 dictation file

HANDLE VIA BYEMAN/
TALENT-KEYHOLE/COMINT
CHANNELS JOINTLY

~~T O P S E C R E T~~
LIMITED DISTRIBUTION

BYE-44373-66
Copy 3

DRAFT

Rec'd 19 Dec 66

TABLE OF CONTENTS

DRAFT

~~T O P S E C R E T~~
LIMITED DISTRIBUTION

HANDLE VIA BYEMAN/
TALENT-KEYHOLE/COMINT
CHANNELS JOINTLY

2 copy of 2 copies
Rec'd

CENTRAL INTELLIGENCE AGENCY

OFFICE OF NATIONAL ESTIMATES

19 December 1966

DRAFT

DRAFT

MEMORANDUM

SUBJECT: Certain Aspects of the Situation in the Mid-1970's

THE PROBLEM

To estimate the general nature of the overhead reconnaissance environment in the mid-1970's.*

FOREWORD

This paper has been prepared at the request of Chairman, COMOR, as a contribution to studies of long-term US overhead reconnaissance requirements. The principal objectives of the paper are: (a) to summarize those aspects of the probable strategic situation in the mid-1970's which will have an important bearing on overhead

* This memorandum has been prepared in ONE and is designed to represent our views as estimators. Although it was prepared with the assistance of a number of appropriate analysts and reconnaissance specialists in CIA, it does not necessarily represent their views about requirements.

reconnaissance requirements; (b) to consider various types of overhead reconnaissance systems -- mainly those now in R&D or under study -- in terms of their potential responsiveness to probable needs for information; and (c) to assess the chances that other nations could and would interfere with US attempts to collect information by means of overhead reconnaissance. In addition, at the request of Chairman, COMOR, we have considered the extent to which overseas bases may be available to support overhead reconnaissance activities in the mid-1970's.

Our assessment is limited to the problems of collecting intelligence information about facilities and activities on the earth's surface. We recognize that in the mid-1970's, there may also be important requirements for close-up observation of objects in space or even on the moon, but these are beyond the scope of the present analysis. Likewise, we make no attempt to take account of any intelligence bonuses which may accrue from such possible overhead reconnaissance programs as a survey of world-wide natural resources under NASA auspices.

Only those overhead reconnaissance systems which are designed to meet national or strategic intelligence requirements, as opposed to tactical or departmental needs, are considered. Finally, we do not consider possible wartime needs for overhead reconnaissance.

CONCLUSIONS

A. Our main foreseeable overhead reconnaissance requirements in the mid-1970's will continue to be for information on the strategic capabilities of the USSR and Communist China. In addition, the US will want to maintain a capability to conduct such reconnaissance against other nations which deny us access, especially those that develop a nuclear weapons capability or accept substantial aid from Communist sources. It is impossible, however, to predict what our specific collection requirements will be in the non-Communist world ten years hence. The capabilities of some nations will be important to our security interests and some crises will affect these interests, but many will not be of such importance and will have little relevance to overhead reconnaissance requirements. Thus, one of the most important considerations of overhead reconnaissance planning is to build as much flexibility as possible into at least some portion of our total capability. (Paras. 1-5)

B. The Soviet weapons mix in the mid-1970's will be sufficiently different from what it is now to complicate considerably our collection and analysis problems. The main changes will probably include a shift in emphasis from additional deployment of fixed strategic systems to modification and improvement of systems already deployed, as well as deployment of mobile systems. These differences will probably reduce somewhat the utility of general photographic search and surveillance, and increase our requirement for overhead collection of high resolution photography and especially of Sigint. In the mid-1970's our requirement for overhead reconnaissance of Communist China will probably be comparable to the situation which obtained with respect to the USSR during the early 1960's -- i.e. searching for and monitoring a largely fixed and readily identifiable strategic force. (Paras. 6-11)

C. We believe that a combination of high resolution and wide swath-width photographic satellite systems (like the KH-8 and KH-9) will satisfy virtually all those needs for intelligence on strategic capabilities which can be met by overhead photography. Satellite systems with resolutions [redacted] probably would not yield results commensurate with the cost of

developing such systems. A more flexible photographic system, capable of collecting and reporting fairly detailed information in near real-time, is needed to support national decision-making when and if a crisis situation warrants it. (Paras. 13-16)

