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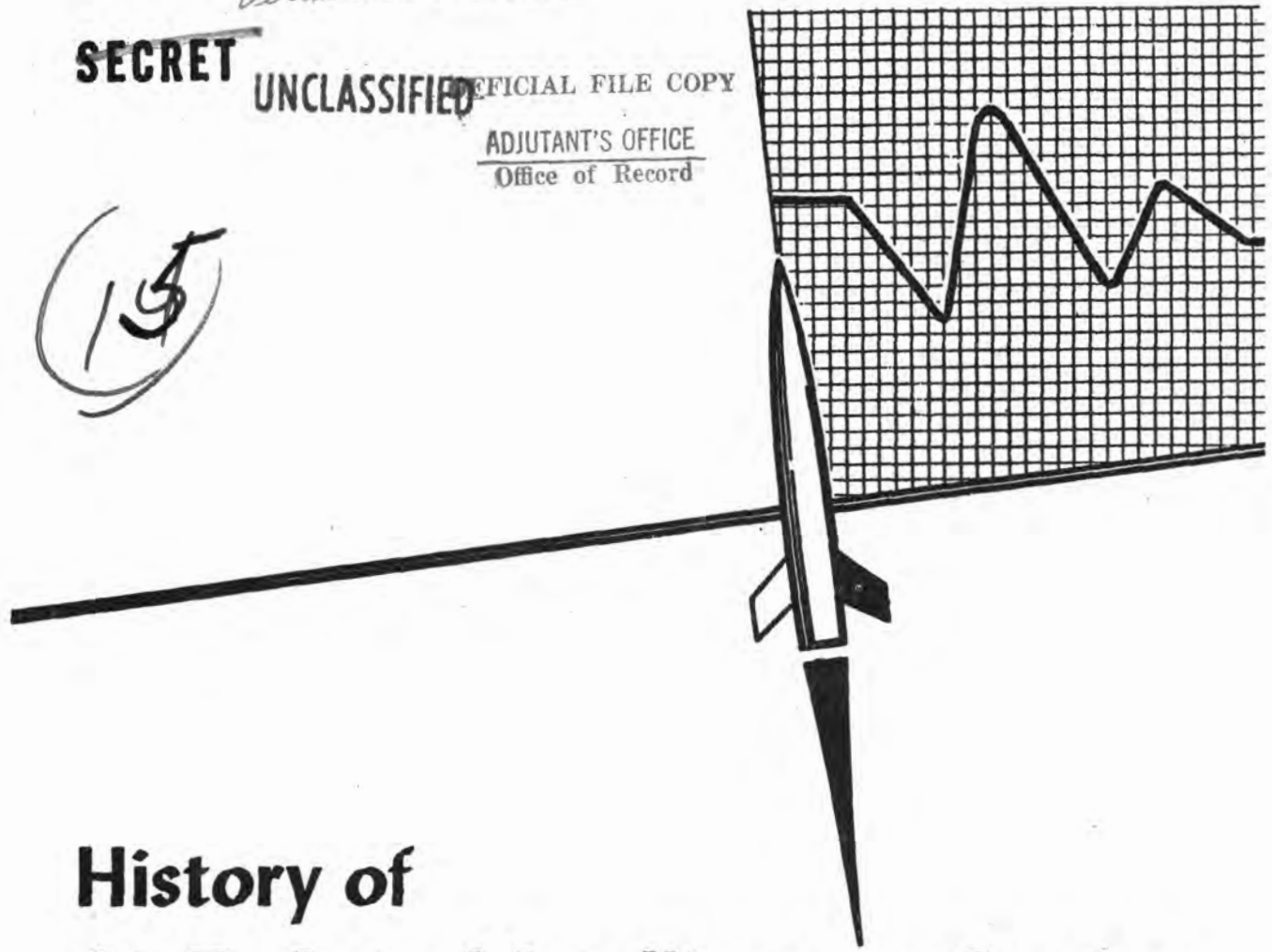
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History of Air Technical Intelligence Center

(AFCIN-4)

WRIGHT-PATTERSON AIR FORCE BASE, OHIO

RCS : AU - D5

1 JANUARY 1958 - 30 JUNE 1958

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Commander
Air Technical Intelligence Center
Wright-Patterson Air Force Base, Ohio

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Project Blue
Book - p 49

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HISTORY OF
AIR TECHNICAL INTELLIGENCE CENTER
(AFCIN-4)
Wright-Patterson Air Force Base
Ohio

1 January 1958 - June 1958

Prepared By
Air Intelligence Office
AIR TECHNICAL INTELLIGENCE CENTER
31 July 1958

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FOREWORD

TO THE HISTORY OF
THE AIR TECHNICAL INTELLIGENCE CENTER
(AFCIN-4)

For the Period

1 January 1958 - 30 June 1958

This edition of the History reflects new program direction by the Air Technical Intelligence Center with emphasis on Soviet sciences and technologies related to space flight. These programs cover all sciences affecting weapon-system capabilities, and include special fuels, advanced propulsion systems, electronics, and other associated technologies.

Programmed activities of the Center are presented in separate chapters. Footnotes, if any, are listed at the end of each chapter.

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SECTION I

ATIC ORGANIZATION AND MANAGEMENT

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CHAPTER I

COMMAND ACTIVITIES

SIGNIFICANT VISITS:

Noteworthy visitors to the Air Technical Intelligence Center during the first half of 1958 included the Chief of Staff of the Japanese Air Force and his deputy to confer with General Watson and members of his staff. (CONFIDENTIAL)

Representatives of the National Security Agency, including the Deputy Director of this agency, visited ATIC in February to discuss staff relationships between NSA and ATIC. (CONFIDENTIAL) (✓)

The Director of Intelligence for the RCAF, the US Air Attache to Canada and a party of five officers visited the Center in March to discuss estimates of Soviet capabilities. (CONFIDENTIAL) (✓)

Air Force visitors included the ARDC Long-Range Planning Committee on Intelligence, and a USAF inspection team for survey of Research and Development in Support of USAF Intelligence and Reconnaissance Functions. (UNCLASSIFIED)

BRIEFINGS:

On 2 April, Colonel Eriksen delivered a briefing to the students and faculty of the Air War College on Soviet research and development and weapon systems of the future, and war gaming the future. On 27 June, Colonel Eriksen addressed the National Academy of Sciences Study Group at Woods Hole, Massachusetts, on the Long-Range Technical Intelligence Estimate. "Soviet Capabilities in Ballistic Missile and Space Vehicle Guidance" was the subject of a briefing at the WADC Symposium in March to about 500 members of industry, the SAB and ranking Air Force personnel.

(CONFIDENTIAL) (✓)

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SAB-SAG RELATIONSHIPS:

The Scientific Advisory Group of the Center proposed a new list of ATIC-SAB counterparts which would coincide as much as possible with the scientific and technical panels of the Scientific Advisory Board. At least one SAG member and one other qualified analyst would comprise the ATIC counterpart of the SAB Panel and serve as the official ATIC-SAB contact. (UNCLASSIFIED)

PROBLEM AREAS:

The SAG took note of a letter from the Strategic Air Command in which ATIC was lauded for its prompt dissemination of air technical intelligence especially by means of preliminary briefs. Although this incident was gratifying in some respects, it emphasized the need for dissemination of intelligence on a timely basis and points out the tremendous loss to the intelligence community resulting from the discontinuance of its foremost dissemination medium, the Air Intelligence Digest, during the austerity program of 1957. (UNCLASSIFIED)

At the same time that ATIC became increasingly aware of the need for timely dissemination of technical intelligence, restrictions placed by CIA on source documents seriously hampered ATIC's ability to perform its basic mission. CIA criticized ATIC for disseminating intelligence derived in whole or in part from CIA documents. In compliance with CIA limitations, the qualitative effectiveness of the ATIC Bulletin was sacrificed and further loss to the intelligence community sustained. At the close of this reporting period, no solution to the problem was in sight. (~~CONFIDENTIAL~~)(U)

The Scientific Consultant Program provided by the close of FY-58 25 scientific consultants and five industrial consultants for ATIC. This did not include the 37 minor dollar-a-year contracts which merely grant ATIC entry into a plant to secure oral discussion on isolated technical problems. Although most proposed

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contracts were negotiated, the program was judged unsatisfactory since none of the major contracts were effective until February 1958 and, being personal services agreements, the contracts all expired 30 June 1958. This generally unsatisfactory experience was beyond the control of ATIC for the most part. ATIC considered including this requirements as part of the Soviet Scientific and Technical Exploitation Program for FY-59, but, because it was just getting started and administrative problems could be expected in initial phases, it was decided a literature-evaluation program would be delayed. For this reason, the Commander determined to continue the consultant program in its present form for the coming fiscal year.

~~(CONFIDENTIAL)~~ (U)

Early in 1958, the Scientific Advisory Group of ATIC discussed the Navy's project currently being propagandized as being able to harass the Soviets by monitoring their communications through the process of bouncing radar signals off the lunar surface. This system is only active and effective for certain periods of time during proper earth-moon spatial orientation. There seems to be sufficient support for the project, and if such widespread, and active support continues, it is feared that serious adverse competition to other electromagnetic intercept methods might result. ~~(SECRET)~~ (U)

ATIC PROGRAM PLANS:

During this report period, the SAG considered plans for three major ATIC programs: long-term collection, astronautics, and infrared photography.

