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**basic Imagery Interpretation report**

# **Feodosiya Naval Test Range Instrumentation Sites (S)**

**BE: VARIOUS  
MISSILE RANGES: NAVAL LAUNCHED FACILITIES  
USSR**

**Top Secret**



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**RCA-17/000125X1**

**NOVEMBER 1979**

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INSTALLATION OR ACTIVITY NAME					COUNTRY
Feodosiya Naval Test Range Instrumentation Sites					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

DMAAC. Tactical Pilotage Chart, Sheets F-4AG and F-3B, scale 1:500,000

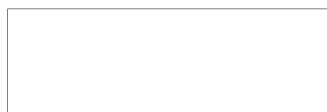
LATEST IMAGERY USED	NEGATION DATE (If required)
[redacted]	NA

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Installation Name	Geographic Coordinates	Category	BE No	COMIREX No	NIETB (MRN) No
Feodosiya Naval Test Range Instrumentation Site 1	44-44-20N 034-31-20E	[redacted]			
Instrumentation Site 2	44-49-00N 034-44-00E				
Instrumentation Site 3	44-49-55N 034-55-55E				
Instrumentation Site 4	44-48-30N 035-04-40E				
Instrumentation Site 5	44-48-20N 035-05-50E				
Instrumentation Site 6	44-49-30N 035-07-40E				
Instrumentation Site 7	44-51-20N 035-08-10E				
Instrumentation Site 8	44-55-30N 035-14-30E				
Instrumentation Site 9	44-57-10N 035-22-55E				
Instrumentation Site 10	45-00-40N 035-26-40E				
Instrumentation Site 11	45-07-50N 035-33-30E				
Instrumentation Site 12 (Chernomor Naval Missile Test Range Instrumentation Site 12)*	45-05-18N 035-44-17E				
Instrumentation Site 12A					
Instrumentation Site 13	45-02-30N 035-48-50E				
Instrumentation Site 14	45-00-00N 035-50-20E				
Instrumentation Site 15 (Chernomorskoye Tracking Facility)*	45-02-50N 035-57-00E				
Instrumentation Site 16	45-03-10N 036-03-30E				
Instrumentation Site 17	45-02-30N 036-07-50E				
Instrumentation Site 18	45-01-50N 036-13-30E				
Instrumentation Site 19	45-03-30N 036-22-20E				

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\*Name change requested to reflect inclusion in Feodosiya Naval Test Range.



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### ABSTRACT

1. (S) This report describes the instrumentation sites of the Feodosiya Naval Test Range (FNTR) within the Feodosiya Naval Trials and Testing Complex (FNTTC) in the USSR.

2. (TSR) The first of the instrumentation sites (3—6, 8—10, and 12—19) were constructed between July 1956 and October 1964. The electronic countermeasure (ECM) area of Site 11 was constructed during 1965 and 1966. Sites 1 and 2 were built during the 1966—1967 time period. A major upgrading program began in 1972 with the construction of new control/operations buildings at sites 2, 4, 9, 12, 14, 15, 17, and 18 and construction of VT-2B-type interferometers at sites 11 and 17.

3. (TSR) Equipment used in the FNTR does not appear to have been changed since the range was first observed. The SHIP WHEEL radar continues to be the major piece of electronics equipment in the FNTR, although there has been a trend away from the van-mounted type in favor of the building-mounted type. No concerted effort to modify the optical shelters or the cinetheodolite buildings was observed, and changes to the instruments themselves could not be ascertained.

4. (S) This report describes the instrumentation sites, the telemetry and optical equipment in them, and their developmental chronologies. It contains a location map of the instrumentation sites, four drawings, and 25 photographs.

### INTRODUCTION

5. [redacted] The FNTTC is one of three major test ranges in the Black Sea area. It has been used by the Soviet Navy since 1948 as the primary range for research, development, testing, and

