

NIE 13-2-62  
25 April 1962  
~~TS 0037330~~

NATIONAL INTELLIGENCE ESTIMATE

Number 13-2-62

Chinese Communist Advanced  
Weapons Capabilities

CIA HISTORICAL REVIEW PROGRAM  
RELEASE AS SANITIZED

*Submitted by the*  
DIRECTOR OF CENTRAL INTELLIGENCE

*Concurred in by the*  
UNITED STATES INTELLIGENCE BOARD

*As indicated overleaf*  
25 APRIL 1962

RELEASE IN PART  
EXEMPTIONS: (b)(1)  
(b)(3)  
DATE: AUG 2001

N? 374

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## TABLE OF CONTENTS

	<i>Page</i>
THE PROBLEM . . . . .	1
FOREWORD . . . . .	1
CONCLUSIONS . . . . .	2
DISCUSSION . . . . .	5
I. CHINESE COMMUNIST OBJECTIVES . . . . .	5
II. EVIDENCE ON ADVANCED WEAPONS PROGRAMS . . . . .	5
Missile Test Range Activities . . . . .	5
III. FACTORS BEARING ON CHINESE COMMUNIST DEVELOPMENT, PRODUCTION, AND DEPLOYMENT OF ADVANCED WEAPONS . . . . .	9
Soviet Assistance . . . . .	9
Chinese Communist Scientific Resources . . . . .	9
Missile Research . . . . .	10
Aeronautical Research . . . . .	11
Nuclear Technology . . . . .	11
Economic Factors . . . . .	12
Basic Industrial Skills . . . . .	13
Operations, Maintenance, and Training . . . . .	14
IV. PRODUCTION AND DEPLOYMENT OF ADVANCED WEAPONS . . . . .	15
Naval Missiles . . . . .	16
Air Defense Missiles . . . . .	16
Air-to-Surface Missiles . . . . .	17
Space Programs . . . . .	17
Advanced Aircraft Delivery Systems . . . . .	17

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## CHINESE COMMUNIST ADVANCED WEAPONS CAPABILITIES

### THE PROBLEM

To estimate the capabilities of Communist China with respect to the development and production of guided missiles and nuclear weapons over the next few years.

### FOREWORD

In analyzing the evidence on Chinese programs for advanced weapons, we have encountered numerous important gaps and apparent inconsistencies. The evidence available to us clearly proves the existence of programs in the missile and nuclear fields, but it is insufficient to permit us to reconstruct these programs in the fashion which is possible for various comparable Soviet programs. Similarly, while we have been able to make some judgments about Chinese progress and the time periods during which further accomplishments are likely, we cannot reach firm conclusions on these matters, or predict the year in which deployment of a complete weapons system will probably begin.

In these circumstances, we have considered it useful to present in this estimate a fairly full picture, not only of the evidence and the major problems which it leaves unresolved, but also of the basic scientific and economic resources available to the Chinese Communists for advanced weapons programs. We have sought in this way to establish a base of information to which, in succeeding estimates on these problems, we can subsequently apply new information and further analysis. We expect that, as these Chinese programs

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(that any substantial missile production is under way. We believe that China has no present operational capabilities with missiles, aside from limited deployment of surface-to-air and possibly air-to-air missiles, all procured from the USSR. (*Paras. 42-55*))

5. We have evidence to indicate that the Chinese Communists have mined and concentrated a significant amount of uranium ore and that, with Soviet help, they were constructing a plant for recovery of uranium in 1960. This strongly indicates an intent to produce fissionable materials, but we have no evidence of such production in Communist China. Assuming an accelerated and highly successful program for the production of plutonium since 1960, the Chinese Communists could detonate an all-plutonium device in early 1963. However, in the light of all the evidence, it is unlikely that the Chinese will meet such a schedule. We believe that the first Chinese test would probably be delayed beyond 1963, perhaps by as much as several years.<sup>1 2</sup> (*Paras. 35-38*)

6. Within a year after exploding their first device, the Chinese Communists could probably produce a few fairly crude fission weapons. Another two years or more would be

<sup>1</sup> For the position of the Assistant Chief of Naval Operations (Intelligence), Department of the Navy, see his footnote to paragraph 38.

<sup>2</sup> The Assistant Chief of Staff, Intelligence, USAF, agrees that the Chinese Communists have accorded a very high priority to the development of nuclear weapons (paragraph 12); and that they probably regard an advanced weapons capability as a political and military necessity if they are to achieve the international status they seek (paragraph 11). He also concurs in the judgment that no drastic cutback in Chinese efforts to develop prototype nuclear weapons has occurred, and that sufficient economic and scientific resources are available to the Chinese Communists to support a few, very high priority projects (paragraph 44). He believes the large-scale withdrawal of Soviet technical aid in mid-1960 undoubtedly has retarded the progress of the Chinese Communists weapons program in certain areas. Nevertheless, he considers it likely that sufficient technical and industrial resources are available and are being funneled into the Chinese Communist atomic energy program on a sufficient priority to permit them to detonate an all-plutonium implosion nuclear device by 1963. If the Chinese detonate their first device in the next year or so, it would be within their capabilities to develop and test a thermonuclear device before the end of the decade. Such a device probably would be extremely heavy, and would represent only a token TN capability. Even such a limited TN capability would go far to establish China as a great power and would have profound psychological impact, particularly in Asia.

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required to develop fission weapons for missile warheads. If the first test should occur in the next year or so, we estimate that toward the last part of the decade the Chinese Communists could have a variety of fission weapons to support many of their military requirements, but only in limited numbers. (*Para. 39*)

7. We believe that the Chinese would at some point in their program endeavor to produce U-235, but we have no evidence of U-235 production at present. Latest evidence indicates that a facility at Lanchou suspected of being a gaseous diffusion plant has not been completed. If this plant is in fact intended to be a gaseous diffusion facility, it probably could not produce weapon grade U-235 before 1965. The Chinese could probably test an all U-235 or composited device within a year after the activation of a production facility. (*Para. 40*)

8. Within the next few years, the Chinese could begin to deploy short-range (up to 350 n.m.) surface-to-surface missiles with nonnuclear warheads. Deployment of medium-range missiles almost certainly is keyed to the availability of nuclear warheads; such plans probably look to the second half of the decade. In the absence of Soviet aid, the Chinese will probably not undertake to produce surface-to-air missile systems, at least until the mid-1960's. (*Paras. 53-59, 63-64*)<sup>3</sup>

9. In more advanced fields—submarine missile systems, IRBMs, ICBMs, antimissile systems, and thermonuclear weapons—China is not likely to achieve independent capabilities during the 1960s. (*Paras. 41, 60, 62*)<sup>4</sup>

<sup>3</sup>The Assistant Chief of Staff, Intelligence, USAF, believes that in view of the accuracy (CEP), system cost, the availability of tactical air forces and other considerations, deployment of 350 n.m. surface-to-surface missiles by the Chinese Communists will almost certainly be dependent upon the availability of nuclear warheads. Therefore, while he agrees that the Chinese within the next few years could begin to deploy short-range surface-to-surface missiles with nonnuclear warheads, he does not agree that they are *likely* to do so until nuclear warheads are available.

<sup>4</sup>For the view of the Assistant Chief of Staff, Intelligence, USAF, regarding Chinese Communist thermonuclear weapons capabilities, see his footnote to paragraph 5.

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## DISCUSSION

### I. CHINESE COMMUNIST OBJECTIVES

10. The Chinese Communist leaders are determined to establish China as a major world power and as a leader of the Communist Bloc of at least coequal status with the Soviet Union. They regard the Far East as China's particular preserve and are determined to be dominant in that area. In general, Peiping would probably prefer to achieve its objectives by political and economic forms of struggle, rather than by direct employment of Chinese forces. However, Communist China has no compunctions about openly using its military forces to extend its control when it can do so with little or no risk.

11. Peiping calculates that the achievement of even limited capabilities with advanced weapons would go far to establish China as a great power and would have a profound psychological impact, particularly in the countries of Asia. Moreover, in areas where Communist-supported forces confront those supported by the West, the Chinese Communist leaders almost certainly consider intervention by one side or the other as an ever-present possibility. They probably reason that possession of advanced weapons would support more aggressive Chinese policies in these areas and would tend to deter strong Western responses. Thus, they probably regard an advanced weapons capability both as a political and a military necessity if they are to achieve the international status they seek.

### II. EVIDENCE ON ADVANCED WEAPONS PROGRAMS

12. The Chinese Communist drive to acquire a nuclear capability apparently antedated their efforts in the guided missile field

by several years. Since the early 1950's, Communist China has accorded a very high priority to the development and production of nuclear weapons. There is no firm evidence that the Chinese Communists have undertaken to develop or produce bomber aircraft. We believe that Chinese Communist commitment to a large-scale program for development of guided missile capabilities probably dates from the late 1950's.

#### Missile Test Range Activities

13. Recent photography has confirmed the existence of a guided missile test center in northwest China; its location in this area had been indicated by a considerable body of evidence accumulated over the past two or three years. The evidence indicates that construction of range facilities could have begun in 1957 and almost certainly was well under way in 1958.

