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Communist China's Strategic Weapons Program

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COMMUNIST CHINA'S STRATEGIC WEAPONS PROGRAM

THE PROBLEM

To assess China's strategic weapons program and to estimate the nature, size, and progress of these programs through the mid-1970's.

CONCLUSIONS

A. The development of strategic weapons systems has been given a high priority in China. Despite economic and political crises over the past decade, work has continued and the Chinese already have in place many of the research and development and production facilities necessary to support important ongoing strategic weapons programs.

B. As a result of these efforts, Communist China already has a regional nuclear strike capability in the sense that it could now have a few thermonuclear weapons for delivery by its two operational medium jet bombers. China could also have some fission weapons in stock.

C. This limited capability will undergo modest augmentation in the next few years as the Chinese produce medium jet bombers and move ahead with the development of strategic missiles and compatible thermonuclear warheads. Medium-range ballistic missile (MRBM) deployment could begin this year or more probably in 1970, reaching a force of some 80-100 launchers in the mid-1970's.

D. As for intercontinental ballistic missiles, if the Chinese achieved the earliest possible initial operational capability (IOC) of late 1972, the number of operational launchers might fall somewhere between 10 and 25 in 1975. In the more likely event that IOC is later, the achievement of a force of this size would slip accordingly.

E. But many uncertainties remain which leave in doubt the future pace, size, and scope of the Chinese program. In general, the Chinese are taking more time in the development and production of modern weapons systems than we judged likely several years ago. China lacks the broad base in technical and economic resources essential to rapid progress in the complex field of modern weapons. This situation has been aggravated, and will to some degree be prolonged, by the disorders, confusion, and uncertainties of the domestic political situation.

F. We have no evidence on how Chinese leaders will adjust the competing priorities between advanced weapons production and deployment and the investment requirements for healthy growth in agriculture and the general industrial sectors. At a minimum, however, we believe Chinese planners will come to recognize, if they do not already, that China cannot begin to match the nuclear strike capability of the superpowers. This may lead them to forego large-scale deployments of early missile systems, hoping to gain an important deterrent effect and added political influence from the possession of a relatively few operational missiles and aircraft.

G. So long as the Chinese strategic force remains relatively small and vulnerable, a condition which is likely to persist beyond the period of this estimate, the Chinese will almost certainly recognize that the actual use of their nuclear weapons against neighbors or the superpowers would involve substantial risks of a devastating counterblow to China.

H. We believe that for reasons of national prestige the Chinese will attempt to orbit a satellite as soon as possible. An attempt this year would probably involve the use of a modified MRBM as a launch vehicle.

DISCUSSION

I. GENERAL CONSIDERATIONS

1. Chinese efforts to develop modern weapons go back to at least 1957-1958. The original program that took shape with Soviet technological and material assistance appeared to be extremely ambitious. At that time Chinese expectations for rapid progress in the nuclear field and in a range of tactical and strategic missiles appeared to be high. But the sudden withdrawal of Soviet technicians in 1960 and the economic confusion and depression of the early 1960's resulting from the Great Leap had a severe impact on the advanced weapons program. Nevertheless, despite economic and political crises Peking persisted in giving high priority to development of advanced weapons and gradually progress was made.

2. A more rational program concentrating on research and development (R&D) in nuclear weapons, surface-to-air, and medium-range ballistic missiles (MRBMs) seemed to emerge during 1963-1964. In 1965, reporting began to suggest increasing Chinese interest in an intercontinental ballistic missile (ICBM). By the end of 1966 the Chinese had demonstrated their understanding of the basic principles of thermonuclear design. In 1967, the MRBM program was judged likely to have reached the stage where deployment could soon begin and the ICBM program was considered likely to have reached the stage where missile testing could start.

