Description of document:	History of Air Technical Intelligence Center (ATIC), Wright-Patterson Air Force Base, Dayton Ohio 1 July 1955-31 December 1955
Requested date:	November 2022
Release date:	December 2022
Posted date:	02-January-2023
Source of document:	National Air & Space Intelligence Center United States Air Force NASIC/SCPD (FOIA) 4180 Watson Way Wright-Patterson AFB, OH 45433-5648 Email: NASIC.FOIA.Office@us.af.mil

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HISTORY OF

AIR TECHNICAL INTELLIGENCE CENTER

1 July 1955 - 31 December 1955

1 Jan 56 - 30 June 56

Prepared by

Air Intelligence Office

AIR TECHNICAL INTELLIGENCE CENTER

31 January 1956

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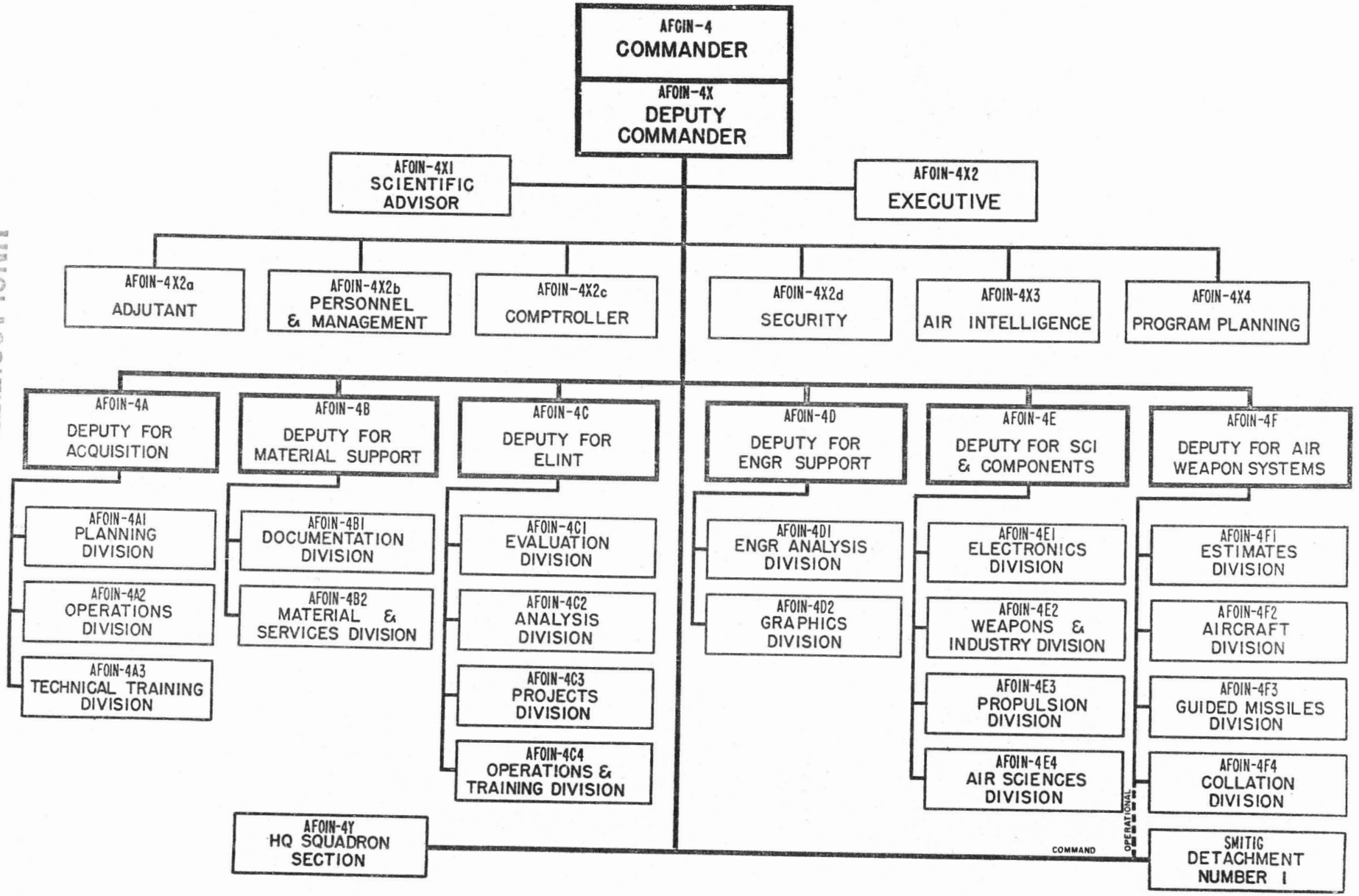
AIR TECHNICAL INTELLIGENCE CENTER



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GLOSSARY

A/I	Airborne Interception
AMC	Air Materiel Command
ARDC	Air Research and Development Command
ATIC	Air Technical Intelligence Center
ATILO	Air Technical Intelligence Liaison Officer
CIA	Central Intelligence Agency
D/I USAF	Director of Intelligence, USAF
ELINT	Electronics Intelligence
FAG	Field Activities Group
ICBM	Intercontinental Ballistic Missile
ICGM	Intelligence Collection Guidance Manual
IFF	Identification Friend or Foe
IGY	International Geophysical Year
ISC	Intelligence Subject Code
JCS	Joint Chiefs of Staff
NACA	National Advisory Committee on Aeronautics
RADC	Rome Air Development Center
REG	Returnee Exploitation Group
R&D	Research and Development
SRI	Specific Request for Information
TDY	Temporary Duty
UFO	Unidentified Flying Objects
USAFSS	United States Air Force Security Service

FOREWORD

TO THE HISTORY OF

THE AIR TECHNICAL INTELLIGENCE CENTER

For the Period

1 July 1955 - 31 December 1955

This edition of the History of the Air Technical Intelligence Center reflects the changes made by a major reorganization during the reporting period. Important activities of the Center are chronicled in the order in which they occurred. Operations and activities of the staff and supporting elements are set forth first, followed by the activities of the intelligence production components of the Center. Footnotes, if any, are listed at the end of each chapter.

GLOSSARY

(Cont'd)

VHF	Very high frequency
WADC	Wright Air Development Center
WHITE STORK	Battelle Memorial Institute (USAF Contractor)

Should be CONFIDENTIAL JMK

I. ORGANIZATION, MISSION, AND PERSONNEL

ORGANIZATION:

The Air Technical Intelligence Center is the technical intelligence element of the Directorate of Intelligence, Hq USAF. It is located at Wright-Patterson Air Force Base, Ohio. (Uncl)

This edition of the History of the Air Technical Intelligence Center covers the major reorganization, effective 1 August 1955, following designation of the Commander as Deputy Director for Technical Intelligence (AFOIN-4) by the Director of Intelligence, Headquarters, USAF. The revamping of organizational structure resulted in establishment of six special staff offices and designation of six deputies for technical intelligence operations.[1] (Uncl)

The reorganization established a Command group consisting of the Commander and Deputy Commander, the Scientific Advisor, the Executive, and the Deputies for specific functions (Directors). These Directors are staff officers representing the Commander within assigned functional areas. Directors have over-all responsibility, establish objectives and operating instructions, and provide planning direction and staff guidance for their respective directorates. (Uncl)

Chiefs of the Air Intelligence Office and the Program Planning Office are primarily responsible for assistance with command functions. The other staff offices (Adjutant, Personnel and Management, Comptroller, and Security) are primarily service elements that assist directorates with administrative and management matters. (Uncl)

The directorates are operating components responsible to a Director. They operate independently within the framework of policies established by the Director. (Uncl)

Both directorates and staff offices are further subdivided into Branches when workload and span of management necessitates. Branch chiefs are working supervisors who exercise administrative and operational supervision over Branch personnel, in addition to performing technical duties. (Uncl)

Further breakdown into Sections is the exception, and is admissible only when justified by the complexity and diversity of Branch responsibilities. (Uncl)

Functional areas assigned to Staff Offices by the reorganization were as follows:

The ADJUTANT performs the usual duties and functions of a military adjutant. In ATIC these duties include the control and storage of thousands of Top Secret and sensitive documents, and the dispatching of some 22,000 intelligence publications during a six-month period. (Uncl)

The PERSONNEL AND MANAGEMENT OFFICE secures manpower allotments for ATIC and performs personnel services pertaining to the recruitment, requisition, placement, and utilization of military personnel and civilians. A newly established ATIC Civilian Personnel Branch permits the Center to administer its own civilian personnel program. (Uncl)

The COMPTROLLER controls the financing of all ATIC mission requirements and operations. He performs all budgetary and financial planning, appropriation accounting, and cost accounting required by the Center. He provides statistical analysis services. (Uncl)

The SECURITY OFFICE maintains a security indoctrination program to minimize or prevent security violations within the Center. The Security Office controls and surveys the security clearances of personnel assigned to the Center, and advises the Commander of the effectiveness and efficiency of the security program. (Uncl)

The AIR INTELLIGENCE OFFICE keeps the Commander and Staff advised on world-wide social, economic, political, and military developments pertinent to the Center's mission. Performs similar services for Headquarters AMC, WADC, and other Department of Defense agencies located on Wright-Patterson Air Force Base. Exercises Staff supervision over all briefings presented by the Center. Edits the Center's intelligence publications. Compiles, edits, and publishes the Center's intelligence periodicals. Advises on public relations and protocol. Makes administrative arrangements for the visits of important persons. Conducts the Center's internal and public information programs. Prepares the Center's History. (Uncl)

