

WORKING PAPER

VEHICLES FOR OVERHEAD RECONNAISSANCEINTRODUCTION:

The importance of overhead reconnaissance has continually increased in importance from June 1956, when the results of the first U-2 flight were available. The insatiable appetite for current intelligence as a basis for decision making has led this nation to commit

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for strategic overhead reconnaissance during recent years. In spite of these high costs, the value of the intelligence has made it prudent to underwrite these programs even though the more classic methods of intelligence procurement did not receive similar stimulation. This has resulted in a heavy dependence on photographic and electronic surveillance from above and while we may not have all of our eggs in one basket, it is evident that we are not well balanced. Until the first U-2 operational loss was incurred in May of 1960, this vehicle carried the heavy burden of overhead reconnaissance. However, foresight enabled us to have an alternate system ready and by August of 1960 the first successful photographic satellite, Corona, was flown. In spite of the fact that the OXCART vehicle was introduced in December 1965, and the satellites have

NRO review(s) completed.

USAF review(s) completed.

carried most of the overhead surveillance load for the procurement of strategic intelligence, Agency U-2 program has had some notable successes, such as missile discovery in Cuba. A succession of orbiting vehicles (Annex I) has provided an ever increasing capability at a directly proportionate rise in costs. Aerodynamic vehicles, manned and unmanned, have also been introduced with varying degrees and os success, /have contributed considerably to strategic intelligence. However, recently they have been limited almost exclusively to tactical and operational intelligence.

Satellites undoubtedly offer the best facility for satisfying strategic intelligence needs in today's environment. This being the case, our primary concern focuses on enemy capabilities to neutralize them although some attention must be directed toward using them only where they are cost effective. It is under these conditions that it is desirable to assess the value of the aerodynamic vehicle, both in the present environment and as a fall-back position in the future.

In making this assessment, costs, vulnerabilities, and growth potential will be reviewed as they apply under varying circumstances, and to the different vehicles. Political acceptability and their use in maintaining forward bases through friendly alliances will also be

covered. The virtue of maintaining an existing aerodynamic capability without continued enhancement of that capability through research will also be explored. The virtue of separate SAC and Agency U-2 fleets will be reviewed.

SUMMARY:

The Agency U-2 program is essential in crisis management situations and as a base for the development of systems that have the only current hope for survival in a hostile environment.

The U-2 can respond to crisis situations anywhere in the world within 50 hours. It can operate from friendly foreign bases, which provide plausible denial, or from carrier decks to cover highly critical military targets or politically critical revolutions, migrations or suppressive activities of governments. It operates cheaply, on a timely basis, and can take advantage of weather breaks. Defensive systems negate its capability for military intelligence over high priority targets over the Soviet Union but it is still highly useful over China and all other nations, particularly in the procuring of high value, unique, ELINT information.

The Agency U-2R program also serves as a base for a small R&D effort which to date has defined two flight regimes in which maneuvering

aerodynamic vehicles can probably survive a totally hostile environment. Considering the very high vulnerability of satellites it can be expected that decisive military action could be preceded by neutralization of opposition satellites. In such a case, aerodynamic vehicles are the only recourse, recognizing that continuous research is necessary to meet this threat.

In continuing the Agency U-2 program, we retain the low cost crisis management aid available anywhere in the world, an understanding of the Chinese electronic capabilities, an informal political base with foreign governments which can be expanded as needed, and a research and development insurance policy to provide some capability if all else is lost.

CONCLUSIONS:

It is obvious that satellites can contribute more to strategic intelligence than aircraft can at the present time, particularly if cost is not a factor. To date, systems have been considered individually rather than by over all planning of collection by the most cost effective system. Difficult political decisions have been solved by placing more money on those systems having no chance of embarrassing political consequences. Very small hedge bets have been placed on those systems which hold the only chance of procuring intelligence in a truly critical

strategic situation. It is difficult to justify budgets for systems to be used in the event of catastrophe, when catastrophe seems so remote.

The decision to be made is whether or not  is a fair premium for insurance that accrues all of the advantages discussed above, either during the life of the policy or when it is finally, if ever, redeemed. This country can operate without the U-2R; it can operate in SAC; and it can operate as a stagnant program with no future. However, foresight for the life of the nation dictates that an ongoing U-2R program with adequate research and development be approved and the virtues of Agency management make it prudent to continue operations in that sector.

