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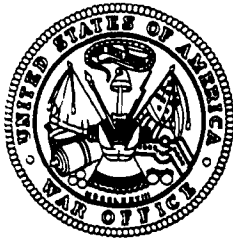
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Joint Photographic Intelligence Report

LOCATION AND DESCRIPTION OF
FLIM FLAM STATION NO 3
LAKE BALKHASH, USSR



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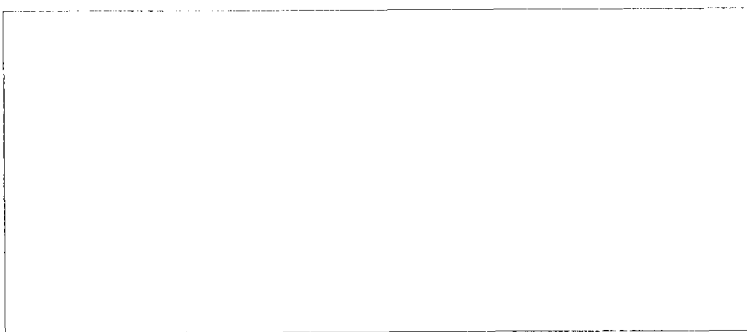
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JULY 1960

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LOCATION AND DESCRIPTION OF
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LAKE BALKHASH, USSR

PIC/JR-16/60

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SC-02753/60

PREFACE

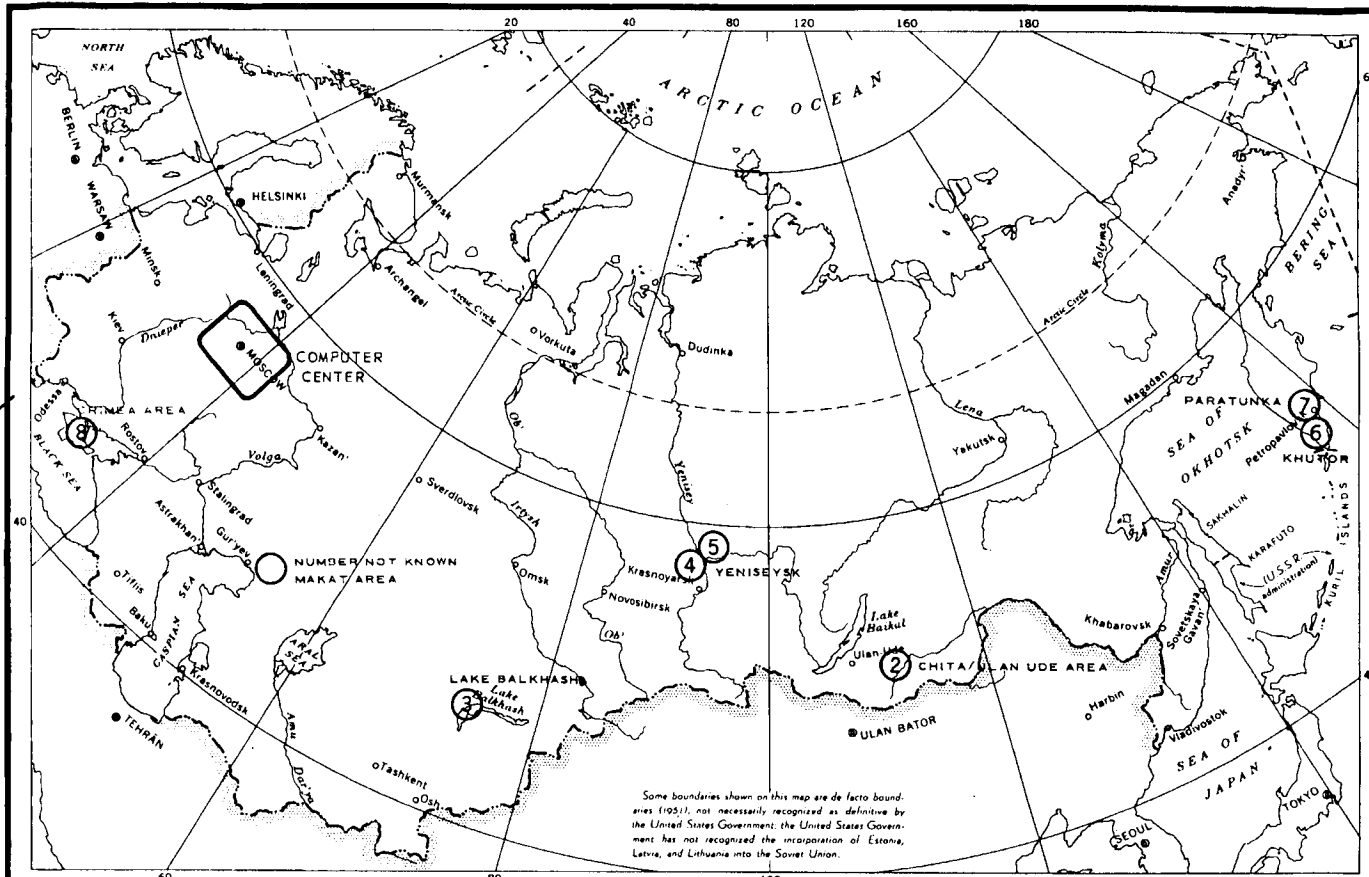
This joint report, based on communications and photographic intelligence, has been prepared by the Army, Navy, Central Intelligence Agency, and National Security Agency, in answer to requirements NSA [REDACTED]