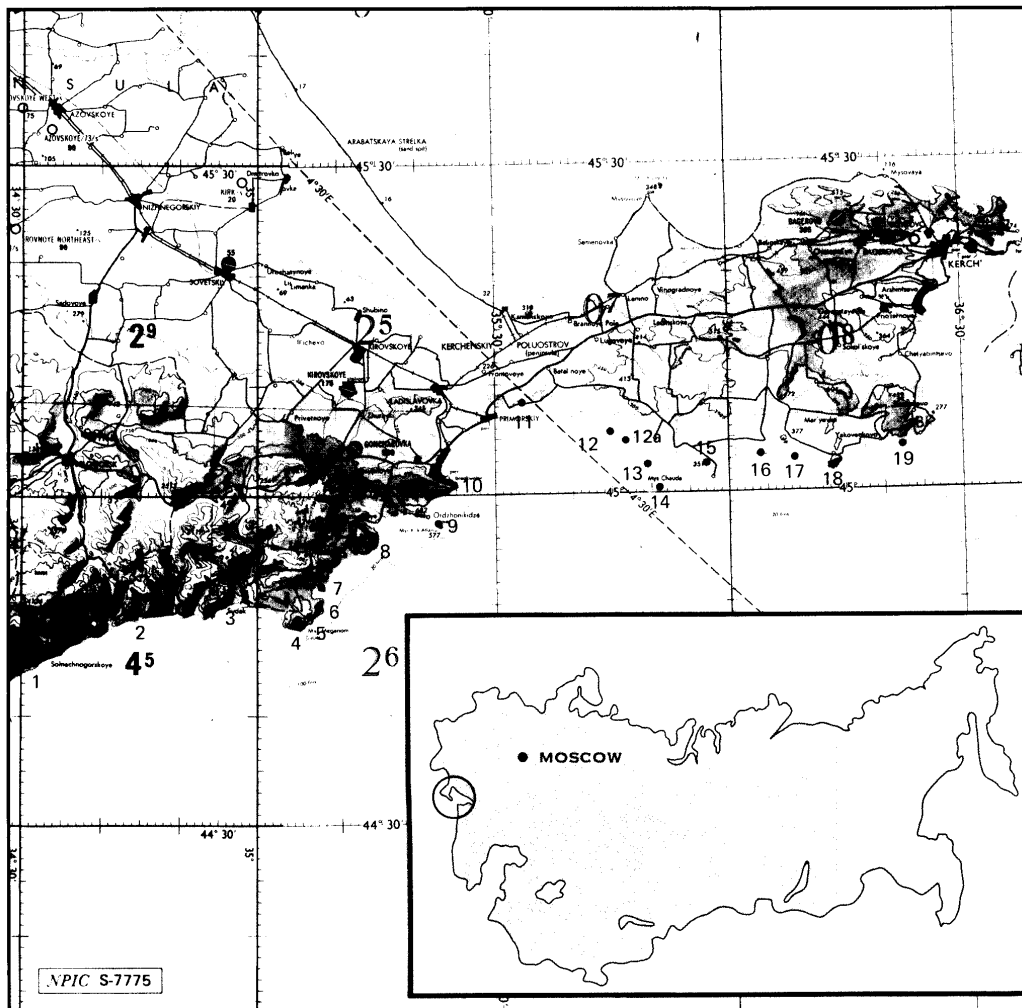


FIGURE 1. INSTRUMENTATION SITES OF THE FEODOSIYA NAVAL TEST RANGE, USSR

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evaluation of antiship cruise missile systems, naval surface-to-air-missile (SAM) systems, and antisubmarine warfare (ASW) systems<sup>1</sup>. It encompasses ship- and land-based launch facilities and land-based support facilities, as well as the instrumentation sites.

6. [REDACTED] The FNTTC conducts firings from land-based launch facilities at Feodosiya Naval Missile Test Facility [REDACTED] and from shipborne launchers in the eastern Black Sea. In the past the FNTTC has also conducted land-based firings from Chernomorskoye Missile Test and Evaluation Facility [REDACTED].

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7. [REDACTED] The instrumentation sites of the FNTR monitor these flights. The sites are approximately centered on Feodosiya Naval Base and Ship Repair Yard (45-01-31N 035-23-40E; [REDACTED] and extend 153 kilometers (km) along the southeast coast of the Crimean Peninsula from northeast of the city of Alushta to south of the city of Kerch (Figure 1). All negation dates and dates of first sightings are from reference document 1.

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### BASIC DESCRIPTION

8. (TSR) The main functions of the instrumentation at any missile test range are the observation and control of the flight test vehicle and control of the test area and test operations. Instrumentation used to accomplish these missions can be optical (theodolites, telescopes, infrared devices, and other lensed systems); photographic (cameras); photo-optical (optical systems incorporating a camera); electro-mechanical (gyroscopes, equipment used in the data collection process); or electronic (radar, radio, computers).<sup>2</sup> Any of the optical equipment (or at least its environmental shelters) and the electronic (i.e., radar) equipment could be observed photographically at a test range, although identification of this equipment at FNTR is hindered by the scale and quality of the imagery and by the size of the equipment. However, based on what is identifiable and on comparisons with US and other Soviet missile tracking ranges, some of the remaining equipment can be placed in the aforementioned categories.

9. (TSR) The SHIP WHEEL, in both van- and building-mounted versions, is the electronic workhorse of the FNTR range. It comprises two vans (a support van and an antenna van) and is capable of tracking and commanding the target vehicle. Identification of the SHIP WHEEL is aided by the fact [REDACTED] configuration. More difficult to identify are the telemetry antennas. Telemetry antennas that have been identified in the FNTR are two-element Cigar antennas and two-element helix antennas. These are receiving antennas and are usually mounted on box-bodied vans.

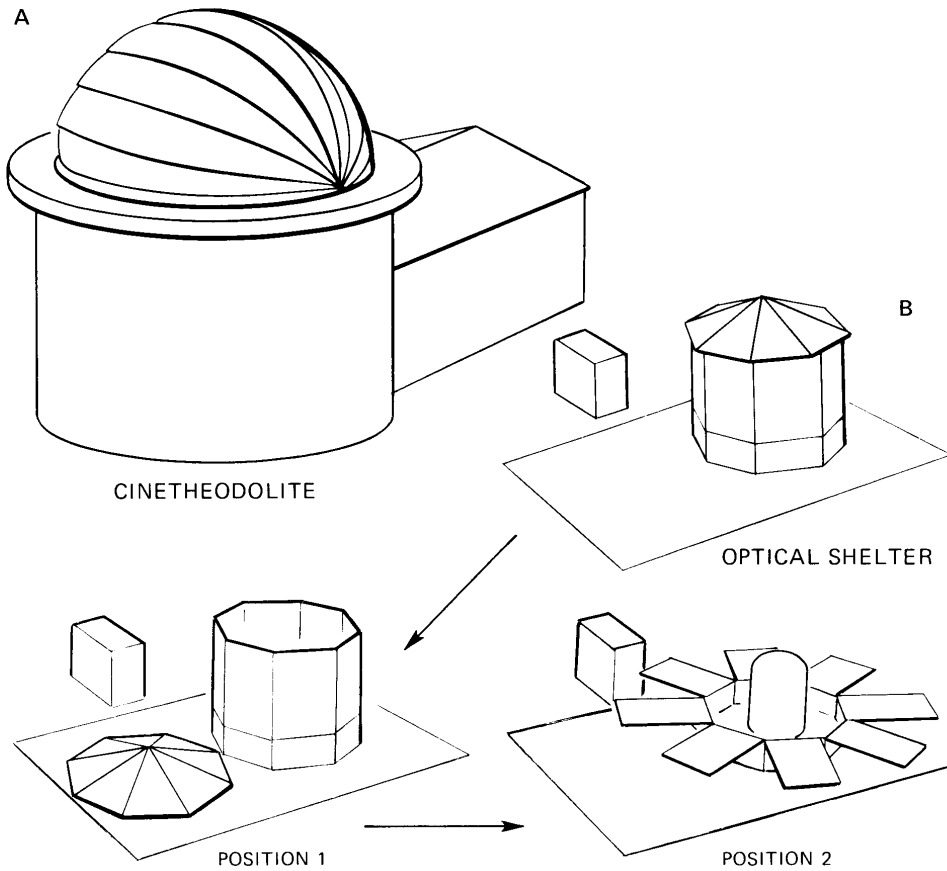
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10. (TSR) Other prominent instrumentation structures in the FNTR include a retractable domed shelter mounted on a permanent cylindrical support structure with an attached rectangular support building (Figure 2A) and an octagonal structure with hinged side panels and a removable lid or lid sections (Figure 2B). Specific identification of the instruments housed in these structures has not been possible. However, it has been determined that the domed cylindrical structure (previously identified as radar A and Opt A) houses some type of cinetheodolite, based on the similarities to a structure in a ground photograph of a Soviet cinetheodolite (Figure 3).<sup>4</sup> The octagonal structure has been identified as a housing for various other optical equipment.

