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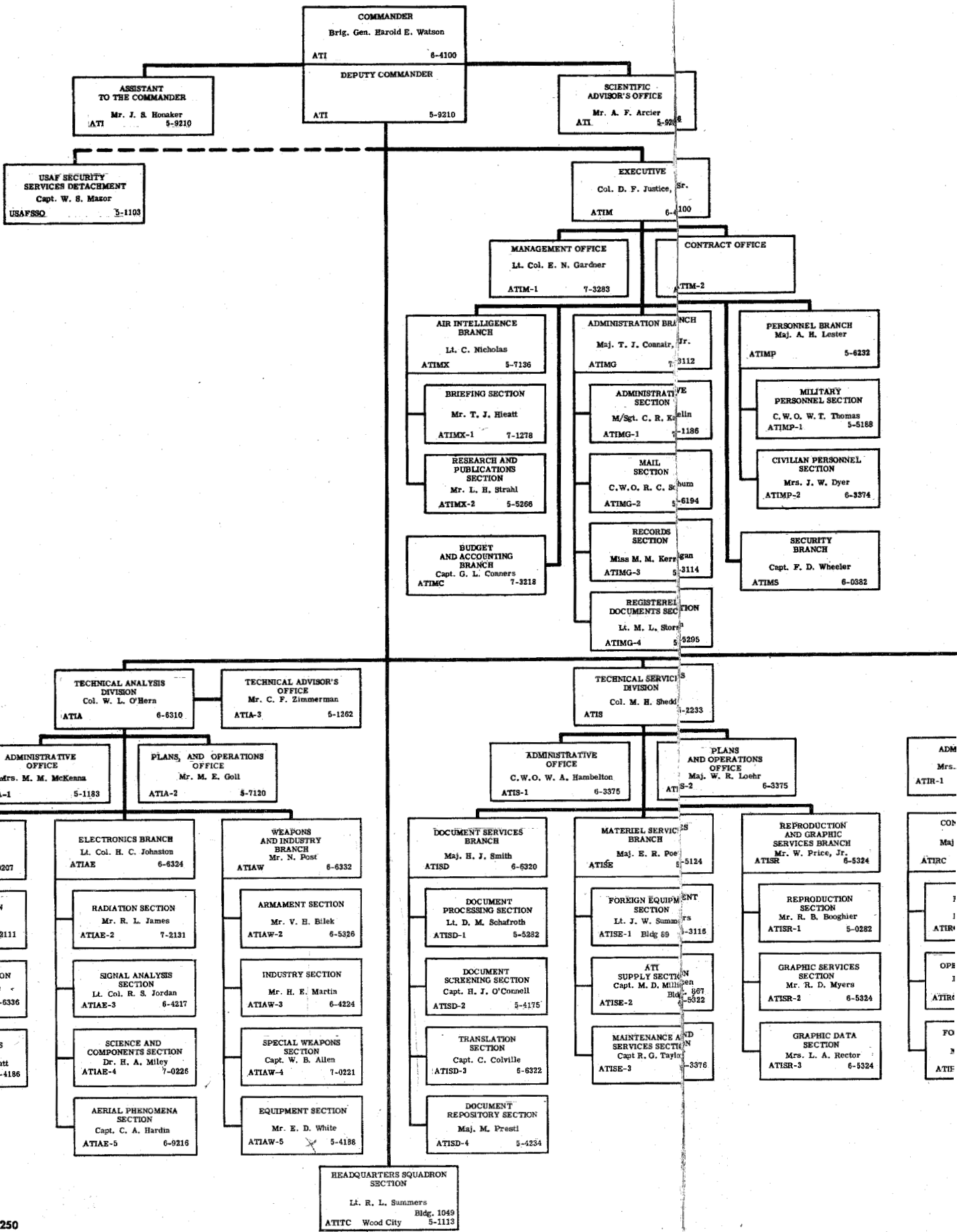
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# ATIC ORGANIZATIONAL DIRECTORY CHART



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HISTORY OF  
AIR TECHNICAL INTELLIGENCE CENTER  
1 January 1955 - 30 June 1955

Prepared by  
Air Intelligence Office  
AIR TECHNICAL INTELLIGENCE CENTER  
31 July 1955

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FOREWORD  
TO THE HISTORY OF  
THE AIR TECHNICAL INTELLIGENCE CENTER  
For the Period  
1 January 1955 - 30 June 1955

In preparing this edition of the History of the Air Technical Intelligence Center, an effort was made to improve the contents and format in accordance with the suggestions outlined in the critique of the previous editions. Organization, mission, and personnel matters are covered on a Center-wide basis instead of a division breakdown, and the chapters on each division are devoted only to operations of that division.

A major reorganization of the Center, which was planned during this reporting period, became effective shortly after the close of the period. This reorganization will be fully recorded in the next edition of the history.

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## I. ORGANIZATION, MISSION, AND PERSONNEL

ORGANIZATION:

The Air Technical Intelligence Center is the technical intelligence element (AFOIN-4) of the Directorate of Intelligence. It is located at Wright-Patterson Air Force Base, Dayton, Ohio. (Uncl)

The organization of the Center is essentially the same as it was at the close of the last reporting period. It consists of the Commander and Staff, Technical Requirements Division, Technical Services Division, and Technical Analysis Division. Each division is further broken down into branches and sections to facilitate specialization, and for convenience in administration and operation. (Uncl)

Shortly after the beginning of 1955 the Commander formulated plans to review the organization of the Center to determine if changes were needed to facilitate the accomplishment of the present day mission. It was his belief that the operational elements of the Center should be relieved of time-consuming tasks which are not a part of their currently assigned responsibilities. The ultimate goals under consideration were the complete segregation of administrative work from technical work, a better grouping and aligning of operational elements in order to more clearly define

responsibilities, and general management improvement designed to increase the quantity and quality of the Center's intelligence products. Division Chiefs were directed to study the problem, and, if a need for reorganization was indicated, to present recommendations and plans. At the close of the reporting period, 30 June 1955, recommendations and plans for reorganization were in the hands of the Commander for study and decision. (Uncl)

On 1 April 1955 Detachment 1 (ATIC) was organized and assigned to the 1125th USAF Field Activities Group.<sup>1</sup> The purpose and function of the Detachment are to collate and analyze technical information pertaining to Soviet Guided Missiles. The Detachment was designated and established at Kelly Air Force Base, Texas because of the necessity for working in close coordination with Headquarters, USAF Security Service. The detachment was authorized six military positions and 20 civilian positions. Colonel Earl J. McFarland, Jr. was appointed Officer in charge of the Detachment on 9 June 1955. (~~CONFIDENTIAL~~) (U)

MISSION:

The mission, functions, and objectives of the Center have not changed during the period covered by this report.

The mission of the Center is to accomplish the technical portion of the over-all mission of the Director of Intelligence.

1. Hq. Comd., USAF, G.O. 19, 7 Apr 55, as amended by G.O.20, 14 Apr 55.

The technical portion of that mission is threefold:

- (1) To lessen the possibility of technological surprise.
- (2) To provide a sound basis for counsel on air preparedness.
- (3) To provide air technical intelligence to support the planning and conduct of air operations.

The objectives established to fulfill the mission of the Center are:

- (1) To acquire, collate, and report on air technical intelligence information and material.
- (2) To produce air technical intelligence required to prevent technological surprise.
- (3) To produce air technical intelligence required for national planning.
- (4) To provide air technical intelligence estimates as basis for operational and development planning.
- (5) To produce air technical intelligence required by research and development agencies.
- (6) To support the USAF intelligence collection effort and conduct such special collection activities as are required.

PERSONNEL:

Brigadier General Harold E. Watson, who assumed command of



the Center 15 September 1954, was designated Deputy Director for Technical Intelligence on 4 May 1955.<sup>2</sup>

Colonel George R. Weinbrenner reported to the Center on 1 June 1955 and was assigned as Deputy Chief, Technical Requirements Division.<sup>3</sup> Colonel Weinbrenner was assigned from Headquarters, USAF, where he had served as Chief of Special Activities Branch under the Deputy Chief of Staff for Operations, USAF.

Key personnel of the Center were:

Colonel John A. O'Mara	Special Advisor to Commander
Mr. A. Francis Arcier	Scientific Advisor to Commander
Mr. John S. Honaker	Civilian Assistant to Commander
Colonel Dane F. Justice, Sr.	Executive
Colonel Malcolm D. Seashore	Chief, Technical Requirements Division
Colonel George R. Weinbrenner	Deputy Chief, Technical Re- quirements Division
Colonel M. J. Piatnitzka	Chief, Planning Office, <sup>4</sup> Technical Requirements Division
Colonel Morris H. Shedd	Chief, Technical Services Division
Colonel Wayne L. O'Hern	Chief, Technical Analysis Division

2. Ltr fr Gen. Samford to Gen. Watson 4 May 55.

3. Hq. USAF S.O. 21, 31 Jan 55.

4. Promoted to Colonel per DAF S.O. 70, 11 Apr 55.

Colonel Ray W. McDuffee

Deputy Chief, Technical  
Analysis Division

Colonel Earl J. McFarland, Jr.