(UNCLASSIFIED)

The SAG emphasized that the results of collection activities must be evaluated continually for quality, substance, importance and significance to air technical intelligence; and that the program must be revised as necessary for collection activities to be of maximum benefit to all concerned. ATIC employed

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several new concepts to increase the quality of raw intelligence information, especially in the scientific research areas of interest to ATIC. (~~SECRET~~)(U)

The SAC made formal recommendations on several proposals for external assistance in the astronautics program, and urged greater cognizance of the space, time, and gravity and anti-gravity areas since it appeared that very little was being done to foster an appreciation for these important factors in astronautics. The group emphasized that the Center's work in the various science and component areas must be made available to external contractors chosen to perform the various studies in order that they may fully utilize ATIC's in-house capabilities and avoid duplication of effort. (~~SECRET~~)(U)

The group reviewed recent developments and future plans for infrared photography. The objectives of this system were to design and produce an infrared photographic system by 1962. This system would incorporate the advantages of ordinary photography with those in infrared to obtain a double sensing intelligence tool. (~~SECRET~~)(U)

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AIR TECHNICAL INTELLIGENCE CENTER

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Harold E. Watson
 HAROLD E. WATSON
 MAJOR GENERAL
 COMMANDER

BLDG 263
AFCIN-4
 COMMANDER
 MAJ GEN WATSON 64100 59209

BLDG 263
AFCIN-4X
 DEPUTY COMMANDER
 COL ERIKSEN 59210 51180

BLDG 263
AFCIN-4X1
 SCIENTIFIC ADVISOR
 MR ARCIER 59206

BLDG 263
AFCIN-4X2
 EXECUTIVE
 COL COOK 59209

BLDG 263
AFCIN-4X2a
 ADMINISTRATIVE SERVICES
 MAJ CONNAIR 59117

BLDG 264
AFCIN-4X2b
 PERSONNEL & MANAGEMENT
 LT COL MCGARITY 58232
 MR SEABOLD 51280

BLDG 264
AFCIN-4X2c
 COMPTROLLER
 COL O'MARA 59231

BLDG 275
AFCIN-4X3
 AIR INTELLIGENCE
 MR WHEEDON 57136

BLDG 263
AFCIN-4X4
 PROGRAM PLANNING
 67332

BLDG 867
AFCIN-4X5
 MATERIAL & FLIGHT SERVICES OFFICE
 LT COL BROWN 55124

BLDG 263
AFCIN-4A
 DEPUTY FOR ACQUISITION
 COL BOYD 73116
 MR KEENEY 64162

BLDG 263
AFCIN-4B
 DEPUTY FOR DOCUMENTATION
 COL WACKWITZ 52233
 MR HONAKER 70230

BLDG 259
AFCIN-4C
 DEPUTY FOR ELINT
 COL PULLING 54119
 MR THOM 53134

BLDG 263
AFCIN-4D
 DEPUTY FOR ENGR SUPPORT
 MR HERMAN 70207

BLDG 263
AFCIN-4E
 DEPUTY FOR SCI COMPONENTS
 COL GILBERT 72111
 MR POST 72111

BLDG 263
AFCIN-4F
 DEPUTY FOR AIR WEAPON SYSTEMS
 COL VILLARS 51262
 66310

AFCIN-4A1
 PLANNING DIVISION
 COL SHADE 51130 67374

AFCIN-4B1
 TECH INFORMATION DIVISION
 MAJ WOODWARD 66320

AFCIN-4C1
 EVALUATION DIVISION
 MR LLOYD 57214

AFCIN-4D1
 ENGR ANALYSIS DIVISION
 MR CONCHA 70277

AFCIN-4E1
 ELECTRONICS DIVISION
 COL HOFFMAN 66324

AFCIN-4F1
 ESTIMATES DIVISION
 57120

AFCIN-4A2
 OPERATIONS DIVISION
 COL LUNDQUIST 54204

AFCIN-4B2
 TRANSLATION DIVISION
 CAPT COLVILLE 66322

AFCIN-4C2
 ANALYSIS DIVISION
 MR LEARISH 67307

AFCIN-4D2
 GRAPHICS DIVISION
 MR PRICE, JR 65324

AFCIN-4E2
 WEAPONS & INDUSTRY DIVISION
 MR MARTIN 51133

AFCIN-4F2
 AIRCRAFT DIVISION
 COL FARRIOR 71246

AFCIN-4B3
 SPECIAL PROJECTS DIVISION
 MAJ HUGHES 70245

AFCIN-4C3
 PROJECTS DIVISION
 MR HAY 64217

AFCIN-4D3
 MACHINE COMPUTATION DIVISION
 MR EISELSTEIN 69260

AFCIN-4E3
 PROPULSION DIVISION
 LT COL RETHMAN 66336

AFCIN-4E4
 AIR SCIENCES DIVISION
 DR WILEY 70167

AFCIN-4F3
 GUIDED MISSILES DIVISION
 COL MANATT 69219

AFCIN-4F4
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 LT COL LONG 57223

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 HQ SQUADRON SECTION
 WPAFB, OHIO
 CAPT SUMMERS 51113

WESTERN OFFICE
 DETACHMENT NR TWO
 PASADENA, CALIFORNIA
 LT COL MITCHELL

ATILO USAF
 WEISBADEN, GERMANY
 COL HUNDT

ATILO PACAF
 HAWAII
 COL PIATNITZA

SMITIG
 DETACHMENT NR ONE
 SAN ANTONIO, TEXAS
 COL MANGUM

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CHAPTER 2

MANAGEMENT AND CONTROL

PLANS AND PROGRAMS:

During the first half of 1958, ATIC made significant improvements in formally documenting projects and tasks for programming total ATIC resources. The result was more effective program planning at all levels, timely completion of program review and more effective presentations to the Bureau of the Budget, BAC and AFCIN. At the same time, this documentation provided a more definitive basis for evaluating technical feasibility and comparison of projects for duplication and propriety under the Center mission. The PPT Index of over 700 programs, projects and tasks was published in January 1958. (~~CONFIDENTIAL~~) (u)

ATIC also devised improved formats for documenting and presenting program data to provide a basis for program analysis of all historical, present and future effort on projects. These include the ATIC "Buying Plan" which was set up and coded for IBM run and "Record of Effort." (UNCLASSIFIED)

To further align all effort with approved objectives, ATIC developed a production schedule which itemized recurring and one-time products planned for FY-59. Formal development of long range intelligence plans provided terms of references for orienting and directing the ATIC program as an integral part of approved long-range intelligence plans.

The Ad Hoc Committee which was established to develop Air Force requirements for Combat Intelligence Reporting during the initial phase of a nuclear war completed its phase of the project and was dissolved.¹ (UNCLASSIFIED)

FINANCIAL AND CONTRACT MANAGEMENT:

ATIC improved the format of the monthly publication, "Financial Management Highlights," to include a number of status-of-funds charts for quick appraisal of

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the Center's financial picture by the Commander and staff. Additional detail was added to Part II for use by project monitors and others at the working level.

(UNCLASSIFIED)

AMC met active contractual requirements of ATIC by 30 June 1958. On that date, ATIC had a total of 223 contracts. Advance copies of all individual consultant purchase requests were in the hands of AMC buyers, and advance copies of all continuing effort PR's were in AMC Procurement channels. (UNCLASSIFIED)

During this report period ATIC established a card file and index system for PPT, PR and Contract Numbers which indicate the three important stages in the life of a task. This system enables ATIC personnel to locate all the data on an item, regardless of the manner in which reference is made to the data or the stage of development to which the item has progressed. The system was set up on all FY 58 and FY 59 purchase requests and all current contracts. (UNCLASSIFIED)

STATISTICAL SERVICES:

ATIC took initial steps to develop statistical functions during this period and established a reports-control system governing both internal and external reports. In addition, ground work was laid to assume several normal statistical functions which had in the past been performed by other than statistical personnel. Accomplishments in this field included the assumption of control over 43 externally required recurring reports of varying frequencies, establishment of control records, preparation of a quarterly publication and establishment of mechanized Classification and Index Files for both military and civilian personnel for purposes of audit or other reporting. (UNCLASSIFIED)

STATISTICAL ANALYSIS:

Special requirements for statistical analyses during this period included compilation of a report on foreign intelligence costs for the President's Board of

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Consultants on foreign intelligence activities and the Bureau of the Budget, computation of additional FY 58 payroll requirements resulting from the Engineers' and Scientists' pay increase, and computation of future civilian payrolls resulting from "Federal Employees' Salary Increase Act of 1958." (UNCLASSIFIED)

ORGIZATIONAL MANAGEMENT:

During the first half of 1958, ATIC experienced no major organizational change. Minor changes in branch structure and nomenclature clarified functional responsibilities, assured better utilization of manpower, eliminated duplication, and provided for shifts in intelligence emphasis and related workloads.

(UNCLASSIFIED)

The Deputy for Air Weapon Systems,² modified the organization of the Guided Missile Division in January by establishment of the Astronautics Branch with space-vehicle development interests, and the elimination of the Facilities Research and the Guidance Control Branches. Functions of these two branches were absorbed by others within the division and by the Deputy for Science and Components. (UNCLASSIFIED)

The Deputy for Science and Components,³ redesignated three branches in the Electronics Division in June: The Radar and Missile Guidance Branch became the Radar Branch; the missile-guidance subject area was transferred to the Navigation Branch which was redesignated the Guidance and Navigation Branch. (UNCLASSIFIED)

In the Office of Administrative Services, the Administrative and Distribution Branch was redesignated Distribution and Services Branch, 1 March 1958. On the same date, the Records Branch was discontinued and the records-management function transferred to the Distribution and Services Branch. In June 1958, records management was again transferred to the Office of the Chief, Administrative Services.⁴

(UNCLASSIFIED)

At the end of this report period, plans for internal reorganization of the

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Deputy for Documentation to assume increased functions were well underway, but had not been finalized. (UNCLASSIFIED)

MANPOWER MANAGEMENT:

Considerable increase in manpower authorizations were received by ATIC during the first half of 1958. In February, an increase of 59 officer and 215 civilian authorizations (195 graded and 20 wage board) was received.⁵ In May, 10 officer and five airman allotments were added.⁶ These spaces were transferred from Headquarters USAF to ATIC, ATILO USAF in support of the ELINT Processing Center effort. In June, eight wage-board allotments were converted to graded.⁷ At the end of the period, manpower authorized and personnel assigned were:

30 June 58

	OFFICER	AIRMAN	CIVILIAN	TOTAL
AUTHORIZED:	266	151	645 (graded 603; wage board 42)	1062
ASSIGNED:	209	152	533 (graded 491; wage board 42)	894

The increase in manpower authorizations led to an ATIC-wide review of manpower needs and utilization resulting in redistribution of spaces and military rank, approved by the Commander 8 April 1958. (UNCLASSIFIED)

MANAGEMENT IMPROVEMENT:

ATIC planned and programmed manning data for machine reporting during this report period. This project had been in the planning stage for over a year. The first mechanized report was published and distributed 23 May 1958.⁸ Work is underway for a similar system for personnel records and reports, both military and civilian. (UNCLASSIFIED)

Photographic responsibilities were redistributed between the Deputies for Acquisition and Engineering Support to eliminate duplication of effort and assure better utilization of photographic capability. Production responsibilities were transferred to the photo-analysis activity under the Deputy for Engineering Support.

