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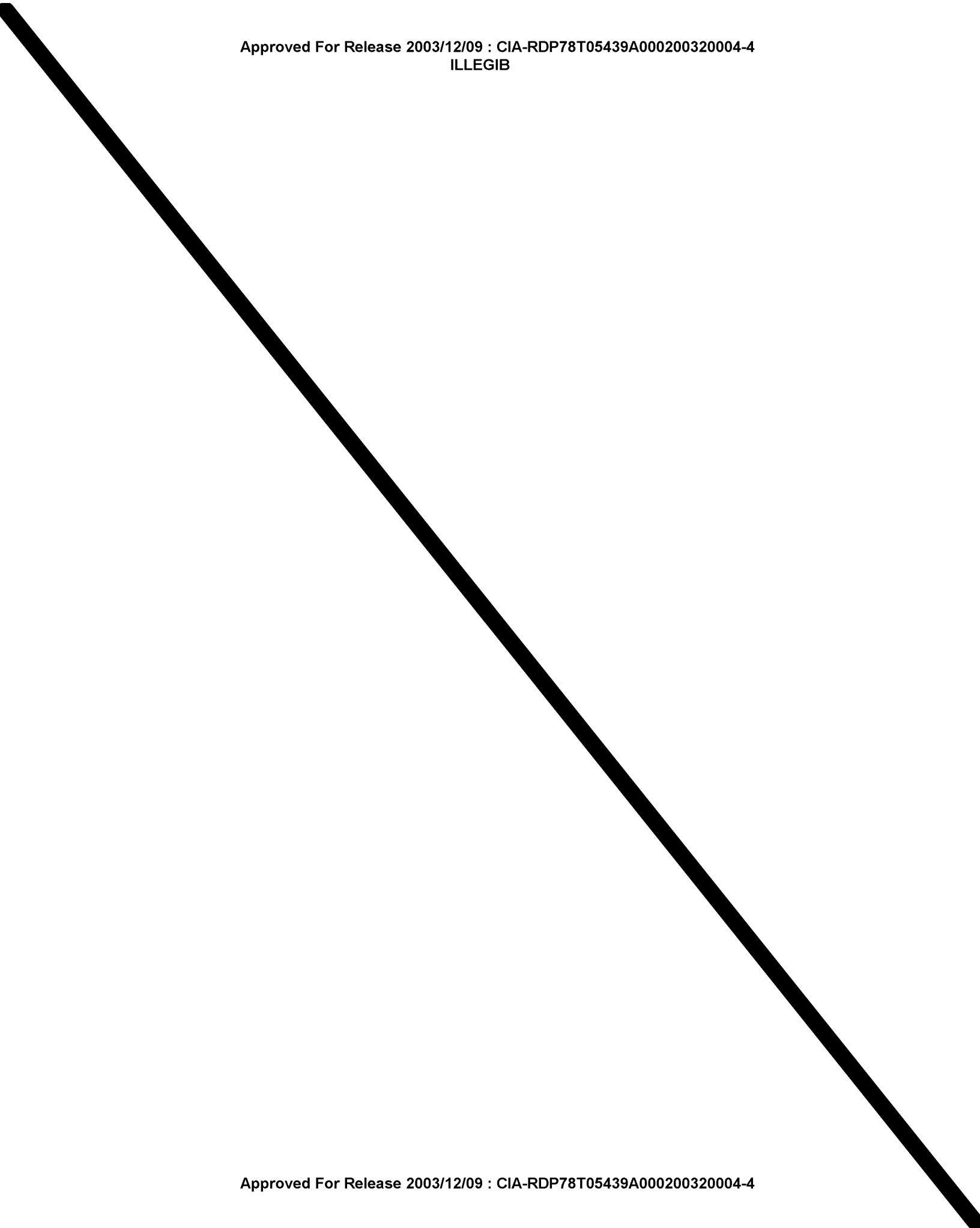

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RADIO FACILITIES NEAR KUN-MING, CHINA

A radio broadcast station, a radio communication station, and a THICK EIGHT direction-finding station have been identified on [redacted] near Kun-ming, China (Figure 1).

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RADIO BROADCAST STATION

The radio broadcast station (24-53N 102-29E), about 15.5 nm southwest of Kun-ming, is a medium- to high-frequency facility composed of three support areas serving groups of curtain antenna arrays, two directional vertical radiators, a horizontal dipole, and an omnidirectional vertical radiator (Figure 2).