11. (S) A description of cinetheodolites and other optical equipment likely to be used at FNTR follows.<sup>4</sup> Figure 4 shows an example of each type, as illustrated by typical US equipment.<sup>4</sup>

- a. Cinetheodolites—the cinetheodolite is primarily an angle (azimuth and elevation) measuring instrument used for obtaining trajectory information. The angles, plus an image of the object being tracked, and a time code are recorded simultaneously on film. Such records, from two or more cinetheodolites, are a prime source of space position, velocity, and acceleration data.
- b. Tracking Telescopes—tracking telescopes, with motion picture cameras and long focal length optical systems, record attitude, events, miss-distance, roll rate and roll position data. They are capable of acquiring attitude and event data at slant ranges of 20 to 30 miles and can provide miss-distance data at altitudes up to 45,000 feet.
- c. Ballistic Cameras—the ballistic camera provides one of the most accurate optical methods in use for the determination of position versus time of a missile flight. A series of exposures is made on a photographic plate as the missile passes through its field of view. The instrument photographs the missile exhaust plume, airborne flare or flashing light beacon against a star background. Two or more cameras, set to scan a sector of the sky through which the missile is expected to pass, are timed synchronously to photograph the passage. Missile position for each exposure can be computed and plotted as a function of time to determine the elements of trajectory. Under favorable atmospheric conditions, normal coverage is in excess of 125 miles.

12. (TSR) These optical instruments, along with the SHIP WHEEL, form the backbone of the FNTR instrumentation sites.



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FIGURE 2. OPTICAL STRUCTURES OBSERVED AT INSTRUMENTATION SITES IN THE FNTR

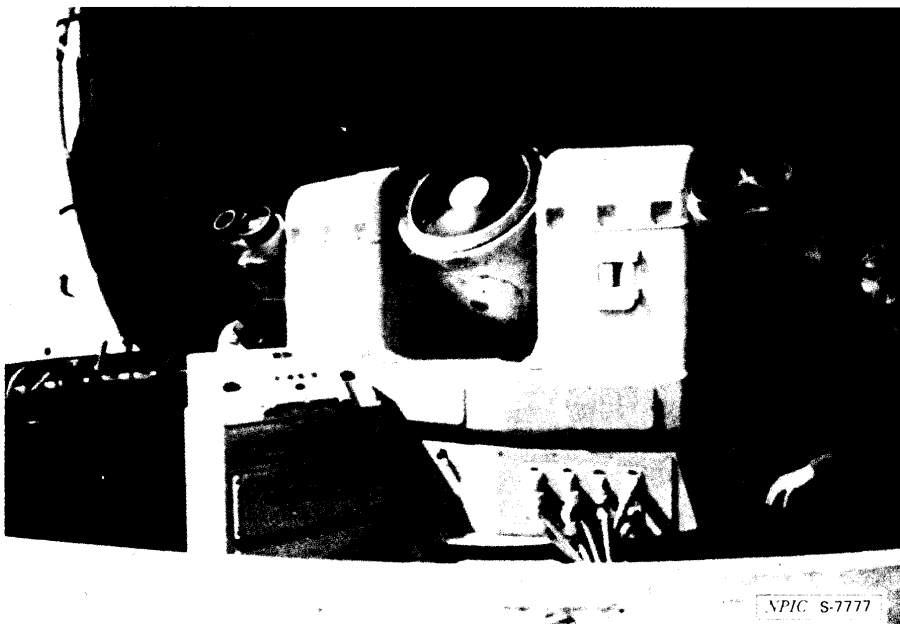
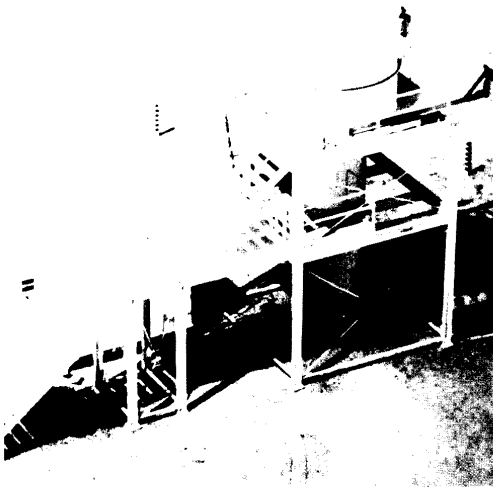
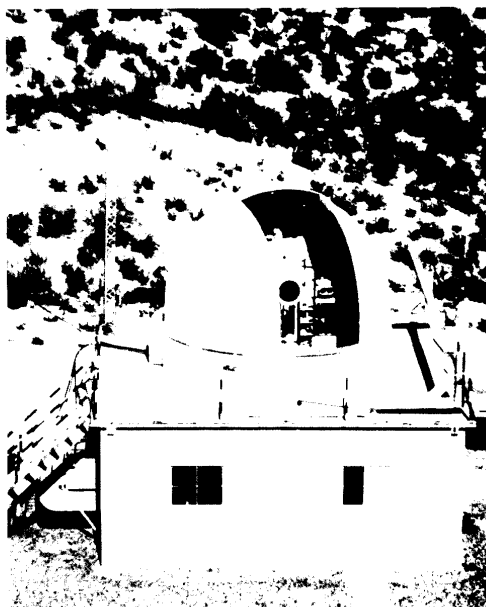