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and training responsibilities remained with the Deputy for Acquisition. (UNCLASSIFIED)

ATIC obtained Air Force agreement on the appropriate airman career field for ELINT activities. Stabilization of this AFSC insures a better interchange of airman personnel from one AF organization to another. (UNCLASSIFIED)

The Center completed a survey of its committees and boards, an extension of the Air Force survey required by the Department of Defense. The Commander of ATIC approved the continuance of 13 Boards and Committees, eliminated two and placed one on an Ad Hoc basis. (UNCLASSIFIED)

KEY PERSONNEL CHANGES:

During the period from 1 January through 30 June 1958, the following changes in key personnel took place within the Center:

1. Colonel William E. Boyd assigned as Deputy for Acquisition, effective 15 January 1958, vice Colonel George R. Weinbrenner transferred.⁹
2. Colonel Eugene G. Cook assigned as Executive, effective 19 February 1958, vice Lt Colonel Chester H. Long relieved.¹⁰
3. Major James W. McFarland assigned Acting Chief, Program Planning Office, effective 17 June 1958.¹¹
4. Colonel Arthur W. Cruikshank, Jr. assigned as Deputy for Air Weapon Systems, effective 30 June 1958, vice Colonel William O. Farrior.¹²
5. Lt. Colonel Robert C. Brown retired from the military service on 31 May 1958.

PERSONNEL ADMINISTRATION:

As reflected in the manpower portion of this report, ATIC received an increase in civilian allotments during this six-month period. ATIC revised procedures to accomplish an accelerated in-hiring program with the objective of attaining full authorized strength by 31 December 1958. As of 30 June, no cut in funds for ATIC was anticipated during FY-59. (UNCLASSIFIED)

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The turn-over rate during this period was the lowest of any period in the history of ATIC. It amounted to less than one half of one per cent, as compared with an average of 2.7% throughout government and industry. (UNCLASSIFIED)

A highlight of this period was the first Center-wide Incentive and Awards Day. In June, all military and civilian employees were invited to attend a ceremony during which all civilians who had received recognition awards during the fiscal year 1958 were presented with their awards by Major General Watson. During the same ceremony, all of the 10-, 20-, and 30-year awards which had accumulated during FY-58 were awarded. This type of ceremony will be held in the future on at least a semi-annual basis. (UNCLASSIFIED)

ATIC's summer-time only employment program expanded considerably this year to a total of 21 clerical and technician-type employees. Security problems presently being experienced may preclude the possibility of carrying on this program in the future, although it has proved to be a productive one. (UNCLASSIFIED)

The 10% pay increase of June 1958 meant that all ATIC engineers and scientists on the payroll as of 24 June will retain the salary adjustment given to them in January, and any physical scientists and engineering processing onto the payroll after 24 June 1958 must be brought in at the base of the grade of the position on which they are employed. (UNCLASSIFIED)

During this period, ATIC's Civilian Personnel Office was authorized one training officer by Headquarters USAF. After this position is filled, staffing of the independent Civilian Personnel Office, which was authorized on 1 December 1955, will be complete. This means that the Center's personnel office can function completely independent of any servicing agreements with other commands in the local area. (UNCLASSIFIED)

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AIR INTELLIGENCE SERVICES:

ATIC cancelled plans for possible expansion of the ATIC Bulletin to supplant in part the services terminated by discontinuance of the Air Intelligence Digest when, during this report period, the Digest was re-instated as an authorized AF publication. (UNCLASSIFIED)

ATIC continued intelligence services to the Air Materiel Command which included periodic briefings to the Command and Staff, and special briefings and estimates for AMC components. (UNCLASSIFIED)

MATERIAL AND FLIGHT SERVICES:

During the first half of 1958 the new ATIC building was completed and occupied. Other ATIC offices in three buildings were consolidated, one other building acquired and one released to the Base. (UNCLASSIFIED)

ATIC submitted three construction projects for the 1960 Military Construction Program for a total of 103,700 square feet at a cost of \$3,408,000.00.

The aircraft assigned to ATIC flew 666 hours with 757,082 seat-passenger miles and carried 165,200 pounds of cargo. (UNCLASSIFIED)

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1. AFCIN-X1 C/S, 28 April 1958
 2. 1125th USAF FAG (HEDCOM USAF) GO Nr 3, 4 February 1958
 3. 1125th USAF FAG (HEDCOM USAF) GO Nr 7, 5 June 1958
 4. 1125th USAF FAG (HEDCOM USAF) G) Nr 7, Sec II, 5 June 1958
 5. PAV Nr 58/3/13, 19 February 1958
 6. PAV Nr 58/4/11, 1 May 1958
 7. PAV Nr 59/1/6, 18 June 1958
 8. ATIC Manning Document, 23 May 1958
 9. 1125th USAF FAG (HEDCOM USAF) GO Nr 1, 6 January 1958
 10. 1125th USAF FAG (HEDCOM USAF) GO Nr 4, 19 February 1958
 11. 1125th USAF FAG (HEDCOM USAF) GO Nr 10, par 5, 17 June 1958
 12. 1125th USAF FAG (HEDCOM USAF) GO Nr 11, 30 June 1958

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SECTION II

ATIC ACTIVITIES

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CHAPTER 3

COLLECTION PLANNING

TECHNICAL RESOURCES:

The period from 1 January through 30 June 1958 was characterized by further integration of hardware-development efforts with ARDC and the receipt and evaluation of prototype units produced under contract to meet intelligence collection requirements. ATIC re-evaluated existing hardware programs and projects concerning modulated radar returns and passive electronic supporting devices. Results included a considerable reduction in scope of the project for modulated radar returns and a decision to reaffirm requirements for the passive electronic supporting devices through the ATIC-CRB before levying a hardware development program on RADC. ~~(SECRET)~~(U)

In the seismic and micro sampling areas, ATIC transferred under active contract to RADC the devices for high-altitude sampling of missile-combustion products. ~~(SECRET)~~(U)

In the photographic area, ATIC evaluated both the Rolleiflex and Speed-Graphic long-focal length prototypes with excellent results and initiated follow-on procurement. The Ground Stereo camera prototype was also tested with acceptable results and additional models placed under procurement. Contract action was completed on the portable long-range Oblique Photo System and on the Zenith Camera System and contractors were engaged on the Technical Objectives Identification System upon preliminary approval of design mock-ups. Test-bed aircraft were allocated and a tentative test program outlined. ATIC developed a new approach for the collection of name-plate data by non-photographic means, and initiated procurement action. ~~(SECRET)~~(U)

The Center participated in review and coordination on the Army operational plan for the airborne acoustic surveillance system which has now become operational world-wide.¹ ATIC will receive data collected by the system and support the Army through

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a development program for improved equipment. (~~SECRET~~)(U)

ATIC transferred to RADC the active project in support of the Army missile surveillance program, and integrated the development program with an existing program at Melpar, Inc., with in-puts from AF Cambridge Research Center on meteorological factors. The Center extended the acoustic program for collection and analysis of engine signals during the period and purchased additional readout equipment. ATIC also participated in the Melpar test program for collecting acoustic data on aircraft and engines in test cells, let a contract for a discreet collection system for acoustic signals, and initiated a program to investigate the adaptation of the acoustic-analysis technique to IR tapes. (~~SECRET~~)(U)

The airborne IR missile surveillance system was transferred to WADC for completion of the development program, and a contract was let with General Mills. During the period the prototype of the bolometric IR scanning camera was completed and delivered for further field testing. (~~SECRET~~)(U)

In the electronics area, ATIC let a contract for a portable acquisition system for modulated radar returns, transferred to RADC the project for missile surveillance through use of the star scintillation technique, and let a contract for a prototype unit for field test. Testing was completed on four types of triggers (IR, acoustic, seismic and RF) and the prototypes accepted. (~~SECRET~~)(U)

HUMAN RESOURCES

During this report period, the Center let several foreign contracts for the production of scientific studies on the Soviet state-of-the-art in fields of ATI interest. The exploitation of scientific and technical organizations continued at both international and domestic conferences where a variety of subjects of ATI interest were covered and new contracts established. Delegation exchanges continued in the fields of plastics and rubber, crystallography, geophysical subject, high polymers, fuels and lubricants, chemistry, and student-faculty exchanges initiated.