D. The pressing need for access to the electronic environment over the Sino-Soviet interior will probably increase by the mid-1970's. Sigint satellites promise to provide regular access within the next few years, and by the mid-1970's may be among the best of our limited means of obtaining indications of enemy preparations for hostility. [redacted] sensors can supplement information from other overhead sensors, but the potential of [redacted] to make a significant contribution does not appear very great when compared to the photographic systems which are likely to be available through the next ten years. Manned orbiting vehicles could also be operational in the mid-1970's, but prospective improvements in unmanned systems may limit the unique contributions of space-borne operators at that time mainly to in-flight sensor repair and adjustment, and perhaps more rapid utilization of weather information and other target data. (Paras. 18-23)

E. By the mid-1970's satellite systems will have reduced or eliminated the need for photo-reconnaissance aircraft as routine collectors of information on strategic capabilities. Aircraft will probably not be required for Sigint collection except to supplement satellite and other collection methods in selected parts of the world not adequately covered by those means. Our requirements for aircraft as collectors of warning and crisis intelligence will be reduced to the extent that [redacted] satellites can satisfy requirements for these two purposes. By the mid-1970's, many countries will have acquired at least a limited capability for downing high-flying aerodynamic vehicles. Even though aircraft may still offer certain advantages over satellite systems for crisis reconnaissance, such advantages would have to be weighed on a case-by-case basis against the chances of harassment or shootdown and the chances that the use of aircraft would exacerbate the crisis. (Paras. 24, 25, 32-34)

F. The Soviets could have both nuclear and non-nuclear kill capabilities against satellites well before the mid-1970's, but we believe that they would seek to destroy US reconnaissance satellites only if they believed general war were imminent or in other special circumstances, such as an occasion in which they

believed they were retaliating against US interference with their own satellites. While we cannot exclude the possibility that several other countries may have a nuclear kill capability by the mid-1970's, we also doubt that they would employ nuclear weapons in peacetime against reconnaissance satellites during the next ten years. (Paras. 35, 36)

G. We believe the chances of physical interference short of destruction are nearly as low as the chances of outright destruction. Nevertheless, emerging technical possibilities over the next ten years -- especially in the field of electronic means, including lasers -- may lead some nations to try to interfere with the effective operation of our satellites, at least selectively. (Paras. 37-44)

H. Shifting national allegiances and enmities, and fluctuating degrees of instability, will continue to make long-term reliance on reconnaissance support bases in foreign territory questionable in the mid-1970's, particularly in the underdeveloped countries. Foreign governments are more likely to oppose the use of their territory for support of reconnaissance aircraft than satellites. (Paras 45-47)

I. Finally, we wish to note that the intelligence community's ability to make effective use of its emerging overhead reconnaissance capabilities will depend on the degree to which it can exploit and absorb increased amounts of information. We must emphasize that the magnitude of this problem will, in turn, be significantly affected by the extent to which flexibility and selectivity can be achieved in programming the collection effort. (Para. 31)

I. STRATEGIC ASPECTS OF THE ENVIRONMENT

Geographic Areas of Interest

1. Overhead reconnaissance systems are suitable mainly for observing military and other physical activities, and our most urgent needs are for information on potential threats to the US and its vital interests. Therefore our main foreseeable overhead reconnaissance requirements in the mid-1970's will continue to be for information on the strategic capabilities of the USSR and Communist China. This top priority will almost certainly not be affected in any substantial way by changes in the political context between now and the mid-1970's, including such otherwise important developments as changes in the temperature of relations among the US, the USSR, and China.

2. There will also be concern about growing Soviet and perhaps Chinese capabilities and intentions to project conventional military power into distant areas of the world. The Soviets in particular are now developing much improved air and sea lift capabilities. Their navy is beginning to operate more extensively in the open seas, and the trend is toward a considerable increase in its activities around the world. In most normal

circumstances, strategic overhead reconnaissance is not likely to be the best available means for monitoring the activities of elusive targets such as surface ships at sea, but there will probably be occasions when it can be a useful supplement to other collection means.

3. Although the USSR and China will probably be the only sources of direct strategic threat to the US in the mid-1970's, they will not be the only priority targets for overhead reconnaissance. [redacted] is an example of how an additional nuclear power can become an important object for collection unless it is forthcoming about its program. We have estimated that nuclear weapons and delivery capabilities may be acquired by some half dozen countries in the next 10 years, principally [redacted] other countries, such as [redacted] might attempt to obtain a delivery system from one of the more advanced countries. Circumstances will determine the urgency of our needs for intelligence information on the programs of such countries, and these will vary widely. But the US will want accurate information on the nuclear and delivery programs of any country, and overhead reconnaissance will have to play a part in gathering information about some of them.

