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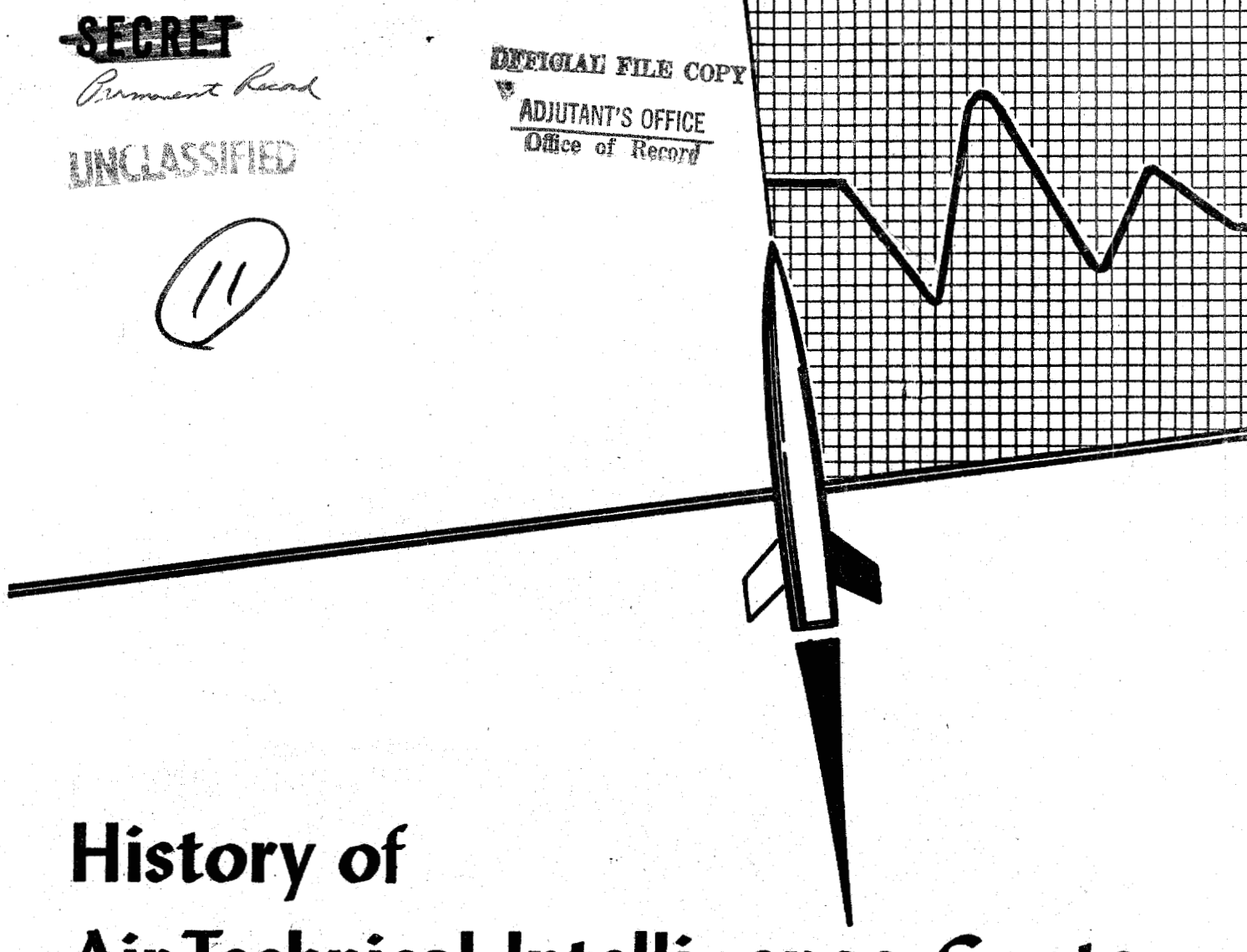

History of
Air Technical Intelligence Center
(AFCIN-4)

WRIGHT-PATTERSON AIR FORCE BASE, OHIO

1 JANUARY 1957 - 30 JUNE 1957

COPY NR. 4

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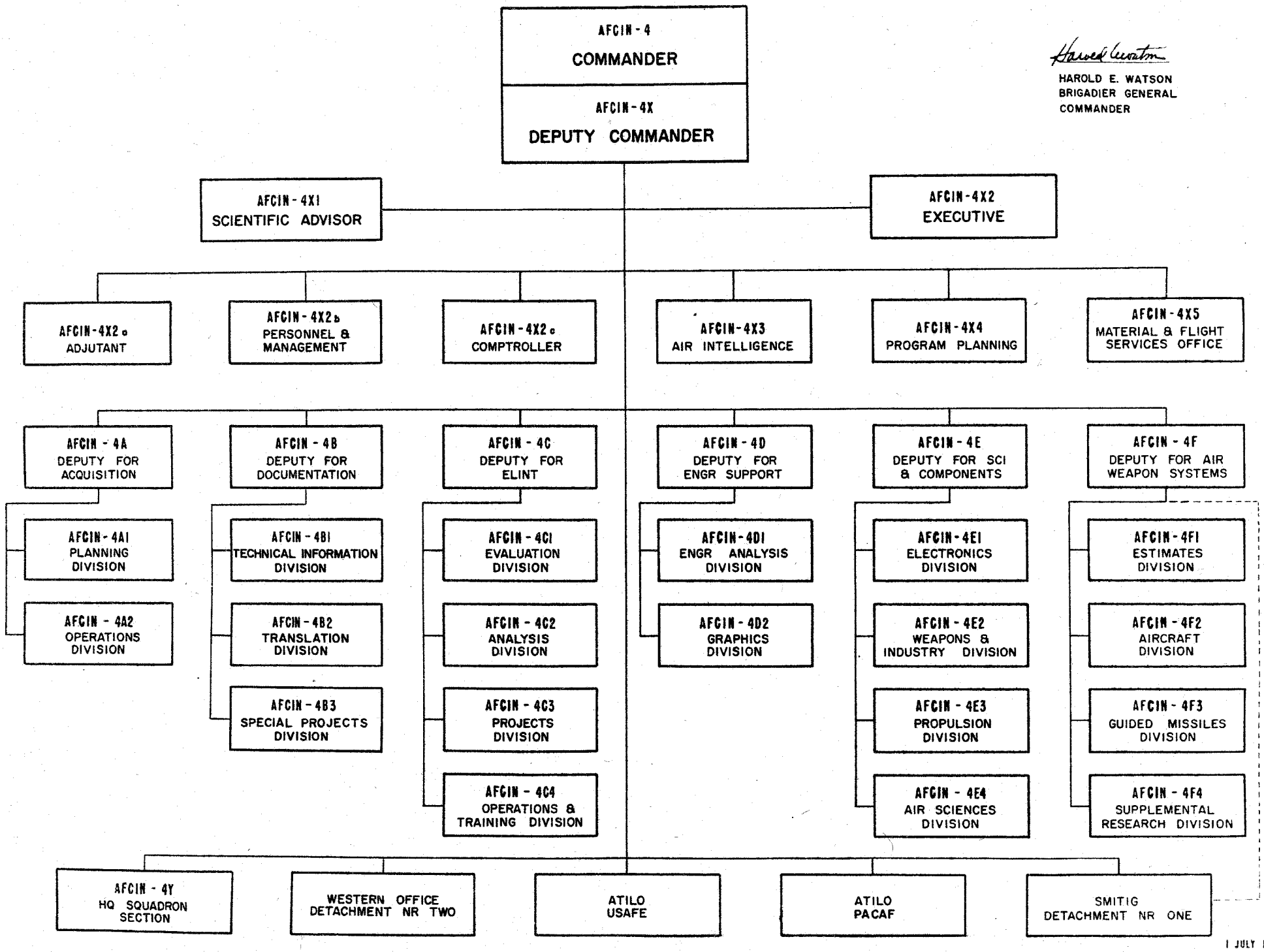
AIR TECHNICAL INTELLIGENCE CENTER



1 JULY 1957

HISTORY OF

AIR TECHNICAL INTELLIGENCE CENTER

(AFCIN-4)

Wright-Patterson Air Force Base

Ohio

1 January 1957 - 30 June 1957

Prepared by

Air Intelligence Office

AIR TECHNICAL INTELLIGENCE CENTER

31 July 1957

Copy No. 4
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FOREWORD

TO THE HISTORY OF

THE AIR TECHNICAL INTELLIGENCE CENTER
(AFCIN-4)

For the Period

1 January 1957 - 30 June 1957

This edition of the History of the Air Technical Intelligence Center reflects an emphasis on improved capabilities for coping with scientific problems, directing programs toward feasible objectives, and obtaining professional services to support the production of air technical intelligence.

Programmed activities of the Center are presented in separate chapters. Production activities reflect the degree to which requirements for intelligence implicit to the mission of ATIC were met. Footnotes, if any, are listed at the end of each chapter.