The PROGRAM PLANNING OFFICE advises the Commander on plans and programs for the future development of ATIC and accomplishment of the air technical intelligence mission. Monitors special contracts set up by ATIC with civilian agencies. (Uncl)

Functional areas assigned to Deputies under the reorganization were as follows:

The DEPUTY FOR ACQUISITION generates and establishes ATIC acquisition requirements, plans and implements the ATIC intelligence acquisition program, supports the USAF scientific and technical intelligence-collection effort, and conducts special collection activities as required. (Uncl)

The DEPUTY FOR MATERIAL SUPPORT receives incoming raw intelligence data, excepting electronic intelligence information, and prepares it for use in the production of air technical intelligence; provides equipment and supplies for all phases of the Center's operations, and provides building maintenance services. (Uncl)

The DEPUTY FOR ELINT serves as the focal point within ATIC for USAF electronic intelligence operations; receives, analyzes, and evaluates all intelligence information that is acquired by the USAF through electronic intelligence operations; makes distribution of this information to appropriate agencies, and provides technical guidance and assistance to all USAF Commands in the development and implementation of the electronic intelligence program. (Uncl)

The DEPUTY FOR ENGINEERING SUPPORT provides the intelligence-producing components of ATIC with engineering-data analysis and photo-interpretation services; and provides reproduction and graphic services to support both the technical and administrative phases of the Center's operations. (Uncl)

The DEPUTY FOR SCIENCE AND COMPONENTS produces air technical intelligence estimates and studies on air weapon components, sciences, and technologies. Specifically, this includes determining the state-of-the-art in air technology, trends of research and development; estimates of performance, characteristics, and capabilities of foreign air weapon components; and the status of related technologies. (Uncl)

The DEPUTY FOR AIR WEAPON SYSTEMS produces air technical intelligence estimates and studies on air weapons and air weapon systems; and provides integrated air technical intelligence needed at national and Hq USAF levels, by major Air Commands, and by other branches of the Armed Services. (Uncl)

The new organization has effected segregation of administrative work from technical work, better alignment of operational elements, more clearly defined responsibilities, and general improvement of management for increased productivity of the Center. Effective span of management was accomplished through directorate organization by major area of specialization. (Uncl)

The organization of Detachment 1 (ATIC), assigned to the 1125th Field Activities Group, remained unchanged.[2] (Uncl)

MISSION:

The mission and objectives of the Center remained unchanged during the period covered by this report.[3] (Uncl)

A new civilian personnel function of significance was acquired in the closing months of 1955. Authority was granted to establish a separate Civilian Personnel Office for the Air Technical Intelligence Center.[4]

This necessitated redefined relationships of the Center with the Air Materiel Command and Wright Air Development Center, Wright-Patterson Air Force Base, Ohio. Firm agreement was reached on future relationships, and the formal agreement was signed on 28 November 1955.[5] The separate Civilian Personnel Office was officially established on 1 December 1955. (Uncl)

PERSONNEL:

Brigadier General Harold E. Watson, Deputy Director of Technical Intelligence, continued as Commander of the Air Technical Intelligence Center during this reporting period.

Colonel John G. Eriksen reported to the Center on 22 July 1955 and was assigned as Deputy Commander on 25 July 1955.[6]

Colonel John A. O'Mara, who had been serving in the capacity of Special Advisor to the Scientific Advisor, was appointed the Comptroller effective 1 August 1955.[7]

Colonel Wayne L. O'Hern was assigned Acting Chief, Program Planning Office, effective 1 August 1955.[8] Colonel O'Hern was transferred overseas effective 26 September 1955.[9]

Colonel Eugene G. Cook was assigned duty with the Center from the 6002d Air Intelligence Service Group.[10] He was appointed Chief, Program Planning Office, effective 6 December 1955.[11]

Key personnel of the Center, as of 31 December 1955, were:

Brigadier General Harold E. Watson	Commander
Colonel John G. Eriksen	Deputy Commander
Mr. A. Francis Arcier	Scientific Advisor

Colonel Dane F. Justice, Sr.	Executive
Major Thomas J. Connair, Jr.	Adjutant
Major Alec H. Lester	Chief, Personnel and Management Office
Colonel John A. O'Mara	Comptroller
Captain Franklin D. Wheeler Major John W. Barton	Chief, Security Office
Mr. Spencer Whedon	Chief, Air Intelligence Office
Colonel Eugene G. Cook	Chief, Program Planning Office
Colonel Malcolm D. Seashore[12]	Director, Deputy for Acquisition
Colonel George R. Weinbrenner[13]	Deputy Director, Deputy for Acquisition
Colonel Morris H. Shedd[14]	Director, Deputy for Material Support
Lt Col Ralph S. Jordan[15]	Director, Deputy for ELINT
Mr. I. Herman	Director, Deputy for Engineering Support
Mr. Nicholas Post	Acting Director, Deputy for Science and Components
Colonel ~~Ray W. McDuffee~~ William O. Farrior[16]	Actg. Director, Deputy for Air Weapon Systems
Colonel Earl J. McFarland, Jr.	OIC, Detachment 1

(Uncl)

Manpower Authorizations: At the beginning of the period, the Air Technical Intelligence Center was authorized 196 officers, 105 airmen, and 374 civilians, a total of 675. At the end of the period 197 officers, 110 airmen, and 374 civilians, a total of 681 were authorized. (Uncl)

PRAM 20, 30pp

Personnel Strength: At the beginning of the period, there were 314 civilians, 194 officers and 118 airmen, a total of 626, assigned to the Air Technical Intelligence Center. At the end of the period, 365 civilians, 212 officers, and 125 airmen were assigned, a total of 702. (Uncl)

ATILO Personnel: Of the personnel authorized for the Air Technical Intelligence Center, a total of 108 were assigned to the overseas Air Technical Intelligence Liaison Officer Program - 25 civilians, 58 officers, and 25 airmen. (CONFIDENTIAL) (2)

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1. Page 1, History of ATIC, 1 Jan 55 - 30 Jun 55.
2. Page 2, History of ATIC, 1 Jan 55 - 30 Jun 55.
3. ATIC History 1 Jan - 30 Jun 55, Page 2-3.
4. Ltr, Hq USAF, dtd 26 Oct 55, "Authority for ATIC Civilian Personnel Office"!
5. Agreement (Air Technical Intelligence Center, Air Materiel Command, and Wright Air Development Center), dtd 28 Nov 55.
6. 1125th FAG (HEDCOM USAF) GO # 47, 25 Jul 55.
7. 1125th FAG (HEDCOM USAF) GO # 53, 15 Aug 55.
8. Ibid.
9. Hq 1125th USAF FAG SO 111, 7 Sep 55.
10. Hq 1125th USAF FAG PERAM Nr. 69, 12 Dec 55
11. 1125th FAG (HEDCOM USAF) GO # 67, 8 Dec 55.
12. See footnote 7.
13. Ibid.
14. Ibid.
15. Ibid.
16. Ibid.

II STAFF ACTIVITIES

TECHNICAL INTELLIGENCE BRIEFINGS AND NOTEWORTHY VISITS:

Complete implementation was accomplished of the program undertaken early in 1955 to acquaint major users of air technical intelligence with the facilities, capabilities, and projects of the Air Technical Intelligence Center. Briefings were presented at many places throughout the United States as well as at the Center itself. Numerous oral and graphic presentations were made to military and civilian officials who visited the Center. Many special briefings were given by Center personnel visiting other commands and agencies to promote wide dissemination of technical intelligence by use of authorized briefing texts on technical studies and estimates of the Center. In order to encourage the widest possible use of the Center's products, briefing texts of estimates and studies were prepared by the Air Intelligence Office and distributed, with visual aids as appropriate, to intelligence briefing officers of using agencies. (Uncl)

(Uncl) Significant Briefings by the Commander and Personnel of the Center:

A Joint AMC-ARDC-ATIC Engine Industry Meeting was held in Baltimore, Maryland on 8 July 1955. ATIC opened the meeting by presenting the Soviet air power threat for the benefit of the top officials of the aircraft engine industry. (~~CONFIDENTIAL~~) (U)

On 22 July 1955 a Briefing on Soviet Air Power was presented in Washington to the staff of the Assistant Secretary of the Air Force for Research and Development. (~~CONFIDENTIAL~~) (U)

On 26 July 1955 the Commander and Staff of the Tactical Air Command, Langley Air Force Base, were given a briefing on Soviet Air Power and Guided Missiles. This briefing was presented at the request of Honorable Roger Lewis. (~~CONFIDENTIAL~~) (U)

Five consultants and two staff members of the Technical Advisory Panel on Electronics, Office of Assistant Secretary of Defense (R&D), visited ATIC 29 August 1955 and were given a thorough briefing on electronic intelligence operations. The briefing was supplemental to, and an enlargement upon, the briefing presented to the Technical Advisory Panel on 28 June 1955 in Washington by General Watson. The visit included a tour of the electronic intelligence facilities of ATIC. The visiting group was headed by Dr. C. Guy Suits, Chairman of the consultant group of the Panel. (~~CONFIDENTIAL~~) (U)

An agreement, known as the Black Crane project, was made between ATIC and Major Air Force contractors for the exchange of intelligence of mutual benefit to all parties. The purpose of the agreement is to correlate contractors' need for air technical intelligence with ATIC need for intimate knowledge of critical factors in air weapons systems development. This arrangement should provide guidance for the contractor in his air weapon design effort and furnish valuable assistance to ATIC in producing comprehensive estimates on foreign air weapons. Implementation of the agreement was effected by the establishment of an intelligence cell by each of the major contractors. Liaison is maintained between personnel of these cells and the Program Planning Office of ATIC. In furtherance of this agreement, the Commander conferred,

in August and October 1955, with officials at the Convair, Northrup, Lockheed, and other plants on the subject of release of applicable air intelligence information to Air Force contractors. (SECRET) (U)