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ATIC initiated a program for the utilization of tri-service Reserve Officers who have scientific, engineering or technical backgrounds, training, or experience to supplement the ATIC mission through special assignments as directed. (UNCLASSIFIED)

ACQUISITION MANAGEMENT:

ATIC exercised a concentrated effort during the first half of 1958 to improve and maintain an adequate management program proportional to the effort to provide adequate "project control". These reports constituted an attempt to keep all collection-planning personnel up to date on the progress of the different projects. A preliminary Catalog of Intelligence Equipment was prepared for distribution to ATILO's and Air Attache offices; this was the first attempt to describe for field personnel the devices that are currently available for field collection of air technical intelligence. (UNCLASSIFIED)

Collection planners of ATIC assumed a validation responsibility in order to take a hard look at any and all new requirements or projects processed. Efforts in this field were made in connection with electronic-collection aids, micro-metal sampling devices, name-plate collection, photographic equipment, a suggested collection device for obtaining "on-the-spot" metal spectrographs, and in the human-resource area. (~~SECRET~~)(U)

In January, ATIC initiated a scientific Russian language training program upon request of the Commander, WADC, for an ATIC employee to conduct the class. Twenty-five WADC scientists, representing the more critical areas of science and technology, have now achieved a reading ability and comprehension of the language sufficient to enable them to read and understand Soviet scientific literature in their respective fields. One of these scientists has published a translation entitled "Russian Meeting on Nuclear Spectroscopy". Others of the group engaged in similar work. ATIC has not yet determined the future course of this program. (UNCLASSIFIED)

CHAPTER 4

COLLECTION OPERATIONS

REQUIREMENTS:

On 1 January 1958, ATIC had 271 active specific requests for information (SRI's). During the period of six months, 136 were initiated and 164 cancelled, leaving 243 active in June 1958. The number of new SRI's initiated by ATIC elements indicated major areas of interest in Soviet weapons and industry, electronics, propulsion, and guided missiles. ATIC received several significant items of Soviet Bloc hardware. ~~(SECRET)~~(C)

EXPLOITATION:

ATIC initiated 30 SRI's to overseas collection offices and placed 35 SRI's on domestic sources during this period. Nineteen of these were of principal interest to the weapons and industry activity of ATIC. ~~(CONFIDENTIAL)~~(C)

Eighteen new sources were made available to ATIC under the RFG program during the six-month period, and during the last four months ATIC furnished five contractor specialists to participate as technical interrogators. ~~(CONFIDENTIAL)~~(C)

EVALUATION:

ATIC processed 242 evaluations of Air Force reports and 62 of CIA reports during this report period. An indication of the value of the 304 reports received by ATIC and covered by these evaluations was compiled. Approximately one-third provided information of slight value, another third valuable or confirmatory information. Principal interest was in the area of Soviet weapons and industry. ~~(CONFIDENTIAL)~~(C)

GUIDANCE:

The Center completed the guidance manual on research facilities which culminated a program and schedule initiated in 1951 which called for the preparation of eleven manuals on the principal engineering fields of ATI interest. (UNCLASSIFIED)

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Action was taken to generate general ATI requirements on the subject of Astronautics to be issued as a new chapter in the Basic Air Intelligence Requirements (BAIR). In support of these requirements, ATIC prepared a guidance letter (ICGL) which pointed out the trend of development on secondary power for space vehicles.
(UNCLASSIFIED)

ATIC satisfied a field request for a brief on Astronomy and Geophysics which gave emphasis to the military implications of research in these fields, particularly to those phases which have a direct and probable relation to air operations. ~~(CONFIDENTIAL)~~ (U)

Other activities included a collection-guidance letter delineating standing information requirements pertinent to the new series of Soviet transport aircraft, two new trip briefs, and additional copies of existing Observation Guides. ~~(CONFIDENTIAL)~~ (U)

TRAINING SERVICES:

During the first half of 1958, 33 Air Attache officers, 10 Air Attache airmen, five ATILO officers and two ATILO airmen received training under ATIC's various photo training programs. (UNCLASSIFIED)

FIELD OPERATIONS:

ATIC placed greater emphasis on active participation in collection programs and made further efforts to establish secure, independent communications channels responsive to its needs for quick reaction. ~~(SECRET)~~ (U)

Further exploitation was achieved by extensive use of members of the US scientific and commercial enterprises whose areas of research coincided with technical interests of ATIC. Individual missions in selected fields are currently operating. A training mission within this concept yielded some nuclear intelligence information and brought about contacts for future exploitation. ~~(SECRET)~~ (U)

Further steps were taken to procure foreign technical equipment more economically,

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securely and with greater operational control through commercial export-import facilities. ~~(SECRET)~~(U)

ATIC evaluation of materials and equipment for better support of field collectors continued. Significant studies covered materials and equipment for infrared photographic application and low light-level techniques. ~~(SECRET)~~(U)

Other efforts included participation in exploitation of three special targets of opportunity acquisition, and monitoring the equipment required and receipt of data from a program designed to acquire air intelligence via gadgetry. ~~(SECRET)~~(U)

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CHAPTER 5

DOCUMENTATION

ATIC-PWS DOCUMENTATION SYSTEM:

Under the unified ATIC-PWS documentation system, ATIC routed 100% of the total take of raw intelligence information to Project White Stork for processing during this report period.¹ ATIC initiated a relatively new mechanized documentation system, presently under pilot operation, which improved the receipting process and the location of classified documents. (~~CONFIDENTIAL~~)(v)

In February, PWS began publishing "TIPS Press" which represented coverage of many newspaper, journals, periodicals, and other documents in the open literature field. This publication is a package of selected items of interest to technical intelligence personnel. A ten-fold increase in distribution of the TIPS sheets was required to meet the demand by the end of June. (UNCLASSIFIED)

Another PWS service which proved of considerable interest to ATIC was the provision of articles covering a variety of subjects from basic science to astronautics. Operation 480 was the designator assigned to a sensitive operation handled by PWS in which uncleared linguistic engineers were utilized to scan selected inputs of foreign scientific and technical literature to identify items of interest. Identified items of greatest importance are processed as "OP-480's" and the remainder are included in the "TIPS Press." PWS provides copies of OP-480 articles for coordination with individual engineers within the Center. These engineers may obtain translations of original articles in their specific fields of interest upon request.

(~~CONFIDENTIAL~~)(v)

SCIENTIFIC AND TECHNICAL EXPLOITATION PROGRAM (STEP):

The United States Foreign Information Center (USFIC)² as a program title was changed to the Scientific and Technical Exploitation Program (STEP) in January 1958. Production of abstracts reached a total of 7,756 by 30 June 1958. These abstracts

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were processed from 88 journals and 575 monographs. ATIC initiated contract negotiations for two contracts: (1) a contract to facilitate the program by screening, evaluating, publishing and disseminating STEP material in its first phase, SOV-STEP (Soviet open literature), and (2) a contract in two levels, pilot operation and systems planning. (~~CONFIDENTIAL~~)(u)

AUTOMATIC TRANSLATION DEVICE:

ATIC continued to follow the RADC project for development of an automatic translation device which is expected to be totally operational by mid-1961.³

(UNCLASSIFIED)

AIR TECHNICAL INTELLIGENCE LIBRARY:

Library services for ATIC were provided during the first half of 1958 in accordance with plans.⁴ (UNCLASSIFIED)

TRANSLATION DISSEMINATION:

ATIC endeavors to avoid, insofar as possible, any connection between ATIC and a given translation in order that specific-interest patterns are not necessarily publicized. The Center implemented procedures during this period to broaden dissemination of unclassified translations to organizations and individuals within the industrial and scientific community and to avoid identifying ATIC as the originator. (~~CONFIDENTIAL~~)(u)

During this historical period, ATIC released the Russian-English Glossary of Aeronautical and Miscellaneous Technical Terms to the Department of Commerce for public sale in the national interest. At the time this glossary was published in November 1956, it was disseminated to ATIC and other government-agency contractors. ATIC will continue to provide inputs of aeronautical and miscellaneous technical terms of this Glossary and to publish periodic supplements or revisions.

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1. ATIC History, 1 July 1957 - 31 December 1957, page 20
2. ATIC History, 1 July 1957 - 31 December 1957, page 21
3. ATIC History, 1 July 1957 - 31 December 1957, page 21
4. ATIC History, 1 July 1957 - 31 December 1957, page 21

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CHAPTER 6

ELECTRONIC INTELLIGENCE
(ELINT)

GENERAL:

ATIC provided a representative to the meeting of the Technical ELINT Panel on 25 June. This panel serves as a technical advisory body to the ELINT Coordinating Group for the exchange of technical and scientific information resulting from research and development or from ELINT activities and for recommendations on practical approaches and solutions to these problems. The three services and CIA provide panel membership. ~~(CONFIDENTIAL)~~(u)

ELINT EVALUATION:

Many ELINT requirements, both for data and for the ELINT systems necessary to obtain particular types of data, are based on special requests for information (SRI's). ATIC devoted considerable effort during this period to facilitate control of actions necessary to satisfy these requirements and to install a system of management which insured timely action on each SRI and provision of information on current status. (UNCLASSIFIED)

ATIC participated in the evaluation of proposals for development of an advanced ferret system scheduled to be operational in 1962, evaluated several special collection devices and prepared requirements for these systems; and continued to monitor the results of the HADC contract to develop the ground passive electronic-reconnaissance facility for future employment by the USAFSS, and took action to resolve funding and space problems. ~~(CONFIDENTIAL)~~(u)

A new approach to the formulation of requirements for the new reconnaissance aircraft (nicknamed Spring Chicken) is expected to have considerable influence on future activity in the ELINT systems requirements area. These requirements were formally stated as a Qualitative Operational Requirement in accordance with AFR 57-3. ~~(CONFIDENTIAL)~~(u)

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ATIC completed the Catalog of USAF ELINT Systems and distributed it to persons concerned with the collection and analysis of data produced by the systems and with requirements and specifications for new or modified systems or the regrouping of component equipment for special purposes. ~~(CONFIDENTIAL)~~(U)

The Center performed an engineering evaluation on five operational or near-operational airborne ELINT collection systems. The approach included a computer technique for representing both the electromagnetic-environment and ferret-system logic, so that an approximation of the results of flying a ferret system against the environment can be obtained by machine computation. ~~(CONFIDENTIAL)~~(U)

The contractor completed examination of the relationships between accuracies of measurement of ELINT parameters and the utility of the resulting information. Contractual activity continued in studies of data-processing methods which included methods of: (1) sorting and processing ELINT data for technical intelligence purposes, (2) determining the characteristics of the modified ELINT data-processing system which was originally designed to process data from the RB-58 to evaluate its applicability to AF needs, (3) identifying an emitter and obtaining its characteristics through the use of ELINT data, and (4) indicating possible changes in the characteristics either of an emitter or of the ELINT collection-processing system which produced the data. ~~(CONFIDENTIAL)~~(U)

ANALYSIS TECHNIQUES:

During the past year, ATIC evaluated four spectrum-analysis equipments. Of these four devices, the Rayspan Analyzer proved the most promising for ELINT applications. (UNCLASSIFIED)

ATIC awarded a contract for the fabrication of an airborne video tape recorder and a video tape recorder-reproducer for ground use. The ground unit will be designed for a laboratory type of environment and will be used for playback of tapes recorder.

