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Air Force Special Projects Production Facility History

Volume II
Resources

DIRECTORATE OF SPECIAL PROJECTS
OFFICE OF THE SECRETARY OF THE AIR FORCE

BYE 15254-76

Classified by BYE-1
Exempt from general declassification
Schedule of Executive Order 11652
Exemption category [ss 5B(2)]
Automatically declassified on
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HQ AIR FORCE SPECIAL PROJECTS PRODUCTION FACILITY

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AIR FORCE SPECIAL PROJECTS PRODUCTION FACILITY HISTORY

VOLUME II

RESOURCES

1 September 1976

This volume consists of 148 pages.

Volume II of III Volumes

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AFSPPF HISTORY
Volume II

PUBLICATION REVIEW

This report has been reviewed and is approved.

Richard E McLaughlin

RICHARD E. McLAUGHLIN
Lt Colonel, USAF
Commander

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AFSPPF HISTORY
Volume II

FOREWORD

There have been many programs, projects, and studies performed at this Facility over its 16 years of existence. While not all efforts resulted in success, the research and development periods did provide knowledge into new techniques and concepts which in many cases were later applied to the design of new equipment, new chemistry formulas, the automation of data extraction and analysis, etc. All tasks under the charter of AFSPPF were performed to: (1) provide the best possible equipment, techniques, and knowledge applicable to satellite photography, (2) ensure the processing and duplication of satellite photography are of the highest possible quality, (3) process, duplicate, and distribute this photography to the designated users, (4) analytically assess satellite camera system performance, and (5) conduct mission-related research and development.

Throughout the years these efforts and achievements have been accomplished because of the priorities afforded this organization at the Secretary of the Air Force level to attain resources. AFSPPF capabilities expanded as the volume of work; complexity of new equipment, film, and chemistry; and the technical ingenuity and impact of assigned scientific personnel increased. The top priority given AFSPPF improved the following aspects of operation: (1) special category manning (SPECAT meaning 100 percent selective manning) and controlled tours of personnel assignments, (2) types and quantity of equipment, (3) amount and means of funding (assigned BRICK-BAT Category which signifies Presidential approval), (4) plant facilities, (5) approval and extent of contractor assistance, (6) refinements of operation including automation, environmentally controlled work and storage areas, self sufficient power and maintenance, etc., (7) storage and supply channels (given the highest priority to utilize or occupy facilities on Westover AFB), and (8) physical plant and classified mission security.

The reputation of this Facility grew with its resources and proven ability to accomplish the assigned mission requirements of processing and duplication, imagery data extraction and analysis, and report preparation and reproduction in a time responsive and qualitative manner.

Volume II addresses the evolution of attaining the human and plant resources, a summary of the equipment at AFSPPF's peak operational capability, and the relationship and contributions jointly developed by contractors and the Facility's research and development engineers.

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31 July 2014

AFSPPF HISTORY
Volume II

TABLE OF CONTENTS

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

DISTRIBUTION

Organization	For Attention of	Copy Number
SAFSS	- Col L. C. Butt	1, 2
SAFSP-2	- Col D. P. Parrish	3, 4, 5, 6
Central Intelligence Agency/OD&E	- [redacted]	7
National Photographic Interpretation Center	- J. Hicks	8

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AFSPPF HISTORY
Volume II

SECTION I

HUMAN

Over the years, the Facility's human resources have grown both in terms of numbers and quality. The quantitative growth was dramatic in the first few years as the organization was being established and the Facility mission defined. The manning was stable in the mid 1960s; however, it increased again in the latter part of the 1960s thru the early 1970s to meet new mission requirements. As the number of personnel increased, the Facility was also establishing a uniquely qualified staff to handle the significantly expanding technical and production scope of our mission. The development of this staff and the identification and selection of individuals for assignment to the Facility involved the establishment of a manpower management system. This section describes the evolution of this system and discusses the quantitative and qualitative growth of the human resources. Table 1-1 presents a summary of authorized manning from 1967-1976.

From the outset, the Facility enjoyed a very high priority for obtaining personnel. Secretary of the Air Force Order 116.2 specified that the original manning for the Facility (AFSPPL) was to be taken from the 8 Reconnaissance Technical Squadron (RTS). The 8RTS was to remain as a separate unit within the same building (P-1900) with AFSPPL having priority over all resources until a detailed plan could be approved by the Secretary of the Air Force.

Until the plan outlining the actual transfer of spaces and manpower, 65 personnel (7 officers and 58 enlisted) of the 8RTS were assigned on 45 days temporary duty to the Facility. Each of these individuals was personally selected by the newly appointed Commander, Lt Colonel Harold Z. Ohlmeyer. With the approval and publication of the Appendix I, entitled "Product Development System," to the SAMOS Development Plan, the organization, function, and manning of the Facility were officially approved by the Secretary of the Air Force.

The original authorized structure included the 65 positions from the 8RTS, and the Commander's position which was authorized at the Office of the Secretary of the Air Force level. This complement, consisting mainly of photo processing personnel, was tasked with the processing and duplication of SAMOS material.

The Facility manning was initially administered by the 1132 Special Activities Group in coordination with the USAF Deputy Chief of Staff/Personnel. The officers and airmen were placed on stabilized tours with assignment deferment status. Assignment actions were processed through the parent Air Force Systems Command.

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31 July 2014

TABLE 1-1

SUMMARY OF AUTHORIZED MANNING FROM 1967-1976

Date	Officers	Enlisted	Civilians	Total
30 Jun 67	25	231	20	276
30 Jun 68	25	231	20	276
30 Jun 69	25	229	20	274
30 Jun 70	23	245	30	298
30 Jun 71	23	246	30	299
30 Jun 72	25	256	28	309
30 Jun 73	25	256	28	309
30 Jun 74	25	256	28	309
30 Jun 75	20	115	25	160
30 Jun 76	7	89	21	117

NOTE: These figures were taken from Unit Detail Lists (UDL).

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AFSPPF HISTORY
Volume II

By the summer of 1961, the unit was authorized 74 spaces. The increase in authorization was due to the establishment of a photographic research and development function. Before the end of 1961, the strength figures had grown to 100. There was an increase of 38 spaces in 1962. The Facility manning doubled to 276 slots in 1963 as the result of being tasked for the duplication of CORONA missions. With this manning, the Facility was supporting the functions of RD, Administration, Logistics, and round-the-clock photographic lab production.

The manpower procedures and the tour stability remained relatively unchanged until December 1964. In 1965 and 1966 a great many of the Facility's experienced photo processing and maintenance technicians, who had been assigned to this unit in excess of four years, were reassigned to support the Southeast Asian commitment. When the Facility began having difficulty in obtaining qualified replacements, action was taken in 1967 to secure special category (SPECAT) manning. Although manpower actions were still forwarded to AFSC, the SPECAT status enabled the Facility to exercise one of the highest manning priorities within the Air Force. Also as a SPECAT unit, the Facility was to be manned at 100%.

On 1 January 1970, the Directorate of Civil Engineering was formed and the unit strength increased to 299.

The Facility reached its peak in authorized strength the following summer when 10 additional spaces were authorized. Six of these spaces were acquired for the Directorate of Evaluation to meet increased workloads brought about by the introduction of the HEXAGON System, while the other four were allotted to the Directorate of Civil Engineering. The engineering spaces were acquired because of increased workload due to the need to operate and maintain an Industrial Waste Treatment Plant and a Water Storage and Pumping Facility.

In early 1971, the Selected Assignments Branch of the Military Personnel Center (MPC) at Randolph AFB Texas assumed the responsibility for manning the Facility's enlisted positions. Under this system, the Facility dealt directly with MPC and all assignments were handled on an individual basis. Records of candidates for each position were thoroughly screened by both MPC and by the Facility. This system, coupled with implementation of procedures through MPC to ensure all newly assigned personnel were completely processed for Special Security Investigation Required (SSIR) clearability prior to arrival at Westover, greatly improved the Facility's personnel management. Under these procedures, the Facility not only received the best qualified enlisted personnel available but also was able to put them to work immediately after arrival.

Since 1967, assignments have been made by selective manning of the officers through a single point of contact at MPC. However by the early 1970s, the identification and selection process had become much more refined. This new process included: (1) exhaustive review of available USAF resources using the

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MPC computer, (2) visiting ROTC units at certain technical schools, and (3) interviewing AFIT graduate students for assignment. The Facility established a system whereby students in the Rochester Institute of Technology (RIT)/Training with Industry (EK) Program could be identified, selected, and cleared prior to assignment.

Equally significant to the increase in manpower has been the improvement in the calibre of the personnel. By 1972, the Facility had assembled a staff uniquely qualified to support the photo programs of the National Reconnaissance Program. These qualitative improvements were made possible by the establishment of a close working relationship with SAFSS, SAFSP, and MPC.

The following is a chronology outlining these manpower trends by functional area.

DIRECTORATE OF RESEARCH AND DEVELOPMENT

Lt Colonel L. Williams arrived from the Aerial Reconnaissance Laboratory at Wright-Patterson AFB Ohio in April of 1961 to direct the newly established research and development function. From an original complement of four personnel (three officers and one civilian), he expanded his staff to ten. The assigned officers had primarily photographic backgrounds, while the civilians hired during 1962 and 1963 generally were physical scientists. This scientific staff was augmented by experienced enlisted precision photo processing technicians.

Many new programs were initiated to improve the Facility's operational capability and to advance the state-of-the-art in processing and printing technology. An AFSPPL Research and Development Evaluation Team was established to assist in the evaluation of the many technical proposals from industry. Initially, this team consisted of the Chief of the Research and Development Division, Lt Colonel Williams (Chairman); Major C. Schmidt, Chief of the AFSPPL Photo Laboratory; [redacted] from RIT; Captain J. Wright from the Intelligence Laboratory at Rome Air Development Center; and Mr. W. Benz from the Western Air Defense Division.

The RD staff was increased to 17 by mid 1964 because of the increase in scope of the RD mission. These additions included a procurement technician to monitor the growing RD budget and six enlisted technicians to perform test and evaluation of prototype and breadboard equipment.

Col Williams organized a series of 12 monthly Photographic Science Seminars which were presented to the Facility personnel by leading technicians to provide instruction on a variety of subjects within the photographic field. These lectures lasted from July 1965 to June 1966 and greatly shortened the learning cycle of the RD physical scientists and enlisted technicians in the fundamentals of photo science.

In the late 1960s, the RD workload increased significantly because of the complexity of the systems/ equipment under development and the fact that many of these items were pushing the state-of-the-art in

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technology. In an effort to accommodate this workload, RD adopted a manpower policy of identifying specific AFIT students in the two year Rochester Institute of Technology and Training with Industry (EK) Program for assignment. Lt E. Wallace was assigned to RD in the summer of 1968. This individual was thoroughly versed in the theory and fundamentals of this field and his experience in working with the prime photographic processing contractor for satellite reconnaissance proved invaluable.

After 1969, all the military program engineer positions were converted to E2895A, Development Engineer - Reconnaissance Research, and as vacancies occurred, these positions were filled by RIT graduates. By 1973, three of the four officer positions were being filled by individuals with this training. During the 1970s, RD was still dependent upon contractor consultants; however, the nature of the service had changed. Where once this Directorate relied on experts from industry or the academic world for consultation and instruction on basic photographic science, it now used consultants for assistance on very specific areas, e.g., Dr. R. Goldberg (DYMAT Corporation) on color chemistry; Mr. R. Swing (National Bureau of Standards) on optics and microdensitometry; Mr. J. Finley (EIKONIX) on image evaluation, etc. The Facility's relationship to contractors is covered in Section II of this volume.

DIRECTORATE OF EVALUATION

The image evaluation function originally was established under the Directorate of Research and Development. The original evaluation staff consisted of photo intelligence officers and enlisted photo-interpreters. The function as initially performed was dependent upon contract consultants and was performed without automatic data processing support. In June 1964, an IBM 1620/1710 System was installed and Lt J. Hilten, an RD mathematician; Mr. P. Johnson, a civilian mathematician; and two enlisted computer programmers were assigned to support the analytical data processing function. As the evaluation function grew and more image analysis software and data handling techniques were developed, the data processing capability was upgraded. The first upgrade was an IBM 360/30 in June 1966 and the second the installation of an IBM 360/40 in September 1970. In order to accomplish the expanding time responsive mission, it became essential to increase the computer staff. In 1966, this increase went from four to six and in July 1971 from six to ten. Data extraction and mensuration continued to be performed by photointerpreters and photo processing technicians. The major portion of the mensuration procedures, machine calibration techniques, and analytical software was originally accomplished under contract by the Information Technology Corporation (later renamed the EIKONIX Corporation).

Two major factors caused a revaluation of the policy of heavy dependence upon contractors for innovative thinking and scientific development in the evaluation field. The first factor was the desire of the Commander at that time, Colonel Swofford, to establish an independent and technically competent imagery evaluation staff within the Facility. The second was the selection of this organization to become technically involved

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31 July 2014

with the HEXAGON System in pre and postflight analysis of imagery quality. This was the first tasking of this type assigned to this Directorate. In the past the Evaluation personnel had strictly fulfilled the role of supporting the post mission analysis of the GAMBIT and CORONA Systems. As an initial step in establishing this capability, EV set up manning document positions for photo scientists and looked to the Rochester Institute of Technology, the University of Arizona, and SAFSP for graduate photo scientists. From the two year RIT/Training with Industry Program, EV recruited a photo scientist officer named Captain S. Noland to replace one of the departing photo intelligence officers. Upon his arrival, this individual was designated Chief of the Technical Analysis Division and the HEXAGON project engineer. Due to the deep involvement in all aspects of analytically characterizing the HEXAGON System, the Directorate requested a manpower increase. The request included a requirement for two additional photo scientist positions. This portion of the request was approved and the two positions filled by RIT graduates (Major M. Pollard and Captain J. Lopez) in the summer of 1971.

With the assignment of these two officers, the Technical Analysis Division was reorganized. Major Pollard outranked Captain Noland and was assigned as Chief of the Analysis Division. With this resource of photo scientists, one was assigned as system project officer for the GAMBIT Program and Capt Noland remained as the HEXAGON project engineer. The project officer functioned as the single point of contact with the Program Office Chairman and was responsible for becoming thoroughly familiar with all facets of his assigned reconnaissance satellite sensor subsystem. He was also responsible for designing tests and evaluating test data for his system.

Concurrently with the upgrade of the photo science staff, the Evaluation Directorate took action to improve the programming/systems analysis staff. Also included in the 1971 manpower increase was a position for a Computer Systems Analyst/Programmer. To secure the best qualified officer for this position, officers completing AFIT training in the computer science field at Rensselaer Polytechnic Institute (RPI) and the Massachusetts Institute of Technology (MIT) were interviewed. Captain W. Jackson of RPI was selected. This addition gave the Data Division three highly qualified officers to accomplish the development and maintenance of software systems that were constantly being updated and expanded to meet the needs of HEXAGON and GAMBIT performance analysis.

By early 1972, the goals of establishing a military scientific and technical staff to perform image analysis on operational reconnaissance systems and developing an in-house computer systems analysis capability, for the most part independent of contractor software development, had been achieved.

DIRECTORATE OF PRODUCTION

The production function was originally called the Operations Division. The Operations Division was

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31 July 2014

divided into the Processing and Shipping Branches. Four administrative personnel were assigned to the Shipping function while the remainder of the personnel were directly engaged in processing and duplication of the photo imagery reproduction mission.

As aforementioned, the entire Division was assigned to the Facility from the 8RTS. All of the enlisted personnel were screened and hand-picked. Two company grade photo laboratory officers (Captains W. Anderson and F. Battey) were recruited and assigned to fill the two Shift Chief vacancies.

Although the laboratory only handled one SAMOS mission, the Facility was involved in duplicating various aircraft reconnaissance imagery. These requirements were cyclical and had varying suspenses from "immediate turn around" (Cuban Crisis) to "as soon as possible" (Cambridge Research Laboratory support). This method of operation was successful as long as the tasking was intermittent. However, when the Facility assumed the mission of duplicating Priority 3 and Priority 4 requirements from each CORONA mission, it became apparent that this size work force was inadequate to sustain round-the-clock operational support.

Therefore in 1963, to allow for a 24-hour per day operation, the manning of this function was approximately doubled. There were usually two ways that these newly created positions were filled. Individuals selected for the senior noncommissioned officer positions were usually recommended by the organization's permanent party personnel. These experienced technicians were normally reassigned to this Facility upon completion of an overseas tour. The junior grade technicians were assigned through normal personnel action or obtained directly from the Basic Photo Processing School at Lowry AFB Colorado. In the latter case, a representative from this organization visited the school and interviewed candidates. In addition to the face-to-face contact, a review was made of the individual's personal history form. Selection was then made based upon class standing, apparent qualification for background clearance, and an overall impression of his maturity, stability, and personal desire.

Prior to 1963, the quality control function had been performed by photo processing technicians who had either demonstrated an aptitude for chemical analysis, sensitometry, etc. or was assigned to personnel who had performed this type function in other units. However, because of the great scientific advancements in quality control, it was decided to man these chemical analysis/quality control positions with graduate chemists. Rather than create additional officer positions, the Division researched and requisitioned enlisted personnel who had graduate degrees. These Engineering/Scientific Assistants were identified either from other Air Force Systems Command units or were selected directly from basic training at Lackland AFB Texas. The chemists were invaluable in establishing mission support quality control procedures especially during the growth period of the mid to late 1960s.

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31 July 2014

In addition to the increased demands for more scientific quality control techniques, the Facility also realized the need for a more efficient process control system to improve the production flow and to ensure customer requirements were being accurately satisfied. A study was made and the decision reached to install a computer which would provide centralized control over the process. In February 1967, an IBM 1130 Computer was installed to provide an automated production and management control system. The system was expanded with the addition of the IBM 1800 Process Monitoring System in November 1968. Originally, these computers were programmed by a staff of three and operated by photo processing technicians. However with the increased workload resulting from the production of HEXAGON imagery, a request was approved to expand the programming staff to include an additional Computer System Analyst position. Also, three of the photo processing slots were converted to enlisted programmers while the remaining three were converted to computer operator positions. To fill the computer systems analyst position, the Facility again looked to the university campus. In July 1971, Lt J. Hill, an AFIT graduate, from RPI arrived. He was selected not only because of his academic credentials but also due to the fact that he had actual experience with the IBM 1800 System.

The assignment of trained computer personnel greatly reduced the dependence on contractor software assistance, increased system reliability, allowed the completion of software documentation, and expanded the capability of the production control system.

DIRECTORATE OF LOGISTICS

Of the original 66 people assigned in January 1961, there were only three photo maintenance and two supply personnel. However within a few months, this function was augmented with the assignment of two civilians, a GS-12 and a GS-9. These individuals, while being physically located at Westover AFB, did not appear on the Facility manning document but were assigned against slots at the Sacramento Air Materiel Area of the Air Materiel Command (now AFLC). These two personnel were assigned to establish an independent supply account for the unit. They established a mechanized account (RAMAC) which was remote from Sacramento. This account was maintained by transmitting transactions via AUTODIN to Sacramento. Once the arrival of the equipment and spare parts started in late 1961, the Air Materiel Command increased the manning by loaning four personnel to assist in handling the increased supply/purchasing activity.

During 1962, the supply staff ordered film and chemicals through Base Procurement. Standard Air Force stock listed items were ordered through the Sacramento Depot while nonstandard items were purchased locally. Although the Facility had been receiving excellent support from the four personnel on loan from the Air Materiel Command, it was decided and approval granted to convert the positions to permanent party and pick the slots up on the unit manning document. The GS-12 and GS-9 civilian positions were converted to an officer and an NCO, and the total manning was increased by one.

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31 July 2014

During the same time frame, the maintenance function was also being expanded. The manning for this area came from three sources: the 8RTS, the Westover AFB Civil Engineering Squadron, and from USAF world-wide resources. Up until 30 June 1963, while both the 8RTS and the Facility occupied Building P-1900, the maintenance staffs of both organizations often supported each other.

By mid 1962, the Maintenance Division consisted of the following branches: Photographic Maintenance, Electronics Maintenance, and Utilities. The Photo Maintenance Branch consisted of 10 personnel who were responsible for maintaining the photographic and evaluation equipment and the chemical support system. At this point in time, there were not many pieces of electronics equipment in this organization, so the three electronics repairmen assigned to the Electronics Maintenance Branch were used primarily to support the 8RTS systems. The Utilities Branch, originally consisting of one electrician, was soon expanded to include a carpenter, a plumber, and a general mechanic. This Branch was very active in assisting in the installation and modification of equipment and in performing building maintenance and minor construction.

Several very significant developments occurred during 1963 which led to a revaluation of the manning levels in the Maintenance Division. First and foremost was the requirement for round-the-clock maintenance support to accomplish the task of CORONA duplication; and secondly, the organization received numerous new generation processors, printers, and pieces of evaluation equipment. This equipment was more sophisticated and required considerably more upkeep. In addition to the introduction of this state-of-the-art equipment, the actual number of equipment items doubled since mid 1961. In the electronics area, several new electronics systems such as the closed circuit TV Monitor System, the Environmental Control System, and the microdensitometers were installed. Due to this increase in mission scope, the Maintenance Division was enlarged to 28 personnel. The authorized staff was now Photographic Maintenance (16), Electronics Maintenance (5), and Utilities (7). In the early 1970s, both the maintenance and the supply responsibilities increased as the unit was assigned more NRO tasks. The spiralling number of supply line items required substantially more warehouse space, thus more personnel to maintain these areas. The number and types of equipment requiring either electronic or photographic maintenance also significantly increased. To satisfy the supply requirements and maintenance support, the Logistics Directorate grew to a peak force of 48 in 1971. The number was reduced to 42 with the transfer of the Utilities Division to the Directorate of Civil Engineering in the fall of 1972.

