## RESEARCH AND DEVELOPMENT

The goal of the research and development program is to explore and develop new techniques and equipment vital to Agency operations of the future. The success of tomorrow's technical operations is directly dependent upon the vigor, imagination and quality of expertise with which we direct today's R&D effort.

Agency R&D specifically provides support to collection, analysis and interpretation of intelligence data. This is done through various components -- Office of Research and Development covering a broad spectrum of new developments, primarily in support of collection and analysis; the Office of ELINT to improve world-wide ELINT operational and analysis capabilities; the Technical Services Division in support of agent operations; the Office of Communications to develop a responsive and secure communication network; and NPIC in the interpretation and analysis of photography.

Each participating office is responsible for the development of its own R&D program. Overall guidance comes from the PFIAB, the National Security Council, and in more detail from the DCI's Scientific Advisory Board and various panels consisting of representatives of private industry and institutions.

Internally, the R&D Review Board sounds out problems facing each of the participating offices. A project approval system and a recently established R&D Catalog provide top management with information and controls necessary to insure a properly directed and dynamic R&D program. Coordination takes place on a continuing basis through the above mechanisms, through informal working relationships within the Agency and with outside contacts in other Agencies, and through formal participation in such committees as GMAIC, SIGINT Committee and Audio Surveillance and Countermeasures Committee.

The technological revolution has had a direct impact on the Agency's R&D program. It is clear that continued technological advances will significantly affect the capabilities of foreign countries as well as our own ability to collect and analyze intelligence data. It should therefore come as no surprise that the Agency's budget reflects a significant increase in 1967 to meet the challenges of the information and technological explosion facing us in the immediate future. This emphasis of effort comes largely in two areas -- photographic interpretation and advanced technical research. Later chapters will more fully describe the essence of CIA's thrust in these and other research areas.

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## AGENT-ORIENTED RESEARCH

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### General

All Agency effort conducted in this area is done by the Technical Services Division, which is charged with developing and making available certain technical equipment, devices, and materials for direct use in, or close support of, clandestine operations. It does almost no basic research, this being more in the province of the Deputy Director of Science and Technology. When basic or background research is required, TSD levies requests for it on the DD/S&T and monitors its progress for the Clandestine Services. The TSD effort in this area, then, is primarily one of development and engineering and it encompasses a wide variety of fields listed below.

[redacted]

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### Accomplishments

The following are illustrative of major accomplishments achieved by TSD in 1965 under each of the major categories of effort:

#### Audio surveillance

TSD concentrated on upgrading reliability and security, and speeding up the time needed for the special packaging of small audio equipment on a quick reaction basis for specific targets.

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[redacted]

#### Visual surveillance

[redacted]

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## ADVANCED TECHNICAL RESEARCH

General:

There is a vast area of unexploited opportunity in the field of technical collection of intelligence and analysis. It is the responsibility of the Office of Research and Development (ORD) to tap these new and promising opportunities through research and to apply available technical know-how to the immediate needs of the Agency.

This effort must be brought to fruition as a result of two major dynamic factors. First, this country's scientific and technical capability and growth potential are almost limitless and can effectively be applied to intelligence purposes. Second, the technological advances of foreign countries and particularly our cold war adversaries open a wide vista of intelligence data to be collected, analyzed and produced as finished intelligence. The interaction of these factors makes the job tough and challenging. It demands a forward-looking R&D program.

ORD's activities can be categorized in the following broad areas:

1. Optics
2. Radio - Physics
3. Physics - Chemistry
4. Audio physics
5. Analysis
6. Biological sciences
7. Medical sciences
8. Behavioral sciences

ORD conducts basic as well as applied research and development in these areas. It differs somewhat from R&D conducted by other components in the Agency in that the others are developing techniques and engineering prototypes to be used specifically in support of their own operations, i.e., communications, ELINT, photographic interpretation, and Agent operations.

Accomplishments:

The following are illustrations of major accomplishments achieved by ORD in 1965:

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2. 25X1

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ADVANCED TECHNICAL RESEARCH (Cont'd) 25X1

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4) Intelligence Processing Research and Development - [redacted] Unquestionably the major single problem area that demands maximum attention, effort and support is research and development on intelligence processing and analysis. Over the years intelligence gathering and collection systems have been installed that have generated more and more intelligence data that must be assimilated, analyzed and evaluated. This explosion has engulfed the Agency in a mushrooming morass of information necessitating an assimilation capability that far exceeds our current capacity to digest, exploit and disseminate these data on a timely basis. Examples are the NPIC overload and the backlog of audio tapes. The President's Foreign Intelligence Advisory Board has recognized that urgent positive action must be taken to introduce new methods and techniques for the processing, storing, retrieving and analyzing of intelligence data.