4. In a more general sense, the underdeveloped world will remain a scene of shifting overhead reconnaissance requirements between now and the mid-1970's. The situation there will be characterized by fluidity of allegiances and enmities, and by fluctuating degrees of instability. Many countries in the underdeveloped world, and many conceivable crises occurring there will have little relevance to overhead reconnaissance. Nonetheless, the US will want to maintain a capability to conduct overhead reconnaissance against nations which deny us access to normal sources of information, especially those that accept substantial aid from Communist sources. Communist-oriented nations jeopardizing their neighbors will of course be candidates for surveillance. We can predict today that Southeast Asia and the Caribbean will continue to be areas of prime concern for the near future, but we will not necessarily have urgent requirements in either or both areas ten years hence. Indeed, it is quite impossible to predict the extent of our overhead reconnaissance requirements in the underdeveloped world in the mid-1970's, or to identify the precise areas or types of targets we will need to cover.

5. Overhead reconnaissance planning for coverage of such areas in the mid-1970's must allow both for uncertainties in the

objective situation and uncertainties about how US policymakers will view it. It is possible, for example, that the US will adopt a policy of disengagement in certain areas of the underdeveloped world in the belief that events there do not affect our vital interests. But intelligence planners must recognize that such a policy could change overnight with respect to a particular area in response to a particular set of developments. The challenge of a Korea, a Suez, or a Congo can and probably will arise again. This would seem to indicate that one of the most important requirements for overhead reconnaissance planning is to build as much flexibility and as rapid a reaction time as possible into at least some portion of our total capability for the mid-1970's.

Effect of Changes in Soviet and Chinese Strategic Capabilities

6. In its broadest aspect, the strategic relation between the US and the USSR will probably be the much same in the mid-1970's as it will be in the late 1960's. That is, neither side will be confident that it could launch a first strike against the other without receiving unacceptable damage in return, and both sides will be acutely conscious of the mutual devastation that

would result from a large-scale nuclear exchange. This relationship will have been maintained, however, at the cost of considerable additional development and deployment of offensive and defensive weapon systems by both sides -- that is, by another round or rounds in the arms race. The resulting Soviet weapons mix will be sufficiently different from what it is now to complicate considerably our collection and analysis problems.

7. In Soviet strategic offensive forces, there will be three main changes which will have a bearing on overhead reconnaissance requirements and which, in general, will somewhat reduce the utility of photographic surveillance and will make it more difficult for us to satisfy our needs for information:

First, a significant portion of the Soviet strategic missile capability in the mid-1970's will not be in fixed locations. At any given time, a number of missile submarines will probably be on station in the open ocean or en route to or from station. Many land-based MRBM/IRBMs will probably be on mobile launchers and some ICBMs may be similarly deployed.

Second, in the mid-1970's almost all Soviet strategic missiles will have designed reaction times of a few minutes at most, while slower-reacting systems like aircraft will have decreased further in importance as an initial strike element.

Third, and perhaps most significant for overhead reconnaissance in the mid-1970's, the main Soviet emphasis in improving strategic attack capabilities will probably have shifted by then from building more launchers to refining deployed systems and retrofitting new systems and components into existing launchers.

(as has the search for new complexes in the recent past). On the other hand, there will be a continuing and even increased need for high resolution photographic and Sigint collection of test range data on systems characteristics. Nevertheless, the missile retrofit problem is not likely to be solved by overhead reconnaissance.

8. Soviet strategic defense forces present different sorts of problems. Their deployment is necessarily fixed and in the open. Well before the mid-1970's, we expect wider deployment of the Tallinn defense system, completion of the Moscow ABM defenses and probably at least some additional deployment of ABM defenses, and an operational missile warning and space surveillance system using Hen House and similar radars. Any continuing deployment will be susceptible to identification by overhead reconnaissance while it is still in the construction stage, but an important feature of the Soviet program may be the modification of deployed systems to improve their capabilities and to counter new US countermeasures. The main problem in the mid-1970's will still be what it is now -- to learn the precise operating characteristics and vulnerabilities of defensive systems which may be quite different from those preferred by the US. Our experience to date suggests that high

resolution overhead photography can contribute marginally to the solution of this problem, but that the key may be interception of radar signals through overhead reconnaissance or other means.

9. Other aspects of Soviet military power will continue to be of strategic importance to the US in the mid-1970's. A number of factors point to some increase in the relative importance of information on Soviet ground, tactical air, tactical missile and naval forces. Among these factors are the increasing power of the Soviet nuclear deterrent, which will probably cause an increase in US concern for the possibility of Soviet non-nuclear military moves under the umbrella of mutual strategic deterrence. Moreover, there have been recent indications that the Soviets are seeking to increase the flexibility of their theater forces and to fit them better for non-nuclear contingencies. Finally, should the cohesion of NATO weaken further, or should the US withdraw significant elements of its forces from Europe (thus putting a higher premium on warning time to get them back), the US need for surveillance of Soviet and East European theater force concentration would probably grow.