Each curtain array consists of an active curtain backed by a passive curtain, suspended from pole frame towers or self-supporting towers. There are 10 groups of pole frame towers and 5 groups of self-supporting towers, arranged according to height, spacing, and similarity of construction (Figure 2, Items Ca through Co). The directional vertical radiators (Figure 2, Items DVa and DVb) are guyed towers backed by parallel rows of towers which act as passive reflectors; antenna DVa also has buried ground radials. The horizontal dipole (Figure 2, Item HD) is suspended between guyed towers, and the omnidirectional vertical radiator (Figure 2, Item OV) is a self-supporting tower. Dimensions and operational characteristics of the antennas are given in Table 1.

Each support area contains a transmitter building, various other electronic facilities or housing and maintenance buildings, and one or two cooling ponds. Underground transmission lines connect the transmitter buildings with the antennas, but specific connections between all buildings and antennas cannot be traced.

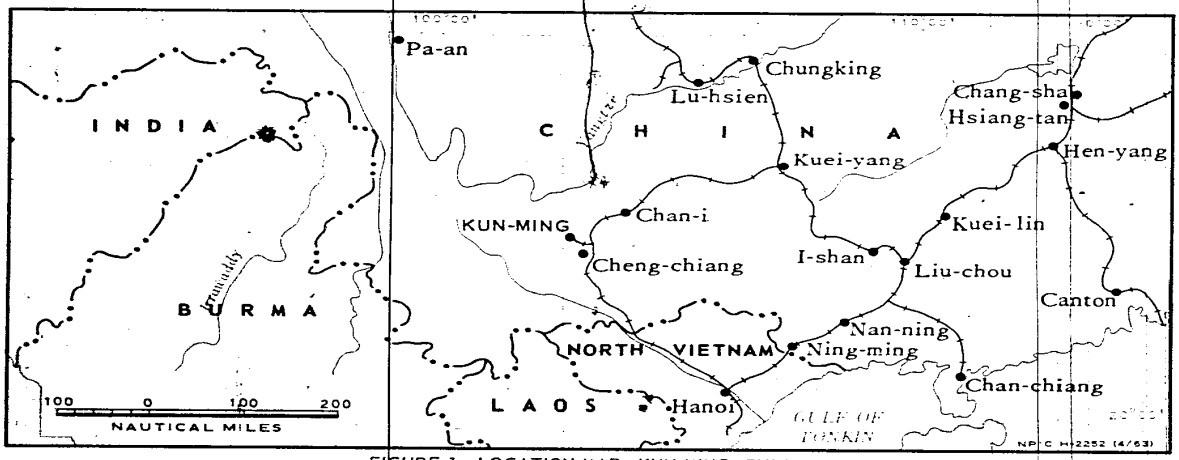

FIGURE 1. LOCATION MAP, KUN-MING, CHINA.

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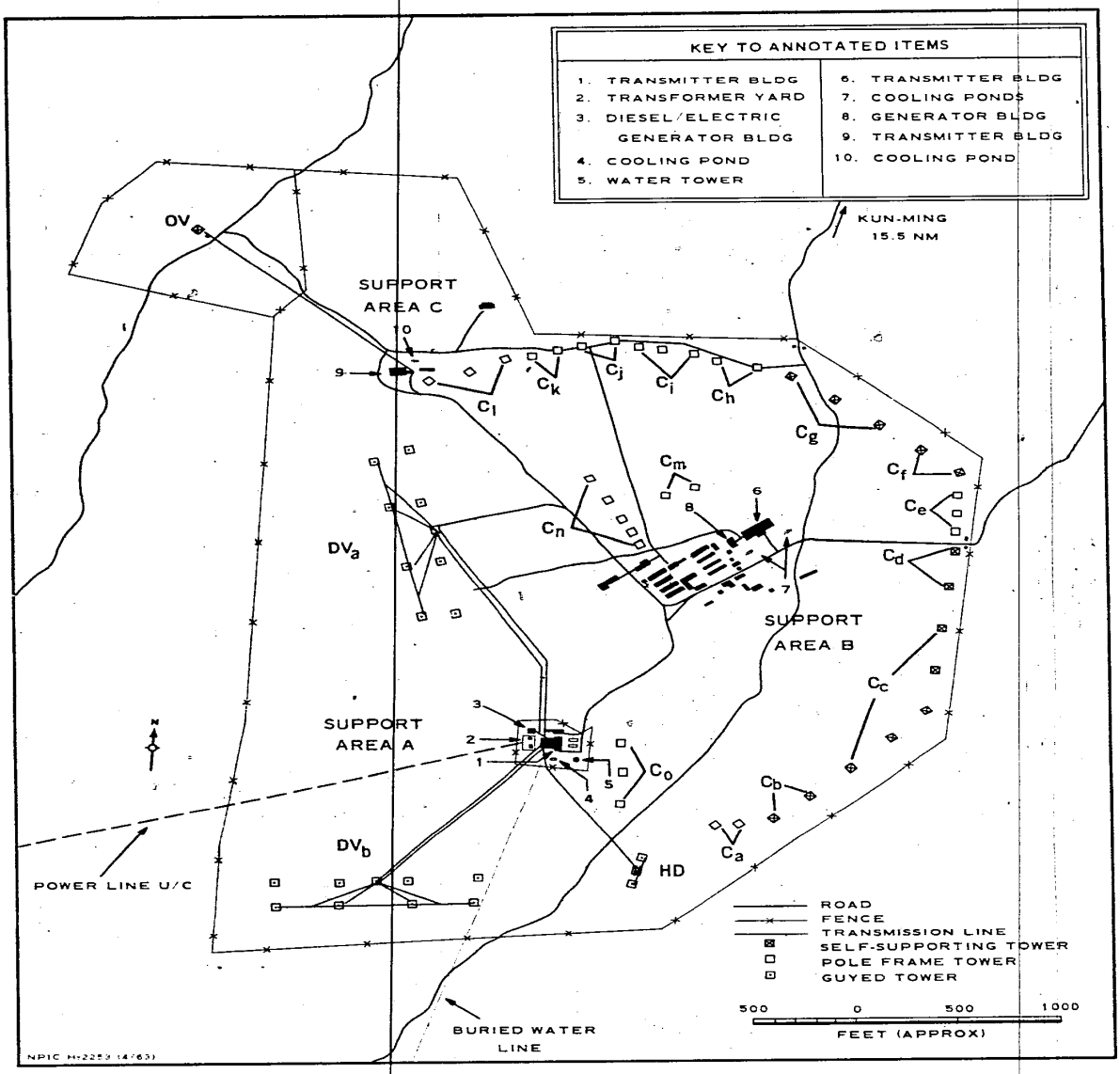