OCI, Detachment 1

Colonel John G. Eriksen, who had been attending the Air University, was assigned to the Center effective 21 June 1955. At the end of the reporting period he was on leave enroute to join. Colonel Eriksen will be assigned as Deputy Commander of the Center. (Uncl)

(Uncl) Manpower Authorizations. At the beginning of the period, the ATIC was authorized 188 officers, 105 airmen, and 327 civilians, a total of 620. At the end of the period, 196 officers, 105 airmen, and 374 civilians, total 675, were authorized. Manpower distribution at the end of the period was:

	CIVILIANS	OFFICERS	AIRMEN	TOTAL
Office of the Commander	5	2	1	8
Executive Organization	17	8	5	30
Personnel and Management Office	10	4	5	19
Adjutant's Office	20	3	8	31
Technical Requirements Division	57	110	51	218
Technical Analysis Division	136	45	8	189
Technical Services Division	107	17	20	144
Headquarters Squadron Section	0	1	7	8
Detachment Number 1	20	6	0	26
Pool	2	9	0	2
<b>Total</b>	<b>374</b>	<b>196</b>	<b>105</b>	<b>675</b>

Of this number, 26 civilians, 70 officers, and 27 airmen allotments were assigned to the oversea ATIC program. ~~(CONFIDENTIAL)~~ (u)

(Uncl) Personnel Strength. As of 1 January 1955, 304 civilians, 180 officers, and 113 airmen, total 597, were assigned. At the close of the period, 314 civilians, 194 officers, and 118 airmen, total 626, were assigned. (Uncl)

## II STAFF ACTIVITIES

(Uncl) Briefings and Noteworthy Visits:

Early in this reporting period the Commander established a program designed to acquaint major users of technical intelligence with the facilities, capabilities and projects of the Air Technical Intelligence Center. The media to implement this program included oral and graphic presentations to civilian and military officials who visited the Center in response to invitations, visits of qualified Center personnel to other commands and agencies for the purpose of special briefings, and increased dissemination of technical intelligence by use of authorized written texts for briefings of technical studies and estimates. Staff responsibility for these presentations and the preparation of briefing texts was delegated to the Air Intelligence Office, which is staffed with qualified speakers, writers and editorial specialists. (Uncl)

In the first half of 1955 approximately 100 briefings were presented to key personnel of US agencies including the Department of Defense, Department of the Air Force, Major Air Force Commands and Department of the Army. Briefings were presented at many points throughout the US, as well as at the Center itself. Some of the important briefings are recorded below. (Uncl)

General R. P. Owenshine (USA-Ret) and Mr. Robert J. Folsy, members of the Clark Committee of the Hoover Commission, visited



the Center on 6 January 1955. The purpose of the visit was to make a survey of the material made available through the USAF Special Security Office located at the Center, and to determine the usefulness of the material to the operations of the Center. (Uncl)

On 12 January 1955, General Watson briefed Mr. M. M. Karlene, Mr. Henry Kearns, and Captain Paul L. High (USN-Ret), of the Hoover Commission, on the mission and functions of the Center. These Hoover Commission members visited the Center to survey the functions and effectiveness of the Center as a part of the Directorate of Intelligence and the intelligence community as a whole. (Uncl)

Mr. S. Paul Johnston and Mr. Robert R. Dexter of the Institute of the Aeronautical Sciences, New York, visited the Center on 24 February 1955. Mr. Johnston is Director of the Institute and Mr. Dexter is the Secretary. General Watson and Mr. Arcier, Scientific Advisor, discussed with these visitors matters of mutual interest, particularly the capability of the institute to assist intelligence in the field of translation. The visitors were given a general briefing of the activities of the Center and were conducted on a tour of the foreign aircraft display. (Uncl)

On 3 March 1955, Major General Millard Lewis, Deputy Director of Intelligence, visited the Center and was given a general orientation briefing on the ELINT<sup>1</sup> activities of the Center. (Uncl)

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1. Electronic Intelligence.

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A group from Headquarters, USAF, visited the Center on 15 April 1955. Members of the group were Mr. Dalimil Kybal and Colonel E. H. Wynn of the Office of Assistant for Development Planning, and Doctor Stefan Pessony, Doctor Carl Bollum, Major George Keegan, Major Robert Bieck of the Directorate of Intelligence. General Watson and his staff briefed the group on the capabilities of the Center to contribute information on the Inter-Continental Ballistic Missile that would be useful in the preparation of Development Planning Objectives. ~~(SECRET)~~ (U)

Honorable Roger Lewis, Assistant Secretary of the Air Force (Materiel) and his Executive, Colonel R. W. Gustafson, visited the Center on 27 April 1955. General Watson briefed the visitors on the mission and functions of the Center, with particular emphasis on the expanded ELINT activity. Mr. Lewis expressed his extreme interest in the operations of the Center. (Uncl)

Doctor Addison Rothrock of the National Advisory Committee for Aeronautics, Washington, D. C., visited the Center on 3 May 1955. The purpose of his visit was to discuss with General Watson and the Center staff the conclusions reached by Center personnel as a result of the meeting with the Joint Intelligence Bureau at London, England, in October 1954. Particular emphasis was placed on discussion of Soviet aircraft engines and estimates of the engines in the BISON (type 37) and BADGER (type 39) aircraft ~~(SECRET)~~ (U)

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Mr. William H. Godel, Deputy to General Erskine, who is Director of Special Operations in the Office of Secretary of Defense, and his assistant, Mr. Phillip Patton, visited the Center 7 June 1955. They were briefed on the facilities of the Center and our ELINT activities. (Uncl)

On 8 June 1955, Major General John A. Sanford, Director of Intelligence visited the ELINT facility of the Center and was given a thorough briefing on the operation of that activity. (Uncl)

Mr. L. G. Prell, Professional Staff Advisor of the Senate Appropriations Committee, conferred with Colonel O'Mara, Acting Commander, and staff members of the Center on 28 June 1955. Mr. Prell's discussion centered around the proposed new building to house the Center, which was under consideration by the Senate Committee. His inquiries indicated that he was concerned as to why we wanted a building similar to the one at Rome Air Development Center, and he seemed to be under the impression that their technical intelligence activities and those of this Center were a duplication of effort and that construction of another such building would not be economical use of funds. He was assured that the mission of the Center and RADC were not similar in scope or nature, and that the building at Rome was only referred to as a type that would completely fill the needs of the Center without the expense of designing a new structure. When these points had been clarified, Mr. Prell seemed convinced of our need for a new building and of the economy of using an existing design.(Uncl)

## IV. SERVICES DIVISION OPERATIONS

As a result of the efforts of the Technical Requirements Division and the intelligence collectors in the field, thousands of documents, photographs, recordings, and pieces of equipment are received at the Center. All of these items require screening, indexing, and processing to insure that each item is referred without delay to that section of the Center having primary interest. Numerous documents must be translated and many of the items must be reproduced to permit simultaneous study by several analysts. Photographs are interpreted as soon as they are received. The Technical Services Division is responsible for all of those functions in support of the operations of the Center. (Uncl)

DOCUMENTS:

During the first half of 1955 the Center received and processed 30,500 documents. Each document was screened to determine subject matter and to establish routing to persons having an interest in the document. More than 65,000 cards were required to cross-index the documents received during the period. There were approximately 225,000 documents on file in the Repository at the close of the period. (Uncl)



The Translation Section translated more than 780,000 words of foreign text; and translation agencies, with which the Center has contracts, translated more than 2 1/4 million words at a cost of \$55,297.00. (~~CONFIDENTIAL~~) (u)

In the early part of 1955 the Central Intelligence Agency made a survey of the abstracts accomplished under the Program on Exploitation of Foreign Language Literature to determine the feasibility of continuing the project. As a result of the survey, CIA felt it advisable to discontinue abstracts per se and to initiate an extracting resume type program pertaining to Soviet scientific and technical periodicals. Other agencies participating in this program, however, took the CIA proposal under advisement and recommended that abstracting continue, but suggested a revision of the list of periodicals to be abstracted. A new program for abstracting 55 periodicals was established in February 1955. This Center will abstract 23 periodicals, 19 will be abstracted by CIA, and 13 by the Air Information Division of the Library of Congress. The participating agencies discussed a plan to have these periodicals abstracted by contract agencies in 1956. (~~CONFIDENTIAL~~) (u)

During the fiscal period which closed 30 June 1955 a contract in the amount of \$100,000 was let by the Center to two translation agencies. Because of the unsatisfactory performance of both contractors, the Center was prevented from taking full advantage of the appropriation

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allotted for its translation services. The factors that contributed to unsatisfactory service on this contract were:

Both contractors lacked technical capability in accomplishing translations.

Organizational structure of both contractors was inadequate to fulfill translation requirements of the Center.

Editorial supervision was apparently entirely lacking.

