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Moscow ABM System and Related RDT&E and Missile Early Warning Facilities (S)

DEPLOYED ABM FACILITIES
BE: Various
USSR

Secret

WNINTEL

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RCA-02/0001/83
NOVEMBER 1983
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INSTALLATION OR ACTIVITY NAME					COUNTRY
Moscow ABM System and Related RDT&E and Missile Early Warning Facilities					UR
UTM COORDINATES	GEOGRAPHIC COORDINATES	CATEGORY	BE NO.	COMIREX NO.	NIETB NO.
NA	See Below	See Below	See Below	See Below	See Below

MAP REFERENCE

SAC. USATC, Series 200, Various Sheets, scale 1:200,000

LATEST IMAGERY USED	NEGATION DATE (if required)
	NA

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Installation Name	Geographic Coordinates	Category	BE No	COMIREX No	NIETB (MRN) No
Moskva ABM Site B06	55-52-28N 037-53-34E				
Moskva SAM Site B16-2	55-34-40N 037-46-21E				
Moskva ABM Site B22	55-37-34N 037-23-25E				
Moskva ABM Launch Site B31	55-54-06N 037-18-30E				
Moskva ABM Site C02	56-10-52N 037-47-16E				
Moskva ABM Launch Complex E05	56-14-41N 038-34-23E				
Moskva ABM Launch Complex E24	55-21-10N 036-29-24E				
Moskva ABM Launch Complex E31	56-08-05N 036-29-37E				
Moskva ABM Launch Complex E33	56-20-01N 036-48-07E				
Moskva SAM and ABM Training Facility	55-33-20N 036-41-12E				
Moskva ABM Support Facility Borovsk	55-17-57N 036-32-58E				
Chekhov ABM/Space Tracking Radar Site A	55-13-52N 037-17-48E				
Chekhov ABM/Space Tracking Radar Site B	55-12-22N 037-17-40E				
Naro-Fominsk ABM/Space Tracking Radar Facility A	55-29-36N 036-41-00E				
Naro-Fominsk ABM/Space Tracking Radar Facility B	55-28-50N 036-38-55E				
Pushkino Phased-Array Radar	56-10-00N 037-46-00E				
Sary-Shagan Missile Test Center	46-01-47N 072-40-09E				
Sary-Shagan Missile Test Center Launch Complex B	46-01-01N 072-28-09E				
Sary-Shagan Missile Test Center Launch Complex F	46-26-34N 072-51-07E				
Sary-Shagan Missile Test Center Range Related Facility 1 (Poss SPT Fac)	45-59-46N 072-26-42E				
Sary-Shagan Missile Test Center Range Related Facility 2	46-24-54N 072-33-01E				
Sary-Shagan Missile Test Center Bent Log Periodic Zigzag Antenna North	46-00-30N 073-40-45E				

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Installation Name	Geographic Coordinates	Category	BE No	COMIREX No	NIETB (MRN) No
Sary-Shagan Missile Test Center Bent Log Periodic Zigzag Antenna South	45-47-39N 073-33-21E				
Sary-Shagan Operations Support Base	46-02-00N 073-30-00E				
Abalakovo Phased-Array Radar Facility	57-52-04N 093-06-57E				
Lyaki Phased-Array Radar Facility	40-52-13N 047-48-03E				
Mishelevka Phased-Array Radar	52-52-53N 103-13-55E				
Olenegorsk HEN HOUSE Radar Facility	68-06-49N 033-54-41E				
Pechora Phased-Array Radar Facility Site A	65-12-38N 057-16-36E				
Sary-Shagan Phased-Array Radar Transmitter North	46-35-15N 074-27-35E				
Sary-Shagan Phased-Array Radar North	46-36-04N 074-29-51E				
Mishelevka HEN HOUSE D	52-52-30N 103-15-39E				
Mukachevo HEN HOUSE Radar Facility	48-22-45N 022-42-32E				
Sary-Shagan HEN HOUSE A	46-36-52N 074-31-23E				
Sevastopol HEN HOUSE Radar Facility	44-34-47N 033-23-14E				
Skrunda HEN HOUSE Radar B	56-42-31N 021-56-33E				
Kiyev OHD Receiver	51-18-04N 030-03-29E				
Kiyev OHD Transmitter	51-38-21N 030-42-09E				
Komsomolsk OHD Receiver	50-23-09N 137-19-31E				
Komsomolsk OHD Transmitter	50-53-32N 136-50-15E				
Nikolayev OHD Receiver	47-02-38N 032-11-55E				
Nikolayev OHD Transmitter	46-48-29N 032-13-13E				

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ABSTRACT

1. The Soviet Union has had active anti-ballistic missile (ABM) programs since early 1962, consisting of the deployment of an ABM system around Moscow, an ABM research, development, test and evaluation (RTD&E) and training program at Sary-Shagan Missile Test Center, and the construction of ballistic missile early warning (BMEW) radars on the periphery of the USSR. This report describes the facilities associated with these programs and the current status of each facility; it includes location maps, tables, annotated photographs, and artist's sketches. (S/WN)

INTRODUCTION

2. The Soviet Union is the only country with an operationally deployed ABM system. This system, deployed in defense of Moscow, is currently being upgraded with new launch complexes, silo launchers, and a large, new ABM radar, all of which will provide an increased defensive capability against ballistic missile attack. (S/WN)

3. The Soviet Union is also engaged in an active ABM research and development program at Sary-Shagan Missile Test Center. This program, judging from the construction of new instrumentation and ABM support facilities there, is expected to continue at a very rapid pace. (S/WN)

4. Finally, the Soviet Union has built and is building BMEW radar sites at appropriate locations in support of defenses against enemy missiles and aircraft. (S/WN)

5. This report describes the facilities associated with all these programs, in the order just presented, and estimates the status of each facility. (S/WN)

BASIC DESCRIPTION

The Moscow ABM System

6. In 1962, concurrent with the construction of ABM test facilities at Sary-Shagan, the Soviets began constructing eight GALOSH ABM launch sites around Moscow and a large phased-array radar (nicknamed DOG HOUSE) at Naro-Fominsk, west-southwest of Moscow, for ABM battle management support. Many problems were apparently encountered in the system development program, and by 1966, even before the system was operational, four of the eight sites at Moscow had been abandoned. The system probably did not become initially operational until the late 1960s, and full operational capability was probably not reached until the early 1970s. (S/WN)

7. The system consisted of the GALOSH long-range ABM missile, capable of reentry vehicle (RV) intercepts above the atmosphere; 64 GALOSH launchers (four sites with 16 missiles each); on-site TRY ADD radars for RV tracking and interceptor control; the large DOG HOUSE radar; and two facilities for ABM support/training. A second large battle management radar, called CAT HOUSE, was completed near Chekhov in late 1975. (S/WN)

8. The Moscow ABM system stayed relatively unchanged through mid-1979 and consisted of the following components (Figure 1): four operational launch complexes deployed on the Moscow E ring (at E05, E24, E31 and E33); the two large battle management radars at Naro-Fominsk and Chekhov; an ABM support facility at Borovsk to receive, assemble, check out, fuel, and load GALOSH missiles into their transport and launch canisters; and a small ground-support equipment

