Optics Division

Activity in the Optics area was initiated prior to the formalization of the Office of Research and Development. This occurred due to the request of Colonel Edward B. Giller, USAF, Assistant Deputy Director (Research), that [redacted] of TSD/ (b)(3)
DDP investigate the state of technology of infrared (IR) scanning systems and prepare recommendations for research and development in that field. This work was initiated in October 1962, approximately three months before [redacted] reported for duty with (b)(3)
ORD/DDR.

On 20 May 1963 [redacted] was appointed Acting (b)(3)
Deputy Assistant Director, ORD. Mr. Robert M. Chapman, who was recruited to fill this position, was formally designated as the Deputy Assistant Director on 9 September 1963 and [redacted] was relieved to devote full (b)(3)
time to his assignment as Chief of the Optics Division. During this period, two more staff members--[redacted] (b)(3)
[redacted] from TSD/DDP and [redacted] (b)(3)
from the [redacted]--were added to (b)(1)
(b)(3)

the roster. The more formalized shape of an organization did not begin to emerge until after November 1963.

Since the mission of ORD was to provide research and development capability in technical and scientific fields for intelligence requirements in general, the Optics mission was directed toward the search for better optical collection devices and ancillary activities and support to the Office of Special Activities in advanced overhead collection systems.

Subsequent to its formation, Optics Division experienced a rapid growth more or less in pace with other divisions of ORD. The added professional personnel included the following:

(b)(3)

Aside from [redacted] who was another transferee from TSD/DDP, all of the added professionals were

(b)(3)

new to the Agency. [redacted] transferred to the Agency from the [redacted] and Lt. Colonel Wallace was a military assignee on active duty. None of the others had had prior Government experience. (b)(3) (b)(1) (b)(3)

In June 1965 the growth of the Optics Division led to the establishment of two branches within the Division: one, the Electro-Optical Branch under the guidance of [redacted] and the other, the Systems Branch under [redacted] The Electro-Optical Branch provided research and development on materials, sub-components, and complete devices; the Systems Branch provided systems studies and operational analyses and welded components into systems to meet operational requirements. The boundaries between these two branches were not highly formalized, however, and all Division personnel contributed, from time to time, to the tasks of both branches. In the evolution of Optics Division, [redacted] became recognized as [redacted] Deputy in 1965. (b)(3) (b)(3) (b)(3) (b)(3)

In the spring of 1963 [redacted] study for Colonel Giller on infrared scanning systems led to the funding of the first Optics Division project, the development of a one-half milliradian infrared

imaging system for high-altitude use. The contract resulted in a new state-of-the-art for IR systems and made possible in 1965 the collection of certain reconnaissance data that would not have been possible in any other way. [redacted] (b)(1) (b)(3)

[redacted] (For their joint efforts in the development of the IR imaging system, [redacted] each received the Intelligence Medal of Merit and a cash award.) (b)(3) The successful operational demonstration that infrared imaging systems could contribute to the Agency's overhead reconnaissance program was followed by the development of a series of IR imaging devices, one right after the other, each of which extended the state-of-the-art. [redacted]

[redacted] (b)(1) (b)(3)

For reasons which are no longer known, but which are possibly the result of unquestioned evolution, all of the Agency's infrared work through the end of FY 1966 was funded with conventional CIA funds. In the spring of 1966, during a review of ORD's technical program, the Bureau of the Budget representative responsible for Agency funding suggested that the ORD projects in support of OSA-type missions be funded through NRO channels. Therefore, beginning in 1967, the Optics Division has obtained its budget, divided almost equally, from two primary sources--the Agency and the NRO. The mainstay of the Optics/

[redacted] (b)(3)

[redacted] program entirely under Agency funds. Other (b)(1) (b)(3)
NRO-funded project areas have included high-altitude crop photography (CHITTER, performed in conjunction with the Biological Sciences Division and also partly with Agency funds), research components for an image-intensifier night camera and for an image-intensifier

sight for night navigation of the U-2, and the continuation of the funding at the [redacted] (b)(1) (b)(3) for research on large optical devices at the Optical Sciences Center.