DIRECTORATE OF CIVIL ENGINEERING

This civil engineering function went from total dependence on base support in the early 1960s to virtually complete self sufficiency in approximately 10 years.

In the 1961-1963 time frame, the maintenance of Building P-1900 was provided on an on-call basis by the 814th Base Civil Engineers. A civil engineering officer's position was authorized in 1962 and assigned

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31 July 2014

to the Directorate of Research and Development. Having no civil engineering staff, his primary duty was to plan and program all Facility construction projects and modifications.

In late 1963 because of the increase in refrigeration equipment which provided environmental control for the precision processors, the Base Civil Engineering Squadron assigned a 15-man air conditioning and refrigeration section to this organization. This temporary duty unit was physically located in P-1900 and performed round-the-clock support on a seven day week work schedule. This procedure worked satisfactorily up to early 1968 when the sophistication of the equipment and environmental areas, plus the change in the base policy (only breakdown maintenance), took place. These events resulted in the Facility initiating action to establish an organic civil engineering capability.

In January 1969, a manpower change request was submitted through channels for 36 spaces to man this function. Upon approval of this request on 1 July 1969, one officer and one airman position were internally reassigned from within the organization; 15 spaces (5 airmen and 10 civilians) were transferred directly from SAC (Westover AFB); 10 Air Police positions (base operating support spaces) were returned by AFSPPF to SAC for application against this requirement. The other 9 spaces (5 airmen and 4 civilians) were provided by the USAF personnel assignment office (AFOMO).

The Directorate of Civil Engineering was formally established 1 January 1970 with a staff which included: 1 officer, 1 senior NCO, 1 draftsman, and 17 refrigeration, 13 Power Production and 5 Water and Waste spaces. The Directorate strength was further increased with the transfer of the Utilities function from the Logistics Directorate in 1972. With this addition the Directorate manning reached its pinnacle of 46 personnel.

Over the two and one-half years of Facility phasedown, the engineering manning was reduced more gradually than any other Directorate due to the continued requirement for utilities and because of the need to maintain the real property assets throughout this period. Civil Engineering bore the responsibility of preparing the Facility's real property for turnover.

The history of the evolution and growth of human resources would not be complete without a short resume of each Commander. For throughout the existence of this Facility it has been the Commander and his "hand-picked" staff who provided the leadership and management which resulted in the major mission and research and development achievements attained by this organization.

The first Commander, Harold Z. Ohlmeyer (Figure 1-1), was assigned as a Lt Colonel from the 8RTS where he had served as Commander for three years. He was the Facility Commander from 16 September 1960 until 18 July 1968, and was promoted to the rank of Colonel on 7 March 1961. This period was one of struggle as well as one of growth and development of a capability to accomplish the assigned mission.

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COLONEL HAROLD Z. OHLMEYER

COMMANDER 1960 - 1968

FIGURE 1-1

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Colonel Ohlmeyer was continually faced with opposition from Hqs 8AF, Hqs Strategic Air Command, and WAFB. The opposition was based on the fact that this organization's initial manning, plant, and equipment were taken from SAC resources. The Facility was constantly assigned more mission tasks which compounded this sensitive situation as it also required additional space, administrative, finance and maintenance support from Base assets. Under Colonel Ohlmeyer's leadership, AFSPPF grew in physical dimension, personnel, and equipment but most of all in technical and production capability to accomplish support for the GAMBIT and HEXAGON Programs. In 1965 with the ever increasing work volume and number of assigned personnel, Colonel Ohlmeyer expanded and aligned the organizational structure by each major functional area. This structure remained in effect until the transfer of the Evaluation Directorate in the summer of 1975. Colonel Ohlmeyer retired from the Air Force on 27 August 1968.

Colonel Ralph J. Swofford (Figure 1-2) was assigned to AFSPPF from 13RTS where he commanded that PACAF organization. After serving as Vice Commander of this Facility from 23 June 1967, Colonel Swofford assumed the position as Commander on 18 July 1968. Colonel Swofford's background in the photo intelligence field, command experience, knowledge of the current reconnaissance programs, and driving personality totally characterized AFSPPF during this period. Colonel Swofford took every opportunity to make known the capability that existed in AFSPPF and closely correlated Facility activities with related efforts under way or planned within the national reconnaissance community. It was due mainly to his efforts that AFSPPF: (1) was allowed to demonstrate its original negative processing capability of CORONA and GAMBIT missions; (2) developed a closed-loop procedure for evaluation of HEXAGON system performance from camera assembly through postflight analysis; and (3) initiated the personnel action required to have more technical/scientific personnel assigned. Colonel Swofford was reassigned to the Air Staff, Intelligence, at the Pentagon on 31 July 1970.

Lt Colonel William E. Callanan (Figure 1-3) was selected as the next Commander. He reported to AFSPPF from the 432RTS, where he commanded that Thailand based organization, on 28 July 1968 and filled the position of Director of Evaluation. He was promoted to full Colonel on 1 August 1968. On 1 February 1969 he assumed the post of Vice Commander and officially became Commander on 15 July 1970 with the reassignment of Colonel Swofford. He served in this position until his retirement from the Air Force on 1 August 1973. These years were marked by the most significant accomplishments achieved by this organization. Although much of the planning had been started or accomplished to support advanced RD programs, new mission requirements (HEXAGON), the changeover to more technical personnel (scientists, chemists, data programmers/analysts), and a new staff management concept, it was under his administration that these goals were reached. He introduced many other new ideas and policies, i.e., departing from the practice of only sole-source contract bidding, supporting the development of new

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COLONEL RALPH J. SWOFFORD

COMMANDER 1968 - 1970

FIGURE 1-2

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COLONEL WILLIAM E. CALLANAN

COMMANDER 1970 - 1973

FIGURE 1-3

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generation microanalyzers for mission data extraction, planning for a color photo reproduction facility, etc. It was also during Colonel Callanan's command that the decision was reached to change Westover Air Force Base from an active duty installation of the Strategic Air Command to an Air Force Reserve (AFRES) Base. The plan was to reduce capabilities (Finance, Administrative, Medical/Dental, Logistics, Maintenance, etc.) to the level of supporting only AFRES requirements. Because of this the future of AFSPPF became a question. Adequacy of Base support, operating costs versus alternate approaches, the absolute need for an alternate processing capability in an era of stringent economy measures and new types of reconnaissance systems, reduction in military manning, and other considerations became a direct concern to the Facility's operational chain of command (Directors of SAFSP, NRO, and SAFSS). At their direction the Facility completed a study on 23 February 1973 of ten options for continuing the AFSPPF mission. The Facility recommended the following option to SAFSP (General D. D. Bradburn) and to SAFSS (General J. Kulpa) that AFSPPF be kept intact with substantially the same mission but that the manning be restructured to have Government civilians and contractors replace 85% of the military personnel. During the interim period while awaiting the decision on the future of the Facility, Colonel Callanan guided many staff studies in an attempt to retain this organization. Also during this period he was directed to cancel construction and real property related equipment procurement wherein savings could be realized while awaiting the final decision.

On 1 August 1973, Colonel Clark E. Davison (Figure 1-4) assumed command and became involved immediately in the action of assessing the support AFRES could provide to this organization, identifying other sources of support, and developing/negotiating a host-tenant agreement in the best interest of the Facility and its personnel. All these actions dealt strictly with operating at the same mission level but receiving AFRES rather than SAC support. However on 24 October 1973, Dr. J. McLucas, Secretary of the Air Force, announced his decision to phase down and ultimately close AFSPPF over a period from April 1974 until December 1976. This drawn out closure was necessary to allow for the development of capabilities at other locations which had been assigned to assume the functions of this organization. Volume III of this history outlines the details involved in the transfer of the Research and Development, Production, and Evaluation functions to new operating locations. It was this unenviable task which characterized Colonel Davison's tour as Commander. He was reassigned to Headquarters USAF, Intelligence, on 31 July 1975.

Two other officers filled the position as Commander during the phasedown/closure period. Lt Colonel Lucious C. Butt (Figure 1-5) having served as Director of Research and Development from 1 August 1974 assumed the position as Commander on 31 July 1975. Colonel Butt's knowledge of current/past RD efforts and his background in satellite reconnaissance programs while serving on the Air Staff and in the Tactical

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COLONEL CLARK E. DAVISON

COMMANDER 1973 - 1975

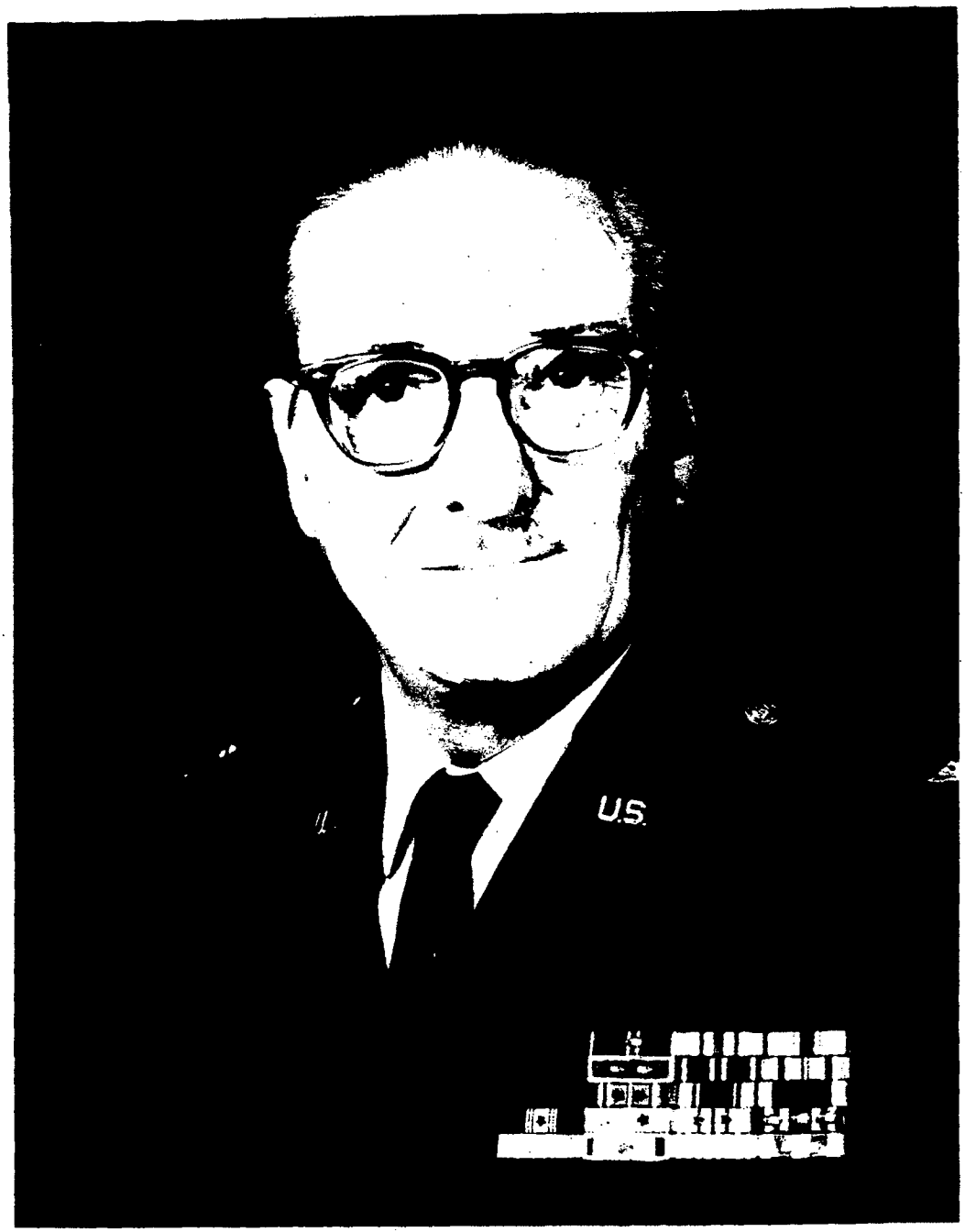

FIGURE 1-4

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LT COLONEL LUCIOUS C. BUTT

COMMANDER 1975 - 1976

FIGURE 1-5

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31 July 2014

Air Reconnaissance Center kept this organization moving forward. Achievements during his command included completion of the Advanced Microcamera System and the Linear Microdensitometer (New Generation Microdensitometer). Although the Facility was destined for closure, Colonel Butt's concern, perseverance, and skill in dealing with SAFSP and SAFSS kept the community aware that AFSPPF still maintained extensive operational capabilities. Lt Colonel Butt was notified that he had been selected for promotion in December 1975. He was reassigned to the Office of the Secretary of the Air Force, Space Systems on 1 June 1976.

Lt Colonel Richard E. McLaughlin (Figure 1-6) assumed command of the organization on 1 June 1976 with the departure of Colonel Butt. Colonel McLaughlin served as Director of Civil Engineering from 29 July 1973 until 1 June 1976. In that capacity he was the civil engineering advisor in the preparation of the site which received the photographic processing function. This mission transferred to the 544th Aerospace Reconnaissance Technical Wing at Offutt AFB. Colonel McLaughlin also provided vital assistance in the relocation of both the Evaluation and RD functions. As the last Facility Commander he was responsible for the movement of the Production Directorate in October 1976, the close down maintenance and "pickling" of the buildings/real-property assigned to AFSPPF, and finally turned over these facilities to Westover AFB. This action was officially completed 1 January 1977.

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LT COLONEL RICHARD E. McLAUGHLIN

COMMANDER 1976 - 1977

FIGURE 1-6

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31 July 2014

AFSPPF HISTORY
Volume II

SECTION II

CONTRACTORS

Several contractors have made valuable contributions to the development and operation of AFSPPF. While AFSPPF has let contracts to over a hundred different firms for a variety of services, certain companies stand out because of the duration of the association and the long-range impact of the service rendered. For the purpose of clarity, these companies have been classified into the following categories: (1) Direct Mission Support, (2) Facility Engineering and Logistics Support, and (3) Research and Development Support.

The key to the success of this organization's contributions and support to the NRP has been the interface/relationships with contractors. The four contractors that stand out as having had the most profound impact on the development and operation of this organization are Data Corporation (renamed Mead Technology Laboratories in 1968), Information Technology Corporation (renamed EIKONIX Corporation in 1971), Eastman Kodak (EK) Company, and the International Business Machines (IBM) Corporation.

The following is a summarization of some of the major contractors who provided support to AFSPPF.

- DIRECT MISSION SUPPORT -

These types of contracts were involved with the development of software/hardware and techniques that directly contributed to mission operations. Under these contracts, the company representatives usually performed their work within the Facility.

Data Corporation/Mead Technology Laboratories, Dayton, Ohio

A. In the summer of 1962, just prior to the initial CORONA tasking, the Facility began its association with Mead (then Data Corporation) with the letting of the Lab Standards Contract. The purpose of this contract was to establish clean room techniques and standards for a precision photographic facility. This contract was to last for a period of ten years, and was to provide extremely valuable information on a wide range of subjects such as image analysis, edge analysis, microdensitometry, quality control equipment, and original negative evaluation. The textual data and results developed through these programs have been used by this Facility as well as other Government agencies within this scientific community.

B. During the early 1960s, Mead, through its Facility contracts, was deeply involved in determining methods for assessing on-orbit camera system performance. One of the recommendations of the Drell Committee was the decision to construct ground targets to measure system resolution. After study under the Lab Standards Contract, Mead was awarded a separate contract to maintain and operate a ground target system which was named the Controlled Range Network (CORN). This network consisted of fixed Mil Standard (tribar) and Gray Scale Targets at specific geographical locations. In addition to the fixed

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31 July 2014

targets, Mead eventually was directed to supply up to nine field teams to deploy mobile targets throughout the United States. This company also developed and deployed three multi-sensor units and many different black and white and color configured targets to meet specific program requirements. Since 1963, up until the Visual Edge Matching (VEM) method developed by Itek was accepted, CORN provided the primary basis for subjective/objective measurement of resolution, smear, exposure, and granularity. Originally, AFSPPF's Research and Development engineers managed the contract, while the operational mission was performed by personnel from the Operations Division, Production Directorate. Starting in the late 1960s, personnel from the Evaluation Directorate took over the operations from PD and worked closely with Mead personnel headed by Mr. E. Ricci and later by Mr. R. Zimmerman in coordinating and scheduling target laydowns through telephone communications and direct teletype to the plant. From an initial expenditure of approximately [redacted] CORN operations reached a peak of over [redacted] in FY 73.

C. In addition to Lab Standards and CORN, Mead had several other major contracts with this organization. These included studies on color processing technology, film grain structure analysis, and an automated tone reproduction program. Mead also built equipment such as the sensitometric spray processor for black and white film which is still in use in the Facility Standards Laboratory; a sensitometric spray color processor which has been invaluable in the Facility's RD efforts; and the BIKINI Ink Jet Digital Printer which is the high speed digital printer for reconstruction of digitized imagery currently being used at the Foreign Technology Division and the Naval Intelligence Support Center. Mead was also responsible for the development of the Mann-Data microanalyzer, the first production oriented microdensitometer with an automatic data recording capability. This development was the basis for the evolution of the sophisticated ADP oriented evaluation system which characterized the Facility in later years.

Information Technology Corporation/EIKONIX Corporation, Burlington, Massachusetts

The initial contract with EIKONIX (then Information Technology Corporation) was let in November 1968 for approximately [redacted] In negotiating this contract, the Facility secured the services of the most knowledgeable and experienced scientist in the field of performance evaluation of photographic imaging systems, [redacted] From the outset, [redacted] worked on-site in close coordination with personnel of the Directorate of Evaluation. He was responsible for a great majority of the innovative techniques/ developments used in systems performance evaluation and image analysis. Even after the Facility established a staff of photo scientists and system analyst/programmers, EIKONIX continued to make valuable contributions by proposing new methods which were then jointly developed and tested by both organizations.

A. One of the most significant contributions was the EIKONIX proposal and development of new designs for image evaluation targets and computer programs to reduce this target data for analytical

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31 July 2014

AFSPPF HISTORY
Volume II

studies. In the area of target development, [redacted] refined the Edge Target Program by vastly improving the software used in data extraction. He also developed a Line Target which offered significant advantage over the Edge Target as an analytical tool for assessing the performance of the HEXAGON Sensor Subsystem. The Line Target was but one of the many tools that EIKONIX developed for HEXAGON. They redesigned targets and developed analytical techniques which replaced those which had been developed for use in the test chamber collimators during the Acceptance preflight testing phase. These modifications have proven invaluable for determination of smear and focus and enabled comparisons of predicted versus actual performance which heretofore had not been possible.

B. EIKONIX performed research on the Viscous Dual Gamma Process. This research demonstrated the feasibility of using a mathematical model to describe the non-linearities in the chemical diffusion of developer and by-products during photographic processing. The Non-Linear Model is presently employed in operational analysis programs.

C. EIKONIX also developed hardware. Their Optical Power Spectrum Analyzer is presently being used and further developed for spectral analysis of film imagery and other applications to system performance assessment at EK and the National Photographic Interpretation Center (NPIC).

Airborne Instruments Laboratory (AIL), Long Island, New York

A. In the latter part of 1967 a decision was reached to upgrade the operational capabilities of the Production Directorate's Laboratory in view of the expected increases in work load due to the new HEXAGON Program. From 1960-1966 the inspection, printing, processing, and quality control of photographic film in production had been largely a manual process. This changed in early 1967 with the purchase of the IBM 1130 Data Monitoring System which provided the status of the printing and processing production cycle and recorded this mission data on a display board in the Production Control Room. However with the continued enhancement of reconnaissance camera systems and the improvement in film capabilities, a decision was made to upgrade the existing IBM 1130 monitoring system with an IBM Model 1800 Process Control Computer in an attempt to improve the quality of the product distributed to the exploitation community. A two-phase system was proposed. The first phase was to program the monitoring of all process variables and printing functions, while the second would be the actual automatic control of the processing equipment. Optimally, this secondary plan would automatically control the setting of all production printers, chemical analysis of all batch chemistry, and the inspection of the finished imagery.

B. Airborne Instruments Laboratory was selected to provide on-site systems analysis and engineering design of the 1800 Process Control System. This contract contained the following major tasks: (1) verification and improvements of software for data monitoring; (2) generation of a processing data base and post-mission analyses system; (3) densitometer and sensitometer data integration; (4) original negative processing control; (5) interfacing the 1800 with the IBM 360 and 1130 computer systems; and (6) tone

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31 July 2014

control curve generation. Contracts on this work lasted from October 1968 to March 1971 at a total cost of approximately [redacted] As the result, AIL provided interfacing equipment to gather data from four densitometer stations and two process control Quantiscan stations. They also wrote the output printing instructions to two printing stations. The automated production procedure operated as follows: the density data from the original negatives was read into the 1800 Process Control System which in turn generated the film printing instructions. Simultaneously, all process parameters were monitored and error alarms set to tolerance specifications. At set intervals during the production cycle, process control strips were read into the computer to monitor the processors and ensure precision control of the processing. This coordinated effort between AFSPPF (Captains D. Johnson and J. Trowell), AIL [redacted] and assistance from the IBM Corporation [redacted] resulted in the first operationally integrated hardware/software processing control system.