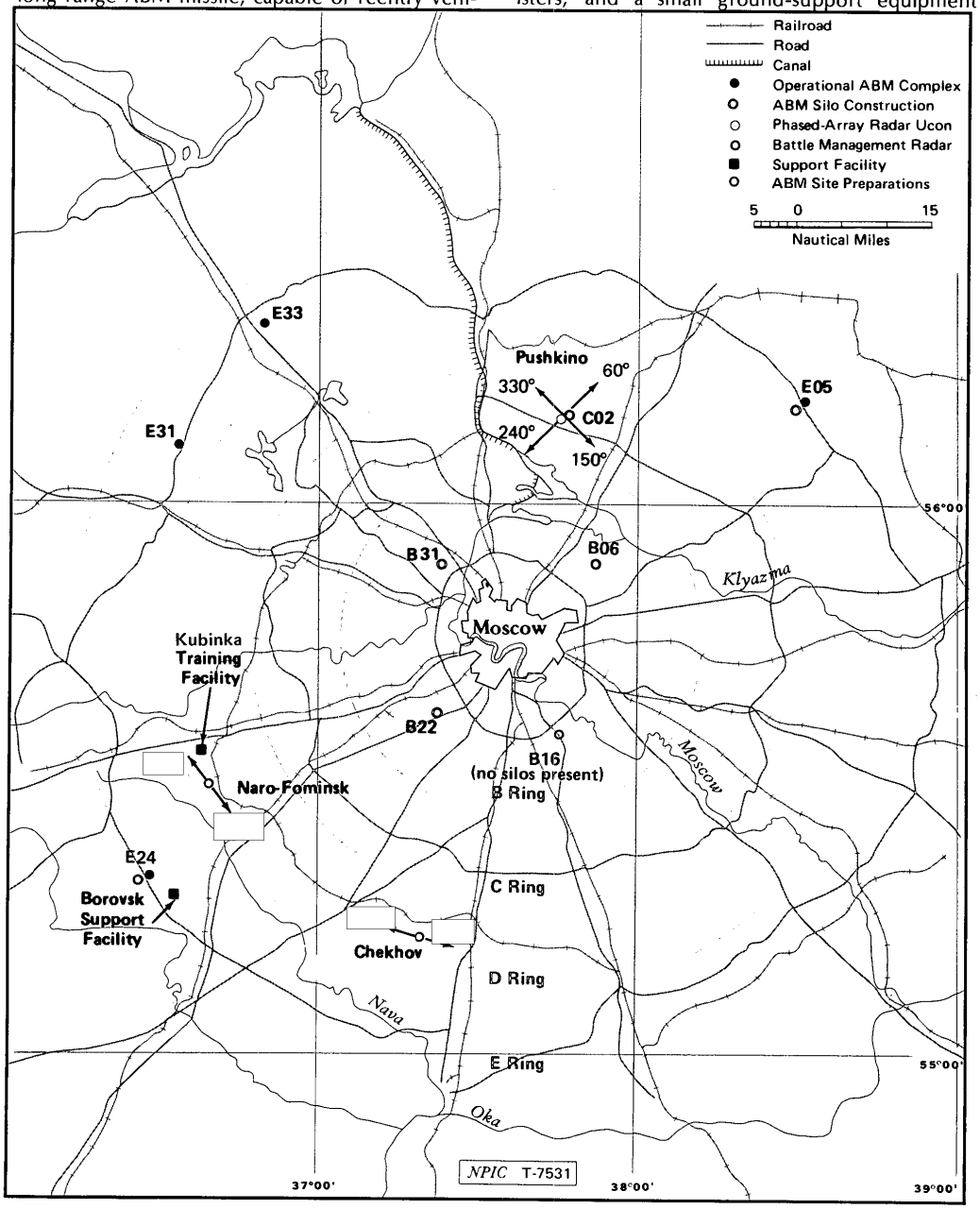

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FIGURE 1. LOCATIONS OF MOSCOW ABM FACILITIES

(GSE) training facility at Kubinka for driver training and for training personnel in loading and erecting the GALOSH canister in its launcher. (S/WN)

9. Starting in mid-1979, the Soviets began to dismantle the GALOSH launcher force. By the end of 1979, half had been removed, leaving only 32 operational ABM launchers, eight at each of the four launch complexes. During this same time, construction of a large, new ABM radar was underway near Pushkino, north of Moscow (Figure 1). (S/WN)

10. There were no further changes to the launcher force until late December 1980, when the first ABM launch silo was observed under very early construction at a new launch site near Pushkino (C02). There are now 68 ABM silos under construction at six sites (Figure 1 and Tables 1 and 2). Fifty-two of the silos are probably for the Soviet's new SH-08 ABM, and 16 will probably house a silo-based version of the GALOSH.* None of the silo launchers is operational yet, but 64 of them have reached the stage of construction where they are accountable under the ABM treaty. These 64 silos, plus the 32 above-ground GALOSH launchers, bring the treaty-accountable launcher force at Moscow to 96 (100 are allowed by the treaty). The four silos not yet accountable (because of their very early construction stage) are at ABM site B06. (S/WN)

11. At one of the new complexes, B16, although launch silos are not yet present, buildings under construction and fence realignment closely resemble activities at other silo complexes, and it is probable that silo construction will also take place there at some point. (S/WN)

12. Finally, there is an anomalous underground structure at the ABM launch complex C02 (near Pushkino) that has some silo-like characteristics; but, for reasons described further on, it is not thought to be a launch silo. (S/WN)

Launch Complexes for Probable High-Acceleration ABM

13. **Moskva ABM Launch Site C02.** This site is 10 nautical miles (nm) north-northwest of Pushkino and 25.5 nm north of Moscow. It is 1,000 meters north-northeast of the Pushkino Phased-Array Radar. The site (Figure 2), all of which is under construction, consists of 12 ABM silos in two launch lines at right angles, a site security building, and two support buildings. The site is unique in being the only ABM silo deployment site built from scratch; all the other silo sites at Moscow were constructed at existing SAM or ABM facilities. C02 was the first of the new silo sites and was initially observed in December 1980. There was no evidence of silos there on [redacted] (S/WN) 25X1

14. The anomalous structure being built at C02 has some silo-like characteristics (it is numbered "Position 13" for this reason), but it is probably not an ABM launch silo. This structure is isolated from the launch silos (Figure 2) and consists of a possible coring containing a vertical cylinder, possibly constructed of facing blocks, that extends slightly above ground level. The depth of the coring and cylinder is unknown; however, no significant excavation was observed in this area, suggesting that the structure is not of launch-silo depth. Figure 3 is an artist's concept of the early construction phase of this structure compared to a typical ABM silo; Figures 4 and 5 provide further comparative data. (S/WN)

15. **Moskva ABM Complex B06.** This facility, 11.5 nm northeast of Moscow, is a former SA-2 SAM launch site (Figure 6). Activity indicating conversion of this site to an ABM complex was first observed in January 1983, when four silos were identified under construction; actual construction probably started sometime in late 1982. Twelve silos are now under construction at this site in two launch lines roughly at right angles. Four of them are not currently counted against the ABM treaty because of the early stage of their construction. Other components of the site include footings for a new security building and two support buildings under construction. (S/WN)

16. **Moskva ABM Site B22.** This former SA-2 SAM site has been undergoing conversion to an ABM silo complex since March 1981 (Figure 7). As of [redacted] 12 equally spaced ABM silos were under construction, five on the eastern side and seven on the northern side of the site. A new site security building has been constructed, and construction is in progress on two large support 25X1

Table 1.
Status of Moscow ABM Launch Complexes

Complex	GALOSH Launchers	ABM Silos Ucon	Date of Latest Imagery
E05	8	8	[redacted]
E24	8	8	
E31	8	0	
E33	8	0	
C02	0	12	
B31	0	16	
B22	0	12	
B16	0	0	
B06	0	12*	
Total	32	68	

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*Four of these 12 are not yet treaty accountable.

This table is classified SECRET/WNINTEL.

(Continued p. 8)

Table 2.
Status of Silo Construction at Moscow ABM Launch Complexes
This table in its entirety is classified SECRET/WNINTEL

Silos	Stage of Construction													Date of Latest Imagery
	Silo Prep	Headworks (HW) Excav	HW Shoring	Shaft Core	Shaft Shoring	Liner Installed	HW Installed	HW Complete	HW Appendage	Back-filled	Door Rails	Door Inst	Externally Comp	
Complex E05														
1														
2														
3														
4														
5														
6														
7														
8														
Complex E24														
1														
2														
3														
4														
5														
6														
7														
8														
Complex C02														
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
Complex B31														
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
Complex B22														
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
Complex B08														
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
Totals for each stage	68	64	64	62	61	55	54	51	50	33	33	7	0	

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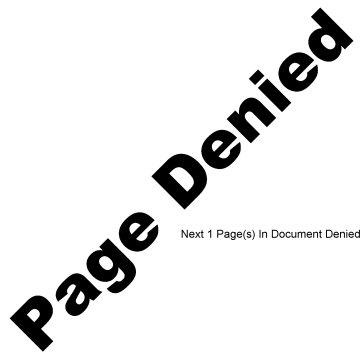

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buildings in the central part of the site. Other components of the site include one flat-roofed administration building and two barracks. (S/WN)

17. **Moskva ABM Launch Site B31.** This ABM silo site (Figure 8) was also converted from an inactive SA-2 SAM site. It contains 16 ABM silos in various stages of construction in a C-configuration along the east, north, and west sides of the site. A new security building has been constructed at the site entrance, and the two large support buildings common to all the Moscow silo sites are under construction in the center of the site. Silos were first identified under construction at this site in late February 1981. There was no evidence of construction on earlier coverage in October 1980. (S/WN)

18. **Moskva SAM Site B16-2.** This facility is being converted from an SA-2 SAM site to a probable ABM complex (Figure 9). It was an active SA-2 launch site in April 1982, when realignment

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of the security fence line was under way. The new fence is the same type being used at all the new ABM sites and consists of large panels that provide both visual and physical security. All of the SA-2 equipment had been removed by July 1982, and extensive grading was under way. (S/WN)

19. On the most recent coverage available, there were still no indications of silo construction. However, a new site security building had been completed, identical in size and appearance to the new security buildings constructed at the other new silo sites, and two large support buildings under construction in the center of the site appear to be identical to new buildings at the other new silo sites. Before any silo construction can take place at this site, some aboveground GALOSH launchers elsewhere will have to be removed to avoid violations of the ABM treaty. (S/WN)