[REDACTED] Navy DNI Project 443-60, and Army A-47-60, which requested a detailed analysis of the FLIM FLAM station located by [REDACTED] in the southwest Lake Balkhash area of the USSR. This report presents both [REDACTED] and photographic analysis of this installation.

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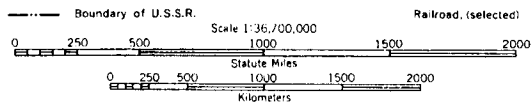
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UNION OF SOVIET SOCIALIST REPUBLICS

DERIVED LOCATIONS OF USSR FLIM FLAM STATIONS. The numbers are the Soviet designations. These stations report to the Computer Center in Moscow.



CIA/PIC G-3224

Base 120401 10-51

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SUMMARY

Correlation of [REDACTED] evidence indicates that FLIM FLAM Station No 3 is located south of Sary Shagan at approximately 45°53'N 73°37'E and that it probably consists of a phase-measuring station and numerous other electronics facilities, some of which cannot be definitely identified. Also present nearby are additional electronics facilities which cannot be positively associated with the FLIM FLAM station, although such an association is possible.

INTRODUCTION

Analysis of FLIM FLAM* tracking data obtained after [REDACTED] combined with other available [REDACTED] evidence, indicates that FLIM FLAM Station No 3 is probably located south of Sary Shagan (46°11'N 73°48'E) rather than at the previously reported tentative location of 46°40'N 74°00'E, approximately 50 nm (nautical miles) southwest of the city of Balkhash. The previous location had been based on analysis of radio direction finding (RDF) bearings and extrapolations for station location from orbital tracking data obtained from Sputnik III during [REDACTED]

[REDACTED] coverage of the northwestern shore of Lake Balkhash was obtained on [REDACTED]. Excellent photography of the area originally suggested by [REDACTED] analysis as the location of Station No 3 fails to reveal any electronic installations. However, in the area of Sary Shagan, on the western shore of the lake, fair to good photography shows an instrumentation complex at approximately the latitude and longitude predicted by the more recent [REDACTED] analysis as the best probable location for this station.

* FLIM FLAM is an arbitrary designation assigned to the binary data stream passed to Moscow by the extensive Soviet tracking network via high-frequency communications facilities.