FIGURE 3. SOVIET CINETHEODOLITE. Photograph taken from reference document 3.



CINETHEODOLITE



TELESCOPE



BALLISTIC CAMERA

FIGURE 4. US RANGE OPTICAL INSTRUMENTATION. Photographs taken from reference document 4.

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**Instrumentation Site 1**

LOCATION: 75.2 km southwest of Feodosiya

NEGATION DATE: June 1966

DATE FIRST SEEN: August 1966 (under construction)<sup>4</sup>

CURRENT INSTRUMENTATION: One cinetheodolite, two optical shelters, one van-mounted SHIP WHEEL, and two two-element telemetry antenna vans (Figure 5)

13. (TSR) The SHIP WHEEL was first seen at Site 1 in June 1967; in May 1968 the environmental shelter housing the cinetheodolite was completed. An optical shelter was built between May and September 1968, and the second shelter had been constructed by October 1969.<sup>5</sup> An abandoned site of a probable optical shelter was detected on high-resolution coverage of June 1973.

14. (TSR) In June 1974 two two-element telemetry antenna vans were seen at the site and have remained there since that time. By  the SHIP WHEEL had been removed, but when the site was seen a year later the SHIP WHEEL was again present. Two electronics vans were added to the site's inventory between July and August 1977 and their arrangement suggests that they may have been used in support of a SHIP WHEEL. Both vans had been removed by June 1978.

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**Instrumentation Site 2**

LOCATION: 56.4 km southwest of Feodosiya

NEGATION DATE: June 1966

DATE FIRST SEEN: August 1963 (under construction)

CURRENT INSTRUMENTATION: One cinetheodolite, two optical shelters, one possible van-mounted SHIP WHEEL, and a possible building-mounted telemetry antenna (Figure 6)

15. (TSR) The permanent structures at Site 2 include two control/operations buildings, a support building, and two hardstands. The original, larger control/operations building and the support building were constructed between 1966 and 1972. The second control/operations building and an addition to the support building were added to the site between October 1972 and March 1973. The most recent construction at the site is an addition to the second control/operations building. The addition was begun in early 1974 and had been completed by June 1975.

16. (TSR) There has been considerable activity involving the vehicles on hardstand 1 over the years. When the hardstand was seen in July 1972, two probable van-mounted SHIP WHEELS and two unidentified vans were present. The latter were probably relocated to hardstand 2 in mid-1973. When the site was seen in July 1975 the support vans for the SHIP WHEELS appeared changed, but the exact nature of this change could not be determined. By October 1977 two vans were in an apparent SHIP WHEEL configuration, and two others had been removed; nothing more than this could be ascertained.

17. (TSR) A possible telemetry antenna was seen on the roof of the large control/operations building on coverage of

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**Instrumentation Site 3**

LOCATION: 42.0 km southwest of Feodosiya

NEGATION DATE: June 1962 (possible field site)

DATE FIRST SEEN: August 1966 (under construction)

CURRENT INSTRUMENTATION: Two cinetheodolites, one optical shelter, one probable optical shelter mounted on a small building, one van-mounted SHIP WHEEL, and one probable van-mounted SHIP WHEEL (Figure 7)

18. (TSR) A single van-mounted SHIP WHEEL was present from July 1972 until July 1977, when a probable SHIP WHEEL was brought in. Both were still present on the latest coverage,

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#### Instrumentation Site 4

LOCATION: 34.5 km southwest of Feodosiya

NEGATION DATE: June 1962

DATE FIRST SEEN: August 1963

CURRENT INSTRUMENTATION: Two cinetheodolites, three optical shelters, two possible instrumentation/optical buildings, three SHIP WHEELS, one SHEET BEND radar, two BAR LOCK radars, one BIG BAR radar, and a possible communications unit

19. (TSR) This site is one of the largest in the range and is divided into instrumentation areas A and B and a support area (Figure 8A).

20. (TSR) In 1972 area A contained the cinetheodolites, two of the optical shelters, both possible instrumentation/optical buildings, two SHIP WHEELS, and a possible communications unit. A possible electronics unit, added in June 1973, consisted of a truck-mounted antenna, three support trucks, and a generator (Figure 8B). This unit had been removed by August 1974. A third SHIP WHEEL was seen in July 1976, and in May 1978 a second support van was placed parallel to the first, creating an atypical SHIP WHEEL configuration. A third optical shelter was beside the first two in October 1977 (Figure 8C).