After 1967 the funding for the large IR imaging systems tapered off. This was caused by a management decision to reduce manned airborne reconnaissance over denied territory, due to the demonstrated success of surface-to-air missiles against the existing reconnaissance aircraft.

The following are the major Agency-funded projects*:

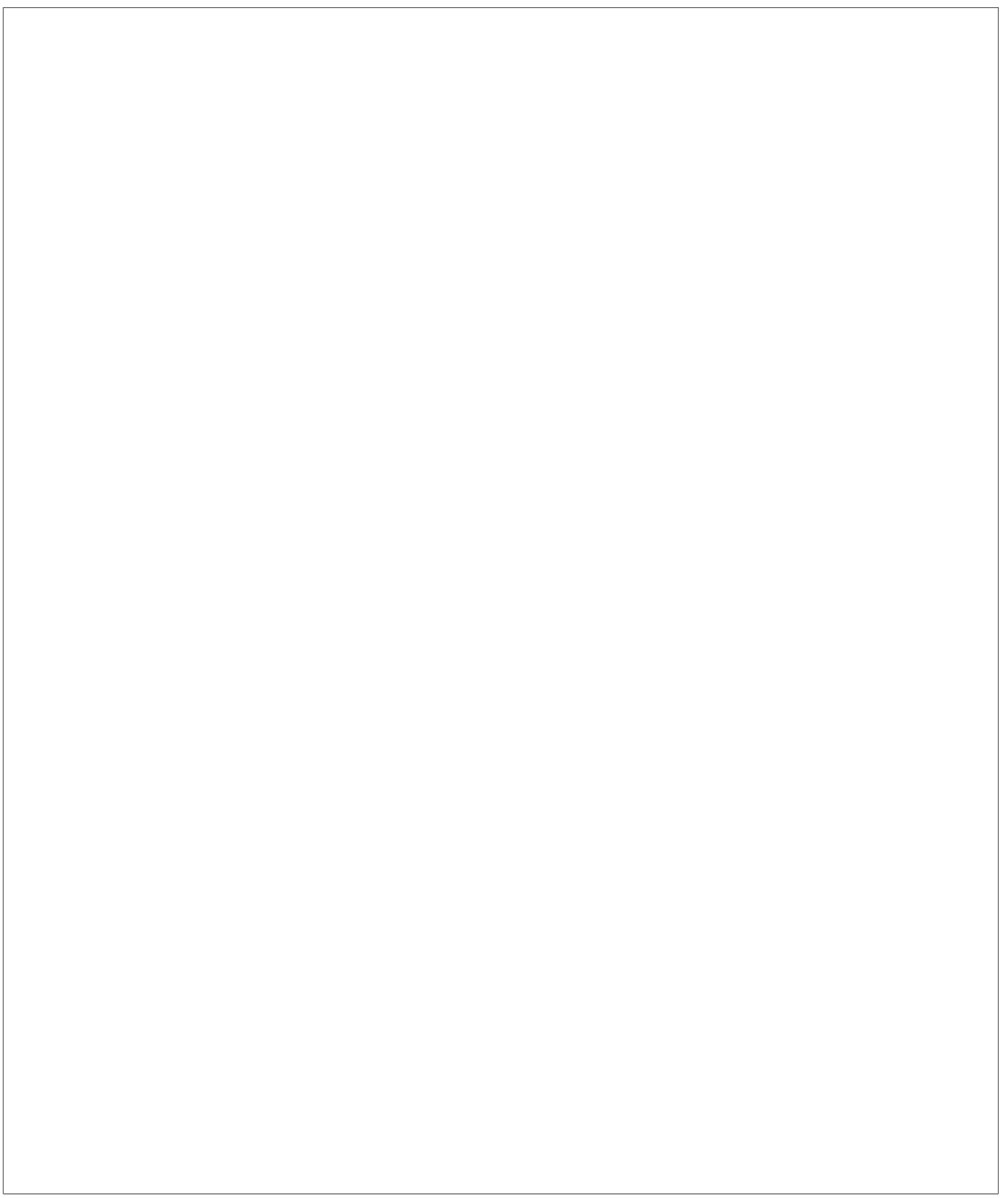
[redacted] (b)(1) (b)(3)

