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imagery analysis report

Probable R&D Facility for
Over-The-Horizon Radar and/or
Ionospheric Radio Wave
Propagation, China (S)



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PROBABLE R&D FACILITY FOR OVER-THE-HORIZON RADAR AND/OR IONOSPHERIC RADIO WAVE PROPAGATION, CHINA (S)

INTRODUCTION

1. The Chinese are constructing two large, unique antennas that, upon completion, will probably be used for an experimental/prototype over-the-horizon (OTH) radar and/or for ionospheric research related to OTH radar development.¹ The antennas are approximately 240 nautical miles (nm) southwest of Beijing, China—in the northern part of the Wuhan Military Region (MR), at Xinxiang Radio Communications Transmitter Station Southeast [redacted]. One antenna is an arc-configured array, and the other is a linear-configured array. The design, orientation, and projected coverage of the antennas would provide the Chinese with the capability of tracking missiles from Shuangchengzi Missile Test Range Complex SSM [redacted], Wuzhai Missile Test Complex [redacted] and Jingyu Missile Test Complex SSM [redacted] to their respective impact areas. In addition, the Chinese would be capable of monitoring Soviet missile test centers at Tyuratam and Sary-Shagan (Figure 1). Included in this report are one annotated photograph, one line drawing, one location map, and one table. The information cutoff date is [redacted] (S/WN)

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DISCUSSION

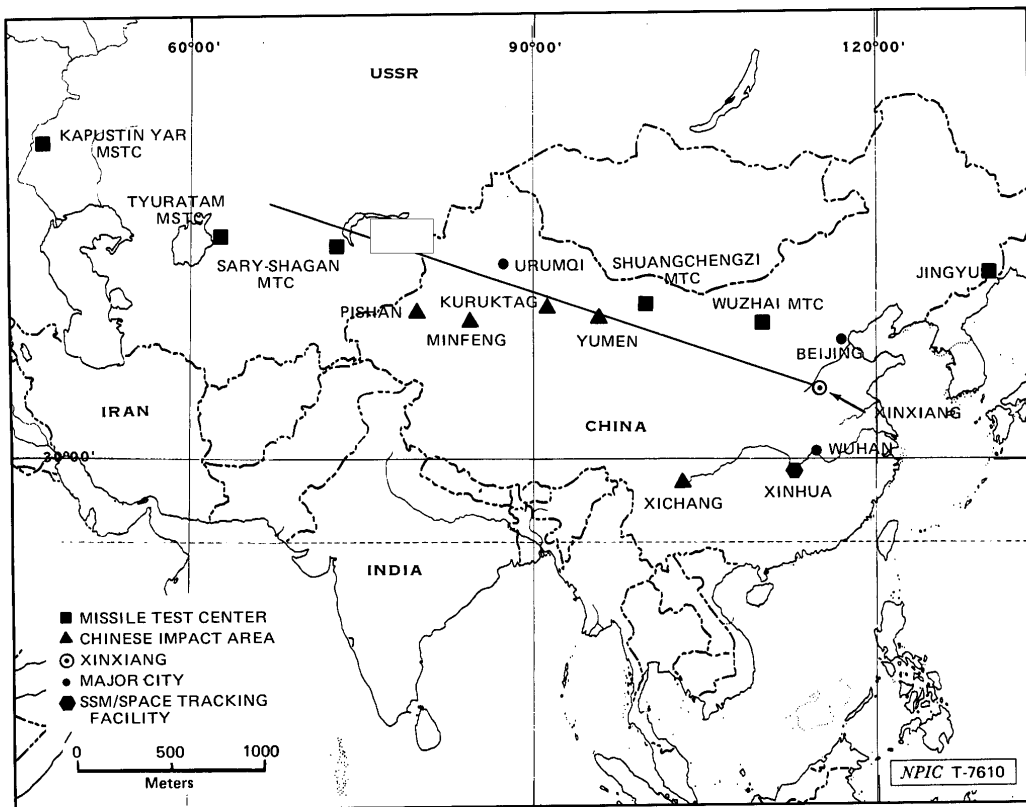
2. Xinxiang Radio Communications (Radcom) Transmitter Station Southeast consists of a wall-secured operations area containing the new antennas, a high-frequency (HF) antenna field, and a wall-secured support area. Both antennas are oriented [redacted]. The arc-configured antenna array, in the northern portion of the operations area, consists of eight [redacted] antenna masts—with a chord distance of [redacted]—and eight [redacted] antenna masts—with a chord distance of [redacted]. The shorter antenna masts are positioned [redacted] in front of the taller masts. This antenna also incorporates five sets of arc-configured, probable antenna wire supports and physically matched feed-lines which connect the antenna with a multistory transmitter/control building. (S/WN)