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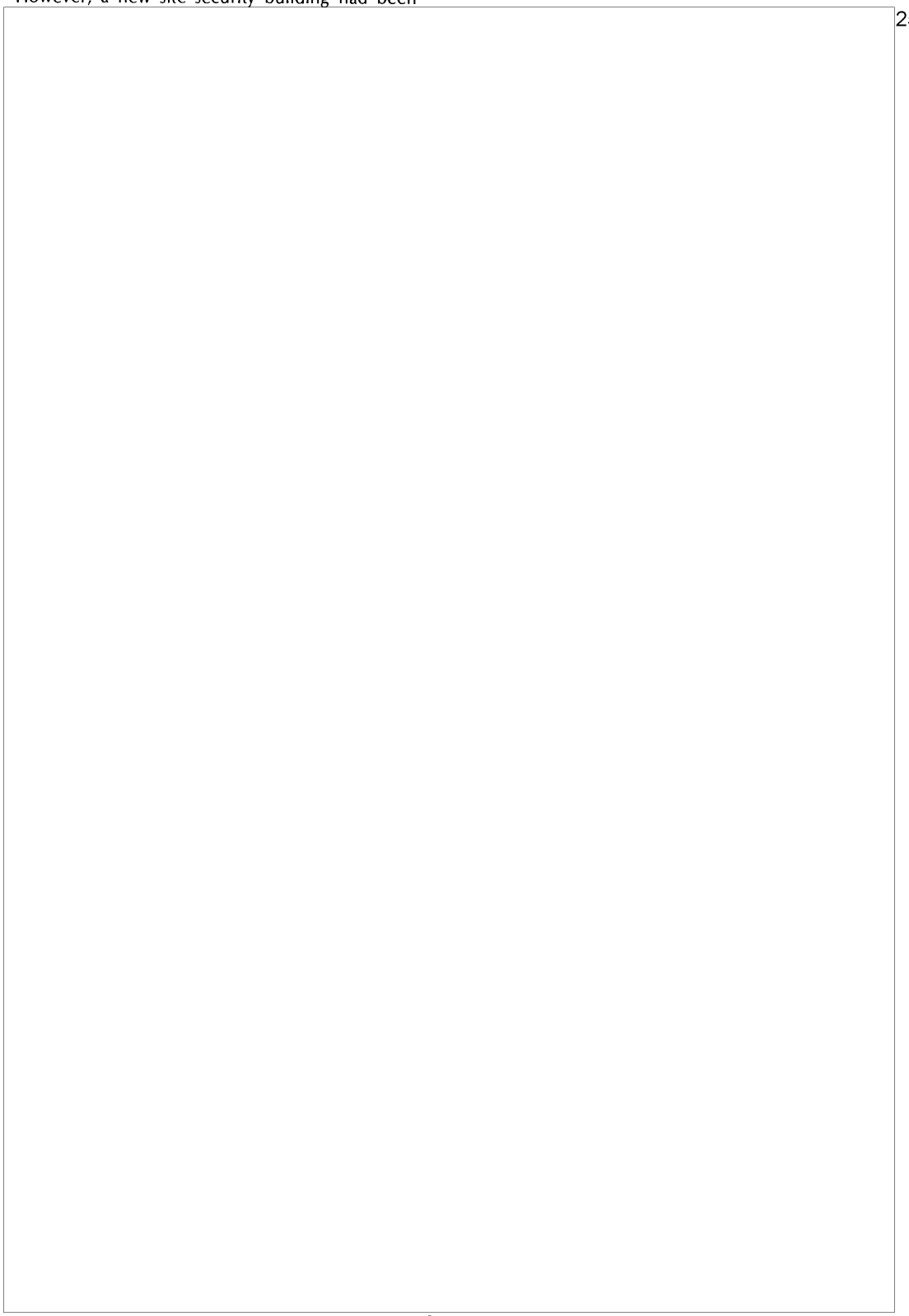

GALOSH Launch Complexes

20. **Moskva ABM Launch Complex E05.** ABM Launch Complex E05 (Figure 10) is one of the original GALOSH complexes deployed in the early 1960s to defend Moscow. During mid-to-late 1979, eight of its 16 aboveground GALOSH launchers were removed. Initial construction of ABM silos was observed on [redacted] No indication of this construction was observed in late November 1981. (S/WN)

21. The eight launch silos currently under construction at this complex are positioned directly behind the removed launcher positions and are evenly spaced 100 meters apart. Other components at the site include the eight remaining aboveground GALOSH launchers, two TRY ADD radar sites, and two large support buildings under construction in the center of the launch site. (S/WN)

22. **Moskva ABM Launch Complex E24.** ABM Launch Complex E24 (Figure 11) is another of the original GALOSH complexes. Eight of its 16 launchers were also removed during mid-to-late 1979, and initial construction of ABM silos was observed on [redacted] No evidence of silo construction was present in late October 1980. (S/WN) 25X1

23. The eight silos under construction at this complex are positioned beside the former GALOSH positions rather than behind them (as at E05), resulting in uneven spacing (from 100 meters to 164 meters). Other components within the facility include the eight GALOSH launchers, two TRY ADD radars, and two large support buildings under construction in the center of the site. (S/WN) 25X1

24. **Moskva ABM Launch Complex E31.** This operational ABM launch complex (Figure 12) is another of the original Moscow ABM complexes.

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It contains a launch area, an operational support facility, and an adjacent housing and support area. Construction of the complex began in June 1965 and was completed by December 1968. (S/WN)

25. The launch area consists of two TRY ADD facilities and eight launch positions. Eight of the complex's 16 GALOSH launchers were dismantled and removed in mid-1979, but no activity suggesting future silo construction has yet been observed. (S/WN)

26. **Moskva ABM Launch Complex E33.** This operational ABM launch complex (Figure 13) is the fourth of the original GALOSH ABM complexes. Like the others, it contains a launch area, an operational support facility, and an adjacent housing and support area. Construction of the complex began in April 1962 and was completed by August 1968. The launch area was constructed over the northern end of Moscow SAM Site E33-1 and consists of two TRY ADD radar facilities and eight GALOSH launch positions. As at the other E-ring sites, eight of the 16 above-ground launchers were dismantled and removed in mid-1979, but, as at E31, no activity indicating future silo construction has been observed. (S/WN)

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ABM Radars

27. **Pushkino Phased-Array Radar Facility.** This new, large, ABM, phased-array radar facility (Figure 14) is under construction 10 nm north-northwest of Pushkino and 25.5 nm north of Moscow. The radar is housed in a truncated pyramidal structure in a late stage of construction. Each of the sloping faces of the structure contains a circular probable receiver array, a rectangular probable transmitter array, and an adjacent smaller rectangular array. The two rectangular arrays abut and form an L-pattern. When completed, the base of the antenna building will probably be below ground level and 150 meters square. The top of the building is 102 meters square with a flat roof supporting a rectangular structure at each of its four corners. The four radar faces are oriented on azimuths of 60, 150, 240, and 330 degrees and are inclined at approximately 30 degrees. (S/WN)

28. Initial ground clearing for this facility was underway by May 1978, but construction had not

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progressed to the point where a functional identification could be made until July 1980. At that time the large transformer yard 1.3 nm west of the main facility and the water treatment facility just south of the main facility could be identified. (S/WN)

29. **Naro-Fominsk ABM/Space Tracking Radar Facility.** This facility (Figure 15), 35 nm southwest of Moscow, is the original battle management radar for the GALOSH ABM system and consists of separate receiving and transmitting areas. Facility A, the receiver site, contains a large, A-frame, phased-array antenna, called DOG HOUSE, oriented on a [redacted] azimuth. Each of the two faces of the antenna is 122 by 122 meters. A large L-shaped control building is next to the antenna; a small building on its roof supports an optical tracking dome. The fence-secured facility also contains one earth-mounded, T-shaped, control bunker. (S/WN)

30. Facility B contains the transmitting antennas for the DOG HOUSE radar. The two antennas are aligned along the opposite sides of a large rectangular control building and have the same orientations as the receiver. Each antenna face is 238 by 10 meters. An optical tracking dome is mounted on a small building on top of the control building. Other components of this fence-secured facility include one large cooling facility, a heating plant, and four support buildings. (S/WN) 25X1

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31. **Chekhov ABM/Space Tracking Radar Facility.** This facility (Figure 16), called CAT HOUSE, is approximately 35 nm south-southwest of Moscow and approximately 6.5 nm northwest of Chekhov and also has separate transmitters and receivers. It was completed by late 1975 and increased battle management support for the Moscow ABM system. Site A consists of two phased-array receiver antennas oriented on azimuths of [redacted] The antenna components for each antenna are mounted on two in-line, A-frame, supporting structures adjacent to a control building. (S/WN)

32. Site B, the transmitter site, is approximately 8,000 feet south of site A and consists of two phased-array transmitting antennas on the same azimuths as the receiver. The antenna components for both antennas are mounted on an A-frame supporting structure and are separated from the control building by a structure of unknown function. Site A and B are both secured by three fence lines. (S/WN)

33. **Moskva ABM Support Facility, Borovsk.** This facility, 45 nm southwest of Moscow, is the only known support facility for the Moscow ABM launch complexes. It consists of an operations area (Figure 17) and a housing and support area (not shown). Construction of the facility had begun in July 1961 but progressed slowly until April 1966. It appeared to be complete by late 1968. By that time it contained a receiving/assembly building, a storage/assembly building, a liquid propellant storage and handling facility, [redacted] (S/WN)

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34. Three large buildings were constructed in the ground support equipment (GSE) handling area of this facility after mid-1980. These buildings

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[redacted]

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include a six-story technical/laboratory building with attached vehicle maintenance garages, an 11-bay vehicle garage, and a clerestory building. The clerestory building is similar to one constructed at the Sary-Shagan Missile Test Center and will probably be used for the maintenance of new ABM Missile GSE. (S/WN)

35. In Mid-1982, trees were cleared from two new areas, areas A and B, on the west side of this facility. In construction area A, a high-bay, rail-served building was under construction (Figure 18). This is a probable receiving, inspection, and maintenance (RIM) building for new silo-launched ABM missiles, which will arrive at this facility in the near future. In construction area B, two large thick-walled buildings were under construction. One of these buildngs will probably be used for storing the new silo-launched GALOSH Missiles and the other for storing the new SH-08 ABM Missiles. (S/WN)

Moskva SAM and ABM Training Facility.