One contractor never received a security clearance for his translators. ~~( )~~ (u)

In an attempt to correct the unsatisfactory performance of both contractors, considerable time was expended in examining returned translations and listing suggested corrections to be used by contractors in reaccomplishing the translations. (Uncl)

A review of all difficulties encountered in obtaining satisfactory performance from translation agencies whose services have been procured through open bids in the past, proves conclusively that the only way to obtain the optimum degree of performance is to obtain the services of a reputable translation agency on a sole source contract. A year contract, as proved by experience, is insufficient to properly educate translation agencies in all matters pertaining to Center requirements. If a sole source can be obtained, it would have the desired effect of providing progressively more satisfactory service in the future. ~~( )~~ (u)

MATERIALS AND FOREIGN EQUIPMENT:

The Center received 388 items of foreign material and equipment with a total weight of 57,000 pounds. All of these items were made available to the analysts for examination and study. Many of the items of material were sent to contract laboratories for analysis as to content. A total of 11,500 photographs were made of nameplate and marking data. Information obtained from these nameplates and markings furnishes a lead to production rates and manufacturing techniques. (~~SECRET~~) (u)

Arrangements were made to construct a stand for display of foreign equipment in the Air Room of the Chief of Staff, USAF. It is scheduled for completion on 1 August 1955. (Uncl)

Representatives of Air Proving Ground Command visited the Center during May 1955 for the purpose of examining the P2M Soviet Radar Set with the intention of putting it in operation for use with Strategic Air Command in their electronic countermeasures training. During this visit it was learned they had an urgent need for WW II German Electron Tubes for use in the Baby Wurtzburg Radar Set. Since no spares were available, SAC often had to completely re-wire a tube circuit before substitution of a replacement could be made. The Center assisted them in locating and obtaining approximately 100 lbs. of German tubes and components. (~~SECRET~~) (u)



V. ANALYSIS DIVISION OPERATIONS

The end product of the Center is finished air technical intelligence in the form of estimates, studies, technical reports, and special reports, covering the entire field of foreign aeronautics and air weapons. These finished intelligence products are the end result of the efforts of collectors in the field and the entire ATIC organization. This finished intelligence is made available to those who are responsible for national planning and for our research and development efforts. (Uncl)

The Technical Analysis Division, which is the production element of the Center, is responsible for the Center's finished intelligence products. The Analysis Division is composed principally of scientists, engineers, and technicians who are trained and experienced in the evaluation and analysis of raw intelligence and basic information concerning aeronautics and related fields. (Uncl)

Raw intelligence received by the Center during the first half of 1955 provided sufficient information on which it could base good estimates and studies of developments in aeronautics, air weapons, and related fields, particularly within the Soviet bloc.

~~(CONFIDENTIAL)~~ (u)

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(Uncl) AIRCRAFT STUDIES AND ESTIMATES:

(Uncl) Special Study of BEAR, FLASHLIGHT and FARMER Aircraft:

A program to analyze information secured from rehearsal fly-bys of Soviet Air Force aircraft was given top priority during May and June 1955. The high priority of this study was necessitated by the fact that new aircraft were identified, plus the intensified emphasis being placed by the Soviets on aircraft programs to develop a strategic warfare capability (simultaneous crash development of BISON, BEAR and BADGER). In addition, it is known that there has been an accelerated development program of high-thrust turbojet engines for these aircraft and the concurrent development of an improved fighter aircraft capability with new axial-flow engines for the FLASHLIGHT and FARMER. ~~(SECRET)~~ (U)

Fly-by rehearsals by the Soviet Air Force were started early for the 1955 May Day show. Data was secured from 11 fly-bys between 3 April and 28 April. The air show portion of the May Day Show was cancelled because of inclement weather. Two rehearsals were held after the May Day Show. ~~(SECRET)~~ (U)

The data obtained from these practice runs resulted in the identification of three new aircraft - the BEAR, a swept-wing bomber powered by 4 turbo-prop engines, the FLASHLIGHT, a two-place

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swept-wing all-weather fighter with two nacelle-mounted axial-flow engines on the wings, and the FARMER, a single-place twin-engine day fighter (believed to be a further development of the MIG series). The sighting of the FLASHLIGHT and FARMER at this time confirmed previous ATIC estimates that the Soviets were developing such aircraft. ~~(CONFIDENTIAL)~~ (u)

Analysis of these aircraft is being accomplished in three phases: (1) ATIC analysis; (2) U.S. Industry analysis and (3) British analysis, after which, through a coordination conference between the ATIC and British representatives, the final estimates will be made. ~~(CONFIDENTIAL)~~ (u)

U.S. Industry participation was by the Bell, Boeing, Chance-Vought, Convair, Douglas, Lockheed, McDonnell, Glenn L. Martin, North American Aviation, and Northrup Companies. These companies were given sufficient material from which they are to prepare an overall weight analysis, in-board profile, and performance and characteristics estimates with a deadline date of 1 July 1955. ~~(CONFIDENTIAL)~~ (u)

Propulsion performance figures are being prepared independently in consultation with NACA and several major engine companies in the U.S. These include United Aircraft (Pratt-Whitney & Hamilton Standard), Curtiss-Wright, and General Electric. ~~(CONFIDENTIAL)~~ (u)

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To supplement ATIC engineering personnel, the services of personnel from ATIC contractor, Battelle Memorial Institute, Columbus, Ohio (Project WHITE STORK) were secured in the capacity of technical writers to assist in the writing of the studies. A total of five studies will result from this effort; two studies on propulsion units and three on characteristics and performance estimates. In addition, information on the BISON aircraft, as reported in a previous ATIC study,<sup>1</sup> will be revised. ~~(S)~~ (U)

As the period closed, rehearsals were being held for the annual Tushino Aviation Show in Moscow, set for 3 July 1955. Preliminary data indicates a new twin-rotor helicopter, the analysis of which will be handled on a similar crash basis in close coordination with G-2, US Army. ~~(S)~~ (U) *and, Gurnee*

(Uncl) Analysis of Bison and Badger:

Two characteristics and performance projects were completed during this period<sup>2</sup> upon the publication of "(Uncl) Analysis of BISON"<sup>3</sup> and "(Uncl) Analysis of BADGER"<sup>4</sup>. Both are technical reports based on aircraft observed in the 1954 May Day Air Show in Moscow and in rehearsals preceding the show. ~~(S)~~ (U) *Franklin, B...*

1. ATIC Study 102-AC-54/4/34.
2. ATIC History 1 Jul-31 Dec 54, Page 70.
3. ATIC Study 102-AC-54/4-34.
4. ATIC Study 102-AC-54/9-34.



The BISON, a swept-wing, four-engine, heavy jet bomber has a gross weight of 365,00 pounds and an estimated wing span of 170 feet. It was initially observed at Ramenskoye Airfield in 1953. Appearance of this bomber in the 1954 May Day Airshow confirmed the development of a Soviet jet heavy bomber and supported the ATIC estimate of its service availability in 1957. The appearance of the BISON in numbers (possibly 19 aircraft participating) in the 1955 air show rehearsal has necessitated a revision of the service availability estimate to 20 aircraft delivered to units in mid-55. ~~(SECRET)~~ (U)

The BADGER, a swept-wing twin-jet aircraft, is apparently designed to fulfill the medium bomber role. The aircraft is estimated to have an operational take-off weight of 150,000 pounds and a wing span of 116 feet. It was originally observed at KAZAN in 1953. The design of BADGER appears to have derived little from Western bomber designs. It's appearance in numbers at the 1954 Air Show indicates that a medium jet bomber aircraft is available for service use. ~~(SECRET)~~ (U)

(Uncl) MIG-15 (Project ZETA):

Performance flight testing of the MIG-15 aircraft at Wright-Patterson AFB was completed during this period. Navy flight evaluation was completed on 12 February. The aircraft is being maintained in flyable storage condition pending a flight test program to begin on 1 August 1955 in which the Air Proving Ground Command,

Eglin AFB, will evaluate the F-86-K against the MIG-15. ~~(S)~~ (U)

Three technical reports<sup>5</sup> were released, based on the analysis and evaluation of individual items from the MIG-15. Progress toward incorporating these and other MIG-15 intelligence products into one summary report<sup>6</sup> was delayed due to higher priority work during this period. ~~(S)~~ (U)

Progress toward publication of the MIG-15 Pilot's Operating Manual<sup>7</sup> was quite satisfactory. The manual will probably be published in July 1955. ~~(S)~~ (U)

(Uncl) Analysis of YAK-23. A project<sup>8</sup> to estimate the performance and characteristics of the Soviet YAK-23 Aircraft was completed, upon publication in May 1955 of a technical report, "(Uncl) Soviet YAK-23 Aircraft".<sup>9</sup> The YAK-23, first observed in the 1948 Moscow Air Show, saw limited use in the Soviet Air Force, but is presently in operational use in Satellite Air Forces. The YAK-23 is a single-seat, low-wing, lightweight jet fighter, the latest in a series designed by Yakovlev. ~~(S)~~ (U)

5. TR-AE-19 "(Uncl) Fuel System of the MIG-15", 26 Mar 55,  
TR-AE-67 "(Uncl) Electro-Mechanical Actuator, 7 Mar 55,  
TR-AE-68 "(Uncl) Soviet Aircraft Gear Pumps", 16 Mar 55.