Fairchild Space and Defense Systems (FSDS), Long Island, New York

A. FSDS was given a contract in November 1971 to develop a new high speed titling system which would be used on the HEXAGON and GAMBIT film size formats. Titling had always been a major problem due to the slow operation of the stamping heads utilized in the manual Unimac Titlers. The decision was made to develop this titler using the ink jet method of application. This effort resulted in the successful design and fabrication of two prototype titlers capable of automatic operation, variable speed, and different character size images. The instruments, utilizing the A. B. Dick Company Video Jet Titling technique, were scheduled to replace the Unimac Titlers and also serve as the backup to the Optical Titling System at EK. Although they achieved the required titling performance, and the feasibility and advantages of using such a system for titling both black and white and color materials were demonstrated, these prototype machines were difficult to maintain. With the successful development of optical titling during processing by EK, this program was curtailed in January 1973. It was unfortunate that this [redacted] worth of equipment was not further refined and put into the production cycle at AFSPPF. It then could have been an operationally viable titling system for all production laboratories. The men who oversaw this program were [redacted] (FSDS), Major M. Rivera (AFSPPF), and [redacted] (RADC).

B. FSDS was awarded a [redacted] contract (December 1973 thru January 1975) to design and fabricate a device which would provide operational calibration of the Niagara/Redondo Printer. A single photo cell, motor driven sensor was developed which when physically placed into the light source would record the intensity level of a Niagara Printer at the film plane on a digital readout meter. This irradiance sensor could be set to the type of film being used thus allowing a faster method of printer machine calibration. This device provided both premission and on-line calibration of all Niagaras/Redondos within the production printing area. Although still basically a manual method, it reduced the preparation time for calibrating the printers during premission activities from a one or two-day task using the old photographic step wedge

NRO APPROVED FOR RELEASE
31 July 2014

method to less than three hours. This sensor also saved valuable time in the initial alignment of the Actinic Butterfly Contrast Control (ABCC) which was added to the Niagara/Redondo in December 1975. This device developed by FSDS [redacted] and closely monitored by AFSPPF (Major J. Johnson) and AFAL [redacted] resulted in significantly decreasing the time required to calibrate this organization's production printers.

Computer Sciences Corporation (CSC), Silver Springs, Maryland

Because of the increase in mission volume and types of production requirements, there were constant modifications to the operational software utilized by the 1800 Processing Control System. By the latter part of 1969 when the Facility was preparing to support the production of HEXAGON imagery, these modifications became so complex that in-house computer resources could not provide this timely and sophisticated support. The Command Staff felt that it was time to hire a company which specialized in computer systems programming and analysis to assist in the on-site support of the Production Directorate. In January 1970 a contract was awarded to CSC for the design, development, documentation, delivery, and testing (under operational conditions) of an integrated processing control software system. The system was written for operational use under a multi-programming executive (MPX) system on the IBM 1800 Data Acquisition and Control System. This software replaced the existing time-sharing executive (TSX) process control system. There were three follow-on yearly contracts negotiated with CSC for further refinement and modification to the process control system. This effort was completed in September 1973 for the total amount of approximately [redacted] It was through the endeavors of men like [redacted] (CSC) and Mr. P. Johnson and Captain J. Hill from AFSPPF that this significant step toward the achievement of an automated processing control system was successful.

Eastman Kodak (EK) Company, Rochester, New York

A. This company, through its contracts with the NRO, has lent major support to this Facility by supplying films, chemicals, cans, spools, and miscellaneous photographic materials through a film and chemicals (F&C) contract. This type of agreement was called a "black" contract as it was controlled by special systems funds out of the [redacted] was responsible for writing the contract annually, approving all orders (calls), and monitoring the expenditures against the contract. The earliest record of this type of contract was for FY 67. Prior to that period, these materials were purchased locally through Westover Air Force Base Procurement. The existence of this F&C Contract has allowed for a smooth and time responsive support pipeline. In fact a mission under production at AFSPPF has never been delayed due to the lack of materials. In those instances where the possibility of a work stoppage existed, the Logistics personnel from both EK and AFSPPF would coordinate the truck or aircraft delivery of the required materials within 18 to 24 hours of the request.

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

B. EK also played an important role in providing transportation for materials and equipment. The first problem was to establish an unclassified method of transporting support materials back and forth between EK and AFSPPF which would not reveal the contractual relationship of these two agencies to other Westover AFB organizations. As a result, three methods of transportation were devised. The first method was the shipment of F&C via commercial truck contracted by EK to a specific individual at Westover AFB, implying that it was for private use. These commercial trucks would be routed directly to the Facility and would have no contact at all with any other base organization. The second method was via commercial aircraft; this was limited to small volume high priority shipments. In this case EK would send a package addressed to an individual, usually the Director of Logistics, which would be picked up at Bradley International Airport. Again, no other Air Force organizations were involved. The third and most covert method of transportation was by trucks which were leased by an individual employed at EK, i.e., [redacted] Chief of Transportation. These trucks were loaded and driven by cleared EK personnel, thus avoiding any outside involvement.

EK provided this organization with transportation support for the movement of items other than those purchased under contract. Through the years equipment sent to EK for modification or repair was picked up and delivered in a leased EK van. The requirement for a more specialized conveyance increased as the equipment became more sophisticated. The concern over careful handling of this precision equipment led to the NRO providing EK with a specially built air-ride van in 1973. This van was used by AFSPPF on several occasions, i.e., in June and July 1975 it was employed to transfer the Evaluation Directorate's mission equipment from Westover AFB to their new operating location at the National Photographic Interpretation Center. In this instance, the use of this van resulted in the following advantages: (1) provided security, (2) the driver understood the delicate nature of the equipment (minicomputers, microdensitometers, etc.), (3) AFSPPF could properly supervise the packing, loading and unloading, and (4) AFSPPF was assured it was the proper type air-ride vehicle.

In the spring of 1974 when Westover AFB was transferred from SAC to AFRES, AFSPPF lost many of its base support functions (Accounting & Finance, Personnel, etc.). The closest installation able to provide this support was the Air Force Systems Command base at Hanscom, approximately 100 miles East of Westover AFB. At that time AFSPPF had one staff car which was used for courier and temporary duty (TDY) trips. It was soon obvious that one car could not handle these two responsibilities, plus the twice weekly trips to Hanscom. Action was initiated through HQ AFSC channels to procure another staff car. This procurement cycle normally took one year but the need for this additional transportation was immediate mainly due to the increased personnel actions associated with the first forced manpower reduction during phasedown. To alleviate this hardship, Colonel W. Owens (SAFSS) directed under their NRO

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31 July 2014

contract that EK rent a vehicle for use by AFSPPF during this interim period. This vehicle was utilized from July through December of 1974 when the Facility received its second Air Force staff car. The EK contact on this transaction was [redacted]

C. In March 1972, EK started furnishing "spare parts" to AFSPPF through their community support contract with the NRO. This contract was also used for routine rehabilitation of such items as processor rollers, Versamat racks, etc. The EK contact was [redacted]

International Business Machines (IBM) Corporation, White Plains, New York

Although never officially a direct support contractor due to the company policy against funded development work, many contributions were made by the IBM Corporation in the design/application of rented and purchased computer systems. A few IBM Managers were given an unclassified briefing on what type of systems software was required to satisfy mission operations. No IBM field engineer or programmer/analysts ever had direct access to applications software or specific satellite reconnaissance flight data. This made negotiations and direct assistance to mission tasks extremely awkward; however, an understanding grew between IBM men like [redacted] and AFSPPF data programming experts like Captains D. Sykes, D. Watson, R. Massarini, and J. Hill which kept the level and scope of conversation centered solely around systems capabilities, flexibilities, and operator/programmer training.

A. The first association with IBM occurred in 1964 when a 1710/1620 Computer System was rented to provide data collection and analytical support to the Research and Development Division. This system was a full scale computer which was primarily operated by program cards, although a paper tape-to-card converter was included. Data from early CORONA and GAMBIT missions was analyzed and reduced by the 1710/1620. This system, capability, and area were the forerunners to the mission evaluation data processing center developed in 1965.

It soon became apparent that the work volume and uniqueness of the requirements needed a more effective, time-responsive, and scientifically oriented data processing computer system. On 13 June 1966, the advanced IBM 360/30 Computer with 25 pieces of component equipment was installed. There was skepticism about the need for this upgrade as the annual rental more than doubled to over [redacted] However it soon became evident that the overall utilization and capability to respond to immediate on-site mission requirements more than justified this action.

In September 1970 based on the predicted volume and types of requirements involved to support the HEXAGON Program, the 360/30 was replaced with the newer, more powerful 360/40 which utilized high speed disk storage units. This change took place on 24 September 1970. However, even this system with a core memory capacity of 256K rapidly became taxed by the volume of requirements during the first few

NRO APPROVED FOR RELEASE
31 July 2014

development/debugging flights of HEXAGON. Again it was recommended by IBM that we upgrade our system to meet the demands placed on the computer system due to AFSPPF's increasing involvement in the pre, post, on-orbit performance analysis and special studies of the HEXAGON reconnaissance camera system. In November 1972, the Facility built its maximum data processing system with the addition of three more tape drives and three more disk drives bringing the total to six tape and six disk drives. The close association between IBM technical representatives and AFSPPF staff scientists resulted in the successful accomplishment of the vital primary mission of the Evaluation Directorate and the support missions of Logistics, Administration, Research and Development, Production, and Civil Engineering.

B. In support of the Production Directorate, an IBM 1130 System was installed in February 1967 to monitor the photographic production cycle. As a result both time and expense were saved by the reduction in rejects and increased efficiency due to this automation.

In November 1968 another Process Control System was developed using the IBM 1800, later modified with the System 7 (March 1973). AFSPPF was the first organization to develop this type of prototype system using a customized computer. The IBM 1800 Computer System could monitor 100 sensors simultaneously, perform high speed computations, and produce recommendations for processing changes and printing instructions. Eventually, the production laboratory was completely monitored by this system.

C. An example of how important and profitable the interplay with IBM personnel and the military became is the development of the Ferranti-Packard Display. IBM was briefed on the problem of displaying the status of as many as 1,200 individual film units during a mission. Printouts, blackboards, and grease pencil boards were all in use, but much time was lost and there were unacceptable delays and errors in posting. IBM arranged a tour of the American Stock Exchange for key people to see a new method for posting stock prices on the exchange floor being developed by Ferranti-Packard of Canada. With IBM's help a high speed display board was developed to portray the status of all film units in current production. The display was driven by the Facility owned IBM 1130 Production Monitor using interfacing and programming developed by IBM.

All these system developments were unique and major advances in IBM's opinion. In fact, like several other computer developments at AFSPPF, it was difficult to quell IBM's desire to advertise these accomplishments.

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

- FACILITY ENGINEERING AND LOGISTICS SUPPORT -

These types of contracts were involved with the various Facility construction projects and the installation and maintenance of equipment in Buildings P-1900 and P-1875.

Eastman Kodak (EK) Company, Rochester, New York

When reviewing the history of this Facility one will find that the major contributor to the success of the production function was the Eastman Kodak Company, Rochester, New York. Operating under the direction of the Configuration Control Board (CCB), EK developed, designed, and built most of the processing, printing, and inspection/viewing machines used at AFSPPF. EK developed much of this equipment under the CCB's Project Authorization Request (PAR) Program to meet urgent national objectives as new satellite reconnaissance systems evolved. From the very beginning the NRO sought to keep AFSPPF's capability compatible with EK's in the event of a catastrophe, strike, or inadvertent breach of national security which would result in closing the photographic printing, processing, and reproduction at EK. Due to the technical expertise at AFSPPF and EK many original designs were briefed to the CCB. The CCB would then direct what action should be taken, if any, and approve funds for continued development/manufacture/modification by either or in some cases both organizations. This resulted in healthy competition which led to improvements in operational production equipment and techniques.

A. In the 1960-1961 era the first production equipment was installed at AFSPPF to print and process film from the SAMOS system. The majority of this initial processing machinery was developed and made by the Houston Fearless Company. The Eltron, which was manufactured by EK, was used to process original negative requirements. SAMOS was a photo-electronic satellite system which produced two 35mm film records for processing. After development, the 35mm strips had to be registered and reassembled onto a 9.5 inch format. EK designed and built the Reassembly Printer for this transfer task. Unfortunately this equipment received very little use as the image quality of the SAMOS system was so poor that future launches of this satellite system were cancelled in July 1963.

B. The Trenton Spray Processor was the first major piece of EK production equipment delivered to AFSPPF. This became the work horse in accomplishing CORONA Program duplication requirements in 1963. In 1964, the Trenton was augmented by the new Dalton Spray Processor also built by EK. These processors could handle any film size from 35mm to 9.5 inches and were high speed (60 feet/minute) spray, precision machines. By 1966, three Daltons had been installed and were operational at AFSPPF and three at Eastman Kodak. The total duplication processing capability of these processors was approximately 400,000 feet per day.

C. High speed continuous duplicate printing was done almost exclusively on EK printers. EK frequently upgraded their equipment to meet a unique requirement or change in a film/processing combination.

NRO APPROVED FOR RELEASE
31 July 2014

Once this change was approved by the NRO/CCB, EK would start fabrication and/or make the modifications to the equipment at AFSPPF. EK produced a whole series of continuous black and white printers such as the Cadillac, Belair, Concord, and finally in 1963 the Niagara Continuous Contact Printer. AFSPPF built their printing capability to a peak in 1972 with the operation of nine Niagara Printers. Eventually, this printer was modified and renamed the Niagara/Redondo or simply the Redondo. This modification took place in late 1972 and was made because of a new higher resolution duplication stock (SO-192) which required a more intense light source.

D. EK designed and fabricated most of the peripheral equipment used in the film production at AFSPPF. Inspection/viewing tables, titlers, cleaner-waxers, splicers, and densitometry stations were primarily EK products. They produced the I-B Sensitometer which was used for monitoring the precision control of the printers and processor through the generation of step tablets. EK also developed many pieces of specialized equipment, i.e., the 10-20-40 Enlarger used to produce high quality enlargements of mission imagery for the Performance Evaluation and Post Flight Analysis Reports produced by AFSPPF.

E. A highly sophisticated print system developed by EK was delivered to AFSPPF in 1975. This system was called the Cayuga Printer System and was the result of several PAR efforts and development studies by AFSPPF and EK. Both organizations had worked for years toward a system which would scan the original film and print duplicates according to optimized control limits. AFSPPF had opted for a flying spot scanner while EK preferred fixed arrays of photodiodes. The EK concept was approved and the Cayuga produced with the EK scanner and a modulated light source.

F. In late 1969 thru 1973 one of the biggest questions being addressed was what, if any, was the value of color satellite photography? A Color Task Force (CTF) was formed by the Deputy Director of the NRO to perform an investigation into the uses of color in the NRP. Up to this time Color Film Types SO-242 and SO-255 and Camouflage Detection Film SO-180 (all developed by EK) had been flown experimentally in CORONA, GAMBIT, and HEXAGON Systems and processed at EK. To prepare for processing color material at AFSPPF the 1411 Color Versamat Processor was installed in June 1966. This machine was replaced by two EK 1811 Color Versamat Processors which arrived at the Facility in August 1969 and were used to process some of the HEXAGON Acceptance test material. Other continuous color printers evolved from EK such as the Seneca, Colorado and the Rainbow and all were delivered to AFSPPF. However as the decision was made to fly only small amounts of color film, the majority of this equipment was used primarily for training.

G. Not only did EK supply the equipment, films, chemistry, and support systems used in production, but they also played a major role in the training and maturation of AFSPPF personnel. Several reconnaissance engineering officers who were assigned tours at AFSPPF were indoctrinated on new photographic duplication equipment, processes, and systems through their one year schooling with EK.

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

H. AFSPPF conducted a research program at the direction of Navy Captain Robert Koch, SAFSS, into the feasibility of providing wider exposure latitude in original negative processing. He suggested a controllable gamma system where high gamma at lower densities would gradually become low gamma for the very high densities. A contract was let to Stanford Research Institute, Menlo Park, California, to determine if a spray processing chemistry could be developed to produce these effects. The program was successful and a wide range of controllability was demonstrated. In parallel with this effort, the CCB encouraged EK to pursue a similar study. EK also developed a viscous development methodology with equal capabilities. Their process was called "Dual Gamma" because two distinct gamma regions were evident. At first this system was promoted as meeting the control requirements, requiring less chemistry. and being more stable. However with more testing, a significant increase in adjacency effects was noted which the interpreters and photo analysts felt was of intelligence value. This was one of the major factors which led to the adoption of viscous processing while the Dual Gamma concept then became of secondary interest. EK built and installed three viscous Yardley Processors at their BRIDGEHEAD processing facility. The Fultron was made by EK for viscous development and could be used for producing original negatives or duplicate positives. Several Fultrons were installed at EK, and one at AFSPPF in addition to a modified Trenton for viscous original processing. However, the Fultron proved to be troublesome to AFSPPF as it was dryer-limited and would come off-line for the least little problem. Although an original GAMBIT mission was successfully processed using the Fultron in January 1973, it was decided to replace it with a second viscous Trenton Processor in 1974. During 1973 the Dalton Processors at EK were modified from spray to viscous for duplication work. Three complete modification kits [redacted] were provided AFSPPF for their Daltons to enable viscous duplication. However, these modifications were never made due to the announced closure of the Facility. The kits were subsequently turned into the National Emergency Reserve (NER) in early 1975.

I. There have been numerous key personnel during the 16 year association with EK starting with Mr. E. Green, the first director of EK's satellite production laboratory and his successor, Mr. R. Koch. Other personnel who provided/coordinated support with AFSPPF were: Mr. D. Schoessler, [redacted] Mr. R. Stowe, [redacted] Mr. J. Alkofer, [redacted]

Houston Fearless (HF) Corporation/CinTel Corporation, Los Angeles, California

Houston Fearless whose name changed to CinTel in 1973 was the first major contractor to provide production equipment to AFSPPF. Most of the processing machinery used by the 8RTS Laboratory prior to the establishment of this Facility was manufactured by HF.

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

A. Due to the limited amount of time left to prepare for supporting the SAMOS Program, AFSPPF asked Houston Fearless to improve existing or develop new processors on a "crash basis." HF was awarded a contract in 1960 to design, manufacture, install, and evaluate a spray-type processor to reproduce imagery from the SAMOS system. In early 1961, HF installed their Model HTA-2 original negative immersion-type processor which was capable of processing at 30 feet per minute. Very shortly thereafter HF delivered their high speed (150 feet per minute) Model SP-120 Duplicate Processor designed specifically to handle 16mm and 35mm black and white film. In mid 1962, HF delivered and installed three HTA-4 medium speed processors. The HTA-4 was capable of developing by either the spray or immersion methods and could process film formats up to 9.5 inches. These machines were originally used as spray processors for original negative processing but were converted to duplicate reproduction processors in the latter part of 1963. This equipment was developed for use in the support of all SAMOS and the early CORONA missions. The key persons involved in these early negotiations were Mr. B. Henshaw from HF and Vice Commander Colonel F. Brown and Laboratory Officer-in-Charge Major C. Schmidt from AFSPPF.

B. HF was given a program to develop a precision spray machine capable of processing 70mm duplicate material up to 250 feet per minute in an effort to significantly increase the output per processor. This effort was successful as the EH-67 increased the processing speed from 40 - 50 feet per minute to 150 feet per minute with no loss in the production quality of the duplicate positive. A total of three processors were built. One went to Beale AFB and was used for special mission requirements while the other two came to AFSPPF. The two at AFSPPF were used from January 1966 to 1971 solely for the reproduction of CORONA requirements. This contractual period covered from June 1965 to January 1966 at a total cost of [redacted] The key individual from HF was Mr. S. Ayhens while Mr. G. Hunter represented AFSPPF.

C. As the mission production requirements increased with the addition of the GAMBIT Program, an investigation was started to develop a faster, higher quality, repeatable processor which could handle up to a 9.5 inch film format. In August 1967, HF was awarded a contract to build this type of high speed production machine. The resulting EH-75 Processor was unique for this time period as it was engineered with a turn around tracking feature using a liquid bearing which reduced the length of the machine to approximately 20 feet. It provided a high speed (150 - 200 feet per minute) dupe capability for mission operations and could hold a $\pm .01 \Delta D$ at a density level of 1.0 across a 9.5 inch film web. The high velocity impingement film dryer design used on the EH-75 is presently being utilized by EK on their CP^2 Color Processor. This contract ended in October 1969 at a cost of [redacted] The EH-75 was used operationally up through May 1972 to support CORONA, GAMBIT, and HEXAGON as well as Facility research and development projects up to 1974. The key people were Mr. S. Ayhens (HF) and Mr. G. Hunter (AFSPPF).