14. The rangehead is located about 50 n.m. northeast of Shuang-cheng-tzu on a rail spur off the Urumchi-Lanchou rail line. It is a large, instrumented area, dispersed along a 30-mile stretch of the Etsin River, comprising a surface-to-surface missile (SSM) launch area, a surface-to-air missile (SAM) launch area, a large main support base containing 185 buildings, a smaller support base servicing the SSM and SAM complexes, a large SSM and SAM assembly area, two revetted storage areas, and several smaller housing and support areas. About 40 n.m. southwest of the main support base is a large new airfield with a 13,500 foot concrete runway. Near the airfield are two large communication centers. (See Figures following page 7)

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15. The three SSM launch complexes have been arbitrarily designated "A," "B," and "C." Complex "A" appears to be completed and operational. This complex contains two large concrete pads suitable for firing ballistic missiles served by paved loop-access roads, a control bunker, and a drive-through check-out building. [REDACTED]

[REDACTED] firings have occurred, probably within the recent past. [REDACTED]

[REDACTED] The two pads under construction at launch complex "B" strongly resemble those at complex "A." Excavation for the pads has been completed, but construction appears to have been suspended. Launch complex "C" has one pad and a drive-through building. Construction work appears to be nearly complete, and the launch pad could have been used. However, the operational status of this complex is undetermined.

16. The ranges of the missile systems to be tested from these facilities cannot be determined from the photography. The launch sites are oriented towards the west, and the down-range instrumentation is also in that direction. The desert terrain to the west would allow the firing of surface-to-surface missiles to ranges of up to 1,100 n.m. within Chinese territory. The pads, associated revetments, and support areas in launch complex "A" closely resemble Soviet facilities at Kapustin Yar used for 700, and probably for 1,100 n.m. ballistic missiles. Launch complex "C" bears some resemblance to other Soviet launching facilities at Kapustin Yar; the type of missile associated with the Soviet complex cannot be ascertained.

17. The surface-to-air missile launch area resembles SA-2 launch facilities at Kapustin Yar, although the two SA-2 sites at Shuang-cheng-tzu are more widely separated and the instrumented area is larger. Construction

work has been completed on the two sites, but only one is equipped with radar and launchers. One of the launchers has been fully revetted, and partial revetments have been provided around a second. [REDACTED]

[REDACTED] The support facilities, also built on the Soviet model, appear completed.

18. It appears that Shuang-cheng-tzu airfield was originally intended to provide logistic support for the missile range, fighter protection, and possibly to conduct air-to-surface missiles (ASM) and air-to-air missiles (AAM) programs. [REDACTED]

[REDACTED] The airfield apparently was designed to handle a large number of aircraft, including the heaviest types, but the limited fuel storage facilities identified do not appear commensurate with a facility of this size. Possible loading hardstands and associated buildings could be intended to serve an ASM program. [REDACTED]

[REDACTED] It is also possible that these facilities relate to AAM training. [REDACTED]

19. The size of the missile rangehead at Shuang-cheng-tzu connotes a very large program. The facilities available at the test center are sufficient to provide a considerable physical capability to carry out extensive missile research and development programs and some troop training. Housing appears adequate for at least 20,000 people. [REDACTED]

[REDACTED] But, some of the com-



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pleted facilities do not appear to have been used for firings. [REDACTED]

[REDACTED] incomplete logistic facilities also characterize the Shuang-cheng-tzu airfield. These facts suggest that what was originally a large, ambitious program for test firing SSMs, SAMs, and possibly ASMs and AAMs has been cut back.

20. Reliable evidence indicates that the Soviets agreed to give a variety of missiles to the Chinese Communists including, we believe, surface-to-surface, surface-to-air, air-to-surface, and air-to-air types.<sup>5</sup> Evidence on activity at the Shuang-cheng-tzu range, indicates that firings of surface-to-surface ballistic missiles have occurred. The ranges to which missiles have been fired cannot be established with confidence, but our evidence suggests that firings have been conducted to ranges of approximately 150 n.m., 300 n.m., 600-700 n.m., and possibly 1,100 n.m. Although there is no direct evidence we believe that firings of surface-to-air missiles have also occurred.

<sup>5</sup> For estimated characteristics of Soviet missiles, see Table, page 18.

There are no indications that air-to-surface or air-to-air missiles have been tested.

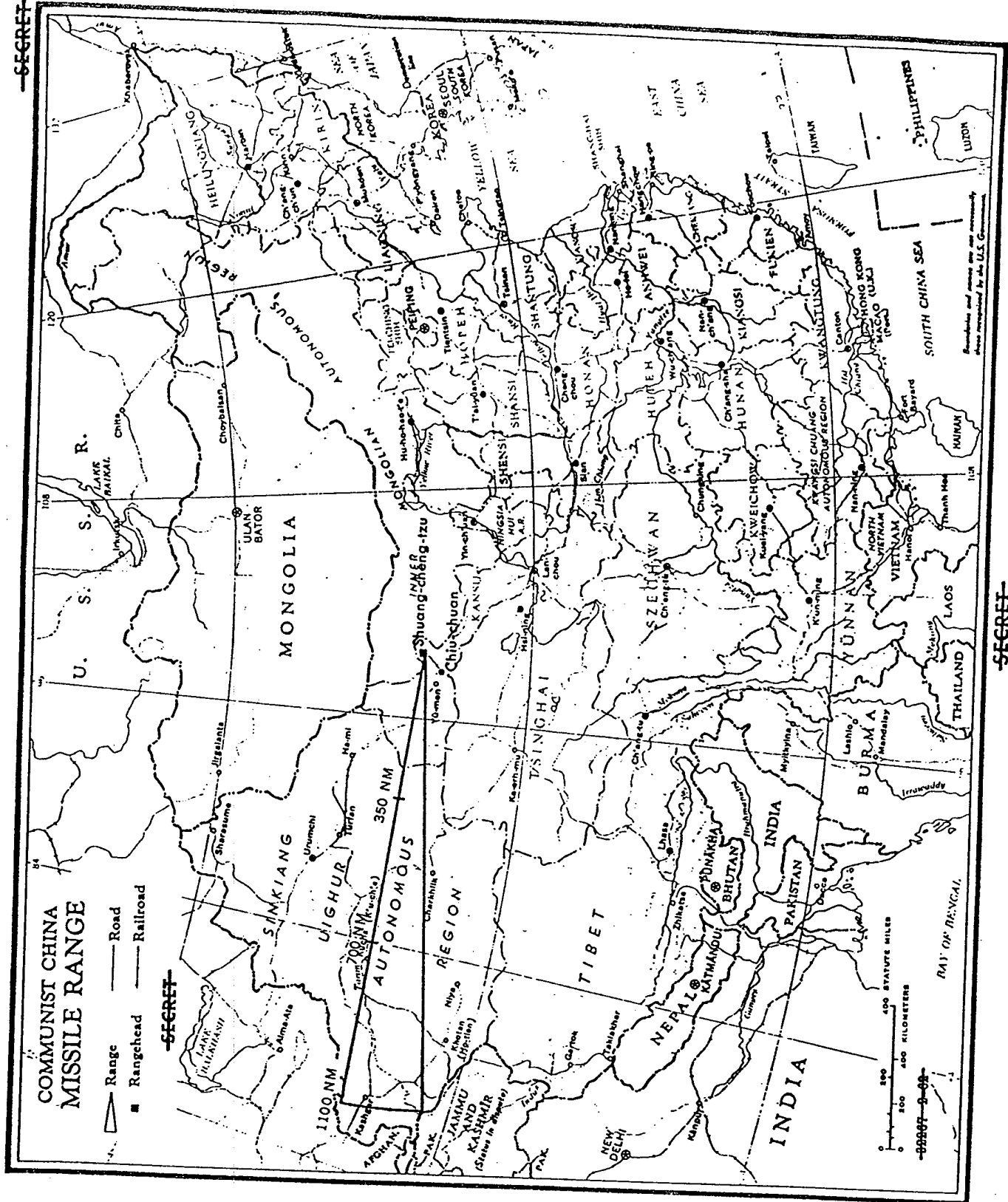
21. Evidence on the timing and extent of range activity is inconclusive. [REDACTED]

[REDACTED] available evidence, together with our estimate of the time required for construction and checkout of range facilities, leads us to believe that test firing of missiles on the range probably began in late 1959 or early 1960. Available evidence provides no basis for determining firing rates.

22. The Soviets probably provided technical assistance at least through mid-1960, and the early firings certainly involved missiles of Soviet manufacture. We believe that the range continues to be operational. The activity to date has probably been primarily for the purpose of range orientation, practice firing of Soviet missiles, and possibly test firing of Chinese copies. Some concurrent operational training, at least with surface-to-air missiles, may also have occurred.