Major General Arthur G. Trudeau, Assistant Chief of Staff, G-2 Intelligence, US Army, visited the Center in July 1955 and was given a special briefing by General Watson on Soviet Air Power. (CONFIDENTIAL) (U)

Twenty members of the staff of the Air Proving Ground Command visited ATIC 12-13 July 1955 and were briefed on the Center's Mission, functions, and facilities. The briefing was followed by an open discussion of current Soviet air technological developments. (CONFIDENTIAL) (U)

A briefing on Soviet aircraft was presented in August 1955 to Honorable Donald A. Quarles, Secretary of the Air Force, and his staff in Washington, D. C. (CONFIDENTIAL) (U)

Soviet helicopters was the subject of a briefing presented on 18 August 1955 to personnel from WADC, AMC, the Army Transportation Corps, Army Aviation Coordinating Office, and US Navy Bureau of Aeronautics Office. (CONFIDENTIAL) (U)

The NACA Subcommittee on Heat Resistant Materials was given a briefing in September 1955. The briefing was based on an ATIC Technical Report, and included latest estimates of Soviet activities in high-temperature alloy development. (CONFIDENTIAL) (U)

Upon request of the Commander of Rome Air Development Center, a briefing was presented to contractors of the RADC Intelligence Laboratory. These contractors are collaborating with RADC on the Advanced

Reconnaissance System Project. The briefing was held at the Center and lasted two days. The second day was devoted to a discussion by a panel composed of several analysts from ATIC. (CONFIDENTIAL) (U)

During October and November 1955, briefings on the technical aspects of the Soviet air defense system were presented to contractors and members of the 110A and 125A Weapon Systems (chemical and nuclear-powered strategic bombers) Project Offices at WADC. (SECRET) (U)

A comprehensive briefing was given in November 1955 to the Commander and Technical Staff of the Air Force Armament Center at Eglin Air Force Base. The briefing included foreign aircraft armament information that possibly could be integrated into development and test programs conducted by the Armament Center. (CONFIDENTIAL) (U)

General Watson presented a significant technical intelligence briefing on 16 December 1955 to approximately 300 top officials of the US aircraft industry. The briefing covered Soviet air power and Soviet air development. The meeting was sponsored by the Air Research and Development Command and was held at Baltimore. (CONFIDENTIAL) (U)

Many other briefings, too numerous to mention, were given to groups and agencies on a need-to-know basis. In each of these briefings the primary effort was to portray the threat of Soviet air power that is posed by the technical advances of the Soviet Union, and to emphasize our awareness of the need for air technical intelligence. (CONFIDENTIAL) (U)

In accordance with ATIC policy of endeavoring to keep abreast of current thinking in the technological sciences, the Center sponsored a visit of an outstanding European authority on applied mathematics and

electronic computers. Professor Doctor Alwin Walther, Director of the Institute for Practical Mathematics, Darmstadt, Germany, visited the Center in September 1955. Leading scientists and technicians from all services and agencies concerned with national defense were invited to participate in a three-day meeting with Doctor Walther. The first day was devoted to lectures by the visitor, and open discussions were held on the second and third days. Doctor Walther explained the state of development of electronic computers in his own country and in most of the other countries of Europe. His lectures were well received and the participants expressed appreciation for the opportunity to exchange ideas with Walther. (Uncl)

III ACQUISITION OPERATIONS

GENERAL:

Acquisition operations in support of intelligence production included all operations, excepting ELINT operations, related to the collection of air technical intelligence information. These operations were performed in meeting an assigned responsibility for implementation and operational support of approved collection plans, the generation of requirements for scientific and technical information and placement of requirements on collection activities, the maintenance of liaison with other intelligence agencies for effective exploitation of active and potential sources, the administration of the Air Technical Intelligence Liaison Officer Program, and direction of intelligence training programs for selected personnel. (Uncl)

Major activities, programs, and projects concerning acquisition of air technical intelligence information included the following during this reporting period:

(Uncl) Melpar. This project involves acoustics collection by which identification of aircraft and guided missile propulsion-unit characteristics is accomplished by fine-line analysis of sound recordings. Significant intelligence was produced during the past six months as a result of acoustic recordings of Soviet aircraft in flight. Plans were crystallized for an intensified effort to apply technology, as currently developed, to guided missile recordings. [redacted] (U)

(U) [redacted] Jadescreen. This project concerns the development of specialized receiving systems to cover the low and very low frequency

spectrum in radio transmission. This system is designed to discover, by interception of signals, the location of Soviet long range navigation sites, and to assess the capabilities of the Soviet air navigation system. The site for one facility at Wakkanai, Japan, was selected and necessary facility construction was completed so that operations can begin early in 1956. A second site at King Salmon AFB, Alaska, was also rehabilitated and operationally activated in November. Action to select sites for temporary operation in Germany and Turkey was initiated and a second Far East site on Okinawa was tentatively selected. A policy agreement was reached with USAFSS, subject to D/I USAF approval, determining the precise responsibility of project operation which devolved upon USAFSS and ATIC, respectively. ~~(SECRET)~~ (U)

(Uncl) Exploitation of Israeli-Egypt Situation. This project was initiated exploring ways and means to exploit the present tense situation which has resulted from the Soviets shipping arms to Egypt, the first time arms in this magnitude have ever been provided to a country outside the Soviet Bloc. It will also provide a method through "people-paper-hardware" sources to obtain valuable air technical intelligence. Considerable coordination is required, and much information on capabilities must be gathered in the area before this plan can be implemented. ~~(SECRET)~~ (U)

(Uncl) International Geophysical Year (IGY):

This project prepares and implements an air technical intelligence collection program to insure that the 1957-58 International Geophysical Year will be fully exploited within the concepts of Air Technical Intelligence Center requirements and NSCID #7.[1] ~~(CONFIDENTIAL)~~ (U)

The IGY is a scientific program wherein thirty-six participating nations will conduct joint and coordinated observations and experiments in meteorology, geomagnetism, aurora and airglow, ionospheric physics, solar activity, cosmic rays, latitude and longitude, glaciology, oceanography, rocket exploitation of the upper atmosphere, gravity measurements, seismology, and Arctic studies. (Uncl)

The aim of the project during 1955 was directed toward establishing a working arrangement with the US National Chairman of the IGY, Dr. Joseph Kaplan. Through Dr. Kaplan and ATILO, Germany, considerable influence was brought to bear on delegates at the Brussels IGY meeting in September, and in previous meetings of the International Geophysical Union, to invite the participation of the USSR. This move was successful, and the Soviet government has agreed to participate to the fullest extent. Over 100 Soviet scientific institutions are taking part in the IGY program. ~~(CONFIDENTIAL)~~ (U)

The project also promoted the exchange of scientific personnel of the experimental and observation groups of the United States, USSR, and other countries. ~~(CONFIDENTIAL)~~ (U)

(Uncl) Scientist Program:

The scientist program supports and assists the ATILO program through the use of selected scientific and technical personnel, and involves selecting and obtaining the services of a group of scientists and technicians whose specialties will provide complete coverage of all basic and applied scientific and technical fields related to air technical intelligence. ~~(CONFIDENTIAL)~~ (U)

During the reporting period, five persons were active in this program: Dr. John Nielson, New York University, visited the United Kingdom, Belgium, Holland, France, Germany, Switzerland, Italy, Yugoslavia and Austria, and furnished a report to ATIC on aircraft metallurgy and accessories in those countries. Messrs. R. L. McManns, W. O. Meckley, W. F. Moore, and W. C. O'Connel of General Electric Company visited France, Sweden, United Kingdom, Germany, in connection with aircraft accessories. A report of these visits was furnished to ATIC. ~~(CONFIDENTIAL)~~ (U)

Dr. D. T. Williams, Battelle Memorial Institute, attended the Atomic Energy Conference at Geneva, Switzerland, and reported on nuclear physics and nucleonics. Dr. Joseph Kaplan, UCLA, visited the United Kingdom, Belgium, France, Germany and Italy in connection with geophysics and the International Geophysical Year. ATIC received a report of his observations. ~~(CONFIDENTIAL)~~ (U)

International scientific and technical meetings were reported on from the air technical intelligence standpoint, as well as International Industrial Fairs. Dr. Clearence Ross, Wright Air Development Center scientist, attended a computer conference in West Germany which was attended by Soviet satellite computer experts. He also covered the Indian Industries Fair in New Delhi during which time he contacted important Indian scientists who had recently been to the USSR. ~~(CONFIDENTIAL)~~ (U)

(Ural) High Power Long Range Radar:

This project is designed to track, by electronic means, the movement of guided missiles at test sites. General Electric Company

furnished equipment and modifications for the present overseas Site #9. Additional equipment was programmed for a second overseas site, which General Electric can furnish in December 1956. (SECRET) (U)

A second high power site is to provide greater coverage and accuracy to permit sightings over different routes when the enemy changes direction for greater range. The "Beneficial Occupancy Date" of the second site is planned for July 1957. (SECRET) (U)

(Uncl) Project Early Harvest:

Under the provisions of this project, ATIC is seeking an airborne means of acquiring information on enemy ground-to-air and air-to-air rockets fired at our aircraft. (SECRET) (U)