SECTION I

ATIC ORGANIZATION AND MANAGEMENT

CHAPTER 1

COMMAND ACTIVITIES

SIGNIFICANT VISITS AND BRIEFINGS

The Commander and Scientific Advisor attended the Annual Meeting of the Institute of the Aeronautical Sciences in New York, N. Y. on 28 and 29 January. (UNCLASSIFIED)

The ELINT Advisory Committee held its February meeting at ATIC. Members of the committee who attended were Capt Carmichael, USN, Colonel Persons, USA, Mr. Clark, CIA, Colonel Richman, AFCIN-Z, and Capt Grady, USN. ATIC directors briefed the committee on their respective relationships to the over-all ELINT program of the USAF. (UNCLASSIFIED)

General Watson attended the National Jet Age Conference of the Air Force Association in Washington, D. C. on 15 February. (UNCLASSIFIED)

On 18, 19, and 20 February, members of the Policy Executive Panel Committee of the Directorate of Intelligence, USAF, visited the Center to familiarize themselves with the Center's operations and to take action on ATIC procurement proposals which required consideration and approval by PEP. (UNCLASSIFIED)

During February, the Advanced Fighter Interceptor Board and the Electronics Communication Panel of the Scientific Advisory Board visited ATIC. ATIC representatives presented to the SAB Panel problems which confront AFCIN-4 in the fields of Communications, Yo-Yo, Radar, and ELINT. This meeting afforded the trading of intelligence information on a need-to-know basis for scientific counsel at the highest level of competence. (CONFIDENTIAL)

Colonel William Davis of the Office of Scientific Research in Washington visited the Center on 18 March to present a briefing to the Directors and key

personnel of the Center. (UNCLASSIFIED)

Group Captain R. B. Ingalls and party of six visited the ATIC on 8 and 9 April for the purpose of discussing ELINT activities. Group Captain Ingalls is Director of Intelligence for the RCAF. (UNCLASSIFIED)

On the afternoon of 15 April, Lt Col Werner Boie, Director of Intelligence, German Air Force, visited the ATIC. Colonel Boie was touring certain USAF installations on a general orientation and familiarization basis, highlighting counterpart command organizations. (UNCLASSIFIED)

Mr. Richard E. Horner, Assistant Secretary of the Air Force for Research and Development, members of his staff, and other USAF representatives, visited the ATIC for an intelligence briefing on 19 April. (UNCLASSIFIED)

On 23 April, General Orval R. Cook, USAF (Ret), President of Aircraft Industries Association visited General Watson for a discussion of plans for the establishment of a Clearing Panel for ATIC programs. ~~(CONFIDENTIAL)~~

On 2 May, General Watson lectured to the faculty and students of the Air War College, Maxwell AFB, Alabama on "Future Soviet Weapons Development." ~~(CONFIDENTIAL)~~

General Watson and Mr. Arcier attended the Spring Meeting of the Scientific Advisory Board at Patrick AFB, Florida on 20 and 21 May 1957. General Watson briefed the meeting on 21 May 1957 on the threat the USAF faces, with emphasis on ICBM, and the problems that must be solved. ~~(CONFIDENTIAL)~~

General Watson and Mr. Arcier visited the National Academy of Sciences' Study Group at Woods Hole, Mass. on 24 and 25 June. General Watson opened the meeting on the second day with a technical intelligence briefing. (UNCLASSIFIED)

EXTERNAL RELATIONSHIPS:

The ATIC Scientific Advisory Group (SAG) has established good working relationships with the Scientific Advisory Board (SAB) of the Air Force and thereby strengthened greatly the scientific capability of the Center for directing its program toward feasible objectives. Center briefings have been given before the whole SAB and to some of its panels. It has been arranged for all panels of the SAB to meet at ATIC during the first half of FY-58. The nuclear panel of the SAB has set up an ad hoc panel with representation from the nuclear panel, the aircraft panel,and the fuels panelto come to ATIC and review all the material which was used in determining the Center's ANP estimates. (~~CONFIDENTIAL~~)

The SAG further strengthened its capability to cope with the Center's scientific problems by establishing personnel working relationships with the AFOSR. This exchange basis serves as an in-depth support to the SAG as well as a guide to "indicators" for intelligence investigation. ATIC planned the organization of a panel of evaluators, available on a routine basis, at nearby universities to supplement the scientific consultants of the Center. (~~CONFIDENTIAL~~)

The SAG recommended positive action to arrange a combined educational-work program that would benefit the analyst and at the same time better prepare him to fulfill his responsibilities at the Center.

The SAG has projected a concept for the future position of literature evaluation and exploitation in the ATIC structure. It has enlarged the emphasis on the collection and evaluation of scientific papers in such areas as fluid mechanics, wave propagation, elasticity and plasticity, and nuclear cross-section. It has supported enlarged attacks on such collection areas as "unconventional methods of propulsion", provided guidance to the collection efforts of special

projects, and evaluated many of the reports. This type of collection has been modified for improved responsiveness to the needs of the analysts. (~~CONFIDENTIAL~~)

CHAPTER 2

MANAGEMENT AND CONTROL

PLANS AND PROGRAMS:

ATIC undertook review of the Program-Project-Task (PPT) System during the first half of 1957. This included a comparison of programs for duplication and propriety of mission for the Air Technical Intelligence Center, and a consideration of the more remote problems concerned with scientific feasibility. This included review of the scientific consultants' PR's to determine the relation of this work to that of Project White Stork (Battelle Memorial Institute) and of CIA for justification of the number of ATIC consultants and a study of comparative costs. (~~CONFIDENTIAL~~)

Implementation of the ATIC Program-Project-Task (PPT) System began during this report period. This included the final development, publication, and use of the PPT Index, the development and use of project summaries, the use of the PPT structure as the basis for development of the FY-59 Budget Estimate and for initiating FY-58 expenditures, use of the project summaries for FY-58 program presentations to the Policy Executive Panel of the Director of Intelligence, USAF, and for preparing the defense of the FY-59 Budget Estimate; and the use of the PPT Index as the basis for developing and implementing a revised job-time reporting procedure. (UNCLASSIFIED)

FINANCIAL AND CONTRACT MANAGEMENT

ATIC developed a Purchase Request Numbering System for FY-58 during this report period. This system will serve as a management tool to provide information on budget projects, initiating directors, etc., without reference to other documents; and improved control without a requirement for additional resources. (UNCLASSIFIED)

The Director of the Air Technical Intelligence Center, AMC procurement personnel, and contractors exerted concentrated effort to put on contract all FY-57 purchase requests on which acceptable proposals were received. (UNCLASSIFIED)

Arrangements were made to mechanize a part of the job time reporting system in order to provide manpower with statistical data on utilization of labor by PPT number and work category within the PPT number. (UNCLASSIFIED)

New format for "Dollar for Dollar" was devised to provide additional data such as budget line item, short description of contractual work performed under each task, and utilization of labor by work category. (UNCLASSIFIED)

The Center evaluated various Project Initiation Forms (PIF's) in relation to proposed budgetary and other considerations. An example of this was the radar echo project proposal. (Questions often arise in connection to PIF's concerning whether the proposal is within the mission of ATIC, and which organization has primary interest in the work requested.) The Scientific Advisory Group of ATIC raised questions concerning the feasibility of requiring a 1-db accuracy and the propriety of the radar echo project's being an intelligence rather than a research and development function. The SAG recommended to limit the amount spent on the project to that required to determine whether the PI data available in ATIC will permit models to be built so that sufficiently accurate echo areas may be measured. (~~CONFIDENTIAL~~)

ORGANIZATIONAL MANAGEMENT:

In April, the Deputy for Material Support was discontinued and two components established in its stead: (1) the Deputy for Documentation and (2) the Material and Flight Services Office[1].

With the establishment of the Deputy for Documentation, responsibility for management of contractual assistance for document research and exploitation was

transferred from the Program Planning Office to this deputy. A change was also made in the method of researching documents. ATIC discontinued the Reading Panel and transferred full responsibility for document research to the contract facility (Battelle Memorial Institute). Reason for this change was the excessive amount of time required of technical personnel by Reading Panel activity.

(CONFIDENTIAL)

The new Deputy for Documentation was assigned responsibility for technical library reader-reference and translation services, giving new emphasis to professional services in support intelligence production. (UNCLASSIFIED)

The material and flight services functions of the former Deputy for Material Services were transferred to a new staff office. The material services responsibilities assigned to the Material and Flight Services Office were primarily for logistics and physical plant management. "Logistics" include regular and specialized supply requirements and distribution, physical handling of materials, and stock records. In addition, this office schedules the use of assigned motor vehicles for transporting personnel and materials. Flight services consist of scheduling assigned aircraft and assistance to rated personnel in maintaining flying proficiency. (UNCLASSIFIED)

At the same time the Material and Flight Services Office was established, the Security Office was discontinued and its functions transferred to the Adjutant's Office (Security Branch)[2]. (UNCLASSIFIED)

Also in April, complete responsibility for the personnel phases of the ATILO program was transferred to the Personnel and Management Office resulting in the discontinuance of the ATILO Activities Branch of the Deputy for Acquisition[3]. This change clarified responsibilities, eliminated overlap of effort,

gave to the ATILO offices full operating responsibility for position and personnel management and provided these offices with a direct channel for communication on personnel matters. (UNCLASSIFIED)