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DISCUSSIONS:

The primary aerodynamic vehicles presently available are U-2R, OXCART and SR-71 aircraft and the 147 H/T and TAGBOARD Drones. At present the Agency has the capability to deploy the U-2R's throughout the world from Edwards Air Force Base.

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The OXCART vehicles, which have considerably more capability than the U-2, (Annex II) are in storage after having only a brief but highly successful operational

exposure. The SR-71 is operating successfully over North Korea and North Vietnam and the 147 H/T is operating successfully in Vietnam and most recently South China. The single operational TAGBOARD mission was not completed.

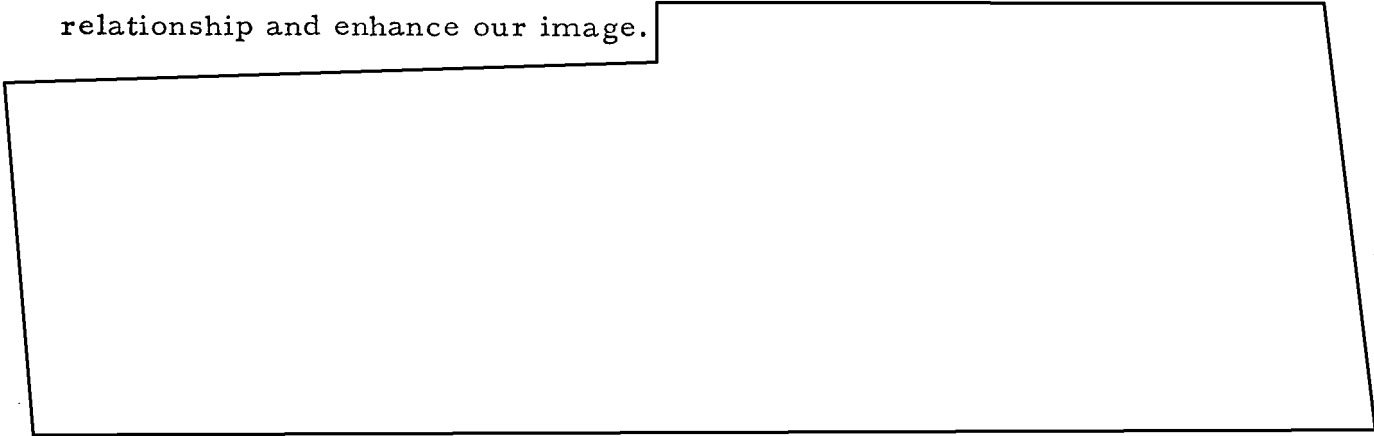
In general, the U-2R's of both SAC and the Agency can survive in the same environment. Both are vulnerable to SA-2's and to some extent to MIG-21's and Mirages. Operations therefore require careful circumnavigation of SA-2 Sites, and the utilization of flight plans to negate the capability of the intercept aircraft. Even if unexpected SA-2's are encountered the pilot does receive warning and can take evasive action. Tail warning devices also permit timely defensive maneuvers for aircraft intercepts. Both obtain high resolution photography (Annex III) and Agency aircraft procure  NRO 25X1

The OXCART, the SR-71 (Annex IV) and to some extent the TAGBOARD, have capabilities which permit them to survive in the same environment. All are marginally vulnerable to the SA-2's and certainly to follow-on systems such as SA-5 Tallin and the Galosh ABM. (Annex V) All are invulnerable to all other known aircraft. Both the OXCART and SR-71 have warning devices which dictate defensive maneuvers in hostile situations. Both manned vehicles obtain high resolution photography  TAGBOARD specifications 25X1

indicate that resolutions of two feet can be expected. The 147 H/T has been used most extensively in Vietnam. Used primarily for tactical intelligence it has a resolution of from two to five feet from an altitude of 68,000 feet.

Although all aerodynamic vehicles are somewhat vulnerable to enemy military capabilities, they are particularly vulnerable to political decisions. The fact that they can be shot down creates a situation very close to a warlike act and this sometimes is unacceptable to this country, particularly in an era of trying to better international relationship and enhance our image.