6. ATIC History 1 Jul-31 Dec 54, Page 65.

7. ATIC History 1 Jul-31 Dec 54, Page 67.

8. ATIC History 1 Jul-31 Dec 54, Page 70.

9. TR-AC-28, 4 April 1955.

(Uncl) Joint ATIC-WADC Report on Project MX-1794:

Publication of an ATIC Technical Report<sup>10</sup> in February 1955 completed a joint study by ATIC and WADC of a radical (circular) aircraft design by A. V. Roe, Canada, Ltd., which is in the development stage. ~~(SECRET)~~ (U)

The subject of this report deals with a proposal for a new type aircraft by A. V. Roe, one of Canada's most progressive members of the aircraft industry. The ultimate purpose of presenting this study was two-fold; to correct a distorted picture presented in previous releases by other agencies, and to acquaint the intelligence community with the current state-of-the-art facts in order to alert them to any air intelligence information which may become available indicating Soviet interest in this specialized field.

~~(SECRET)~~ (U)

Other aircraft projects, upon which considerable work was accomplished, included studies and estimates of the FRESCO fighter,<sup>11</sup> HOUND helicopter,<sup>12</sup> and the Soviet aircraft maintenance system.<sup>13</sup> Work on the FRESCO study progressed steadily, but periodic receipt of new data on modified versions of that aircraft increased the

10. TR-AC-117, 15 February 1955.

11. ATIC History 1 Jul-31 Dec 54, Page 67.

12. ATIC History 1 Jul-31 Dec 54, Page 68.

13. ATIC History 1 Jul-31 Dec 54, Page 70.



scope of the study. Four variations of the FRESCO have been sighted and data on each design will be incorporated in the study. ~~(S)~~

~~(S)~~ (U)

(Uncl) GUIDED MISSILE STUDIES:

Project "~~(S)~~ DRAGGLE" was redesignated "~~(S)~~ ASLOPE" during this period.<sup>14</sup> This is a project to cover ATIC participation in the USAF program for developing a long-range reconnaissance radar. The principal purpose of the project is to provide means of acquiring intelligence data on the trajectory and velocity of foreign guided missiles. Equipment was constructed and tested in May 1955, and was installed at the overseas field site. Operation started on 1 June 1955. ~~(S)~~ (U)

A new ATIC project "~~(S)~~ Soviet Bloc Surface-to-Air Guided Missile Launch Sites" was initiated during this period. The purpose of the project is to identify and analyze Soviet Bloc operational Surface-to-Air launch sites. It is a continuation of the efforts reported in a previous ATIC Study,<sup>15</sup> but broadened to include satellites, since possible sites have been reported in such areas as Shanghai, China. The sites are to be studied as single units and in deployed defense systems. The project will be on an extended-time basis with periodic studies to be prepared as warranted. The

14. ATIC History 1 Jul-31 Dec 54, Page 73.

15. ATIC Study 102-AC-54/11-34 "~~(S)~~ Possible Surface-to-Air Guided Missile Launch Sites in the Moscow Area."

18. IR-AC-45, 1 Feb 55.

17. AITC History 1 Jul 31 Dec 54, Page 72.

16. Purchase Request Nr. 161203, Contract Nr. AF 33(600)-30230.

negotiations are being contemplated with a U.S. manufacturer, which, of the more important rocket power plants. It was noted that ne-  
velopment activities, and the design and performance characteristics  
ices, including the development facilities, the research and de-  
veyed the development programs supported by the French Armed Ser-  
" (Uncl) French Rocket Power Plant Development Program 18 sur-  
the French and British rocket power plant development programs.  
Two AITC Technical Reports were issued outlining the status of

(Uncl) Rocket Propulsion Programs: <sup>h 3-2</sup>

(Uncl) PROPOSITION STUDIES:

(Uncl) (S)

with ballistic missiles was nearly completed as the period closed. 17  
urgent projects. The study of surface-to-surface missiles dealing  
tively low-priority basis because of the workload imposed by more  
Missile projects in this area of research were reduced to a rela-  
(Uncl) Air Weapon Trend Studies. The two active guided

(Uncl) (S) on missile systems effectiveness.

Pomona, California. These firms will furnish operations analyses  
has been negotiated with Consolidated-Vultee Aircraft Company,  
a cost-free basis has been secured and, in addition, a contract 16  
assistance of Douglas Aircraft Company, Long Beach, California, on

if completed, could provide the French with rocket power plants in the 10,000 pound thrust range comparable with those being developed in the U. S. ~~(CONFIDENTIAL)~~ (u)

"(Uncl) British Rocket Power Plant Development Program<sup>19</sup> was similar in coverage. One of the significant conclusions was that, in view of the limited practical experience with actual hardware and the past program requirements, British developments of conventional turbopump propellant-feed rocket power plants in the thrust range up to 10,000 pounds are at least two years behind the U.S. ~~(CONFIDENTIAL)~~ (u)

This current survey of foreign rocket power plant development programs<sup>20</sup> will be concluded upon publication, scheduled for September 1955, of a third study of Soviet rocket power plant developments. ~~(CONFIDENTIAL)~~ (u)

4E-30 (Uncl) Turboprop Engines:

One turboprop engine study was published during this period. "(Uncl) Soviet JUMO-022 Turboprop Engine Development and Production Capabilities", which presented an analysis of the JUMO-022 series turboprop engine development progress, compared Soviet development progress as of late 1953 with that of the U.S. and estimated the JUMO-022 series development capabilities. Design and

19. TR-AC-46, 17 Jan 55.

20. ATIC History 1 Jul-31 Dec 54, Page 75.



development of the basic JUMO-022 series was begun for the Soviets at ZAVOD 2 in the USSR by German Junkers personnel in mid-1947.<sup>21</sup> During the period of 1947 - 1953 the Soviet effort in development of turboprop engines greatly exceeded that of the U.S. and future development will be at a rate at least comparable with that of the U.S. ~~(SECRET)~~ (u)

This study of the JUMO-022 series was considered sufficiently significant to justify the initiation of a project to continue the analysis of the Soviet progress as of late 1954, utilizing the Pratt and Whitney (United Aircraft Corp) facilities on contract<sup>22</sup> to produce a technical report on the subject. ~~(SECRET)~~ (u)

A new project was also initiated to study the estimated turboprop engine in the BEAR aircraft. This was in connection with the special fly-by project discussed under "Aircraft". In this new project an estimate will be made of the turboprop engine in the BEAR aircraft, together with a comparison with significant British and U.S. turboprop power plants. ~~(SECRET)~~ (u)

4E-29 (Uncl) Turbojet Engines:

Two productions were distributed on turbojets engines during the period. An ATIC Study "~~(SECRET)~~ (u) Inspection and Performance Calibration of a Soviet VK-1 Turbojet Engine", released

21. ATIC Study 102-AC-54/8-34, 22 Nov 54.  
22. Contract AF-33(600)-29655

in April 1955, reported the results of a joint ATIC, WADC (Power Plant Lab.) effort.<sup>23</sup> This engine from the MIG-15 BIS, which was landed in South Korea by a North Korean defector, was made the subject of extensive examination to determine its condition with regard to further use, to confirm its reported performance, and to learn something of its operating characteristics. ~~(SECRET)~~ (u)

An ATIC Technical Report "~~(SECRET)~~ Estimated Turbojet Engine in the BISON and BADGER Aircraft", also released in April, presented Soviet developments of high-thrust turbojet engines, and was based on sightings of the BISON and BADGER aircraft in the 1954 May Day Air Show over Moscow.<sup>24</sup> This study estimated the configuration and performance of the 1954 operational turbojet engine; estimated the performance of a 1957 operational version of this power plant, and compared it with significant British and U.S. turbojet power plants. ~~(SECRET)~~ (u)

A new project to investigate and analyze the SSoviet Iykula engine designs was initiated during this period. Reports have been received containing information on the activities and successes of the Soviet engine designer, Iykula, and information available

23. ATIC Study 102-AC-54/9-34, 4 Oct 54, Project 10200, ATIC History 1 Jul 54-31 Dec 54, Page 75.

24. ATIC TR-AC-42, 27 Sep 54, Project 10187, ATIC History 1 Jul-31 Dec 54, Page 74.

appeared to justify a study of the "turbofan" type engine. Results, if significant, will be presented in an ATIC Study. ~~(U)~~  
~~(U)~~ (u)

A project to revise a previous ATIC Study<sup>25</sup> (now obsolete) on the characteristics of British and U.S. axial flow turbojet engines was initiated in January. This project will result in a technical report containing tabulations of data and performance characteristics of current British and U.S. turbojet engines. The trend curves developed will be of assistance in estimating development capabilities of Soviet turbojet engines. ~~(U)~~ (u)

A companion project to the turboprop engine study of the BEAR aircraft, has been initiated to estimate the turbojet engine in the FLASHLIGHT and FARMER Aircraft. This study will present Soviet developments of nominal-thrust turbojet engines, estimate their configuration and performance in the two aircraft, and compare them with similar British and U.S. turbojet power plants. ~~(U)~~ (u)

4E-24 (Uncl) Propeller Studies:

The distribution of two ATIC Technical Reports, "(Uncl) Evaluation of the Soviet Propeller Model VISH-107-1a"<sup>26</sup> and "(Uncl) Evaluation of the Soviet Propeller Model VISH-111-V-20"<sup>27</sup> completed

- 25. ATIC Study 102-AC-52/41-31, 1952.
- 26. ATIC TR-AC-30, 1 Mar 55.
- 27. ATIC-TR-AC-38, 1 Jul 55.