In May, responsibility for the personnel phases of the airmen's program was transferred from the Hq Squadron Section to the Personnel and Management Office, the Squadron Commander continuing to be responsible for command jurisdiction and administration supervision of airmen[4]. This change completed the consolidation of all personnel functions under the Personnel and Management Office. (UNCLASSIFIED)

With the AF discontinuance of Hq FEAF in Japan and the establishment of Hq PACAF in Hawaii, the office of the Chief ATILO, Pacific, was likewise moved from Tokyo to Hawaii. A sub-office was retained in Tokyo. (UNCLASSIFIED)

One other minor change occurred during the period. The Systems Integration Branch was established in the Estimates Division, Deputy for Air Weapon Systems[5]. (UNCL)

KEY PERSONNEL CHANGES

Colonel Michael J. Piatnitza was assigned as chief of the new ATILO office, Hq AFPAC, Hawaii, effective 5 June 1957. Colonel Piatnitza was formerly chief of the Planning Division, Deputy for Acquisition[6]. (UNCLASSIFIED)

Colonel William E. Boyd[7] was assigned as chief of the Deputy for Documentation, formerly Deputy for Material Support, effective 20 June 1957, replacing Colonel Morris H. Shedd[8] who was assigned as special assistant to the Commander until late in June when Colonel Shedd departed for mission training. (UNCLASSIFIED)

Mr. John S. Honaker was assigned as deputy chief, Deputy for Documentation. Mr. Honaker was formerly assigned to the Program Planning Office[9]. (UNCLASSIFIED)

Major Eugene R. Poe[10] was assigned as acting chief, Material and Flight Services Office until Colonel Herbert E. Johnson, Jr. reports for duty. (UNCLASSIFIED)

MANPOWER MANAGEMENT

The manpower problem continued to be acute. During the period, ATIC received an increase of only one allotment, civilian. Despite continued effort to eliminate nonessential activities, streamline work methods, shift personnel, and where possible and permissible to use contractual assistance, manpower allotments did not even meet the requirements of the ATIC's current program, let alone permit expansion to satisfy increased requests for the ATIC product and services. Therefore, many important program areas had to be curtailed and deferred. (UNCLAS)

Authorized and assigned strength at the end of the period were:

	OFFICERS	AIRMEN	CIVILIANS	TOTAL
AUTHORIZED	197	101	425	723
ASSIGNED	195	122	422	739

Military strength included 20 ROTC assignees. (UNCLASSIFIED)

PERSONNEL ADMINISTRATION:

During the period, the ATIC was able to keep its assigned strength almost to capacity. Never did civilian strength drop more than ten, and then only for brief periods. Early recruitment undertaken prior to separation resulted in obtaining replacements almost as soon as vacancies occurred. The same held true for military replacements. Civilian separation rate continued at the low average of 5.7 persons per month or approximately 1.41%. (UNCLASSIFIED)

In May, an Air Force team examined the ATIC's civilian personnel activities. This was the first inspection since the ATIC was authorized to assume its own civilian personnel functions in December, 1955. The report of this survey expressed general approval of the ATIC's program. (UNCLASSIFIED)

In June, with the establishment of the ATIC Incentive Awards Committee[11], the Air Technical Intelligence Center assumed the last of its civilian personnel functions formerly performed by Hq, Air Materiel Command. (UNCLASSIFIED)

During the same month a military awards and decorations program was also established. (UNCLASSIFIED)

PROCEDURES

Chief progress made in refining or establishing procedures to increase efficiency of operation and conserve manpower consisted of defining areas of responsibility and relationships and standardizing forms and records for contract management and administration, and modification of the job time reporting procedure for cost accounting to conform to the PPT numbering system and to include staff offices as well as operating components. (UNCLASSIFIED)

ATIC installed procedures to improve security control including a new system for identifying and controlling visitors, a special procedure for safeguarding highly confidential information, and modification of standard security practices. (UNCLASSIFIED)

AIR INTELLIGENCE SERVICES:

ATIC continued to provide briefings, general intelligence estimates, and intelligence summaries to AMC field activities and Hq Staff, as dictated by the world situation. (UNCLASSIFIED)

MATERIAL SERVICES:

One of the major supply problems during this period was the requirement for specialized equipment and other standard equipment beyond the standard allowance. A One-of-a-Kind UAL was established for ATIC on 15 June 1957. (UNCLASSIFIED)

FLIGHT SERVICES:

The two a/c assigned to ATIC flew 236 hours, handled 189 passengers, and carried 15,310 pounds of cargo. (UNCLASSIFIED)

The familiarization program on the YAK-18 was terminated during this period. It was grounded on 26 June 1957 because of failure of the fabric to pass the

tests prescribed by TO-1-1-25. (UNCLASSIFIED)

ADMINISTRATIVE SERVICES:

During this report period, the ATIC Communications Network capabilities increased to include on-line cryptographic operations with Detachment Number 2, Western Office, Pasadena, California. ATIC also obtained additional equipment for installation in the new ATIC Building when completed. (UNCLASSIFIED)

On 22 March 1957, the Adjutant was delegated authority to issue Invitational Travel Orders[12].

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1. 1125th USAF FAG GO No. 2, 1 Apr 57.
2. Ibid.
3. Ibid.
4. Memo from the Commander, ATIC, 15 May 57.
5. 1125th USAF FAG GO No. 2, 1 Apr 57.
6. PERAM 21, par 3, 6 Jun 57.
7. GO No. 1, par11, 12 Mar 57.
8. GO No. 1, par 2, 12 Mar 57.
9. GO No. 1, par 4, 12 Mar 57.
10. GO No. 1, par 3, 12 Mar 57.
11. 1125th USAF FAG (HEDCOM USAF) SPECIAL ORDERS no. 66, 17 Jun 57.
12. GO 20, Hq Comd, 22 Mar 57.

SECTION II

ATIC ACTIVITIES

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CHAPTER 3

COLLECTION PLANNING

HUMAN RESOURCES:

The field of metallurgy has been especially well-exploited by US scientists who have visited the Soviet Union under Air Technical Intelligence Center Sponsorship, and by contacts with Soviet metallurgists who have visited the US. ~~(SECRET)~~

ATIC sponsored a symposium on the theory of switching (electronic computer field) which resulted in further acquisition of information on the state of the computer art in the USSR and continued the program for exchange of ideas through induced correspondence between US and Soviet scientists in various scientific fields, by contacts at international conferences, and by individual visitors and exchange delegates with the USSR. ~~(SECRET)~~

Some exchanges have taken place between US and Soviet observation teams in the Antarctic IGY exercises and others have been proposed in the Arctic area. A new working group was established to formulate the intelligence requirements of the entire US intelligence community and to process them through the USNC. The emphasis is on the promotion of a large and extensive scientist exchange with the Soviets at their various IGY observation posts. No exchanges have yet occurred; however, considerable work was completed on selecting the proposed exchange sites and scientific disciplines involved. ~~(SECRET)~~

Since the close of the last report period, an ATILO office has been established at Headquarters PACAF. This was the major new development in the ATILO program which must constantly evolve with the world situation and the American role played in it. (UNCLASSIFIED)

~~SECRET~~

[redacted]

TECHNICAL RESOURCES:

The collection of air technical intelligence by scientific methods was provided effective support by ATIC's addition of devices which are the product of advanced thinking. These devices are the result of the analysis of the collection problem and application of the most effective physical concepts. In addition, devices were devised to satisfy requests from the field personnel. These techniques added positive scientific means to the classical methods of collection and provided irrefutable data of unquestionable integrity. (SECRET)

ATIC continued to improve the acoustics technology for the collection of air technical intelligence information on foreign aircraft and missiles propulsion units. The production of useful information from operating Soviet aircraft continued with increasing scope and increase of air technical intelligence. (SECRET)

The techniques of the acoustic project are applicable to radar wherein the modulation of the return signals can likewise be analyzed to provide air technical intelligence information at much greater ranges and under a wider variety of environmental conditions. ATIC conducted domestic tests in order to optimize the techniques before establishing foreign collection plans. (SECRET)

Recorders, triggers and other components and systems are undergoing domestic tests or are being introduced into the field for attended and unattended operation for the collection of acoustic, infrared, radio frequency, nuclear and photographic intelligence information. These devices can reduce the overload of monitoring personnel at peak periods and can be used in the future at remote unattended locations. (SECRET)

[redacted]

Infrared operational devices and collection systems are being procured to obtain air technical intelligence information on foreign aircraft and missiles. One type of infrared radiometer is in the foreign field. The airborne infrared search-track and collection system is progressing through construction and test. Operational plans are under consideration. The infrared cameras, both for the PbS (lead sulphide) and Bolometer region will be operational in the near future. (SECRET)

Progress was made in photographic projects and programs initiated in prior periods and operational applications are in the planning stage. The programs all advanced satisfactorily and the acquisition of several prototypes and test models is imminent. (SECRET)

Air Technical Intelligence Center continued its support of AEC in the development of nuclear detection devices which will be employed in the detection of nuclear powered aircraft. (SECRET)

Air Technical Intelligence Center obtained a significant body of data pertinent to monitoring the 100-160 kcs radio frequencies spectrum applicable to long-range navigation; and, upon completion of an expendable prototype for receiving the 10-500 kcs spectrum, determined in cooperation with Air Force Security Service that the desired capabilities could be substantially obtained without incurring the cost of production models. (SECRET)