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Total costs of the various systems are elusive and hard to identify. Military overhead and support is difficult to break out and the diversified activities of the people and bases associated with Agency programs make allocation of costs difficult. (Annex VI) In spite of this, it is easy to recognize the great disparity in costs between the U-2R and any of the new satellites. Although almost any figure will be arguable,

This

does not consider the great variation in the amount of photography obtained by each system, but even on a per square mile cost basis U-2R photography is only a small fraction of the cost of satellite photography.

The vulnerability of satellites is also pertinent to the need for an ongoing reconnaissance program utilizing aerodynamic vehicles. Although virtually invulnerable a few years ago, it is now generally conceded that either the United States or the Soviet Union can neutralize any or all vehicles of the opposition when they so desire. (Annex VII) To date, there seems to be a standoff which is dictated by an expectation that any such action would bring a reprisal in kind. It can therefore be reasonably expected that any enemy preparation for decisive military action would be preceded by a neutralization of opposition satellites. In other words, they will poke our eyes out before they kick us. In such a case, aerodynamic vehicles are our only recourse, recognizing that without continuous research, even this capability cannot be ready and cannot operate for long.

The real hope of establishing a fall-back position for coverage of the Soviet, as well as the non-Soviet environment lies in research and development related to survivable aerodynamic vehicles. Work



done so far has identified only two flight regimes which offer a considerable chance of survival of the vehicle. Investigations in both the High Explosive and Nuclear environment have been studied and indicate varying potentials.

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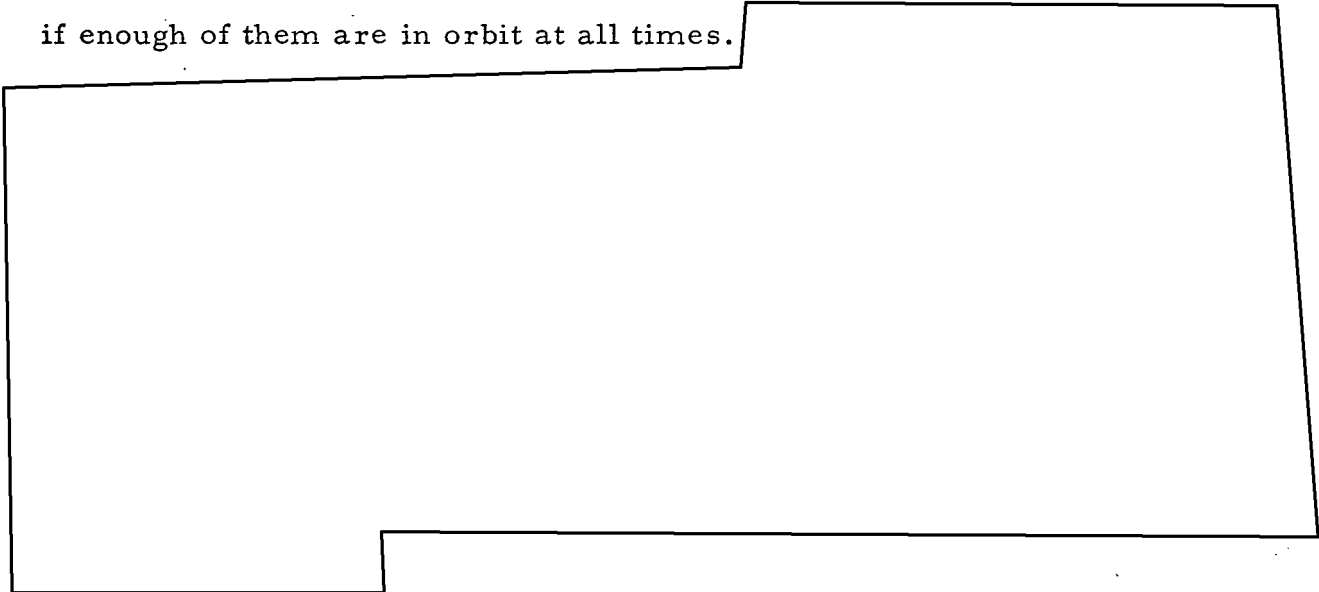
Specifically then, what advantages would accrue from maintaining a U-2R reconnaissance capability? The need of most immediate importance in considering the maintenance of the U-2R capability relates to its ability to respond quickly to cover crisis situations. Deployment to any part of the world, ready for operations can regularly be achieved in 50 hours. It is then in position to maintain surveillance on any schedule desired within the limits of daylight and cloudiness. The primary advantage it has over satellites in this regard is that it can take advantage of short breaks in the weather not available to the regularly orbiting vehicles.