36. This facility (Figure 19) is 34 nm west-southwest of Moscow, in the southwest corner of Kubinka Army Barrack AL 1 [redacted] It is used to train personnel in mating and erecting the GALOSH canister in the launcher-erector. The facility has a double-loop, figure-eight road pattern with a GALOSH launcher-erector on one side and a double-bay, drive-through building, [redacted] on the other. A security/administration building is at the entrance to the facility, and a partially revetted POL storage tank is near the drive-through building. The facility is secured on all sides by a solid fence. (S/WN)

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Anti-Ballistic Missile Research and Development

Sary-Shagan Missile Test Center

37. The Sary-Shagan Missile Test Center (Figure 20) is the RDT&E and training center for Soviet ABM systems. ABMs are tested at the Center's Launch Complexes B and F, which are supported by 15 tracking facilities. A new tracking system, components of which have recently been completed, will probably support future ABM efforts. This system has been under construction since 1978 and consists of Range Related Facility 1; Range Related Facility 2; a new impact area with six remote tracking towers; nine new optical tracking stations; a new interferometer; and two bent, log periodic, zigzag antennas. (S/WN)

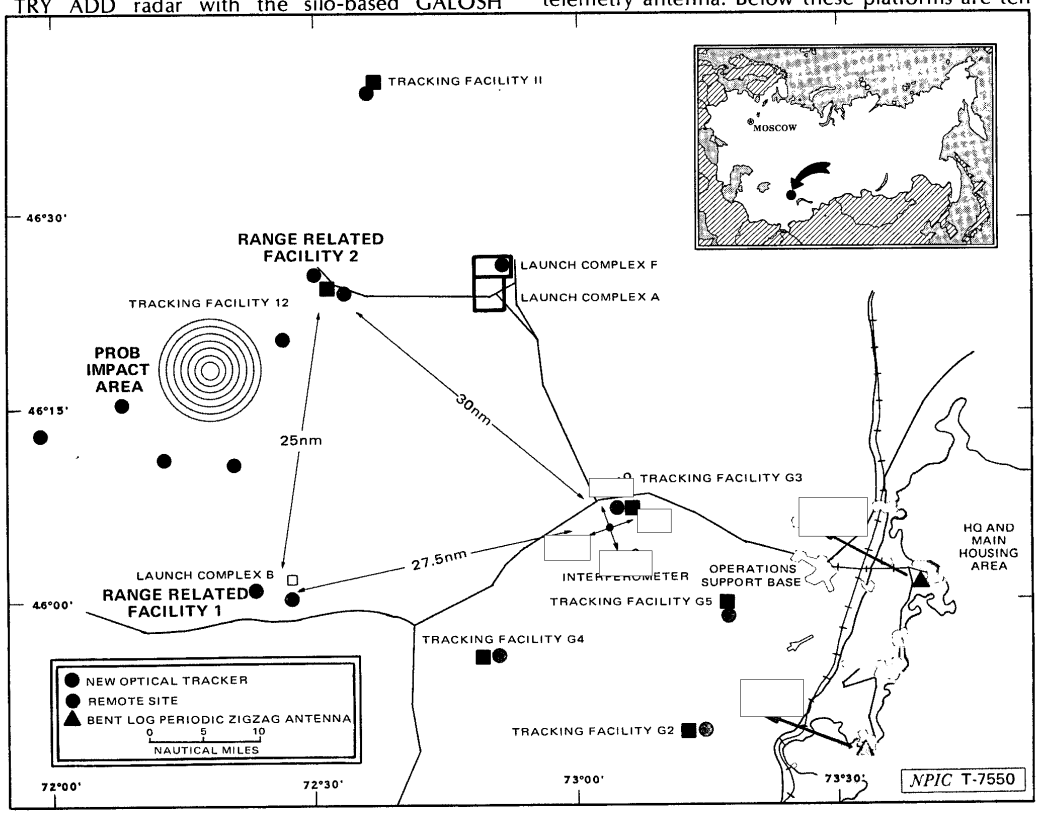
38. An increase in the number of future ABM launches is indicated by the construction of new ABM handling facilities and the recent arrival of ABM canisters at the ABM receiving area of the Operations Support Base. (S/WN)

39. **Launch Complex B.** Launch Complex B (Figure 21) is the RDT&E and training complex for the GALOSH ABM system. This complex consists of TRY ADD radars, three surface launch positions (C1, C2, and C3), and two silo launch positions (C4 and C5). Surface-launched GALOSH missile firings have occurred at this launch complex since the mid-1960s. Silo launches of the GALOSH, following completion of the two GALOSH silos in March 1979, so far total five: two from C4 in March and June 1979, and three from C5 in June and December 1980, and in June 1983. (S/WN)

40. Soviet intentions to continue to use the TRY ADD radar with the silo-based GALOSH system were indicated when the radar dome over the TRY ADD A building was replaced without any modification to the 40-meter diameter dish antenna. The original dome was removed and a new geodesic dome was installed in early February 1982. (S/WN)

41. **Launch Complex F.** Launch Complex F is the RDT&E for the new SH-08 ABM. All launches of that missile have been from launch site 3 (Figure 22), which has two surface launchers (3A and 3D) and two launch silos (3B and 3C). Six launches occurred from surface launch pad 3A between April 1978 and February 1980. There have been only two silo launches since the silos were completed in June 1979; these were from silo 3B in July 1979 and April 1980. Silo 3C was dismantled in May 1980, reconstructed, and completed by July 1981. The last 11 launches of the SH-08 ABM have been surface launches, all from launch pad 3D, between July 1980 and June 1983. There were no launches detected in 1982, but two launches have occurred so far in 1983, one in January and the latest in 3 June. (S/WN)

42. **Range Related Facility 1.** Range Related Facility 1 (Figure 23) is a new tracking facility that forms part of an upgraded tracking system for the range. It is 1.7 nm southwest of Launch Complex B and consists of an operations area, a support area, and a construction camp. The triple-secured operations area contains a two-story rectangular operations building, a two-story stepped-roof operations building, three lattice towers, a pedestal-mounted 64-element telemetry antenna, and two pedestal-mounted TT-EL-01 telemetry antennas. On top of the main lattice tower are two [redacted] 25X1 hexagonal platforms, each with an unidentified telemetry antenna. Below these platforms are ten



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25X1
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FIGURE 20. SARY-SHAGAN MISSILE TEST CENTER (MTC)

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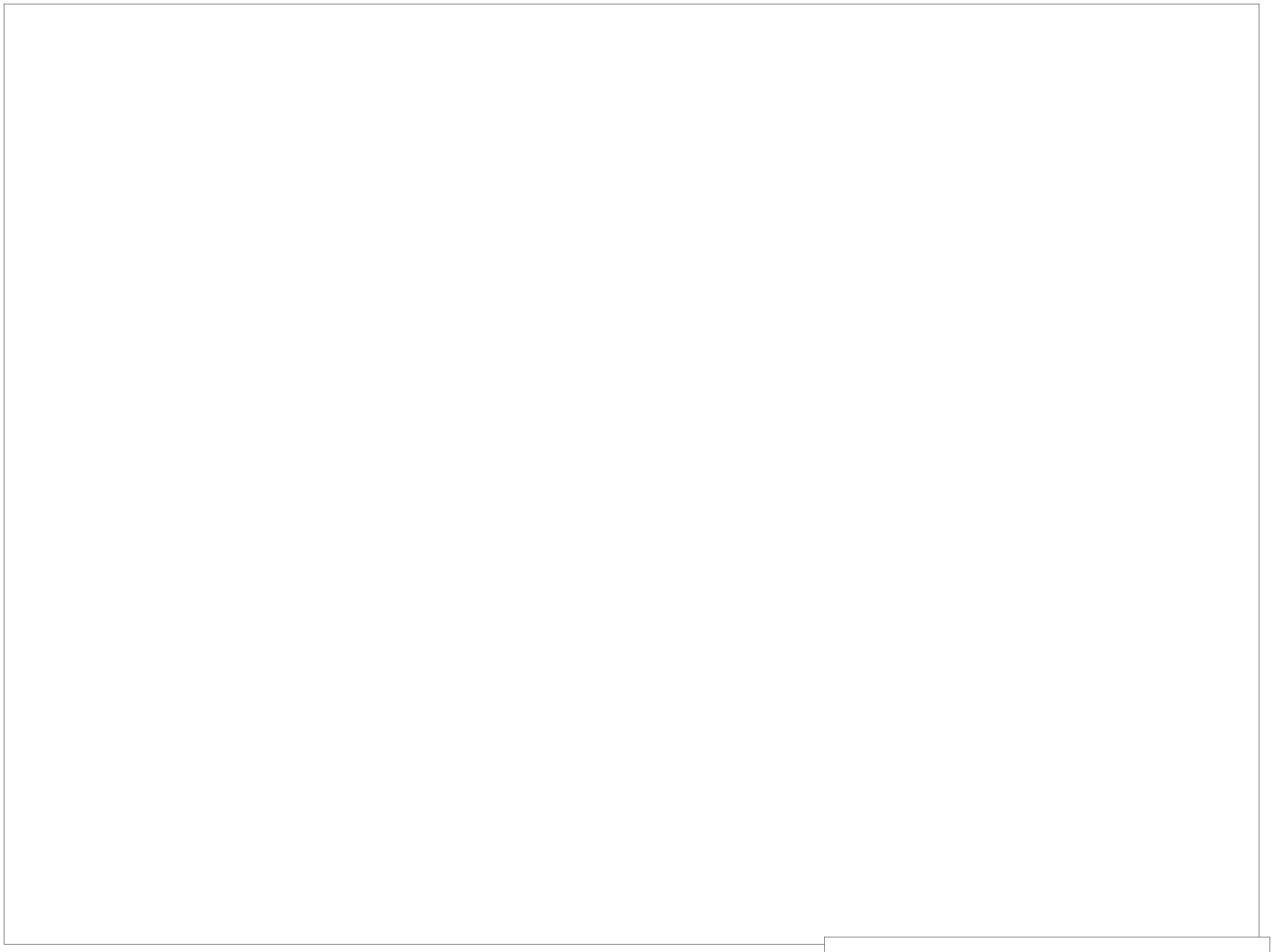