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NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

Valley Electric and Heating Company, East Longmeadow, Massachusetts

Valley Electric, as it was referred to by AFSPPF engineers, is a small, versatile non-union company which has worked on many Facility contracts related to the installation of equipment and building modifications. Headed by Mr. J. D'Arcy, Valley Electric has done outstanding work as a subcontractor in the areas of general construction, electrical systems, stainless steel piping, and equipment modifications mainly associated with new RD efforts. Major projects which Valley Electric supported were: (1) the modification of Building P-1875 to house the RD Directorate; (2) several modifications to Building P-1900 for vaulting of secure areas and the installation of an effluent collection system under contract with EK; (3) the modification of the vapor compression evaporators in the Industrial Waste Treatment Plant and the installation and modification of the Electrolytic Silver Recovery System both under contract with Food Machinery Corporation (FMC); and (4) the installation and modification of support equipment. The following presents more detail and background on some of Valley Electric's other work at the Facility:

A. In 1963, Valley Electric installed the first Trenton Photographic Spray Processor. This processor was designed to develop original negative film. The installation of this piece of equipment gave this Facility the capability to act as an alternate to the EK processing facility. In 1964, they installed three EK Dalton Photographic Spray Processors. These replaced the HF HTA-4 and the EK EH-18 Processors in performing high speed satellite mission imagery duplication. In 1968, Valley Electric installed the EK Fultron Photographic Spray Processor which provided this Facility with more capability to process original negative film. However, problems with the dryer and keeping this machine on-line resulted in its removal, and early in 1973 Valley Electric installed a second EK Trenton Processor. This Trenton Processor had a viscous development capability when it was installed, and the other Trenton was soon modified for viscous. This gave AFSPPF the same type of production equipment as EK.

B. Valley Electric was chosen to construct the intricate stainless steel piping network necessary to collect the water-borne waste photo chemicals from all sources within Buildings P-1900 and P-1875 and carry them to the holding tanks for later transfer to the Industrial Waste Treatment Plant. The system, designed by EK, and installed under their contract, has proven to be an excellent water pollution abatement program.

Valley Electric supported many other miscellaneous projects during the physical development of this organization. It dealt closely with both Logistics and Civil Engineering Directorate personnel. The only cumbersome problem was that of building access, at times it took as many as eight AFSPPF escorts a day to enable continuation of work projects. No Valley Electric personnel were ever given security

NRO APPROVED FOR RELEASE
31 July 2014

clearances. The man who stood out in all support work provided to this Facility was Valley Electric's Chief Foreman, [redacted]

Anderson-Nichols & Company, Boston, Massachusetts

Anderson-Nichols could rightfully be called the "Architects of AFSPPF" as during the years 1961 - 1973 they received contracts for the major construction modifications/additions to P-1900. They were briefed on the plant engineering requirements of the Facility and quickly gained insight as to what was needed to support our mission. Major design projects accomplished by Anderson-Nichols were:

1961 - Modification of P-1900. New cooling towers, mechanical rooms, and air conditioning units in the plenum.

1963 - Augmentation to the Modification of P-1900. Reconfigured walls in the lab, additional plenum, and mechanical equipment.

1966 - Phase III Modification. Upgraded Production Laboratory area, additional vaulted work areas, installation of Ion Exchange Silver Recovery System.

1968 - Electrical Emergency Power Plant Addition.

1972 - Water Storage and Pumping Facility.

Subcontractors for these projects included:

Hart Engineering Company, East Providence, Rhode Island

Valley Electric and Heating Company, East Longmeadow, Massachusetts

Hundreds Corporations, Wellesley Hills, Massachusetts

R. H. White Construction Corporation, Auburn, Massachusetts

Peabody Construction Corporation, Boston, Massachusetts

An engineer from Anderson-Nichols by the name of [redacted] was very instrumental in designing the air conditioning system and the facilities required to make AFSPPF a self-sufficient utilities organization. Key personnel from AFSPPF on these negotiations and plans were Major W. Clark and Chief Master Sergeant R. Travers, both from the Civil Engineering Directorate.

S & T Western, Incorporated, Long Beach, California

S & T Western designed and helped monitor the construction of the Industrial Waste Treatment Plant as part of a FY 71 Military Construction Program. This experimental prototype plant was built to take waterborne photo waste from the processors/chemical mix area and separate the chemicals concentrating them into a sludge which would then form into a solid state at room temperature. The Industrial Waste Treatment Plant met all design objectives. The physical construction was performed by the Hart Engineering Company. Among the key people involved in this project were [redacted] from S&T Western and Chief Master Sergeant R. Buckelew of AFSPPF.

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

- RESEARCH AND DEVELOPMENT SUPPORT -

These types of contracts were involved with those firms which built specific items of equipment to advance the state-of-the-art in all phases of aerial reconnaissance processing, printing, and imagery analysis.

Technical Operations (Tech Ops), Incorporated, Burlington, Massachusetts

Over the years Technical Operations has provided support to AFSPPF in three major areas: (1) consultant in the development of new image analysis techniques; (2) design and manufacture of a new state-of-the-art production microdensitometer; and (3) advanced printer and printing technology research.

A. In July 1965, Tech Ops was contracted to investigate the feasibility of using coherent radiation sources (lasers) to increase printing web velocities and resolution transfer. This effort was an extension of the early study which indicated that it was feasible to employ lasers for use in contact printers. The effort attained resolutions in excess of 200 lines/mm on duplication film using the printer breadboard apparatus. An EK Concord Printer was subsequently modified with a fixed beam exposing source which could optically fan a 70mm film format. The resulting duplicates were superior to the products obtained from the Concord using its conventional exposing source. In fact, experimental evidence demonstrated that the modified Concord Printer attained 380 - 400 lines/mm, which was greater than the published characteristics capability of the dupe stock, 8430. With this encouragement, it was decided to modify a Niagara Printer to test the use on 9.5 inch material. A large Argon laser and the necessary optics were acquired and mated to a Niagara. However, banding problems occurred which were apparently a result of the optics and coherent radiation. In 1972, a one year contract was initiated with Technology, Inc. to solve the coherence/banding problems but this company was also unable to isolate the cause(s). Due to coherence problems, it was determined that at this time laser printing would offer no definitive advantages for contact printing. The Tech Ops contract ended in September 1966 at a total cost of [redacted] The key personnel were [redacted] (Tech Ops), Lt R. Stenstrom (RADC), and Lt L. Spanberger (AFSPPF).

B. To advance the state-of-the-art in microdensitometry and provide a means of meeting the microdensitometry needs of future photographic systems, a contract was awarded in February 1971 to Tech Ops for research on an improved, linear microdensitometer.

This program was successful and led to a two-phase follow-on effort. In Phase I, Tech Ops and Cornell Aeronautical Laboratories (later renamed Calspan Corp) were awarded funds to prepare a detailed concept/design proposal for a New Generation Microdensitometer (NGM). Tech Ops won the competition and was given a contract for Phase II, the fabrication of two instruments. The use of microdensitometers as tools for objective measurement of image quality, camera performance, and process evaluation had significantly increased with the advent of the HEXAGON Program requirements in 1971. The optical

NRO APPROVED FOR RELEASE
31 July 2014

components of previous make and model microdensitometers were designed from a geometric standpoint with little consideration for diffraction and coherence problems. Study efforts indicated that much of the lack of repeatability was due to inattention to the diffraction theory and its application to microscope optics. The study further showed that the inability to establish and maintain focus throughout scans also contributed to lack of repeatability. The above problems with existing microdensitometers, coupled with an increasing demand for microdensitometric measurements, led to the development and fabrication of the NGM, also referred to as the Linear Microdensitometer (LMD). The NGM was designed to employ state-of-the-art electronics, optics, and data processing systems in addressing the stringent demands of a high volume mission data mensuration environment and meeting the advanced capability desired in a research laboratory instrument. Some of this machine's unique features include: (1) a Pneumatic Focus Control Servo System which was capable of setting and maintaining focus to ± .5 micrometers (in August 1972, this focus control system was modified and retrofitted to the existing Photometric Data Systems (PDS) Microdensitometers at AFSPPF); (2) capability of measuring both black and white and color material; (3) dual axis scanning to avoid moving the film platen to the desired orientation; (4) laser light sources; (5) automatic scan control and data collection by a NOVA 1230 Computer; (6) automated elements such as quality control monitoring, maintenance and optical alignment, scan data display, etc.; and (7) ability to scan either photo chips or film roll stock. These characteristics have all been demonstrated during the Acceptance/Test and Evaluation (T&E) phases. The first machine (SN-001) was delivered to AFSPPF in March 1975 for its operational T&E, while SN-002 was shipped to EK in April 1976. The total funding for these two systems including research and fabrication was [redacted] This project, which held wide community interest, terminated in September 1975. There were several personnel involved in the development of the NGM, the key people being Mr. J. Fallon and Mr. R. Larson (Tech Ops), Captain R. Hoffman (RADC), and Majors J. Johnson and M. Pollard (AFSPPF).

C. In May 1973, Tech Ops was awarded a one year contract for the amount of [redacted] to use the photoresist technology in establishing a method to transfer more image information from the original negatives to the duplicate. This contract was called Advanced Contact Printing Research and resulted in the development of a unique phase relief image transfer technique. Photoresist was coated on the original negative and an interferometric fringe pattern exposure was then applied to the photoresist coated side. A uniform exposure applied through the original negative selectively retarded the modulation of the fringe pattern resulting in a modulated phase relief image. After processing the photoresist, the phase image was replicated by either thermoplastic transfer layers or a paralene intermediate and then a thermoplastic replicate. Special off-axis viewers were used to view the images. This technique resulted in the achievement of high resolution transfer and good continuous tone properties superior to conventional duplicates. A follow-on program was proposed to improve the cosmetic quality of the image and demonstrate feasibility

NRO APPROVED FOR RELEASE
31 July 2014

on wider film formats; however, it was not approved due to lack of funds and the competition with other successful programs. The people who monitored this effort were [redacted] (AFAL), and Captain B. Britton (AFSPPF). The Tech Ops directors for this program were Mr. G. Reynolds and Mr. P. Mueller.

Perkin-Elmer (PE) Corporation, Norwalk, Connecticut

AFSPPF has had many associations with PE throughout their 16 year history. The most notable was the coordination of operational planning, Acceptance/Readiness testing, and analysis of the HEXAGON Camera System between the two organizations from May 1969 - June 1975. In the period from 1963 - 1966, much consultation was performed by Mr. M. Rosenau in the areas of image analysis methodology. Other projects resulted in the following contracts:

A. Perkin-Elmer performed a valuable research study on advanced contact printing between July 1968 and July 1969. The study proved the non-linearity of the contact printing process and provided valuable information for printer design. One of the basic findings of the study was that Niagara Printer losses are attributable to the granularity of the original/duplicate combination rather than the printer itself. This conclusion established the need for improved original materials and better duplicate films rather than immediate changes to the printing techniques themselves. The key personnel involved in this [redacted] program were Mr. W. Thiessen and Mr. R. Jones (PE), Mr. N. Julian (AFSPPF), and [redacted] (AFAL).

B. Perkin-Elmer was awarded a contract in November 1971 to design, construct, and install optics into a Niagara Printer to provide high resolution printing of Free-Radical print-out materials. The reason for this effort was the fact that duplicating film technology had advanced to the point where materials and systems were limiting factors in overall image quality. New non-conventional materials under development, such as dye type Free-Radical, were under evaluation as a possible means of increasing resolution retention in the duplication process. It was determined that a high resolution roll-to-roll printer capable of rates compatible with production requirements was required to fully evaluate the potential of the Free-Radical. A seven kilowatt Mercury-Xenon light source and a special optical system were installed in a Niagara Printer. The optical system was designed to: (1) pass only highly actinic light energy (matched to the spectral sensitivity of Free-Radical material), (2) reject non-actinic heat energy, and (3) collimate the light. The spectral characteristics of the reflector, dichroic mirrors, and the collimating optics were designed to deliver approximately two watts per square centimeter to the printing slit over the 350 to 510 nanometer spectral sensitivity range of the Free-Radical material.

This modified Niagara Printer was then evaluated. The evaluation resulted in the following conclusions: (1) The standard 3414 silver halide original negative (ON) could not withstand the heat at the exposures required for the Free-Radical duplicating material. This machine was also to be used to print Photo Horizons PH-500 material. The PH-500 material was projected to have a speed of 20 millijoules per

NRO APPROVED FOR RELEASE
31 July 2014

square centimeter (to produce a net density of 1.0) which required 5 to 10 times the amount of exposure. This meant that the printer had to be run at one-fifth to one-tenth the design speed (15 feet per minute) which would destroy the original negative 3414 Film Type. (2) When faster transport speeds were attempted a blurring of the standard tribar target prints occurred. It was felt that this problem was probably the result of outgassing of the iodoform in the Free-Radical coating during the ON to duplicate image transfer which caused separation of the films. (3) Miscellaneous problems were experienced with the thermal and the electrical control of the seven kilowatt lamp.

As the result of this effort, it was decided that brute force and high power exposure are no alternatives for production printing with insensitive duplication material. This contract ended in January 1974 at a total cost of [redacted] Mr. W. Roman (PE), Mr. N. Julian and Chief Master Sergeant V. Altenhein (AFSPPF), and [redacted] (AFAL) represented their organizations on this project.

C. In 1966, PE designed and built one of the first microcameras used at this Facility, and even though it was built for AFSPPF, it was purchased as an off-the-shelf piece of equipment. This device was a fixed-focus machine and was used for approximately six years in film evaluation work. In May 1974, a contract was let to design and fabricate two advanced capability microcameras to satisfy the research and development requirements at AFSPPF and the step-and-repeat automation requirement for production at EK. An innovative type of electro-pneumatic focus servo was developed to meet the precise focus position tolerance (± .1 micron) and to accommodate emulsions with variable thickness. The Zeiss Optics employed were the best available; thus this Advanced Microcamera System, as it is called, could be utilized primarily to evaluate the characteristics of the film as the optical degradation is minimized. The focus servo/optics combination produced resolution values on 3414 which demonstrated that this film was better at all contrasts than its published characteristics specifications stated. This instrument with its state-of-the-art control, optics, and automated features is far superior to any other microcamera ever built. The Advanced Microcamera System was delivered to the Materials Analysis Laboratory for operational T&E in August 1975. It is used to determine the resolution variables at different depths within the emulsion and is especially vital in working with the various layers of color film. It was also designed with an energy source intense enough to expose target patterns on non-conventional slow speed materials. The cost of the two microcameras was [redacted] Captain B. Britton and Mr. M. Worwood (AFSPPF), Mr. D. Groening (AFAL), and Mr. W. Roman (PE) were the key men on this program.

Houston Fearless (HF) Corporation/Cin Tel Corporation, Los Angeles, California

A. In July 1965, HF was given a contract to build a Controllable Development Processor (CDP) and to procure a similar unit from Canadian Applied Research Ltd (CARL). The objective of this program was to permit on-line controllable development of overexposed or underexposed original material during

NRO APPROVED FOR RELEASE
31 July 2014

mission processing.

Both processors had the capability for partially developing and scanning with infrared (IR) to determine the amount of development necessary for maximum information output from the original material. A total of five applications of heat shock allowed a theoretical speed shift of ± 2.5 stops. The concepts of continuous, controllable processing scanning; storing of density elements by a computer; and programming of processing development were pioneered through this program. These two units proved operationally impractical due to: (1) mechanical design problems, (2) the tendency of the heated bands used for heat shock in the CDP to degradate the film, and (3) the CARL which was built on an aircraft type frame was incapable of consistently tracking film. This contract terminated in July 1967 at a cost of approximately [redacted] The key personnel involved were [redacted] (HF), Mr. G. Hunter and Major C. Schmidt (AFSPPF), and [redacted] (ASD).

B. Houston Fearless proposed and was funded for the development of a high resolution printer (HRP-100) utilizing a transparent drum and a high intensity exposure plasma arc source. The machine was never considered acceptable for high quality printing at AFSPPF because: (1) it had a tendency to collect foreign particles on the glass drum, and (2) the lack of uniformity when using an arc source. The effort lasted from June 1963 to December 1968 and amounted to over [redacted] The HRP-100 was never used at AFSPPF, but two of its modified series (HRP-400s) were procured and operated at the 9RTS, Beale AFB and one at the 548RTS at Hickam, Hawaii for approximately five years. [redacted] (HF) and Mr. G. Hunter (AFSPPF) directed this development program.

C. In June 1968, HF developed a five-element, no-contact microwave film dryer for black and white and color materials in an attempt to solve the drying limitations of high speed, production processors. This was one of the initial efforts in the use of microwave energy for uniformly removing moisture from the emulsion so that the nonuniformities caused by conventional surface drying were reduced. This effort was successful, tested, and a uniform drying speed of 100 feet/minute was achieved. Microwave drying is presently being used commercially. The program lasted until February 1970 and cost [redacted] The primary personnel in this program were [redacted] (HF) and Mr. G. Hunter and Master Sergeant L. Miller (AFSPPF).

Kollmorgen Corporation, Newburgh, New York

It should be noted that these projects were negotiated with the MacBeth Division of Kollmorgen. The Kollmorgen Corporation purchased the MacBeth Corporation and made it a subsidiary division in September 1967.

A. The MacBeth Color Group of Kollmorgen was contracted to conduct research on transparent color film production techniques. They were asked to establish measurement techniques for determining

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NRO APPROVED FOR RELEASE
31 July 2014

color density specifications necessary for the production and control of color duplicates and provide a systems analysis of the color tone reproduction cycle to include process control standards. The contractor conducted an evaluation of existing equipment, methods of measurement and control, and color reproduction in the photographic duplication cycle and authored the following: (1) techniques based on existing or available equipment for densitometry, sensitometry, and colorimetry to improve the precision of color quality control; (2) methods and equipment characteristics necessary for exact color photographic duplication; and (3) techniques for maintaining maximum resolution in the duplicate while achieving optimum color balance, with particular attention to maintaining density differences of microimagery. This contract lasted from June 1970 to October 1971 and cost [redacted] The primary representation involved in this effort was by [redacted] (Kollmorgen), Mr. G. Myers and Major F. Lowe (AFSPPF), and [redacted] (AFAL).

B. In May 1972, the MacBeth Instrument Division was given a [redacted] one year contract to develop a stable color densitometer which provided the measurement capability for both wide band (Status A) and narrow band color densities in an automated system. An engineering model densitometer was modified to provide both Status A and narrow band filter densities, and the output made compatible with a standard teletype terminal for data display and input to a process control computer. This prototype system is called the TDA 1000. The TDA 1000 is a stable instrument which has become the primary densitometer used in the tone reproduction quality control system for reading both black and white and color materials. [redacted] (Kollmorgen), Major F. Lowe (AFSPPF), and [redacted] (AFAL) monitored this program.

C. In June 1972, MacBeth was given a [redacted] contract which ran until October 1973 to develop a KCS-18 Colorimeter capable of characterizing the transmission signatures of transparent color film samples. The instrument measures intensity in 20 narrow bands across the visible spectrum and provides the color coordinates to enable computation of the Commission Internationale de l'Eclairage (CIE) color values. This was the first successful development of a colorimeter for film use. This instrument has proven to be significantly faster and more accurate than a color densitometer. The KCS-18 has been used by the Materials Analysis Laboratory to calculate and verify all color reproduction work. Principal workers on this contract were [redacted] (MacBeth), Major F. Lowe (AFSPPF), and [redacted] (AFAL).

Taylor Instrument Company, Rochester, New York

A. In 1962 - 1964, Taylor Instruments designed and installed a complete system of environmental controls for the Production Laboratory. A control center was installed in Room 4 to enable centralized monitoring and control by the Facility civil engineers over the air conditioning, heating, air flow,

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NRO APPROVED FOR RELEASE
31 July 2014

temperature, humidity, pressure, and electrical support for the Clean Room areas. This system made up of intricate monitoring controls worked exceptionally well from its inception right up to the closure of the Facility. The key men from Taylor Instruments were the designer, [redacted] and the local representative, [redacted]

B. Taylor Instruments offered a complete line of sensors, monitors, and control devices. It was for this reason that they were selected to instrument the production processors for monitoring inputs to the Process Control System. The first contract was let in March 1972 to install an instrumentation package on Dalton #1. This package was designed to: (1) provide a more accurate and reliable means of monitoring the mechanical and chemical functions of the processor, (2) allow remote control of critical functions of the processor, and (3) give the operator the capability of physically monitoring and controlling all functions of the processor from a central location. This contract was successfully completed in three months. The first installation proved so successful that in May 1973 another contract was awarded to modify Dalton #2, Dalton #3, Trenton #1, and Trenton #2. However, this contract did not run as smoothly as the first with the major problem centering around personnel. During the first installation [redacted] the designing engineer, was responsible for supervising the installation of the Taylor equipment and debugging the processor. [redacted] was an extremely knowledgeable and dedicated individual who not only monitored the installation of this modification but carefully explained and trained the Facility's maintenance men on the intricacies of the system. During the second contract, [redacted] was transferred and a new inexperienced Chief Engineer was assigned. This, coupled with a slow and uninspired installation crew which had been hired through a local union hall, made the installation and troubleshooting of these modifications very time consuming. The installation was finally completed in late 1974; however, AFSPPF continued to experience many problems with the instrumentation. These problems necessitated many calls to Taylor and resulted in minimal cooperation from them. Finally, after the Facility threatened to refuse to accept the modification and to withhold payment for its installation, Taylor sent down a knowledgeable engineering team who were able to quickly resolve all major problems. Once this unique system was completely installed and "debugged," it proved a very valuable tool in automatically controlling the processors.