Preliminary coordination with Wright Air Development Center, Air Materiel Command, Air Research and Development Command, Rome Air Development Center, Air Force Director of Operations, and Air Force Director of Intelligence, resulted in several possible approaches, of which the following appeared most feasible:

a. Use of an instrumented drone to pick-up and relay certain information by radio to the control aircraft.

b. The control aircraft would record this information and also pick-up directly by infrared and other means, additional information about missiles. (SECRET) (U)

(Uncl) Infrared:

A study was made of ATIC collection requirements which may be solved through utilization of infrared techniques, with plans drawn up

for implementation as funds become available. Purchase Requests to be initiated for procurement included equipments such as:

a. An automatic, unattended radiometer which can make infrared radiation measurements against active ICBM rocket motors from above the horizon to the end of their active phase at distances of fifty miles or more.

b. Portable, unattended infrared radiometer which can be used in a fixed position against test stands of rocket and jet motors as well as in warm-up positions of new types of aircraft prior to the Moscow showings.

c. Airborne infrared detection and tracking equipment for use against ICBM with ranging to be provided by radar techniques. (SECRET) (U)

Contract effort was initiated with Aerojet General Corporation to provide infrared radiation measurement instrumentation (known as radiometers under Project WATCH DOG) for the Moscow Air Show and collection purposes.[2] The contract is running ahead of the original schedule, with delivery of the equipments promised 6 February 1956. Steps are being taken to route this equipment via the United Kingdom to obtain infrared radiation pattern measurements against by-pass engines, such as the Conway. (SECRET) (U)

Infrared consultation services were provided by Dr. Paul J. Ovrebo, Physicist, upon request to the Office of the Assistant Secretary of Defense and to various USAF Research and Development Headquarters Groups. Dr. Ovrebo has been serving as a member of the Working Group for Fuzing and Homing under the Ad Hoc Committee for Anti-ICBM under sponsorship

of the Scientific Advisory Group formed by Dr. Guy Stever, Chief Scientist, Headquarters, USAF. (SECRET) (U)

(Uncl) Intelligence Collection Guidance:

During this reporting period, 254 Specific Requests for Information (SRI) were initiated. (Uncl)

Ten trip briefs were completed and forwarded to air attaches and officials who were planning to travel in areas of intelligence interest. These trip briefs are designed to furnish collection guidance for the individual traveller in a specific area. (CONFIDENTIAL) (U)

Intelligence Collection Guidance Manuals (ICGM) on Industrial Recognition and Industrial Methods were produced during this reporting period. These manuals are designed to assist collectors in the recognition and collection of significant information relative to the field of aircraft and component manufacturing. (Uncl)

(Uncl) Returnee Exploitation Group (REG). The REG Program was established to fully exploit the intelligence potential of prisoners and refugees returned from Russia and other countries of the Soviet orbit. Activity in the program has gradually diminished but several important sources were exploited during the past six months. They included persons knowledgable on communications, biological and chemical warfare, and atomic energy. (CONFIDENTIAL) (U)

(Uncl) Air Technical Intelligence Liaison Officer (ATILO) Program:

The purposes and designs of the ATILO program did not change during this period.[3] The ATILO organization in Salzburg, Austria, was deactivated 14 July 1955 as a result of the signing of the peace treaty with

Austria. While in the process of deactivation, Capt. Roy F. Moullen and Lt. Malcolm J. Stokes, of the Salzburg office, were killed while participating in a training flight. With the suspension of intelligence collection in the Salzburg area, much technical intelligence information will be lost. Resumption of this collection effort may be effected when an Air Attache Office is established in Austria. (Uncl)

The Egypt-Israeli arms situation resulted in Headquarters USAF placing a requirement on ATIC for an ATILO in that area. On 6 December 1955 Major James E. Bauer departed this station for Cairo after proper briefing and instructions. An aeronautical engineer ATILO from Germany was also assigned TDY to Cairo to provide any necessary support. These officers are expected to fully exploit the opportunity to observe Soviet materiel that is being sent to the West for the first time. ~~(SECRET)~~ (U)

A specialized intelligence photography course was given to 19 Air Attache Officers during the reporting period. Four airmen assigned to attache offices also attended the course. (Uncl)

More than 5000 photographic negatives and prints were made during the past six months. Most of these negatives and prints were of highly classified material from overseas sources.

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1. National Security Council Intelligence Directive #7.
2. USAF Contract AF 33 (600) 31696).
3. See page 16, History of ATIC, 1 Jan 55 - 30 Jun 55.

IV MATERIAL SUPPORT OPERATIONS

GENERAL:

Material support operations centered on documentation and other services in support of ATIC intelligence-producing activities. This included provision for receipt of raw intelligence data (ELINT excepted) and preparation of data for use by the intelligence-producing elements of the Center, and provision of equipment, supplies, and building maintenance services for the Center's operations. (Uncl)

Document services included screening, extracting, coding, cataloging, researching, locating, and processing ATI documents; translating, evaluating, and identifying foreign language documents; and storing, circulating, and retiring ATI documents. Major programs and projects during this reporting period included: (Uncl)

(Uncl) TRANSLATION CONTRACT FOR FISCAL YEAR 1956.[1] A contract for translation services was let to O. W. Leibiger Research Laboratories, Inc., on 14 November 1955. As agreed upon, the stipulated amount may be increased during Fiscal Year 1956 as required. At the present rate, it is anticipated that the Fiscal Year 1955 contractors will not complete all outstanding translations in less than one year. The contractor selected was considered the best qualified of 47 considered. Recommendation has been made that a sole-source award be given to this agency upon satisfactory performance of the FY 56 translation contract. This would enable ATIC to develop a contractor facility to service translation requirements on a continuing basis. (CONFIDENTIAL) (2)

(Uncl) CENTRAL INTELLIGENCE AGENCY INTELLIGENCE SUBJECT CODE (ISC). Coordination on changes in the ISC was continued in a meeting held at ATIC on 13 September 1955 with representatives of CIA, D/I USAF, and ATIC. This meeting was held primarily to discuss recommended changes to the 600 Series of the ISC, but it became apparent that changes would also be required in the 400, 500, and 700 Series of the code. ATIC had found the CIA Country Code difficult to apply to the air technical intelligence mission. As a result of this meeting, suggested revisions have been forwarded to CIA for possible inclusion in the 400, 500, 600, and 700 Series. One revision to the 600 Series, Atomic Energy and BW-CW portions, has been accepted by CIA. Revisions to the Industrial Engineering Section of the 700 Series are in process of coordination with the Deputy Director for Targets, D/I before submission to CIA. (~~CONFIDENTIAL~~) (U)

(Uncl) FOREIGN EQUIPMENT:

Material and equipment services included provision of facilities and services pertinent to the handling and processing of all foreign equipment received by the Air Force for analytical purposes, including responsibility for extraction of nameplate and marking data. This activity includes the transportation and delivery of foreign equipment items of intelligence interest that are acquired by various means. The items may range from a nut or bolt to a complete aircraft. Facilities include those required for identification, warehousing, shipping, and display; and services include maintenance of records associated with foreign material and equipment. During this reporting period,

413 items of foreign equipment were received and processed. Total weight of these items was 76,275 pounds. Approximately 2300 photo frames of nameplate and marking data were made. ~~(SECRET)~~ (U)

On 17 August 1955 a Soviet YAK-18 was transported to ATIC from Korea. This aircraft had been made available to us by a North Korean pilot who defected. It was turned over to WADC for flight test and maintenance. Logistic support throughout the flight test program will be furnished by ATIC. ~~(CONFIDENTIAL)~~ (U)

A display of foreign equipment was set up by ATIC in the Air Room of Headquarters, US Air Force in Europe in August 1955. The items were on exhibit until the end of the year and were a source of considerable interest.(Uncl)

(Uncl) MAINTENANCE. The major activity in the building maintenance and services area during this reporting period was the completion of a remodeling program. An extensive program was initiated which included the building of ten-foot ceilinged areas, seven-foot partitions, acoustic-tiled areas, paneling of all newly constructed areas and painting of Building 263, Wright-Patterson AFB. This renovation provided more privacy to each office group and eliminated the distractions that occur when a large number of persons must work in an unpartitioned area. (Uncl)

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1. See page 28, History of ATIC, 1 Jan 55 - 30 Jun 55.

V ELECTRONICS INTELLIGENCE OPERATIONS

GENERAL:

ELINT operations during the reporting period consisted of the acquisition of electronic intelligence information (signal analysis) through the interception of foreign radar, radiation, and radio signals, and the development of devices to improve our capability in the ELINT collection effort. (SECRET) (U)

Much effort was expended on developing and improving recorders, analyzers, and computers to meet the needs of our ELINT collection program. (CONFIDENTIAL) (U)

(Uncl) Project Activities:

Evaluation of the AN/APD-4 airborne instantaneous direction-finder system for electronic reconnaissance, as installed in the RB-47H aircraft, was undertaken. Techniques for use in the reduction of data from AN/APD-4 are still under study. (CONFIDENTIAL) (U)

A pulse-measuring device was designed, built, and tested. This device is capable of determining instantaneously and conclusively whether intercepted radar beams are being pulsed from the same source. Analysis was conducted to prove the adequacy of the intercept equipment and the techniques employed, as well as of the material collected. The air crew of the ERB-29, a special ferret aircraft, was briefed on this equipment. The ERB-29 is due to be phased out of service in the Fall of 1956 because of obsolescence. (SECRET) (U)

The project to obtain new laboratory type ferret aircraft succeeded in establishing the configuration for two scheduled ERB-47's. Negotiations are being conducted for an advance aircraft with the expectation that at least one can be equipped on a "Quick Reaction Capability" basis before the ERB-29 is phased out of service. (SECRET) (U)