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The hardware resulting from this procurement may become AF standard equipment for video recording applications. (UNCLASSIFIED)

Another contract was for the preparation of an "ELINT Processors Manual" to include details of reduction and analysis equipment, techniques recommended for processing ELINT data, general philosophy of ELINT, collection techniques and intercept-system descriptions. (UNCLASSIFIED)

At the request of SAC, ATIC initiated a feasibility study to investigate a small air-transportable ELINT analysis laboratory. The plan calls for the planning and equipping of two such laboratories which can accompany a ferret aircraft to a mission staging point and be used for on-side processing of data collected by the aircraft. Units will include magnetic tape playback and duplication, photoreadout, plotting and storage facilities for mission analysis. (~~SECRET~~)(U)

INTERCEPT TECHNIQUES:

ATIC awarded a contract to Polarad Electronics Corporation for procurement of seven miniature modular systems, and completed plans for increasing the sensitivity, the quality and the quantity of extracted information over that originally specified in the contract. (UNCLASSIFIED)

ATIC extended work which involved the overseas deployment of contractor personnel, for installation and operation of equipment to provide special interception and recording of telemetry signals. This extension of contractual services took advantage of the contractor's extensive familiarity with data reduction and analysis, previous field experience in overseas site type of operations and thorough knowledge of photographic and wide-band magnetic-tape recording techniques. (~~SECRET~~)(U)

The Center revised the experimental site plans to provide for a mobile concept rather than a fixed, testing laboratory. The objective of the mobile ELINT intercept facility is to design and develop a non-standard, laboratory type of intercept facility in which new air and ground equipment can be tested, and techniques developed, and which can be deployed for actual intercept operations to meet detailed, specific,

technical intelligence requirements. To meet the requirement for training of technical personnel in intercept operations, ATIC requisitioned three semi-trailers, Type H-1, mobile radio squadron. One of these units is for deployment to USAF, one unit for use at other locations, and the other for evaluation and testing of techniques and equipments at Wright-Patterson Air Force Base. ~~(SECRET)~~(U)

ATIC participated in the concerted effort to establish a USAF standard inventory Time System applicable to both ELINT and COMINT requirements. ATIC, WADC, and RADC representatives cooperated in resolving the various parameters and drafting specifications preliminary to the programming for January 1960 of electronic timing sets to replace the QRC-37F's currently in use. ~~(SECRET)~~(U)

ELINT ANALYSIS:

The sharp increase in reporting from the field of unique and significant signal data made possible an analysis effort concentrated on new types of signals. The team approach for processing signal intercepts permitted analysts to specialize in a comparatively small number of signal types. ATIC established a third analysis team for ground-based electronics and navigational aids. ~~(SECRET)~~(U)

The name of the ATIC Signal Review was changed to ATIC ELINT Reporter on 30 April 1958. A new feature, a listing of "Signals Needing Further Attention," was added. It provides an informal guide to help processing organizations fulfill existing ELINT requirements. ~~(CONFIDENTIAL)~~(U)

The ELINT sites began intercepting Soviet telemetry signals in Alaska and a new family of signals associated with Soviet ballistic missiles became apparent. (SECRET)

SPUTNIK III provided as many intercept data during the first 15 days of its orbiting as are normally acquired over a six-month period from missile firings at the Kapustin Yar Missile Test Range. ~~(SECRET)~~(U)

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The volume of tail fire-control signals associated with the Soviet TU-16 aircraft increased and several were analyzed. Sufficient data are not yet available to establish firmly the scan pattern of this radar, but when more sophisticated data are received they are expected to aid in resolving unsolved problems on these signals. ~~(SECRET)~~ (U)

ATIC completed the preliminary study of signals of the MUSHROOM type. This study established areas requiring further detailed study and identified deficiencies in available data. ~~(SECRET)~~ (U)

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CHAPTER 7

ENGINEERING SUPPORT

ENGINEERING ANALYSIS:

During the first half of 1958, computations were made for several missile configurations and variations, for trajectories on surface-to-air missiles; and for flight paths of long-range missiles fired to shorter ranges, including determination of their vulnerability to intercept along a radio line-of-sight from specific stations on the earth. Calculations were made on miss coefficient of various range missiles for both optimum and now optimum trajectories. (UNCLASSIFIED)

The Center developed methods for predicting missile weights and a procedure based on a force and stress analysis during acceleration, and estimated weights of CRAB SPIDER and TRAPCOR SPIDER. The estimation method combined results of actual practice as well as theoretical analysis. Other analyses covered incidents 70 through 83 on the FPS/17, as well as several satellite passages. A complete set of Cinerama-type alpha charts was developed for a new launcher location. ATIC completed the problem of making an engineering estimate of the requirements to place the first Soviet satellite in orbit and presented results in February 1958. (~~SECRET~~) (✓)

ATIC expanded existing missions and incorporated new missions in their aircraft-performance presentation to show which would generalize the performance characteristics of the aircraft, and initiated work on this requirement for six Soviet bombers and transports. This work included concentrated effort to improve and refine present aircraft-weight estimation methods for bomber, fighter, and transport aircraft as follows:

1. Correlation of structural component weights with dimensional data of known aircraft through use of the Readix digital computer.
2. Expansion of data-collection coverage on known aircraft.

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3. Revision and recoding of the parametric study for the electro-data computer. Results included improved tail-weight estimation methods, and confirmation and refinement of other current procedures. (~~SECRET~~) (U)

ARLC activities completed the formal flight-test program of the Polish-built Soviet helicopter (H-38) in May, and APGC personnel completed tests of the anti-icing system in June. Formal reports to ATIC were not available as of the close of this reporting period. (~~CONFIDENTIAL~~) (U)

COMPUTERS:

During this period, the Center acquired an automatic compiler to reduce the time required to program problems for the computer. This compiler assists the mathematician by using the computer logic to formulate routines which are described in terms of equations rather than in the machine language. Problems originally requiring three weeks to lay out can now be compiled in three days. (UNCLASSIFIED)

Another piece of equipment installed by ATIC was an automatic plotter which can handle plots up to 40" x 40" in size, and identify with special symbols up to 12 different curves on one plot. (UNCLASSIFIED)

All problems originally established on the READIX were transferred to DATATRON during this period. The Center completed a pilot plant operation on a control system for documents which involves transferring information to punch cards to control inventory and destruction of certain incoming reports. (UNCLASSIFIED)

PHOTO ANALYSIS:

During the first six months of 1958, ATIC accomplished detailed interpretation of foreign electronic equipment and completed dimensional drawings of such items as FISHNET, TOKEN, ROCKCAKE, TRESPASS and LONGEYE. The Center also completed dimensional analyses of Sputnik II and initiated interpretation of Sputnik III. (~~CONFIDENTIAL~~) (U)

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GRAPHICS:

A full in-house capability became essential upon assignment of responsibility for direct support of the photo-analysis effort to the photographic laboratory. Accordingly, ATIC ordered 52 major line items of equipment to meet this new requirement. (UNCLASSIFIED)

TECHNICAL ILLUSTRATION:

ATIC implemented an inspection drawing program, a program for making accurately scaled drawings from actual equipment, and acquired new equipment for additional service to the Center which included silk-screening equipment. (UNCLASSIFIED)

REPRODUCTION:

ATIC initiated a new color-coded work-order system which helped to expedite the processing of orders from the various components, and negotiated a new contract which will aid in the processing and dissemination of translations and other documents. The contract provided for microfilming service, reproducible hard copy, and minor maintenance of RECORDAK equipment. (UNCLASSIFIED)

ATIC's production increase in typing and make-up was 75% during this period. An average of all phases of reproduction indicated approximately 50% increase over the previous six months. Eight new pieces of reproduction equipment were installed, and cross-training of employees to help increase production was continued as part of the training program. (UNCLASSIFIED)

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CHAPTER 8

PROPULSION

ROCKET PROPULSION:

Industry continued to give assistance to ATIC in the rocket-propulsion filed during this period. Aerojet-General Corporation completed analysis of rocket-engine exhaust-pattern photography and continued with a further detailed investigation to determine propellant combinations and rocket engine design-performance data. The Rocketdyne Division of North American Aviation, Inc., made reports to ATIC on the Soviet capability to develop ICBM and satellite rocket Powerplants. ~~(CONFIDENTIAL)~~ (U)

NUCLEAR PROPULSION:

ATIC proceeded with preparing its study of Soviet capabilities in nuclear gas turbine powerplant developments, and finalizing procurement actions to provide contractor assistance in determining Soviet capabilities in nuclear-rocket, nuclear-ramjet, and ionic-rocket propulsion systems. ~~(CONFIDENTIAL)~~ (U)

RAMJET PROPULSION:

Work by Marquardt Aircraft Company which is associated with establishing performance and characteristics of Soviet ramjets for specific missile applications was approximately 85% complete as of 30 June 1958. ATIC extended the present activity to include a review of hypersonic ramjet engine development potential. ~~(CONFIDENTIAL)~~ (U)

TURBOJET PROPULSION:

Preliminary reports on the formulation of methods for synthesizing and matching turbojet off-design component performance uncovered gaps in the procedure and mathematical errors.¹ The contract for similar methods for analyzing turboprop and turbofan powerplants was extended to include a complete analysis of the NK-4 turboprop engine. ~~(CONFIDENTIAL)~~ (U)

Pratt and Whitney Division of United Aircraft Corporation continued its study of Soviet capability to develop a high-speed turbojet engine.² ATIC obtained the assistance of General Electric Company² through contract for a detailed analysis of

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the Soviet AM-9 turbojet engine and engaged in in-house study to formulate the basic thermodynamic cycle at sea level static conditions and to determine the method of afterburner regulation at altitude conditions. The nature of the intelligence-information available, however, warrants much more extensive exploitation.