The success of this [redacted] program has to be centered around Staff Sergeant K. Shultz. He was the Air Force liaison during both installations and the maintenance man responsible for the instrumentation. In effect, Sergeant Shultz trained Taylor's installation crew and supervisor during the second contract period. Other key members of AFSPPF who were responsible for making the "Taylor Package" operational were Captains M. Riley and D. Sykes.

Fairchild Space and Defense Systems (FSDS), Long Island, New York

A. The Advanced Automatic Film Titling System (AAFTS) was developed by FSDS in November 1971.

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NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

The purpose of the AAFTS was to provide an automatic titling capability for roll films from 70mm to 9.5 inches in width and up to 1,000 feet in length. The system would operate under computer control and title at speeds of 100 feet/minute without damage or degradation to the original material. Material would be transported in a manual mode at speeds up to 500 feet/minute. Alphanumerics could be applied to the edge of the film in a single or dual line format in one of three character sizes. During development, certain adjustments were made and the specifications changed. The AAFTS, as delivered, could title up to 60 feet/minute and transport material at 300 feet/minute. Character heights were adjustable from .045 to .110 inch at rates from 10 to 20 per inch. Titling could be recorded outside the image area on either film edge and was properly positioned in the longitudinal direction via electronic sensing of frame marks or frame-leading edges. The system operated automatically or manually for single frame operation. Characters were formed by controlling the charge and deflection of liquid ink droplets ejected from a pressure nozzle, thus eliminating embossing and physical stress on the film.

Two of these systems were delivered to AFSPPF in late 1972. On 12 April 1973, one unit was shipped to EK to be used in the development of operating software. The AAFTS met or exceeded most specifications during the T&E phase; however, component reliability was inadequate. Efforts on the part of the manufacturer enabled the successful completion of the tests under laboratory conditions in March 1973. After the system was transferred to the production environment in May 1973, malfunctions of the hardware and software were constantly encountered. Ultimately, the systems were declared not operationally acceptable due mainly to inconsistent performance. The actual contract was terminated in December 1972 at a total cost of [redacted] Key personnel in the development and test of the AAFTS were [redacted] and [redacted] (FSDS), [redacted] (RADC), and Major F. Lowe (AFSPPF).

B. FSDS was awarded a contract in December 1971 to design and fabricate a continuous roll processor to evaluate heat-processed photographic non-conventional material. FSDS fabricated a large heat chamber, film transport, and associated control system which provided absolute temperature control and uniformity throughout the chamber to ± 1 degree Centigrade. This Free-Radical Heat Processor, as it was called, was configured to scrub the exhaust air to ensure removal of environmental contaminants. The machine was delivered in March 1973 and underwent extensive test and evaluation. The Air Force Environmental Health Laboratory performed an evaluation of the work area and ambient environment at AFSPPF to ensure compliance with operational safety standards. In all cases, the system was certified to be safe. The contract was completed in May 1973 at a cost of [redacted] This instrument was shipped to the [redacted] in the spring of 1976 where it will be used to process and evaluate non-conventional materials. The project monitors and engineers on this program were [redacted] (FSDS), Captain M. Riley (AFSPPF), and [redacted] (AFAL).

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

C. In June 1973, FSDS undertook a one year contract to develop an exposure control technique for processing density histograms of original material and determining the properly weighted exposure to minimize the impact of non-informational imaged areas, i.e., clouds, water, snow, etc. The results of an AIL effort to develop a high speed densitometer which could scan the ON and provide printing instructions for reproduction indicated that it was feasible to automatically make density measurements, if the instrument were programmed to discriminate between informational and non-informational imaged areas. If these two categories could not be properly recognized by the computer it would result in poor printing instructions. FSDS developed a statistical technique which considered a density histogram of the target imagery and accurately estimated, by analyzing skew, the average density of the intelligence bearing information. From the average density, one could compute accurate minimum and maximum densities; the required input for printing instructions. This algorithm was tested manually using the output histogram of the AIL Scanning Densitometer for input data to the algorithm. The results demonstrated the feasibility of generating automatic print instructions. This contract cost [redacted] and was monitored by [redacted] and [redacted] from FSDS and Major J. Johnson and Chief Master Sergeant V. Altenhein from AFSPPF.

Food Machinery Corporation (FMC), Santa Clara, California

A. The handling of the projected quantities of duplicate film required for the operational 6.6 inch HEXAGON missions posed serious logistics problems within AFSPPF. The processing capability was adequate to attain the predicted photo reproduction footage requirements, but the sheer volume of material to be handled and transported from the Production Laboratory area to Shipping posed security problems. Therefore in June 1968 a contract was let to FMC to perform a study on the entire handling problem from quality assurance to sorting, packing, and shipping. The following actions resulted:

The problem of moving the product from the Final Inspection Section was solved by the installation of a belt conveyor running through a concrete tunnel which carried the product to the Shipping area. In Shipping, the material was stored in a special feed rack according to can content. A color code system was developed to identify reproduction generations and expedite handling. The specific rolls for a particular customer were then selected and packaged.

Special racks and storage inventories were developed for chemical storage, both in the warehouse and in Building P-1900, to permit fork-lift handling of the photo chemicals. Special acid storage, handling, and metering systems were also developed for accuracy and safety.

The incinerator utilized for the classified disposal of film and the recovery of silver operated satisfactorily but had several drawbacks. The mulcher operated at noise levels in excess of 140 decibels and the temperature in the room during an operation could reach as high as 150 degrees Fahrenheit. The operator feeding the mulcher was also exposed to physical danger due to the possibility of a missile

NRO APPROVED FOR RELEASE
31 July 2014

"kickback." FMC solved this by designing an insulated enclosure with a feed conveyor. Upon completion of this modification the noise level was reduced to 80 decibels and the temperature to approximately 75 degrees Fahrenheit, while the operator no longer had to work under the unsafe conditions of a "kickback" now that film could be fed by the conveyor. This effort lasted through December 1971 and cost [redacted] The key personnel involved were [redacted] (FMC), [redacted] (RADC), and Lt Colonel M. Trout and Mr. G. Hunter (AFSPPF).

B. FMC designed a completely automated Batch System which could take the input parameters for a specific mix of photochemicals and then automatically control the quantity, sequence, temperature, and mix time from the preloaded storage hoppers through the weigh feeders. Large batches of accurately proportioned chemistry could be prepared at any time during a mission, eliminating lost batches due to an incorrect human measurement. This equipment was successfully used at AFSPPF from 1970 until its transfer with the Production Directorate function in October 1976. The cost of the contract was [redacted] and the major people involved were [redacted] (FMC), [redacted] (RADC), and Captain W. Neyman and Mr. G. Hunter (AFSPPF).

C. A continuous flow Electrolytic Silver Recovery and Hypo Conservation System was specifically developed by FMC for AFSPPF. This system consisted of four subsystems: (1) electrolytic silver recovery, (2) hypo storage and distribution, (3) hypo collection and return, and (4) hypo rejection and replenishment. Prior to this system, waste hypo was processed for silver recovery in steel wool cartridges and then dumped into the Base storm drains. Under the old system, the hypo could be used only once, the silver was contaminated, and local streams were being polluted. However, the Electrolytic Silver Recovery and Hypo Conservation System permitted the hypo to be constantly recycled which resulted in a 4 ton a day chemical reduction in new hypo based on a 24 hour processing cycle. This system is capable of recovering silver and recycling hypo from 250,000 feet of 9.5 inch dupe stock within a 24 hour period. The operation of this system resulted in an 81% savings (machines, personnel, chemistry, recovered silver, maintenance, etc.) over the previous mode of operation. The system will be transferred to the 544 ARTW with the Production function. [redacted] (FMC), Major W. Clark, Mr. G. Hunter, and Sergeant R. Denison (AFSPPF), and [redacted] (RADC) supervised this [redacted] contract which ran from July 1970 to March 1972.

D. The Vacuum Film Dryer was designed and built by FMC. This machine, which demonstrated the capability of drying 70mm dupe stock at speeds in excess of 300 feet/minute, consisted of a vacuum chamber with two 3 foot steam heated drums about which the 70mm film was wrapped (emulsion up). The film entered and exited the vacuum chamber through a special no-leak vacuum gate. The heat applied to the film base caused the water to uniformly vaporize and then be drawn away by the vacuum. As the heat was supplied through the base to the emulsion, the latent heat of vaporization caused the emulsion to remain cool and dry. The film wet-to-dry path was 72 inches as opposed to hundreds of feet for conventional

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31 July 2014

dryers. With the cancellation of the CORONA Program, the requirement to process/dry large quantities of 70mm film ceased. The machine was stored in a Facility warehouse and was then scrapped as no organization could make use of its capability. This program lasted from November 1968 to February 1970 and cost [redacted] The key personnel who monitored this project were [redacted] (FMC), Captain W. Neyman, Mr. G. Hunter, and Technical Sergeant D. Blair (AFSPPF), and [redacted] (ASD).

E. As part of a long range research effort in pollution abatement, FMC was given a contract in July 1969 to design a closed-loop system to eliminate the release of pollutants at AFSPPF. As a result, a complete system was developed which took the liquid photowaste and concentrated it into a solid form by vapor compressor evaporators and kettle dryers. The solid bulk chemical concentrate was then transported to an approved site for final disposal. All wash water used in photo production was purified by reverse osmosis units. Construction and use of the Industrial Waste Treatment Facility enabled AFSPPF to meet the stringent requirements for pollution set by the Environmental Protection Agency (EPA). This FMC effort which included plant start-up, testing, and maintenance consultation was completed in May 1976 and cost [redacted] Numerous people were involved in developing this antipollution facility. [redacted] and [redacted] (FMC); Mr. G. Hunter, Lt Colonel R. McLaughlin, Chief Master Sergeant R. Buckelew, and Master Sergeant R. Denison (AFSPPF); and [redacted] (AFAL) were the major contributors.

Energy Conversion Devices (ECD) Incorporated, Troy, Michigan

In February 1975 a one year contract was awarded to Energy Conversion Devices for the development of a non-conventional photographic material. This unusual new type of material is a proprietary development of ECD. Their technology offers great potential for making an improved duplicating film that would be dry processed (thermal); offers excellent latent and developed image stability; achieves high image quality; and exhibits excellent mechanical stability. This contract was for research and application to the performance requirements of a high resolution duplicating material. The funding for this effort is [redacted] and the key personnel are [redacted] (ECD) and Major J. Johnson (AFSPPF).

AIL Information Systems, Los Angeles, California

A. The Semiautomatic Densitometric Control System (SDCS) was designed and manufactured by AIL Information Systems and was delivered to AFSPPF in February 1971. A combined effort of T&E, hardware and software modification, and data analysis extended through May 1972. This initial evaluation indicated the system did not discriminate against unwanted density information. A second contract was let to upgrade the software system. The completed system was returned to AFSPPF in May 1975. The scope of this program was to evaluate the feasibility of determining the exposure required to produce acceptable duplicate positives from rolls of original negative material. More specifically, the second contract was to determine

NRO APPROVED FOR RELEASE
31 July 2014

the effects of non-informational areas (clouds, water, snow, etc.) on the histogram of density distribution extracted from the original. AIL purchased an algorithm from FSDS which when implemented into the machine software was to provide computer analysis of the collected density data and then apply the corrective bias to the density data results. The SDCS would then have the capability to automatically scan full rolls of original negative material and arrive at optimum printing instructions for each frame and a best average instruction for each roll. Unfortunately, large errors were prevalent in the output after implementation of the algorithm. Much of this problem was eliminated by producing new software for the Facility's IBM 360 Computer System which relegated the SDCS to simply a collection device. This machine has always proved to be an accurate and precise scanning densitometer.

Up to this date the value of the SDCS was of an indirect nature. It has, however, provided a more definitive understanding of photographic density and its distribution within a variety of image categories and a better insight into density data handling. Basically, it has demonstrated the feasibility of automated densitometry. The Semiautomatic Densitometric Control System was shipped to [redacted] where further study will continue and applications developed. This effort lasted from August 1969 to May 1975 at a total cost of [redacted] Key personnel were [redacted] (AIL), Major J. Johnson and Chief Master Sergeant V. Altenhein (AFSPPF), and [redacted] (ASD).

B. AIL was contracted in July 1970 to evaluate the feasibility of utilizing the air gate principle for continuous roll contact printing of materials up to 9.5 inches wide. A breadboard was designed and constructed to demonstrate the feasibility of a developmental model which would retain maximum ON image resolution in the duplicate positive copy. The design included: (1) automatic frame-by-frame exposure control of the variable length frames which occur within individual rolls of original imagery, and (2) printing speeds of 50, 100, and 150 feet/minute. Breadboard equipment failures caused a termination of the T&E in March 1972 before final proof of whether a developmental model could perform to these design specifications. Subsequently, CCB approval was granted for an air gate developmental model program. This contract was awarded in July 1974 for the design and construction of an Advanced Model Air Gate Printer. At the time of RD relocation, T&E of the Air Gate Printer was under way. Preliminary results indicate that performance is essentially equivalent to a Redondo Printer. This printer was sent to [redacted] where further T&E and investigations are planned using high resolution targets and operational imagery on developmental materials. The second contract lasted until December 1975. The total cost of these two efforts was [redacted] The key personnel were [redacted] (AIL), Mr. N. Julian and Major J. Johnson (AFSPPF), and [redacted] (AFAL).

Minnesota Mining & Manufacturing Company (3M), St. Paul, Minnesota

A. The 3M Company developed a new completely dry photographic film and called it 3M Type 784SP Dry

NRO APPROVED FOR RELEASE
31 July 2014

Silver Microfilm. They proposed the use of this non-conventional material in overhead reconnaissance to the National Photographic Interpretation Center (NPIC) in 1970. The 3M Company stressed that this material had the following potential advantages over conventional film processing: (1) simplified processing, particularly freedom from the need for wet chemistry and a supply of fresh water; (2) logistics involved with wet chemistry supply; and (3) wet chemistry disposal. Dry Silver was a film with its processing chemistry built into the coating; this chemistry required a temperature of approximately 260 degrees Fahrenheit to activate development. For these reasons a contract was given to 3M first by NPIC and then by AFSPPF in January 1972 to support test runs on different formulations of the 784 Dry Silver Microfilm in an attempt to develop a high quality duplication material.

Tests and evaluation were conducted on three 1,000 square yard lots of material using a roll-to-roll system. A drum-type Niagara Printer was modified by 3M and AFSPPF engineers with a Gallium-doped Mercury-arc lamp spectrally matched (420 nanometers) to the Dry Silver. A 3M portable heat processor with a capability of providing controllable temperatures and dwell times versus film transport speeds was used. The T&E resulted in unexpected variations in resolution and sensitometry for a fixed processing temperature, where path length and transport speeds were varied to give a fixed dwell time product. Further experiments confirmed that this effect was related to the thermal gradient (rate of film temperature rise) as the exposed material entered the heat chamber of the processor. Heat processed material was also found to be affected by exposure to a standard light table environment. An image color transmission shift from dark blue-black to reddish brown was observed. Contrast and related exposure latitude were found to be correctable by rebalancing of the formulation silver to binder ratio. In the third lot where this ratio was readjusted, degradations were experienced on the pilot coater. The coater became loaded by the heavier viscous formulation, resulting in a difference in coating weight, streaking, and large density variations. Resolution tests, using low contrast tribar targets, showed that this type Dry Silver was within ± one target group of SO-192 at levels of 200 to 275 lines/mm on the 3414 target masters.

This contractual effort ran until March 1975 when it was terminated. There was no further follow-on work because of the problems of getting access (priority) to the pilot coating plant and the lack of 3M interest in performing additional evaluation and analysis support unless they received a substantial order for this product. This three year effort cost approximately [redacted] The personnel involved were [redacted] (3M), [redacted] (AFAL) [redacted] (NPIC), and Mr. N. Julian and Sergeant V. Altenhein (AFSPPF).

B. The 3M Company developed and fabricated two generations of heat processors for their Dry Silver product. AFSPPF provided engineering direction and conducted the T&E program for these generations of machines. The Improved High Capacity Processor incorporated a heated aluminum drum designed to rapidly preheat the film materials by direct contact, thus providing higher processing rates in a short heat

NRO APPROVED FOR RELEASE
31 July 2014

path. Processing rates in excess of 100 feet/minute were demonstrated. However, problems were encountered with uniformity of the heat processing, especially the cyclic variations in the developed density along the processed product. These variations occurred in cycles of a one drum circumference, leading to the conclusion that there were thermal gradients on the drum surface and/or that film thermal contact varied cyclicly. This problem was never resolved and both machines were stored at AFSPPF. These machines were declared excess and probably will be scrapped because there is no community requirement for their use at this time. This contractor was involved with AFSPPF from June 1970 to June 1974 although no AFSPPF funding was used. [redacted] from 3M and Mr. N. Julian from AFSPPF were the key men on this project.

Dymat International Corporation, Santa Monica, California

A. Based on studies performed by the Color Task Force in the period from 1969 to 1973, the NRO decided not to include large flight loads of color type films in satellite reconnaissance missions. The NRO did, however, direct the GAMBIT and HEXAGON Program Offices to continue flying small segments of color materials in an effort to improve the full color capability cycle (new/improved color film, chemistry, processing equipment and techniques; exploitation application; and optimizing a color duplication method). The first factor that AFSPPF addressed was the development of a production model spray type color processor. Much of this work was done in parallel with the same type of requirements being pursued by Eastman Kodak research and development efforts.

A contract was let to Dymat in August 1970, mainly for the services of Dr. R. Goldberg, to research the feasibility of processing color film mission requirements at faster speeds utilizing spray instead of the immersion method. The EH-75 Spray Processor was modified for color chemistry so that the original and duplicate color films could be spray processed in three steps: (1) black and white develop, (2) color develop, and (3) bleach and dry. The work between Dymat and the Facility's RD personnel resulted in demonstrating color processing at 125 feet/minute and the design of a full scale high speed processor. However, this processor was never built as the CCB directed that an EK developed machine (significantly slower speed) be manufactured. The EH-75 was disassembled and sent to EK for the use of some of its features/parts. The contract lasted until February 1971 and cost [redacted] The key personnel involved were Dr. R. Goldberg (Dymat), Mr. G. Hunter (AFSPPF), and [redacted] (ASD).

B. Next AFSPPF started work on improving the quality and amount of information being extracted from color imagery. In August 1970, Dymat worked on developing a Silver-Color Process for AFSPPF which would improve the information content of aerial imagery in an effort to equal the resolution attained from black and white film. Unfortunately, the multilayer construction of color films introduces losses which lower the resolution of the color original and duplicate. Up to this time, the standard procedure

NRO APPROVED FOR RELEASE
31 July 2014

had been to make a black and white duplicate of the green or top layer of a color scene/target to obtain the maximum information. The rationale based on numerous studies was that the top layer, due to its location and emulsion characteristics, has the greatest resolution. Lt General Lew Allen (SAF/SP-1, Director) commented at a briefing at AFSPPF, "that maximum color information was present in the silver halide of the top layer, if it could only be exploited!" The process is the direct result of that postulate. Silver-Color makes use of the silver present in the top layer of color film to enhance its resolution capabilities as well as to increase the transfer of information into the color duplicate. Initial research work on the Silver-Color Program was done by hand in laboratory beakers, but as the program progressed, a Facility developed "3211" Color Processor (combined 1811 and 1411 Versamat machines) was used so that processing parameters could be varied for optimizing the results. The major changes from the standard EK color process were: (1) the negative silver produced by the first developer is removed by a dichromate bleach; and (2) the positive silver produced is rehalogenated and precisely developed in the top layer to subtly enhance the resolution of the imagery. The silver is extremely fine grained and is introduced in direct proportion to the top layer density.

Two operational comparisons were made between Silver-Color and the best standard color process. In both tests, a subjective comparison in terms of ground resolved distances from the original and duplicate Silver-Color reproductions was better than the original and duplicate produced by the EA-5 standard process. These comparisons were made by 12 photo analysts from NPIC. After much negotiation, the specifications of the Silver-Color Process developed by Dr. Goldberg and Mr. Hunter were given to EK to evaluate and make further tests and comparisons. The future of Silver-Color lies in the hands of the CCB/NRO who, based on the final findings from the studies at EK, will determine whether this process will be used for mission production. This contract ran up through January 1974 and cost [redacted]

Baird-Atomic, Incorporated, Bedford, Massachusetts

In 1968, AFSPPF investigated the possibilities of providing chip or selective area prints versus continuous roll reproductions of the full coverage to the intelligence community. The major question centered around how to produce high quality chips, as the photo interpretation analysts would not accept inferior quality just to reduce volume. Consultations with Mr. W. Miller of Miller-Holzworth, Incorporated, Salem, Ohio led to the idea of a step and repeat printer with an air bladder pressure platen and a highly collimated light source. Mr. Miller felt the chip requirements could be met by successive exposures produced in registration for any length chip. Miller-Holzworth did not make such a printer but recommended Baird-Atomic, Incorporated.

In 1969, a contract was let to Baird-Atomic to develop the step and repeat High Resolution Printer (HRP). The cost of this contract was [redacted] The printer was delivered to AFSPPF in September 1971

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31 July 2014

for test and evaluation. However, by this time, the chip concept was determined inadequate by the United States Intelligence Board (USIB), and although successfully meeting the design and operational specifications the HRP project was cancelled.