10. In addition to the foregoing, a wide range of important supporting facilities and elements will be candidates for overhead reconnaissance of the USSR in the mid-1970's. For example, the lead-time required for US weapons development and the costliness and complexity of our weapon systems, assure that planners will not relax their pressure on intelligence to push back ever farther into the Soviet R&D cycle in virtually every field. There are severe limits to the capabilities of overhead reconnaissance in this respect, since Soviet drawing boards will remain indoors. Nevertheless, a very high priority will be placed on the gathering of information, by overhead reconnaissance and other means, which might help to determine the Soviet weapon system characteristics early in the testing phases of their development.

11. Communist China will probably be deploying both MRBM/IRBM and ICBM forces by the mid-1970's, though the missiles will probably be crude and not very numerous by US and Soviet standards. The Chinese may also have a limited capability for launching missiles from submarines, and they will be developing more sophisticated weapons. Our overhead reconnaissance requirements and China's susceptibility to collection from overhead vehicles in the mid-1970's will probably be comparable to the situation with respect

to the USSR in the early 1960's -- that is, we will probably be searching for additional deployment of a largely fixed and readily identifiable strategic force, counting and targeting missile sites, and monitoring for warning indications. We will also be wanting to check troop concentrations and other conventional activity, and, if Sino-Soviet relations deteriorate still further, will probably have an increasing requirement to monitor the Sino-Soviet border.

II. REQUIREMENTS FOR VARIOUS OVERHEAD RECONNAISSANCE SYSTEMS

12. In considering overhead reconnaissance for peacetime strategic intelligence purposes, three general objectives emerge as of primary concern: the collection of intelligence bearing on a nation's strategic capabilities; the collection of warning indications; and the collection of information required for national decision-making in crisis situations. In this section, we discuss the potential of various types of overhead reconnaissance systems -- mainly those now under development or study -- in these three areas, taking into account the previously discussed changes which might take place in the strategic aspects of the environment by the mid-1970's.

Photographic Satellites

13. The KH-9 system, which will be able to obtain three to five foot resolution photography of the entire Sino-Soviet area in a single mission, is to replace both the current KH-4 and KH-7 systems in the next few years. This system will be capable of responding to general requirements for search and surveillance of strategically important installations, and will provide a large body of indications intelligence. Its single-mission capacity

should reduce the number of missions presently required for routine search and surveillance. Despite the obvious advantages of the KH-9, however, there will be a continuing and possibly an increasing need for photography of higher resolution such as the [redacted] obtained by the KH-8 camera system. Such resolutions will be of importance in defining the parameters of new or modified weapon systems, and for closely analyzing activities whose gross dimensions are only suggested by other sources. We believe that a combination of high resolution and wide swath-width systems like these will meet virtually all anticipated needs for intelligence on strategic capabilities which are susceptible to collection by overhead photography.

14. Satellite systems with still higher resolution can of course, be developed, but probably would not yield results commensurate with their cost. It is doubtful, for example, that the analyst would learn enough more about the characteristics of a new missile system from, say, the planned [redacted] resolution of the KH-10 camera than he could from KH-8 photography. Only if resolution gets to the point where markings or such things as [redacted] are

discernible is higher resolution likely to be of significantly greater value. In addition, the narrower swath width of the KH-10 (on the order of one mile as compared with five miles for the KH-8) would create targeting problems and would sacrifice opportunities for the analyst to establish interrelationships between proximate objects at the time of coverage.

15. In addition to systems for regular and recurring strategic intelligence collection, a more flexible system is required for what is undoubtedly the most complex problem which the reconnaissance planner must face -- crisis situations. Uncertainties of time, place, duration, intensity, and geographic extent make crisis reconnaissance difficult. Furthermore, tactical intelligence has a way of taking on strategic importance in crisis situations as the decision-maker develops a need for the most timely and detailed information possible. Thus, if a reconnaissance satellite system is to be relied upon for crisis situations, we think it will need to be capable of remaining in orbit for extended periods of time (months rather than days), of repeatedly obtaining high resolution, wide swath-width photography of any point on the earth's surface on short notice, and of transmitting the resultant imagery to ground

receiving stations very soon after it is obtained. (These are termed [redacted] "near real-time" systems because of their ability to return information rapidly.) The quantity and quality of photography from such a satellite, moreover, must be sufficient to inspire the confidnece of the decision-makers who must act on the basis of the information obtained. While it is difficult to quantify confidence in terms of camera resolution, the photo analyst would likely be called upon to make the kinds of judgments he could derive from one to two foot resolutions: e.g., to determine the occupancy of missile and antiaircraft sites, the location of street barricades, and personnel concentrations, the type and direction of vehicular movement, the identity of bulk open cargo at staging areas and terminal points.