ELINT devised a mock-up of a ferret aircraft intercept position with receivers, pulse analyzers, recorders, and accessories used by ferret operators. It is being used for developing and testing new intercept techniques and equipment. (CONFIDENTIAL) (U)

Several projects have been initiated to attain greater recording capabilities for intercepted signals. A flying spot scanner video recording technique is being procured from Telechrome Corporation. Three standard model Davies 7-channel airborne tape recorders will be installed and tested in the laboratory ferret mock-up for eventual installation in laboratory ferrets. A dual-channel airborne tape recorder is being developed as a replacement for the wire recorders now in use. (SECRET) (U)

ATIC is collaborating with the Aero Reconnaissance Laboratory, WADC, in arranging a flight test of the QRC-16, a device which, in conjunction with an AN/APR-9 receiver, is expected to record lobe and field strength data on intercepted radar beams. (CONFIDENTIAL) (U)

Studies were made of the TOKEN radio-frequency spectrum signal density and related characteristics data to aid in the USAF project for development of a countermeasures capability against the TOKEN radar. The TOKEN is a Soviet radar installation used throughout the Soviet Bloc. (CONFIDENTIAL) (U)

The "Ready", second prototype machine data reduction device designed to process data, was delivered in July. Its unique feature is its ability to give an instantaneous reading of pulse repetition frequency. From this reading, radars may be speedily identified without processing excessive, redundant data. (SECRET) (U)

A facsimile-type signal separator, QRC-26, was placed in use in July to satisfy our requirements to simplify the problem of identification of individual signals from audio tapes containing many signals. (CONFIDENTIAL) (U)

The first of a new series of ELINT Progress Reports was published in October 1955. The purpose of these reports was to improve the USAF ELINT capability by providing timely and comprehensive reporting of current ELINT intelligence and technology. Material for these reports was solicited from all organizations engaged in the ELINT effort. Reports published during this reporting period were:

TR-DE-55-1	"(Uncl) Developments in Signal Intercept and Analysis". Annual progress report for fiscal year 1955. (Report SECRET)
TR-DE-55-2	"(Conf) (U) Analysis of Reported 'Sixth Frequency' Radiation from TOKEN Radars" (Report SECRET)
TR-DE-55-3	"(Uncl) Developments in Signal Intercept and Analysis" (Report SECRET)
TR-DE-55-3A	"(Uncl) ELINT Progress Report Supplement" (Report TOP SECRET)
TR-DE-55-4	"(Conf) (U) Report on ERB-29 Ferret Configuration" (Report SECRET)
TR-DE-55-5	"(Uncl) ELINT Progress Report" (Report SECRET) November issue.
TR-DE-55-6	"(Uncl) ELINT Progress Report" (Report SECRET) December issue.

VI ENGINEERING SUPPORT OPERATIONS

GENERAL. Engineering Support operations were established for engineering-data analysis and photo-interpretation services in support of ATIC intelligence-producing elements, and for reproduction and graphic services to support both the technical and administrative phases of the Center's operation. Engineering services included responsibility for determining weight and balance, design layout, and structural characteristics of foreign aircraft and missiles; for making performance estimates on all types of aircraft and monitoring flight test programs on foreign aircraft and equipment; and for developing methodology by which to arrive at solutions. Graphic services were extended to include increased administrative functions and scope of operations, and facilities were added for repro-typing and proofreading all ATIC publications. (Uncl)

(Uncl) Engineering Support Activities:

In July 1955 weight estimates of the Soviet helicopters, HORSE and HOUND, were prepared, and previous weight estimates of Soviet aircraft BEAR, FARMER, and FLASHLIGHT were defended in a joint Anglo-American conference. ~~(SECRET)~~ (U)

Preliminary design work was accomplished, including design layout and weight and balance calculations, for an estimated 1961 Soviet supersonic medium bomber and a 1959 Soviet supersonic fighter-bomber. ~~(SECRET)~~ (U)

An analysis of the Soviet FARMER aircraft, a new day fighter, was begun after the 1955 May Day Show, and was continued through the last six months of 1955. The drag analysis on the aircraft was computed by the analysts. The calculations of thrust required, rate of climb, and

other performance parameters required in general performance analysis were computed on UNIVAC. In addition to doing a general performance analysis on FARMER, calculations were made on use of the aircraft in ground attack missions. Work was also accomplished on a 1957 version of the FARMER, using more powerful engines. (SECRET) (U)

The performance analysis of the Soviet FLASHLIGHT aircraft, a new all-weather interceptor, was completed in July 1955. The last part of the analysis on this aircraft was the turn-radius capability at altitudes from sea level through 45,000 feet. (SECRET) (U)

A performance analysis was completed on the Soviet FRESCO aircraft (MIG-17). This analysis concerned the C and D types of the FRESCO. Capabilities estimates for ground attack missions also were completed for both types. (SECRET) (U)

Performance estimates were calculated for a 1961 Soviet supersonic bomber to be powered by two turbofan engines. When the first estimate was completed it was indicated that this particular aircraft would not meet the requirements set for it. A second estimate was initiated and was in process at the close of this reporting period. (SECRET) (U)

Analysis work was initiated and continued on the Soviet BEAR, a new turboprop aircraft; the Soviet BISON, a heavy jet bomber comparable to the US B-52; the Soviet HOUND (type 36) helicopter; the Soviet HORSE, a new twin-rotor helicopter; and the Soviet FAGOT (MIG-15). Some of this work was completed and other phases of it are in the finishing stage. (SECRET) (U)

Engineering and analysis data were prepared on flight tests of the Soviet YAK-18 and the MIG-15. The MIG-15 test was to evaluate the Soviet aircraft against the Air Force F-86K in actual flight. ATIC monitored both of these flight tests. (~~CONFIDENTIAL~~) (U)

Photo interpretation was accomplished and drawings were originated or revised on the following aircraft:[1]

BADGER	CRATE	MASCOT
BEAGLE	FARMER	MIDGET
BEAR	FLASHLIGHT	HORSE
BISON	FRESCO-A, B, C, and D	HOUND
COACH		

(~~CONFIDENTIAL~~) (U)

In August, a READIX digital computer was delivered by the contractor for installation at ATIC. From August through the end of this period, personnel were engaged in developing the necessary computing routines and in learning the mechanical operation of the electronic design of the computer. Unfortunately, many delays in the installation were encountered because of breakdown on the machine. Late in September, the drum was ruined, and many troubles with the power line were encountered, causing a delay of approximately six weeks. The drum was resurfaced by the contractor and the necessary design changes were made in the logic. In the middle of November, the computer made its first satisfactory arithmetic operations. From that time on, encouraging results have been obtained. At present the computer has not passed any of its acceptance tests. It is anticipated that the operation will be up to expected quality by January or February 1956. (Uncl)

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1. BADGER - Soviet two-engine turbojet medium bomber.
   BEAGLE - Soviet two-engine turbojet light bomber.
   BEAR - Soviet four-engine turboprop heavy bomber.
   BISON - Soviet four-engine turbojet heavy bomber.
   COACH - Soviet two-engine conventional transport.
   CRATE - Soviet two-engine conventional transport.
   FARMER - Soviet day fighter.
   FLASHLIGHT - Soviet all-weather interceptor.
   FRESCO - Soviet fighter, four types.
   MASCOT - Trainer version of Soviet BEAGLE.
   MIDGET - Soviet trainer version of FAGOT (MIG-15).
   HORSE - Soviet twin-rotor helicopter.
   HOUND - Soviet single-rotor helicopter.

VII SCIENTIFIC INTELLIGENCE OPERATIONS

GENERAL. Scientific intelligence estimates, studies, and technical reports are some of the end products of ATIC. Areas covered by these estimates, studies and technical reports include air weapon components such as armament, electronics, instrumentation, and propulsion; technologies such as the composition and manufacture of metal, ceramics, plastics, and rubber; and capabilities of foreign nations to conduct air warfare. Other subjects covered include basic and applied sciences such as heat transfer, fluid mechanics, astrophysics, geophysics, celestial mechanics, and all other sciences related to air power. The impact of a technological break-through in any of these supporting sciences and technologies may well result in a potentially serious threat to the United States.

(Uncl) ELECTRONICS STUDIES AND ESTIMATES:

(U)(~~CONFIDENTIAL~~) Soviet Capabilities in Electronic Measurements. An ATIC study, based for the most part on Soviet text and instruction books, was made on the technical aspects of Soviet electronic measurement techniques and test equipment. This study generally concluded that the USSR was in good position to satisfy its requirements in this field. This study was distributed in December 1955.[1] ~~(CONFIDENTIAL)~~ (U)

(Uncl) Analysis of Foreign Radio Device:

In October 1955, ATIC analyzed a transmitter listening device which was discovered embedded in a plaster wall in a USAF officers home. A preliminary examination of this equipment resulted in the publication

of a Preliminary Report on Foreign Equipment. The analysis revealed that the unit was capable of detecting normal voice conversation at a distance of approximately 75 feet.[2] (~~SECRET~~) (U)

In addition to the Preliminary Report, an ATIC Technical Report, was published following an analysis of the equipment by the Farnsworth Electronics Company under contract. This latter report was given special dissemination, particularly to Air Attaches in foreign countries.[3] (~~SECRET~~) (U)

(Uncl) WEAPONS AND INDUSTRY STUDIES:

(Uncl) Investigation of Soviet Gunnery Training. Aided by a contract with the Crosley Division of the AVCO Manufacturing Corporation, armament specialists of the Center completed an ATIC Study "(U) Study of Soviet A-1 Air Gunnery Trainer". This study furnishes an insight to the gunnery training technique and the resultant proficiency of Soviet fighter pilots. It also contains a valuable contribution by the Rheem Manufacturing Company on the principle of fighter aircraft gunnery trainers and the latest US developments for the purpose of comparison.[4] (~~CONFIDENTIAL~~) (U)