In 1974, a new application arose for the HRP concept. The Automatic Composite Step and Repeat (ACSAR) Printer was developed to meet this requirement of compositing multiple copies from the black and white ON without slitting, collating, and transporting the original material through a roll-to-roll printer numerous times. A contract was given to Baird-Atomic in September 1974 to design, construct, and demonstrate the operation of a developmental model of an ACSAR Printer. To fully meet this requirement, the decision was made to add the following subsystems to the HRP: (1) Frame Mark/Code Reader; (2) Frame Length Servo, (3) Flash Detection, (4) Automatic Operation. Basically, the Automatic Operation System is comprised of a PDP-11/05 Minicomputer which receives operational input instructions from the Frame Mark/Code Reader System and feeds the operational parameters to the printer. The film inputs (four ON rolls sequentially spliced together) are programmed through the computer to automatically recomposite the imagery in the desired frame-by-frame order onto a single duplicate positive roll. The printer operated at speeds of 60 exposures/minute. The capabilities of this printer were briefed to the KENNEN Program Office and resulted in the purchase of three instruments to satisfy program requirements. The developmental model of the ACSAR Printer will be shipped to [redacted] where it will be utilized as a test bed for future application efforts.

[redacted] (Baird-Atomic), Lt Colonel L. Butt and Mr. N. Julian (AFSPPF), and [redacted] (AFAL) supervised and monitored this [redacted] program which ran through February 1975.

Itek Corporation, Lexington, Massachusetts

A. Itek received a contract called Objective Photo Quality Measurement in May 1971. The purpose of this study was to determine objective mensuration/data collection methods for quantitatively evaluating the quality of duplicate images which correlate well with subjectively determined quality of the same imagery. The contractor performed both objective and subjective experimental correlative analyses using controlled simulated aerial photography from their Ground Model Facility. Itek developed a unique multi-dimensional scaling technique to account for the non-linearities of the photointerpreters' subjective rankings. The basic objective mensuration was made by microdensitometry at Itek. Some of the techniques employed using microdensitometry were edge slope gradient, acuteness, and power spectrum analysis. The best objective/subjective correlate was edge slope. This research program provided valuable insights into the nature of the psychophysical variables involved in subjective ratings. As a result of this work AFSPPF did an extensive evaluation into the use of edge slope as a film quality measure. The Facility found that although

NRO APPROVED FOR RELEASE
31 July 2014

there was a correlation between objective and subjective values on laboratory controlled imagery with the same contrast and density levels, that this technique had no application to operational mission imagery with its many variations in quality. The contract ended in November 1972 and cost a total of [redacted] Mr. W. Attaya (Itek), Mr. G. Myers and Captain E. Wallace (AFSPPF), and Captain R. Hoffman (RADC) were the major contributors and monitors of this program.

B. Because of the need for calibrated, high resolution scene photography for use in research and development and the T&E of printers and duplication materials at AFSPPF, a contract was let to Itek in October 1974 to furnish the Facility high resolution photography of composite simulated scenes and resolution targets from their Ground Model Facility. This one year [redacted] contract called for photography on Government furnished 70mm 3414 Film which consisted of a matrix of exposure conditions, two relative haze conditions, and two sun angles. The scene imagery included buildings, houses, cars, trucks, railroad tracks, trains, runways, modern type aircraft, and highways. The supervisors of this program were [redacted] (Itek) and Captain B. Britton (AFSPPF).

Horizons Incorporated (HI), Cleveland, Ohio

In October 1964, AFSPPF embarked on their first contract with HI to find a high resolution non-conventional duplication material which would: (1) reduce the use of silver, and (2) eliminate the conventional develop/fix/wash/dry sequence and its associated logistics and pollution problems. In the early stages of this effort, AFSPPF dealt with HI, but in August 1970, a special division was set up to handle the photographic RD work to be accomplished by this company. This subsidiary was called Photo Horizons.

Horizons' non-conventional product was known as Free-Radical. This material had a dye-molecular image structure with the photosensitive component Iodoform. To fix the image, the Iodoform was eliminated by a one-to-two minute exposure to a 160 degree Centigrade heat source. Many different combinations of Free-Radical coatings were formulated, tested, and evaluated. However, too many problems were encountered, i.e., shelf-life, image archival quality, image color neutrality, small exposure latitude for high resolution transfer, etc. Although many of these types of problems were resolved, others were not and would have required additional funding for more intensive research into the whole Free-Radical mechanism. It was decided by the CCB that Free-Radical material was not economically nor practically feasible for use as a duplication stock for the reproduction of high quality reconnaissance photography. So this effort, which was closely coordinated between the NRO (Koch, [redacted] Owens), CIA [redacted] AFAL [redacted] AFSPPF (Battey/Neyman/Julian), and Horizons [redacted] was discontinued in December 1974 after 10 years of research, test, and evaluation at the Facility funded cost of [redacted]

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

SECTION III

EQUIPMENT

The capabilities and limitations of major equipment have always been key factors affecting mission accomplishment. During the life of the Facility, operational equipment in support of the processing/duplication and image evaluation tasks has dramatically improved by all qualitative standards.

These improvements were made possible by the close interaction between the Research and Development Directorate and the operational directorates tasked with image evaluation and photographic production. In most cases, the RD efforts in developing hardware were in direct response to the mission support requirements of this Facility. Because of this relationship, the Facility provided a unique operational environment to test and evaluate new items of equipment, and consequently was the first Government organization to receive and utilize state-of-the-art hardware.

There were other cases where AFSPPF was asked to pursue certain concepts and designs by direction of the National Reconnaissance Office (NRO) and/or the Configuration Control Board (CCB). An example of this was the Optical Power Spectrum Analyzer (OPSA). [redacted] with EIKONIX Corporation for a piece of hardware which could measure the quality of film through spectral analysis. The effort was prompted by the need for a new objective technique to evaluate the system performance of the HEXAGON camera. There were other machines available which could measure by spectral analysis, i.e., the Recognition Systems Incorporated (RSI) instrument called the Research Optical Spectrum Analyzer (ROSA). However, the ROSA was evaluated by analysts at the National Photographic Interpretation Center (NPIC) and found to be inadequate for system assessment because of low dynamic range and a design more suited for the laboratory than for operational use. The OPSA machine was designed and manufactured by EIKONIX at a cost of [redacted] and was delivered to AFSPPF on 22 May 1972 for T&E. The unique features of the OPSA were the helium-neon laser light source; special structure for operational roll film handling; built-in NOVA 1200 Computer for data recording, system monitoring, and control; and the inclusion in system software of routines for training, maintenance, and diagnostics. The development of this machine was supervised by Mr. J. Finley, engineered by Mr. J. Poles and Mr. R. Whitney, and the optical transform system designed by Mr. P. Considine. The RD coordinator at AFSPPF was Captain E. Wallace and the operational monitor from the Evaluation Directorate was Captain J. Lopez. This prototype instrument was sent back to EIKONIX for upgrading in March 1974 and then to NPIC for further study and application to system performance analysis. The findings were favorable and resulted in the purchase of two improved models of the EIKONIX Optical Power Spectrum Analyzer for work at EK and application to the new reconnaissance system at the [redacted]

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

The evolution of various types of equipment (printers, processors, titlers, microanalyzers, etc.) has been discussed/described in other sections of Volumes I and II. For example, the history of the most significant processors used or tested/developed/modified at AFSPPF included the Trenton (1963 - 1976), Fultron (1970 - 1973), Dundee (1971 - 1974), all used for ON processing; and the SP-120s (1961 - 1962), Cadillac (1962 - 1964), Daltons (1964 - 1976), Versamats (1965 - 1976), EH-67 (1967 - 1973), EH-75 (1968 - 1974), 1411 Color Versamat (1966 - 1969), 1811 Color Versamat (1969 - 1976), and Electro-Color Processor (1968 - 1971) used in the duplicating process. The degrees of acceptance achieved by these processors varied from uselessness to immense success. However, it should be noted that even though some were failures that the experience and technology gained through the development of these machines made the expenditure of time and money worthwhile. From the early 1960s up to Facility closure, it has been primarily the work of AFSPPF maintenance/logistics personnel which has resulted in the successful implementation/reconfiguration and daily maintenance of the operational equipment which enabled this Facility to meet its expanding mission requirements. The Photo and Electronic maintenance personnel worked closely with the Research and Development, Evaluation, and Production Directorates in servicing and calibrating their precision mission equipment. In cases of severe technological problems these maintenance men would coordinate with the original contract manufacturer, in particular, maintenance people and engineers from EK and technicians from Valley Electric. As testimony to their expertise and abilities in the 16 years of operation, AFSPPF was never delayed in mission production by equipment failures or lack of supplies/parts.

Because equipment evolution has been traced elsewhere in this history, Section III will consist primarily of equipment listings. These listings will be broken down by their respective functional areas and include the following information: (1) Stock Numbers, (2) Equipment description (parts number, model number, and manufacturer), (3) Unit and Total Costs, (4) Accountability (EMO Equipment, Base-owned; Facility Equipment, AFSPPF-owned), (5) Total Pieces of Equipment, (6) Accountability Code Identifier and Function, and (7) Listing Date. The listings are the inventory of on-hand items as of 30 May 1975 and depict the Facility's peak equipment capability to support photo production, image evaluation, and research and development.

The legend for the accountability codes printed at the top of each inventory listing is:

Account Code	Directorate	Functional Areas	Figure No.	Page Nos.
A	PD	Operations, Chem Mix, Photo Lab	3-1	3-5 - 3-9
B	LG	Logistics	3-2	3-10
C	PD	Select Print Lab	3-3	3-11 - 3-14
D	LG	Photo Maintenance	3-4	3-15

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

Account Code	Directorate	Functional Areas	Figure No.	Page Nos.
E	DA	AFSPPF Administration	3-5	3-16
F	EV	Analysis, Reports, Data Processing[1]	3-6	3-17 - 3-19
G	RD	Research	3-7	3-20 - 3-22
H	SA	Shipping	3-8	3-23
I	DE	Refrigeration/Air Conditioning	3-9	3-24 - 3-25
J	RD	T&E, Development Engineering	3-10	3-26 - 3-28
K	LG	Electronic Maintenance	3-11	3-29 - 3-30
L	SA	Special Activities	3-12	3-31
M		- No Account Assigned -		
N	PD	Materials Analysis Lab	3-13	3-32 - 3-34
O	PD	Quality Assurance	3-14	3-35 - 3-37
P	SA	Communications[2]	3-15	3-38
Q	DE	DE Administration	3-16	3-39
R	DE	Electric Power	3-17	3-40
S	LG	Supply	3-18	3-41
T	DE	Water & Waste	3-19	3-42
U	DE	Utilities	3-20	3-43 - 3-44
V&W		- No Accounts Assigned -		
X	LG	Warehouse Stock	3-21	3-45
Y	LG	Temporary Loan	3-22	3-46

NOTES: [1] Does not include Computer systems.
[2] Does not include specific Communications receiving/transmitting equipment.

The Facility was directed by Air Force regulations and the DPI 6399 Equipment Management Section (DONDSB), Sunnyvale AFS California to submit information on the status and utilization of the Automatic Data Processing Equipment (ADPE) assigned to AFSPPF. The Data Division was also referred to as DPI Operating Location "Q" (OL - "Q") to the uncleared equipment management people at DONDSB. To fully account and manage the equipment, cost, and utilization, the Data Division designed several types of reports on the different computer systems, components, and associated support equipment. The frequency of these reports varied from monthly (Utilization and Verification of Service Report) to a Semi-annual Physical Inventory Report IAW AFM 171-9, Chapter 2. These reports were not only useful as a daily management tool but were also the main reference in making in-house evaluations of AFSPPF's data

NRO APPROVED FOR RELEASE
31 July 2014

processing capability. The following are examples of some of these printouts: (1) Figure 3-23 is a copy of the Equipment Inventory Report which presents the complete inventory, as of 15 April 1974, of the PCAM Equipment, IBM 360/40, IBM 1130, IBM 1800, and IBM System 7; (2) Figure 3-24 on pages 3-61 thru 3-64 is a copy of the Monthly Inventory Report (as of 3 June 1975) which covers a complete listing of the last production computer system in the Facility, the PDP-11/40; (3) Figure 3-25 on pages 3-65 thru 3-69 is a copy of the Report on System Utilization as of June 1975, this monthly data gave a complete breakdown of computer hours spent on different mission requirements and support; (4) Figure 3-26 on pages 3-70 thru 3-73 shows an example of an Equipment Cost Accounting Report as of 1 July 1975; (5) A plotted graphic method was also used to display computer utilization over the previous 18 months, see Figure 3-27. This example covers the period from November 1973 thru April 1975. The three charted lines represent system utilization, periodic maintenance (P.M.), and unscheduled maintenance (U.M.).

The following is a summary of the disposition of the major pieces of this equipment: (1) Code F items were shipped to NPIC with the Evaluation Function transfer in July/August 1975; (2) Codes A and O items were shipped starting in May 1976 to Offutt AFB for use in the Production function at their new operating location with the 544th Aerospace Reconnaissance Technical Wing (ARTW). Equipment will continue to be shipped up to the full operational capability date at ARTW in November 1976; (3) Accounts G and J items were shipped starting in April 1976 to RD's new operating location at CIA's Image Technology Division in Washington DC. RD will complete their movement of equipment by December 1976; (4) Account N items will be shipped to DIA/Technology Division (DC-6) in the fall of 1976 where this agency is planning to establish a new standards laboratory; and (5) Code C and the Technical Reports Division of Account F items are programmed for shipment to Los Angeles Air Force Station in December 1976 where SAFSP plans to start a small graphics and printing plant. Most of the other major pieces of equipment will be disguised and left as fixed property to Building P-1900, turned back to the Air Force/community as excess, or scrapped to salvage certain parts/components for other development efforts.

The equipment in the National Emergency Reserve (NER) will be shipped to [redacted] in the fall of 1976.

NRO APPROVED FOR RELEASE
31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE A – PRODUCTION

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3540L000043	SEALER HEAT VENTRCO MDL-15MGCR	[redacted]	0	1	1	[redacted]
3694L003030	SHOWER AIR PORTABLE MDL-347 LAMINAIRE FLOW		0	1	1	
3920L0C0070	CART DOLLY PER SPPL DWG #84		0	2	2	
3920L000071	TRUCK ERECTA-SHELF T-2433		0	27	27	
3920L000073	TRUCK HEAVY DUTY ERECTA 18X36X38IN		0	2	2	
3920L000074	TRUCK HEAVY DUTY 18X36X54 IN		0	11	11	
3920L000075	TRUCK HEAVY DUTY ST1474 18X48X78		0	5	5	
3920L000076	HAND TRUCK 500LB CAP		0	2	2	
3920L000C81	TRUCK ERECTA T2454 24X48X58IN		0	35	35	
3920L000468	TRUCK MDL 1360-15		0	1	1	
3920L001779	JACK PALLET MDL W2T-90		0	1	1	
3920LD02077	JACK PALLET HYD LIFT (BLUE GIANT)		0	1	1	
3920L002105	DOLLY FILM SPOOL PN-612-27		0	3	3	
3920L002698	TRUCK TABLE PN-828-207		0	1	1	
4110L003033	FREEZER 19.5 CU FT SEARS COLD SPOT FROSTLESS		0	1	1	
41102669291	REFRIGERATOR-FREEZER 12 CU FT NORGE		0	1	1	
42308925745	DECONTAMINATION MACHINE SHOE CLEANER		0	1	1	
4240L001598	TANK (FOR SCOTT AIR PACK)		0	2	2	
42409192864	BREATHING APPARATUS		0	2	2	
5140L002084	TOOL BOX W/ACESSORIES		0	1	1	
5440L000667	LADDER ALUMINUM W/ROLLERS & RAILS		0	2	2	
58204508291	CAMERA CCTV KINTEL MDD 20/20		0	1	1	
58204711276	RECEIVER CCTV MIRATEL L14M		0	1	1	
5830L000151	INTERCOM 2WAY MDL-TLC3		0	1	1	
5965L000153	HEADSET TELEX PN-1200/PN 10256/C		0	2	2	
6515L003069	EYEBATHE		0	2	2	
6530L003031	STOOL STAINLESS STEEL ROTARY		0	33	33	
6640L000201	CART CLEAN ROOM 304SS WA-4		0	10	10	
6640L0C0202	CART GLASSWARE PN-7759		0	1	1	
6640L000204	TABLE CLEANROOM 3X2FT MDL-BD324		0	12	12	
6640L000205	TABLE CLEANROOM 3X3FT MDL-BD336		0	1	1	
6640L000206	TABLE CLEANROOM 4X2FT MDL-BD424		0	15	15	
6640L000207	TABLE CLEANROOM 4FT X30IN MDL-BD430L		0	14	14	
6640L000209	TABLE CLEANROOM 5X3FT MDL-BD536		0	9	9	
6640L000210	TABLE CLEANROOM 6X2FT MDL-BD624		0	2	2	

FIGURE 3-1

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE A – PRODUCTION

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6640L000211	TABLE CLEANROOM 6FT X30IN MDL-80630	[redacted]	0	4	4	[redacted]
6640L000215	TABLE CLEANROOM 6X3FT MDL-80636		0	5	5	
6640L000216	TABLE CLEANROOM 8X2FT MDL-80824		0	1	1	
6640L000217	TABLE CLEANROOM 8FT X36IN MDL-80830 30 IN W		0	1	1	
6640L000219	TABLE CLEANROOM 8FT X45IN MDL3-80845		0	2	2	
6640L000230	OVEN THERMOSTATIC CONTROL CHAMBER PN-2084X		0	1	1	
6645L000253	TIMER MDL-168		0	1	1	
6645L000254	TIME STAMP STROMBERG PN-12AM		0	10	10	
6645L001917	TIME STAMP STROMBERG PN-12		0	3	3	
6645L002504	CLOCK DIGITAL READOUT MDL-24H3DC2		0	1	1	
66452861019	TIME STAMP SIMPLEX MDL HA2G		0	9	9	
66455266266	TIME STAMP STROMBERG MDL-8		0	8	8	
66655615787	RADIAC SET PN-AN-PDR27C		0	1	1	
6670L000007	SCALE TOLEDO MDL-3630		0	1	1	
6670L000275	BALANCE CHEMICAL MDL-1195		0	1	1	
6670L000277	BALANCE SCALE MDL-11515		0	1	1	
6670L000278	SCALE 15K CAPACITY		0	1	1	
6680L000311	TACHOSCOPE HASSLER MDL-8		0	8	8	
6720L000318	CAMERA POLAROID MDL-250		0	1	1	
6730L002767	READER PORTABLE MICROFICHE W/20X MAGNIFICATION		0	1	1	
6740L000213	TABLE EDITING 30IN PN-1-218-R-001		0	2	2	
6740L000347	TABLE LIGHT RICHARDS TYPE-GFL918 PN-910106		0	2	2	
6740L000371	CLEANER TACONIC TACKEY ROLL PN-1-506-E-001		0	2	2	
6740L000394	PROCESSOR EKTACHROME RT COLOR MDL-1411M		0	1	1	
6740L000405	PROCESSOR VISCOUS FILM TRENTON PN-1-105-E-1098		0	2	2	
6740L000406	CABINET VISCOUS DEVELOPER TRENTON		0	2	2	
6740L000407	PROCESSOR MODIFIED DALTON PN-1-112-E-100		0	3	3	
6740L000414	TABLE EDITING 30IN MDL-III PN-1-236-E-001		0	4	4	
6740L000415	TABLE DENSITOMETER MDL-III PN-1-237-R-001		0	6	6	
6740L000417	TITLER UNIMAK-FILM PN-1-309-E-001		0	4	4	
6740L000432	MIXER 1/4HP DIRECT DRIVE 1 X 42" SHAFT		0	7	7	
6740L000439	TANK MIXING 150GAL CAP SS		0	14	14	
6740L000440	TANK MIXING 500LITERS		0	7	7	
6740L000441	RACK FILM STORAGE CLEANROOM		0	4	4	
6740L000475	TABLE 3 DRAWER PN-2553-11		0	1	1	

FIGURE 3-1 (CONT'D)