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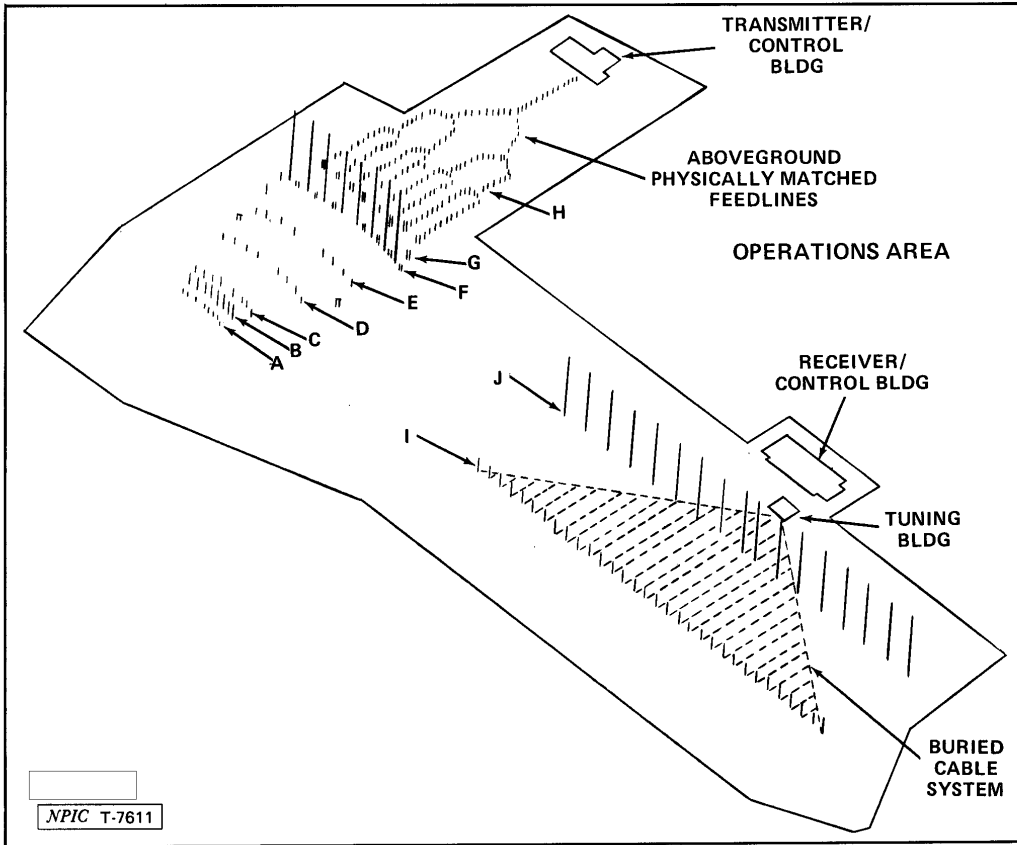


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FIGURE 1. ORIENTATION OF THE XINXIANG ANTENNAS

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FIGURE 2. ARC- AND LINEAR-CONFIGURED ANTENNA ARRAYS

Table 1.
Antennas at Xinxiang
(Items keyed to Figures 2 and 3)

Arc-Configured Antenna Array

Items	Height (Meters)	Pole Separation (Meters)	Chord Distance (Meters)	Distance Between Pole Rows (Meters)
Prob Antenna Wire Supports	A			A-B
Antenna Masts	B			B-C
Prob Antenna Wire Supports	C			C-D
Prob Antenna Wire Supports	D			D-E
Prob Antenna Wire Supports	E			E-F
Antenna Masts	F			F-G
Prob Antenna Wire Supports	G			
Feedline System	H			

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Linear-Configured Antenna Array

Items	Height (Meters)	Pole Separation (Meters)	Chord Distance (Meters)	Distance Between Pole Rows (Meters)
Antenna Masts	I			I-J
Antenna Masts	J			

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Single Rhombic Antennas

Array No	Major Axis (Meters)	Minor Axis (Meters)	Leg Length (Meters)	End Pole Height (Meters)	Side Pole Height (Meters)	Firing Azimuth (Degrees)	Tilt Angle (Degrees)
1							
2							

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This table in its entirety is classified SECRET/WNINTEL.