Costs:

This activity contains [redacted] positions (including 3 in the Office of Logistics) in the 1967 budget. This represents an increase of [redacted] and [redacted] people over 1966.

Savings:

The CIA Cost Reduction Program submitted to the Bureau of the Budget on 1 September 1965 listed cost savings goals totaling [redacted] in 1967 including liquidation of Project [redacted] During the budget review process additional budgetary cost savings were identified that amount to [redacted] for total cost reduction of [redacted] These savings have been applied toward reducing the budget estimate for this activity.

Change 1967/1966:

The increase of [redacted] in 1967 consists of the following:

| | |
|---|---|
| R&D Projects (See supporting back-up) ..... | [redacted] |
| Personal Services including an increase of [redacted] positions and [redacted] .... | |
| Travel and Other ..... | |
| Total ..... | |

30 September 1965

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COMMUNICATIONS RESEARCH (Cont'd)

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Conclude testing of Commo satellite and supporting systems and launch one of the satellites for orbiting experiments. This will be followed by contracting for operational satellites.

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Improve detection sensitivity and ability to dig deeper into complex signals in reduced time and with reduced size and weight of equipment.

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Costs

25X1 This activity contains and 25X1 positions in the 1967 budget, which represents a slight decrease from the 1966 level.

Changes

25X1 The decrease of in 1967 is a result of a reduction in the SIGINT contractural program.

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## PHOTOGRAPHIC INTERPRETATION RESEARCH

### General

The National Photographic Interpretation Center (NPIC) is responsible for the development of equipment and techniques to advance the exploitation of photography and other imagery in support of the national intelligence effort. The development of new systems, instruments, materials, and devices for photographic exploitation includes a wide range of optical-mechancial and electronic instrumentation as well as the application of automated systems for the extraction of data from photographic and related materials. In addition, the Center provides technical advice and support to Agency and government components responsible for the development of new photographic systems for intelligence collection. Its research and development activity is coordinated with interested elements of the Intelligence Community for their possible use or further adaptation.

### Accomplishments

In 1965 the research and development program concentrated on bringing to successful completion a number of significant development projects started during previous years. Also, substantial effort was expended on the initiation of new projects designed to enable NPIC to cope with the products of new and improved collection systems and to keep abreast of the rapidly expanding reconnaissance technology.

Major development projects which were completed during the year included:

- Prototype rear-projection screen
- Roll-film-scanning stereo viewer
- Ultra-high performance stereo-chip comparator
- Variable-ratio, anamorphic eyepieces
- Electronic automated registration change detector
- High-speed, high-precision, on-line plotter
- Ultra-high performance, high-power, stereo-chip viewer
- Vital interim reports of photo interpreter performance studies
- Various immediate response development services for specific operational requirements

Fifty-three new contract actions were initiated during the year. Increased emphasis was placed on expansion of the research and development effort in the fields of basic image analysis, modulated light viewing and reproduction; automatic-stereo scanning, automatic-image interpretation, automatic target recognition, and human factors involved in the exploitation process. Continued effort was given to problems of exploiting imagery from unconventional collection media such as [redacted] 25X1 25X1

A Committee on Photographic Exploitation

PHOTOGRAPHIC INTERPRETATION RESEARCH (Cont'd)

Equipment (COPE) was established to advance the interchange of information between the various departments and agencies involved in imagery exploitation. This committee, under the chairmanship of NPIC, will provide an improved means of exchanging R&D information and will seek to eliminate duplication of effort in the development of exploitation equipment.

Program Design

Significant advances have been made in the planning, initiation, and control of the R&D program. It is now organized into 15 major sub-programs:

1. Automatic Target Recognition Program
2. Automatic Stereo Scanning Program
3. Photo Interpretation Module
4. Data Link
5. Image Analysis Program
6. Human Factors Program
7. [redacted]
8. Direct Viewing Systems
9. Rear Projection Viewing Systems
10. Modulated Light Imaging Systems Program
11. Materials Handling
12. Information Handling Systems
13. Reproduction Techniques and Materials
14. Mensuration Systems
15. Miscellaneous - includes such items as modifications to existing equipment, automatic focusing system, motorized film rewind, and film editing table development.