(Uncl) Evaluation of Foreign Aircraft Gun. With the aid of a contract with the Armour Research Foundation, ATIC completed the evaluation of the French 30-mm DEFA 541 Automatic Aircraft Gun and published the results in a Technical Report. Conclusions were reached as to the potential this basic German design offers to the Soviets for exploitation to obtain improved aircraft guns.[5] (~~CONFIDENTIAL~~) (U)

(Uncl) Soviet High Explosives for Aerial Munitions. ATIC completed a study of Soviet high explosives for aerial munitions which was distributed in November 1955. This study is the only known compilation of information on this subject and should serve as a useful research aid in evaluating future Soviet capabilities to damage or destroy targets by aerial attack.[6] (CONFIDENTIAL)

(Uncl) Metallurgy. A significant ATIC Study of Soviet metallurgical research capability was released during this period. This study set forth the implications of the Soviet metallurgical capability with respect to high-temperature alloys, a field important to air-weapons development. The study was designed particularly for the utilization of top-level defense planners in the United States and was not widely disseminated to other agencies.[7] (CONFIDENTIAL)

(Uncl) Vacuum Melting. Subsequent to the release of the study on metallurgy mentioned above, ATIC confirmed, by examination of Soviet turbine buckets, that the Soviets are doing vacuum melting of high-temperature alloys on production scale, which means they are four years advanced in production technology in this particular field over the US. The US industry is now in pilot-plant production stage. This was an important discovery. The advantages of vacuum melting are, (1)stronger alloys, (2) conservation of critical materials, (3) better fabrication and machining processes, such as were found in the Soviet buckets examined. (SECRET)

(Uncl) Non-Metallic Materials:

The program for investigating the status of Soviet-bloc nations in rubber and plastics was completed upon publication of two ATIC studies.

One of these studies, concerned with selected satellite nations, was released in September;[8] the other, with reference to the USSR, was released in November.[9] (~~CONFIDENTIAL~~) (U)

One of the more significant intelligence items for this period was the reporting of Teflon in the USSR. This was the first indication ATIC had received that the Soviets have Teflon, a highly important plastic material. (~~CONFIDENTIAL~~) (U)

In the area of Ceramics and Cermets, an ATIC study was published on the status of development in these fields by selected Soviet-bloc nations.[10] (~~CONFIDENTIAL~~) (U)

(Uncl) Producibility Studies on Aircraft:

A producibility study on the Soviet BADGER aircraft was published 8 November 1955 under the title, "Manufacturing Analysis of BADGER". In this study it was concluded that the Soviets can, and probably do, produce this bomber in series production, and that the design of the aircraft permits high producibility and quick acceleration to peak production.[11] (~~SECRET~~) (U)

Producibility studies were also made, but not published, on the BISON and BEAR bombers, and on the FARMER fighter and FLASHLIGHT interceptor. These studies will be released early in 1956. (~~CONFIDENTIAL~~) (U)

(Uncl) Soviet East German Tube Manufacturing. An analysis of Soviet and East German electronic tube manufacturing technology was completed and the study was released in October 1955. This study compares the efficiency of the Soviet and East German tube production processes, in terms of labor, area, and machines, with equivalent US requirements.

The comparison indicates low efficiencies on the part of the Soviets.[13] ~~(CONFIDENTIAL)~~ (U)

(Uncl) Soviet Aeronautical Instrument Industry Study. Investigation of the level of technology of the Soviet aeronautical instrument industry was completed in December 1955. A technical study entitled "~~(CONFIDENTIAL)~~ (U) The Status of USSR Production Technology in the Manufacture of Aircraft Instruments" was released during the same month. This study was produced with the aid of a contractor, Project WHITE STORK (Battelle Memorial Institute), and the assistance of several US instrument manufacturers. The study indicates that the Soviet instruments examined meet US performance specifications and are much cheaper in manhours, materials, and machine time than their US counterparts. It appears that the Soviet instruments would be more difficult to adjust and maintain than equivalent US instruments. Reductions in cost are obtained by simplification of design.[13] ~~(SECRET)~~ (U)

(Uncl) Supersonic Fighter Production Capabilities. A study was initiated in September 1955 to assess the capability of the Soviet aircraft industry to produce supersonic fighters. This project is set up to examine the production characteristics of supersonic fighters in order to determine the penalties upon performance and production output that might result if production difficulties are not satisfactorily solved. The objective of the project is to prepare for producibility estimates on future Soviet aircraft. ~~(CONFIDENTIAL)~~ (U)

(Uncl) Aerial Photographic Capabilities. An ATIC Study, "(U) Aerial Photographic Capabilities of Selected Soviet-Bloc Nations",

was released 16 November 1955.[14] This completed the project with WHITE STORK in this area. This was the second of two studies dealing with the subject of aerial photography in the Soviet bloc. The first study dealt primarily with descriptions of equipment.[15] The present study represents and effort to evaluate data on the potential of selected Soviet-Bloc nations for future progress. ~~(CONFIDENTIAL)~~ (U)

(Uncl) PROPULSION STUDIES AND ESTIMATES:

(Uncl) Program for the Study of Soviet Personnel and Facilities Associated With Propulsion Systems R&D in the USSR. A new program was initiated to conduct a survey to determine the personalities, facilities and activities that are most likely to contribute to the capability of the USSR in propulsion systems research and development, and the application of the related basic sciences to the design and performance of the various propulsion system components. This program will assure a more complete coverage of the intelligence available in the unclassified literature on the subject. A companion work request was placed on Project WHITE STORK that will cover the areas of gas turbine power plants, nuclear energy application to propulsion, propellers, rocket power plants, and reciprocating engines. This is a long term program and will result, initially, in the preparation of three loose-leaf handbooks on personalities, facilities, and activities. The handbooks are to be used by ATI Specialists and contractor personnel as background material in the study of specific areas of propulsion. ~~(CONFIDENTIAL)~~ (U)

(Uncl) Estimate of Engine in FLASHLIGHT and FARMER:

A major product of ATIC during this period was a study on the

estimated turbojet engine in the FLASHLIGHT-FARMER aircraft. The study presented Soviet developments of low-thrust turbojet engines, configuration and performance of the turbojet engine in the FLASHLIGHT-FARMER aircraft, and compared this engine with significant engines of the US, UK, and France.[16] (SECRET)

Intelligence reports and data supplied insight into the Soviet design philosophy for aircraft gas turbine engines, but did not provide specific data for analysis of engines in FLASHLIGHT and FARMER aircraft. The dimensions of these aircraft, and dimensions affecting engine installations were obtained by photo interpretation. (SECRET)

The basic engine estimated for the FLASHLIGHT and FARMER aircraft is considered to be a single-rotor, axial-flow compressor type with no unusual design features or radical design innovations which might offer super-performance. The version of the engine installed in FARMER is estimated to be equipped with afterburner. The configuration of the afterburner incorporated in the engine for FARMER is expected to be of the rather simple type in which complicated flameholder rigs are eliminated. (SECRET)

Both the FLASHLIGHT and FARMER are powered by twin-engine installations; FLASHLIGHT engines are installed in wing-mounted nacelles, while those in FARMER are buried in the fuselage. Engines are of the same basic configuration and performance, and compare favorably with contemporary British and US engine designs of the same pressure-ratio class. The appearance of turbojet engines with axial-flow compressors in the FLASHLIGHT and FARMER aircraft has demonstrated that Soviet designers

are capable of developing engines of reasonably advanced design. These engines are the latest ones in the 6,000 to 7,000 thrust category to be observed by intelligence sources. (~~SECRET~~) (U)

(Uncl) Rocket Propulsion Programs. The programmed survey of foreign rocket power plant technologies was completed and an ATIC study prepared. This study evaluated the effects of the German exploitation program on the Soviet rocket power plant developments, and presented an estimate of the Soviet development capabilities.[17] (~~CONFIDENTIAL~~) (U)

(Uncl) Fuel Technology:

During the current reporting period projects were initiated in the fields of solid rocket propellants and crude oils. (Uncl)

The solid rocket propellant study was initiated in response to a request from the Joint Technical Intelligence Sub-Committee, JCS. It represents an ATIC effort that will serve Army and Navy interests as well as Air Force. The project has a two-fold purpose: First, to provide a technical report of the solid propellant state-of-the-art in the Soviet-bloc nations based on open literature; and Second, to combine that data with classified information available, to produce an ATIC estimate of the solid propellant capability of the Soviet bloc. (~~SECRET~~) (U)

The project "(U) Aircraft Fuels from Soviet Crude Oils" was initiated to compile and tabulate those chemical compositions and physical characteristics of crude oils originating in the Soviet bloc and Austria which definitely determine the quality and performance of the aircraft fuels they produce. In addition, this work will provide data for the appraisal

of Soviet technological capability in conversion processing for the manufacture of aircraft fuels. Soviet design data for a petroleum refinery, recently offered to Finland, contained modern Soviet equipment. This design data will be used in this study. ~~(SECRET)~~ (U)

Activity on the high energy fuels project was broadened in the latter months of 1955 to include hydrogen, ozone, flourine and other fuels as well as boron. Magnitude of the work on the synthetic lubricants project has indicated that assistance will be required from a contractor in searching available Soviet literature. For that purpose a contract negotiation was commenced to secure help from the Monsanto Chemical Company. ~~(CONFIDENTIAL)~~ (U)