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separate mounts, six of which are occupied by 3-meter-diameter microwave dish antennas. A second tower has a large probable rectangular screen antenna attached to the side and oriented toward the new impact area. This tower also has two hexagonal platforms on top. A platform on top of the third tower supports two unidentified antennas. The support area consists of two apartment-type buildings under construction and one heating plant. (S/WN)

43. **Range Related Facility 2.** This facility (Figure 24), also newly constructed, is similar to Facility 1. It is 1 nm west of Tracking Facility 12 and 25 nm north of Facility 1. It also consists of an operations area, a support area, and a construction camp. The double-secured operations area contains a two-story rectangular operations building, a two-story stepped-roof operations building, two lattice towers, a large antenna pedestal for a probable 64-element telemetry antenna, and two pedestal-mounted TT-EL-01 telemetry antennas. The main lattice tower is one of six remote towers constructed around the new impact area. The top of this tower contains two hexagonal platforms each with an unidentified telemetry antenna. No antennas have been identified on the second lattice tower. The support area consists of a single apartment-type building under construction and a heating plant. (S/WN)

44. **Remote Tracking Towers.** Six remote tracking towers are in the late stages of construction around the new impact area (Figure 20). These lattice towers are at (1) 46-11-17N 072-21-24E, (2) 46-11-38N 072-12-33E, (3) 46-16-23N 072-08-51E, (4) 46-21-51N 072-27-58E, (5) 46-14-05N 071-58-57E, and (6) 46-24-54N 072-27-58E. Each tower (Figure 25) has two [redacted] hexagonal platforms, each with an unidentified telemetry antenna. There is a small control building at the base of towers 1 through 4, which will probably be added to towers 5 and 6, and a [redacted] diameter microwave dish mounted on the side near the top of towers 1 through 4. (S/WN)

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45. **Optical Tracker Sites.** Nine new optical tracker sites have been constructed at the Sary-Shagan Missile Range at or near existing tracking facilities. Each site consists of a center position for a mobile optical tracker, three cable-connected positions each containing a calibration monument (Figure 26, inset A), and a cable-connected position with a calibration building (Figure 26, inset B). (S/WN)

46. The optical tracker sites at Tracking Facility 11, Tracking Facility 12, Electronic Site D near Launch Complex F, and Instrumentation Sites B2 and B3, both near Launch Complex B, are all associated with ABM research and development. These five optical tracker sites are similar in having a hardstand near the center for a mobile optical tracker (Figure 26, inset C). A mobile optical tracker [redacted] diameter dome is at this position at Electronic Site D. The dome of this tracker was open on [redacted] Similar mobile optical trackers are at Tracking Facilities 11 and 12. To date, mobile optical trackers have not been at Instrumentation Sites B2 nor B3, but, judging from activities at similar sites, they are expected in the future. (S/WN)

47. The optical tracker sites at Tracking Facilities G2, G3, G4, and G5 are near the SA-10 research and development area. At these four optical tracker sites the center positions consist of a control building [redacted] with an attached [redacted] diameter optical tracking dome on a [redacted] tall circular structure (Figure 27). (S/WN)

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48. **Bent Log Periodic Antennas.** Two probably identical antennas—the Sary-Shagan Bent Log Periodic Zigzag Antenna South (Figure 28), and the Sary-Shagan Bent Log Periodic Zigzag Antenna North (Figure 29)—are under construction 13 nm apart near the lake front at the Sary-Shagan Missile Test Center. The south antenna is 1 nm south-southwest of Launch Complex D the north antenna is 0.5 nm south-southwest of Tracking Facility 1 Construction began on both antennas in early 1982 and appears to be nearly complete. The antennas are being constructed in a graded and fence-secured area. Each antenna consists of two antenna element support structures (see Figure 30 for artist's drawing of one of the support structures) long joined at one end to make a narrow V meters above the ground. The two supports form an angle of at their apex and are meters apart at the open end. Each supports vertical and horizontal elements decreasing in size in a log periodic sequence toward the apex. The axis of the south antenna is oriented on a azimuth of the azimuth of the axis of the north antenna is (S/WN)

49. **Operations Support Base.** The Explosives and Solid-Propellant Handling Facility at the Operations Support Base (Figure 31) has been undergoing expansion since early 1982. This facility will probably become the handling area for silo-launched GALOSH and SH-08 ABMs. A drive-through building on the east side of the facility has become the receiving, inspection, and maintenance (RIM) building for the SH-08 missile. During 1982, six probable shipping canisters for this missile were in front of the RIM building; the missiles themselves were probably stored inside. A new probable open-storage area for missile silo canisters was constructed on the southeast side and just outside the security fence of this facility. This area was later included within the security fence, and a new loop road was constructed to the RIM building. Between three probable SH-08 missile silo canisters arrived and were on a small hardstand on the west side of this facility. A fourth canister was present on (S/WN)

50. A GALOSH missile-silo canister was parked along with the surface-launched GALOSH canisters on it was gone on A GALOSH missile was silo-launched from Launch Complex B in June 1983, probably using this canister. A new probable GALOSH missile-silo canister storage area was under construction just outside the security fence in the southwest corner of this facility. The security fence has been extended to include it. This new area consists of a large 10-bay structure with thick concrete walls. A large area in front of the structure was paved, and an earthern berm was constructed in back. (S/WN)

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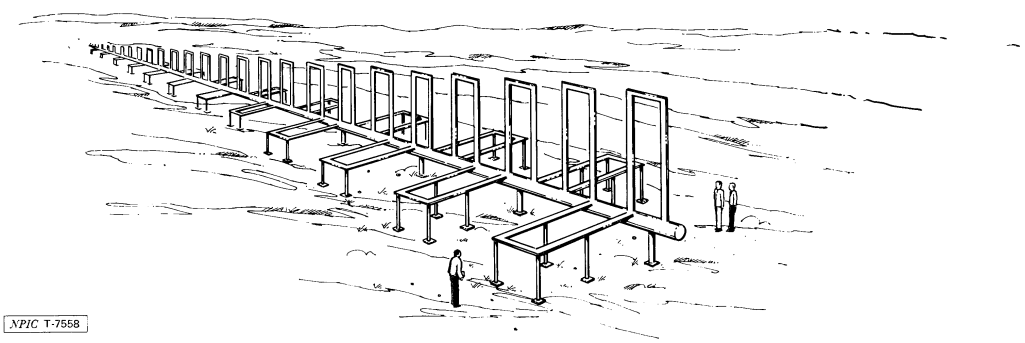

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FIGURE 30. ARTIST'S CONCEPT OF ANTENNA SUPPORT STRUCTURE, SARY-SHAGAN BENT LOG PERIODIC ZIGZAG ANTENNAS

Ballistic Missile Early Warning and Anti-Satellite Radars

New Phased-Array Radar Facilities

51. New phased-array radar facilities for ballistic missile attack warning are under construction or have recently been completed at six locations in

25X1

the USSR: Abalakovo, Pechora, Lyaki, Mishelevka, Sary-Shagan, and Olenegorsk (Figure 32). The new radars are of two types: a single receiving array, and bistatic arrays (transmitter and receiver at separate sites). Four of the five bistatic phased-array radar facilities are similar in most visible respects, except for a variation in transmitter heights: the transmitters heights at Sary-Shagan and Abalakovo are 37 meters; the heights at Pechora and Lyaki and 56 meters (Table 3). (S/WN)

52. **Abalakovo Phased-Array Radar Facility.** This facility (Figure 33) is located 19 nm southeast of the city of Abalakovo and consists of an operations area, a water treatment and storage area, and a construction support area. The operations area contains a bistatic phased-array radar under construction, with the transmitter and receiver separated by 840 meters. When complete, this radar will close a gap toward the northeast in the Soviet's ballistic missile early warning (BMEW)

Table 3.
Bistatic Phased-Array Radar Facilities

Facility	Transmitter Width	Transmitter Height	Receiver Width	Receiver Height	Separation Between Transmitter and Receiver
Abalakovo	45	37	95	86	840
Pechora	45	56	95	86	800
Lyaki	45	56	95	86	1,200
Mishelevka	Ucon	Ucon	Ucon	Ucon	870
Sary-Shagan	45	37	95	86	2,700
Olenegorsk*	N/A	N/A	95	46	N/A

*XMTR source is original HEN HOUSE.