21. (TSR) Area B was constructed between 1968 and early 1972, at which time the instrumentation included an optical shelter, two support vans, two trucks, and at least four van-mounted antennas. Two of the van-mounted antennas were later identified as SHEET BENDs and the other two as probable telemetry antennas. In August 1972 foundations for a large support building could be seen (Figure 8D). The two trucks, which had been between the SHEET BENDs, had been removed by September 1973. By June 1974 one SHEET BEND, both probable telemetry vans, and the optical shelter had been removed and a BAR LOCK had been positioned near the large support building. This area has remained basically unchanged since that time (Figure 8E).

22. (TSR) The support area includes a separately secured radar site. A BIG BAR was present from 1964 until December 1978, when it was moved outside the fence and replaced by a BAR LOCK.

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**Instrumentation Site 5**

LOCATION: 33.6 km southwest of Feodosiya

NEGATION DATE: June 1962

DATE FIRST SEEN: August 1963

CURRENT INSTRUMENTATION: No equipment present

23. (TSR) This site (Figure 9) consists of a small building and a hardstand. It is usually unoccupied, although a few vehicles/pieces of equipment have been seen on the hardstand. Two abandoned sites for probable optical shelters can be seen within the fence line.

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**Instrumentation Site 6**

LOCATION: 30.4 km southwest of Feodosiya

NEGATION DATE: August 1962

DATE FIRST SEEN: August 1963 (under construction)

CURRENT INSTRUMENTATION: One possible optical/electronics position and unidentified, building-mounted instrumentation

24. (TSR) Instrumentation Site 6 (Figure 10A) originally consisted of three buildings and a hardstand. An abandoned probable optical shelter position could be seen near the hardstand, and between September and November 1974 a tower-mounted platform was erected in this area. The tower-mounted platform was not present when the site was seen in October 1977 and had probably been moved approximately 3,000 meters to the northwest.

25. (TSR) A major redesign of the site took place between May and July 1975. During this period, observed changes to the control building included placement of instrumentation on the roof and the addition of a set of rails, which were laid from the enlarged front door to a semicircular wall. The small building behind the control building was razed and replaced by a probable fuel tank/generator. The appearance of a few vehicles at the site was the principal activity until [redacted] when the instrument housed within the control building was seen on the rails (Figure 10B).

26. (TSR) The presence of an abandoned probable optical shelter position at Site 6 indicates that it once functioned as an optical facility for the FNTR. With the construction of the tracked position, however, Instrumentation Site 6 resembles other sites along the Black Sea coast that have been tentatively identified as coast watch stations. Three of these, one between Instrumentation Sites 8 and 9 and one each at Instrumentation Sites 10 and 15, are within the FNTR. This suggests that Instrumentation Site 6 may no longer be a part of the FNTR. If these coast watch stations can be used for range safety or are capable of monitoring the flight of a missile, however, Instrumentation Site 6 and those stations within the FNTR may have a dual function.

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**Instrumentation Site 7**

LOCATION: 27.4 km southwest of Feodosiya

NEGATION DATE: September 1968

DATE FIRST SEEN: September 1969

CURRENT INSTRUMENTATION: One optical shelter

27. (TSR) From 1969 until July 1978 this site, which consists solely of one optical shelter, was within the Feodosiya Naval Missile Range Electronics R&D Facility [redacted] Be-25X1  
between May 1977 and July 1978 the site was relocated approximately 300 meters southwest to just outside the Feodosiya Naval Missile Test Facility [redacted] Figure 11). Because the 25X1  
shelter walls of the original site were left in place, the position could again be used to house optical equipment.

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### Instrumentation Site 8

LOCATION: 16.0 km southwest of Feodosiya

NEGATION DATE: August 1963

DATE FIRST SEEN: October 1964 (under construction)

CURRENT INSTRUMENTATION: Two optical shelters; two van-mounted SHIP WHEELs; two probable telemetry antenna vans; one possible ground-mounted, two-element telemetry antenna; and one possible ground-mounted FORK REST antenna

28. (TSR) When seen in 1970 this instrumentation site (Figure 12) had a single SHIP WHEEL antenna van flanked by two optical shelters. Two support vans and three van trucks were on a hardstand nearby. By at least July 1972 one of the optical shelters had been relocated and a second SHIP WHEEL antenna van had been placed near the first. At that time a third support-type van was added to the hardstand, and by March 1973 four were present. Other unidentified vehicles were seen on the hardstand, but by May 1978 only four support-type vans were present. In December 1978 three SHIP WHEEL-type support vans and two probable telemetry vans were seen on the hardstand. One of the support-type vans may be for the possible two-element telemetry antenna which is a slight distance down the slope. This antenna and a possible FORK REST antenna have been present since at least June 1974 and probably are part of the original equipment.

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### Instrumentation Site 9

LOCATION: 8.0 km southwest of Feodosiya

NEGATION DATE: August 1962

DATE FIRST SEEN: October 1964

CURRENT INSTRUMENTATION: One cinetheodolite; one optical shelter; one building-mounted, two-element Cigar antenna; one building-mounted SHIP WHEEL; and two ground-mounted, probable two-element helix antennas

29. (TSR) In August 1969, equipment at this site (Figure 13) included a cinetheodolite, two optical shelters, one van-mounted SHIP WHEEL, and two probable telemetry antenna vans. By October 1971 one of the probable telemetry antenna vans had apparently been moved next to the van-mounted SHIP WHEEL, and the other had been removed from the site. In July 1972 the probable telemetry van was moved again and could be identified as a two-element Cigar antenna van; by August one of the optical shelters had been removed. A new, large control/operations building that houses a SHIP WHEEL was constructed between July 1972 and July 1973; the van-mounted SHIP WHEEL was removed from the site in May 1973. Two ground-mounted, probable two-element helix antennas were seen near the cinetheodolite in August 1974, and in November the two-element Cigar antenna van was no longer present. A building-mounted, two-element Cigar antenna was seen in late 1975.