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DETAILS FROM PHOTOGRAPHIC ANALYSIS

The instrumentation complex consists of two sites positioned 5 nm apart along a north-south line and connected by an improved road and a cable line. These two sites could operate together as one functional unit. For convenience of description, the northernmost site is labeled Site A and the southernmost, Site B. In addition, the photography shows two nearby communications stations, which together constitute the major base communications facilities for the entire Sary Shagan complex. These two stations, one for receiving and the other for transmitting, probably have a secondary role of providing the major portion of the communications for the instrumentation complex when it is in operation. Descriptions of the instrumentation sites and communications stations follow.

Site A

This site, located at approximately 45°53'N 73°37'E, consists of a phase-measuring station, a probable instrumentation area, four receiving rhombic antennas (not part of the base communications), a control area, and a support area (see Figure 1). The site appears complete and operational. There is no evidence of construction under way.

Of particular interest is the phase-measuring station. This station, road-served and enclosed by a circular fence, appears to consist of four instrumentation points, which are positioned so that two perpendicular baselines having a cruciform configuration are formed. The four points are situated on a level plain enclosed by a low mound. The baselines are oriented north-south and east-west. At each end of each baseline there is an instrumentation point; the instruments themselves, however, cannot be identified. At the intersection of the baselines is a bunker. The road serving the station enters through the fence and encircles the instrumentation points between the fence and the mound. A cable line leads from the bunker southwest through the control area and terminates at the probable instrumentation area 3,100 feet away. Unlike other Soviet phase-measuring sta-

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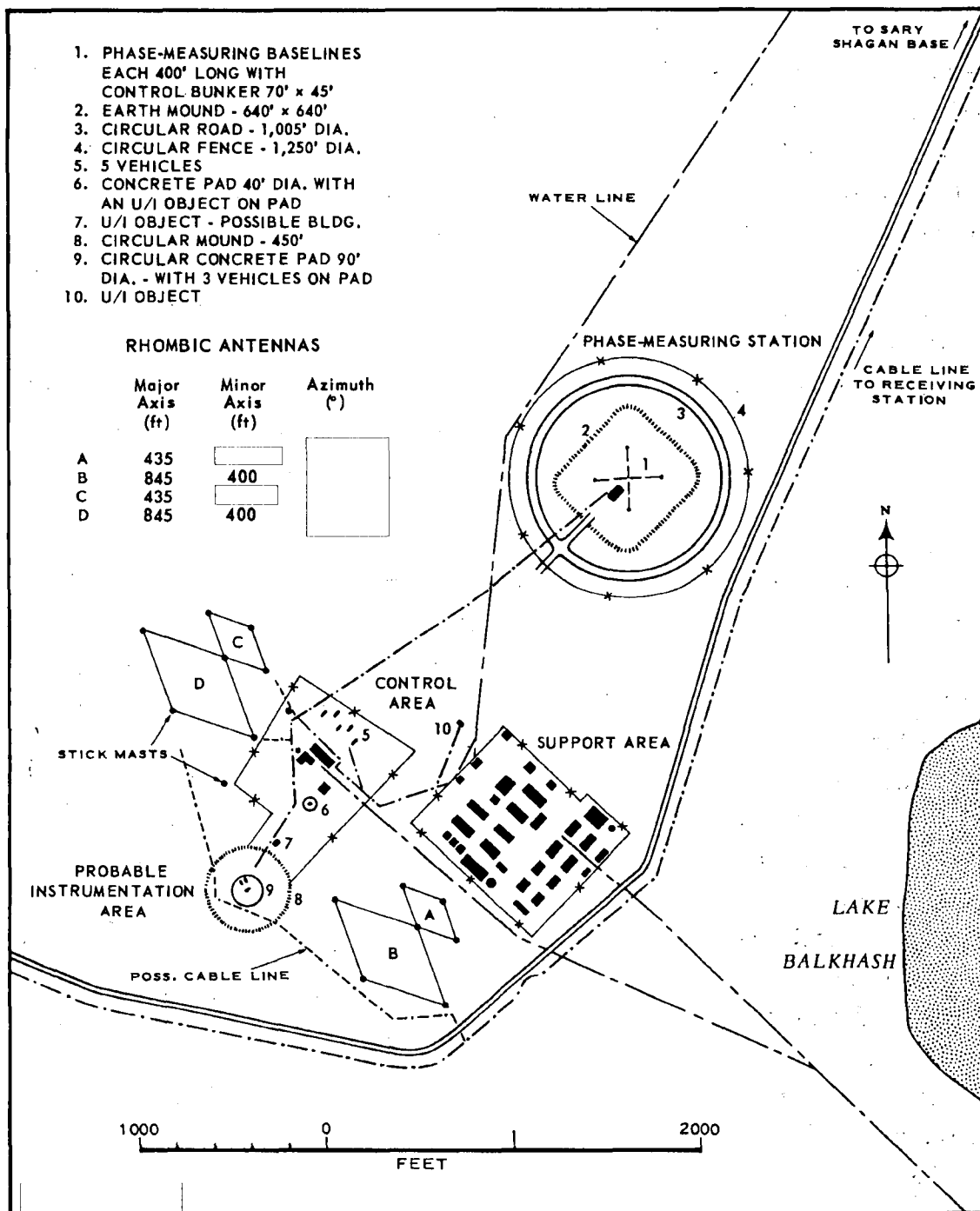