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**COMMUNIST CHINA  
MISSILE RANGE**

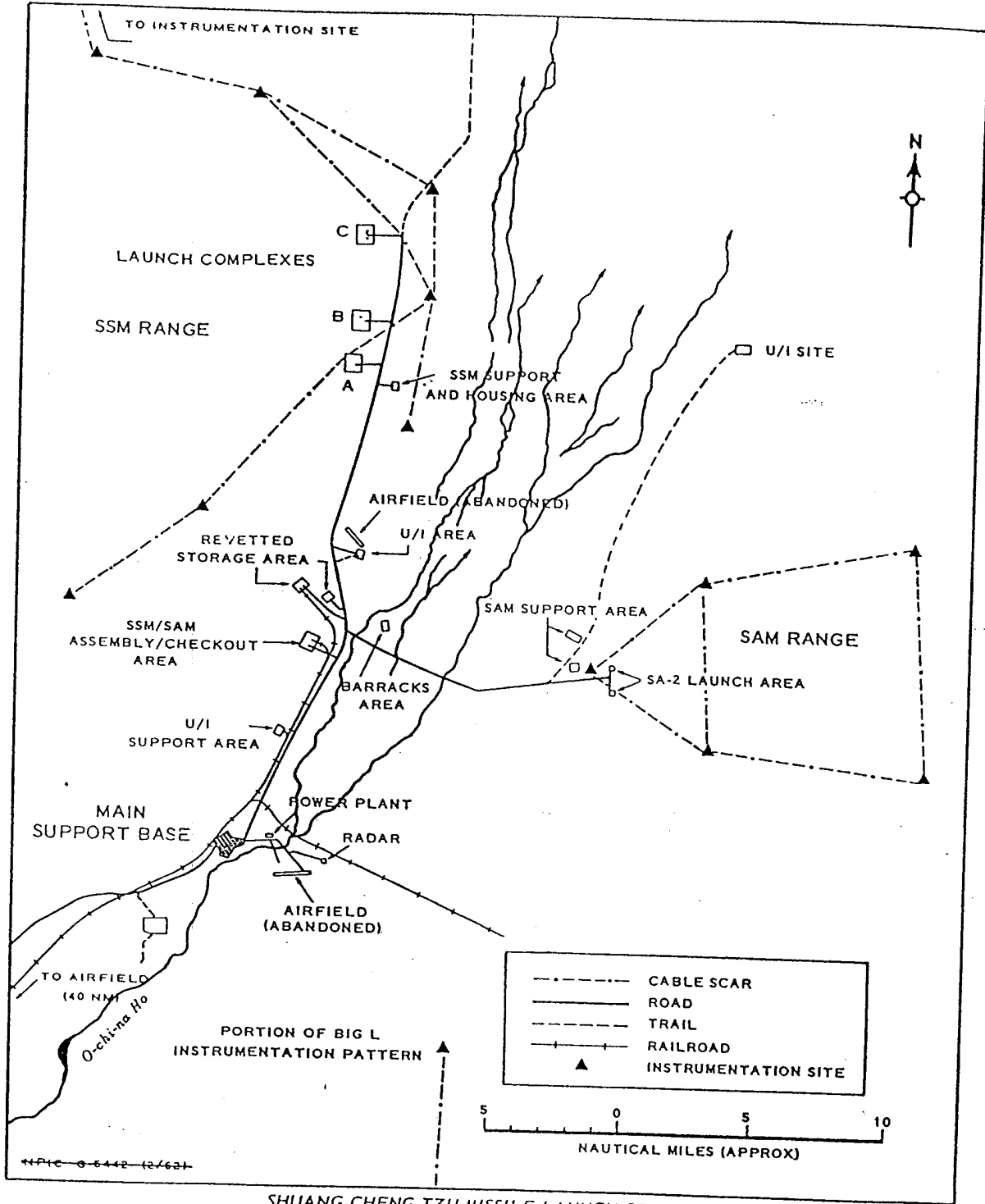
- Range
- Rangehead
- Road
- Railroad

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0 200 400 STATUTE MILES  
0 200 400 KILOMETERS

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Reproduced and revised from data furnished by the U.S. Government

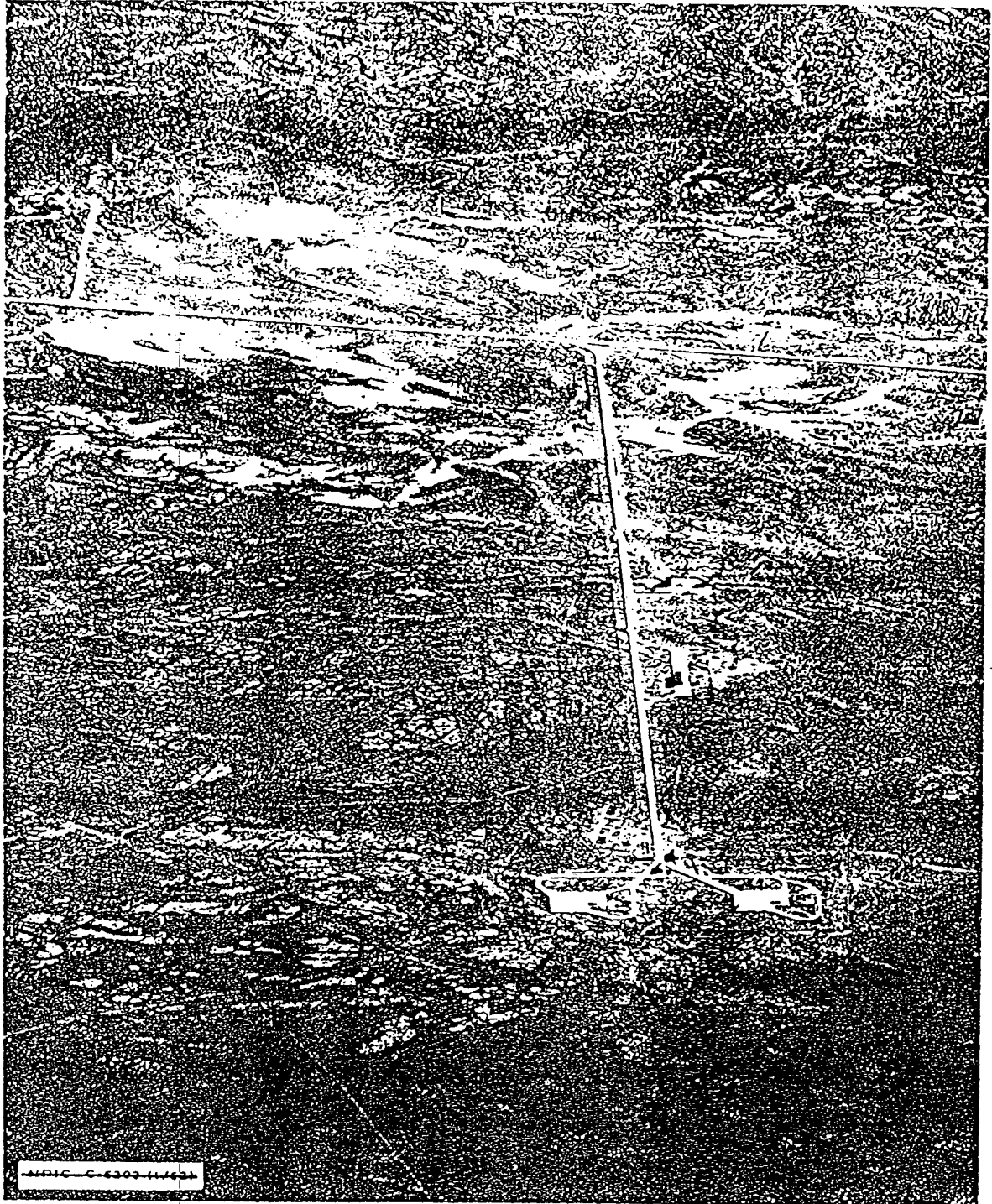


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SHUANG-CHENG-TZU MISSILE LAUNCH CENTER.