FIGURE 2. RADIO BROADCAST STATION.

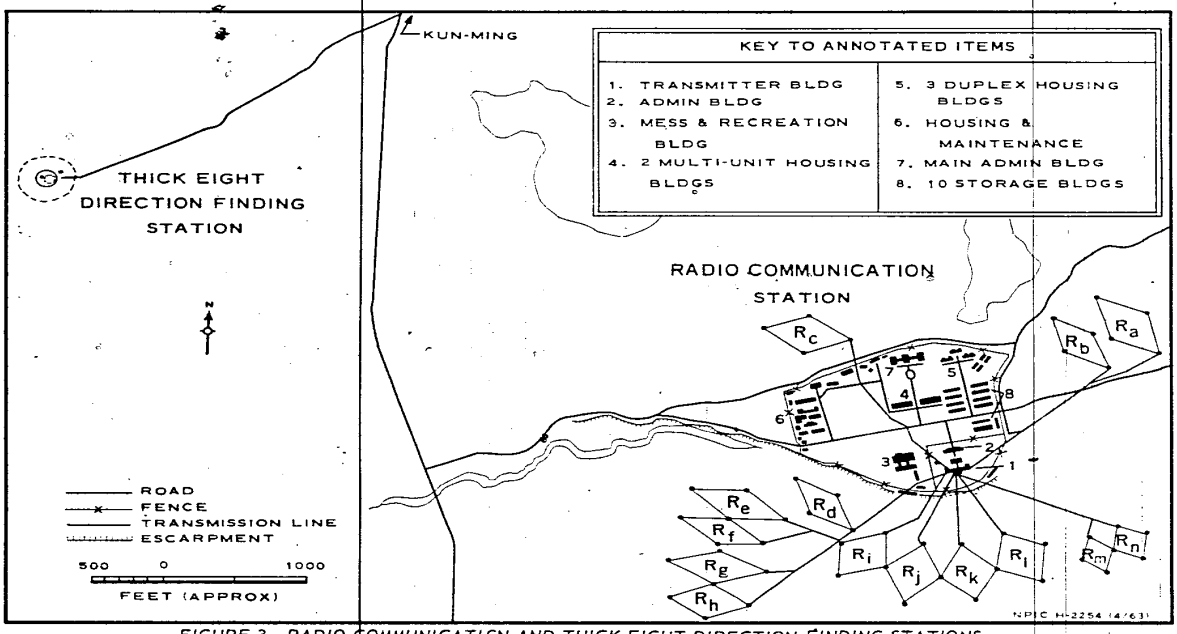

FIGURE 3. RADIO COMMUNICATION AND THICK EIGHT DIRECTION-FINDING STATIONS.