16. The cost of developing and effectively utilizing [redacted] near real-time systems will be enormous, and the cost increases with the number of reconnaissance contingencies which the system is designed to meet. A system designed to supplement other available means of gathering warning information need not necessarily provide repetitive or wide area coverage but should be able to photograph small targets (e.g. missile launch sites) on very short

notice and should be able to send the resultant imagery back to ground receiving stations [redacted] A system designed for crises reconnaissance, on the other hand, should have a capability to provide repetitive coverage of a wide geographic area, but need not necessarily be able to send the photography back to ground receiving stations quite so quickly. Because of the factors discussed in paragraphs 7 and 16 of this paper, however, we are dubious about the value of even [redacted] photographic means for providing useful strategic warning under the conditions which will be prevailing in the mid-1970's. It is likely, therefore, that near real-time satellite systems will suffice to meet those requirements which photography could realistically be expected to fulfill for both warning and crisis reconnaissance purposes.

17. We note that a number of technological improvements for existing or planned photographic reconnaissance systems are already under investigation and could be operational in the mid-1970's. Success in [redacted] for example, could increase the effectiveness of the above photographic satellites for strategic intelligence collection by enabling them to obtain [redacted] photographic

capability could also improve our ability to collect warning indications since many preparations for hostility [redacted]

[redacted]

[redacted]

Other Sensor Systems

21. Intelligence needs left unfulfilled by Sigint and photographic information can sometimes be met by data from other overhead sensors. [redacted] have proven useful in estimating activity levels at military and industrial installations. Utilization of [redacted] sensors may eventually

[redacted]

[redacted]

22. [redacted]

[redacted]

[redacted]

23. Manned orbiting vehicles are also under development for use in overhead reconnaissance. The operators of space stations like these are not likely to contribute much through visual intelligence reporting, since neither the analyst nor the decision-maker will be eager to base his judgments or actions on unverified visual reports from such stations. The operators will probably have a capacity for more efficient handling of costly and sophisticated overhead reconnaissance resources; even here, however, several potential attributes of manned vehicles, such as reliable in-flight processing and rapid and accurate retargeting, may be achievable in unmanned systems by the mid-1970's. Thus, the unique contributions of the space-borne operator in the mid-1970's may be limited mainly to his ability to repair and adjust sensors while in flight, and perhaps to take more rapid advantage of weather information and other target data.

Aircraft Systems

24. The political and operational hazards involved in the use of reconnaissance aircraft over denied areas, and the advent of satellite reconnaissance, have already made the collection of strategic intelligence information from overflying vehicles a rarity -- except in crisis situations or other special circumstances (e.g. Cuba). The capabilities of the KH-8 and KH-9 satellite systems will further reduce or entirely eliminate the need for photo-reconnaissance aircraft as routine collectors of information on strategic capabilities. The need for aircraft as collectors of warning and crisis intelligence will have been reduced by the mid-1970's by whatever extent [redacted] satellites can satisfy our collection requirements for these two purposes. The flexibility, reliability, and response time of aircraft, however, may still confer certain advantages for crisis reconnaissance purposes in the mid-1970's -- especially if a crisis arises suddenly and unexpectedly -- though the use of reconnaissance aircraft in a crisis directly involving the major powers will always carry the risk of exacerbating the crisis.

25. Aircraft will probably not be required for Sigint collection by the mid-1970's except to supplement other collection methods in those parts of the world which are not adequately covered by Sigint satellites. Of course, airborne photographic and Sigint platforms will still be required through the mid-1970's for the collection of tactical and some types of departmental intelligence information.

Continuing Limitations of Overhead Reconnaissance

26. It is in the nature of the warning problem that no overhead reconnaissance system, by recording military preparations and other physical activities, is capable of providing clear and unequivocal warning of a country's intention to attack the US. By the mid-1970's, monitoring even physical preparations by Soviet strategic attack forces will have moved several notches closer to impossible because of the continuing shift from bombers to missiles as the primary arm of Soviet strategic attack forces, the hardening of additional ICBM launchers, and the probable initiation of routine missile submarine patrols off the US coasts. Efforts will therefore need to be made to observe and analyze a broader spectrum of Soviet activities on a more timely basis merely to retain our present limited capabilities to obtain indications of Soviet preparations for attack.