In a continuing effort to provide current data in support of the acquisition of air technical intelligence, ATIC made several changes and refinements in collection plans. These included complete reprogramming of Projects and Tasks to define more adequately the method and type of effort

involved in the acquisition of air technical intelligence through the media of human and technical resources, and considerable work on plans for special type visual aids which more adequately depict the type of technical work and effort involved in the acquisition of air technical intelligence. (UNCLASSIFIED)

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CHAPTER 4

COLLECTION OPERATIONS

CAPABILITIES:

The capability of ATIC to achieve successful collection operations is still largely limited because of the lack of availability of direct penetration sources with access to critical areas within the Soviet Union. At present, capabilities consist mainly of furnishing instrumentation support, financial support and guidance in terms of carefully defined requirements and background information. (~~SECRET~~)

Of the collection programs in which ATIC actually participates, the resources seem equally divided between the following three programs: The ATILO Program, the Air Attache Program, and the Covert Program (Non-Military). A review of the capabilities seem to indicate that a redirection of the ATILO Program may be warranted. A study of this subject was undertaken during this report period. (~~SECRET~~)

REQUIREMENTS:

In an effort to improve the quality of the overseas collection program, ATIC furnished to the D/I contributions for Informal Guidance Letters to 36 Air Attaches. At the same time, the Director of Intelligence, Headquarters, USAF, was furnished contributions to the evaluation of 27 Air Attache Offices for use in the preparation of Officer Effectiveness Reports. (~~CONFIDENTIAL~~)

The first group of preliminary reports covered the exploitation of Hungarian Refugees who are resettling in Canada. These sources were exploited by the Joint Intelligence Bureau (JIB), Ottawa, Canada, with the Central Intelligence Agency (CIA) serving as liaison between that organization and

~~SECRET~~

the Director of Intelligence, Headquarters, USAF. 16 of the 54 reports received were of sufficient technical interest to justify the initiation of SRI's. (S)

During the month of May a project was initiated to exploit Spanish repatriates from the USSR. Several thousand skilled and semi-skilled sources are involved and the project is expected to be in existence for approximately two years. ATIC furnished to the Air Force representative in this joint operation considerable air technical intelligence (ATI) guidance material to insure coverage of ATI interests. (S)

A new procedure for maintaining SRI control over the ELINT collection requirements was developed and fifteen SRI's initiated under this new procedure. (SECRET)

EXPLOITATION:

The Returnee Exploitation Group (REG), Frankfurt, Germany and the British Scientific and Technical Intelligence Branch (STIB) obtained 12 new sources. Of the 12, six were returnees from the Soviet guided missile activities located at Postfach-908, USSR. (SECRET)

A general evaluation of the information obtained during the past six months from REG sources associated with Soviet missile activities enabled ATIC to make concrete estimates of the Soviet state-of-the-art, and present capabilities in surface-to-air missiles. These sources also provided enough detail to evaluate the Moscow Missile Air Defense System. (S)

ATIC achieved good results from the exploitation of foreign commercial import firms in support of acquisition. (SECRET)

In addition to the previously reported European sources, a third source was established for the purpose of exploiting intelligence targets in the Middle East. (SECRET)

The CIA arranged to utilize the flights of the USAF 4602d Air Intelligence Service Squadron located throughout the United States (the Headquarters being Ent Air Force Base, Colorado Springs, Colorado), to assist in debriefing Hungarian Refugees. ATIC arranged through the Directorate of Intelligence, Headquarters, USAF, for ATIC specialists to participate in personal interrogations of these sources. ATIC screened approximately 2000 preliminary interrogation reports, and referred those of technical interest to technical specialists concerned for review and preparation of specific requirements. (CONFIDENTIAL)

ATIC made extensive use of key members of the US scientific community and encouraged personnel whose areas of research coincided with the technical interests of ATIC to take trips wherever possible behind the Iron Curtain to visit Soviet scientists working in similar fields. These visits constituted one of the most successful attempts to obtain intelligence information from the USSR. In this connection, close coordination existed between ATIC and the CIA to insure domestic exploitation of those Soviet scientists who attended various technical symposiums, etc., in the US during this period. (SECRET)

Though ATIC continued to place emphasis on exploitation by instrumentation, no major advances occurred during this period. Work continued on a new film emulsion with a speed approximately five times that of the fastest film available at present to the intelligence community. (CONFIDENTIAL)

A new miniature recorder, manufactured specifically for intelligence, was field tested prior to issue to operational personnel. Preliminary tests indicated that further refinement of a mechanical nature is required before the unit will be ready for field use. (SECRET)

[redacted]

ACQUISITION:

As a result of intelligence collection operations, various items of electronic communications gear, industrial machinery, and samples of metals and fuels produced by the USSR and utilized in one aspect or another by the Soviet military system were obtained. ATIC obtained reports of scientific and technical nature covering science of metallurgy, boundary layer phenomenon, non-linear mechanics, and many other related subjects required for technical evaluation of the Soviet capabilities in these areas. (SECRET)

From the acquisition point of view, intelligence obtained from photographs continues to contribute the major share to the collection program. Excellent photography of Soviet aircraft and refueling exercises were obtained. (SECRET)

GUIDANCE:

The Air Technical Intelligence Center participation in the Intelligence Collection Guidance Manual Program (ICGM) continues on schedule. In addition, ATIC actively participated in the preparation and development of the first inter-service collection guidance manual, monitored by the Department of the Army, covering the field of "Infrared". (UNCLASSIFIED)

ATIC began work on contributions to the Intelligence Collection Guidance Letter (ICGL) "Indicators of Nuclear Energy Activities" which was proposed for expansion into an inter-service manual on "Nuclear Energy", monitored by the Director of Intelligence, Headquarters, USAF. ATIC released an ICGL, to furnish interim guidance pending issue of the Nuclear Energy Manual; and prepared an ICGL on "Electromagnetic Radiation Data" requesting collection of signal characteristics of all known commercial and military electronic equipment of all countries. (CONFIDENTIAL)

[redacted]

Other ATIC guidance and requirements included material for the following: (1) ICGL on the subject of "Aerial Photographic Coverage Information" which outlines Air Force needs for information on world-wide indexing of aerial stereo-photography for mapping, charting or reconnaissance purposes; and (2) ICGL on "Employment of Civil Aircraft in Unconventional Attack" to alert collectors, in areas from which civil aircraft could fly directly to the US, to the potential danger. (CONFIDENTIAL)

ATIC expanded use of the machine system for recording raw intelligence data and extracting information related to requirements for use in Guidance products. All data is now compiled by a "single item, single card" system developed for simplicity and rapid retrieval of information. (UNCLASSIFIED)

ATIC published four Technical Trip Briefs and two ATI Observation Guides, and prepared a new Observation Guide for "IRBM-ICBM Missile Airframe Manufacturing". Field collectors approved of the "Rocket Engine Manufacturing and Test Facilities" observation guide. (CONFIDENTIAL)

TRAINING:

In making further progress in developing a full "in house" photographic service capability, training in the use of new photographic equipment was received locally and, at the Pako Corporation factory. Production in printing was increased 400% for the last six month period. (UNCLASSIFIED.

CHAPTER 5

DOCUMENTATION

INFORMATION PROCESSING:

Although no drastic changes in the basic documentation functions occurred as a preliminary to the reorganization, the procedure for information processing did. During May 1957 a pilot-line operation was established to determine the advisability of having Project White Stork process all intelligence information documents. This test was successful and on 7 June the Reading Panel operation which had been under test was discontinued in favor of Project White Stork's (PWS) processing of information into the Technical Intelligence Processing System (TIPS) files. (UNCLASSIFIED)

Under this system, the following information types and quantities are inputs:

A selected portion of ATIC's Intelligence receipts, such as unevaluated intelligence documents produced by the USAF, the Navy, the Army, the Central Intelligence Agency (CIA), and the Department of State.

A selected portion of ATIC's receipts of finished intelligence reports either by ATIC or by other members of the intelligence community.

Foreign-language technical information, primarily from the Soviet bloc, but also from Germany, Italy, and other countries. Periodicals, books, monographs, and atlases are included in this category.

English-language technical abstracts and extracts, or references to foreign-language technical books and periodical articles.