This table is SECRET/WNINTEL.

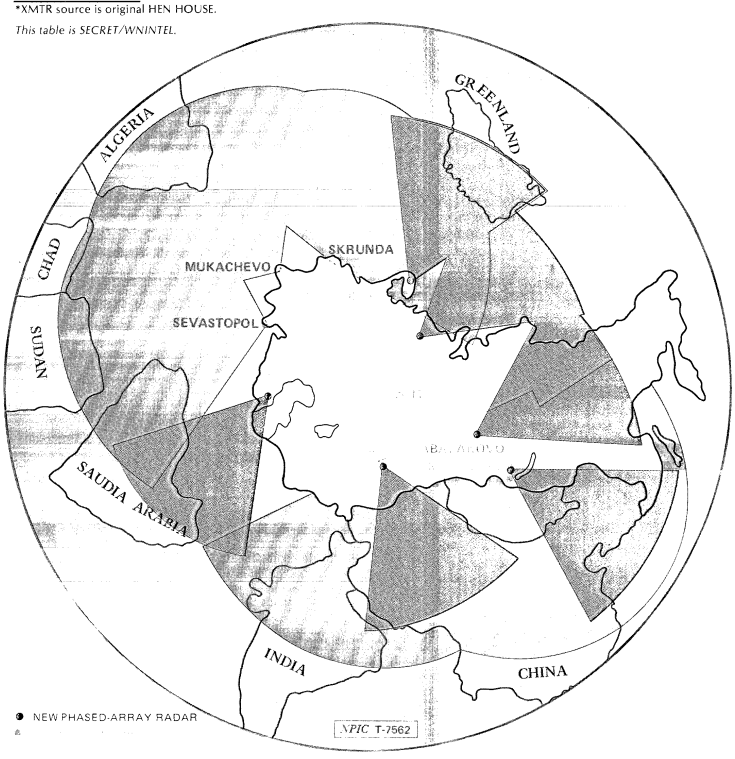

FIGURE 32. LOCATION AND APPROXIMATE COVERAGE OF BALLISTIC MISSILE EARLY WARNING RADAR FACILITIES

radar coverage. Both radars are on an azimuth of 40 degrees and both have an elevation angle of 20 degrees. A review of imagery revealed that the radar was not under construction on [redacted] although some of the buildings in the construction support area, not shown on Figure 33, had been completed. The radar was in the early-to-mid-stage of construction when it was identified on [redacted] the date of the next imagery. The construction support area contains the Kargino Radio-Relay Station [redacted] and about 75 other buildings. (S/WN)

53. **Pechora Phased-Array Radar Facility.** This facility (Figure 34) consists of an operations area, a satellite communications area, and a support area. The facility was under construction when first observed in November 1974 and was externally complete in July 1978. (S/WN)

54. The operations area contains a transmitting and a receiving antenna 760 meters apart and 25 support buildings and structures. Both antennas are large planar arrays on an azimuth of 360 degrees, with a 20-degree elevation angle. The transmitter has a possible beam forming/side lobe suppression device extending out from the antenna face on either side. (S/WN)

55. The satellite communications area consists of an externally complete type C satellite communications and two support buildings. Although neither of two expected [redacted] diameter antennas has yet been mounted, their pedestals are externally complete. The support area contains about 150 buildings and structures. (S/WN)

56. **Lyaki Phased-Array Radar Facility.** This facility (Figure 35) consists of an operations area, a water treatment/cooling area, an electric power substation area, a possible electric power generating area, a support area, and a housing area (not shown on the figure). The facility was under construction when first observed in July 1976 and was externally complete in September 1979. The operations area contains a transmitting and a receiving antenna, similar to those at Pechora, 1,150 meters apart. Both antennas are on an azimuth of [redacted] and have an elevation angle of 20 degrees like the Pechora radar. The transmitter has a possible beam-forming/side-lobe suppression device under construction on each side of its antenna face. (S/WN)

57. The water treatment/cooling area consists of five forced-draft cooling units (each unit has three cooling fans), three water treatment buildings, five support buildings, one water pumphouse, and 14 underground water storage reservoirs. The electric power substation area contains two large transformer yards, seven support buildings, and three horizontal fuel tanks. The possible electric power generating area consists of a possible electric power plant under construction, open storage for construction material, 12 support buildings, and two large vertical fuel tanks. (S/WN)

58. The support area contains an eastern section with over 30 buildings and structures and a western section with a type C communications satellite building and over 70 buildings and structures. The type C building was under construction

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on and was nearly complete by . The two expected diameter antennas have not yet been mounted on its roof. (S/WN) 25X1

59. The housing area is about 5 nm north of the operations area and consists of a helicopter landing pad and over 100 buildings and structures. (S/WN)

60. **Mishelevka Phased-Array Radar Facility.** This facility, about 0.8 nm southwest of the Mishelevka HEN HOUSE Radar Facility, consists of an operations area and a construction support area (Figure 36). Construction was first observed at this facility in March 1981 and was still at an early stage in June 1983. The antennas at this facility, when complete, are expected to be bistatic planar arrays similar to the phased-array antennas at Abalakovo, Pechora, Lyaki, and Sary-Shagan. (S/WN)

61. The operations area (Figure 37) will consist of a transmitting and a receiving antenna 660 meters apart. The azimuth of those antennas, when complete, will be The construction support area is northwest of the operations area and consists of 50 buildings and structures. (S/WN) 25X1

62. **Sary-Shagan Phased-Array Radar Facility.** Sary-Shagan Phased-Array Radar Facility (Figure 38) consists of a receiver area (Sary-Shagan Probable Phased-Array Radar North), a transmitter area (Sary-Shagan Phased-Array Radar Transmitter North), and a construction support area. The antennas at this facility are similar to those at Pechora and Lyaki and those under construction at Abalakovo and Mishelevka. (S/WN)

63. The receiver area (Figure 39) consists of a receiving antenna and 15 buildings and structures. The antenna is on an azimuth of has an elevation angle of 20 degrees, and is 1.5 nm from the transmitting antenna. (S/WN) 25X1

64. The transmitter area (Figure 40) consists of a transmitting antenna in a late stage of construction and a probable water cooling and treatment section. The transmitting antenna is on a azimuth and has an elevation angle of 20 degrees. The probable water cooling and treatment section consists of ten buildings and structures in an early stage of construction. (S/WN) 25X1

65. The construction support area consists of open storage and 25 buildings and structures. (S/WN)

66. **Olenegorsk Phased-Array Radar Facility.** This facility is collocated with the Olenegorsk HEN HOUSE Radar Facility. It is the oldest of the new phased arrays and consists of a receiving antenna only (Figure 41). The antenna was first observed under construction in March 1973 and was externally complete in April 1977. The antenna is on an azimuth of 310 degrees and has an elevation angle of 20 degrees. The antenna face at Olenegorsk is 95 by 46 meters; the receiver antenna faces at Pechora, Lyaki, and Sary-Shagan are 95 by 86 meters. (S/WN)

25X1

HEN HOUSE Radar Facilities

67. Fifteen HEN HOUSE radars are deployed at six locations in the Soviet Union (Figure 32). These radars can be divided into two functional types: antisatellite (ASAT) radars, and ballistic missile early warning (BMEW) radars. HEN HOUSE ASAT radars provide detection and tracking of satellites that overfly the Soviet Union. Each radar consists of two antennas on the same azimuth but with different elevations angles, varying from 20 to 80 degrees. Each antenna can scan 15 degrees on either side of the base azimuth. HEN HOUSE ASAT radars are deployed at two facilities in the Soviet Union: the Sary-Shagan Missile Test Center, and at Mishelevka. (S/WN)

68. HEN HOUSE BMEW radars are also of two types. The first-generation radars are configured with a 30-degree angle between the orientation azimuths of the two antenna faces. Each antenna beam can be steered 15 degrees on either side of the base azimuth, thus providing a 60-degree sector of coverage from the two faces. Each antenna face has an elevation angle of 20 degrees. Two of the seven HEN HOUSE BMEW radars—radar A at Skrunda and the HEN HOUSE at Olenegorsk—are first-generation HEN HOUSES. (S/WN)

69. Second-generation HEN HOUSE BMEW radars are configured with either a 60-degree or a 120-degree angle between the orientation azimuths of their two antennas. These antennas can scan 30 degrees on either side of their boresight azimuths. Again, each of the antenna faces has an elevation of 20 degrees. Second-generation HEN HOUSE radars are deployed at five sites: Skrunda, Mishelevka, Sary-Shagan, Sevastopol, and Mukachevo. (S/WN)

70. **Mishelevka HEN HOUSE Radar Facility.** The Mishelevka HEN HOUSE Radar Facility (Figure 42) consists of an operations area, a communications satellite area, a support area, and a construction support area. The operations area consists of four HEN HOUSE ASAT radars (A through D), one second-generation HEN HOUSE BMEW radar (E), and 30 support buildings and structures. The azimuths of the radar E antennas are separated by 120 degree. (S/WN)

71. The communications satellite area is about 1,330 meters north-northwest of the operations area and contains a type C satellite communications building with two [redacted] diameter antennas, a security building, and a support building. (S/WN) 25X1

72. The support area contains over 200 support buildings and structures. The construction support area contains over 50 buildings and structures. (S/WN)