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### Instrumentation Site 10

LOCATION: 2.2 km southeast of Feodosiya

NEGATION DATE: August 1963

DATE FIRST SEEN: October 1964

CURRENT INSTRUMENTATION: Two optical shelters and one van-mounted SHIP WHEEL at the R&D facility; one BAR LOCK and one SHEET BEND at the NIS (literally translated as observation and communications post)

30. (TSR) Site 10 (Figure 14A) is not typical of the instrumentation sites in that it has been moved several times, although it has always remained within a small area on Cape Ili. The original location of Site 10A was near an NIS post (Figure 14B). It was later relocated 1.8 km west to a second location, designated Site 10B (Figure 14C). During the time Site 10B was active, some range equipment was also seen at the Feodosiya Probable Naval Weapons R&D Facility [REDACTED] 25X1 [REDACTED] Figure 14D). All of the equipment previously at Site 10, such as optical shelters and SHIP WHEELS, is now present at the R&D facility. Other possible range-related equipment can also be found at the NIS post, and two buildings presently under construction in the area may prove to be part of the FNTR facilities (Figure 14E). Table 1 gives a brief chronology of the various locations and the major pieces of equipment at Site 10. 25X1

31. (TSR) In addition to the optical shelters and SHIP WHEEL, there is a building-mounted, possible single-element telemetry antenna at the R&D facility. Since November 1977 a probable two-element telemetry van has been parked in front of the building with this antenna.

32. (TSR) One SHEET BEND has been present at the NIS post since 1966, and a second one was present from July 1972 until November 1975. A BAR LOCK was brought to the post in April 1976 and has remained since that time. Between May 1975 and July 1976 a series of rooms were constructed into the cliff face; these rooms may be an observation area. During the same period an unidentified instrument and its environmental shelter were positioned nearby.



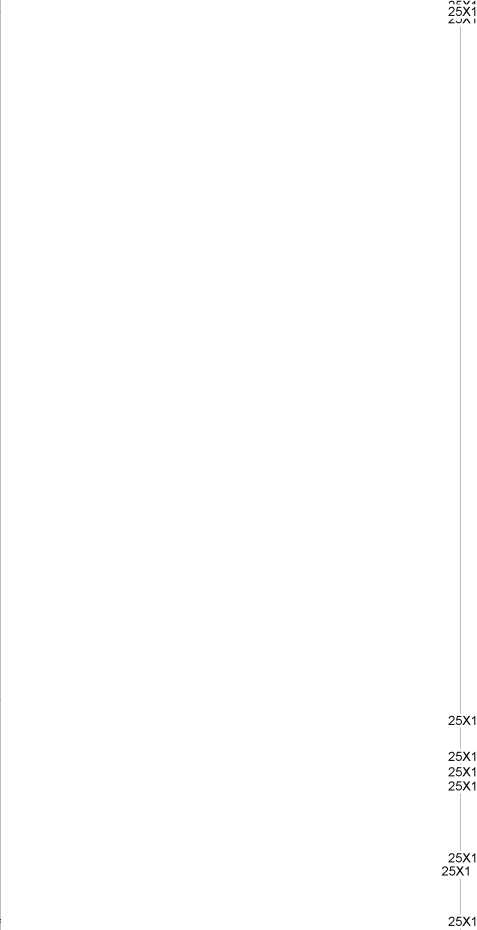
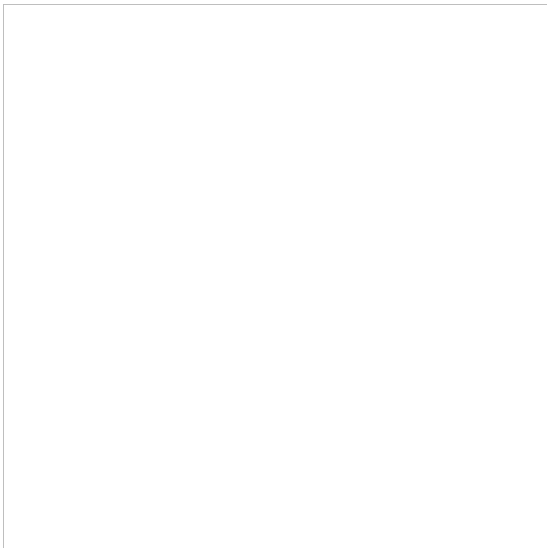
Date	Site A		Site B		R&D Facility	
	Item	Status	Item	Status	Item	Status
1964	Control building	Ucon (Oct)				
	Optical shelter position	Abandoned				
1965	Control building	Complete (Jan)				
	Cinetheodolite	Complete } (Aug)				
	Optical shelter	Present }				
1966	Cinetheodolite	Abandoned				
	SHIP WHEEL	Present (Aug)				
1971	Optical shelter	Removed } (Apr)	SHIP WHEEL } Present (Jul)		2 optical shelters	Present (Aug)
	SHIP WHEEL	Removed }	Optical shelter }			
	Facility abandoned (Aug)					
1972			SHIP WHEEL	Removed (Mar) Returned (Sep)		
1973					SHIP WHEEL 1	Present (Oct)
1977			SHIP WHEEL	Removed (Aug)		
1978			Optical shelter	Removed (Apr)	SHIP WHEEL 2	Present (Apr)
			Prob optical position	Removed (Aug)	SHIP WHEEL 1	Removed
					SHIP WHEEL 2	Operational } (Nov)
					Two-element telemetry van	Present }