3. Subsequent events, however, showed that the Chinese program had probably not advanced as far as we had believed, and, in general, the programs have not moved forward as fast as we once thought likely. We have received no information of activity related to the construction of operational sites for MRBMs, and there have been no indications that ICBM flight testing has occurred. The record of the last two years thus raises some perplexing and complicated questions about the pace and direction of the Chinese effort and what factors control it.

4. A principal problem is that there is no adequate historical background for judging China's technical and industrial capabilities for producing and deploying weapons systems embodying advanced technologies. It could be argued, for example, that most of the progress in modern weapons recorded thus far has been in R&D, and that China, possessing only a small pool of skilled and highly trained technicians and few sophisticated industrial plants, will face many delays and setbacks in moving on to series production and deployment of intricate weapon systems. On the other hand, it could be argued that the advantages to China of following the pioneering work of others and the benefits of being able to obtain much useful data, materials, and equipment from abroad will help to

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reduce the time required to accomplish programs. On balance, the record seems increasingly to indicate that the Chinese are in fact taking more time in the development and production of modern weapons systems than we judged likely on the basis of their progress several years ago.

5. Moreover, the chances for any marked improvement are reduced by the unhealthy political situation in China. Although it is not possible to pinpoint where damage has been done, there is good evidence that the disruptions of the Cultural Revolution have intruded into the organizations responsible for military science and technology and the governmental ministries in charge of nuclear and missile development. During 1967 and 1968 industrial production in general declined as did imports from [redacted] suppliers of specialized equipment and materials, a good portion of which is of the type that in the past has been used in Chinese advanced weapons programs.

6. The present trend of events in China seems, however, to be toward regaining order. But at the same time there are indications that Peking is persisting with policies that are likely to erode efficiency and managerial control still further. These policies reflect Mao Tse-tung's determination to "reform" intellectuals, whom he deeply distrusts, and his belief that somehow through exhortation and "revolutionary" practices the creativity and productivity of the masses can be released. Perhaps the most lasting and damaging impact of Maoist policies will be on education which has already suffered three years of severe disruption. The shortening of school terms, the politically and ideologically laden curricula, and the criteria for selecting and promoting students now being inflicted on Chinese education could, if long continued, severely hamper China's technological progress five or 10 years hence.

7. The Chinese already have in place many of the R&D and production facilities necessary to support an important ongoing advanced weapons program. But the intrusion of political disorder has been disruptive; its ultimate cost will depend, of course, on the time it takes to re-establish political and administrative order.

8. Even with a restoration of order, the overall capacity of the Chinese economy will remain limited for many years. It will be able to support a large-scale production and deployment program for strategic weapons only by scrimping or neglecting the investment requirements for healthy growth in agriculture and in the general industrial sector. We believe the hard facts of their overall economic situation will weigh heavily in considering the size and pace of weapon system deployment.

9. There is little evidence on Chinese thinking with respect to the role advanced weapons could play in their overall strategy. Chinese leaders probably believe that possession of strategic weapons will greatly enhance China's prestige and strengthen its claims to leadership in Asia and its status as a great power. The Chinese probably hope that possession of a strategic capa-

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bility will also have more tangible benefits including greater security in supporting revolutionary struggles, particularly in Asia, and a lessened danger of nuclear strikes on China. Finally, they would also hope any confrontation would be limited to the level of conventional arms where the Chinese would expect to be able to fight more nearly on their own terms. Moreover, as their relations with Moscow have deteriorated and as the Soviets have continued a military buildup on the Sino-Soviet border, the Chinese probably have thought of their strategic weapons development also in terms of deterring the Soviets.

10. Nevertheless, Chinese military planners must recognize that in the foreseeable future China cannot begin to match the nuclear striking capability of the superpowers. They probably also realize that the deterrent credibility of their first-generation missile systems will be limited because these systems would have a poor chance of surviving an offensive strike against China. These circumstances raise several possibilities for the future of Chinese strategic weapons deployment. Peking might opt for only token deployments of first generation systems in order to concentrate resources and energy on improvements and refinements that would lead to better weapons that would appear more credible—both as a threat and as a deterrent. On the other hand, the Chinese might conclude that a larger initial deployment of weapons, regardless of the technical capabilities, would still enhance their political position, especially in Asia, and have a considerable psychological impact on the US.