An extensive survey and evaluation of Soviet liquid rocket propellant developments was concluded upon the publication of a study entitled "~~(S)~~ (U) Basic Soviet Liquid Rocket Propellants Investigation". This study was designed to determine the USSR capability in this area; to provide evaluated liquid rocket propellant information with which a better over-all evaluation of Soviet weapons systems can be made; and to provide significant information to domestic R&D facilities.[18] ~~(SECRET)~~ (U)

(Uncl) AIR SCIENCE STUDIES:

(Uncl) Astronomy and Astrophysics. A study, "~~(S)~~ (U) Initial Report on the Capability of the USSR in Astronomy and Astrophysics", was prepared with the assistance of Project WHITE STORK and was released 15 August 1955. This report covered a survey of 1849 research contributions made by the Soviets in recent years. The only phases of astronomy

considered were those which might contribute to progress in the operation or development of air weapon systems.[19] (~~SECRET~~) (U)

(Uncl) Unidentified Flying Objects (BLUE BOOK):[20]

The purpose of this project is to collect, evaluate, and disseminate information concerning unidentified flying objects and aerial phenomena and to determine whether or not they constitute a threat to US security. (~~CONFIDENTIAL~~) (U)

During the period 1 January 1955 to 31 December 1955, a total of 427 Unidentified Flying Object Reports were received and processed in accordance with AFR 200-2. Analysis of these reports resulted in identifications being established in 97 per cent of those cases for which there was sufficient information for evaluation. In addition to formal reports, 198 letters from the public were also received and processed. (Uncl)

UFO Special Report No. 14 was completed, printed and distributed in this period. This report was downgraded from Secret to Unclassified for the purpose of release to the public.[21] (Uncl)

On 25 October 1955, this report was made the subject of a press release by the Secretary of the Air Force, Mr. Donald A. Quarles. This report and the subsequent release have done much to lift the aura of mystery which, in the minds of the public, has surrounded the program since its inception.[22] (Uncl)

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1. ATIC Study 102-EL-55/1-24, 15 Apr 55.
2. ATIC Report FE-6032-EL, 8 Nov 55.

3. ATIC Report TIR-EL-55-1, 30 Nov 55.

4. ATIC Study 102-AE-55/7-34, 22 July 55.

5. ATIC Report TIR-WI-55-1, 11 Oct 55.

6. ATIC Study 102-AE-55/9-34, 20 Oct 55.

7. ATIC Study 102-AE-55/6-34, 6 June 55.

8. ATIC Study 102-AE-54/8-34, 1 July 55.

9. ATIC Study 102-AE-55/2-34, 1 Aug 55.

10. ATIC Study 102-AE-54/9-34, 11 Apr 55.

11. ATIC Study 102-AE-55/10-34, 9 Sep 55.

12. ATIC Study 102-AE-55/4-34, 16 Aug 55.

13. ATIC Study 102-AE-55/8-34, 22 Sep 55.

14. ATIC Study 102-AE-55/1-34, 14 Sep 55.

15. See Page 94, ATIC History 1 Jul 54-31 Dec 54.

16. ATIC Study 102-AC-55/9-34, 7 Oct 55.

17. ATIC Study TIS-PR-55-1, 20 Sep 55.

18. ATIC Study 102-AC-55/7-34, 1 Jun 55.

19. ATIC Study 102-EL-54/5-34, 30 Mar 55.

20. See Page 64, ATIC History, 1 Jan 55-30 Jun 55.

21. Analysis of Reports of Unidentified Aerial Objects, 5 May 55.

22. Dept. of Defense News Release NR. 1053-55, 25 Oct 55.

VIII AIR WEAPON SYSTEMS INTELLIGENCE OPERATIONS

GENERAL:

Some of the major products of ATIC are the studies and estimates which result from the evaluation of foreign air weapons and air weapon systems. These products contain finished, integrated air technical intelligence on foreign aircraft and missiles, and on facilities and equipments that support foreign air weapon systems. Information contained in these studies and estimates is used as a basis for national defense planning, and furnishes guidance for our own research and development effort. (Uncl)

Five new types of Soviet aircraft were observed in 1955 during rehearsals for the May Day Show in Moscow and for the Soviet Aviation Day Show at Tushino, and again during the Tushino Air Show itself on 3 July 1955. These new aircraft consisted of a twin-rotor helicopter, a jet transport, a jet day fighter, an all-weather interceptor, and a turboprop heavy bomber. They were designated HORSE, CAMEL, FARMER, FLASHLIGHT, and BEAR respectively. The development of these types of aircraft had been previously predicted by ATIC, but their appearance and the acquisition of photographs and observer descriptions was the first go-ahead signal for the production of performance and characteristics estimates. Studies were completed on the FARMER, FLASHLIGHT, and BEAR. ~~(CONFIDENTIAL)~~ (U)

(Uncl) ESTIMATES AND STUDIES:

(Uncl) Analysis of FARMER:

A study of the FARMER was made for the purpose of estimating the characteristics, performance, effectiveness, producibility, and develop-

ment potential of this new Soviet fighter.[1] (~~SECRET~~) (U)

The FARMER is the latest of the Soviet fighter-type aircraft. It is a swept-wing, high-altitude, high-speed, day interceptor, powered by two turbojet engines mounted in the fuselage. The FARMER is believed to be the latest effort of the MIG designers. (~~SECRET~~) (U)

First sighted in April 1955, FARMERS were observed in various numbers during the ensuing months. Sixty FARMERS were observed at one time on the 7th of June 1955. Prior to the first sighting of the FARMER, ATIC had estimated that the Soviets would have a fighter aircraft superior to the FRESCO (MIG-17) by mid-1955. The sighting of April and May confirmed that estimate. Performance estimates of this study are in line with those made prior to the sightings. (~~SECRET~~) (U)

The FARMER resembles the FAGOT (MIG-15) and FRESCO (MIG-17), but is larger than either of them. The power plant for this aircraft is estimated to be two axial-flow turbojet engines, and they are probably fitted with afterburners. Static thrust of each engine at sea level is estimated to be 6,700 pounds without afterburning, and 8,050 pounds with afterburning. (~~SECRET~~) (U)

No positive identification can be made of the armament installation on the FARMER. It is estimated to be four fixed, forward-firing, 23-mm guns. It may even have some new higher-performance type of gun. (~~SECRET~~) (U)

The combat radius of the FARMER is 220 nautical miles, the combat ceiling is 58,000 feet. It has a maximum speed at sea level of 645 knots; at 35,000 feet, 630 knots. (~~SECRET~~) (U)

On the basis of photographic evidence, it appears that the FARMER

should not be difficult to produce. The Soviets could probably make good use of existing production facilities with few changes. (~~SECRET~~) (U)

The performance of FARMER is superior to any previously known Soviet fighter. The estimated fire power used in conjunction with a range radar should make the FARMER an effective weapon of defense against all current operational US bombers. The apparent lack of aircraft-intercept radar on the FARMER, however, limits its over-all effectiveness. (~~SECRET~~) (U)

Major conclusions reached in this analysis included the following:

The estimate of 200 FARMERS in operational units in the Soviet Air Force by mid-1955, plus the estimated excellent interceptor performance of the design, poses a serious threat to US strategic bombers during day operations. This threat is not as serious under bad-weather conditions or night operations. (~~SECRET~~) (U)

FARMER probably will be used as an air-superiority fighter and as a ground-support fighter. With major modification to the nose section, A/I gear could be added to FARMER, giving it an all-weather capability. (~~SECRET~~) (U)

FARMER is estimated to have a good performance growth potential. It has excellent climb and altitude performance; with improvements in engine thrust and aerodynamic cleanliness, it is possible for FARMER to become a true supersonic fighter by 1957. (~~SECRET~~) (U)

(Uncl) Analysis of FLASHLIGHT:

An ATIC study, "Analysis of FLASHLIGHT", was completed in October 1955. This analysis presented an estimate of the operational capabilities and development potential of FLASHLIGHT, the new Soviet twin-jet, all-weather interceptor.[2] (~~SECRET~~) (U)

The sighting of the FLASHLIGHT in April 1955 provided the first firm evidence that the Soviets have an operational all-weather interceptor with an Airborne Interception (A/I) radar fire-control system. FLASHLIGHT apparently has sufficient speed to be capable of intercepting current high-speed jet bombers, although some speed performance has been sacrificed to permit installation of the long-range A/I radar. (~~SECRET~~) (U)

The engine is estimated to compare favorably with contemporary British and US engine designs. Some form of automatic flight-control system may be provided on FLASHLIGHT. It is considered that ground-control-approach (GCA) equipment is available for use in landing. The Soviets are known to have developed and produced flight and engine instruments that would meet the requirements of FLASHLIGHT. (~~SECRET~~) (U)

The very-high-frequency (VHF) communications equipment is similar to, and believed to be a modified copy of, the US SCR-522 set. The automatic radio compass, marker-beacon receiver, and IFF transponder equipment is patterned after US and British equipment of World War II. (~~SECRET~~) (U)

The fire-control system of FLASHLIGHT is considered to compare favorably with the all-weather systems of the United States. The radar capability is estimated to be 30 nautical miles search and 20 nautical miles track against a B-47-type aircraft. Mechanical equipment is estimated to be similar to that of the FAGOT (MIG-15). The electrical power requirements can be met by standard generators of the USSR. (~~SECRET~~) (U)

The aircraft has great development potential in the fields of weapons and fire control. The fire-control system can be further developed as a system for lead-pursuit attacks in all-weather conditions.