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**Instrumentation Site 11**

LOCATION: 18.9 km northeast of Feodosiya

NEGATION DATE: October 1964

DATE FIRST SEEN: January 1965 (under construction)

CURRENT INSTRUMENTATION: One VT-2B-type interferometer; an ECM site; two building-mounted SHIP WHEELS; two building-mounted, two-element helix antennas; two building-mounted, two-element Cigar antennas; and an electronics dish mounted on an antisaircraft (AAA) gun carriage

33. (TSR) Instrumentation Site 11 (Figure 15A) is within the Feodosiya Naval Missile Support Facility [redacted] and consists of an interferometer; an ECM site; two buildings, one housing two SHIP WHEELS and the other (an L-shaped building) housing four telemetry antennas; and a small hardstand with an electronics dish mounted on an AAA gun carriage. The first section to be constructed was the ECM site (Figure 15B), which includes a control building and a long hardstand parallel to the coastline. The hardstand normally supports four TUB BRICK radars, but only two were present from March to September 1972 and from January to April 1978; from October 1976 until July 1977 none were present. The control building was enlarged to approximately twice its original size between mid-1970 and mid-1971. A WHIFF BRICK radar and three vehicles were positioned just outside the ECM site from May to August 1975, when they were removed to a distant hardstand. They were finally removed from the site in July 1977. Several vehicles were again seen near the ECM site from [redacted] but they could not be identified.

34. (TSR) The interferometer, which was begun in March 1972 and appeared to be complete by July 1973, was the second section to be constructed. It has a baseline of 180 meters with legs of [redacted]

35. (TSR) Construction of the building housing the two SHIP WHEELS was started in early 1974 and finished by July 1975 (Figure 15C). During the same time period, a SHIP WHEEL was also installed on the roof of the large L-shaped operations building at Primorskiy Torpedo Check-out Facility [redacted] (Figure 15D). The location suggests that the primary mission of this SHIP WHEEL is the support of ASW testing directed from Primorskiy Heliport [redacted] and Kirovskoye Airfield ([redacted]).

36. (TSR) The other major structure at Site 11 is the L-shaped operations building, which faces the ECM site and has four roof-mounted telemetry antennas (Figure 15B). Three of the telemetry antennas have been present since at least September 1972 (the building itself predates the earliest imagery) and the fourth, the two-element helix in mid-roof, has been present since October 1973. These telemetry antennas were first positively identified in October 1976. A new electronics position had been established near the shoreline by [redacted]. The position consists of a dish mounted on an AAA gun carriage, an electronics support van, and a possible observation tower (Figure 15E).

FIGURE 15B. ECM SITE AT FNTR INST

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### Instrumentation Site 12

LOCATION: 28.1 km east-northeast of Feodosiya

NEGATION DATE: Predates available imagery

DATE FIRST SEEN: June 1962

CURRENT INSTRUMENTATION: Two cinetheodolites, two optical shelters (one building mounted), and a van-mounted SHIP WHEEL

37. (TSR) In 1968 this site included a control building, two cinetheodolites connected by a building, and four hardstands (number 1 immediately to the south and number 2 immediately to the north of the cinetheodolites, and number 3 and number 4 farther north of the cinetheodolites; Figure 16).

38. (TSR) Hardstand 1 has been occupied continuously since 1968 by a van-mounted SHIP WHEEL. Hardstand 2 was occupied by a possible END TRAY radar in 1968. Since 1968, however, identification of this radar or of the various vehicles that have periodically occupied the hardstand has been precluded by the interpretability and scale of the imagery. Two trucks parked end to end occupied hardstand 3 until mid-1972 when they were realigned, slightly offset, and a small building was constructed nearby. In June 1968 a probable mast was seen beside one of the trucks, indicating that this area may be used for communications. Hardstand 4 was occupied by two trucks until its abandonment in October 1972.

39. (TSR) One optical shelter mounted on a bilevel building was present in March 1968. From June 1968 to March 1973 there may have been a second probable optical shelter on the lower level. A new ground-mounted optical shelter had been constructed beside the building-mounted optical shelter by at least November 1974.

40. (TSR) Two buildings and a lattice tower have been built near the control building. The first building, a two-story structure, was constructed between June 1968 and July 1972; the second was constructed between October 1972 and December 1973. Either or both may be control/operations buildings. The lattice tower had been erected by November 1974.

41. (TSR) On  the building-mounted optical shelter and one of the cinetheodolites were open and a HAZE helicopter was on the helipad. (The addition to the helipad was first seen in June 1978.)

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**Instrumentation Site 12A**

LOCATION: 30.0 km east of Feodosiya

NEGATION DATE: October 1966

DATE FIRST SEEN: March 1968

CURRENT INSTRUMENTATION: Two optical shelters (one building mounted, one ground mounted)

42. (TSR) Only optical equipment has been observed at Site 12A. There are both a building-mounted and a ground-mounted optical shelter (Figure 17), and the site does not appear to have changed since it was first seen. The building-mounted optical shelter somewhat resembles the one at Site 12.

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**Instrumentation Site 13**

LOCATION: 33.0 km east of Feodosiya

NEGATION DATE: July 1956

DATE FIRST SEEN: June 1962

CURRENT INSTRUMENTATION: One cinetheodolite, one probable optical position, and a van-mounted SHIP WHEEL

43. (TSR) This site has remained relatively unchanged over the years. Prior to August 1977 the site consisted of a cinetheodolite, a van-mounted SHIP WHEEL, and a standard octagonal optical shelter. After that date, however, the optical shelter was apparently removed and a square probable optical position, resembling the one seen previously at Instrumentation Site 10B, was constructed in almost the same place (Figure 18).