11. Another strategic choice confronting the Chinese is the balance in allocating limited resources between intercontinental and regional strategic forces and between weapons systems within the regional force. Rather than concentrating all resources on, say, an ICBM program, the Chinese may believe that they could more quickly enhance their overall military posture by allocating some of their limited means to a force which could threaten much of Asia. Within the regional force concept, for example, the idea of producing more than a few TU-16 bombers as weapons carriers might become more attractive to the Chinese if they encountered serious difficulties with their MRBM system.

12. In sum, the future of China's advanced weapons development depends not only on political and strategic questions but on technical and economic capabilities as well. The uncertainties as to how all these factors might influence various weapons programs suggest caution in estimating the probable rate of progress over the next few years, particularly with respect to the production and deployment of complex and costly missile systems.

II. TRENDS AND PROSPECTS

A. The Nuclear Program

13. *Weapon Testing and Development.* Peking's most notable achievements have probably been in the field of nuclear weapons design. The Chinese have concentrated their effort on thermonuclear weapons and have rapidly suc-

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ceeded in developing a high-yield device deliverable by medium bombers. Five of China's first eight tests have been related directly to thermonuclear development. [redacted]

[redacted]

14. [redacted]

[redacted]

15. [redacted]

[redacted]

16. In focusing on thermonuclear development, the Chinese have not done the type of testing that would be expected if a light fission weapon, either for a missile or bomber, were their objective. But the Chinese may have stockpiled a few fission bombs based on the results of the first two tests as an emergency capability, and the work done for the first two tests would also have been useful in developing the fission device used in the fourth test, which the Chinese claimed was delivered by a missile. [redacted]

[redacted]

[redacted] the possibility that the Chinese have intended all along to deploy their first MRBMs with thermonuclear rather than fission warheads. Or they may have been awaiting the availability of plutonium before developing an improved fission warhead for MRBMs. Work on such a warhead may begin soon [redacted]

[redacted] About

a year or so after testing began the warhead might be ready for deployment. This would require a concentrated effort, however, and the Chinese may not have sufficient scientific talent and facilities to push ahead rapidly on the development of both thermonuclear and fission weapons.

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TABLE I

CHINESE NUCLEAR TESTS

<u>Test</u>	<u>Date</u>		<u>Delivery</u>	
CHIC 1	16 Oct 1964		Tower	
CHIC 2	14 May 1965		Airdrop	
CHIC 3	9 May 1966		Airdrop	
CHIC 4	27 Oct 1966		Missile	
CHIC 5	27 Dec 1966		Tower	
CHIC 6	17 Jun 1967		Airdrop	
CHIC 7	24 Dec 1967		Airdrop	
CHIC 8	27 Dec 1968 ^a		Airdrop	

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B. Nuclear Materials Production

17. Considering the probable initial operational capability (IOC) dates and deployment levels of Chinese delivery systems, stringencies in the supply of fissionable material are not likely to be an immediate major problem. This is not to say that the Chinese have not had problems in this area. Earlier availability of plutonium, for example, would have been helpful in weapons development. But with the accumulated output of U-235, and with plutonium becoming available, fissionable materials production will probably be able to keep pace with modest initial deployment programs.

18. We are still uncertain as to the exact process being used for U-235 production at the Lanchou uranium isotope separation facility. This uncertainty

[Redacted]

[Redacted] The availability of plutonium and ongoing U-235 production, however, will help considerably to relieve any such constraint.