In accumulating and choosing information for inclusion into TIPS, Project White Stork also considered possible future assignments from ATIC. (CONFIDENTIAL)

UNIFIED ATIC-FWS DOCUMENTATION SYSTEM:

ATIC made plans for a unified documentation system when it became apparent that certain documentation efforts by the Documentation Division and FWS were, in effect, duplication. The plan of February 1957 contained radical departures from present ATIC document operating and handling methods, and proposed separation of all material in the Center into two groups. The proposal consigned all conventional intelligence reports directly to FWS who would assume accountability, process, prepare TIPS cards for ATIC specialists, and then destroy the document. The plan proposed direct routing to the ATI Library all US proprietary information, Soviet-bloc open literature, NATO and US open literature, finished intelligence reports, etc. ATIC Library responsibility included cataloging for retrieval and filing the positive copy of all documents microcopied at FWS. The immediate lack of professionally qualified documentation personnel in ATIC to direct vitally necessary cataloging and reference activities created a problem which may prove difficult to overcome. (SECRET)

Under the unified ATIC-FWS documentation system, by the end of May 10% of the total receipts of raw intelligence were routed directly to FWS to test the system. Since FWS handled this volume satisfactorily, the flow of documents was gradually increased. As of 6 June 1957, 100% or the total take of raw intelligence information was routed directly to FWS for processing. Under this system, ATIC discontinued originating agency and other locator files and the use of ATIC accession numbers. (SECRET)

The Reading Panel was dissolved 6 June 1957. The dynamic retrieval code was terminated effective this date also, since PWS assumed concomitant responsibility for the retrieval of all raw intelligence information. (SECRET)

Emphasis was placed on the immediate procurement of professional personnel to staff key positions in the Reader Services area and to direct library activities. A cataloging operation was started in early June. Library circulation techniques were applied to disseminate library holdings to ATIC personnel, and a reading lounge was established adjacent to the Library. (CONFIDENTIAL)

FOREIGN LANGUAGE EXPLOITATION:

Work continued on the translation contract for FY-57 with the O. W. Leibiger Research Laboratories, Inc., and negotiations for translation services during FY-58. ATIC selected the University of Syracuse, N.Y., to translate in its entirety the monthly periodical of the Soviet Air Force, "Herald of the Air Fleet." (CONFIDENTIAL)

ATIC made initial distribution of approximately 2,000 copies of the Russian-English Glossary of Aeronautical and Miscellaneous Technical Terms during this report period. (UNCLASSIFIED)

UNITED STATES FOREIGN INFORMATION CENTER (USFIC):

Problems appeared early in the implementation of the abstracting program started during the last report period. The AID, because of personnel and budgetary deficiencies could not process the entire selection of documents. It became necessary to explore the abstracting capabilities of the Air Attaches and Air Intelligence Special Groups overseas. Selected items were assigned to overseas activities, others to the Air Intelligence Division of the Library of Congress (AID), and some to ATIC. Results were encouraging as indicated by first reports. (CONFIDENTIAL)

CHAPTER 6

ELECTRONICS INTELLIGENCE (ELINT)

GENERAL:

The Air Technical Intelligence Center participated in the establishment of a Special ELINT Advisory Group. This Group consists of Army, Navy and CIA members in addition to the Air Force personnel. Their objective is the establishment of special requirements and a review of the capability required to perform these requirements. The Committee held its first meeting on 6 March and has convened monthly. The Technical Director, ELINT, is the Air Force Technical Representative to this group. (SECRET)

ATIC continued to work with the Electronic Countermeasures Equipment Management Group, and expended particular effort to achieve the proper equipping of the ELINT Analysis Centers. (UNCLASSIFIED)

SYSTEMS EVALUATION:

The Systems Evaluation program progressed slowly due to insufficient number of personnel. A compilation of a comparatively complete list of specific Air Force-wide ELINT collection requirements was published. This provided the collector, analyst and data reducer with a guide for the direction of ELINT effort in the matter of priorities, technical detail and scope. Contractual assistance was utilized in the areas of analysis of missile data, degradation of pulsed-type signals, data reduction, and location of signal sources. Positive steps were formulated for the implementation of an ELINT quality control program. (SECRET)

ANALYSIS:

ELINT improved its capability for processing signal intercepts by

organizing three specialized teams in the areas of guided missile, airborne, and ground intercepts, respectively. This higher degree of specialization among the analysts has increased the efficiency of the operation and improved the quality of the analysis. (UNCLASSIFIED)

The expansion of the processing capabilities of the Intermediate Processing Centers, particularly in Europe, lessened the amount of time which ATIC personnel previously spent in screening raw data. This resulted in more available time for further analysis and categorizing of the data. (CONFIDENTIAL)

The improved procedures here and the expansion of facilities abroad contributed to the marked increase in the number of intercepts categorized in the Current Interest File. (UNCLASSIFIED)

Priority processing for this period was in the missile associated signals. A contractor processed the majority of the data on known missile firings. During this period the AN/FLR-3 passive detection equipment located at an overseas site produced the first data of sufficient quality to machine process and analyze. (SECRET)

Progress also has been made in the formulation of an Air Force-wide standard IBM system for both collection and processing reporting. (UNCLASSIFIED)

The new Soviet height finder (nicknamed ROCK CAKE) was intercepted during this period. A thorough study of its parameters enabled ATIC to associate this radar with Soviet Early Warning Radars including TOKEN and KNIFEREST B, at a number of locations. (SECRET)

ATIC made a study of intercepts of the Soviet navigation system MOON collected by a USAF Security Service site in Japan which resulted in the

definite conclusion that most of these intercepts were from the European MOON chain. A separate study of MOON intercepts from European and Japanese sites showed no correlation with Soviet missile firings at the Kapustin Yar test range. (SECRET)

ATIC experienced a significant increase in the quantity and quality of data attributed to the Soviet FLASHLIGHT (Yak-25) aircraft. Indications are that the Soviets have a far greater potential for anti-aircraft operation than that credited to them from collateral sources. Extensive work was done to resolve the scan characteristics of this equipment. (SECRET)

CAPABILITY IMPROVEMENT:

The Federal Telephone Lab engineers delivered the first CP 216/APD4 Film Reader to ATIC and demonstrated its data processing capabilities to ATIC, SAC, TAC and WADC. On 11 April the equipment was loaned to the Air Proving Ground Command for use in Operational Suitability Tests of RB-66 aircraft. (UNCLASSIFIED)

ATIC completed an evaluation of the KEDROD, a small mechanical device to perform essentially the same function as the CP 216/APD4, and determined that the device functioned satisfactorily. (UNCLASSIFIED)

ELINT personnel of ATIC coordinated the conclusion of a contractual arrangement for the installation of BOSCAR Model D Film Readers in Intermediate Processing Centers and arranged contacts for contractor representatives in the theaters. ELINT engineers promoted a program for comprehensive contractor maintenance of nine BOSCAR units. (UNCLASSIFIED)

ATIC completed a preliminary study of spurious responses in superheterodyne receivers. This was based on theoretical and experimental evaluation of at least four types of classified equipment. The results showed the magnitude of

the spurious response problem in existing ELINT receivers and the serious significance of this in ELINT collection capabilities. (UNCLASSIFIED)

During this period several steps were taken to establish an Alaskan Intermediate Processing Center. Equipment, manpower, and space planning were accomplished. ATIC's ELINT Field Support personnel placed orders for equipment required to begin operation and obtained initial equipment deliveries. Complete intermediate processing equipment was delivered and installed at the FEAF Intermediate Processing Center. Equipment for both intermediate and elementary processing was procured for and delivered to SAC. ELINT personnel assisted SAC and AMC in establishing standard equipment components lists for organizations accomplishing these two levels of processing. (CONFIDENTIAL)

At the request of USAF Security Service, ATIC initiated procurement for a time base generator with greatly increased accuracy over existing equipment for use in Security Service installations. A study of the problem area of accurate timing resulted in a request for a Qualitative Operational Requirements on the subject. (UNCLASSIFIED)

ATIC received a "Tone Burst Analyzer" for high speed readout of pulse repetition frequency for evaluation. Operational weaknesses in the design of the unit were revealed during tests and modifications which could optimize the analyzer performance were discussed with the manufacturer. The latter initiated an engineering change proposal which would cover the required changes during an additional six weeks of effort. The proposal was incorporated into the basic contract during June 1957. (UNCLASSIFIED)

T57-20621 -4

Program approval was obtained during the period to include procurement of an AN/GLA-7(V) automatic data reduction system for installation at ATIC. The program includes evaluation of the system, determination of the feasibility of utilizing the system for production of technical intelligence and establishing AF requirements for automatic processing systems. Funds were authorized for early FY-58 procurement of the system and procurement action was initiated by RAFD through RADC as engineering monitor for the resulting contract. Planning for the operation and management of the system was initiated by ATIC Systems Evaluation engineers. (UNCLASSIFIED)

TRAINING:

In addition to the numerous briefings and demonstrations given to visitors, formalized ELINT training was given to five airmen from USAF Security Service, one Airman from TAC, and one Intelligence Specialist from USAFE. (UNCLASSIFIED)

PUBLICATIONS:

ELINT publications of ATIC during this report period included twelve SECRET Signal Reviews and the following studies:

TIR-DE-57-1	Evaluation of QRC-26 Facsimile Type Signal Separator	(CONFIDENTIAL)
TIR-DE-57-2	ELINT Progress Rept Nr 10.	(SECRET)

CHAPTER 7

ENGINEERING SUPPORT

ENGINEERING ANALYSIS:

ATIC made new weight estimates to reflect estimated changes in dimensions and propulsion systems of BISON and BADGER, and started layout of BADGER. FLASHLIGHT performance was estimated with external stores. FISHBED A and B, FACEPLATE, FISHPOT, and FITTER performance was completed with and without external stores. An estimate of MIG-17 performance was done with two engine versions. A study was started on a nuclear bomber. (SECRET)

Analyses of CAMEL, CAMP, and HARE were completed. Installed thrust and fuel flow were estimated for CAMEL engine, and for the BADGER-BISON engine. (SECRET)

ATIC began work on processing infra-red data, and refining methods of computing ranges photogrammetrically. A dynamic performance analysis was initiated to estimate climb performance using two degrees of freedom and normal acceleration as parameters. (SECRET)

Programmed computations by electronic computer included the analysis of take-off distance as a function of temperature as well as altitude. (Uncl)

ATIC and the Deputy Director of Intelligence (Technical) representatives (Great Britain) standardized the weight terminology of DDI-Tech and ATIC, reconciled some differences of opinion on specific aircraft, and devised new methods of estimating weights utilizing the electronic computer. (Uncl)

COMPUTERS:

ATIC began procurement action for a second general-purpose digital computer to meet higher computing speed requirements. Early in May specifications were forwarded to AMC and in June a contract was awarded to Electro Data Corporation. (Uncl)

PHOTO ANALYSIS:

ATIC produced new drawings of FARMER, FLASHLIGHT A, and FRESCO E, based on good quality photography obtained in the Soviet Zone of Germany; and revised drawings of HARE, HOUND, COLT, FRESCO D, and MADGE.