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**Instrumentation Site 14**

LOCATION: 35.2 km east of Feodosiya

NEGATION DATE: July 1956

DATE FIRST SEEN: July 1962

CURRENT INSTRUMENTATION: One cinetheodolite, two building-mounted optical shelters, and a building-mounted SHIP WHEEL

44. (TSR) A second control/operations building at Site 14 (Figure 19) was constructed east of the original control/operations building between September 1972 and January 1974; however, the SHIP WHEEL was not seen on the roof until August 1977. A van-mounted SHIP WHEEL that had previously supported the site was not removed until at least June 1978.

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### Instrumentation Site 15

LOCATION: 44.2 km east of Feodosiya

NEGATION DATE: Predates imagery

DATE FIRST SEEN: July 1956

CURRENT INSTRUMENTATION: One building-mounted SHIP WHEEL; two optical shelters; and two building-mounted, two-element telemetry antennas

45.  This site (Figure 20) was the range control center for the FNTR until 1966, 25X1 when a second center was established in the vicinity of Instrumentation Site 10.<sup>o</sup> A three-story control/operations building, south of the original control/operations building, was begun in August 1971 and finished by August 1972. The SHIP WHEEL (installed by July 1976 though possibly present as early as June 1975) and the two telemetry antennas (which were erected in June 1977) are on its roof.

46. (TSR) A variety of mobile electronics equipment has been housed on and around the three hardstands west of the newer control/operations building. A probable SHEET BEND was situated between the newer control/operations building and the easternmost hardstand (number 1) from at least February 1972 until August 1975. Hardstand 1 has been occupied by a single unidentified van almost continuously since July 1972. It is possible that this van and the two-element Cigar antenna van identified at the hardstand in April 1978 (possibly present as early as May 1977) were the same vehicle. A probable END TRAY was also on this hardstand for approximately four months in mid-1978. Identification of the equipment that has sporadically occupied hardstand 2 (immediately west of hardstand 1) has not been possible except for the probable two-element Cigar telemetry antenna van which was present from May to September 1977. A van-mounted SHIP WHEEL occupied hardstand 3 (west of and across the road from hardstand 2) from at least 1972 until mid-1976 and again from September 1977 until January 1978.

47. (TSR) The southernmost optical shelter was removed in September 1974 for as few as two or as many as nine months; no other changes in the optical shelters were observed.

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**Instrumentation Site 16**

LOCATION: 52.6 km east of Feodosiya

NEGATION DATE: July 1956

DATE FIRST SEEN: July 1962

CURRENT INSTRUMENTATION: One cinetheodolite, two building-mounted optical shelters, one possible optical shelter, and two possible optical positions

48. (TSR) Instrumentation Site 16 contains only optical tracking equipment. The two optical shelters are mounted on structures and attached to a common building, resembling the shelters at Instrumentation Site 14. A third, possible optical shelter and two possible optical positions lie between the beach and the cinetheodolite building (Figure 21).

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**Instrumentation Site 17**

LOCATION: 58.2 km east of Feodosiya

NEGATION DATE: July 1956

DATE FIRST SEEN: July 1962

CURRENT INSTRUMENTATION: An interferometer, one cinetheodolite, two optical shelters (one building mounted), and two building-mounted SHIP WHEELS

49. (TSR) In 1972 this site (Figure 22) included a cinetheodolite, a standard ground-mounted optical shelter, a control/operations building, and a van-mounted SHIP WHEEL. The interferometer and the second control/operations building were under construction at that time and were completed by late 1973. In November 1974 SHIP WHEELS were seen on both ends of the second control/operations building, and the building-mounted optical shelter was under construction. This second optical shelter did not appear to be complete until August 1977.

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**Instrumentation Site 18**

LOCATION: 65.6 km east of Feodosiya

NEGATION DATE: August 1962

DATE FIRST SEEN: August 1963

CURRENT INSTRUMENTATION: Three optical shelters, a probable telemetry antenna, and an instrumentation/observation tower

50. (TSR) The original control/operations building, two optical shelters, and a van-mounted SHIP WHEEL were present in 1972 (Figure 23). By late 1973 construction had begun on the second control/operations building, and one of the optical shelters had been removed and was not replaced until 1977. The second control/operations building was complete between mid-1975 and mid-1976 and has a possible radar/instrumentation position on its roof. Also during the 1975-1976 time period, the van-mounted SHIP WHEEL was removed from the site, a tall instrumentation/observation tower was erected beside the older control/operations building, and an optical shelter was seen where only a position had existed before.

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**Instrumentation Site 19**

LOCATION: 77.8 km east of Feodosiya

NEGATION DATE: August 1962

DATE FIRST SEEN: August 1963

CURRENT INSTRUMENTATION: One SHEET BEND, one possible SHEET BEND, and two possible optical/instrumentation positions

51. (TSR) The first SHEET BEND was present in 1971, and a second, possible SHEET BEND was added in November 1972. This site has none of the optical equipment usually associated with the FNTR, but it does have two positions which might be for optical instruments. One of these is at the instrumentation site and the other is in front of the lighthouse facility which is collocated with the instrumentation site (Figure 24).

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(TSR) All applicable KEYHOLE imagery through [redacted] was used in the preparation of this report. 25X1

MAPS OR CHARTS

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REQUIREMENT

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- (S) Comments and queries regarding this report are welcome. They may be directed to [redacted] Soviet Strategic Forces Division, Imagery Exploitation Group, NPIC [redacted] 25X1  
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- (S) Acknowledgments: the author wishes to thank [redacted] OIA, for their assistance and materials. 25X1

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