27. As indicated in an earlier paragraph, research and development is another area in which overhead reconnaissance can go only so far. Overhead reconnaissance will not get us back as far as we want to go in the Soviet weapons development cycle, nor is it likely to prevent us from becoming more and more uncertain about such things as Soviet nuclear weapons development under the test ban treaty as time takes us farther from the 1963 base point.

28. Neither will overhead reconnaissance be able to answer all the questions of detailed weapons characteristics that may be critical in the mid-1970's. It will not tell us the exact nature and extent of the changes taking place at Soviet missile sites, for example, and, because of the general nature of these changes -- technological improvement as opposed to physical expansion -- it will leave many other questions about Soviet strategic capabilities unanswered. Nonetheless, overhead reconnaissance, and high resolution photography in particular, will be looked upon to help determine Soviet weapon system characteristics as early as possible in the testing phase.

Other Considerations

29. Although overhead reconnaissance systems are suitable mainly for collecting data on military activities, substantial amounts of economic, scientific and even political intelligence are also gathered from overhead platforms. Such information is almost always obtained as a by-product of the military intelligence collection effort, however. It is not anticipated, therefore that any overhead collection systems significantly different from those required for the collection of strategic intelligence will be needed to satisfy such requirements during the next ten years.

30. Future arms control agreements might call for overhead reconnaissance as a means for inspecting and supervising such agreements. In general, an arms control agreement probably would not significantly alter either US overhead reconnaissance capabilities or requirements except as specific provisions might facilitate or discourage such reconnaissance. An arms control agreement providing for adequate ground inspection would, theoretically, reduce the amount of overhead reconnaissance required for the collection of strategic intelligence. The most likely types of agreement, however -- limited both in scope and in

provision for inspection -- would probably result in no reduction and perhaps an increase in overhead reconnaissance requirements. It is unlikely that any such agreements would require new and different types of reconnaissance systems.

31. It should go without saying that the development and employment of the overhead reconnaissance systems discussed in this paper will involve the expenditures of large amounts of time and money. What we also want to emphasize is that investments in sensor and vehicle development must be accompanied by investments in the means of exploitation, analysis, and information control if we are to gain from a capability to watch virtually any area of the world, [redacted] and to retrieve the raw data almost at once. Processing of the large volume of communications which can be collected by a stationary Sigint satellite, for example, will have to be done automaticlly and will require further advances in automation techniques. Automation will also have to be applied more extensively to the collection, handling, and analysis of satellite photography without sacrificing the essential ingredient of substantive judgment by experienced analysts. The intelligence community's ability to make effective use of its emerging overhead

reconnaissance capabilities will thus depend on the degree to which it can exploit and absorb increased amounts of information. But we must emphasize that the magnitude of this problem will, in turn, be significantly affected by the extent to which flexibility and selectivity can be achieved in programming the collection effort.

III. CHANCES OF HARASSMENT AND DENIAL

Aerial Reconnaissance

32. By the mid-1970's, all but the most technologically backward countries probably will have, or will be able to acquire, the capability to detect reconnaissance aircraft overflying their territory. Many countries, including a number in the under-developed world, will have acquired at least a limited capability for downing high-flying aerodynamic vehicles. The USSR will have widely deployed its Tallinn-type defensive system, and regardless of whether this system is SAM or ABM, it seems likely that it will have significant capabilities against vehicles of the U-2 and SR-71 types. The Tallinn system will almost certainly not be deployed anywhere outside the Warsaw Pact area in the mid-1970's. The Soviets will also have retained a number of their more up-to-date SA-2's, and increasing numbers of Communist and other countries will probably have acquired these or earlier versions.* The SA-2 has proved itself capable of intercepting and destroying the U-2. The capabilities of its several versions against more advanced

* Even such countries as Mali, Afghanistan and Outer Mongolia, have already acquired or are reportedly about to receive SA-2's.

aircraft such as the SR-71 will probably remain a subject of continuing uncertainty and concern. Overhead reconnaissance planners may be able to calculate with considerable confidence that such aircraft can survive in an SA-2 environment by virtue of its speed, altitude and ECM capabilities. But they will not be able to give the US policymaker a firm guarantee against the loss of an aircraft and crew in a hostile country through shoot-down or malfunction.

33. During the period under ~~construction~~ consideration, any Communist country (except perhaps for Cuba) probably would attempt to prevent, by whatever means available, unauthorized flights over its territory by US reconnaissance aircraft. The actions of non-Communist countries, and of non-aligned nations in particular, will be less predictable, especially in crisis situations. Countries allied with the US probably would make informal inquiries as to our intentions; others probably would register strong diplomatic protests; some would take more vigorous action, perhaps including attempts at shootdown.