the project<sup>28</sup> utilizing the Curtiss-Wright Corporation on contract<sup>29</sup> to analyze and evaluate Soviet Propellers. Both propellers under study were constant-speed type; the VISH-107-1c from a YAK-9P fighter aircraft and the VISH-111-V-20 from a YAK-11 trainer type aircraft. ~~(CONFIDENTIAL)~~ (u)

A new project<sup>30</sup> was initiated in April 1955 to determine the feasibility of obtaining propeller performance and an indication of turbo-prop engine power class by photographic means. This is an exploratory project to test a theory to determine projected blade plan form by means of a series of photographs taken of a propeller blade while in rotation. ~~(SECRET)~~ (u)

(Uncl) AIRCRAFT ARMAMENT:

4E-11 (Uncl) Investigation of Foreign Fire Control Equipment:<sup>31</sup>

An ATIC Technical Report "(Uncl) Installation of Guns in Turrets of TU-4"<sup>32</sup> was distributed in January 1955 in connection with a call contract<sup>33</sup> with the Emerson Electric Company, St Louis, Mo. This report, which completes all outstanding calls with Emerson,

28. ATIC History 1 Jul 54-31 Dec 54, Page 77.

29. Contract-AF-33(600)-24034.

30. Project 15501, 18 Apr 55 (Previously reported 10204, ATIC History 1 Jul 54-31 Dec 54, Page 77).

31. Project 30037, ATIC History, 1 Jul-31 Dec 54, Page 86.

32. TR-AE-21, 15 Aug 54.

33. Contract-AF-33(600)-18147.



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determines the design configurations for Soviet TU-4 turrets based on the installation of the Soviet 23-mm NS gun and the 23-mm NR (high-performance) gun. In addition, it compares the relative effectiveness of these two Soviet guns and a 50 Cal. M2 U.S. aircraft machine gun installation in this type of turret. The 50 Cal. M2 is the nearest counterpart of the Soviet 12.7mm aircraft gun. The report also includes a graphic presentation of the cones of fire and the areas of greatest lethality against attacking jet fighter aircraft. ~~(SECRET)~~ (U)

Investigations on Soviet Aircraft fire control systems were continued under a contract<sup>34</sup> with the Crosley Division, AVCO Mfg. Corp., Cincinnati, Ohio. Two work requests have been made on the contract, one on Soviet Air Gunnery Trainer and one on ARO Radar Installation in MIG-15. ~~(CONFIDENTIAL)~~ (U)

4E-12 (Uncl) Evaluation of Foreign Aircraft Gun (French 30mm 30 mm).<sup>35</sup>

This program, to provide a technical evaluation of the French revolver-type aircraft gun, including an evaluation of the physical design and performance characteristics, was broadened in scope during this period to include the test firing of U.S. and British ammunition as a part of the program. The purpose of these added tests was to confirm the interchangeability of the ammunition to be used by NATO countries in their various 30-mm aircraft guns.

34. Contract-AF-33(600)-24502.

35. Project 30082, ATIC History, 1 Jul-31 Dec 54, Pages 97, 98.

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The final report, prepared by the contractor,<sup>36</sup> Armour Research Foundation, Chicago, Illinois, has been reviewed at ATIC preparatory to publication. (~~CONFIDENTIAL~~) (u)

4E-13 (Uncl) Other Armament Projects. New projects were initiated to revise the existing project "(Uncl) Defensive Fire Control Diagrams of Soviet Aircraft", and to assemble and publish a study, "(Uncl) Significant Development and Trends of Soviet Aircraft Armament Systems". This latter project is considered important since it will assemble, in one volume, the significant technical developments and trends in the field of Soviet aircraft armament, utilizing those numerous publications released in the past on individual items. (~~SECRET~~) (u)

(Uncl) AIRCRAFT EQUIPMENT. In addition to the technical reports distributed during this reporting period on the MIG-15 fuel system, electro-mechanical actuators, and hydraulic pumps, basic studies were in progress in several areas. Battelle Memorial Institute was requested to perform research and submit initial reports on Soviet technology in the fields of aircraft instrumentation,<sup>37</sup> aircraft mechanical equipment,<sup>38</sup> aircraft electrical equipment,<sup>39</sup>

36. Contract AF-33(600)-28834.

37. Project 30057, ATIC History, 1 Jul-31 Dec 54, Page 90.

38. Project 30066, ATIC History, 1 Jul-31 Dec 54, Page 92, 93.

39. Project 30069, ATIC History, 1 Jul-31 Dec 54, Page 94.

erial photographic reconnaissance equipment,<sup>40</sup> and aircrew and  
aero-medical equipment.<sup>41</sup> ATIC Technical Studies will be prepared  
on the basis of those initial reports. (~~CONFIDENTIAL~~) (u)

(Uncl) MANUFACTURING METHODS AND TECHNIQUES:

One project, "(Uncl) Development of Analog Ratios for Analysis  
of Vacuum Tube Production,"<sup>42</sup> was completed upon distribution of an  
ATIC Technical Report on the subject.<sup>43</sup> The purpose of this pro-  
ject was to develop a technique for estimating production rates of  
vacuum tube manufacturing by the use of known factors in U.S. pro-  
duction. It is necessary to develop a technique based on data that  
are measurable, obtainable, minimum in number, and sufficient to  
approximate output with a reasonable degree of accuracy. Although  
this particular study was primarily intended to develop relationship  
for estimating the output of electron tube plants, one of its pur-  
poses was to explore the general feasibility of this kind of ap-  
proach as a basis for development of prediction equations for other  
types of products. (~~CONFIDENTIAL~~) (u)

Work continued on studies in manufacturing methods and tech-  
niques that were active during the last reporting period. Those  
studies were: "(Uncl) Soviet Capabilities in Aircraft Instrument

- 40. Project 30068, ATIC History, 1 Jul-31 Dec 54, Page 94.
- 41. Project 9974, ATIC History, 1 Jul-31 Dec 54, Page 103.
- 42. Project 30062, ATIC History 1 Jul-31 Dec 54, Page 96.
- 43. TR-AE-66, 1 Mar 55.

Manufacturing,<sup>44</sup> "(Uncl) Status of Soviet and East German Electron Tube Manufacturing Methods",<sup>45</sup> "(Uncl) USSR Heavy Press Capabilities Technology",<sup>46</sup> "(Uncl) Adaptability of the Soviet Aircraft Industry to Heavy Bomber Production".<sup>47</sup> These projects were in various stages of documentation, including coordination within industry and intelligence circles. (~~CONFIDENTIAL~~) (u)

2E-22  
(Uncl) Quality Control in the Soviet Aircraft Industry. This new project was initiated to ascertain the status of quality control in the Soviet aircraft industry, and to study its effect on the capability of the Soviets to manufacture current and future air weapons of adequate and consistent quality. Quality control represents one of the factors that can be used to judge the level of industrial technology. (~~CONFIDENTIAL~~) (u)

"(Uncl) Producibility of the BADGER Aircraft". This new project is a study to determine the producibility of the Soviet BADGER airframe through an industrial engineering analysis. The BADGER aircraft is currently one of the most formidable threats to U.S. strategic targets since it is in production and is known to be operationally available in large numbers. Definition of the production factors necessary to build this aircraft in a hypothetical

44. Project 30050, ATIC History 1 Jul-31 Dec 54, Page 88.

45. Project 30093, ATIC History 1 Jul-31 Dec 54, Page 102.

46. Project 30088, ATIC History 1 Jul-31 Dec 54, Page 99.

47. Project 30080, ATIC History 1 Jul-31 Dec 54, Page 97.



plant will enable the Air Targets analysts to fit these conclusions to a particular location in USSR and thus enable an estimate of current rate of production. (~~SECRET~~) (u)

"(Uncl) Film on Soviet Industry".

This project will utilize film from CIA, Army Signal Corps and other agencies in producing a documentary movie on the Soviet industry which will reflect the USSR ability to produce and maintain a modern Air Force. The Air Photographic and Charting Service will assist the ATIC in obtaining pictures of American industry where required, completing the narrative, and producing the film which will be made available to other agencies. (~~CONFIDENTIAL~~) (u)

In addition to the projects already mentioned, two new projects were started to accomplish the evaluation of a Zeiss (E. German) gear-checking gauge, and a Soviet-produced automatic sorting gauge for sorting bearing races. These are to be accomplished by contracting agencies. (~~CONFIDENTIAL~~) (u)

(Uncl) MATERIALS:

4E-14 (Uncl) SOVIET Bloc Metallurgy:

A total of six metallurgical capabilities studies of the Soviet bloc nations were released during the current reporting period. These studies completed the program for review and revision of Soviet bloc metallurgical capabilities as outlined in the the two active projects in this area,<sup>48</sup> in which ATIC utilized

48. Project 30022 ATIC History 1 July 54 - 31 Dec 54 page 86,  
Project 30065 ATIC History 1 July 54 - 31 Dec 54 page 92.

the services of Battelle Memorial Institute. (~~CONFIDENTIAL~~) (u)

One of these studies,<sup>49</sup> "(Uncl) The Status of Aircraft Metallurgy in USSR (Research and Development)", dealt with the present and future capabilities of the USSR in metallurgical development. On the basis of the study it was concluded that, in general, with respect to quality, USSR metallurgical research is on a par with that of the U.S.; that it is broad in scope, covering all the major aircraft fields; and that the Soviets' metallurgical research is not hampered by their political philosophy.