During this period, ATIC acquired a Mann Comparator capable of measuring accuracy plus or minus 1 micron and four scanning stereoscopes for general interpretation. (Uncl)

TECHNICAL ILLUSTRATION:

ATIC revised the Defensive Fire Control Diagrams of Soviet bomber aircraft, and started large-scale drawings of the inboard profiles of Soviet aircraft. (Uncl)

PUBLICATIONS:

ATIC obtained four new Pres-to-line Copy Holders for use in conjunction with the Justowriter Recorder-Reproducers, and a new Vari-Typer Composing Machine, Model DSJ, to replace the present Vari-Typer. (Uncl)

GRAPHIC DATA:

Increased photo intelligence coverage established a requirement for some automation. ATIC obtained approval for a Flexowriter Programatic Automatic Writing Machine for the cataloging of intelligence information on to photo mount cards, locator cards, and other documents.(Uncl)

REPRODUCTION:

ATIC developed a capability of absorbing increased reproduction workloads despite a decrease in assigned personnel by supplementing automatic attachments to equipment on hand and by the cross-training program designed to make each operator more versatile in machine operation. (Uncl)

The Congressional Joint Committee on Printing granted ATIC a waiver on the Government Printing and Binding Regulation, dated 1 July 1956, which permits the accomplishment of half-tone reproductions by the use of sensitized paper masters and existing half-tone negatives. This approval was based on ATIC publication requirements for NATO editions. (CONFIDENTIAL)

During this period, ATIC acquired two photostat expeditors, two Thermo-Fax machines, and one Burke and James copy camera. (UNCLASSIFIED)

CHAPTER 8

PROPULSION

PROPULSION SYSTEMS:

The Handbook of Known Soviet Aircraft Engines[1], was revised and expanded in the turboprop section and in the turbojet section. The additions and changes resulted from new intelligence obtained from air show photography and interrogation reports. (SECRET)

Approximately 10 completed and 100 rough draft Biographical Sketches were made covering Soviet Personnel and Facilities associated with propulsion systems research and development in the USSR. Progress to date has not been satisfactory, due to a lack of manhours allocated to this task. (SECRET)

Work proceeded on a report[2], by Combustion and Explosives Research Inc., on fundamental and applied combustion and gas dynamics research in the USSR. ATIC plans to extend the existing contract through FY-58 at a reduced rate of effort to provide continuous surveillance of Soviet progress in combustion research. (SECRET)

RAMJET ENGINES:

The Soviet capability to develop supersonic ramjet engines was determined by the publication of a handbook[3] prepared by Marquardt Aircraft Company, under contract[4], completing Phase I of an over-all Soviet ramjet capabilities analysis. Phase II of this task was initiated[5], which provides for a study by Marquardt to determine the most probable Soviet approach to advanced supersonic ramjet configuration and performance required for specific missile applications. (SECRET)

TURBOJET AND TURBOPROP ENGINES:

Work by a contractor to develop methods for obtaining engine component performance and for matching gas turbine components was 65% complete[6] at the close of this period. (SECRET)

Work on an in-house task to analyze the turbojet engines in CAMEL, BISON and BADGER progressed slowly. Numerous technical difficulties have prevented completion of the study and finalization of the refined estimates. These difficulties have centered around the performance of the improved engine in BISON. (SECRET)

Estimates of the configuration and performance of gas turbine engines in the Soviet aircraft displayed in 1956 airshows were published in an ATIC Study[7]. Aircraft included in this study consist of BLOWLAMP, FISHPOT, FITTER, FISHBED "A" and "B", FACEPLATE and CAMP. (SECRET)

Preparations were made for General Electric Company to perform an altitude performance analysis of foreign aircraft gas turbine propulsion systems. (CONFIDENTIAL)

A contract[8] was accepted by Pratt-Whitney Aircraft to determine the Soviet capability to develop a high-speed turbojet engine. Work on this contract is approximately 25% complete. The comptroller's office has been requested to extend the contract to include a Supplemental Agreement to determine Soviet capability to develop a high subsonic Mach number turboprop engine and a Supplemental Agreement to determine Soviet capability for development of a supersonic propeller and control system. (CONFIDENTIAL)

An ATIC Study[9] covering the estimated turboprop engine in BEAR was published on 5 May 1957. This study presents a summary of Soviet developments of large turboprop engines, gives estimates of the configuration and

performance of the "K" engine in BEAR, and compares this engine with significant British and US turboprop engines. (SECRET)

PROPELLERS:

Analysis of BEAR[10] propeller was completed. (CONFIDENTIAL)

A computer program for the strip analysis of various Soviet propellers was initiated, using the computer facilities available at the Propeller Laboratory of WADC. The WADC facility was used to accomplish the strip analysis of the Madge propeller. (CONFIDENTIAL)

ATIC determined the performance capability of an imaginary propeller with a configuration similar to the BEAR propeller to be installed on a hypothetical low altitude nuclear-powered turboprop bomber. The propeller performance curves were submitted to Lockheed Aircraft Corporation, Marietta, Georgia[11]. (SECRET)

FUEL TECHNOLOGY:

A study entitled, "Soviet Bloc Solid Propellant Technology"[12] was completed 1 March 1957. This study summarized Soviet technical publications applicable to solid propellant development and evaluated accomplishments to date. (SECRET)

An analysis of a Soviet petroleum refinery was completed in April by Socony-Mobil. This report will be published as a Technical Report and is an evaluation of the refinery design submitted to Finland by the USSR. The design represents standard equipment available within Russia. (SECRET)

A technical report on Soviet and Satellite Petroleum Products Analysis[13] was published 10 May 1957. This report was an in-house product and presents an analysis of data and an evaluation of all the POLSAMS collected since the publication of the preceding report on the same subject. (SECRET)

[redacted]

A "Reference File of Soviet Crudes" was completed. This file was compiled by PWS and contains all analytical and physical data on crude oils available within the Soviet Union. (SECRET)

Two new contracts were awarded during the last six months:

A contract was initiated for a literature survey and evaluation of Soviet Research on Ozone chemistry and its application as a rocket oxidizer. (SECRET)

A contract was let to Pennyslvania Salt Manufacturing Company for a similar survey to establish the Soviet state-of-the-art of Fluorine Chemistry and application as a rocket fuel oxidizer. The bid is to include an evaluation of all Russian Technical Literature on this subject. (SECRET)

A literature search to determine Soviet work on radiation effects on fuels, lubricants, and other fluids for nuclear-powered aircraft was initiated with PWS. (SECRET)

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1. TIR-102-AC-53/3-34
2. AF33(600)-33600
3. TIS-PR-57-4
4. AF33(600)-33448
5. AF33(600)-34841
6. AF33(600)-33711
7. TIS-PR-57-3
8. AF33(600)-33689
9. TIS-PR-56-4
10. TIS-PR-57-1
11. AF30(602)-1614

[redacted]

12. TIS-PR-57-2

13. TIR-PR-57-1

~~SECRET~~

CHAPTER 9

ELECTRONICS

GENERAL:

During this period ATIC developed a program for extensive contractual assistance in the analysis of Soviet Bloc electronic equipment capabilities. This program will aid in producing current electronic capability reports and evaluations of Soviet and Satellite future capabilities. (~~SECRET~~)

Four studies and handbooks were produced during this period; "Soviet Capabilities in Radio Navigation,"[1] "The Status of Ferromagnetic Technology in the USSR and Selected Satellite Nations,"[2] "Soviet Electronic Equipment for Missile Guidance,"[3] and "Revision of Soviet and Satellite Communication Handbook."[4]

RADAR AND ELECTRONIC GUIDANCE SYSTEMS:

Recent photo information confirmed that the FLASHLIGHT aircraft does have AI equipment similar to that observed in mock-up at the Zhukorskii Air Engineering Academy by General Twining's party. There were no appreciable changes in the estimated parameters of the FLASHLIGHT radar, but an additional mode of operation compatible with an estimated operational air-to-air beam-riding missile was advanced as a likelihood. (~~SECRET~~)

Work on the analysis of important electronic guidance information obtained from German returnees of the Bushbeck group continued with the assistance of a contractor.