FIGURE 1. SITE A. Significant features of this site are the phase-measuring station, the probable instrumentation area, and the control area.

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tions, Site A contains no domed instruments. All heretofore noted missile-associated tracking stations utilizing phase measuring are similar in configuration. The three associated with Tyura Tam 2/ and the seven associated with Kapustin Yar 3/ include, in addition to a phase-measuring device, another associated tracking facility consisting of two to five 20-foot-diameter domed instruments. In contrast to the other stations, Site A has a road encircling the phase-measuring device, probably for calibration, and also has rhombic antennas and two circular concrete pads probably containing instruments.

The probable instrumentation area consists of a circular concrete pad encircled by a low mound; three vehicles are positioned on the pad. No instruments can be identified in the area. The probability that this area has an instrumentation function is suggested by the presence of the vehicles on the pad and the cable line from the phase-measuring station and the control area. A possible cable also leads from this instrumentation area to the cable line along the all-weather road.

The four rhombic antennas (items A, B, C, and D) are arranged in two pairs, one pair on each side of the control area; both pairs are oriented toward Moscow. Each pair consists of a day and a night rhombic which are separated and arranged for diversity reception. Rhombic data are given with Figure 1. Stick masts which may support other types of antennas are also located in the vicinity, but obliquity precludes further analysis of these masts.

The control area, located just north of the probable instrumentation area, contains three buildings, a small circular concrete pad with an unidentified object on it, five vehicles in a staggered line, and other unidentified objects. This area is probably the control point for the phase-measuring station, the probable instrumentation area, the rhombic antennas, and the unidentified objects.

The support area, located approximately midway between the phase-measuring station and the probable instrumentation area, lies adjacent to

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the road connecting Sites A and B. The area, which is partially fenced, contains at least 30 buildings of various types and a standpipe. An athletic field is adjacent. A water line leads from the shore of Lake Balkhash through the support area and then toward the main portion of the Sary Shagan Support Base. The area appears to have no unusual features.

Site B

This site, located at 45°48'N 73°35'E, contains a tall self-supporting lattice tower, a radar operations area, and a support area (see Figure 2). Construction under way at the time of photography involved minor expansion and the completion of permanent facilities and could have been finished in a relatively short time; the site appears to be operational.