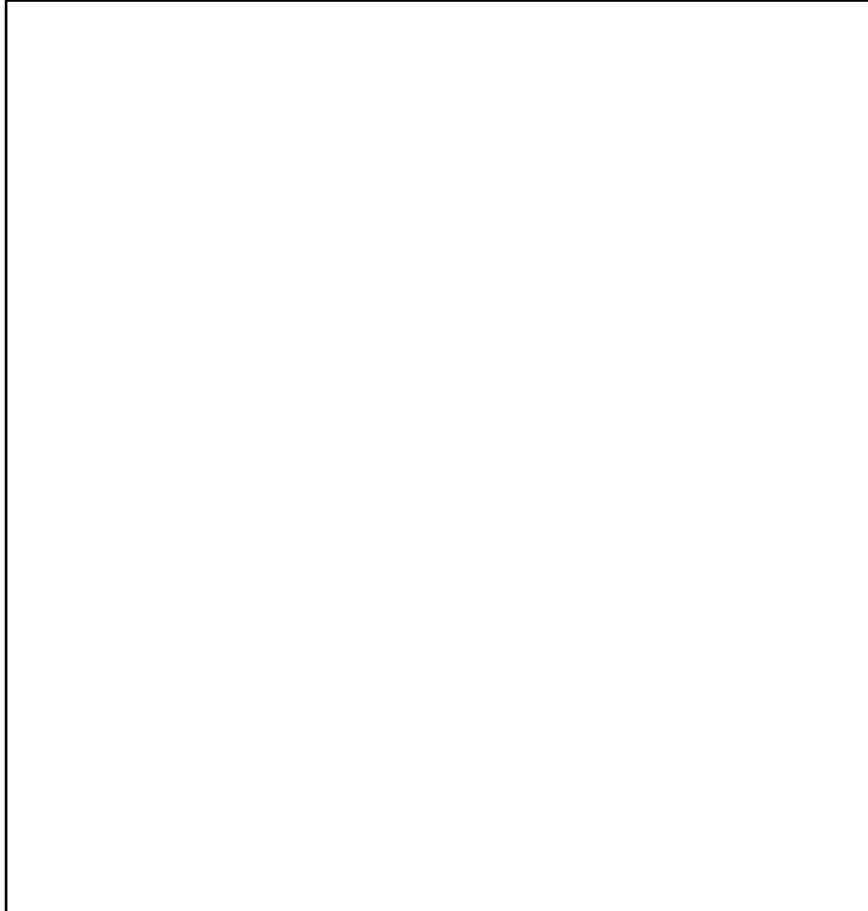
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19. There is good evidence that there is a nuclear energy complex near Yumen. We believe this complex includes a large plutonium reactor and chemical separation facilities.

[Redacted]

20. We believe that for the next several years, at least, the supply of Chinese fissionable materials will be limited to the output from the Yumen reactor and the U-235 plant at Lanchou. While this will probably be sufficient for their needs during this period, in the longer term the Chinese probably will seek to expand capacity, especially for U-235 production.



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C. Delivery Systems

21. *The MRBM Program.* In late 1967 it appeared that MRBM deployment might be imminent. Though detailed information was lacking, it was known that the Chinese had been working on an MRBM-type missile for several years. In 1965, our information indicated that activity at the Shuang-cheng-tzu Missile Test Range (SCTMTR) had quickened. In October 1966 the Chinese claimed that they had exploded a nuclear device delivered by a missile. By mid-1967, it seemed that a reasonably paced development program would have progressed to the point at which troop training might be about to take place preliminary to deployment.

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22. Since then we have received no information indicating that operational launch site construction has begun. It is possible that MRBM site preparation is underway, but we are inclined to believe that some indication of this type of construction would become available not long after it had begun.

23. It is not possible to explain the apparent delay with much confidence. Technical problems with the missile itself could account for it, but our information does not enable us to make a firm judgment. [REDACTED]

24. It is also possible that the Cultural Revolution may have slowed progress in some way. As noted earlier, it could be that priorities assigned to the nuclear development program are influencing the deployment schedule. Even the possibility that the Chinese have never intended to deploy their first 1,000-mile MRBM cannot be completely ruled out. It could be that the principal purpose of the MRBM program was to develop technology for an ICBM and that the Chinese have elected to await development of a missile more convenient to handle—perhaps one using solid propellants—before deploying MRBMs.