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3. The linear-configured antenna array, in the southern portion of the operations area, consists of seventeen [] antenna masts—with a chord distance of []—and thirty-two [] meter-high antenna masts—with a chord distance of []. The shorter masts are positioned [] meters in front of the taller masts. The linear-configured antenna array contains a buried cable system, rather than the heavy antenna feedline system associated with the arc-configured antenna array. This buried cable system connects the smaller masts to a small tuning building in front of a receiver/control building. The antennas and associated mensural data are presented in Figures 2 and 3 and Table 1. (S/WN)

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4. Supports for the aboveground, physically matched feedlines from the transmitter/control building to the arc-configured antenna array suggest a transmitting function for this antenna. Conversely, the absence of any aboveground feedline supports for the linear-configured antenna array indicates a receiver function for this antenna. Usually, antennas operating with the power necessary for long-range transmissions would not have the receiver adjacent to the transmitting antenna (bistatic array), unless they were designed to operate with a pulse signal. The orientation of the antennas on a [] azimuth and the heights and configuration of the antenna masts suggest that Xinxiang installation may be a prototype used in the research and development of an OTH radar detection system. Based upon data derived from OTH models being tested in the United States, one skip or refraction off the ionosphere would illuminate an area at a distance from 500 nm to 1,800 nm; a second skip would double this range.^{2,3} These distances would allow for monitoring of selected Soviet missile test centers. (S/WN)

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5. Alternately, the new antennas may be used to conduct HF signal propagation research against the ionosphere. This research would aid in the development of a more reliable, higher quality, and improved means of communications. []

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6. Construction of the new antennas was first detected in August 1978. Prior to that time, Xinxiang station consisted of a wall-secured, control/support area containing five buildings and the adjacent antenna field containing three single antennas and one double rhombic antenna. In early August 1978, the security wall for the operations area was constructed around an area containing one of the single rhombic antennas and the double rhombic antenna. Construction was also underway on the multistory transmitter/control building and on the single-story receiver/control building. By August 1979, these structures had been externally completed. During this time, the single and double rhombic antennas, on an azimuth of [] remained in place. However, by June 1980, they had been dismantled, and excavations for the linear-configured antenna array had been observed. By August 1982, the 17-mast, linear-configured antenna array and the eight-mast, arc-configured antenna array had been erected. The antennas appeared to be nearly complete on []. However, the apparent absence of insulators and active antenna wires indicated that the antennas may not have been operational. The actual stringing of the antenna wires may have been postponed until the arrival/installation of signals-processing equipment. (S/WN)

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7. In addition to the abovementioned antennas, Xinxiang radcom station retains two single, bi-directional, rhombic, HF communications antennas adjacent to the operations area (Figure 3). They are oriented [] northward toward the western edge of Beijing and southward toward Wuhan MR. (Possibly, they are also oriented toward the Xinhua SSM/Space Tracking Facility [] however, no corresponding antennas have been identified at Xinhua.) Xinxiang station also contains a support area with one multistory administration building, two barracks, one messhall, one probable quarters building, one vehicle shed, and two support buildings. (S/WN)

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IMAGERY ANALYST'S COMMENTS

8. The two antennas appeared not to be operational during the reporting period. The masts and feedline supports lacked the distinguishing wires and insulators required for a thorough analysis of these two antennas. However, based on antenna design and on the theory of antenna construction, Xinxiang station may function as a prototype OTH bistatic radar. This station may also be involved in experimental ionospheric testing for future communication systems. The orientation of the antennas and the location of the station provide the capability for OTH radar research and development and data collection from Soviet missile test centers. The Chinese are apparently attempting to enter the highly technical area of ionospheric refraction used in an OTH radar system. An OTH system, if deployed, would greatly improve China's long-range air surveillance/ballistic missile early warning capabilities. (S/WN)

REFERENCES

IMAGERY

All applicable satellite imagery acquired from August 1973 through [redacted] was used in the preparation of this report. (S/WN) 25X1

MAPS AND CHARTS

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DOCUMENTS

- 1. DIA. 141310Z, *First Identification of a Probable Over the Horizon Radar (OHD) in China (S)*, Dec 82 (SECRET/TK/NOFORN*)
- 2. MSN. "Antenna Tests Establish Ionospheric Limitations," Jun 82 (UNCLASSIFIED)
- 3. *Aviation Week & Space Technology*, "Backscatter Radar Unit Enters Production Phase," Aug 82 (UNCLASSIFIED)
- 4. CIA. [redacted] WI-WIS-77-21J, *Weapons Intelligence Summary*, 1 Feb 77 [redacted]

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5. [redacted] 25X1

*Extracted information is [redacted] 25X1

**Extracted information is classified [redacted] 25X1

***Extracted information is [redacted] 25X1

Comments and queries regarding this report are welcome. They may be directed to [redacted] 25X1
East Asian Forces Division, Imagery Exploitation Group, NPIC, [redacted] They may also 25X1
be directed to [redacted] Defense Intelligence Agency [redacted] 25X1

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