~~(CONFIDENTIAL)~~ (u)

RECIPROCATING ENGINES:

ATIC confined activity on reciprocating engines during this period substantially to developing engine performance curves in support of the flight-test program and providing technical assistance for the propulsion and rotor system. ~~(CONFIDENTIAL)~~ (u)

PROPELLERS AND ROTORS:

ATIC developed a method for determining the thrust and efficiency of any propeller during static and low-speed take-off conditions, and spent appreciable effort to support various mission profiles. ~~(CONFIDENTIAL)~~ (u)

FUELS TECHNOLOGY:

The Coordinating Research Council, in conjunction with ATIC, initiated a re-evaluation of the air intelligence petroleum-product program during this report period. The purpose was primarily to identify areas in which major intelligence effort should be placed as well as those areas where continued POL intelligence effort is no longer warranted. ~~(CONFIDENTIAL)~~ (u)

Petroleum-product analyses performed by the Phoenix Chemical Laboratory for ATIC demonstrated that the Soviets are consistently meeting their specification requirements. The production of satisfactory jet fuels from highly sulfurous crudes indicates the Soviet industries capabilities. A study of fundamental and applied combustion in the USSR, conducted under contract by Combustion and Explosives Research, Inc., revealed that, in spite of a resurgence of interest since 1953, Soviet combustion scientists did not show a proper appreciation for the delineation of approaches to combustion problems. However, since 1957 a new Soviet trend parallels that of the

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Western World very closely. (~~CONFIDENTIAL~~)(u)

Dow Chemical Company completed an intensive study of Soviet literature on basic chemical research which concluded that a synthetic lubricants program has been underway in the USSR for the past three years. The Olin Mathieson Chemical Corporation and ATIC completed a study of boron chemistry research in the USSR which revealed that the Soviets have been conducting a broad research program in boron chemistry which provided them with a capability for pilot-plant production as early as 1954.

(~~CONFIDENTIAL~~)(u)

Survey work performed by Pennsalt Chemicals Corporation and ATIC produced no evidence of the use of liquid fluorine as a propellant oxidant by the Soviets. They are capable, however, of producing elemental fluorine in substantial quantities.

(~~CONFIDENTIAL~~)(u)

The study conducted by the Welsback Corporation for ATIC on Soviet ozone research development, and application did not uncover by the end of this report period any reliable information to establish the use of liquid ozone, or oxygen enriched with ozone, in Soviet propulsion systems; but did reveal that the Karpov Institute in Moscow has a group engaged in the study of alkali metal ozonides as well as other peroxidic compounds. (~~CONFIDENTIAL~~)(u)

An ATIC study of Soviet radiation effects on fuels, fluids, and lubricants revealed no significant achievements. Soviet interests revealed in this study were confined to relatively low radiation dosage. (~~CONFIDENTIAL~~)(u)

ATIC undertook an extensive survey of Soviet interest in transconventional energy sources and obtained for this study the services and talents of a team of chemists, physicists, and engineers under the leadership of a recognized authority in the field of advanced energy sources. (~~CONFIDENTIAL~~)(u)

Review by ATIC of Soviet published reports revealed that research was being

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conducted by the Soviets which can be associated with the development of nuclear fuels for air-weapon use. Plans were made for a complete survey. (~~CONFIDENTIAL~~)(U)

A thermal-stability literature survey by ATIC indicated that the Soviets have been and are studying the effect of temperature on their jet fuel. On the basis of the available information, it appeared that Soviet, as well as US, progress for a more thermally stable jet fuel for future high-performance aircraft have not provided a completely satisfactory solution. (~~CONFIDENTIAL~~)(U)

ATIC completed the final report on UK solid and liquid propellant research, development and production for US propellant research and development agencies. The report serves as a tool in supporting US R&D and the sanctioned exchange of information. (~~CONFIDENTIAL~~)(U)

ATIC, in collaboration with Project White Stork, compiled a reference file of available properties on all known Soviet, Satellite, and Austrain crude oils. Nothing similar to this reference file exists within the intelligence community and it is expected to prove an invaluable tool in future detailed analyses of Soviet petroleum products. (~~CONFIDENTIAL~~)(U)

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1. ATIC HISTORY, 1 July - 31 December 1957, page 37
 2. IBID.

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CHAPTER 9

ELECTRONICS

GENERAL:

During the first half of 1958, ATIC brought to the attention of the main intelligence offices in the US, the Pacific, and Europe the necessity for tapping with greater intensity all Sino-Soviet bloc electronics activity; and drew up a plan for penetrating long-neglected geographical areas of the world where electronic technologies of the USSR have been increasing. The plan pinpointed specific locations where foreign electronic exercises should be looked for, and recommended techniques to be used for surveillance. ~~(SECRET)~~(U)

RADAR:

During the past six months, ATIC obtained contractual assistance from Westinghouse to aid in the evaluation of foreign airborne radar systems development. In the ground-radar area, the contractor completed about 30% of the project. In the general radar area, ATIC compiled non-communication types of signal characteristics for the revision of Handbook TR-EL-20-2. Radar echo area measurements were made on several foreign aircraft and missiles under WADC Contract, and one report was completed.

~~(CONFIDENTIAL)~~(U)

The in-house analysis of latest known equipment characteristics and the estimated characteristics of future ground and airborne radars was completed for inclusion in the study, "Estimates of the Present and Future Soviet-Bloc Electronics Equipment Capability." ~~(CONFIDENTIAL)~~(U)

ELECTRONIC GUIDANCE AND NAVIGATION:

As of 30 June 1958, ATIC had received only preliminary reports from contractual programs in this area and issued two reports. These constituted an evaluation of the ARK-5 radio compass, and an analysis of the Yo Yo radar. (UNCLASSIFIED)

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COMMUNICATIONS:

The RCA study to determine communication system capability and equipment specifications in support of air offensive and defensive operations resulted in a comprehensive analysis of present Soviet air communications and an estimate of future trends in the Soviet communications field. RCA will continue to examine Soviet communications further. (~~SECRET~~)(u)

Stanford Research Institute made an assessment of Soviet capability in the field of scatter propagation as applied to air-weapons development. This study indicated new evidence of increasing interest in the field of forward scatter communication and in the use of backscatter techniques. It implied that a close surveillance of new information should be continued, since evidence pointed toward Soviet applications of scatter techniques in the near future. (~~SECRET~~)(u)

Studies by Radiation, Incorporated, of Soviet capabilities in the field of telemetry revealed some interesting Soviet system-design trends. One of these trends is the apparent attempt to standardize on amplitude as a carrier with pulse-position modulation for information channels. Of considerable interest to this program are the Soviet satellites and their associated telemetry. (~~SECRET~~)(u)

ASTRONAUTICAL ELECTRONICS:

Astronautical electronics has required an ever increasing amount of effort since October 1957. ATIC effort has thus far been principally in the education of engineers, re-alignment of project plans, and production of contributions to TIS-GM-58-3, "Soviet Astronautics." (~~SECRET~~)(u)

ELECTRICAL COUNTERMEASURES:

The greatest amount of ATIC's electronic effort is still that associated with countermeasures. ATIC completed a study of Soviet electronic-countermeasures capabilities which was based on last year's contractor report. This study contained at least 50% in-house effort, because of administrative difficulties in transmitting

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certain types of intelligence information to the contractor and the up-surge in quantity of new information after contract cut-off date. (~~SECRET~~)(U)

INFRARED:

ATIC released a study of Soviet bloc capabilities in the application of infrared to aerial warfare in response to numerous requests, and initiated a contract with Aerojet-General Corporation for a more thorough study. The firm took a very positive and aggressive approach to the problem of IR application in the aircraft and missile fields, despite a paucity of intelligence information. (~~CONFIDENTIAL~~)(U)

ELECTRONIC COMPONENTS:

In the components field, ATIC developed studies of Soviet microwave tubes and digital computers, and prepared a manuscript of a study of passive components. (UNCLASSIFIED)

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CHAPTER 10

ARMAMENT

AIRCRAFT ARMAMENT AND FIRE-CONTROL SYSTEMS:

During this reporting period, ATIC concluded contracted studies for analysis and evaluation of Soviet bombers' defensive armament systems, and for characteristics and performance of seven current Soviet fighter armament systems. In-house effort produced diagrams of vulnerable areas, and vulnerability information of Soviet fighter and bomber aircraft. (~~CONFIDENTIAL~~)(u)

The contract with Haller, Raymond and Brown, Inc., neared completion.¹

VULNERABILITY:

ATIC extended contractual coverage of the vulnerability analysis of foreign aircraft by the Ballistics Analysis Laboratory of Johns Hopkins University, and released two studies of the vulnerability of the BISON and BEAR to US air-to-air weapons.² (UNCLASSIFIED)

AIR ORDNANCE AND WARHEADS:

During this period ATIC gave special attention to Soviet basic sciences for indications of interest in potential state-of-the-art advances which contributed to the production of unique destruction devices in the future era of satellites and other space vehicles. Analysis efforts in this field were preliminary in nature.

(~~CONFIDENTIAL~~)(u)

The Center contracted for warhead study designs on Soviet air-to-air and surface-to-air missiles, and air-to-air unguided rockets. Armour Research Foundation of Chicago conducted a Soviet aircraft gun evaluation for ATIC, and the Ballistics Research Laboratory completed spark-range ballistic tests to determine stability factors for the Soviet 23-mm and 37-mm projectiles. (~~CONFIDENTIAL~~)(u)

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Production of a technical movie for visual identification of Soviet aircraft gun fire established a requirement for a supplemental movie to include all air vehicle types which have similar appearance to aircrews. A shortage in the supply of Soviet 37-mm aircraft ammunition for various tests imposed another requirement upon ATIC to program the rebuilding of anti-aircraft ammunition for the aircraft gun.