The outstanding feature of this site is the fenced self-supporting lattice tower, approximately 450 feet high. An object is barely visible atop the tower, but the poor resolution of the photography precludes its identification. A possible cable leads from an unidentified object located along the northern portion of the tower fence toward the support area, but the cable scar becomes obliterated by heavy trackage near the support area. A ditch from the unidentified object leads to the radar operations area. From this area another ditch leads to the support area and apparently terminates at the standpipe.

The radar operations area is fenced and contains a TOKEN-type radar with its accompanying vehicles, at least four buildings of varying sizes, a circular tank under construction, and two semiburied structures. A ditch leads from the two structures to another semiburied structure 1,300 feet northeast of the area. This latter structure was apparently being fenced at the time of the photography. A graded road runs from the radar operations area to the main road serving Site B.

The support area contains at least 22 buildings of varying sizes (one under construction), a standpipe, two earth-mounded tanks, a motor pool, and other facilities. About 1,200 feet west of the area is a small building.

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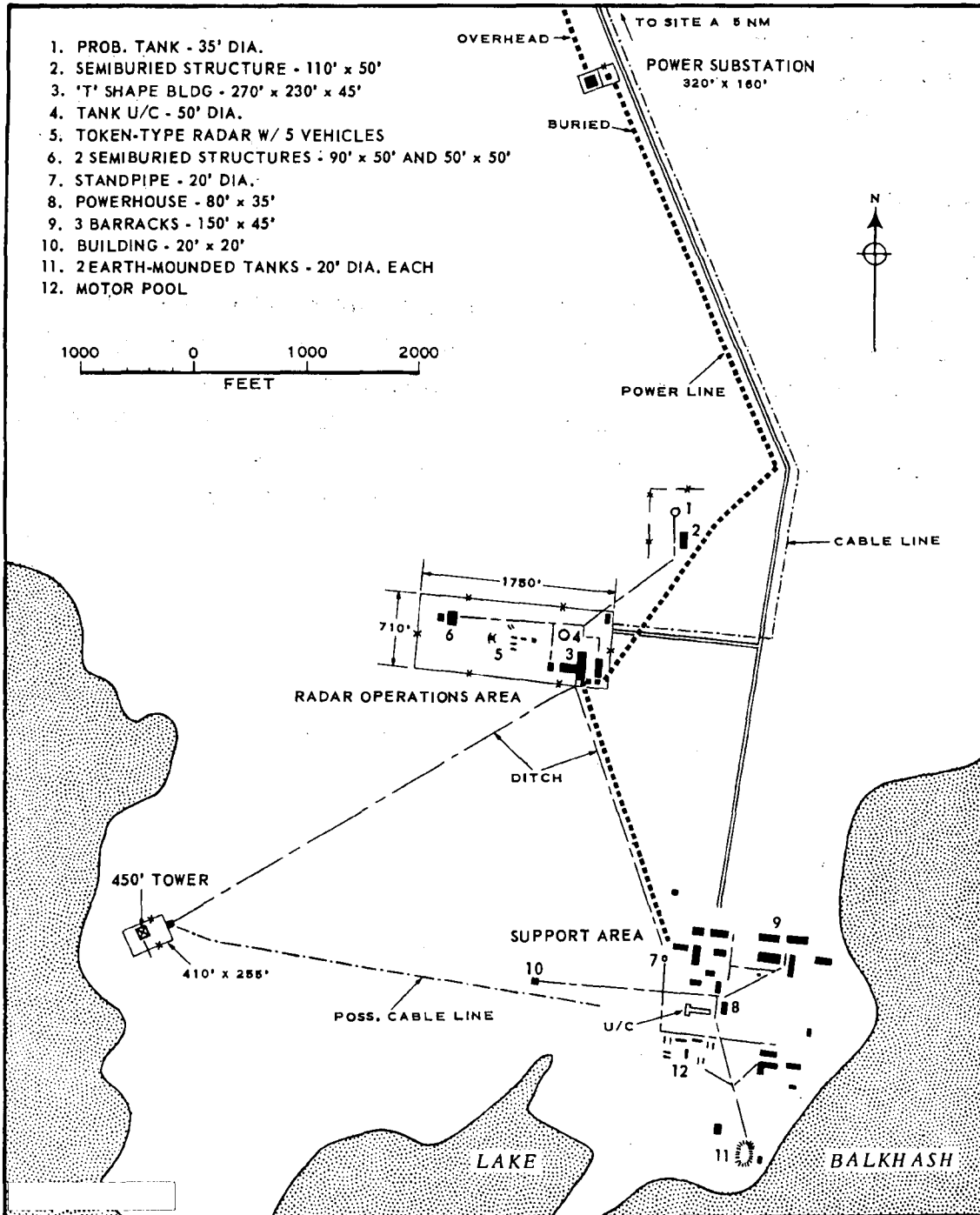