25. This seems unlikely, however, as there is evidence that the Chinese are continuing with liquid propelled MRBM firings, and we believe that they intend eventually to deploy this system. We estimate that the missile probably has radio-inertial guidance and uses storable propellants. The system probably is road transportable, but it is likely that missiles would be deployed at fixed sites involving permanent support facilities. The generally poor road network in China and the likely level of Chinese missile development suggest that initial deployment would be at soft sites near rail lines.

26. It is possible that this system is now ready to deploy. If so, and the earliest possible operational capability was their goal, the Chinese could soon deploy the missile in rudimentary field launch positions. This approach would downgrade the reliability and accuracy of the system. Moreover, if MRBM deployment were to begin soon, it would almost certainly have to be with warheads based on the fourth test, which would mean that the Chinese had tied up fissionable material in the production of an inefficient warhead.

27. A much more likely prospect is that the Chinese will take the time to prepare permanent sites with adequate support facilities. It would probably take the Chinese a year or more to prepare their first permanent launch facilities. Thus, if site preparation should begin soon, it would still be sometime in 1970 before the Chinese had an operational MRBM capability.

28. We have no good basis for estimating the size of the MRBM force that might be deployed. It continues to seem probable that the Chinese objective might be to provide coverage of important military bases and population centers in the arc stretching from Japan through the Philippines, Southeast Asia, and northern India, hoping in this way to hold Asian countries hostage against any

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US threat to China. Given the state of Sino-Soviet relations, we would expect some MRBMs to be targeted against the USSR.

29. China's limited economic, industrial, and technical base, however, probably cannot support a very rapid deployment of MRBMs and other oncoming weapons as well. The Chinese might opt for a larger number of jet medium bombers at the expense of a MRBM force. Or, deployment of MRBMs might be limited pending the availability of solid fuel missiles which, judging from reports of a large industrial complex at Hu-ho-hao-te, the Chinese intend to develop. Considering all these factors, we believe the Chinese might decide on a force on the order of 80-100 MRBMs. If begun in 1970, such a program could extend into the mid-1970's.

30. *Medium Bomber Program.* [redacted] in 1968 the Chinese completed their first TU-16-type jet medium bomber at the Sian aircraft manufacturing plant. The Soviets began helping the Chinese build this plant in the late 1950's, but, when the Soviets withdrew, work stopped for several years. Construction resumed in 1964 and the plant could have been essentially completed by early 1967. Production efforts probably began about that time. Although this aircraft is a copy of a proven Soviet bomber, the first few units produced by the Chinese probably will have to undergo extensive flight testing. If the flight test program goes well, assignment of TU-16s to operational units could begin by late 1969.

31. There is presently no good basis for estimating the number of TU-16s the Chinese will choose to deploy. Although the Chinese initially will probably look to the TU-16 primarily as a means for carrying nuclear weapons, it would be useful in other roles as well. We estimate that production could reach a rate of four or five aircraft a month in about two years. Because of testing requirements and initial production problems, however, only a few of these aircraft are likely to be deployed during the next year or two. [redacted]

32. The usefulness of the TU-16 in a strategic role would be increased if the Chinese had a standoff, nuclear armed, air-to-surface missile. So far, there is no evidence that the Chinese are active in this field; and in view of the difficult technologies involved in both the missile and warhead, we think it unlikely that the Chinese could develop such a system during the period of this estimate.

33. *Missile Submarines.* Although the Chinese launched a Soviet-type, G-class, diesel-powered submarine in 1964, there is no good evidence—either with regard to missile development or to construction of additional submarines—to indicate that the Chinese are presently giving much attention to the early development of a missile launching submarine force. We believe that the Chinese will not look to diesel-powered submarines with their limited endurance and high noise levels as a means of threatening the continental US, and they may also feel that a submarine force of this type would not add enough to their regional capability to warrant the cost. The Chinese have shown some interest in nuclear-powered

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submarine technology, but, even if they have already started work on designing such a submarine, they would probably not be able to develop it before the late 1970's at the earliest.