~~(CONFIDENTIAL)~~ (U)

DEFENSIVE ANALYZERS:

ATIC completed the development of a mechanized means to analyze the effectiveness of an enemy's anti-aircraft and surface-to-air defense network. An associated plan was then undertaken for the development of an anti-missile defense analyzer which could readily evaluate the over-all effect of changing intelligence inputs by use of an electronic computer. ~~(CONFIDENTIAL)~~ (U)

SPECIAL WEAPONS:

ATIC let a contract for a study of non-nuclear components of special weapons. The objective of the study was to develop an estimate of nuclear weapons compatible with Soviet aircraft and missiles. Other principal activities in the area of nuclear weapons included participation in conferences on high-altitude effects and on warhead analysis compatible to missiles photographed during the November 1957 Moscow parade. (UNCLASSIFIED)

ATIC made a survey of intelligence of Soviet and satellite biological and chemical warfare for Hq AREC covering significant intelligence information for the past two years, and activated a study of Soviet biological and chemical weapons as well as of the Soviet aircraft and missile weapon systems delivering several individual biological and chemical agents. (UNCLASSIFIED)

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AAA CAPABILITIES:

ATIC contracted for a study of the characteristics, performance and engagement capabilities of the Soviet towed and self-propelled versions of the 57-mm AAA weapon and its various alternative fire-control directors and radars, on carriage sights and other auxiliaries. (~~CONFIDENTIAL~~)(u)

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1. ATIC HISTORY, 1 July - 31 December 1957, page 43
 2. ATIC HISTORY, 1 July - 31 December 1957, page 44

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CHAPTER 11

EQUIPMENT

AIR WEAPONS EQUIPMENT

During the first half of 1958, the rapid pace of events continued to impact heavily upon the Equipment area. Secondary electric power, formerly of relative unimportance, appeared as the limiting factor to the effectiveness of the most advanced air weapons--the space vehicles. Aeromedical equipment burst forth from the trifles of the parachute and the oxygen mask to include the principal obstacles to man's realization of the ultimate in his imagination; his own conquest of space. The earth-monitoring satellite replaced the aerial camera in future planning. The grounding of the guided missile by long and uncertain count-downs lent urgency to the development of reliability predictions, and finally, the Soviet capability to have developed inertial guidance systems for missiles necessitated a determination of the extent to which they have been selected for operational use. ~~(SECRET)~~(U)

GUIDANCE AND NAVIGATION

Work on Soviet non-radiating guidance and navigation continued to confirm the theoretical competence of the Soviets in non-linear systems. It also became increasingly evident that the Soviets were expending considerable effort in the study of sampled data systems and in self-adjusting systems. By these methods more accurate guidance systems are achievable without corresponding increases in the accuracies of components of the systems. ~~(SECRET)~~(U)

The Soviet capability for presently having developed an all-inertial guidance system for ballistic missiles has been amply demonstrated, and it is extremely probable that such systems have been developed. ATIC therefore accepted as a

first priority objective to establish the degree to which these systems have been placed in operational use. For this reason and others, a highly qualified engineer from the Minneapolis-Honeywell Regulator Company, who is rendering external assistance in this area, was selected and sent to Europe to assist in interrogating German guidance experts who have returned from the Soviet Union, where they were occupied for many years with the development of guidance equipment. (~~SECRET~~)(u)

AIR WEAPONS RELIABILITY

During the first half of 1958, two principal events marked ATIC progress toward evaluation of Soviet air weapons reliability--that factor by which all other performance parameters must be multiplied in order to evaluate operational effectiveness. The first was the completion for coordination of an intelligence study on Soviet Arctic air technical capabilities. The second was the completion of the development of a method for applying technical information toward determining air weapons serviceability and the initiation of procurement to secure the required external assistance to test the method on a particular Soviet aircraft. Heretofore, technical information has been used only in a qualitative manner in estimating weapons' serviceability and reliability, and the need has long been recognized to develop quantitative relationships between the technical information that becomes available from intelligence operations and the estimates of weapon system serviceability and reliability that must be made prior to effective operational planning. (~~SECRET~~)(u)

AEROMEDICAL EQUIPMENT

In response to the rapid growth of intelligence requirements in the Aero-medical Equipment Area, ATIC accomplished extensive planning to increase the appropriate capabilities. This included the completion of procurement action

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and securing a contract for external assistance from CONVAIR, San Diego. By this contract ATIC has secured the assistance of the Chief of CONVAIR's Human Factors Staff, Dr. D. W. Conover, who will personally monitor the work at CONVAIR and will be assisted by Charles W. Tuck, a graduate of the Naval Intelligence School and formerly Assistant Naval Attache and Assistant Naval Attache for Air, Moscow. Mr. Tuck is fluent in the Russian language, as are approximately ten other professional employees of CONVAIR, San Diego, including one who has worked as a physicist and translator of Soviet scientific literature since 1921. ~~(SECRET)~~(U)

ELECTRIC POWER EQUIPMENT

The duration of its source of electric power now limits the effective life of the space vehicle and makes this source one of the principal considerations in evaluating weapon effectiveness. Not included in the present state-of-the-art is a non-air breathing power source of adequate capacity and having a duration in the order of six months or one year. To assist in this area, ATIC contracted with The American Power Jet Company to perform a study of the available information in order to arrive at an estimate of Soviet trends and capabilities in this area. Nuclear, solar, and other sources of energy for conversion to electric power will be examined. ~~(SECRET)~~(U)

AERIAL RECONNAISSANCE EQUIPMENT

The possibilities for aerial reconnaissance presented by the earth satellite require a complete re-examination of Soviet technologies relating to reconnaissance equipment. For this purpose ATIC prepared a Work Statement for contractual assistance with the expectation that such assistance will begin during the second quarter of fiscal year 1959. An earth satellite developed ostensibly for the purpose of making astronomical observations from outside the earth's atmosphere could secure a vast and continuing amount of intelligence information. ~~(SECRET)~~(U)

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EQUIPMENT FOR NUCLEAR POWERED AIRCRAFT (NPA)

In view of the special importance of this subject, a study of the equipment requirements and Soviet capabilities for meeting these requirements was prepared with the assistance of CONVAIR, Fort Worth. The report of the results of this study will be ready for publication early in FY-1959, and will also include a comprehensive treatment of various intelligence indicators applicable to NPA equipment. ~~(SECRET)~~ (C)

GUIDED MISSILE GROUND TECHNICAL EQUIPMENT

Because of the potential of the ground support equipment for indicating as well as limiting guided missile capabilities, ATIC took action to secure external assistance in this area. In an evaluation by ATIC of the proposals of the five responding organizations, that of the American Machine and Foundry Company was selected for procurement negotiations. ~~(SECRET)~~ (C)

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CHAPTER 12

MATERIALS

METALLURGY AND INORGANIC MATERIALS

During the reporting period ATIC determined that the Soviets possess a high state-of-the-art in the electrolytic production (laboratory stage only) of titanium, tantalum, and columbium, three of the exotic metals now being considered on a world-wide basis for missiles, nuclear power reactors, and astronomical vehicles. It was also determined that research on columbium-base alloys in the USSR is directed largely toward atomic energy applications. In addition to the Soviet efforts on high-temperature alloys, it was ascertained that the USSR has developed super high-strength steels on a par with those of the U. S. The status of aluminum, magnesium, and titanium, to all appearances, has not changed. ~~(SECRET)~~(U)

ATIC furnished information and participated in the Metals Sub-Committee, COCOM Conference at Paris in May, 1958; and furnished sufficient technical intelligence data to the State Department to persuade the other delegates of all the NATO nations to hold present embargoes against the USSR on all important metal systems and alloys. ~~(SECRET)~~(U)

ORGANIC CHEMISTRY

It was confirmed that Soviet production on isoprene rubbers, highly important to air weapons, has been increased as well as the production of emulsion-polymerized rubbers. ~~(CONFIDENTIAL)~~(U)

The chemistry group furnished data on certain plastics to WADC and the COCOM Subcommittee in Paris, France, which met in April, 1958. (UNCLASSIFIED)

At the close of this period, two technical reports were being finalized on Soviet rubber and plastics R&D and technology with respect to the application of these materials in advanced air weapons. (UNCLASSIFIED)

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CHAPTER 13

INDUSTRIAL ENGINEERING

AIR WEAPONS PRODUCIBILITY

The predominance of ATIC effort in industrial engineering during the first six months of 1958 was with external-assistance projects and in-house evaluation of raw intelligence data related to Soviet air weapons production capability.

(UNCLASSIFIED)

In the field of aircraft producibility, Douglas Aircraft Corporation completed the producibility analysis and comparison of the Soviet bombers BLOWLAMP and BACKFIN and ATIC prepared a study on the manufacturing analysis of the Soviet jet fighters FACEPLATE and FISHBED. Boeing Aircraft Company completed work and submitted the final Phase III report on Soviet supersonic bomber production capability. ATIC incorporated new and significant intelligence data.¹ ~~(CONFIDENTIAL)~~ (U)

The Center revised producibility evaluations of Soviet fighter and bomber aircraft for a new characteristics study and assisted Northrop Aircraft, Inc., with the appraisal of Soviet capability to manufacture a 1968 all-weather fighter. ~~(SECRET)~~ (U)

Two significant contributions were made during this period to support future Soviet air-weapon-system estimates. The first covered indications of a new Soviet heavy jet bomber and the implications on the development schedule and performance. The second was an analysis of aircraft and missile development programs to assist in determining whether the Soviets had made any ascertainable shift in emphasis from aircraft development to guided missiles development. ~~(SECRET)~~ (U)

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GUIDED MISSILES PRODUCIBILITY

In the field of guided missiles producibility, major ATIC effort was applied to the Minneapolis-Honeywell contract dealing with an analysis of critical manufacturing aspects of gyroscopes, accelerometers, platforms and airborne computers for inertial guidance systems.² Phase I was completed in June 1958, and ATIC provided assistance to the contractor in preliminary review of intelligence data for the evaluation of Soviet manufacturing capability in this field. The Center completed negotiations with the Glenn L. Martin Company for a producibility study on long-range surface-to-surface ballistic missiles, and entered into a contract and agreement as to the approach and extent of coverage. ~~(SECRET)~~ (U)

PRECISION MANUFACTURING TECHNIQUES

ATIC effort in this area resulted in virtual completion of two Soviet state-of-the-art studies in manufacturing technology.³ The first was on the status of Soviet welding technology and the second on the status of Soviet and East German receiving-tube manufacturing technology. During this period, ATIC placed emphasis on monitoring data related to the development of fabrication and assembly methods and equipment by Soviet aviation institutes as a basis for assessing current and future air weapons production activity. ~~(SECRET)~~ (U)

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1. ATIC HISTORY, 1 July - 31 December 1958, page 53.
 2. ATIC HISTORY, 1 July - 31 December 1958, page 54.
 3. ATIC HISTORY, 1 July - 31 December 1958, page 55.