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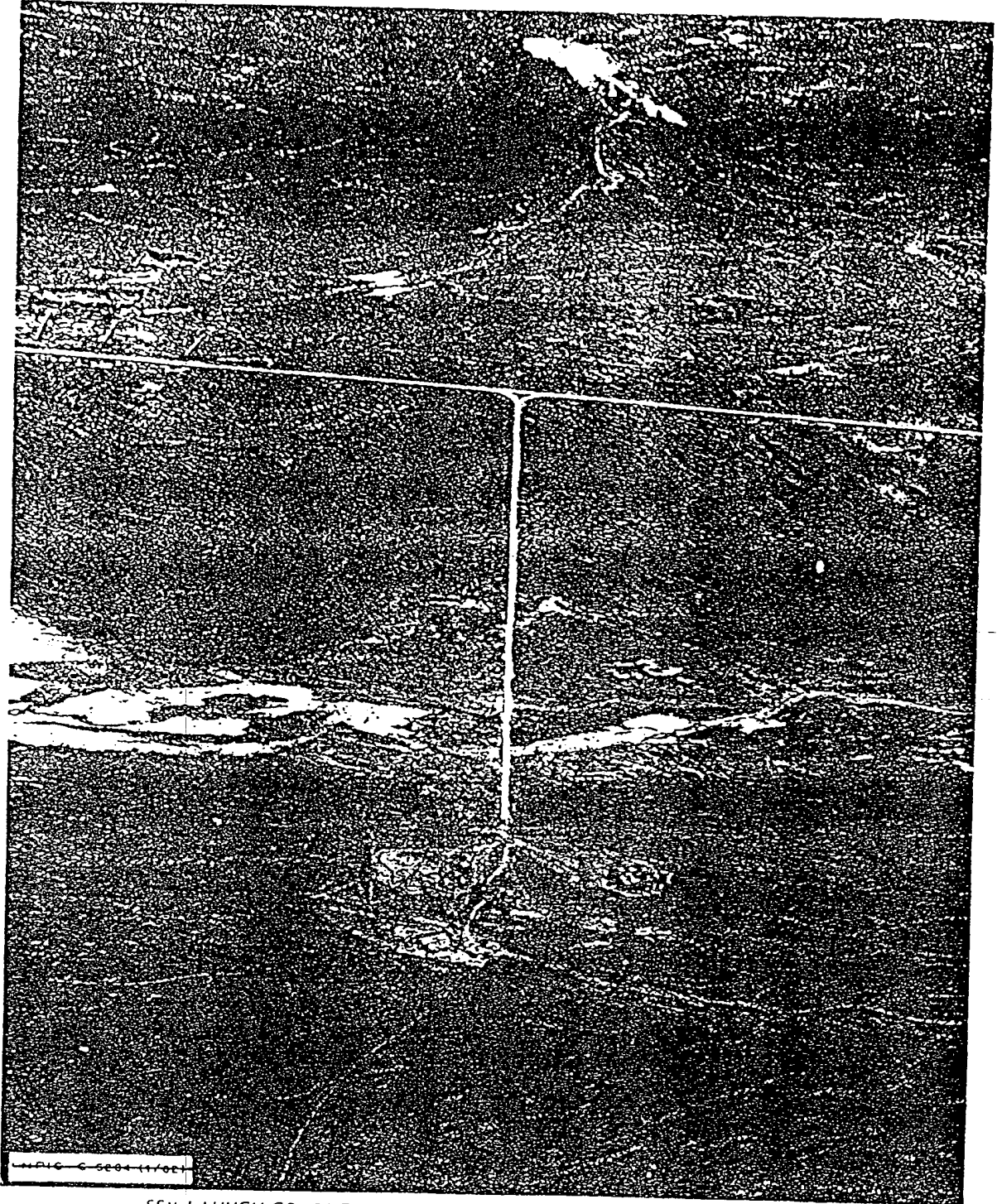


SSM LAUNCH COMPLEX A, SHUANG-CHENG-TZU MISSILE LAUNCH CENTER.

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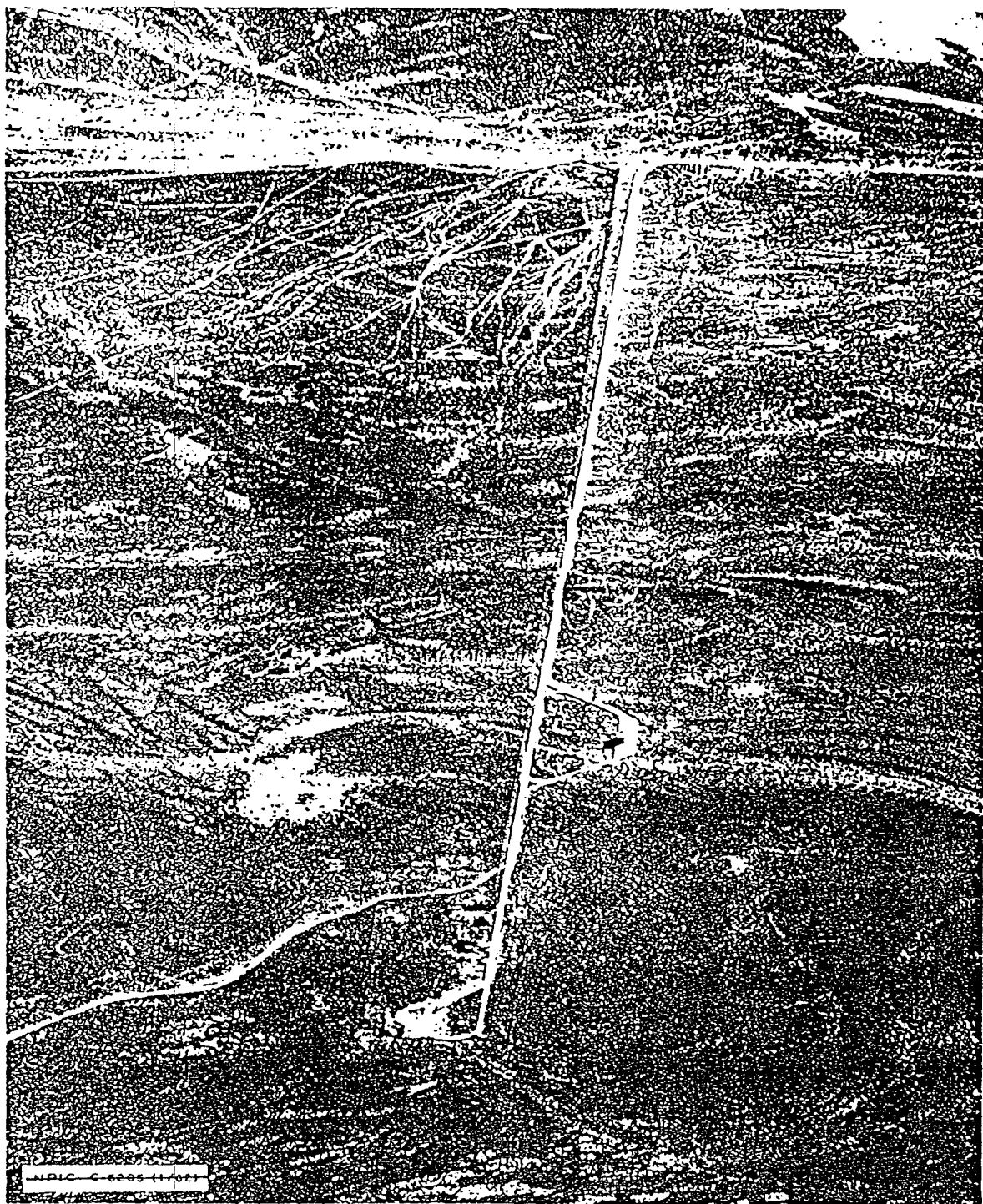


SSM LAUNCH COMPLEX B, SHUANG-CHENG-TZU MISSILE LAUNCH CENTER.

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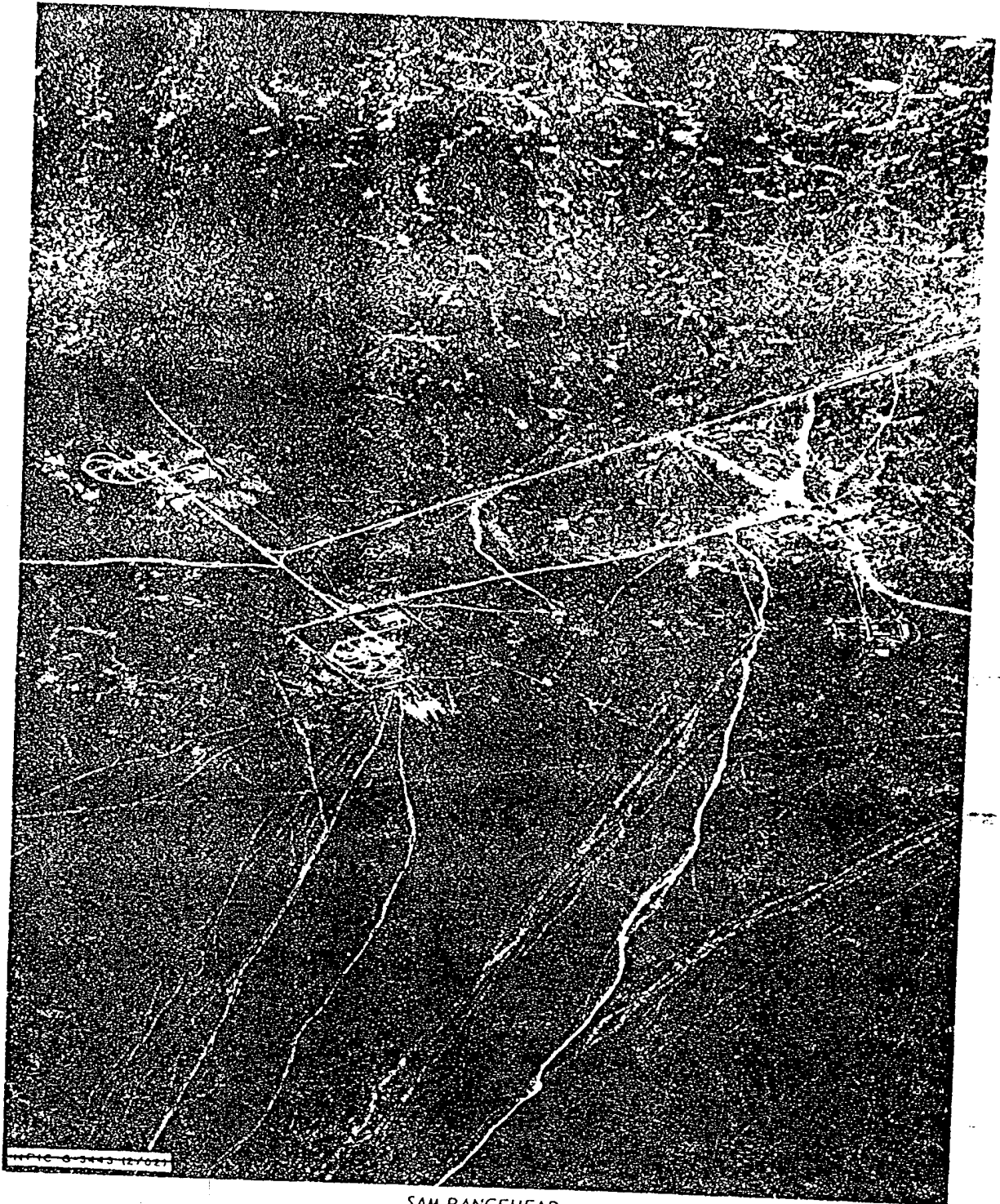


SSM LAUNCH COMPLEX C, SHUANG-CHENG-TZU MISSILE LAUNCH CENTER.