73. **Mukachevo HEN HOUSE Radar Facility.** The Mukachevo HEN HOUSE Radar Facility (Figure 43) consists of an operations area and a support area. The operations area consists of a second-generation HEN HOUSE BMEW radar and support structures. The facility was first observed under construction in January 1973 and by May 1976 was externally complete. Each antenna is 270 meters long with an elevation angle of 20 degrees. A 60-

degree angle is formed between the boresight azimuths (195 and 255 degrees) of the two antenna faces. The beam of each antenna can be swung 30 degrees on either side of the boresight azimuth. (S/WN)

74. The support area is about 600 meters northeast of the operations area and contains 100 support buildings. (S/WN)

25X1

25X1

75. **Olenegorsk HEN HOUSE Radar Facility.** The Olenegorsk HEN HOUSE Radar Facility (Figure 44) consists of an operations area, a support area, and a satellite communications area. The operations area consists of a first-generation HEN HOUSE BMEW radar, a phased-array radar receiver, and 20 on-site support buildings and structures. The HEN HOUSE radar has boresight azimuths of 295 degrees and 325 degrees (a 30-degree angle of separation between the boresight azimuths), an elevation angle of 20 degrees, and can probably serve as the transmitter for the phased-array receiver as well as operate independently. (S/WN)

76. The support area is southeast of the operations area and consists of 50 buildings and structures. The satellite communications area, 2.4 nm east of the operations area, consists of a type C control building with two [redacted] antennas. (S/WN)

77. **Sary-Shagan HEN HOUSE Radar Facility.** The Sary-Shagan HEN HOUSE Radar Facility (Figure 45) consists of an operations area, a satellite communications area, and a support area. The operations area consists of four HEN HOUSE ASAT radars (A-D), one second-generation HEN HOUSE BMEW radar (E), and 30 support buildings and structures. The HEN HOUSE BMEW has 60 degrees of separation between its antenna face orientations. (S/WN)

78. The satellite communications area, 1.3 nm northwest of the operations area, consists of a type C satellite communications building with two [redacted] antennas. Five additional buildings are also in the area. The support area is located west of the operations area and contains over 150 buildings. (S/WN) 25X1

79. **Sevastopol HEN HOUSE Radar Facility.** The Sevastopol HEN HOUSE Radar Facility (Figure 46) consists of an operations area and a support area. The operations area consists of a second-generation HEN HOUSE BMEW radar and 20 support buildings and structures. One face of the radar is on an azimuth of [redacted] the other face is on an azimuth [redacted] (S/WN) 25X1 25X1 25X1

[redacted] 25X1

80. The support area is west of the operations area and contains 35 buildings. (S/WN)

81. **Skrunda HEN HOUSE Radar Facility.** Skrunda HEN HOUSE Radar Facility (Figure 47) consists of an operations area, a satellite communications area, and a support area. The operations area (Figure 48) consists of a first-generation and a second-generation HEN HOUSE BMEW radar (radars A and B), and 25 support buildings. The boresight azimuths of the antenna faces of radars A and B are separated by 30 and 120 degrees, respectively. (S/WN)

82. The satellite communications area is about 1.5 nm northeast of the operations area. Although no antennas have been mounted on the roof of the type C satellite communications building as yet, two [redacted] antennas are expected. Five additional buildings are also in the area. The support area is north of the satellite communications area and contains 100 buildings. (S/WN)

Over-The-Horizon Detection Radar Facilities

83. Soviet over-the-horizon detection (OHD) radar facilities are at Komsomolsk, Kiyev, and Nikolayev (Figure 49). Each OHD facility contains a transmitter site and a receiver site, which form a bistatic OHD radar system. Each transmitter and receiver site contains large, stacked, horizontal dipole arrays that can be electrically steered to detect and track targets at extended ranges over the horizon. Although these facilities are intended primarily for defense against ballistic missiles, they can also be used against aircraft. These three facilities also contain log-periodic antenna arrays (LPAAs) at the transmitter site and a circularly disposed antenna array (CDAA) at the receiver site. The LPAAs are used to transmit an ionospheric sounding signal that is received and analyzed by the CDAA. Based on an analysis of this signal, an optimum frequency is then selected for operation of the OHD system. (S/WN)

84. The Nikolayev OHD system is the prototype OHD facility. It is oriented [redacted] from north, which covers four Soviet missile test centers and much of China. (S/WN)

85. The azimuths of the Komsomolsk and Kiyev radars, [redacted] respectively, provide coverage of ICBM sites in the United States. The external appearance and dimensions of the Komsomolsk and Kiyev radars are essentially the same. Their transmitter and receiver radars have two different sizes of dipole elements, compared to a single element size for the Nikolayev radar. This permits a more efficient frequency selection than is possible with only one size. (S/WN)

86. **Komsomolsk OHD Radar System.** The Komsomolsk OHD Radar System consists of a transmitter facility and a receiver facility, 36 nm apart, that appear to be intended for providing long-range radar coverage of the United States and Canada. The transmitter facility, 20 nm north-northwest of the city of Komsomolsk, was first observed under construction in July 1974, although it was probably started in early 1973. The receiver facility, 16 nm southeast of the city of Komsomolsk, was observed under construction in March 1973 and was externally complete by July 1979. The system is oriented on an azimuth of [redacted] (S/WN) 25X1 25X1

87. **Komsomolsk OHD Transmitter Facility.** The transmitter facility (Figure 50) consists of a large array with seven interior towers [redacted] high; a small array of seven interior towers [redacted] meters high; a central control building; eight LPAAs; two 52-meter-high towers; on-site support buildings; and a support area. The large and small arrays each have two end towers [redacted] high and [redacted] high, respectively, that support a back screens. The large and small arrays together form an antenna about 510 meters long. Each of the interior towers of the large and small arrays has eight horizontal caged dipole antennas. (S/WN) 25X1 25X1 25X1 25X1 25X1

88. The eight LPAAs are arranged in two groups of four on each side of the OHD transmitter array. Each array has an overall length of about 194 meters and contains wire elements logarithmically spaced and suspended between side support wires. These support wires are in turn suspended from three pairs of towers that increase in height as they progress outward from the OHD transmitter array. The orientation of each array in the LPAA differ by 45-degree intervals and together provide 360 degrees of coverage. (S/WN)

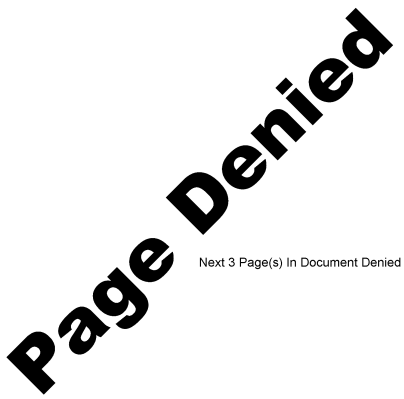
89. There are two towers 52 meters high northwest of the small transmitting array. Possibly the function of these towers is calibration/testing. (S/WN)

90. On-site support buildings include a small operations building joined by a corridor to the main control building, two buildings across the road from the control building that contain probable pumping equipment for POL and possibly auxiliary generators, a four-unit cooling tower, and miscellaneous support buildings. (S/WN)

91. The support area, not shown, is about 0.5 nm southwest of the transmitting arrays. The area contains a heating plant, two POL tanks, a POL pumphouse, two water tanks, a messhall, an administration building, three vehicle parking garages, seven multistory apartment buildings, and 15 support buildings. (S/WN) 25X1

92. **Komsomolsk OHD Receiver Facility.** The receiver facility (Figure 51) consists of an operations area, a circular disposed antenna array (CDAA), a support area, and a construction support area. The operations area (Figure 52) consists of a large and a small receiving array, two 52-meter-high towers, and on-site support buildings. The large array consists of 15 interior towers each 140 meters high and two end towers that support a back screen. The overall length of the large array is 436 meters. The interior towers are [redacted] wide at the base, with a separation distance of [redacted] meters. Each interior tower of the large array supports ten stacked horizontal caged dipole antennas. The end towers are [redacted] high. On-site support buildings include a small administration building attached by a corridor to the primary control building; a three-stack, forced-draft cooler; buried POL and water tanks; an 25X1 25X1 25X1 25X1

(Continued p. 39)



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aboveground water tank; a water pumphouse; and several small support buildings. The small array consists of ten interior towers, each [ ] meters high, and two end towers, [ ] meters high, that support a back screen. The interior towers are [ ] meters apart, and the overall length of the small array is [ ] meters. Each interior tower supports ten horizontal caged dipole antennas. There are two possible calibration/test towers northwest of the small receiving array 52 meters high. (S/WN)

93. The CDAA (Figure 51) is 1.5 nm southeast of the receiving arrays and consists of three concentric circles of vertical-caged antennas and masts and a central control building. The outer ring is [ ] meters in diameter and has one hundred twenty [ ] vertical-caged antenna elements spaced [ ] apart; the middle ring is [ ] meters in diameter and has 60 masts [ ] meters high spaced [ ] meters apart; and the inner ring is [ ] meters in diameter and has one hundred twenty [ ] vertical-caged antenna elements spaced [ ] meters apart. A vertical-caged antenna element [ ] meters, is on top of the control building, which is [ ] A mast, [ ] meters high, was observed in the southwest corner of the CDAA. (S/WN)