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In the study, "(Uncl) The Status of Aircraft Metallurgy in the USSR (Summary and Addendum)",<sup>50</sup> an overall assessment of the present status and future capability of the Soviet Union in aircraft metallurgy was presented. It covered the period of mid-1953 through 1 December 1954. As the title implies, it was a supplement to the previous studies issued on specific fields of Soviet metallurgy. (~~CONFIDENTIAL~~) (u)

The four other studies on metallurgy that were published during the period were: "(Uncl) Status of Welding Technology in the USSR",<sup>51</sup> "(Uncl) The Present Status and Future Capability of Czechoslovakia in Air Weapons Metallurgy",<sup>52</sup> "(Uncl) The Present

49. ATIC Study 102-AE-54/4-34.

50. ATIC Study 102-AE-54/4-34.

51. ATIC Study 102-AE-54/3-34.

52. ATIC Study 102-AE-54/5-16.

Status and Future Capabilities of Hungary in Air Weapons Metallurgy",<sup>53</sup> and "(Uncl) The Present Status and Future Capabilities of East Germany in Air Weapons Metallurgy".<sup>54</sup> (Uncl)

Surveillance of this important aspect of the Soviet bloc industrial complex was continued by the initiation of a new project "(Uncl) Status of Air Weapons Metallurgy in the USSR and Satellites" which will utilize Battelle Memorial Institute in preparing studies on the USSR and on selected satellites with the purpose of confirming or revising present metallurgical estimates on the basis of evidence obtained since the previous studies were published. ~~(CONFIDENTIAL)~~

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(Uncl) Western Europe Metallurgy:

An ATIC Study "(Uncl) Air Weapons Metallurgical Capabilities of Western Europe"<sup>55</sup> was completed and distributed during this period for the purpose of providing a comparison between metallurgical research in West European countries and in the United States, and to show the potential each country has for developing alloys for air weapons. Knowledge of such potential may become important if the political status of such governments should change. This study was produced through the combined efforts of the ATIC

53. ATIC Study 102-AR-54/6-5.

54. ATIC Study 102-AE-54/7-23G.

55. ATIC Study 102-AE-55/3-100, (Previously reported as TR-AE-65; ATIC History 1 July 54 - 31 Dec 54, page 95).

The results were expected to provide a basis for estimating the impact of the presence of this system upon similar developments being made in the U.S., to permit evaluation for long range navigation and missile guidance applications, and to determine the equipment required to maintain an intelligence scrutiny for future transmissions. Equipment used in this operation was specially constructed by the Spray Corporation under their contract with WADC, who participated on a joint support basis. Under the terms of a separate contract,<sup>68</sup> Farnsworth is to build phase measuring equipment using parts and schematics supplied by the Bell Telephone Laboratories. A new contract has been signed to secure the services of the Stanford Research Institute, Palo Alto, California,<sup>69</sup> for development, production, and field test of intercept equipment in connection with this project. (S) (u)

Two new projects were initiated: "~~(S)~~ Evaluation of Soviet Neptun Shipboard Radar" was a project conducted jointly with Office of Naval Intelligence to evaluate the Ship Radar Station on the Soviet tanker "TUAPSE," the electronic components of the station, other electronic ship equipment, and documents and literature. This project was completed and a report to be published by the Navy will contain an ATIC contribution. (S) (u)

68. Contract-AF-33(600)-28363.

69. Contract-AF-33(600)-29654.



and Dr. John P. Nielsen of New York University who is under consultant contract to ATIC.<sup>56</sup> Other well known U.S. Metallurgists coordinated in the final preparation of the study. (~~CONFIDENTIAL~~) (u)

A new project was initiated to continue this program through the utilization of Dr. Nielsen on contract<sup>57</sup> and will result in the publication of an ATIC study with specific attention to the present and future capabilities of Western European countries with respect to basic metallurgical research and development and the applied metallurgy of air weapons. (~~CONFIDENTIAL~~) (u)

(Uncl) Foreign Production Status of Titanium. This project<sup>58</sup> to ascertain the present and future status of foreign titanium technology on a world-wide basis is in support of Scientific Estimates Committee and Joint Technical Intelligence Sub-Committee requirements. Semi-annual letter reports and special reports, as warranted, will be submitted. During this period, reports transmitting nine articles on foreign titanium technology were forwarded to the JTIS and SEC in accordance with the program. (~~CONFIDENTIAL~~) (u)

(Uncl) Rubber, Plastics, and Ceramics:

An ATIC Study in connection with the project titled "(Uncl) Evaluation of Research and Development in Elastomers in Significant Nations"<sup>59</sup> was received from the contractor, Battelle Memorial

56. Project 30077 - ATIC History 1 July 54 - 31 Dec 54, page 95.

57. Contract-AF-33(600)-28412.

58. Project 30079 - ATIC History 1 July 54 - 31 Dec 54, page 96.

59. Project 30078, ATIC History 1 July - 31 Dec 54, pages 95, 96.

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Institute, and was coordinated during this period with competent representatives of industry and ARDC. It was felt that such a coordination would greatly enhance the value of the product to the user. ~~(CONFIDENTIAL)~~ (u)

A similar situation prevailed with regard to the project "(Uncl) Evaluation of Research and Development in Ceramics and Cermets"<sup>60</sup> except that coordination was completed during this period and the study is in production. (Uncl)

A new project, "(Uncl) Foreign Status of the Fields of Ceramics and Cermets," was initiated to continue the White Stork study of Soviet bloc nations previously accomplished under project 30084. The purpose of this project is to compile specific information and derive logical conclusions as to the extent of activity, as well as present and probable future capabilities of the USSR and certain satellites, in ceramics, cermets and related fields. ~~(CONFIDENTIAL)~~ (u)

(Uncl) SPECIAL WEAPONS:

(Uncl) Nuclear Reactors:

This project<sup>61</sup> utilizes Battelle Memorial Institute to collate and integrate information into an abstract file. Abstracts on foreign atomic energy activities are forwarded to ATIC monthly. Bibliographies on prominent Soviet physicists are furnished to ATIC on a continuing basis. (Uncl)

60. Project 30084, ATIC History 1 July - 31 Dec 54, page 98.

61. Project 30051, History of ATIC, 1 July - 31 Dec 54, page 89.

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A new project, "(Uncl) Estimate of USSR Heat Transfer Capabilities", was placed with Battelle Memorial Institute in May 1955. Its purpose is to determine the present and future research, development, and applications capability of the USSR in the field of heat transfer with respect to its influence on the performance characteristics and capabilities of air weapons. Heat transfer is one of several basic sciences that are playing an increasingly significant role in modern air weapons technology. The determination of the Soviet accomplishments, particularly from the applications standpoint in the field of heat transfer, is considered to be mandatory to provide adequate support in the preparation of estimates of current and future Soviet capabilities in air weapons. ~~(CONFIDENTIAL)~~ (u)

(Uncl) Biological and Chemical Warfare.<sup>62</sup> This program is to utilize WHITE STORK to process and integrate into the abstract files on a continuing basis, information on design and performance characteristics of air BW - CW weapons and munitions; aircraft and associated mounts, racks and launchers; and loading or ground-handling equipment and techniques. Status reports were furnished by the contractor during the period. ~~(CONFIDENTIAL)~~ (u)

(Uncl) ELECTRONICS:

(Uncl) Radar and Communications Studies:

Two ATIC Technical Reports were distributed during this period in connection with the project "(Uncl) Air Aspects of Decimeter

62. Project WHITE STORK (9974) ATIC History 1 July - 31 Dec 54, page 102.

Communications Systems". These reports completed the current program. The report, "~~(S)~~ (U) Evaluation of East German RVG 903B Mobile Decimeter Relay Equipment",<sup>63</sup> investigated the characteristics, performance, and general construction of the item of equipment and compared it with the RVG-902 previously examined and reported.<sup>64</sup> "~~(S)~~ (U) East German Carrier Telephone Equipment IAE-8"<sup>65</sup> is a report on an item of equipment designed for either fixed or mobile operation. The purpose of the report was to present all the technical information that is available pertaining to the equipment and to familiarize communications personnel with its operation and maintenance. These two reports were produced through the utilization of Farnsworth Electronics Corp, Ft. Wayne, Indiana, under Contract to ATIC.<sup>66</sup> (~~SECRET~~) (U)

In connection with the project for collection and analysis of VLF and LF data, one technical report, "~~(S)~~ (U) Preliminary Analysis of Soviet "MOON" System Signals,<sup>67</sup> was distributed. This publication reported on the intercept and analysis of signals of a Soviet navigation system and was based on the observations of a group of U.S. scientists and engineers during August and September 1954.

- 63. TR-EL-24, 20 Oct 1954.
- 64. TR-EL-45-2, 27 Feb 1953.
- 65. TR-EL-45-6, 30 Sep 1954.
- 66. Contract-AF-33(600)-8222.
- 67. TR-EL-29, 25 Mar 1955.