NAVIGATION SYSTEMS:

During this period much progress was made in the study of Soviet utilization of Low and Very Low Frequencies for navigation purposes; One report included a study of the Soviet MOON navigation system, and another covered unusual Low-frequency pulsed transmissions. (~~SECRET~~)

~~SECRET~~

A handbook of Soviet and Satellite Navigational Electronics Equipment, a reference manual for collectors and users of the intelligence product, and a basic study of the present and future Soviet Air Navigation capabilities were completed. ([redacted])

Evaluation of a Soviet Airborne ADF-Type ARK-5 was initiated with Farnsworth Electronics; testing was completed. ([redacted])

ATIC acquired Soviet DME Transmitter and Receiver, part of the Soviet SD-1 equipment, in June 1957. This is the first known sample of this Navaid to become available to US intelligence. Immediate action was taken to determine frequencies of operation and other characteristics. ([redacted])

COMMUNICATIONS:

The first revision to "Handbook of Soviet and Satellite Communication Equipment" was published and distributed in March 1957. This revision contains technical details, sketches, and operational status of Soviet and Satellite communications equipment known to be currently in operation or under development. ([redacted])

A technical report called "Analysis and Evaluation of Soviet Inter-Communication Amplifier SPU-2" was published. It contains an analysis of a two-position intercommunication amplifier which is known to be used in the latest Soviet aircraft. ([redacted])

ATIC started a detailed technical analysis of the East German point-to-point VHF communications equipment, URG-951A, and completed work on an analysis of the "Communist Chinese Radio Broadcast Receiver." ([redacted])

Other analyses started during this period included Decimeter Equipment (RVG-905B), the RVG-904B, the Soviet V-3 Multiplexing Equipment, and the East German RVG-931H ultra-high-frequency communications equipment. ([redacted])

ATIC began a study on the USSR capabilities in radio-wave scatter propagation during this report period. This study includes such factors as (a) basic and applied research and development programs, (b) applications of scatter propagation techniques, (c) laboratory, institute, and factory facilities, (d) significant scientific, technical and engineering personalities, (e) apparent aims, objectives, and trends of research, development, and application programs and projects, (f) support by the USSR government of the above programs and projects, and (g) training of personnel in research, development, and application. (SECRET)

ELECTRONIC COUNTERMEASURES:

Interest in Electronic Countermeasures continued at a high level. An interim study entitled "Technical Aspects of Soviet Offensive ECM Capabilities," was distributed in January. A no-cost extension of the contract with Sylvania was negotiated to extend the contract period through the end of the fiscal year. (CONFIDENTIAL)

ELECTRONIC COMPONENTS:

ATIC released a study entitled "The Status of Ferromagnetic Technology in the USSR and Selected Satellite Nations," in March 1957. Particular emphasis was placed on ferrite materials and applications. (CONFIDENTIAL)

INFRARED:

ATIC undertook a study on Soviet Infrared Capabilities, bringing up-to-date the 1954 study on this subject. A task for the collation and publication of available information on the infrared radiation characteristics of Soviet aircraft was initiated with contractual assistance. (CONFIDENTIAL)

1. TIS-EL-57-1
2. TIS-EL-57-2
3. TIS-EL-57-3
4. TIH-EL-2

CHAPTER 10

ARMAMENT

(UNCL) AIRCRAFT ARMAMENT

During this reporting period, ATIC continued to monitor the efforts of Aircraft Armaments, Inc., Cockeysville, Maryland, on the contracted study effort for analysis and evaluation of Soviet defensive armament systems[1]. Configuration studies for the BISON, BEAR, BADGER and BLOWLAMP were completed. The study leading to evolving of the equations of the mathematical duel model between the Soviet bombers and U.S. fighter aircraft was completed and programming of these equations for solution on the ATIC computer was begun. (CONFIDENTIAL)

On 17 May 1957 the contract for the study of the Characteristics and Performance of Soviet Fighter Armament Systems was released to Crosley Division, AVCO Manufacturing Corporation[2]. (CONFIDENTIAL)

The contract[3] established on 1 Nov 56 with the Ballistics Analysis Laboratory, The John Hopkins University, Baltimore, Maryland, for vulnerability and lethality studies of foreign aircraft and weapons, progressed satisfactorily. The first of a series of end products was the ATIC Study "Lethality of Soviet 122 mm Projectile Against B-47 Aircraft". (CONFIDENTIAL)

The contractor, on the completion of the above study, shifted his effort to the second problem, "The Vulnerability of BISON, BADGER and BEAR to Current and Future U.S. Interceptor Weapons." A portion of the computations for this problem were completed on the ATIC Readix computer in May 1957. (CONFIDENTIAL)

ATIC initiated contract negotiaions[4] to obtain the services of a contractor to research and prepare an analysis of significant Soviet bombing accuracy data. (CONFIDENTIAL)

[redacted]

With the receipt of a small quantity of 37-mm and 23-mm ammunition from a Polish airplane which defected to Denmark, ATIC arranged a series of tests with the Air Force Armament Center, Eglin AFB. The primary requirement was for recognition-guidance aids to Hq FEAF. ATIC's MIG-15 guns and gun tray were refurbished and provided to AFAC for a night firing identification test, with the camera position simulating the B-50 crew observation position. A simulation of a Soviet fighter firing a burst scoring a miss of 500-700 ft will then be photographed in color. For comparison, US cal. 50 tracer ammunition will also be fired under the same conditions to give the observers a known reference plane. (SECRET)

ANTI-AIRCRAFT WEAPONS

A contract[5] with American Machine and Foundry Advanced Research Division was extended to cover the programming and analysis of the Leningrad surface-to-air defense system. During this period, ATIC tabulated the topographic elevation of 30,000 square-mile area around Leningrad on a square-nautical-mile grid basis. These data and the network of anti-aircraft guns and surface-to-air missile defense sites, as supplied by SAC, were provided to the contractor. (SECRET)

The contractor coded the mathematical flow diagrams for the IBM704 computer and performed component run-offs of the burst analysis and low level terrain analysis. (SECRET)

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1. AF33(600)-33408
2. AF33(600)-24502, Call Ltr Nr 7
3. AF33(600)-33898
4. PR 708267
5. AF33(600)-31900

[redacted]

[redacted]

CHAPTER 11

EQUIPMENT

(UNCL) AIR-WEAPONS EQUIPMENT

GENERAL:

Of the three major products released during the period of January to July 1957, two related to specific areas of Soviet technology and one related to exploitation of a Soviet aircraft under simulated Arctic conditions. Of the first two, one[1] presented the results of an extensive study (dtd 7 Jun 57) of the landing gears of the principal Soviet operational aircraft. Herein it was shown how the Soviets had accepted some penalties in regard to the weights of their landing gears in order that larger tires could be used so that the aircraft could use runways of minimum improvement. [redacted]

The second published report[2] (dtd 9 Jan 57) relating to Soviet aircraft ice protection equipment. In this study, the ice protection equipment of the principal operational Soviet aircraft was described and it was shown that Soviet aircraft are usually protected from atmospheric icing by heating the exposed surfaces with hot air and that no new or novel ice protection equipment has been developed by the Soviets. [redacted]

The third published report[3] (dtd 15 Feb 57), related to the cold weather exploitation of a Soviet aircraft. It described low temperature tests of FAGOT in the Climatic Hangar at Eglin Air Force Base. In these tests a FAGOT aircraft was subjected to tests down to an ambient temperature of -65°F. and it was shown that the Soviets had successfully implemented their expressed policy that no special pre-winter preparation of their aircraft shall be required. [redacted]

[redacted]

On 22 March 1956, Call Nr 201, on the Minneapolis-Honeywell Regulator Company contract[4] was accepted by the contractor. This marked the beginning of a program of external assistance to the extent of $25,000 for FY-57 in the studying of Soviet non-radiating guidance and navigation equipment. (SECRET)

In support of estimates regarding Soviet nuclear powered aircraft, ATIC made plans for external assistance with reference to the necessary aircraft and ground support equipment. (SECRET)

Because of the critical importance of combat intelligence, and the uncertainty of Soviet plans for direct bomb damage assessment, ATIC sought external assistance to determine the Soviet capability for aerial photographic reconnaissance. (SECRET)

The fact of the guided missile and the imminence of the earth satellite created a crucial requirement for an electrical power source with capabilities far in excess of any existing today. ATIC planned external assistance from Project White Stork to determine the Soviet capability for exploitation of nuclear batteries, solar batteries, and improved chemical batteries. (SECRET)

An especially difficult technical problem confronting ATIC is the determining of the maintenance requirements of Soviet air weapons. It is felt that high serviceability can be achieved only through low maintenance requirements. It is also felt that the relative importance attached by a nation to serviceability and reliability is indicative of its defensive or offensive intentions. Serviceability for a planned offensive can be achieved by means of a standdown, which is not available to the nation on the defensive because of the lack of adequate warning. Project White Stork is assisting on this problem. (SECRET)

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1. TIS-WI-57-4
2. TIS-WI-56-6
3. TIS-WI-56-7
4. AF33(600)-33894

CHAPTER 12

MATERIALS

METALLURGY AND INORGANIC MATERIALS:

In the field of metallurgy, ATIC obtained and confirmed significant intelligence information with respect to high-temperature alloys for turbojet and ANP applications. New intelligence information involves Soviet supply and R&D projects in molybdenum and R&D in vanadium base alloys. (CONFIDENTIAL)

Four new tasks were initiated to ascertain the Soviet status in (1) R&D and process metallurgy, (2) ANP metals, (3) propulsion alloys, and (4) supersonic and hypersonic airframe materials. The task on ICBM materials continued. The metals group of ATIC prepared three other reports. One covered the type and amount of each material required to build one each of the new Soviet aircraft. The others covered the status of metallurgy in Western Europe, the Soviet status of special metals (Group IV) and compounds pertinent to semiconductor materials for transistors. It was found that semiconductor materials activity in the USSR has increased since 1954, signifying that the Soviets are pursuing research in this field. (SECRET)

ATIC began a study to ascertain the Soviet status in high-temperature glass, since this material is presently undergoing research in the US with respect to applications for high-speed aircraft. (SECRET)

POLYMER MATERIALS (PLASTICS AND RUBBER):

ATIC published three studies during this period on the status of the Soviets and Satellites in high polymers as applied to air-weapons. The Soviet intent to develop plastics and rubber for supersonic and nuclear-power aircraft is strongly indicated. (SECRET)

Three new tasks in the polymer field were initiated to ascertain the Soviet status in polymeric synthesis, heat-resistant polymers, and radiation-resistant polymers. [redacted]

[redacted]

CHAPTER 13

INDUSTRIAL TECHNOLOGIES

PRODUCIBILITY STUDIES ON AIRCRAFT

ATIC completed manufacturing analyses of the Soviet jet fighter FISHPOT and FITTER on 6 May 1957. These studies were based on material prepared by Lockheed Aircraft Corporation, Burbank, California, as part of a project on the effect of alternate manufacturing methods and techniques on the performance and facility requirements for supersonic fighter aircraft. (CONFIDENTIAL)

After more than a year's delay due to procedural difficulty, a contract was finally signed with Boeing Airplane Company in May 1957, to undertake the study of factors affecting Soviet supersonic bomber production. This project will consist of three phases similar to those in the study by Lockheed on supersonic fighters. [redacted]

In June a contract was signed with North American Aviation Inc., to complete a manufacturing analysis of FISHBED and FACEPLATE. [redacted]

Negotiations were also completed in June for a contract with Douglas Aircraft Corporation to provide a manufacturing analysis of BLOWLAMP. [redacted]

GUIDED MISSILE PRODUCIBILITY

As a result of their work under contract with ATIC, the Convair Astronautics Division of General Dynamics Corporation prepared a well illustrated report entitled, "ICBM Manufacturing Analysis Related to Soviet Capabilities." [redacted]

PROPULSION SYSTEMS PRODUCIBILITY

As a result of Phase II of a project on rocket propulsion carried out by North American Aviation Inc., a report entitled "100 Metric Ton Rocket Engine Manufacturing Analysis" was published. [redacted]

[redacted]

[redacted]

CHAPTER 14

AIR SCIENCES

(UNCL) AIR SCIENCES

ATIC completed several reports during this period, and most of them were disseminated. A report[1] on "Preliminary Analysis of Soviet Research in Heat Transfer as Applied to Air Weapon Development" revealed that the USSR has developed a broad basic capability in the field of heat transfer, as evidenced by the quality of the institutes, personnel and research programs associated with heat transfer. Considerable Soviet heat-transfer research of possible interest to air-weapon problems was identified. The Soviets seem to be as capable as scientists in the West at using mathematics and other theoretical tools of the heat-transfer research. They should be able to solve specific air-weapon heat-transfer problems. ([redacted])

ATIC disseminated a "Preliminary Report[2] of a Survey of Soviet Scientific Literature on Acoustics." This work was undertaken to determine, as well as possible from a small sampling of Soviet open literature, the state of the military applications of the fine structure analysis of aircraft sounds, and to find out whether a more thorough study would be worthwhile. The preliminary study has led to the firm but incomplete conclusion that the Soviets now have the potentiality of being several years ahead of us in the applications of fine structure analysis of acoustic spectra. Beyond this, there is a strong but unproved implication that they are ahead of us. A further study has been initiated in an effort to resolve this uncertainty. ([redacted])

A report[3] was completed on "Feasibility and Value of Determining Soviet Capability in the Intercontinental Ballistic Missile from Unclassified Soviet Literature." Based on the results of this study, it is considered that it is

[redacted]

not feasible to determine Soviet status in the development of ICBM's through review and correlation of unclassified Soviet literature. However, it is considered that the Soviet unclassified literature does show capability of building an ICBM if they so desire. (SECRET)

A report[4] was disseminated on "Astronomical Capabilities of Western Europe." This report describes the nature of the work that is being done in astronomy by Western European countries and depicts the astronomical capabilities of these countries by contrasting their work with comparable undertakings of the United States. European astronomers give more attention to solar astronomy than do American astronomers, and the combined capabilities of both groups are probably superior to those of the Soviets in this area. More attention is given to the new fields of radio astronomy and star scintillations than in the U.S. Western Europe's capabilities in navigational astronomy, meteor studies, celestial mechanics, and asteroids are believed to be inferior to those of the Soviets. (SECRET)

A report[5] on "Preliminary Study of Soviet Capabilities in Seismology" was completed. It appears that the over-all Soviet capability in seismology is com parable to that of the leading Western countries. Their potentialities in this subject are high, as evidenced by their work in theoretical seismology which is well developed. If they so desired, the Soviets could, within a short time, presumably advance all fields of seismology beyond the levels attained by the West. As a result of this preliminary study an enlarged analysis program is being initiated to determine Soviet Bloc capabilities in selected areas of

seismology and acoustics, as they apply to air weapons and air operations and as they support the Integrated Airborne Passive Search and Tracking Intelligence System. (SECRET)

ATIC completed a study[6] on "Soviet Capability to Develop and Launch a Military Earth Satellite". The capability of the USSR to develop and launch a military satellite will be largely determined by the results of their IGY Satellite Program. The Soviets have more than a passive historical interest in astronautics. They have taken definite positive action in this area of scientific endeavor and, if their achievements in aviation, nuclear technology, astronomy, automatics, telemechanics and rocket technology are criteria of their competence in these fields, then it must be recognized that they have a definite competence in interplanetary communications. (SECRET)

Reports were near completion concerning Soviet capabilities in celestial mechanics, nonlinear mechanics, meteorics, aurora and night sky radiations, and geomagnetism. Basic science studies are being initiated in wave propagation, solid state physics, chemistry, geodesy and gravimetry, and in several other fields of science. (SECRET)

(UNCL) UNIDENTIFIED FLYING OBJECTS

The emphasis given to the UFO controversy through the media of books, unofficial UFO organizations, motion pictures, and radio and television programs keeps a large number of UFO reports coming to the Center. The steady growth of unofficial UFO organizations (now more than forty) continued unabated. Of particular interest is the appearance of such organizations in Europe; a few contacted this Center on certain UFO incidents. (UNCLASSIFIED)

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The over-all basis of the UFO program was improved by the preparation of a detailed revision of AFR 200-2 "Unidentified Flying Objects." The final draft was approved by Hq USAF for printing. (UNCLASSIFIED)

The Secretary of the Air Force directed that Project "Blue Book" Report Nr. 14 be made public domain and be sold to the public at a nominal price. A small addendum is being prepared to bring the report up to date. (UNCLASSIFIED)

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1. TIS-SC-57-1, Project Nr. 30087, 7 Feb 57
2. TIR-SC-57-2, Project Nr. 25010, 12 Apr 57
3. ZP-7-043, Contract Nr. AF33(600)-31597, 1 Apr 57
4. TIR-SC-57-1, Project Nr. 25110, 3 May 57
5. TIS-SC-57, being printed.
6. An input to AFCIN-4F3 Project Nr. 17013, 14 May 57

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CHAPTER 15

AIR WARFARE AND WEAPON SYSTEMS

INTEGRATED PRODUCTS:

Work proceeded on revisions to AIE-11, "The Threat of Military Surprise from Soviet Technological Superiority", and to the study "Estimated Characteristics of Soviet Air Weapons".

AIR WARFARE SYSTEMS:

ATIC continued to support the ARDC Weapon System Project Offices and their contractors during this reporting period. A considerable increased number of briefings have been given, both formal and informal, studies prepared, pointing directly to their requirements in order that new U. S. weapons will be planned to meet the enemy environment that is estimated for the time period when the U. S. weapons become operational. This support included intelligence related to specific systems referenced in the previous ATIC history.

The "Aeronautical R and D in the U. K." Study, and studies on France, Sweden, and Switzerland were completed. The final report on Soviet Capability and Aircraft Structural Design will be included in the Aerodynamics Study. (UNCLASSIFIED)

Revision to Appendix B, FAIS 2-1 (Long Range) was completed. The study entitled "The Capability of the Soviet Bloc Air Defense Weapon System Against Low-level, High-speed Penetrations (1956-1960)", was completed during May. (UNCLASSIFIED)

ATIC established a working level committee, and prepared a preliminary report on Soviet Capability To Develop and Launch A Military Earth Satellite. It is planned to expand the scope of this task to encompass "astronautics", a

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