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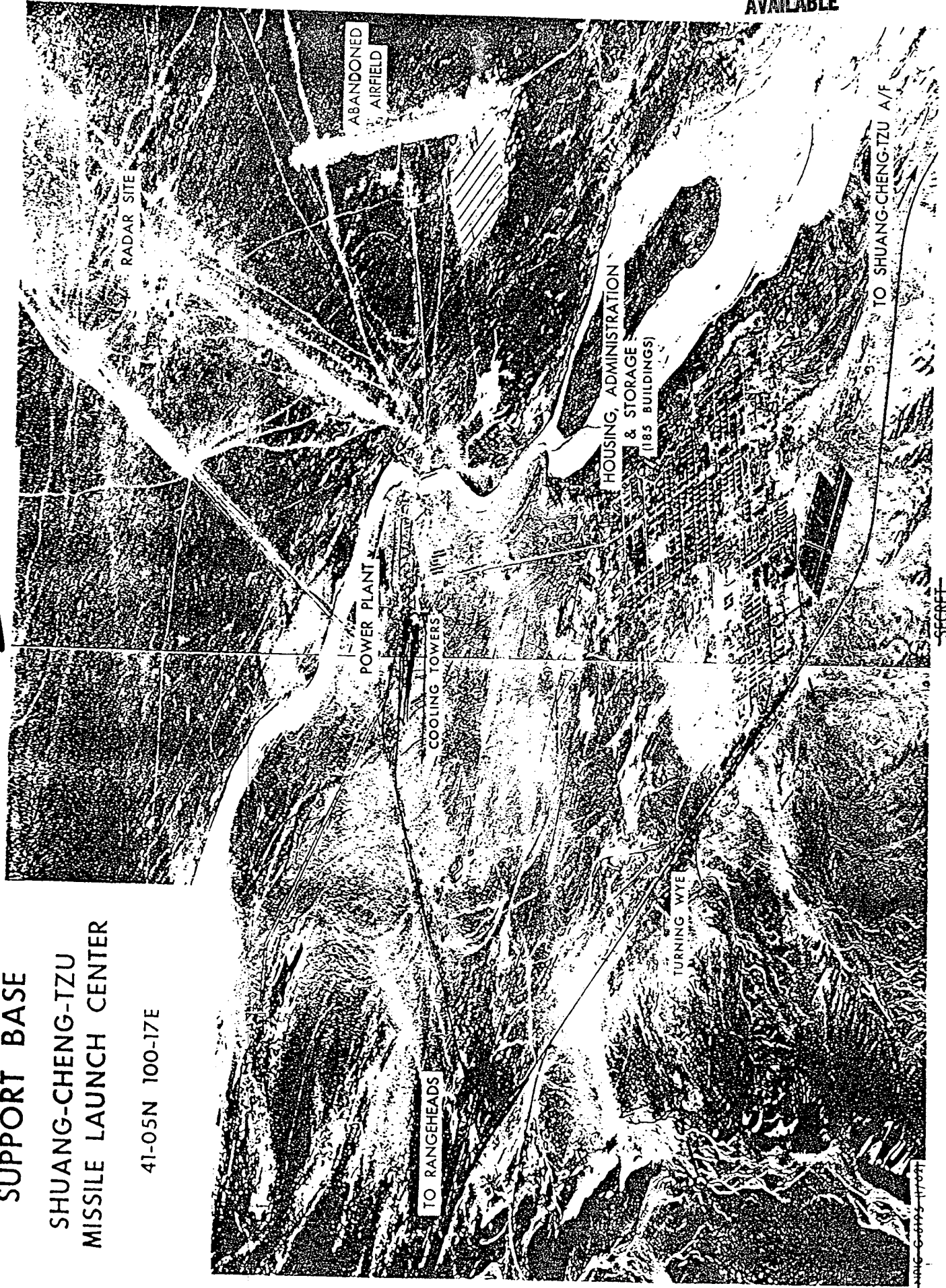


SAM RANGEHEAD

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SUPPORT BASE  
SHUANG-CHENG-TZU  
MISSILE LAUNCH CENTER

41-05N 100-17E



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41-05N 100-17E





SHUANG-CHENG-TZU AIRFIELD

40-21N 99-47E

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### III. FACTORS BEARING ON CHINESE COMMUNIST DEVELOPMENT, PRODUCTION, AND DEPLOYMENT OF ADVANCED WEAPONS

#### Soviet Assistance

23. A major factor in the pace of Chinese advanced weapons programs is the kind and amount of assistance provided by the USSR. This factor is also the source of considerable uncertainty in our appraisals, since we have little direct evidence on Soviet assistance in the fields of nuclear and missile weapons, and must rely primarily upon information concerning other programs and upon deduction from our knowledge of political relations between the two countries.

24. We believe that the Chinese, while seeking as much Soviet assistance as possible, at the same time have aimed at an independent capability in the fields of guided missiles and nuclear weapons. They have in the past, even while enjoying Soviet help, sought to develop native capabilities for the production of aircraft, submarines, and electronic equipment. Until mid-1960, Soviet aid was provided at a high level in a number of military fields. We believe, however, that in the nuclear and possibly the missile field this aid was provided at a more deliberate pace.

25. The withdrawal of Soviet technicians and scientists from China in mid-1960 had adverse effects upon Chinese programs to produce jet fighters, destroyers, and submarines. There is some evidence, although it is less conclusive, that Chinese nuclear weapons and missile programs were similarly affected, and this, plus the serious deterioration of relations between Moscow and Peiping since that time, leads us to estimate that Soviet aid in these fields was also sharply cut back. However, we believe that the nuclear and missile development programs were sufficiently advanced that even a complete halt in Soviet assistance would have caused delays rather than their abandonment.

26. The present state of Sino-Soviet relations indicates that there is little immediate prospect for a return to former levels of Soviet assistance. Even over a longer period of two or three years, we doubt that the USSR would significantly increase its assistance unless Peiping bowed to Moscow's demands for hegemony over the Communist movement or Moscow itself accepted the necessity of reconstituting the Bloc on a new basis allowing for Chinese coleadership. Both these contingencies appear unlikely.

27. We therefore believe that, while the Soviets may still be extending limited assistance and may continue to do so, China's future progress in advanced weapons will be determined primarily by native abilities in utilizing and further developing the information and facilities already received from the USSR. This belief is supported by a recent public statement by Foreign Minister Chen Yi. In January 1962, he told a Chinese Communist audience that "by relying mainly on our own efforts, in addition to international aid, scientific and technical problems in China's economic construction and national defense can be solved."

#### Chinese Communist Scientific Resources

28. Since its inception, the Chinese Communist regime has stressed the paramount importance of placing science and technology at the service of production. The emphasis on production appears not only in industrial research and development facilities, but also in the Academy of Sciences and in educational centers. Moreover, this philosophy has been imposed on a force of scientific and technical manpower which is grossly inadequate. Only a very few well-trained and experienced scientists, probably about 2,000, are available for research in all fields; of these, probably about 600 received training on the doctorate level in the West. An additional 1,000 doctorate level graduates have returned from

training in the USSR in the last few years, but this group has yet to gain significant research experience. The total number of researchers and technicians employed by the Chinese Academy, research facilities, and educational institutions is probably only about 40,000. The comparable figure for Japan is about 300,000; for the USSR, 750,000.

29. Comparatively little fundamental research has been undertaken because of the policy of the regime and the shortage of trained personnel. Instead, the emphasis has been placed on engineering efforts, almost all of which have been concerned with adapting imported devices, equipment, and techniques to the manufacturing facilities of China. Significant gaps are believed to exist in research areas basic to advanced weapons development such as physics, chemistry, metallurgy, computer design, electronics, and supersonic aerodynamics.

30. Until Soviet scientific and technical aid was cut back, Communist China had been making progress under a well-conceived but unrealistically-scheduled 12-year plan to raise its scientific level by 1967. Eleven broad technological fields considered vital to the rapid attainment of economic and military goals were emphasized, including electronics, atomic energy, jet propulsion, automation, and precision instruments, alloy systems and metallurgical processes, and heavy organic chemical synthesis. Although the original goals now appear unattainable, we believe that progress toward them will continue, particularly in areas such as atomic energy and electronics where a limited degree of self-sufficiency has already been reached.