[redacted] (b)(1) (b)(3)

Project CHIGOE

In 1965, Optics Division work was directed in part toward [redacted] when the Director (b)(3) of Central Intelligence, Admiral Raborn, requested a [redacted] study and recommendations as (b)(1) (b)(3) to how such a program might be accomplished. From this request came the [redacted] concept, which later (b)(1) (b)(3) became known as [redacted] On 16 July 1965 ORD sub- (b)(1) (b)(3) mitted the "Report to the Director: [redacted] and Technical (b)(1) (b)(3) Recommendations for Agency Programs." Subsequently, the DD/S&T, Dr. Wheelon, and his staff met with Dr. Harold Brown, then Director of Defense Research and Engineering, to coordinate Agency and DOD programs and to prepare a consolidated report for the Bureau of the Budget. At this meeting it was agreed that [redacted] (b)(1) (b)(3) A series of briefings and coordination meetings were held

with Navy Liaison, CNO, Bureau of Weapons, Joint Chiefs of Staff, Vietnam Task Force, and elements of BOB. On 7 September 1965 the first funding for



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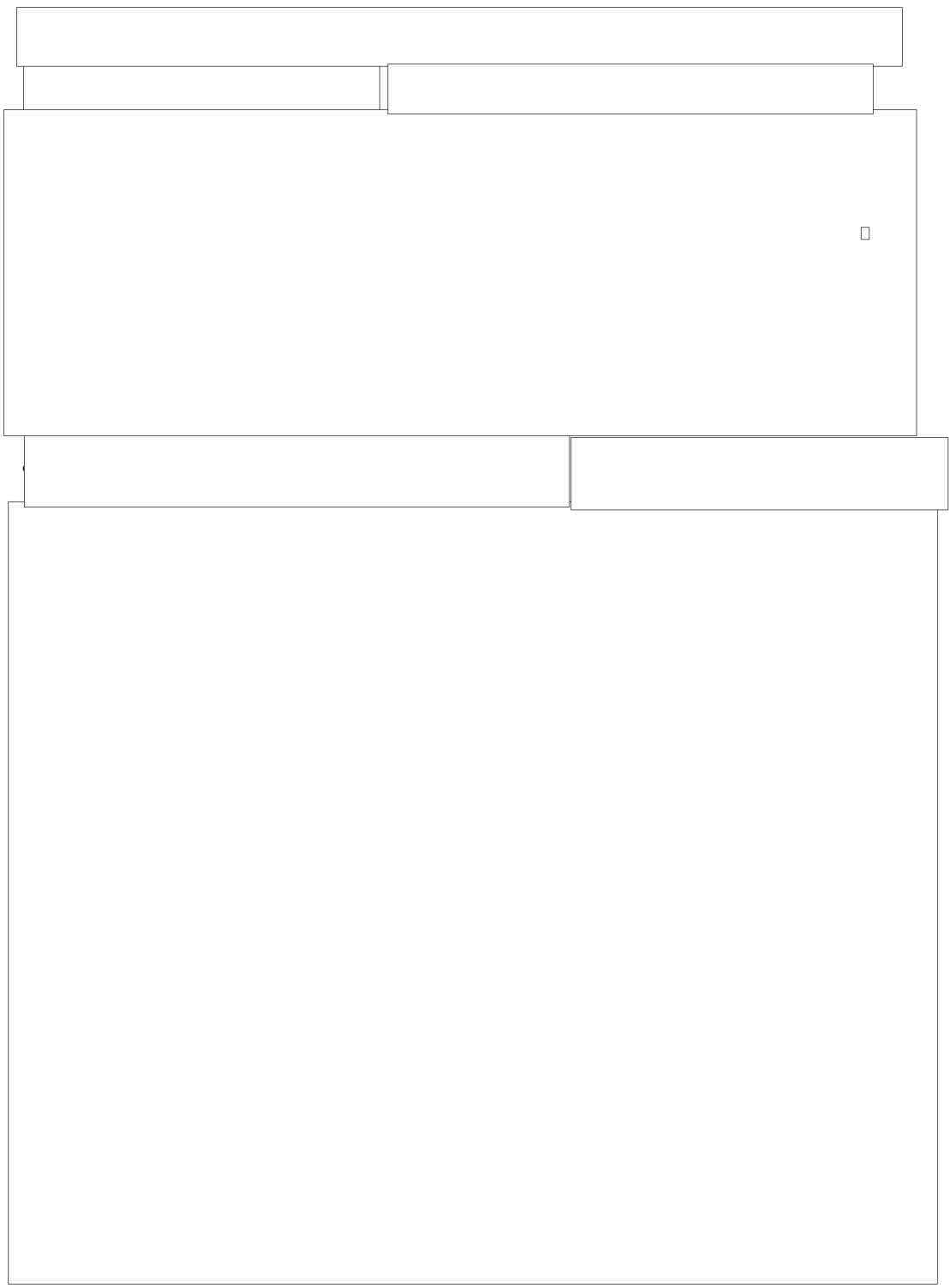