FIGURE 2. SITE B. The outstanding feature of this site is the 450-foot self-supporting lattice tower.

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A ditch from this building leads into the support area and on to the two earth-mounded tanks; the ditch is covered within the support area. One nm north of Site B and adjacent to the road serving the site is a power substation. An overhead power line leads from the Sary Shagan Support Base to the substation. The power line then leads underground into the radar operations area. There is some indication that the line continues into the support area.

Sary Shagan Base Communications

The Sary Shagan base communications receiving station is located at 45°55'N 73°38'E, adjacent to the north side of Site A (see Figure 3). The station is fenced and includes eight single rhombics arranged in four pairs (a day and night rhombic in each pair). The pairs are arranged for diversity reception. Two pairs (items 3, 4, 9, and 10) are oriented toward Moscow and the other two (items 1, 2, 11, and 12) toward Kapustin Yar. Ten other stick masts located within the station are arranged in pairs and probably support horizontal antennas (items 5, 6, 7, 8, 13, 14, and 15). A cable line leads from this station south along the improved road and terminates in the radar operations area at Site B. Antenna data are given with Figure 3.

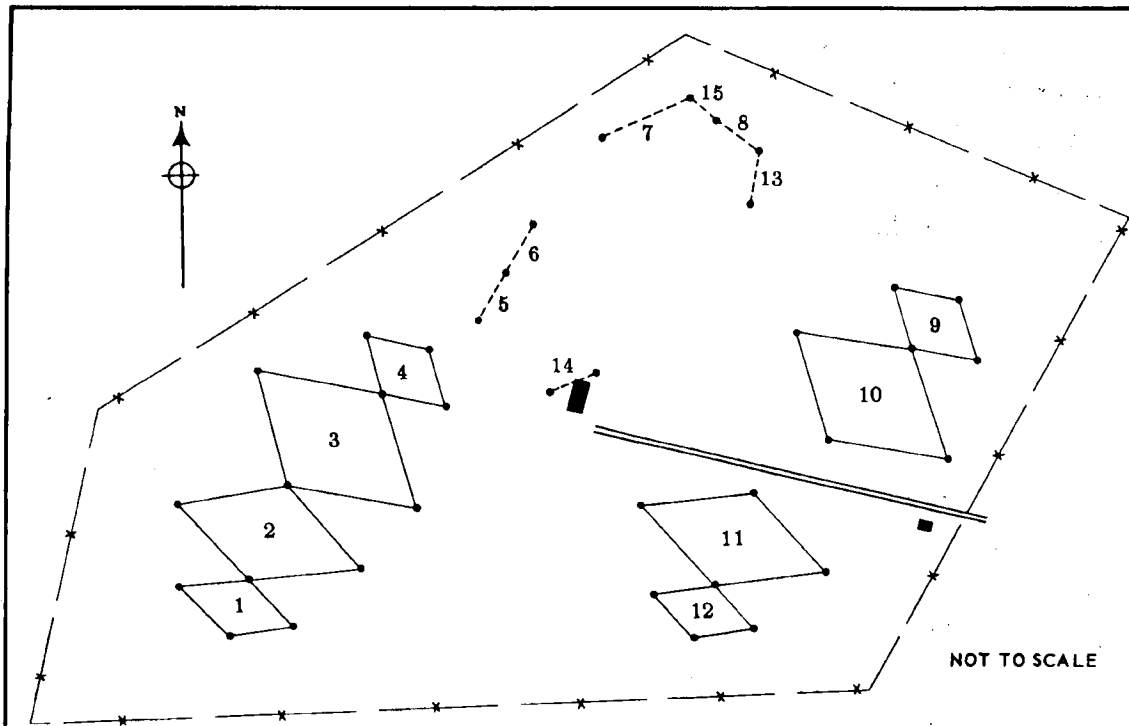
The base communications transmitting station is located at 46°03'N 73°36'E, 9 nm north of Site A (see Figure 4). The station, measuring 2,600 by 2,400 feet, is fenced and contains four double rhombics (items 1, 2, 3, and 4) arranged in two pairs (one day and one night rhombic in each pair); the orientations of the rhombics are almost identical with those in the receiving station. Twenty other stick masts, which probably support horizontal antennas (items 5-20), are also apparent. Antenna data are given with Figure 4.