31. The shortage of trained scientific and technical manpower probably cannot be significantly ameliorated for a number of years. The most recent additions of competent personnel have been trained in the USSR. However, beginning in 1957 the numbers of new Chinese students entering the USSR sharply

diminished, and we believe that few if any were admitted in the fall of 1961. About 2,000 Chinese students, mostly graduates, who have been permitted to remain in the USSR, probably will complete their courses in the next two years or so. Within about four to six years, China can be producing, in significant numbers, men with good overall technical training, but an additional period of years will be required for this group to acquire a background of practical experience.

#### Missile Research

32. The resources available to Communist China for missile research are extremely limited. Scientific competence in missile design is restricted to a small group, trained in the US and other Western countries, who are concentrated for the most part at the Institute of Mechanics in Peiping. Since 1956, the Institute has been headed by Dr. Chien Hsueh-sen, who played a leading role in the US missile program prior to 1950 and was considered one of the world's leading aerodynamicists. However, there is evidence that the lack of competent juniors, the pressure of administrative duties, the demands of ideological training, and the lack of first rate scientific facilities have combined to prevent the accomplishment of significant research in the field of guided missiles.

33. Considering these severe limitations, we do not believe that the Chinese have as yet embarked on a major program in original missile design. Instead, efforts in the missile field have probably been limited for the most part to copying Soviet missiles. The early development of a native Chinese capability to design, develop, and test a sophisticated missile system would have involved Soviet assistance on a much larger scale than we believe has been provided thus far. It would have required a large-scale program of training and exchange in missile-associated aspects of a large number of scientific disciplines.

There is no evidence of such a large program. However, the Chinese probably have undertaken relatively modest research and development programs on a selective basis.

#### Aeronautical Research

34. At the present time, the Chinese Communist effort in aeronautical research and development is in its infancy. The program has been directed primarily toward training the labor forces and the production engineers necessary to build an aircraft industry in the shortest possible time. There is an acute shortage of well-trained aeronautical scientists, and aeronautical research facilities are almost nonexistent. A small aeronautical research effort is under way at the Institute of Mechanics. The Peiping Aeronautical College, founded in 1952 or early 1953, concentrates primarily on the practical training of students in aeronautical engineering and aircraft engine design, and only a few students are retained for advanced theoretical study. We believe that the Chinese aircraft industry will be heavily dependent on foreign research for many more years to come, and that it is unlikely to produce within the foreseeable future any significant military aircraft with airframes and engines of native design.

#### Nuclear Technology<sup>6</sup>

35. China's efforts in the field of atomic energy and the extent of Soviet assistance through about mid-1960 have been described in detail in a 1960 estimate.<sup>7</sup> The present estimate takes into consideration the withdrawal of Soviet assistance, recent Chinese economic reverses, and new information. Its

<sup>6</sup>For the views of the Assistant Chief of Staff, Intelligence, USAF, regarding Chinese Communist nuclear weapons capabilities, see his footnote to paragraph 5, page 3.

<sup>7</sup>NIE 13-2-60, "The Chinese Communist Atomic Energy Program," dated 13 December 1960 (Limited Distribution).

purpose is to assess the probable timing of the Chinese Communist achievement of certain major objectives, including the construction of uranium metal plants, production reactors and related separation facilities, gaseous diffusion plants, and the fabrication of nuclear devices.

36. As has been previously estimated, we believe the Chinese have mined and concentrated sufficient uranium ore to supply the needs of their atomic energy program. Available evidence indicates that the Chinese, with Soviet help, were constructing a plant for recovery of natural uranium metal prior to the withdrawal of Soviet technicians in mid-1960. Assuming that construction was well along at that time, the plant could have been completed by the end of 1960 and production of uranium metal could have started early in 1961.

37. Production of uranium metal provides a strong indication of intent to produce plutonium, and we estimate that plutonium will be the first material available for weapon fabrication. We have no evidence of Chinese construction of a plutonium production facility. Recent photographic coverage of certain suspect areas produced negative results; the location of a production reactor outside the area of coverage remains a possibility. However, assuming a uranium metal production rate of 30 tons per month—based on our assessment of early Soviet achievement—a 200-ton reactor load could have been produced by about September 1961. Such an amount would be sufficient for a single reactor with an initial power level of about 200 MW. Full-power reactor operation could have been achieved early in 1962. Sufficient plutonium for a single weapons test could become available about a year later.

38. This schedule assumes that the construction of the reactor and chemical separation plant has been in phase with that of the uranium metal plant and that no major diffi-

culties are encountered at any stage in the process. With the further assumption that very little additional time would be required for device fabrication, the Chinese could test an all-plutonium device early in 1963.<sup>8</sup> However, we believe it unlikely that the Chinese will meet the schedule implied by these assumptions. If the foregoing series of assumptions proves invalid, the first Chinese nuclear test would be considerably delayed, perhaps by as much as several years beyond 1963.

39. Within a year after exploding their first device, the Chinese Communists could probably produce a few fairly crude fission weapons deliverable by medium bombers. Thereafter, at least two years and probably more would be required for the Chinese Communists to develop more advanced fission weapons suitable for delivery by missiles. Considerable nuclear testing would be involved in this development. Thus, if the first test should occur in the next year or so, we estimate that toward the last part of the decade, the Chinese Communists could have a variety of fission weapons to support many of their military requirements, but only in limited numbers.

40. We believe the Chinese would at some point in their program endeavor to produce uranium-235 for use in their weapons program. Aerial photography of September 1959 revealed a 2,000 foot building in Lanchou which had some of the characteristics of a Soviet gaseous diffusion plant, although no provision for power supply was evident. It

<sup>8</sup>The Assistant Chief of Naval Operations (Intelligence), Department of the Navy, believes that the framework of assumptions on which this time schedule is predicated is logical in the abstract but not yet supported by basic evidence sufficient to lend it estimative validity. In the absence of what he considers to be any evidence pertaining to or indicative of the production of fissionable materials in Communist China and in the light of the relatively elementary state of known nuclear research facilities, he believes that a reliable estimate of the Chinese Communist program in the development of nuclear weapons cannot yet be made.

was apparent that if a gaseous diffusion process were involved the Chinese would have to add a second building to obtain weapon-grade uranium-235. Overflight photography in February 1962 gave no further indication of provision for an electric power supply or of preparation for construction of a second building. This same photography indicates arrested development at the nearby hydroelectric power station which the Chinese had hoped to put in operation in 1960. Thus, if indeed the Lanchou site were to be a gaseous diffusion plant, the Chinese probably could not produce weapon-grade uranium-235 there before 1965 even if construction of another building were started now. The Chinese Communists could test an all-U-235 or composited device within about a year after the activation of a production facility. We have no evidence of any other suspect U-235 production facility in Communist China.

41. We do not believe that the Chinese Communists could have a thermonuclear weapons capability by the end of the decade.

#### Economic Factors

42. Communist China's drive to industrialize and to become a major military power at the same time has produced an uneven economic development. The Chinese have emphasized heavy industry, and with Soviet assistance have built up the aircraft, electronics, shipbuilding, and armaments industries. Today these industries are generally the most advanced in terms of production technology and skilled manpower. In terms of level of output and variety of product, Communist China's engineering industries are roughly comparable to those of the USSR in the early 1930s and are much inferior to those of contemporary Japan. However, certain industries producing military equipment are approaching the general technological level of similar Soviet industries in the early 1950s, and in some respects are little more

than a decade behind other industrialized countries. Communist China's relatively low level of engineering skills and experience render any attempt to create a production capability for advanced weapons—particularly from wholly Chinese resources—a difficult task at a time when the regime has been forced to cut back the heavy industrial sector of the economy.

43. Classified documents captured from Chinese Communist forces in Tibet indicate cutbacks in China's budgeted defense expenditures for 1961 and sharply reduced allocations of materials to the military. The documents reveal low morale and severe food shortages in the armed forces in the winter of 1960-1961, which had been at least partially alleviated by the summer of 1961. They also indicate a poor state of maintenance and supply, rapid deterioration of equipment and high accident rates. These reports provide the first conclusive evidence that the general economic retrenchment in 1961 affected the military as well as the rest of the economy.

44. Although the efficiency of the Chinese Communist armed forces have probably been impaired, it is possible that Chinese Communist advanced weapons programs have not been adversely affected. Even in an economic crisis, resources could probably be found to support a few, very high priority projects—especially those in a research and development phase. Thus, we doubt that there has been any drastic cutback in Chinese efforts to develop prototype nuclear weapons. Similarly, test firing of missiles at the Shaung-cheng-tzu range has apparently continued, although this program does not appear to have reached planned levels. However, the net effect of the accumulated evidence is to cast doubt on the existence of any current program for guided missile production in support of deployment.