34. Thus, the political and operational hazards involved in the use of reconnaissance aircraft, together with improvements in

satellite reconnaissance techniques, will almost certainly combine to virtually preclude the collection of strategic intelligence on denied areas by overflying manned aircraft in the mid-1970's. While aircraft may still offer certain advantages over satellite systems for crisis reconnaissance, such advantages would have to be weighed on a case-by-case basis against the chances of harassment or shootdown and the chances that the use of aircraft would exacerbate the crisis.

Satellite Reconnaissance

35. Destruction. The Soviet Union may already possess a nuclear kill capability against satellites. When their new space surveillance radar system becomes operational in 1967-1968, the Soviets may be able to destroy satellites in orbit near the earth without resorting to nuclear weapons after the satellites had passed over the USSR a few times. In considering the possible use of such capabilities, however, they would recognize that the destruction of US reconnaissance satellites would upset US-Soviet relations, would expose their own satellites to counter attack, and might even stimulate Western military programs -- particularly if the Soviets undertood a widespread antisatellite campaign.

Attacking manned reconnaissance satellites would carry even graver consequences. We believe, therefore, that the Soviets would seek to destroy US satellites only if they believed general war were imminent or in other special circumstances, such as an occasion in which they believed they were retaliating against US interference with their own satellites.

36. We cannot exclude the possibility that several additional countries may also have a nuclear kill capability by the mid-1970's. Largely because of the international disapprobation which would ensue, however, we doubt that either the USSR or any other country capable of doing so would employ nuclear weapons in peacetime against reconnaissance satellites during the next ten years. Communist China is a possible exception, however.

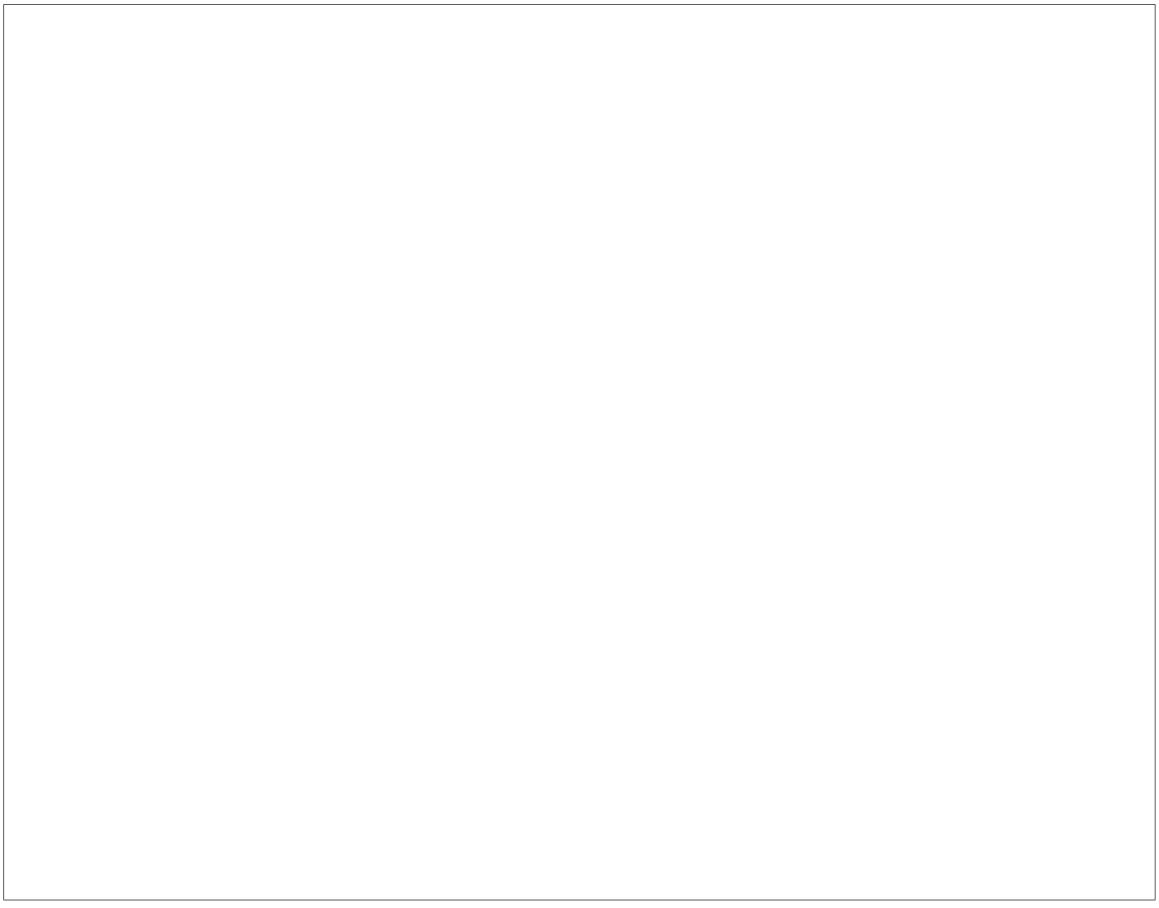
37. A number of means for interfering with satellite reconnaissanee vehicles short of destruction probably will become available by the mid-1970's. These could include physical interference from manned, co-orbiting platforms, jamming of satellite command and control communications, and the use of lasers against satellites. In general, we believe the chances of physical interference short of destruction are nearly as low as the chances of