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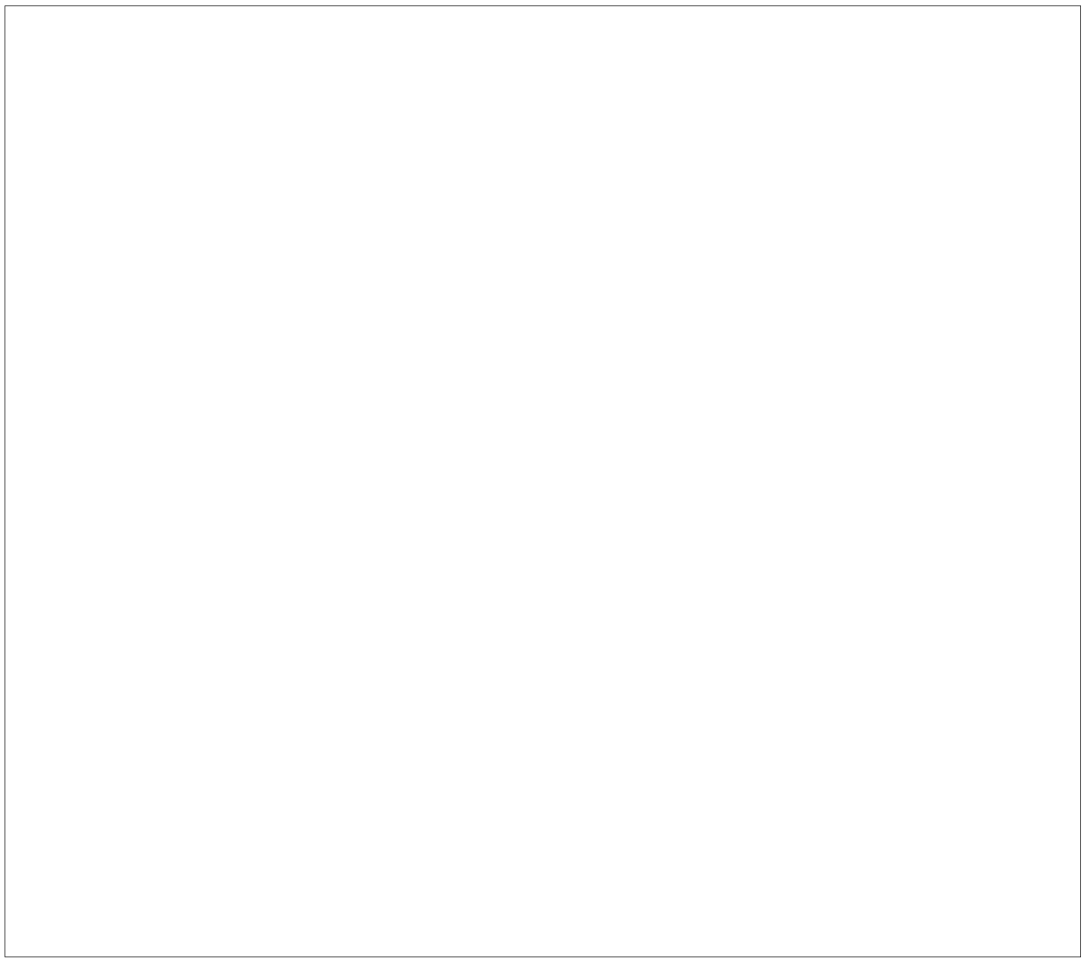