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE A — PRODUCTION

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6740L001538	CABINET 2DWR PN-802	[redacted]	0	1	1	[redacted]
6740L001539	CABINET 4DWR PN-304		0	3	3	
6740L001581	CLEANER /RACK RINSER VERSAMAT MDL-III		0	1	1	
6740L001619	TABLE TRACING 11IN 18IN MDL-1118-I		0	2	2	
6740L001708	LID POPPER PLASTIC CAN		0	3	3	
6740L001962	PRINTER I.D. W/TELETYPEWRITER PN-045-001		0	1	1	
6740L001963	FLASHER EDGE PN-106-450		0	1	1	
6740L001988	ADAPTER FEED MDL-F4224 MILLER HOLZWORTH B&W VER.		0	1	1	
6740L001989	RACK DEVELOPER PN-460223		0	53	53	
6740L001990	RACK BUFFER PN-460238		0	2	2	
674DL001991	RACK HASTALEY PN-460239		0	8	8	
6740L002106	PRE-SPLICE COMPLEX		0	1	1	
6740L002141	TABLE EVALUATION PN-258-001 40IN		0	2	2	
6740L002289	TABLE MAKE-UP MDL-III PN-254-001		0	4	4	
6740L002501	FINO-R-SCOPE PN-80045N W/ILLUMINATOR PN-80104N		0	2	2	
6740L002606	SINK PROCESSING 24X36X5IN MDL-AF235		0	4	4	
6740L002621	TABLE INSPECTION CAMDEN MDL-III PN-264-001		0	4	4	
6740L002622	TABLE INSPECTION PRE-PROCESS PN-260-001		0	1	1	
6740L002641	TABLE INSPECTION CAMDEN MDL-V PN-266-001		0	4	4	
6740L002867	TITLER INK JET VIDEO SYSTEM W/TELETYPE PN-124781		0	1	1	
6740L002868	FIND-R-SCOPE #0744 W/ILLUMINATOR #0746 HEADMOUNT		0	1	1	
6740L002872	FLASHER CONTINUOUS RAWSTOCK PN-153-001		0	1	1	
6740L002873	TITLE REMOVER PN-613-001		0	1	1	
6740L002961	PRINTER CONTACT 9.5IN MOD TO REDONDO		0	6	6	
6740L002962	TABLE MAKE-UP MDL II SER# 102		0	1	1	
6740L002983	TANK MIXING PORTABLE 30GAL MDL5027770-5 W/MOTOR		0	2	2	
6740L002984	TABLE DENSITOMETER MDL-VI PN253-001FIBER OPTICS		0	1	1	
674DL003032	MAGAZINE MDL-A9A BLUE COVER VERSAMAT		0	4	4	
6740L003034	PUNCH PRESS PNEUMATIC W/HOMEMADE WORK STATION		0	1	1	
6740L003035	TANK BLEACH 500 LITER PLASTIC		0	2	2	
6740L003036	TANK STORAGE SS 2200 LITER		0	12	12	
6740L003037	TANK MIXING & STORAGE SS 2200 LITER		0	2	2	
6740L003038	TANK MIXING VISCOUS SS 500 LITER		0	2	2	
6740L003039	TANK MIXING SS 1500 LITER		0	3	3	
6740L003040	TANK STORAGE VISCOUS SS 1600 LITER		0	2	2	

FIGURE 3-1 (CONT'D)

BYE 15254-76

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE A – PRODUCTION

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6740L003131	PRINTER CONTINUOUS CAYUGA PN-357-100 SN 104		0	1	1	
67401069032PK	PRINTER RAINBOW PN-1-032-E-200		0	1	1	
67401092987	PROCESSOR EKTACHROME RT MDL-1811M		0	1	1	
67401784784	PROCESSOR EKTACHROME MDL-1811MG VERSAMAT		0	1	1	
67407593416	ADAPTER ROLL FILM TAKE-UP (FOR VERSAMAT)		0	4	4	
67407593417	MAGAZINE PN F3934 (FOR VERSAMAT)		0	2	2	
67407665280	PROCESSOR PN-11CM VERSAMAT B & W		0	1	1	
67405679980	ADAPTER ROLL FEED PN-F4224 (FOR VERSAMAT)		0	3	3	
7110L002139	STOOL POSTAL TILT SEAT		0	8	8	
7110L002336	CABINET TAPE STORAGE		0	1	1	
7110L002357	CHAIR LAMINAIRE MDL-X100		0	12	12	
7110L002583	CABINET 30DWRS PN-1350-10 WRIGHT LINE		0	1	1	
7110L002585	CABINET 15DWRS PN-1350-10		0	1	1	
7110L003024	CABINET FILE GREEN 2DRW W/LOCK COLE		0	4	4	
7110L003025	CABINET FILE&CLOSET GREEN 3DRW W/COMB LOCK SAFE		0	2	2	
7110L003026	CABINET FILE&CLOSET GREEN (3 SHELVES) 3 DRW		0	2	2	
7110L003028	CABINET CARD FILE/WRIGHT LINE/4 DRW W/LOCK GREY		0	1	1	
71102626663	TABLE OFFICE 60X34IN		2	0	2	
71102709838	DESK TYPIST 60X30IN		3	0	3	
71102709840	DESK FLAT DBL PED 60X34IN		14	0	14	
71102738785	CHAIR STR W/OUT ARMS		1	0	1	
71102738793	CHAIR SWIVAL W/ARMS		15	0	15	
71102863797	CABINET FILE 5DWRS LEGAL SZ		1	0	1	
71102863798	CABINET FILE 5DWRS LETTER SZ W/OUT LOCK		2	0	2	
71109764852	CABINET FILE 4DWRS W/COMB LOCK		1	0	1	
7125L000524	CABINET 2DOOR 78X40X18IN PM-ATC450		0	4	4	
7125L000530	CABINET TAPE STORAGE PN-3632-11		0	2	2	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		12	15	27	
7195L000534	CABINET 35 1/2X12X28 3/4IN PN-1616		0	2	2	
7195L003041	BOARD VISUAL DISPLAY FER.PACKARD $$INCLUDES DESIGN		0	1	1	
7290L000537	DRYER HAIR		0	2	2	
7330L000539	OPENER-CAN ELECTRIC DAISY NO.1508		0	1	1	
7420L002355	CALCULATOR WANG MDL-154		0	1	1	
74201621469	CALCULATOR REMINGTON		1	0	1	
7430P2000094665	TYPEWRITER MAG TAPE MDL-775		1	0	1	

FIGURE 3-1 (CONT'D)

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE A – PRODUCTION

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
74302673456	TYPEWRITER ELEC	[redacted]	2	0	2	[redacted]
74306345062	TYPEWRITER MANUAL		1	0	1	
7440L000482	CABINET STORAGE UNIT PN-1130-00		0	5	5	
7440L003101	COMPUTER PDP-11/40-BC CENTRAL PROCESSOR KD11-A		0	1	1	
7440L003102	DECWRITER II LA36-CA W/2 RK05-AA DISK DRIVES		0	1	1	
7440L003103	DISK DRIVE CONTROLLER RK11-D		0	1	1	
7440L003104	READER & PUNCH HIGH SPEED PC-11 PC-05		0	1	1	
7440L003105	CONTROL & 1ST MAG TAPE DRIVE TM11-EA TU10 TU10M		0	1	1	
7440L003106	CATHODE RAY TUBE VT05-BA		0	2	2	
7440L003107	EXTENSION MOUNTING BOX BA11-ES W/COMPONENTS		0	1	1	
7440L003108	PRINTER LINE 132 COL.LP11-VA		0	1	1	
7440L003109	FILE,DIGITAL I/O MASTER W/COMPONENTS		0	1	1	
7440L003110	TERMINAL NUM.DATA ENTRY 16 KEY 16 CHAR. RT01-BA		0	6	6	
7460L003029	CABINET TAPE STORAGE 7'HIGH W/ROLL-UP DOOR		0	2	2	
74604598892	DESK KEYPUNCH GRAY W/3 BLUE DWRS PN-2559-11		0	4	4	
79106808296	POLISHER FLOOR 1 DISK		0	1	1	
79109138478	SCRUBBING MACHINE FLOOR		1	0	1	
79109288712	VACUUM CLEANER WATER PICK-UP MDL-MIC5G-VA		0	1	1	
	TOTAL FOR ACCOUNT CODE A		57	572	629	[redacted]

FIGURE 3-1 (CONT'D)

BYE 15254-76
Handle via Byeman / Talent-Keyhole Controls Only

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EQUIPMENT INVENTORY

ACCOUNT CODE B – LOGISTICS

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3920L000086	DOLLY STEEL TRUCK	[redacted]	0	2	2	[redacted]
39208471305	TRUCK HAND FOLDINGLT ALUM		1	0	1	
41402033782	FAN FLOOR MOL 30IN		1	0	1	
42405424451	MASK CBR MIL-M50079		159	0	159	
6720L001710	CAMERA POLARIOD MOL-360		0	1	1	
67300742729	MICROFICHE VIEWER		1	0	1	
7110L002973	CHAIR EXEC SWIVAL/GREEN CONFERENCE		0	1	1	
71101430864	DESK,L-UNIT		0	1	1	
71101430902	DESK ATTACHMENT, L-UNIT TABLES		0	1	1	
71102676981	TABLE OFFICE 45X34IN		1	0	1	
71102709838	DESK TYPIST 60X30IN		2	0	2	
71102709840	DESK FLAT DBL PED 60X34IN		3	0	3	
71102738793	CHAIR SWIVAL W/ARMS		0	3	3	
71102863797	CABINET FILE 5DWRS LEGAL SZ		1	0	1	
71105846251	DESK FLAT RIGHT PED 40X30IN		1	0	1	
71106636360	CABINET 2DWR SAFE TYPE		2	0	2	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	2	2	
7420L002766	CALCULATOR FRIDEN MOL-1101		0	1	1	
74205799255	CALCULATOR REMINGTON		1	0	1	
74302472C47	TYPEWRITER IBM-19		0	1	1	
74302673456	TYPEWRITER ELEC		1	0	1	
74605799771	FILE VISIBLE INDEX		3	0	3	
	TOTAL FOR ACCOUNT CODE B		177	13	190	

FIGURE 3-2

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE C – SELECT LAB

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3610L000052	PAPER CUTTER MDL-21EW314	[redacted]	0	1	1	[redacted]
3610L000060	TRIMMER ALL METAL NIKOR 15X15 PN-3201	[redacted]	0	1	1	[redacted]
3610L003082	TRIMMER PAPER PREMIER (GREEN) 24 X24"	[redacted]	0	1	1	[redacted]
4110L000097	FREEZERATOR KREONITE MODEL KRF911	[redacted]	0	1	1	[redacted]
4110L000099	FREEZERATOR MDL SVC-60	[redacted]	0	1	1	[redacted]
42308925745	DECONTAMINATION MACHINE SHOE CLEANER	[redacted]	0	1	1	[redacted]
5110L002203	TRIMMER SAFETY NIKOR 24IN	[redacted]	0	1	1	[redacted]
5820L002145	MONITOR SET VIDEO	[redacted]	0	1	1	[redacted]
6210L000169	ILLUMINATOR VUETTE 20X24IN	[redacted]	0	1	1	[redacted]
65307100220	TABLE SURGICAL 20X24X40 1/2IN	[redacted]	0	1	1	[redacted]
6625L001870	STROBE TUBE LUMIN BARE	[redacted]	0	1	1	[redacted]
6640L000207	TABLE CLEANROOM 4FT X30IN MDL-BD430L	[redacted]	0	1	1	[redacted]
6640L000210	TABLE CLEANROOM 6X2FT MDL-BD624	[redacted]	0	1	1	[redacted]
6640L000211	TABLE CLEANROOM 6FT X30IN MDL-BD630	[redacted]	0	2	2	[redacted]
6640L000217	TABLE CLEANROOM 8FT X36IN MDL-BD830 30 IN W	[redacted]	0	1	1	[redacted]
6640L000222	TABLE UTILITY MOD-B300X	[redacted]	0	1	1	[redacted]
6645L000252	TIMER AUDIBLE	[redacted]	0	1	1	[redacted]
6645L000253	TIMER MDL-168	[redacted]	0	7	7	[redacted]
6645L000255	TIMER ELECTRONIC INTERVAL MDL-TM560R	[redacted]	0	1	1	[redacted]
6650L000266	MICROSCOPE (F/VC-1 PRINTER)	[redacted]	0	1	1	[redacted]
6720L000317	CAMERA STD 16IN BELLOWS CALUMET-CCP400	[redacted]	0	1	1	[redacted]
6720L000319	CAMERA BROWN 24IN CIMMODE MDL-51-1	[redacted]	0	1	1	[redacted]
6720L000320	CAMERA NIKON F	[redacted]	0	1	1	[redacted]
6720L000321	CAMERA CALUMET-C1	[redacted]	0	1	1	[redacted]
6720L001913	CAMERA 70MM HASSELBLAD W/ACCESSORIES	[redacted]	0	5	5	[redacted]
67205582933	CAMERA CROWN GRAPH 45IN	[redacted]	0	1	1	[redacted]
6730L000323	STROBONAR HONRYWELL 60S SLAVE UNIT CAT # 3781	[redacted]	0	1	1	[redacted]
6730L000326	PROJECTOR 35MM SLIDE CARCUSEL MDL-550	[redacted]	0	1	1	[redacted]
6730L000331	VIEWER TRANSPARENCY MDL-T-214	[redacted]	0	1	1	[redacted]
6730L000334	MICRO-FILE RECORDAK MACHINE PN-MRD-2	[redacted]	0	1	1	[redacted]
6730L001735	STROBONAR HONEYWELL 880	[redacted]	0	1	1	[redacted]
6730L001826	PHOTO TIMER KIT	[redacted]	0	2	2	[redacted]
6730L001827	WASHER FILM HURRICANE MDL-4	[redacted]	0	1	1	[redacted]
6730L003079	PROJECTOR 16MMKODAK ANALYST	[redacted]	0	1	1	[redacted]
6740L000284	SINK CALUMET MDL-3060	[redacted]	0	1	1	[redacted]

FIGURE 3-3

NRO APPROVED FOR RELEASE
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EQUIPMENT INVENTORY

ACCOUNT CODE C – SELECT LAB

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6740L000346	TABLE LIGHT RICHARDS TYPE-GFL940MC PN-910454	[redacted]	0	1	1	[redacted]
6740L000352	STAND CAMERA TYPE NRC12		0	1	1	
6740L000354	LAMP W/GATOR GRIPLITE		0	1	1	
6740L000356	CLEANER FILM TACKEY ROLLER MDL-TR127		0	1	1	
6740L000362	DRYER PRINT PAKONOMY MDL-26W		0	2	2	
6740L000373	PROCESSOR COLOR FILM W/NITROGEN BURST MDL-CP816		0	1	1	
6740L000374	TESTER LIGHT MDL-D59		0	1	1	
6740L000377	ENLARGER WILD MDL-VG1 PN-NC105295K		0	1	1	
6740L000383	SINK ASSY MDL-AP3085		0	1	1	
6740L000384	DUST & STATIC REMOVAL UNIT MDL-A2K		0	1	1	
6740L000388	ENLARGER OMEGA OE2V		0	1	1	
6740L000390	REFLECTION HEAD MCBETH MDL-ER30		0	1	1	
6740L000402	MIXER CHEMICAL 1550RPM .67AMP CONTINUOUS DUTY		0	1	1	
6740L000422	TRIPOD MDL-2 ADJ HEIGHT 39-90IN		0	1	1	
6740L000428	EXPOSURE UNIT W/VACUUM PUMP 24X24IN		0	1	1	
6740L000429	METER TEMP COLOR GROSSEN SIXTICOLOR		0	1	1	
6740L000442	ENLARGER P&E MDL 8200/MICROCAMERA		0	1	1	
6740L000444	SINK 36X96X38IN #92-30		0	1	1	
6740L000447	SINK 24X36X38IN #92-9		0	1	1	
6740L000471	PROCESSOR DRY-TO-DRY LOGEFLO MDL-L024		0	1	1	
6740LC01601	DENSITOMETER REFLECTION MDL-RD400D		0	1	1	
6740L001688	PROCESSOR RAPID COLOR MDL-30		0	1	1	
6740L001736	REFLECTASOL UMBRELLA 36SQ INS		0	2	2	
6740L001786	TACKING IRON		0	1	1	
6740L001805	PRINTER XRAY FILM I.D.		0	1	1	
6740L001834	PROCESSOR CALUMET MDL-BW814		0	1	1	
6740L001835	PROCESSOR CALUMET MDL-CP821		0	1	1	
6740L001887	TABLE TILTING COLIGHT 45X30IN		0	1	1	
6740L001888	TABLE ART LAYOUT & STRIPPING		0	1	1	
6740L002033	EASEL MDL-PR810		0	1	1	
6740L002069	WASHER PRINT CALUMET MDL-515		0	2	2	
6740L002079	PROCESSOR PAKO CTX		0	1	1	
6740L002107	TRANSLATOR COLOR NEGATIVE MDL-2K		0	1	1	
6740L002116	RECORDER VIDEO TAPE AKAI 1/4		0	1	1	
6740L002135	ANALYZER VIDEO COLOR NEG MDL-2K		0	1	1	

FIGURE 3-3 (CONT'D)

BYE 15254-76
Handle via Byeman / Talent-Keyhole Controls Only

TOP SECRET - HEXAGON / GAMBIT
[redacted]

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE C – SELECT LAB

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6740L002229	METER EXPOSURE GOSSEN LUNA-PRO	[redacted]	0	2	2	[redacted]
6740L002418	LIGHT FLASH ATTACH STROBONAR -770		0	1	1	
6740L002648	ENLARGER BEACON PRECISION PN-1-023-E-001		0	1	1	
6740L002991	DRYER TEMPRO MDL 400 PAKO		0	1	1	
6740L003075	TANK MIXING PORTABLE CALUMET SS 8 GAL SIZE		C	1	1	
6740L003076	TRIPOD HUSKIE		0	1	1	
6740L003077	PRINTER PROJECTION OMEGA D-6 PRO-LAB		0	1	1	
6740L003078	DUPLICATOR SLIDE HONEYWELL REPRONAR MDL 805A		0	1	1	
6740L003080	CAMERA COPY POLAROID MP-4		0	1	1	
6740L003081	SINK CALUMET SS 24 X 48"		0	1	1	
67400432292	PRINTER EN-22		0	1	1	
6740D600081	DRYER RACK PAKO MOD-2 DRYCAB		0	2	2	
67404023429	BASKET HIGH CAP MDL-HC50 8X10IN		0	2	2	
67405272054	PRINTER PROJECTION PN-815A		0	1	1	
67406631459	PRESS DRY MOUNTING PN-1		0	1	1	
67407330672	PRINTER CONTACT PN-MH1119		0	1	1	
67407665280	PROCESSOR VERSAMAT 11CM PN453563		0	1	1	
67408327312	PROCESSOR EKTAMATIC MDL-214K		0	1	1	
6750L001703	PROCESSOR CALUMET COLOR PRINT 3 1/2 GAL		0	1	1	
6750L001710	ANALYZER COLOR MACBETH PN-NB500PA		0	2	2	
6750L001931	STAND LIGHT MDL-SSRH COLORTRAN		0	2	2	
6760L000233	CASE CARRYING CAMERA MDL-C1D		0	1	1	
6760L000462	LENS CAL TAR 375MM		0	1	1	
6760L000485	DENSITOMETER MDL-TD100		0	1	1	
6760L000491	METER EXPOSURE METRASTAR PN-11957		0	1	1	
6760L000495	LIGHT PHOTO ASSY QUARTZ KING-650		0	1	1	
6760L000498	DENSITOMETER QUANTALOG MDL-TD102		0	1	1	
6760L000500	DENSITOMETER QUANTALOG MDL-TD203		0	1	1	
6760L001696	LENS ENLARGER NIKOR 50MM		0	2	2	
6760L001918	MAGAZINE HASSELBLAD CAMERA		0	6	6	
6760L001919	LENS HASSELBLAD CAMERA 40MM DISTOGON PN-20036		0	1	1	
6760L001920	LENS HASSELBLAD CAMERA 150MM SONNOR PN-20060		0	1	1	
6760L001921	LENS HASSELBLAD CAMERA 250MM SONNOR PN-20079		C	1	1	
6760L001922	MAGAZINE ROLL FILM PN-30058 HASSELBLAD		0	4	4	
6760L001923	BELLOWS EXTENSION HASSELBLAD CAMERA PN-40223		0	1	1	

FIGURE 3-3 (CONT'D)

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE C – SELECT LAB

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMD EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6760L001924	HOOD MAGINIFYING HASSELBLAD CAMERA PN-42013	[redacted]	0	2	2	[redacted]
6760L001925	FILTER COLOR BALANCE HASSELBLAD CAMERA PN-50199		0	1	1	
6760L001926	CASE HASSELBLAD CAMERA PN-58092		0	1	1	
6760L001945	RACK ROLL 220 FILM MDL-860		0	2	2	
6760L001969	METER FLASH		0	1	1	
6760L002068	MAGAZINE 70MM HASSELBLAD		0	1	1	
6760L002630	LENS NIKOR 135MM F2.8		0	1	1	
6780L000503	MODULE CLEANROOM WALL MTD A002		0	1	1	
6780L002144	LIGHTING KIT MDL-LP333		0	1	1	
7110L001803	CABINET DRYSIDE PN-848		0	1	1	
7110L001808	CABINET DRYSIDE PN-836		0	1	1	
7110L001809	CABINET DRYSIDE PN-836 PLUSB30 W/VISULITE W/AE42		0	2	2	
7110L001810	CABINET DRYSIDE PN-836 PLUS 836 W/16X20IN VISULITE		0	3	3	
7110L003072	CABINET DRYSIDE B20B36B20 W/76" TOP		0	1	1	
7110L003073	CABINET DRYSIDE B36 W/VISULITE (GREY COLOR)		0	1	1	
71101326477	CABINET FILE 4 DRW W/C LOCK		1	0	1	
71102709840	DESK FLAT DBL PED 60X34IN		2	0	2	
71102738785	CHAIR STR W/OUT ARMS		0	0	0	
71102738793	CHAIR SWIVAL W/ARMS		2	0	2	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	11	11	
743D2673456	TYPEWRITER ELEC		1	0	1	
74605799771	FILE VISIBLE INDEX		2	0	2	
7910L003074	VACUUM CLEANER KENT MDL-VA W/ATTACHMENTS		0	1	1	
	TOTAL FOR ACCOUNT CODE C		8	166	174	[redacted]