D. The ICBM Program

34. There is evidence that construction of a large launch facility was begun at the SCTMTR in the late summer of 1965, but there are no indications that the facility has ever been used for firings. It is not yet possible to make firm judgments about the implications of this delay. We believe it is probable, however, that the Chinese ICBM program as originally envisioned has undergone important change.

35. Nevertheless, we continue to believe that the ICBM and MRBM programs have been closely related and that the most logical approach for the Chinese to use remains one which utilizes the clustering of MRBM engines to achieve the thrust level required for an ICBM engine. We also continue to believe that the missile will probably be a two-stage vehicle about 100 feet in length [redacted]

36. The question of when the Chinese might begin test firings is a difficult one, particularly in view of a possible program change. But we assume that flight testing could begin sometime this year. It should be pointed out, however, that there frequently have been long lapses between various phases in Chinese programs, and there is considerable reason to doubt that China's ICBM program will proceed smoothly from one phase to another.

37. From whatever time the Chinese begin testing—it is likely to require at least three years to achieve an IOC. Thus, if flight testing were to begin later this year, the earliest possible IOC would probably be late 1972. However, this allows the Chinese only a bit more time than required by the Soviets or the US with first-generation ICBMs and assumes fairly smooth progress. In the light of China's inexperience and limited technical and scientific base, and considering general political and economic conditions in China, more time will probably be required. Thus, IOC is more likely to be later than 1972, perhaps by as much as two or three years.

38. [redacted]

39. We have no basis at this time for estimating how far the Chinese will carry deployment of their first-generation ICBM. In view of the requirements of other military programs and the pressure on resources, however, we believe deployment will proceed at a moderate pace and well below any possible maximums. By moderate we mean that if the Chinese achieved the earliest possible

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IOC of late 1972, the number of operational ICBM launchers in 1975 might fall somewhere between 10 and 25. In the more likely event that IOC is later, the achievement of a force of this size would slip accordingly.

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40. [redacted] Problems of this sort could lead the Chinese to limit deployment of this first generation system to a very small force.

41. In this connection, we note that a solid propellant facility at Hu-ho-hao-te reportedly has engine test facilities which suggest that rocket engines up to ICBM size could be produced there. Though a major attempt to develop a second generation system would almost certainly retard deployment of their first system, it is possible that the Chinese are looking ahead to a solid-fueled ICBM which could be deployed fairly readily in hardened sites. The Chinese probably would not be able to deploy a solid propellant ICBM before 1975 at the earliest.

42. There is no evidential basis for estimating the accuracy and reliability of China's first ICBM, but we believe that it will fall considerably below present Soviet standards. The Chinese could probably develop relatively simple exoatmospheric decoys, e.g., balloons, by the time of first deployment. The development of an effective chaff system and of sophisticated, endoatmospheric decoys almost certainly could not be accomplished by 1975. Multiple reentry vehicles are also unlikely to be available by this time. Though the first generation warhead may have some inherent hardness, we have no basis for making quantitative estimates about the hardness of this or future warheads.

E. Space Program

43. We believe that for reasons of national prestige the Chinese will attempt to orbit a satellite as soon as possible. The Chinese probably regard 1969 as a particularly auspicious year for such an event, combining as it does the 20th anniversary of the Chinese People's Republic and the planned 9th Party Congress.

44. It is possible that the Chinese might have an ICBM booster ready this year for a space shot. But, in view of the fact that the Chinese would almost certainly first want to flight test their ICBM booster, this seems unlikely. Thus we believe that if the Chinese attempt to orbit a satellite this year they will probably modify their MRBM for use as a space booster.