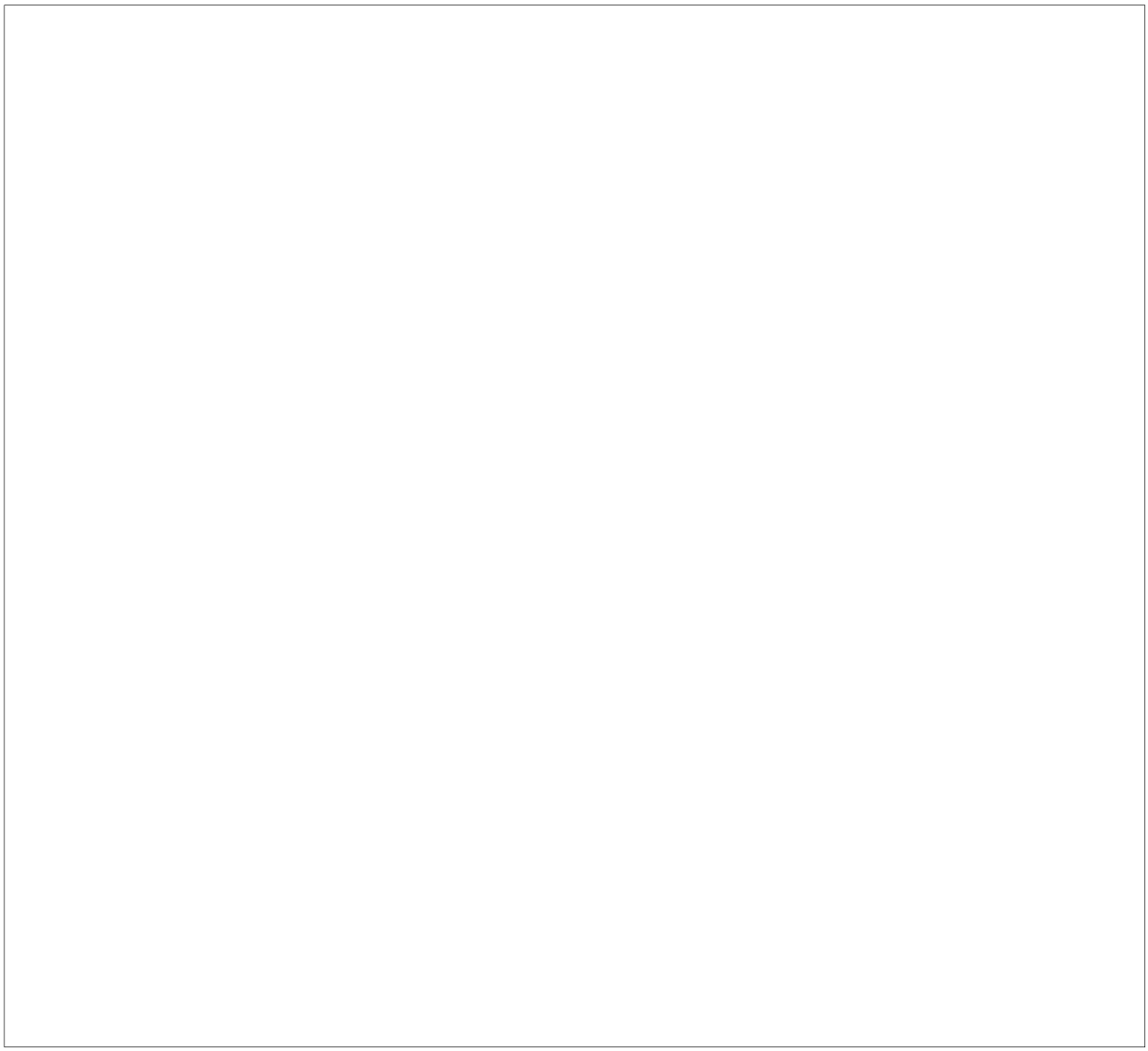

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At Zaporozhye Radar Plant ZPE [redacted] Figure 4) generator/support vans similar in appearance to those at the five plants were also seen from June 1979 through July 1982. These vans, however, were probably associated with other radar systems produced at the Zaporozhye plant, rather than with the BIG BACK. (S/WN)

10. Antennas and antenna trailers are produced at Pravdinsk (Figure 5), also the final assembly point for the entire BIG BACK system. BIG BACK components have been observed there since April 1978. Electronics equipment is mounted in the operations van trailers at Gorkiy Radar Plant Sormovo (Figure 6), 15 nm southeast of Pravdinsk. Operations van trailers were first identified at Gorkiy in September 1973. Operations and generator/support vans were first observed at Gorkiy Communications Equipment Plant Lenin 197 Frunze 32 (Figure 7) on [redacted] Electronics equipment produced at this plant is probably mounted in the vans here. Generator and generator/support vans are produced at two Soviet generator plants: Novosibirsk Genera-

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tor Plant (Figure 8), and Kursk Radio Vehicle Assembly Plant (Figure 9). These vans have been at Novosibirsk since April 1977 and at Kursk since July 1979. (S/WN)

11. Field testing and troop training with the BIG BACK began in spring 1979. Sary Shagan Missile Test Center Launch Complex A [redacted] was used for probable integration tests with an air defense network, including various surface-to-air missile systems. Full scale deployment began in the summer 1980. The initial deployments (Table 1) were in the Moscow Military District (MD) and two southwestern border MDs. Deployments during 1981 and 1982 covered the Sino-Soviet border (including two deployments in Mongolia) and the northwestern border MDs. In spring 1983, the Soviets began to fill in gaps in the remaining border MDs. (S/WN) 25X1

REFERENCES

IMAGERY

All available satellite imagery acquired from September 1973 through August 1983 was used in the preparation of this report. (S/WN)

Comments and queries regarding this report are welcome. They may be directed to [redacted] 25X1
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[redacted] (S) 25X1

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