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RHOMBIC DATA

| No | Major Axis (ft) | Minor Axis (ft) | Leg (ft) | End Pole Height (ft) | Tilt Angle (° ') | Azimuth (°) | Design Frequency (mc) |
|----|-----------------|-----------------|----------|----------------------|----------------------|----------------------|-----------------------|
| 1 | 440 | 295 | 240 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 2 | 685 | 325 | 380 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 3 | 790 | 375 | 440 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 4 | 405 | 195 | 220 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 9 | 405 | 195 | 225 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 10 | 790 | 375 | 435 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 11 | 685 | 325 | 380 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 12 | 440 | 205 | 240 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

STICK MAST ANTENNA DATA

| No | Distance Between Stick Masts (ft) | Height (ft) | Azimuth (°) | No | Distance Between Stick Masts (ft) | Height (ft) | Azimuth (°) |
|----|-----------------------------------|----------------------|----------------------|----|-----------------------------------|-------------|----------------------|
| 5 | 160 | <input type="text"/> | <input type="text"/> | 13 | 165 | 65 | <input type="text"/> |
| 6 | 160 | 90 | <input type="text"/> | 14 | 130 | 65 | <input type="text"/> |
| 7 | 275 | 50 | <input type="text"/> | 15 | 90 | 50 | <input type="text"/> |
| 8 | 200 | 65 | <input type="text"/> | | | | |

FIGURE 3. COMMUNICATIONS RECEIVING STATION. The rhombic antennas at this station are oriented toward Moscow and Kapustin Yar.