CHAPTER 14

AIR SCIENCESNONLINEAR MECHANICS

During this period, ATIC completed a survey report on Soviet capabilities in nonlinear mechanics and some applications. It was shown that research in this subject area is more extensive in the USSR than in the U. S. The Russians have been leaders in this subject for a long time. The military significance of nonlinear mechanics is not direct enough always to be obvious. However, the applications to such areas as nonlinear oscillations and servomechanisms are obviously of considerable importance in the development of missiles and other air weapons. ~~(SECRET)~~ (U)

The special problems and fields to which nonlinear mechanics is applicable are so numerous as to pervade all fields of applied science and technology. In view of the 788 publications and the 38 books reviewed in the field of nonlinear mechanics, this study can touch only on some of the guide points in the development of the theory involved and afford some needed background for other studies which will make important inputs from nonlinear mechanics. ~~(SECRET)~~ (U)

CELESTIAL MECHANICS

ATIC completed two reports in celestial mechanics: (1) Soviet Competency in Celestial Mechanics, and (2) Review of Soviet Celestial Mechanics Literature. The reports revealed that the Soviet capability in this area is more than equal to that of the U. S. Because of the emphasis the Soviets place on celestial mechanics, their potential here also exceeds that of the U. S. and their training and facilities enable them to refine and apply the well established classical theory so as to produce five times the amount of work in this area. Moreover, the Soviets have added a greatly increased knowledge of stability theory and of the three-body

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problem to the effects of variable mass to give them a sound lead in some very modern aspects of celestial mechanics. Then, under the direction and integrating influence of the Academy of Sciences, the Soviets are now able to orient their capabilities in celestial mechanics specifically toward space satellites and space travel. ~~(SECRET)~~(U)

AIRGLOW AND AURORAE RESEARCH

ATIC completed two reports in airglow and auroral radiations: (1) Soviet Competency in Airglow and Auroral Radiations, and (2) Review of Soviet Airglow and Auroral Literature. They revealed that the magnitude of the over-all airglow and auroral research of the Soviet and satellite countries is about equal to that of the U. S., but considerably less than that of the entire Western world. The Soviets excel in the investigation of airglow excitation mechanisms. In the related topics of zodiacal light, noctilucent clouds, and twilight scattering they have substantially outpublished the West. Their airglow work is of higher value than their auroral research. The development of Soviet instrumentation for airglow and auroral research has lagged behind corresponding developments in the West, but these developments are being currently accelerated. Neither the number nor the competence level of the Soviet scientists actively publishing in these areas of geophysical research is equal to that in the West. The Satellite Nations are important to the Soviet competence in aurora and night-sky airglow work mainly because they provide a geographical extension of Soviet controlled observation stations. These two reports on airglow and aurorae have use in evaluating Soviet capabilities in various subject areas such as astronautics, missiles and communications. ~~(SECRET)~~(U)

OTHER AIR SCIENCE EMPHASES

ATIC continued work on Soviet competency in meteorics and geo-magnetism, wave propagation, solid state physics, selected areas of physics and chemistry,

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information theory, Boolean algebra, solar-terrestrial relationships, atmospheric optics, geodesy and gravimetry, and seismology. (~~CONFIDENTIAL~~)(U)

UNIDENTIFIED FLYING OBJECTS

The increase in UFO reports has continued unabated, and a total of 391 reports were received during this period. This should be compared with totals of 122, 201, and 250 respectively for the first half year periods of 1955, 1956 and 1957. The peak of UFO activities is generally in the second-half of any given year. A disproportionately greater number of foreign UFO reports was received during the present period, particularly from the Far East. The majority of these reports were found to be conventional objects and explainable things. (UNCLASSIFIED)

Extensive story and graphics materials were prepared for a series of TV (Armstrong Circle Theater, CBS, 22 Jan 58), Mike Wallace Interview Hour (NBC, 8 Mar 58), and Saturday Evening Post, Life, and Argosy (for writer Max Gunther, 9-13 June 1958). The earth satellite and space flight emphasis and the resulting increase in the purchase of telescopes and other viewing equipment is already influencing the UFO sightings and reports. (UNCLASSIFIED)

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CHAPTER 15

AIR WARFARE AND WEAPON SYSTEMS

INTEGRATED PRODUCTS:

ATIC accomplished annual revision and distribution of AIE-11, "The Threat of Military Surprise from Soviet Technological Superiority," in April 1958. In February, "Estimated Characteristics of Soviet Air Weapons" was brought up to date. ATIC made 10 contributions to ARDC project offices and their contractors during the first half of 1958. ~~(CONFIDENTIAL)~~ (U)

SOVIET AIR DEFENSE WARFARE SYSTEM:

In the study of the technical effectiveness of the Soviet air-defense warfare system, ATIC continued with the external assistance of Northrop Aircraft and internal assistance of the computer activity for study of the effects of ECM on Soviet radars. ~~(SECRET)~~ (U)

SOVIET AIR RESEARCH AND DEVELOPMENT:

ATIC proceeded with the study of the training, motivation, and career opportunities of Soviet scientific and technical personnel as underlying factors in Soviet air research and development programs. Proposals for bids to cover this study were submitted to the Center by International Studies, MIT (CENIS), and Associates for International Research, Inc., (AIRINC). The Corporation for Economic and Industrial Research (CEIR) declined to bid. ATIC evaluated these proposals and accepted those of AIRINC. (UNCLASSIFIED)

MATHEMATICAL SIMULATION METHODOLOGY:

The Center negotiated a contract with Applied Physics Laboratory of Johns Hopkins University in April 1958. The first phase of the contract called for the compilation of a handbook of results of all pertinent studies performed in analysis.

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GUIDED MISSILE WEAPON SYSTEMS:

During this period, ATIC made studies on the effect of earth rotation on measurements of free flight trajectories. In June, ATIC signed a contract with the Martin Company for evaluation of the capabilities and performance characteristics of the space vehicle and of the ICBM programs of the USSR. ~~(SECRET)~~ (U)

The Center made contractual arrangements with three corporations during this period. One was for studies in the area of Soviet capability for active defense against the ICBM by the University of Michigan. The contract with Aerojet General Corporation was for a detailed analysis of possible Soviet infrared seeking air-to-air missile systems, and with the Bendix Systems Division for a detailed analysis of possible Soviet semi-active radar homing air-to-air missile systems. ~~(CONFIDENTIAL)~~ (U)

The AF Ballistic Missile Division of ARDC, Ramo-Wooldridge Corporation, and ATIC finalized working agreements and agreed upon a detailed analysis of all data on the Soviet ballistic missile flight-test program for each range category of missiles being tested as the first joint undertaking under the agreement. Ramo-Wooldridge completed the facility and assigned 10 persons to the project; ATIC assigned a full-time resident project officer to insure that group effort satisfies ATIC requirements. (UNCLASSIFIED)

Other contracts in support of defensive guided missile capabilities included studies and analyses of Soviet low-altitude and of long-range surface-to-air missile systems. (UNCLASSIFIED)

ASTRONAUTICS:

The limited in-house capability of ATIC in the field of astronautics made external assistance necessary to fulfill the goals set forth for the Center. Battelle Memorial Institute initiated the development of an astronautics intelligence program

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to correlate the available information on Soviet science, scientists, and scientific organizations directly connected with astronautics. ATIC extended the scope of assistance by the Martin Corporation in the area of ballistic missiles to include the progress and support activities for space systems and astronautics, indicate the various developmental milestones in a space systems and astronautics program, and point out Soviet progress in research, development, production and testing, and utilization of space systems equipment. ~~(SECRET)~~(U)

The AF Ballistic Missiles Division of ARLC and Ramo-Wooldridge Corporation agreed to institute a special project at the Space Technology Laboratory of Ramo-Wooldridge to prepare a summary report on US space technology for ATIC and a study on US astronautics aimed at the time period of 1970 and beyond. ~~(SECRET)~~(U)

ATIC released the first of a series of semiannual studies concerned with the technical aspects of Soviet astronautics which postulates a Soviet space program for 1958-1966, and discusses the threat resulting from it as well as the technical capabilities to support the program. ~~(SECRET)~~(U)

NATIONAL AND JOINT COMMAND AND AIR STAFF SUPPORT:

In the air warfare and weapon systems area, ATIC completed twelve studies and reports and made nine major contributions to studies and estimates by other agencies. Other products included 126 tech briefs, 52 SIRAB items and 4 COSIB items,

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GLOSSARY

AFCRC	Air Force Cambridge Research Center
AMC	Air Materiel Command
APGC	Air Proving Ground Command
ARDC	Air Research and Development Command
ATILO	Air Technical Intelligence Liaison Officer
BAC	Budget Advisory Committee
CIA	Central Intelligence Agency
COMINT	Communications Intelligence
CRB	Collection Requirements Board
CRC	Coordinating Research Council
ECM	Electronic Countermeasures
ELINT	Electronics Intelligence
ICBM	Intercontinental Ballistic Missile
ICGL	Intelligence Collection Guidance Letter
ICGM	Intelligence Collection Guidance Manual
RADC	Rome Air Development Center
REG	Returnee Exploitation Group
SAB	Scientific Advisory Board (AF)
SAC	Strategic Air Command
SAG	Scientific Advisory Group (ATIC)
STEP	Scientific and Technical Exploitation Program
TIPS	Technical Intelligence Processing System
UFO	Unidentified Flying Object
WADC	Wright Air Development Center

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