#### Basic Industrial Skills

45. *Metallurgy.* The ferrous metallurgical industry is one of the most highly developed in Communist China, and rapid progress has also been made in increasing the output of nonferrous metals and minerals. However, high-temperature alloys used in the manufacture of jet engines must still be imported. For missile engine production, imports of certain specialty steels and refractory metals might be required, depending upon the technical characteristics of the missile system.

46. *Electronics.* Rapid progress has also been made in the electronics industry, which by mid-1960 had grown from a modest group of small-scale enterprises into a large-scale industry consisting of 45 major plants. With Soviet Bloc technical assistance, the Chinese have produced largely from foreign prototypes a variety of military electronic equipment including ground radars, servomechanisms, radio equipment, and navigation aids. With no further Soviet aid, we doubt that at present they can produce all of the components for a radio-inertial guidance system for short-range, and possibly medium-range, ballistic missiles.

47. *Chemicals.* The chemical industry of Communist China has expanded rapidly, but is still grossly inadequate to meet the demands placed on it. It has been heavily dependent on Bloc equipment and technical assistance, and in certain areas suffered severe setbacks with the withdrawal of Soviet aid. There is no synthetic industry of any consequence. The Chinese can probably produce, however, the simpler types of liquid rocket fuels and solid propellants.

48. *Machine Tools.* The machine tool industry of Communist China, aided by the import of production technology and machine tool designs from the Bloc, has rapidly increased production in the past decade (from about 3,300 units in 1950 to 40,000-45,000

units in 1960). The product-mix is limited and heavily weighted with general purpose types, but some prototypes of specialized, modern machines have been built. The absolute volume of specialized tools which would be required to support a sizable production program for a single missile system is not large. But the pace of such a production program would depend heavily on the amount of Soviet assistance which had been supplied, and particularly the quality and completeness of tooling provided. The domestic industry at present probably could, albeit with difficulty, produce the tooling required for Chinese manufacture of relatively simple tactical and short-range missile systems. Any more ambitious program for the production of more complex systems would be gravely handicapped if Soviet tooling were not available.

49. *Aircraft.* Communist China's aircraft industry, largely developed since 1958, is currently limited to the production of earlier model Soviet jet fighters, small transports, and helicopters. Although information since mid-1960 is lacking, production rates on all types are believed to be low. The extent of Chinese dependence on imported components is not known, but the aircraft industry probably continues to depend on Soviet supply of some key components, such as jet engine parts or materials. Much of the basic technology of producing jet aircraft is applicable and adaptable to missile production.

50. *Shipbuilding.* Communist China has emerged as a shipbuilding nation of considerable potential. The industry currently is capable of producing merchant ships of up to 15,000 GRT, and of assembling the hulls for submarines and destroyers. Some expansion of yards and related industries is continuing. In naval construction, the Chinese depended upon the Soviets not only for technical assistance but also ordnance, electronics, and high performance propulsion equipment. Certain new construction programs of naval

vessels were halted following the withdrawal of Soviet aid.

51. *Vehicles.* Except for medium tanks, no vehicles manufactured within Communist China are designed exclusively for military use. The Chinese probably are capable of producing tracked and wheeled vehicles necessary for mounting and transporting ground support equipment for missile systems. However, these requirements would place an additional burden on the Chinese Communist vehicle industry, already strained by the requirements for economic expansion and the ground armaments program. Imports from some source would probably be necessary, although the adaptability of many vehicles would permit considerable flexibility in the type and source of imports.

#### Operations, Maintenance, and Training

52. The skilled manpower requirements for large-scale deployment and field maintenance of offensive and defensive missile systems probably present the Chinese Communist leaders with problems equal in difficulty to the initial problems of producing the missiles and associated equipment. The principal factors affecting Chinese troop training are the scale of the deployment program, the technical advancement and complexity of the missile systems, and the origin of the missiles and associated equipment (i.e., whether they are supplied by the Soviets or produced in large measure by the Chinese themselves). The more dependence placed on the USSR for supply of missiles and associated equipment, the more dependent the Chinese are likely to be on Soviet assistance in training and maintenance.

53. We cannot make a precise assessment of the limitations which the manpower and materials needed for training, site construction, and field maintenance may place upon Chinese missile programs over the next few years. But we believe such requirements

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will be a major factor in Chinese Communist decisions on force level goals. Chinese problems in this respect would be greatly alleviated by relatively modest Soviet assistance. However, barring a change in Sino-Soviet relations, we doubt that such assistance will be forthcoming.

#### IV. PRODUCTION AND DEPLOYMENT OF ADVANCED WEAPONS

54. The recently acquired Chinese Communist army documents have provided some measure of current capabilities. According to one document, Marshal Yeh Chien-ying, chief of training for the armed forces, stated in January 1961 that Communist China has "no unconventional weapons" in a context which indicated that he was referring to both offensive missiles and atomic weapons. Reporting to the Military Affairs Committee in April 1961, Marshal Yeh noted that "we still do not have atomic weapons and space ships." These statements, considered in the light of the available evidence, support our belief that the Chinese have no present capabilities with advanced weapons.

55. In his January 1961 statement, Marshal Yeh also declared that "if there is a war within several (literally, 'three-five') years, we will have to rely on the weapons we now have on hand." This statement implies the existence of programs for the future production and deployment of advanced weapons. There is little evidence as to the present status of such programs. No Chinese missile production facility has been identified, nor, aside from a few SAM sites at Peiping is there any evidence of deployment. However, certain inferences as to Chinese progress to date can be drawn from the evidence relating to the test range and from a consideration of the factors bearing on development and production of advanced weapons.

56. It is apparent that native Chinese capabilities are very limited and that the extent of previous Soviet assistance is a critical factor. The evidence indicates that the Soviets probably agreed to assist the Chinese in acquiring operational capabilities with a family of surface-to-surface missiles of up to 1,100 n.m. range, and with other missile types. Considering the previous pattern of Soviet military aid, we believe that the Chinese probably received some assistance prior to mid-1960 in the creation of an independent missile production capability. We believe that the Chinese Communists would probably first seek to produce short-range (up to 350 n.m.) surface-to-surface ballistic missiles. The relative simplicity of production and the coverage by such missiles of targets peripheral to China point in this direction.<sup>9</sup> Short-range missiles could be fitted with nonnuclear warheads until nuclear warheads became available.

57. Chinese production of Soviet short-range missiles would depend at least initially upon Soviet aid in setting up production facilities and in supplying certain precision parts, principally propulsion and electronic components. The extent of Soviet aid cannot be ascertained. We believe that some aid probably was provided, but not in sufficient quantity to bring the Chinese to the point of independent production prior to mid-1960.

58. Any emerging Chinese production capabilities would have been seriously impeded by the Soviet withdrawal of technical assistance and by the possible stoppage of the flow of critical parts. However, given sufficient priority, these setbacks could be overcome. If so, the Chinese Communists could begin deployment of short-range surface-to-surface missiles within the next year.<sup>10</sup>

<sup>9</sup> See Figure, following page.

<sup>10</sup> For the views of the Assistant Chief of Staff, Intelligence, USAF, on Chinese Communist deployment of short-range missiles, see his footnote to paragraph 8.

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59. Without nuclear warheads, medium-range missiles (700 n.m. and 1,100 n.m.) are ineffective against most military targets. Therefore, the Chinese Communists probably do not plan to begin deployment of medium-range missiles in significant numbers before the latter half of the decade. A medium-range missile deployed in this time period would most probably be a copy of a Soviet system, but toward the end of the decade could be an original Chinese design. It is possible that the Chinese Communists might deploy a token force without nuclear warheads somewhat earlier for propaganda purposes and in order to gain experience with the weapon system.

60. There is no evidence that the Soviets have provided the Chinese with any aid in the development of IRBM or ICBM capabilities. Without such aid, progress made in the development of such systems would be the result of native effort including research and development, design, manufacture, and the construction of a new test range suitable for testing such systems. Complete testing of an ICBM system could not be conducted entirely within the boundaries of Communist China.

61. We have no evidence to indicate that the Chinese have taken even preliminary steps in an ICBM development program. Considering the lack of an adequate research and development base and the advanced technological and engineering requirements for ICBM development, we believe that 10 or more years would be required for the Chinese Communists to achieve an initial operational capability with an ICBM system of native design. Development of a sophisticated IRBM system similar to the Soviet 2,500 n.m. SS-5 would be a task of like magnitude, and would require nearly as long a time.

#### Naval Missiles

62. There is no evidence of a Chinese Communist program for development of a ship-launched guided missile suitable for delivery of a nuclear warhead. We believe that development of such a capability with submarine-launched short-range ballistic missiles would require about 10 years without Soviet assistance. There is no evidence of Chinese Communist interest in cruise-type missiles, but submarines could be equipped with such systems in about the same time period, and surface ships somewhat earlier.

#### Air Defense Missiles

63. At present, the Chinese would probably have great difficulty in producing the relatively complex SA-2 system without extensive Soviet assistance. Such production is unlikely in the next few years, and surface-to-air missile deployment in Communist China through 1965 is therefore heavily dependent upon Soviet assistance. We think it certain that the USSR supplied the missiles and associated equipment for SA-2 testing in the rangehead area and for limited deployment at Peiping. However, the three sites located near Peiping would clearly be inadequate for defense of the area, suggesting that a planned deployment program may have been halted before completion.