Although this advantage is not as decisive in highly defended areas, there are still many world situations on all continents which require overhead reconnaissance and are in areas that are not highly defended. Typical of these are the Mid-East, border areas of Europe, Africa,

South and Central America. With the operation of U-2R's from carriers, most areas can be reached without any foreign base agreements.

It is not argued that satellites cannot provide the same coverage if enough of them are in orbit at all times.

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Secondly and probably most critical is the backup capability if orbiting vehicles are neutralized. Presently available drones can handle part of the job but have no maneuver capability responsive to unanticipated threats encountered during the mission. Vulnerable as they are, the world situation would necessarily be so critical, and the needs for intelligence so great, that the risks would be acceptable. A few SR-71's are available to enhance the U-2 capability but the nine OXCART vehicles in storage would take a minimum of 12 to 18 months to put in an operational status.

Problems which arise in the consideration of U-2R utilization by CIA also relate to cover. Solution of these problems has been one of the



In considering whether the U-2R capability should exist in both the Agency and SAC, or should be consolidated in one or the other, the arguments draw heavily from past experience and auger heavily that the Agency should retain a U-2R capability.

Historically, the U-2 capability was developed by the Agency and throughout the years all of the collection and defensive improvements have been developed there. Systems developed relatively cheaply under this program have been used by the military services to great advantage both from the point of view of cost and improved capability. It has also been generally recognized that the Agency system of procurement, which is possible because of its small size, can respond more rapidly, securely and effectively than most other systems. In addition, engineers do not

migrate to any extent but live within narrowly defined problem areas most of their careers. The virtue of the system can be argued but the success it has achieved is irrefutable.

Operations have been just as successful with both the U-2 and the OXCART. In spite of the fact that the Air Force is now operating U-2's and finally SR-71's successfully, there is no question that the Agency has always conducted highly professional and efficient operations. With the consistent pressure to transfer operational responsibility to the Air Force after development in the Agency - whether it be aircraft or satellite - it cannot be expected that the Agency can maintain the highly capable teams necessary to continually come up with new systems. Although the decision must essentially be based on "need" it is recognized that retention of a U-2R capability in the Agency brings with it a continuing capability for progress at a very reasonable cost.

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Response time by the Agency organization would be hard to improve upon. Within 50 hours of an alert, aircraft and complete support can be in position and ready for deployment. Complete agreement for film processing [redacted] by the Air Force have been worked out and are effective. Although the military could be expected to effect a similar deployment pattern, the fact that Agency personnel have long tenure in their jobs tends to smooth and retain good relationships as well as retain the initiatives. [redacted]

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[redacted]

A final point in retaining an Agency U-2R capability pertains to the closeness of intelligence analysis and operational personnel. Complete dependence does not have to be placed on reports as all source information is available the moment it arrives in Washington. In addition, highly skilled analysts with expertise in every part of the world are available for complete discussion of problems.

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ANNEX II - Capability of U-2 and OXCART

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ANNEX IV - Capabilities of OXCART, SR-71's, TAGBOARD, 147H, 147T

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ANNEX IX - List of World Situations Which Could Have used U-2  
Reconnaissance

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ANNEX IX

WORLD SITUATIONS

In past few years several periods of international tension have occurred in widely separated areas of the world in which the U-2 could have been deployed to provide reliable timely information on these events. Such crises as the June 1967 Israeli-Arab conflict, the August 1968 invasion of Czechoslovakia, the Chinese-Soviet Manchurian Border incident to name a few. In all of the above instances by proper flight planning so as to avoid known SAM Sites (even those with the advanced SA-2 SAM System) the U-2 could have provided meaningful photographic inputs for the analysis of the activity.