The second project "(Uncl) Technical Aspects of Soviet Air Force Communications" was initiated to produce studies on the technical aspects of communications associated with the defensive, strategic, and tactical air operations of the Soviet bloc air forces. The acquisition phase, to run through August 1955, is to consist of visits, consultation, and coordination with other government agencies. Upon completion of these actions, a contract will be secured for assimilation and compilation of data. ~~(S)~~ (u)

(Uncl) ELECTRONIC SCIENCES:

Two ATIC finished intelligence products were distributed during the current reporting period in the area of Electronic Science. The study, "(Uncl) Soviet Bloc capabilities in Application of Infrared to Aerial Warfare",<sup>70</sup> completed the program<sup>71</sup> for revision of a previous ATIC Study<sup>72</sup> on Soviet Capabilities in that area. The revised study is concerned primarily with those applications feasible for serial operation. In practice, this means application to equipment and components for the passive detection of infrared radiation. ~~(S)~~ (u)

Another ATIC project, conducted by Battelle Memorial Institute on contract, resulted in the production of an ATIC Technical report,

70. ATIC Study No. 102-EL-54/6-34, 25 Oct 54.

71. Project 20081, ATIC History 1 Jul - 31 Dec 54, page 84.

72. Study No. 102-EL-10/51-34, Aug 51.

"(Uncl) The Status of Research and Development in Dielectrics in the USSR".<sup>73</sup> This product is composed mostly of a literature survey. It deals with dielectric theory in the USSR, dielectric materials, and the applications of dielectrics. (~~CONFIDENTIAL~~) (u)

Other projects which were active in the science area of electronics, but which did not result in finished intelligence production, included studies by Battelle Memorial Institute in electronic component parts, geophysics and astronomy applied to air operations, and solid state research. Work also progressed on projects to determine Soviet capabilities in electronic measuring techniques and test equipment, magnetrons, klystrons and travelling wave tubes, and magnetic amplifier development. (~~CONFIDENTIAL~~) (u)

(Uncl) European Astronomical Capabilities. This project was initiated to ascertain the astronomical capabilities of European countries with emphasis on possible applications to aircraft and guided missile trajectories. This will be accomplished through the authorization of Dr. L. V. Robinson, ATIC analyst, to attend the meeting of the International Astronomical Union in Dublin, Ireland, during the period August and September 1955, and visits to leading astronomers in Europe. The countries to be covered include Great Britain, France, West Germany and Italy. (~~CONFIDENTIAL~~) (u)

73. Technical Report TR-EL-28, 28 Feb 55.

(Uncl) FUELS AND LUBRICANTS:

"(Uncl) Soviet Petroleum Products Analysis Report." <sup>74</sup> A

study on Soviet petroleum products was released in May 1955. It brought up-to-date a compilation of analysis and evaluation data for Soviet petroleum products for the year 1953 and part of 1954, and was based on analyses made by the Phoenix Chemical Laboratory, Inc., Chicago, Illinois, under contract to AFIC. <sup>75</sup> This report supplemented data published in two previous reports <sup>76</sup> and is to be followed by a companion study now in production. (~~CONFIDENTIAL~~) (u)

"(u) (~~CONFIDENTIAL~~) Boron Resources Survey, USSR and Satellite Countries":

This is a new study initiated in May to utilize project WHITE STORK to survey all available literature to determine the resources of boron and boron-bearing ores available to the USSR and satellite countries. Because of the high-energy output of boron when used as a fuel in air-breathing propulsion systems; because it will probably find use as one of the intermediate fuels between the petroleum hydrocarbons and nuclear energy; and because of its applications in the field of atomic energy, boron is a critical area for research. The capability of an unfriendly power to develop an effective high-energy boron fuel will depend in large part on the

74. AFIC Study No. 102-AE-55/3-34, 1 Apr 55.

75. Contract-AF-33(616)-2716.

76. AFIC Study 102-AG-51/45-34, AFIC Study 102-AG-53/14-34, AFIC History 1 Jul 54 - 31 Dec 54, page 76.

availability of sufficient raw material resources. (~~CONFIDENTIAL~~) (u)

In addition to the above, projects were also active in this area on the subjects of Chemical compounds used as rocket fuels,<sup>77</sup> catalytic cracking processes,<sup>78</sup> and synthetic lubricant developments.<sup>79</sup> (~~CONFIDENTIAL~~) (u)

(Uncl) MISCELLANEOUS PRODUCTS AND CONTRIBUTIONS TO OTHER PUBLICATIONS:

48-11  
(Uncl) National Intelligence Estimates (NIE)<sup>80</sup> and National Intelligence Studies (NIS):<sup>81</sup>

In support of the NIE program ATIC submitted a contribution to NIE-11-3-55 in February 1955. This publication is entitled "~~CONFIDENTIAL~~ (u) ~~CONFIDENTIAL~~ Soviet Capabilities and Probable Soviet Courses of Action through 1960". (~~CONFIDENTIAL~~) (u)

Contributions to the NIS program consisted of information on the USSR, Section 72, "Air, Ground and Naval Weapons". In these contributions, ATIC was responsible for integration of Army and Navy portions with those of ATIC into the final format. Contributions were also forwarded on Section 17, "(Uncl) Basic Scientific Capabilities for NIS publications on Norway, Yugoslavia and India". (~~CONFIDENTIAL~~) (u)

- 77. Project 10172, ATIC History 1 Jul 54-31 Dec 54, Page 78.
- 78. Project 10184, ATIC History 1 Jul 54-31 Dec 54, Page 78.
- 79. Project 10197, ATIC History 1 Jul 54-31 Dec 54, Page 78.
- 80. Project 10194, ATIC History 1 Jul 54-31 Dec 54, Page 80.
- 81. Project 10175, ATIC History 1 Jul 54-31 Dec 54, Page 80.



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(Uncl) "The Threat of Military Surprise from Soviet Technological Superiority (AIE-11)". In view of favorable reaction by the Air Force Council and other Air Staff Officers to a brief paper presented by ATIC in mid-1954 on "(Uncl) The Threat of Soviet Technological Superiority", ATIC was directed by the Director of Intelligence to prepare a finished study on the subject by the end of February 1955. Accordingly, a Top Secret publication, "Air Intelligence Estimate (AIE-11)", was prepared and given selective distribution. (The estimate, based on ATIC's total knowledge of Soviet technology, presents in concise form the aspects of their technology which appear to present possibilities of technological surprise. ~~(SECRET)~~ (U))

(Uncl) Soviet Bloc Air Defense Systems (FAIS 2-2). The ATIC contribution to the publication, "~~(SECRET)~~ Soviet Bloc Air Defense System", Force Air Intelligence Study 2-2/2 was completed and forwarded to the Director of Intelligence 9 March 1955. ~~(SECRET)~~ ~~(SECRET)~~ (U)

(U) ~~(SECRET)~~ Radar Equipment and Navigational Aid Systems (AIS-2-22). This project is designed to supply the Director of Intelligence with electronic radar, navigation, and communication information. ATIC contributions consisted of artists drawings of equipment, technical specifications, and radar coverage patterns which were forwarded on a periodical basis. Information gathered in connection with this project will also be used in other electronic intelligence publications including Electronics Handbooks.

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x (u) ~~(CONFIDENTIAL)~~ Benefit to USSR of Public Disclosures of U.S. Classified Information. In compliance with a memorandum from the Office of the Secretary of Defense to the Secretary of the Air Force, ATIC was directed to prepare a study on the benefits to the USSR of our disclosures, inadvertent and otherwise, of technical information. An ATIC contribution was prepared and forwarded to the Director of Intelligence 19 May 55. It was based on papers and reports on this subject collected by ATIC in the past, plus information from raw intelligence reports and finished studies which contain examples of how Soviet technology and directional emphasis on weapons development have been furthered in this manner. ~~(CONFIDENTIAL)~~ (u)

~~(CONFIDENTIAL)~~

(Uncl) Estimated Characteristics of Soviet Air Weapons.

The annual ATIC Study "(Uncl) Estimated Characteristics of Soviet Air Weapon"<sup>82</sup> was published on 3 January 1955 and advance distribution made to Hq. USAF, ARDC, and all Major Air Commands with a combat mission. The purpose of this very important study is to provide in convenient tabular form the estimated characteristics of present and future Soviet Air Weapons. ~~(CONFIDENTIAL)~~ (u)

"(Uncl) Characteristics and Performance Handbook, USSR Aircraft"<sup>83</sup> BISON and BADGER handbook sheets were forwarded to the Director of Intelligence in February and data for the FRESCO, HOUND and BEAGLE II-28 handbooks were being assembled as the period closed. ~~(CONFIDENTIAL)~~ (u)

<sup>82</sup>. ATIC Study No. 102-AC-55/1-34, 3 Jan 55.

<sup>83</sup>. Project 10128, ATIC History, 1 Jul-31 Dec 54, Page 107.

"(Uncl) Handbook on Foreign Aircraft Engines (other than Soviet Bloc)".<sup>84</sup> The basic handbook, containing only the section on France was released in May 1955. Sections on Argentina, Australia, Belgium, Canada, Spain, Sweden, and Switzerland were completed and an order was placed for printing during the same month.

~~(CONFIDENTIAL)~~ (u)

"(Uncl) Handbook on Known Soviet Aircraft Engines".