94. The support area, not shown, is about 4 nm east of the receiving arrays. It contains a heating plant, two POL tanks, a POL pumphouse, and underground water tank, a water pumphouse, two aboveground water tanks, an administration building, two vehicle parking garages, six multistory apartment buildings, and 20 support buildings. The construction support area, located between the operations area and the CDAA, contains numerous support buildings and sheds. (S/WN)

95. **Kiyev Over-The-Horizon Detection Radar System.** The Kiyev OHD system is similar to the Komsomolsk Radar System. Both systems are bistatic, with wide separation between transmitter and receiver (31 nm at Kiev, 36 nm at Komsomolsk). But there are two differences. First, the CDAA at Kiyev is much closer to the operations area (0.6 nm) than the CDAA at Komsomolsk (1.5 nm). Second, the Kiyev system has a satellite communications system under construction at the receiver, while the Komsomolsk system does not. The Kiyev OHD radar is oriented on an azimuth of [ ] which provides long-range radar coverage of the United States and Canada. (S/WN)

96. **Kiyev OHD Transmitter.** The Kiyev OHD Transmitter (Figure 53) is 71 nm north of the city of Kiyev and is similar to the Komsomolsk OHD transmitter. The facility was first observed under construction in March 1973 and was externally complete by October 1976. (S/WN)

97. **Kiyev OHD Receiver.** The Kiyev Receiver (Figure 54) is 55 nm north-northwest of the city of Kiyev and is similar to the Komsomolsk Receiver. However, a type C satellite communications control building, is under construction in the western part of the operations area. This construction was first observed on [ ] the building was externally complete, but neither of the [ ] antennas had been mounted on its roof. (S/WN)

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98. **Nikolayev OHD Radar System.** The Nikolayev OHD Radar System consists of a transmitter and receiver facilities about 14 nm apart that appear to provide long-range radar coverage of much of China. The system is believed to be the Soviet prototype for research and development in the field of OHD radars. Like the Komsomolsk and Kiyev OHD radars, Nikolayev is a bistatic system and also operates a CDAA and an LPAA. However, Nikolayev differs from the other two systems in two aspects. First, the separation between the CDAA and the receiving antenna at Nikolayev is closer (130 meters) than the separation at Komsomolsk (1.5 nm) or Kiyev (0.6 nm). Second, the LPAA at Nikolayev is a greater distance from the transmitting antenna (0.7 nm) than at Komsomolsk and Kiev, where the antennas are collocated. Additionally, the LPAA at Nikolayev consists of a single log-periodic antenna instead of the eight LPAAs at each of the other two facilities. (S/WN)

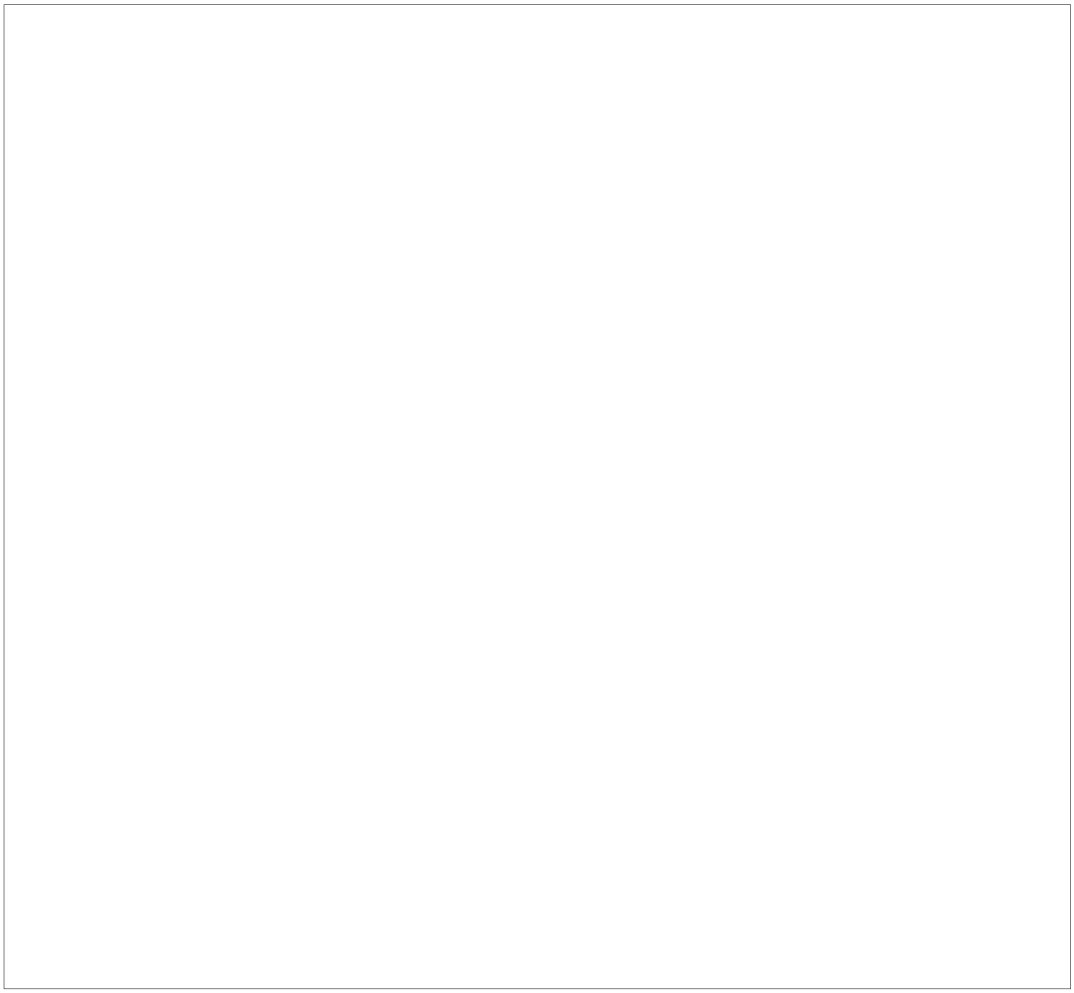
99. **Nikolayev OHD Transmitter Facility.** The transmitter facility (Figure 55), 12 nm southeast of the city of Nikolayev, was first observed under construction in June 1968 and consists of an operations area and an LPAA. The operations area contains a transmitting antenna (Figure 56) of 13 interior towers 90 meters high, supporting antenna elements, and two end towers, also 90 meters high, that support a back screen. Each of the 13 interior towers contains eight stacked, horizontal-caged dipole antennas. A central control building, a four-unit forced draft cooling tower, a heating plant, and several sheds are also in the area. (S/WN)

100. The LPAA (Figure 57) is 0.7 nm northwest of the operations area and contains a single log-periodic antenna, a control building, a security building, a two-unit forced-draft cooling tower, and a vehicle parking area where six vehicles are usually observed. The log-periodic antenna is supported by two large towers 120 meters high, two towers 57 meters high, and two small towers 6 meters high. (S/WN)

101. **Nikolayev OHD Receiver Facility.** The receiver facility (Figure 58), 12 nm northeast of the city of Nikolayev, was first observed under construction in June 1968 and by May 1972 was externally complete. The facility consists of a large array with 30 interior towers 143 meters high, two end towers 143 meters high that support a back screen, a CDAA, two 26-meter high masts, and a support area. Eleven horizontal caged dipole antennas are mounted on each of the 30 interior towers that comprise the 333-meter long array. A large control building, a four-unit forced-draft cooling tower, and a support building are just behind the receiving array. The CDAA is similar in appearance and dimensions to the ones at the Komsomolsk and Kiyev OHD facilities. (S/WN)

102. The support area contains a heating plant, an administration building, several multistory apartment buildings, and numerous support buildings. (S/WN)

25X1



25X1

REFERENCES

IMAGERY

All available satellite imagery acquired as of [redacted] was used in the preparation of this report. (S/WN) 25X1

MAPS OR CHARTS

SAC. US Air Target Charts, Series 200, Various sheets, scale 1:200,000 (UNCLASSIFIED)

REQUIREMENT

COMIREX B01
Project 543060B

Comments and queries regarding this report are welcome. They may be directed to [redacted] 25X1
[redacted] Soviet Strategic Forces Division, Imagery Exploitation Group, NPIC, on [redacted] or green extension (9) 25X1
[redacted] 25X1

Footnote (see paragraph 12)

*The association of specific ABM types with individual launch sites, although not absolutely established, is strongly indicated in several ways: 1. The locations of the "B" and "C" ring silo sites (10-25 nautical miles from the center of Moscow) appear to be much more suitable for deployment of the close-in, SH-08 ABM now being tested than for a GALOSH type missile. The silos constructed at the two "E" ring sites (approximately 45 nautical miles out) are at known deployment distances for the GALOSH and are collocated with existing GALOSH launchers. They are, therefore, much more likely candidates to house the silo-based version of that missile. 2. The spacing of the silos at the two "E ring" sites and the spacing of the GALOSH test silos at Sary-Shagan are about the same (100 meters or greater); likewise, the silo spacing at the Moscow "B and C ring" sites and the spacing of the SH-08 ABM test silos at Sary-Shagan are also about the same (50 meters). 3. The silos at the "E ring" sites will apparently function with collocated TRY ADD radars, which do not have the capability to handle the high acceleration ABM. The "B and C ring" silo sites, on the other hand, will probably operate with the new Pushkino radar.