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Small Airborne Cameras

The development of several small cameras, such as are suitable for [redacted] was started during this period, but the results are not yet generally available. These include conventional photographic cameras; cameras that first record on film, develop the film and read-out the image via a flying-spot scanner combined with a radio link; and small real-time and slow-scan TV cameras.

(b)(1)
(b)(3)

High-Speed Isodensitracer

In conjunction with NPIC, experience showed that the photointerpreter's detection and comprehension of detail could be improved, in some cases, by expansion of the density range of the original by means of electronic amplification in an instrument known as an isodensitracer. In 1965 it required one day to expand the contrast range of only part of a photograph. Optics Division undertook the development of a high-speed isodensitracer to reduce this time to minutes; final evaluation of the development has not been completed.

Aircraft Systems

Most of the projects undertaken by Optics Division have had some relatively clear-cut application to the optical world--optical reconnaissance and vision, data reduction, or at least optical components, as in the case of the mercury sniffer. The Division personnel were so often exposed to aircraft in the course of their work on other devices (aircraft to test sensors, use of sensors for guidance of aircraft, etc.) that some of them began to feel very much at home with aircraft systems. The Division

(b)(1)
(b)(3)

Miscellaneous

Optics Division had a variety of small projects which were terminated at various points in their development.

(b)(1)
(b)(3)

For the most part, Optics Division has been engaged in applications of research and development rather than in long-range projects requiring a basic research phase. This is natural when a newly formed organization attempts to acquire tools to accomplish its mission. With the establishment of the Optical Sciences Laboratory in Optics Division, the trend is

toward in-house analysis of optical phenomena prior to external contracting for optical manipulations.

One of the questions often posed to the Optics Division was "How do you accomplish your developments so rapidly?" The answer was to use total contracting for all phases of the work, with the philosophy that at some point prior to phase completion there would be sufficient data to render a decision to go ahead. If the decision were made at that time to proceed with the next phase, six months to a year could be saved, depending on the complexity of the system under development. Also, the philosophy was to design for an operational prototype, which meant that the first model would be designed for use operationally, if necessary. This involved a large risk factor, but if the project engineer were sufficiently knowledgeable and close to the development, the risk would not be as great as it appeared. The first 1/2 mrad IR scanner produced under this concept was used operationally.

The major problem which faced the Optics Division was the top-level decision that R&D on large reconnaissance systems would not be undertaken. This somewhat

reversed the original mission of the Division, and its role and mission had to be restructured. Funding became a problem, and the tendency was to fund those R&D projects which had the least amount of risk. While this was understandable in the light of "tight money," it stifled bold approaches toward the solution of problems. Certainly fewer state-of-the-art systems would be developed if this tendency continued. In the final analysis, however, there were not as many restrictions placed on the Agency's technical people as on those of the Department of Defense.