Engine data and performance sheets were completed and released on 18 May 1955 on eleven Soviet aircraft engines (turbojet and turbo-prop). Of these, seven were new additions to the handbook and the others were revisions. ~~(CONFIDENTIAL)~~ (u)

"(Uncl) Aircraft Armament Handbook". Revision of the Chapters on Soviet Bomb Fuzes was distributed in January 1955. The Chapter on Soviet Aircraft Rockets is being prepared for submission to the Director of Intelligence. A review of the program to date resulted in a change in the project to establish an order of priority for completion of the sections relating to various countries. It is planned to accomplish complete revision of the handbook by 31 December 1955. ~~(CONFIDENTIAL)~~ (u)

(Uncl) MISCELLANEOUS AND SPECIAL ACTIVITIES:

(Uncl) Scientific Consultants Program. A project was initiated in April 1955 to authorize the establishment, through contractual arrangement, of a nucleus of scientific consultants in the broad areas of basic and applied sciences which are related to, and

84. Project 10151, ATIC History, 1 Jul-31 Dec 54, Page 107.



support, research and development of air weapons. These scientists will analyze and evaluate scientific and technical information acquired by ATIC, assist in making long-range estimates, travel overseas to Western European countries on specific projects, and prepare finished scientific intelligence capabilities studies with assistance of ATIC engineers. As of 1 July, one consultant, Dr. John P. Nielsen of New York University, was under contract covering the area of metallurgy.<sup>85</sup> Contract negotiations are in progress in the fields of heat transfer, gas and fluid dynamics, nuclear reactors, nuclear instrumentation, nucleonics, ceramics, plastics, rubber, aerodynamics, structure, geophysics, electrical systems, and mechanical systems. ~~(CONFIDENTIAL)~~ (u)

2K-12

(Uncl) Air Frame Research and Development Capabilities of the USSR and Satellites. Two projects were initiated during this period to study the state-of-the-art in the field of airframe research and development (aerodynamics and structural mechanics) in the USSR. Information will be compiled on the organizational structure, facilities, personalities, and basic trends. The bulk of the material to be presented in these studies will be derived from information contained in NIS contributions from this Center and from Project White Stork. ~~(CONFIDENTIAL)~~ (u)

✓ (Uncl) Blue Book (Unidentified Flying Objects):

The purpose of this project is to collect, evaluate, and disseminate information concerning unidentified flying objects

<sup>85.</sup> Contract AF 33(600)-28412.



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and aerial phenomena and to determine whether or not they represent a threat to the security of the United States. (~~CONFIDENTIAL~~) (u)

During the six-month reporting period ending 30 June 1955 a total of 177 reports were received and processed in accordance with AFR 200-2. Of these, six (3%) were unknown, and ten (6%) contained insufficient data for evaluation. The cases reviewed produced no new trends or developments. (Uncl)

The cooperative UFO program between the ATIC and the 4602d Air Intelligence Service Squadron (AISC) as established by AFR 200-2, dated 12 August 1954, reached its full effectiveness during this period. A series of conferences between ATIC project Blue Book personnel and personnel of the 4602d AISC produced an evaluation guide and standard operating procedures. This program provides for rapid "on the spot" UFO investigations and as a result, the insufficient data cases have been reduced from 20% in the last period to 6% in this period, and the unknown from 10% to 3%. (Uncl)

Final coordination and completion of the UFO Special Report #14, prepared in cooperation with Battelle Memorial Institute, Columbus, Ohio, under contract, was accomplished as a result of several meetings held during May 1955 between ATIC personnel and the contractor. The study was thoroughly reviewed and appropriate re-editing performed to reduce the classification of the report from Secret to Unclassified. The study is in the process of printing. (~~CONFIDENTIAL~~) (u)

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4D-8

(Uncl) Methods of Analysis (Engineering Data):

In January 1955 the need for an automatic computer facility was officially recognized. A project was originated in order to handle the various problems associated with obtaining the computer and modifying the room for the computer. A computer maintenance technician was assigned in April and trained for a period of several weeks at the J. B. Rea Company plant in California. In May, a mathematician was added to the staff. Prior to the close of the period, basic problems were considered which either are or will soon be in a form suitable for the computer. These problems include:

- (1) Computation of the thrust required, rate of climb and nautical miles per pound for subsonic and supersonic aircraft.
- (2) The over-all performance of surface-to-surface ballistic missiles.
- (3) The determination of true dimensions from photographs of aircraft.
- (4) The establishing of an automatic file of aircraft and aircraft component weights.
- (5) Engine Performance.
- (6) Signal analysis data reduction.
- (7) Attache trip folder files.
- (8) Special intelligence automatic files, etc.

Although the computer had not arrived as the period closed, these problems are typical of those which will be run on the

computer to improve the technical reliability of the ATIC operation. During May and June, AMC's Univac was used to compute aircraft performance for the Soviet Air Show reports. ~~(CONFIDENTIAL)~~ (u)

(Uncl) Analysis of ELINT<sup>86</sup> Material:

Analysis of non-communications signal intercepts has been stepped up in the past six months. A new building occupied on 7 February 1955 with almost 9000 square feet of floor space has permitted the installation of new analysis equipment and improved facilities. Four new analysis booths have been designed along broadcast studio lines with a console unit for matching, switching, amplification, filtering, and sound reproduction. Equipment for these booths includes a cart-mounted oscilloscope with camera, a Sonograph sound spectrum analyzer, a Brush recorder, an Ampex magnetic tape recorder-playback equipment and Pierce wire-recording equipment. The operation of these booths is supported by an expanded shop for maintenance, modification, and testing of equipment. Two sound proof rooms have been equipped with special lighting for use as a projection room for standard film-recorded intercepts and as a machine-data handling room with a Benson-Lehner BOSGAR for reduction of APD-4(XA-1) film. ~~(CONFIDENTIAL)~~ (u)

Haller, Raymond and Brown Inc., under contract to ATIC, has completed study and programming of an IBM card storage system for signal intercept data. This program has been inaugurated in

86. ELINT - Electronic Intelligence.

Air Force ELINT agencies and necessary equipment has been ordered for ATIC participation. Plans were made for the exchange of summary cards with SAC groups concerned and that program is in operation. (Uncl)

Data reduction equipment<sup>87</sup> for crystal video receiving devices has been in the process of redesign and is scheduled for early delivery. This equipment is expected to speed up analysis of intercept data from special missions. As a further aid to processing special mission data and as a useful tool for analysis of regular missions, a letter initiated QRC action to produce a signal separator for automatic reproduction of audio recorded signals on a dual time-base graph.<sup>88</sup> For dense signals a repetitive pattern of illuminations becomes apparent in such a device and signals from different sources can be sorted out. This technique is currently being used with manually-prepared graphs with considerable success. The automatic device, delivery of which is expected momentarily, should effect a desirable reduction in the time necessary for the work. (~~CONFIDENTIAL~~) (u)

In line with a long recognized need for a signal characteristics catalog as an aid to analysis, a project has been initiated and contract negotiations completed for preparation of such a reference file. The actual design and compilation of the file is

87. "Ready" Equipment on Haller, Raymond and Brown Contract-AF 33(600)-15660.

88. QRC - Quick Reaction Capability.



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expected to take approximately two years. The contractor is Electronic Engineering Company in Los Angeles, California. A program for collection of data to be included in the file will be worked out as a joint effort with WADC, SAC, and TAC, with the assistance of other interested agencies such as FCC, USAFSS, CIA, ANEEG, and NSA. (Uncl)

40-2 (Uncl) Technical Assistance for ELINT Operations:

An ERB-29 aircraft, for special exploratory missions has been equipped by WADC and manned by SAC personnel. Instrumentation of the aircraft was monitored by ATIC. Preliminary tests of the aircraft were completed and upon conclusion of final tests now in progress at WADC the aircraft is expected to be on operational status. ~~(S)~~ (U)

On the basis of progress made on the ERB-29, a request has been submitted for eight aircraft. Planning for instrumentation of these laboratory-type ferrets is in progress and is expected to be completed within the next two months. ~~(S)~~ (U)

40-3 Among the activities directed toward providing better equipment for signal intercepts is a contract for development of a video recording device on a flying spot scanner principle. This contract has resulted in development of a ground type recorder-reproducer, which is almost perfected and ready for service. An extension of this work to the development of an associated airborne recorder has been planned and necessary papers are ready for the 1 July

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release of fiscal 1956 funds to initiate procurement action. (Uncl)

Data from special ERB-29 flight test missions have been supplied to the Princeton Analytical Research Group for evaluation of accuracy of ferret direction finding operations. Anomalies discovered in the study of the test data have delayed completion of the work but it should yield useful data on parameters and limitations of equipment. (Uncl)

A short term program to survey the analysis methods used by ATIC and to evaluate the overall USAF techniques of signal analysis has been arranged. It is proposed that this survey be handled by the Glenn L. Martin Company. Since that company is doing extensive development work for WADC and others on signal intercept equipment, it is felt that such a contractual arrangement will serve the dual purpose of accomplishing the survey and familiarizing Glenn L. Martin personnel with the problems of analyzing intercept data. (~~CONFIDENTIAL~~) (u)

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