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NPIC has a comprehensive five year development plan designed to prepare the Center for the technological advances in acquisition systems and the various disciplines pertinent to exploitation techniques. A small development laboratory is operated by NPIC. This laboratory has successfully carried out investigations of advanced techniques in photography, chemistry, optics, and electronics as part of the over all development program.

Objectives

The five year plan developed during 1965

## PHOTOGRAPHIC INTERPRETATION RESEARCH (Cont'd)

includes a marked acceleration in R&D activity. Reconnaissance technology has been expanding at a much faster rate than exploitation techniques. Substantial increases will be required to equip the Center to handle the input from new, sophisticated, high-quality, high-volume collection media. The dynamic changes in planned inputs to the Center will make obsolete much of the equipment currently on hand. As a result this effort will necessarily be directed to such problems as larger film widths, changed formats with larger scales and increased film area, higher information packing densities, new image forming

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Major emphasis will be placed on:

Applying technological advances to expand production activities,

Automating the process whereever possible,

Increasing the efficiency of photo interpretation equipment, and

Seeking entirely new techniques in the exploitation process to limit where possible expanding requirements for additional personnel.

Costs

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Research and Development for photographic interpretation equipment will require and the services of people in 1967. Of the total requirement, is for projects and the remainder for program administratic

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Savings

Because of the high priority of this activity, no cost savings goals were reported in the CIA Cost Reduction Program forwarded to the Bureau of the Budget on 1 September 1965. However, during the budget review process, were identified as cost savings and applied toward the reduction of the budget estimate for 1967.

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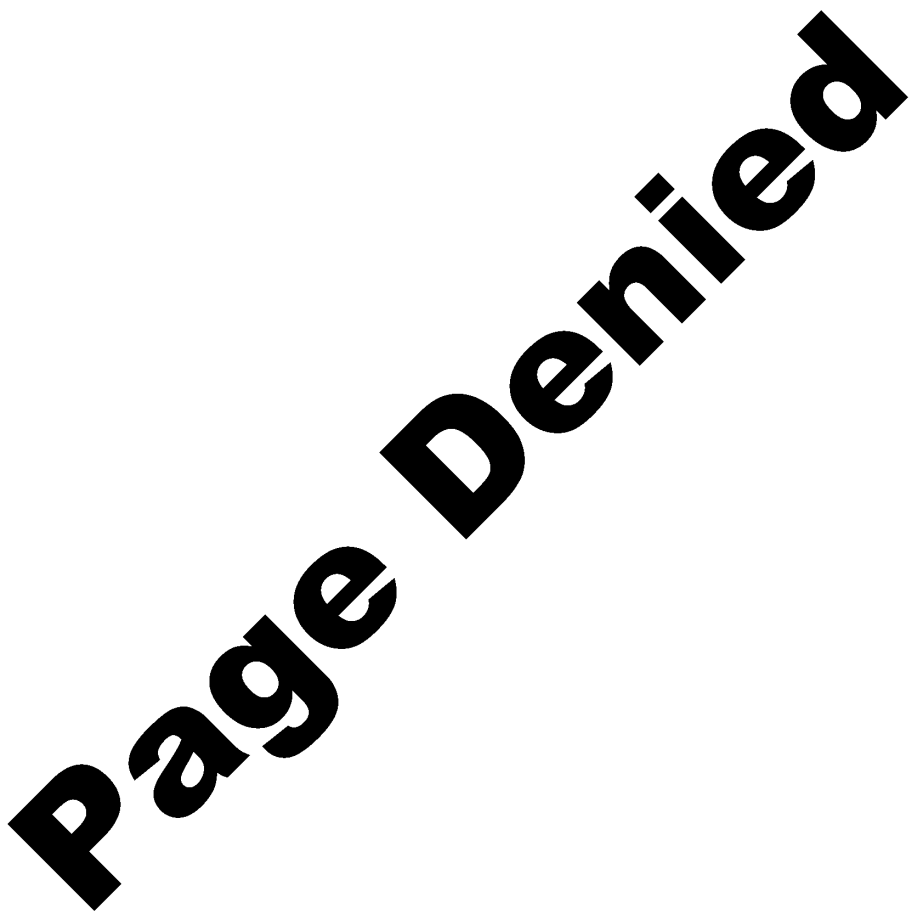


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