outright destruction, and for the same reasons. Diplomatic protests or attempts at camouflage and concealment are serious possibilities, however, and when considering a period as long ahead as 10 years, overhead reconnaissance planning must take account of the emerging technical possibilities for actual physical interference.

38. Diplomatic Means. Diplomatic protests against satellite reconnaissance by any of the major powers might be interpreted as a sign of weakness by others unless backed up by the capability actually to interfere with the offending satellites. There is not now any international covenant against the free use of space so long as the vehicles involved do not contain weapons of mass destruction, and we doubt that either of the two principal space users will press very hard for a more restrictive covenant in view of their expanding use of space systems for reconnaissance and other military support. We doubt, therefore, that any of the major powers would pursue diplomatic protest as a means of interfering with US satellite reconnaissance programs, unless such protests were a prelude to more serious and far-reaching antisatellite efforts.

39. Some of the lesser powers, however, -- the non-aligned nations in particular -- might begin to see or imagine a threat to their own interests in the military space programs of the major powers, or might seize upon such US or Soviet programs as one of a number of grievances against either or both countries. While a concerted diplomatic campaign in the UN or elsewhere against US satellite reconnaissance programs might prove embarrassing, it would not pose a direct threat to those programs and is thus not likely seriously to jeopardize our satellite reconnaissance effort.

[redacted]



43. Jamming. Electronic jamming of satellite command, control, and readout communications could probably be used by the mid-1970's to interfere with satellite reconnaissance. Planned US satellite reconnaissance communications systems will, however, be designed to make jamming difficult. As the sophistication of our communications techniques increases, such jamming will become even more difficult. Further, Soviet jamming efforts would be

readily apparent to US intelligence and probably could be countered. It seems unlikely, therefore, that jamming of control or readout communications would be a practicable means for regularly disrupting satellite reconnaissance. [redacted]

[redacted]

44. Lasers. By the mid-1970's, lasers may be one of the most effective possible means of interfering with reconnaissance satellites orbiting near the earth. By then, anti-satellite lasers may be capable of doing anything from causing the overexposure of a portion of a single frame of satellite film to causing malfunction of critical system components (thereby bringing about the failure of an entire mission), possibly without the cause becoming apparent to the offended party. This relatively discreet and largely covert capability for interfering with reconnaissance satellites may encourage the development of lasers for this role. The Soviet Union probably could have lasers capable of such employment by the mid-1970's, and several other countries -- both East European and non-Communist -- might also be able to achieve a limited capability in this field. What this

means in terms of a specific threat to US reconnaissance satellites is difficult to measure in the abstract, but the potential advantages of lasers in this role seem to be great and they offer the option of selective use to minimize the risk of retaliation.

IV. AVAILABILITY OF OVERSEAS BASES

45. As noted in our earlier discussion of the geographic areas which the US might be interested in for reconnaissance purposes in the mid-1970's, the situation throughout much of the world will be characterized by fluidity of allegiances and enmities and by fluctuating degrees of instability. The same factors that make it difficult to predict what our specific overhead reconnaissance requirements will be in the non-Communist world ten years hence make it equally difficult to predict what countries will be amenable to having US overhead reconnaissance support bases on their territory.

[redacted]

[redacted]

In view of the uncertainties involved in the long-term availability of such satellite support bases, however, prudence would seem to

dictate that every effort be made to limit those bases to US territory, and that future reconnaissance satellite systems make use of satellite relay and on-board "record and dump" capabilities in so far as possible. The utilization of relay or record and dump capabilities would not only eliminate the political and security problems inherent in any reconnaissance satellite support station located on non-US territory, but would enable the more timely handling of satellite-derived intelligence data.