64. The present level of Soviet assistance is not known. If Soviet aid is withheld entirely we believe that, rather than embarking on a native SA-2 production program, the Chinese Communists will continue over the next few years to rely on their sizable fighter force as their primary air defense weapon. We do not believe that the Chinese Communists could develop an independent antimissile capability for many years. The USSR is unlikely to provide antimissile systems to other Bloc countries in this decade.

65. There is no firm evidence of air-to-air missile deployment in Communist China. However, the Soviet Union may have supplied some AAMs to Communist China in 1959 to counter the Sidewinders employed by the Nationalist Chinese. The Chinese may have received the AA-2, an infrared homing type which would require no special airborne radar, and possibly the Soviet AA-1, a beam rider missile. Production of the AA-2 would present no great difficulties, and we believe that the Chinese could have an independent production capability now or at least within the next year or so. However, without Soviet aid, we doubt that the Chinese can produce more complex AAM systems such as beam riders or radar homing types for a number of years.

#### Air-to-Surface Missiles

66. We believe that the Soviets probably agreed to provide ASMs to the Chinese Communists, as well as either BADGER jet medium bombers (compatible with Soviet ASMs of up to 100 n.m. range) or assistance in producing BADGERS. Recent photography of Wu-kung airfield revealed two BADGERS which they probably received in 1959; we do not believe that any BADGERS have been delivered to China since that time. There is no evidence that ASMs have been provided to the Chinese Communists. We doubt that they will be capable of producing ASMs for a number of years without extensive aid, including entire production facilities. Moreover, if the Chinese are to achieve any significant ASM capability, additional delivery aircraft would be required. Aside from the two BADGERS, they have only 10 obsolete BULL piston medium bombers.

#### Space Programs

67. The Chinese have expressed interest in launching an earth satellite, but there is no evidence of such a program. Although the Soviets could easily provide assistance for a token space program, they are probably reluctant at this time to participate in a venture which would add materially to China's prestige. Whenever the Chinese Communists achieve competence with medium-range missiles, they might develop a second stage in order to orbit a small satellite primarily for propaganda purposes. The development of such a space launching system without Soviet aid would be extremely difficult and would require several years. It is possible that the Chinese will produce and launch upper atmosphere sounding rockets in the next few years.

#### Advanced Aircraft Delivery Systems

68. Communist China's aircraft industry, largely developed since 1958, is currently believed to be limited to the production of early model Soviet jet fighters, small transports, and helicopters. It is possible that prior to the withdrawal of Soviet technicians in mid-1960, the Communist Chinese received sufficient technical assistance to enable them to produce BADGER (TU-16) jet medium bombers within the next few years. The BADGER's superiority to the obsolete BULL might lead Communist China to produce a small number in order to achieve a more effective nuclear delivery capability. On the other hand, Sino-Soviet relations might improve to the extent that the Soviets would be willing to provide some additional BADGERS to the Chinese. We doubt that they will provide heavy bombers or assistance in making them. Nor do we believe that Communist China is likely to undertake a native program aimed at development of a heavy bomber.

TABLE  
ESTIMATED CHARACTERISTICS OF SOVIET MISSILES \*

	SS-1	SS-2	SS-3	SS-4	SA-2	AA-1	AA-2	AS-1
Initial Operational Capability <sup>b</sup>	1957	1954	1956	Late 1958	1957	1955-1956	1955-1956	1956-1957
Range (n.m.) <sup>c</sup>	150	350	700	1,100	25-30	5	1-4	55
Altitude (ft.)	..	..	..	..	<sup>d</sup> 60,000	..	..	..
Warhead Weight (lbs.) <sup>e</sup>	1,500	2,000	3,000	3,000	400	35 HE	25 HE	3,000
Guidance	All-inertial	Radio track-radio command	Radio inertial	Radio inertial	Track while scan	Radar beam rider	Infrared homing	Beam riding-semi-active homing (against ships) Solid
Accuracy (CEP)	½ n.m.	¼ n.m.	1 n.m.	1½ n.m.	100 ft.	20 ft.	10 ft.	150 ft.
Propellants	Storable liquid	Nonstor-able liquid	Nonstor-able liquid	Nonstor-able liquid	Solid	Solid	Solid	Solid
Speed	..	..	..	..	Mach 3	Mach 1.7	Mach 2	Mach 0.8

\* This table includes Soviet missiles which we believe may have been given to Communist China; the possible transfer of other types is not precluded. The designations SS-1 through SS-4 refer to surface-to-surface ballistic missiles (SSMs), SA-2 to a surface-to-air missile (SAM) system, AA-1 and AA-2 to air-to-air missiles (AAMs), and AS-1 to an air-to-surface missile (ASM).

<sup>b</sup> In the Soviet armed forces.

<sup>c</sup> Maximum horizontal range is given for SSMs, and maximum slant range for the SA-2. Range for AAMs and the AS-1 is given from launching aircraft.

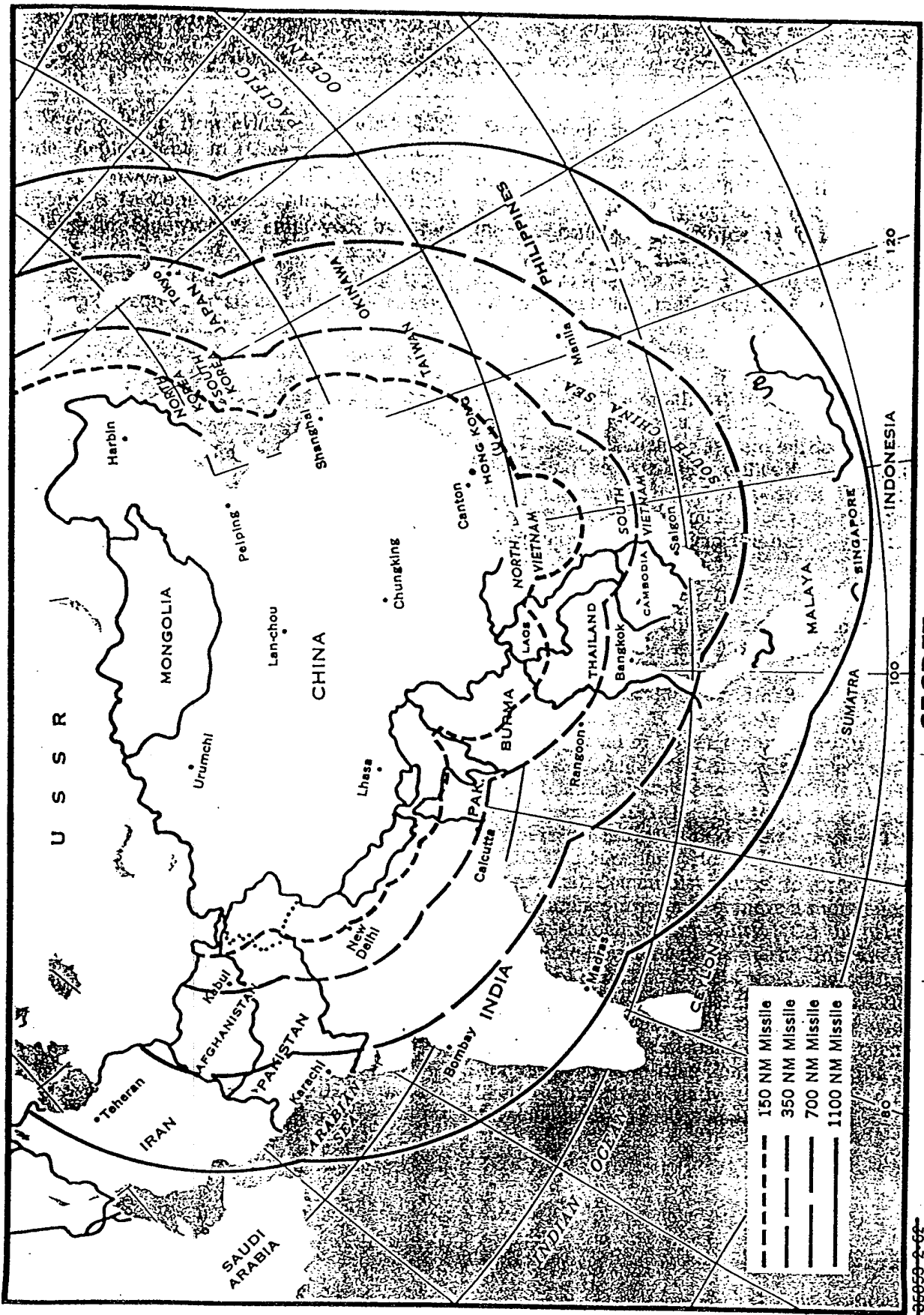
<sup>d</sup> The SA-2 is believed to have some capability up to 80,000 feet.; minimum altitude capability averages about 2,500 feet.

<sup>e</sup> Unless otherwise noted, warhead weights are for either an HE or nuclear payload. We do not believe that the Soviets have given nuclear warheads to the Chinese.

<sup>f</sup> Plus speed of the launching aircraft.

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# Potential Target Coverage of Surface-To-Surface Missiles From Communist China's Borders



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