The transmitter building in Support Area A (Figure 2, Item 1) measures 100 by 85 feet and serves antennas DVa, DVb, HD, and Co. The area also has a diesel-electric generator building, 25 by 25 feet; a transformer yard, 75 by 50 feet; a cooling pond, 50 by 20 feet; and a water tower of undetermined dimensions. Support Area B, the largest at the station, has a transmitter building (Figure 2, Item 6) which measures 155 by 55 feet and appears to serve antennas Ca through Cg. Other facilities in the area include a generator building, 50 by 30 feet; two cooling ponds, each 50 by 20 feet; and numerous housing and maintenance buildings. The transmitter building in Support Area C (Figure 2, Item 9) measures 120 by 40 feet and apparently serves antennas OV and Ch through Cn; the cooling pond in the area is 20 by [redacted]

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RADIO COMMUNICATION STATION

The radio communication station (24-56N 102-48E), about 8.5 nm southeast of Kun-ming, consists of 14 rhombic antennas, a transmitter building measuring 180 by 30 feet, and numerous support buildings (Figure 3). The large number of storage and barracks-type support buildings suggests that, for logistical purposes, the station is located at a military garrison or storage area. The station could be a point-to-point broadcast-relay facility, but the long-range rhombic antennas (Table 2), oriented to most points of the compass, and the THICK EIGHT direction-finding station nearby indicate that it has a radio communication function. It is also doubtful that more than one radio broadcast station would be located in the Kun-ming area.

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THICK EIGHT DIRECTION-FINDING STATION

The THICK EIGHT direction-finding station (24-56N 102-46E), about 1.3 nm west-northwest of the radio communication station, is a high-frequency facility associated with the communication station. A typical THICK EIGHT installation (Figure 3), it consists of 8 cage antennas, each [redacted] feet in diameter and [redacted] feet high, arranged in a circle [redacted] feet in diameter. The screen grid ground system is 140 feet in diameter, and the radial cable ground system is 420 feet in diameter. Frequency ranges are estimated variously at 3.5 to 20 and 3.5 to 28 megacycles.

TABLE 1. ANTENNAS, RADIO BROADCAST STATION

Item Figure 2	Distance Between Towers/Poles (ft)	Tower/Pole Height (ft)	Azimuth Direction of Principal Radiation		Fundamental Frequency**
			Forward Azimuth (°)	Back Azimuth (°)	
Curtain Antenna Arrays			25X1D		
Ca	120	120*	[redacted]		20.5 mc
Cb	235	160			9.2 mc
Cc	260	220			9.5 mc
Cd	240	180			10.2 mc
Ce	120	120			20.5 mc
Cf	240	160			10.2 mc
Cg	260	220			9.5 mc
Ch	175	120			14.1 mc
Ci	120	90			20.5 mc
Cj	125	75			19.7 mc
Ck	120	90*			20.5 mc
Cl	190	100*			12.9 mc
Cm	150	60			16.4 mc
Cn	160	60			15.4 mc
Co	180	120			13.6 mc
Directional Vertical Radiators					
DVa	340	335			700 kc
DVb	310	290			810 kc
Horizontal Dipole					
HD	150	380			700 kc
Omnidirectional Vertical Radiator					
OV		490			595 kc

* Approximate

**Estimated for curtain arrays based on wavelengths derived from the distance between the towers/poles, less one-quarter wavelength at each end of the antenna to account for suspension and insulation. It was assumed that the curtain arrays consist of half-wave dipoles and are in the HF range.

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TABLE 2. RHOMBIC ANTENNAS, RADIO COMMUNICATION STATION

Item Figure 3	Major Axis (ft)	Minor Axis (ft)	Pole Height (ft)	Side Length (ft)	Computed Tilt Angle (°)	Azimuth of Maximum Radiation (°)	Wavelengths Per Leg Length*	Fundamental Frequency (mc)
Ra	750	375	105				4	9.8
Rb	650	256	85	345			5	14.2
Rc	660	375	85	375			3	7.9
Rd	650	255	85	345			6	17.0
Re	775	295	85	405			6	14.5
Rf	625	255	85	340			6	19.4
Rg	775	320	105	410			4	9.6
Rh	585	330	85	330			3	8.9
Ri	540	415	105	350			2	5.6
Rj	540	415	105	350			2	5.6
Rk	540	415	105	350			2	5.6
Rl	540	415	105	350			2	5.6
Rm	375	260	85	230			2	8.5
Rn	375	260	85	230			2	8.5

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REFERENCES

PHOTOGRAPHY

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MAPS OR CHARTS

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SAC. US Air Target Chart, Series 200, Sheet 0496-17A, 1st ed, Sep 59 (SECRET)

DOCUMENTS

REQUIREMENT

NSA. A053 R-25-62

NPIC PROJECT

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