Rapid production of FLASHLIGHT is facilitated by the design of the aircraft. (~~SECRET~~) (U)

From analysis of available data, several conclusions were reached in the study, including these:

First, in FLASHLIGHT, the Soviets have in operational units, an all-weather interceptor with an A/I radar fire-control system capable of long-range detection and continuous automatic fire-control solution for unlimited pursuit attacks with a fixed gun-weapon installation. (~~SECRET~~) (U)

Second, FLASHLIGHT is armed with two large-caliber weapons of a new type, or possibly armed with rockets. If the armament consists of large-caliber guns, the aircraft will be capable only of lead-pursuit attacks in all-weather conditions. (~~SECRET~~) (U)

Third, FLASHLIGHT is estimated to be effective as an all-weather area interceptor against current high-speed jet bombers. (~~SECRET~~) (U)

Fourth, the large fuselage of FLASHLIGHT provides a good development potential for this aircraft, since guided or unguided missiles could be carried in the basic airframe. (~~SECRET~~) (U)

(Uncl) Analysis of BEAR:

A study of the new Soviet turboprop bomber, BEAR, was completed in December 1955, and release of the study is scheduled for February 1956. The study contains an estimate of the operational capabilities and development potential of this Soviet turboprop, swept-wing, four-engine heavy bomber. BEAR is in the weight class intermediate between that of BADGER and BISON. BEAR is the result of one of three known Soviet design

and development programs for strategic air weapons, the other two having produced BADGER and BISON. The analysis presented in the study of the BEAR was based on interpretation of photographs, and supplementary intelligence, particularly on the engine.[3] (~~SECRET~~) (U)

BEAR is estimated to have a combat radius of 3,900 nautical miles with a 10,000-pound bomb load, a target altitude of 40,000 feet, and a target speed of 435 knots. These values may be increased for an optimum mission, at cruise ceiling for maximum range, to a combat radius of 4,250 nautical miles. With a 3,000-pound bomb load, the optimum mission combat radius can be extended to 4,500 nautical miles. The target altitude in the optimum mission is increased to 42,100 - 42,500 feet, but the target speed is reduced to 410 knots. Mission times for BEAR are estimated to range from 19 to 22 hours. The combat radius of BEAR is outstanding and points to use of BEAR for extreme-radius, strategic bombing missions. (~~SECRET~~) (U)

BEAR probably carries a crew of 10, and it is estimated that the crew is provided with bullet-resistant glass in the tail compartment and with armor plate for the pilots and gunners. (~~SECRET~~) (U)

The appearance of up to seven BEARs through July 1955 indicates the successful development of a turboprop heavy bomber estimated to have become operational in 1955. (~~SECRET~~) (U)

The use of existing Soviet electronic and armament equipments may have simplified and speeded the BEAR development program. Improvement in performance could be made by eliminating numerous fuselage protrusions. (~~SECRET~~) (U)

The power plants installed in the BEAR are four engines known as the K engines, which have severe altitude performance limitations. It is estimated that the Soviets will continue to develop these engines in an effort to overcome these limitations. (~~SECRET~~) (U)

The BEAR is estimated to be capable of carrying special weapons, a load of 10 metric tons of conventional bombs, or a short-range air-to-ground guided missile, thereby permitting mission accomplishment without entering heavily defended target areas. The defensive armament of the BEAR includes only tail and lower aft defenses, indicating a relaxation of the all-direction defense concept of BADGER and BISON. BEAR is vulnerable to attack by a rocket-armed interceptor, since rockets could be released outside the lethal gun-range of the BEAR. (~~SECRET~~) (U)

The bombing and navigation systems of the BEAR are considered to be operationally adequate for high-altitude missions under both visual and blind conditions. BEAR is considered suitable for a reconnaissance role. (~~SECRET~~) (U)

Existing Soviet manufacturing materials and methods are considered satisfactory for the production of the BEAR. The K power plants can probably be produced by existing Soviet methods. Performance growth for the BEAR hinges on the development of turboprop engines with greater power available at altitude and development of an improved propeller. The BEAR is presently fitted with four pairs of 4-blade, contra-rotating propellers. (~~SECRET~~) (U)

(Uncl) Analysis of the HOUND Helicopter. On the project which provides for producing a study on the HOUND helicopter, enough information

has been collected to complete a study for release about March 1956. The HOUND first appeared in the Tushino Air Show in July 1953. It resembles the USAF H-19 helicopter and is powered by one ASh-82FN reciprocating engine. The HOUND is a 1½ ton payload transport-cargo helicopter. It has demonstrated its ability to carry a variety of equipment such as a jeep, a field gun, ord an 8-place light truck. Unloading is accomplished through clamshell doors, at the rear of the fuselage, by means of a portable ramp carried internally. During this reporting period, performance sheets were completed and forwarded to D/I USAF for inclusion in the Aircraft Characteristics Handbook of Soviet and Satellite Nations. ~~(CONFIDENTIAL)~~ (U)

(Uncl) CONTRIBUTIONS TO NATIONAL INTELLIGENCE PUBLICATIONS:

During the reporting period, the following contributions for the National Intelligence Survey Program were prepared and forwarded to the Deputy Director for Estimates D/I USAF: Section 17 on the USSR and Czechoslovakia containing a brief summary on basic air weapons research and development capabilities and trends; Section 70 on Finland, Austria, and Turkey describing the aeronautical aspects of the scientific structure of each country; Section 71 on Finland, Austria, and Turkey describing electronic research and development activities, capabilities and trends; Section 72 on Finland and Austria presenting basic data reflecting on air weapons research and development capabilities and trends in aircraft design. ~~(SECRET)~~ (U)

Contributions for the National Intelligence Estimates Program were also forwarded to the Deputy Director for Estimates on the NIE 41-55,

"Probable Developments in Japan Through the Next Decade"; NIE 11-10-55, "Soviet Gross Capabilities for Attack on the US in 1965; NIE 12-55, "Probable Developments in the Satellites As They Affect Sino-Soviet Bloc Capabilities Through 1956-1960"; and NIE 11-5-55, "Air Defense of the Sino-Soviet Bloc, 1955-1960". ~~(SECRET)~~ (U)

(Uncl) REVISION OF AIE-11. A revision of AIE-11 (Air Intelligence Estimate) was released in December 1955. This estimate is designed to identify areas of Air Force interest where the possibility of Soviet technological superiority exists, and to determine the nature and degree of possible Soviet technological superiority as a basis for action to prevent technological surprise. This is one of the Center's most important recurring products. Through this publication, the National Defense Planners are given narrative and graphic explanations of the technical fields where the threat of Soviet superiority or capability would place the United States in a dangerous position. ~~(SECRET)~~ (U)

(Uncl) GUIDED MISSILES PROJECTS:

A "Guided Missiles Handbook of Foreign Nations other than the USSR and Satellites" was completed and sent to reproduction facilities. It is scheduled for release in January 1956. (Uncl)

Several projects were initiated during the reporting period to study the various aspects of Soviet capabilities in the guided missile field. Work continued on Soviet activity in the development of air-to-surface guided missiles, surface-to-surface guided missiles, and guided missile launching sites of the Soviet bloc. Reports on all of these activities are due for release during the first half of 1956. ~~(SECRET)~~ (U)

(Uncl) HANDBOOKS:

(Uncl) Characteristics Aircraft Handbook of Soviet and Satellite Nations. The title of a joint USAF-US Navy handbook was changed from "Characteristics and Performance Handbooks, USSR Aircraft" to, "Characteristics Aircraft Handbook of Soviet and Satellite Nations" with contents assigned an over-all security classification of CONFIDENTIAL, and a new companion publication having the same title but assigned an over-all security classification of SECRET was created. The latter, also a joint USAF-US Navy publication, contains the newest Soviet and Satellite aircraft presented in USAF Green-Book type format with performance calculated using USAF MIL-C-5011A.[4] Included in the initial publication are the FARMER and FLASHLIGHT fighters, and the BADGER, BEAR and BISON bombers. During December, photostatic copies of the SECRET portion of the Handbook were forwarded to Headquarters, USAF, for coordination with the US Navy. At the same time, a comprehensive revision to the CONFIDENTIAL handbook was forwarded for publication. The revision, which makes this publication current, consists of a new index, data for the introductory pages for Albania, Bulgaria, Communist China, Czechoslovakia, East Germany, Hungary, Poland and Rumania, and new format sheets for the FARMER, FLASHLIGHT, MIG-17 (FRESCO), and YAK-23 (FLORA) fighters; the BEAR and IL-28 (BEAGLE) bombers; the CAMEL and CRATE transports; and the HORSE and MI-4 (HOUND) Helicopters. ~~(SECRET)~~ (U)

(Uncl) Handbook on Foreign Aircraft Other Than Soviet. A final draft of a comprehensive aircraft handbook entitled, "Characteristics and Performance Handbook of Aircraft of Foreign Countries (Other Than Soviet)", was forwarded for reproduction in December, with release

scheduled for January 1956. The original plan for this project envisioned ultimate production of four volumes comprising Europe, Africa, Asia, Latin America, and the British Commonwealth of Nations. This was changed to include all the "Friendly Nations" of the world in one volume. All previously published aircraft handbooks for this project will be rescinded with the publication of the aforementioned handbook which is scheduled for early 1956. ~~(CONFIDENTIAL)~~ (U)

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1. ATIC Study 102-AC-55/15-34, 23 Sep 55.
2. ATIC Study 102-AC-55/16-34, 13 Oct 55.
3. ATIC Study 102-AC-55/17-34, 9 Aug 55, "Analysis of BEAR".
4. Specifications that are used as a basis for comparison of performance of aircraft.

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