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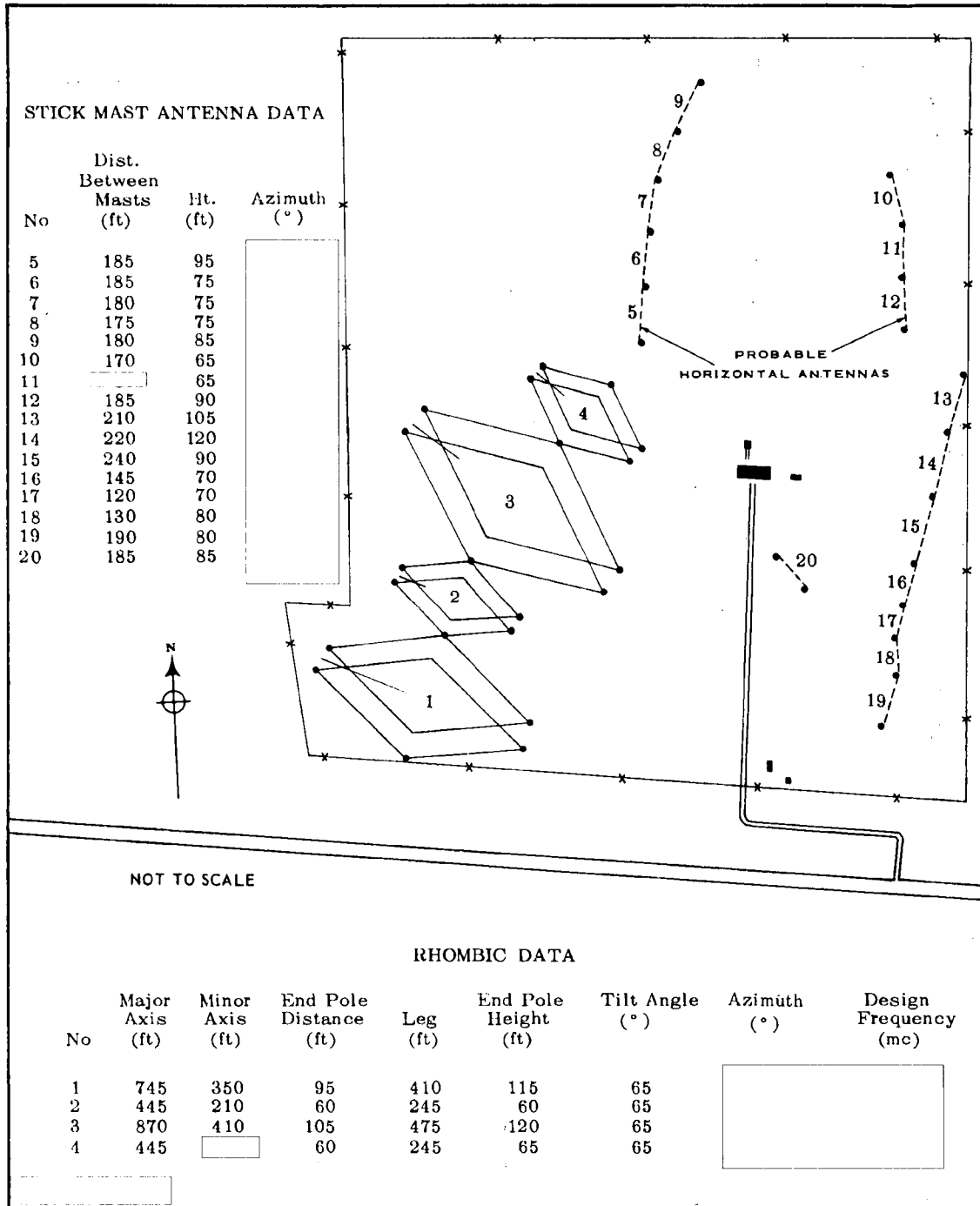


FIGURE 4. COMMUNICATIONS TRANSMITTING STATION. This station and the receiving station probably provide the major portion of the communications for the instrumentation complex (Sites A and B).

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CONCLUSIONS

1. The FLIM FLAM angular data are probably derived from the phase-measuring station.
2. The north-south/east-west orientation of the phase-measuring station suggests that the station may have been designed for tracking space vehicles, rather than missiles.
3. The TOKEN-type radar at Site B is probably not the ranging radar.
4. The circular concrete pad at Site A is possibly the location of the FLIM FLAM ranging apparatus, which may or may not have been present at the time of photography.
5. The rhombic antennas at Site A are possibly used for the reception of time signals transmitted from the Moscow area.
6. It cannot be determined whether the 450-foot lattice tower at Site B is part of the FLIM FLAM station.
7. The rhombic antenna arrays in the transmitting and receiving stations which are oriented toward Moscow are probably used for high-frequency communications between the FLIM FLAM station and Moscow.

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SOURCES

PHOTO DATA:

MAP DATA:

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