FIGURE 3-3 (CONT'D)

BYE 15254-76
Handle via Byeman / Talent-Keyhole Controls Only

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE D – PHOTO MAINT

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
34155417241	GRINDER BENCH TYPE	[redacted]	0	2	2	[redacted]
3416L001822	LATHE PRECISION MULTI FUNCTIONAL UNIMAT # 3213B		0	1	1	
34161864061	LATHE MOTOR DRIVEN WESCO SN_14001180		0	1	1	
3439L001869	WELDING KIT MODEL # 25_TP		0	1	1	
3441L001823	V BLOCK AND CLAMP STARRETT #568C #2203F		0	1	1	
3442L001680	PRESS #50H DAKE HAND HYDRAULIC		0	1	1	
3460L000038	GRINDER LATH PORT PN-11-611		0	1	1	
3460L001830	COLLET SET PRECISION INC) PN-S-1255		0	1	1	
4730L001501	REEL HOSE PNEUMATIC		0	1	1	
4940L000109	CLEANER VAPOR DEGREASER ULTRASONIC PN-2012		0	1	1	
5130L000128	DRILL HVY DTY 1/2IN #425		0	1	1	
51302931846	DRILL ELE 1/4IN PORTABLE		0	1	1	
51403136917	CASE TOOL 6DRWS		0	1	1	
51406084757	CABINET TOOL 3DRW STEEL		0	1	1	
52102211918	CALIPER MICROMETER INSIDE		0	1	1	
6625L002765	MULTIMETER DIGITAL PN-3300A		0	1	1	
6625L003118	METER TRIPLET MDL 630-APL		0	1	1	
6625L003119	AMMETER CLAMP VOLT MDL 749 WESTON		0	1	1	
6625L003120	TEST STAND RECEIVER 55166 TAYLOR		0	1	1	
6625L003121	TEST STAND CONTROLLER TAYLOR		0	1	1	
6625L003122	TEST UNIT ELECTRIC/AIR		0	1	1	
6685L001003	PYROMETER ALNOR 0-1200 DEGRES		0	1	1	
6740L001675	SCREWDRIVER ELEC PN-10		0	1	1	
71102709840	DESK FLAT DBL PED 60X34IN		2	0	2	
71102738793	CHAIR SWIVAL W/ARMS		0	1	1	
71102863797	CABINET FILE 5DWRS LEGAL SZ		2	0	2	
7125L001812	BIN STORAGE V-GRIP 18X38X76IN		0	3	3	
7195L000535	TABLE WORK PN-2908		0	1	1	
7195L001764	TABLE WORK EQUIPTO PN216-5		0	4	4	
7910L003007	CLEANER VACUUM MASTERCRAFT WET/DRY		0	1	1	
	TOTAL FOR ACCOUNT CODE D		4	34	38	

FIGURE 3-4

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE E – ADMINISTRATION

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMD EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
36109848637	COPIER 3M MDL-209	[redacted]	0	1	1	[redacted]
3750L003085	MOWER-TRACTOR 8 H.P.ELECTRIC		0	1	1	
37505278049	MOWER PWR 20IN CUT		0	1	1	
38252270488	SNOW REMOVAL UNIT 24IN		2	0	2	
66754834662	TABLE TRACING TILT 48X36IN		0	1	1	
6720L000322	VIEWER MAGNIFICATION W/DIAL INDICATOR MDL-1		0	1	1	
6730L000325	VIEWER PROJECTION MDL-6000A		0	1	1	
67304488877	SCREEN PROJECTION 8X8FT		0	1	1	
6740L000353	STANO PROJECTION COLLASIBLE PN-82922		0	1	1	
6760L002690	PROJECTOR SLIDE EKTAGRAPHIC PN-AF2		0	1	1	
71059609011	TABLE DINING PN-805		1	0	1	
7110L002972	TABLE W/CORTELEX TOP 36 X 60 WOOD LEGS		0	1	1	
7110L002973	CHAIR EXEC SWIVAL/GREEN CONFERENCE		0	11	11	
7110L70053528	DESK EXEC 60X30IN CRESTWOOD		1	0	1	
7110L70053628	CREDENZA OFFICE 2 SLIDING DOOR		2	0	2	
7110L70053728	CHAIR STR W/ARMS ROYAL BLUE		7	0	7	
7110L70053828	DESK TYPIST 60X30IN LEFT PED MAHOG		1	0	1	
7110L70053928	CHAIR STR W/OUT ARMS BLUE		1	0	1	
7110L70054028	CHAIR ROTARY W/ARMS BLUE		1	0	1	
7110L70054128	TABLE OFFICE EXEC 60X30IN MAHOG W/COLETEX TOP		1	0	1	
7110P280212048	TABLE CONFERENCE WALNUT PN-280212048		2	0	2	
7110P4540	CHAIR CONFERENCE YELLOW		12	0	12	
71102626663	TABLE OFFICE 60X34IN		1	0	1	
7110270 9838	DESK TYPIST 60X30IN		3	0	3	
7110270 9840	DESK FLAT DBL PED 60X34IN		5	0	5	
71102738785	CHAIR STR W/OUT ARMS		1	0	1	
71102738793	CHAIR SWIVAL W/ARMS		4	0	4	
71102863797	CABINET FILE 5DWRS LEGAL SZ		2	0	2	
71105146214	CHAIR ROTARY W/ARMS BRCWN EXEC		1	0	1	
7110 6636360	CABINET 20WR SAFE TYPE		1	0	1	
7110 9764852	CABINET FILE 4DWRS W/CCMB LOCK		2	0	2	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		6	0	6	
7195L701185 28	TROPHY CASE BIRCH 48X70X18IN		2	0	2	
71958218995	STAND LECTURE METAL W/LIGHT		1	0	1	
74202051087	CALCULATOR FRIDEN		1	0	1	
74302472047	TYPEWRITER IBM EXEC MDL D		1	0	1	
74302673456	TYPEWRITER ELEC		2	0	2	
74305437736	TYPEWRITER OLIVETTI		1	0	1	
7430656C458	TYPEWRITER IBM EXEC		1	1	2	
7840L003008	TAPE PLAYER PA SYSTEM W/SPEAKERS		0	1	1	
7840L003009	TAPES MUSIC		0	3	3	
7910L002080	CLEANER VACUUM KIRBY		0	1	1	
	TOTAL FOR ACCOUNT CODE E		66	27	93	[redacted]

FIGURE 3-5

BYE 15254-76
Handle via Byeman / Talent-Keyhole Controls Only

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EQUIPMENT INVENTORY

ACCOUNT CODE F – TECH EVALUATION

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3610L000050	DUPLICATOR OFFSET MULTILITH PROCESS PN-1850	[redacted]	0	1	1	[redacted]
3610L000054	PAPER CUTTER TABLE OPERATED 43X29 1/2 IN PAPER		0	1	1	
3610L001504	COPING MACHINE XEROX MODEL 720		0	1	1	
3610L001916	IMAGER MASTER ELECTROSTIC MODEL 805		0	1	1	
3610L002228	CUTTER TAB SCOTT HEAVY DUTY		0	1	1	
3610L002581	LAMINATOR LAMINEX MDL-12 VOLT		0	1	1	
3610L002584	CUTTER PAPER CHALLENGERSTYLE 265HR		0	1	1	
3610L002639	BINDING MACHINE ELECT 16IN MODEL 244BN		0	1	1	
3610L002761	COPIER TRANSPARENCY MDL-45C		0	1	1	
3610L002916	PUNCH ELECTRIC MDL-111PM		0	1	1	
3610L002955	BONDING MACH THERM-A-BOND GBC MDL 298BN		0	1	1	
3610L002967	PAPER CUTTER PREMIER 19 X 20		0	1	1	
3610L003001	MULTIGRAPH AUTO EXPOSURE CABINET 1485		0	1	1	
36100335272	PUNCH MACHINE PAPER ELECT		0	1	1	
36102401703	MULTIGRAPH MDL 1250WAF		0	2	2	
36102881596	DRILL CHALLENGE WITH/ ACTUATED HEAD		0	1	1	
3694L000063	WORK STATION LAMINAR FLOW MOD-A001		0	4	4	
3694L002580	WORK STATION LAMINAR FLOW CLASS 100		0	2	2	
3920L000082	TRUCK TAPE CAT # 3621-10		0	1	1	
4310L000105	COMPRESSOR PAASCHE PN-8665		0	1	1	
4320L000106	DEHUMIDIFIER PN-W47T4415N		0	1	1	
5130L000124	CUTTING TOOL PRECISION PN-K-11		0	1	1	
5210L003015	INDICATOR DIAL STARETT 711-TIS		0	1	1	
62308731710	LAMP FLOURESCENT W/MAGNIFIER MDL LFM-1A		0	1	1	
6640L000209	TABLE CLEANROOM 5X3FT MDL-BD536		0	1	1	
6640L000211	TABLE CLEANROOM 6FT X30IN MDL-BD630		0	2	2	
6640L000226	TABLE UTILITY MDL-UT152		0	1	1	
6650L002230	MICROSCOPE STERO ZOOM B & L ZOOM 7		0	6	6	
6650L002288	OBJECTIVE WILD PN-185-383		0	5	5	
6675L000288	TRACING BOARD W/T-8 LAMP 24X36X3/4IN		0	2	2	
6675L000296	TABLE STUDIO DRAWING 38X60IN PN-86050		0	1	1	
6675L000297	TABLE STUDIO DRAWING 38X72IN PN-86005F		0	1	1	
6675L000299	TABLE STUDIO DRAWING 44X72IN PN-86005F		0	3	3	
6675L000303	BOARD DRAWING 24X30IN PN-3810-00		0	1	1	
66751905269	DRAFTING MACHINE 36X60IN		0	1	1	

FIGURE 3-6

Handle via Byeman / Talent · Keyhole
Controls Only

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE F – TECH EVALUATION

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
66754834642	TABLE TRACING ADJ MDL-165	[redacted]	0	1	1	[redacted]
66755266221	TABLE DRAFTING 84X42 IN		0	1	1	
66756413200	LETTERING SET		0	1	1	
66759556158	MICROSCOPE STEREOSCOPE MDL-ZOOM 70 B & L		0	1	1	
6685L002992	BAROMETER SETH THOMAS #1504		0	1	1	
67209226560	CAMERA CALUMET PN-CC401		0	1	1	
6730L000327	PROJECTOR 35MM SLIDE CAROUSEL MDL-800		0	1	1	
6730L001611	PROJECTOR OVERHEAD 3M-MDL-521ALF		0	1	1	
67304065868	SCREEN PROJECTION 70X70IN		0	1	1	
67309175189	VIEWER VARISCAN MARK-II PN-206-1		0	1	1	
6740L000214	TABLE MICROSCOPE VIEWING PN-1-219-E-001		0	5	5	
6740L000351	TABLE LIGHT MICROSCOPE & CAMERA ATTACH PN-910460		0	1	1	
6740L000398	TABLE ELEVATION RICHARDS MDL-TE2860 PN-940100		0	3	3	
6740L000415	TABLE DENSITOMETER MDL-III PN-1-237-R-001		0	2	2	
6740L000467	RECORDER DENSITOMETER AIL #392493-1		0	2	2	
6740L001603	MICRO-D SYS/W/DIGITAL PDP-8I COMPUTER/TELETYWTER		0	2	2	
6740L001788	DRAFTING MACHINE		0	1	1	
6740L002210	TABLE LIGHT RICHARDS MIM-2		0	4	4	
6740L002942	COMPUTER MINI W/TELETYPEDIGITAL R/O PDP-8E		0	1	1	
67401810991PK	TABLELIGHT RICHARDS MDL-GFL940MC PN-910400		0	1	1	
67406631459	PRESS DRY MOUNTING PN-1		0	1	1	
7110L000510	FILE ATLAS VERTICAL 18 1/2X29X26IN		0	1	1	
7110L000516	TABLE HAMILTON L CONTOUR 37 1/4X50IN		0	1	1	
7110L000517	TABLE MECHANICAL DRAWING 38 1/2X28 1/2IN		0	2	2	
7110L000520	TABOURET STUDIO 17X29X27IN PN-8632		0	4	4	
71101326496	FILE CAB 3 1/4X7 3/8IN CARD 11 DWRS		3	0	3	
71102050821	FILE MAP CAB 5DWRS		3	0	3	
71102626663	TABLE OFFICE 60X34IN		20	0	20	
71102676981	TABLE OFFICE 45X34IN		2	2	4	
71102709838	DESK TYPIST 60X30IN LEFT PED		2	0	2	
71102709840	DESK FLAT DBL PED 60X34IN		25	0	25	
71102738785	CHAIR STR W/OUT ARMS		0	3	3	
71102738793	CHAIR SWIVAL W/ARMS		27	0	27	
71102863797	CABINET FILE 5DWRS LEGAL SZ W/O LOCK		13	0	13	
71102863798	CABINET FILE 5DWRS LETTER SZ W/LOCK		1	0	1	

FIGURE 3-6 (CONT'D)

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31 July 2014

FIGURE 3-6 (CONT'D)

EQUIPMENT INVENTORY

ACCOUNT CODE F - TECH EVALUATION

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
71107823151	DESK TYPEWRITER RIGHT PED W/OUT LOCK	[redacted]	0	2	2	[redacted]
71109226831	FILE CAB IBM CARDS 7 OBL DWRS		0	1	1	
71109226834	CABINET STORAGE FILE 20DWRS		0	4	4	
71109764852	CABINET FILE 4DWRS W/CGMB LOCK		5	0	5	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	33	33	
71256415436	CABINET STORAGE KNOCKDOWN		0	1	1	
7195L002968	CLEANROOM LAMINAR FLOW HOOD MDL-CT1210/1215		0	3	3	
7410L002502	COLLATOR TANDEMATIC 40 BIN MDL-213CM		0	1	1	
7410L002503	COMPOSSING MACHINE PHOTO TYPOSING W/FONTS MDL-K		0	1	1	
7420L002637	CALCULATOR HEATH PN-IC-2008		0	1	1	
7420L002689	CALCULATOR MINATURE PN-HP35		0	1	1	
7420L002965	CALCULATOR SR-22 TEXINSTR SER#220003754		0	1	1	
7420L002993	CALCULATOR HP-45		0	1	1	
74302472047	TYPEWRITER IBM-19		1	1	2	
74302673456	TYPEWRITER ELEC		1	0	1	
7440L001854	CABINET DISK PACK STORAGE MDL-5812-12		0	1	1	
7440L002691	COMPUTER SYSTEM PDP-8/W/DIGITAL R/OUT		0	1	1	
7440L002773	INTERFACE MAGNETIC TAPE BUS #TR06-AC/ PDP-8 COMP		0	1	1	
7440L003098	PRINTER LE8-VA 132 COL 64CHAR 0300LPM DIGITALPDP-8		0	1	1	
74604598892	DESK KEYPUNCH GRAY W/3 BLUE DWRS PN-2559-11		0	2	2	
7470L000090	WAXER COATER PN-WC2543		0	1	1	
7490L001676	EMBOSSING MACHINE LABELON		0	1	1	
7490L001851	DECOLLATOR MOORE FORMS		0	1	1	
7510L001927	STORAGE UNIT LIBRARY/WRIGHT LINE 6 SHELVES		0	1	1	
7510L002393	CLEANER PEN ULTRASONIC		0	1	1	
7510L002970	STORAGE UNITS LIBRARY 7 SHELVE WRIGHT LINE		0	1	1	
7510L002971	STORAGE LUNDIA FULL SPACE CABINET WOOD		0	1	1	
7510L003003	STORAGE UNITS LIBRARY/WRIGHT LINE 3 SHELVES		0	1	1	
7510L003004	STORAGE UNITS LIBRARY/TABCO 6 SHELVES		0	1	1	
7910L000458	VACUUM CLEANER HOME-N-SHOP PN-99K1782N		0	1	1	
79105261775	VACUUM CLEANER G E SWIVEL MDL-V11C7		0	1	1	
79106808296	POLISHER FLOOR 1 DISK		1	0	1	
	TOTAL FOR ACCOUNT CODE F		104	167	271	

BYE 15254-76
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TOP SECRET - HEXAGON / GAMBIT
[redacted]

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE G – RESEARCH DIV

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3405L001815	SA* BAND METAL CUTTUNG MODEL C_4	[redacted]	0	1	1	[redacted]
3410L001807	COATING MACHINE ANODIZING DIZOR		0	1	1	
34136186617	DRILL PRESS FLOOR MODEL PN_2LMS		0	1	1	
3415L000006	GRINDER BENCH TYPE PRECISION DRILL MODEL 21		0	1	1	
3415L000C08	GRINDING AND CUTTING MACHINE		0	1	1	
3415L001746	FINISHING MACHINE ABRASIVE BELT 6IN		0	1	1	
3415L001747	GRINDER PEDESTAL MODEL 7IN ABRASIVE DISK ROCKWELL		0	1	1	
3416L000009	LATHE PRECISION PN_CL8187AB		0	1	1	
3416L000010	LATHE ASSY W/STAND BY TELESCOPE AND ATTCH		0	1	1	
3416L000011	LATHE HYDRASHIFT CINCUNATTI MOD LR		0	1	1	
3417L000012	MILLING MACHINE BRIDGEPORT12/BRJ		0	2	2	
3419L000016	BAND CUTTING MACH CONTCUR_MATUC PN_1612_3		0	1	1	
3431L001754	WELDER SPOT MODEL # 302		0	1	1	
3431L001755	WELDER AC/OC MILLER MODEL # 330A/B/SP		0	1	1	
3433L001861	WELDER SOLID STATE STUD MODEL NSA_80		0	1	1	
3433L001928	TORCH MODEL# 4448		0	1	1	
3439L000025	WELDING KIT PN_NE_927		0	1	1	
3439L001852	WELDING AND CUTTING KIT MDL-MS609		0	1	1	
3441L000026	BRAKE PRESS PN_247		0	1	1	
3441L001814	DIE/HOLDER FOR BRAKE PRESS #247		0	1	1	
3441L001816	BRAKE FINGER BOX 20GAAGE MOL WHITNEY JENSEN		0	1	1	
3441L001817	BRAKE COMBINATION BENDING MDL 814 14GAGE		0	1	1	
3441L001818	LOCKFORMER MODEL 24 PCRT W/ATTCH PITTS MACH		0	1	1	
34412238332	FORMING MACHINE SHEET METAL		0	1	1	
34443768978	PRESS COMPOUND LEVERAGE #21/2		0	1	1	
3445L000027	NOTCHER FLOUR MDL HAND METAL		0	1	1	
3445L000028	SHEARS PWR SORG 52IN MAX 12 GAGE STD MTR 2,3 HP		0	1	1	
3445L001756	PUNCH PRESS WIEDMANN HAND OPERATED TURRETW/STAND		0	1	1	
3449L000029	FIXTURE SHARPENING END MILL WELDON COMB#7 W/MICRO		0	1	1	
3455L000031	SET MACHINE REAMER STD SHANK HS RH SPIRAL 1116_111		0	1	1	
3455L000032	SET REAMER WELDON JIG BORER FOR STAINLESS STEEL		0	1	1	
3455L000033	MILL ROUNDING SET SS		0	1	1	
3460L000034	ANGLE BOX PN-UB-666		0	2	2	
3460L000036	V-BLOCKS PN-UB-3386 3 X 3 1/2		0	2	2	
3460L000037	V-BLOCKS PN-UB-667		0	2	2	

FIGURE 3-7

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE G – RESEARCH DIV

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMD EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3460L000039	CHUCK SPINDLE NOSE COLLECT	[redacted]	0	2	2	[redacted]
3460L000040	CHUCK CENTERING HEAD		0	1	1	
3920L000084	LEVER TRUCK FAIRBANKS #C-74		0	1	1	
3920L000085	LIFTER 750LB CAP MDL 2K-GP		0	1	1	
3990L000096	BLOCK PERMANENT #745-855 MAGNET		0	1	1	
4240L001598	TANK (FOR SCOTT AIR PACK)		0	3	3	
42409192864	BREATHING APPARATUS		1	0	1	
4310L001863	COMPRESSOR TWO STAGE BELT DRIVEN 5HP		0	1	1	
5110L001615	REAMER MACH HIGH SPEED STEEL		0	1	1	
5120L000117	VISE GRIPMASTER 6IN #6-SV		0	1	1	
5120L000118	STEP BLOCK SET		0	1	1	
5120L000121	DRESSER W/CASE GRNDG WHEEL		0	1	1	
5120D821811	TAP EXTRACTOR SET SIZE 4 THRU 5/16IN		0	1	1	
51202930464	CRIMPING TOOL STRIPPING PN-29400		0	1	1	
51203226231	WRENCH SET SOCKET 3/8IN DRIVE SQUARE		0	1	1	
5130L002226	BUFFER LONG SHAFT PN-23-233		0	1	1	
5130L002908	NIBBLER ELECTRIC PN-M-26397		0	1	1	
5130L002910	GRINDER SURFACE		0	1	1	
5130L003083	BUFFER 6" ROCKWELL 1/2HP MDL 438-02-314-0249		0	1	1	
51302931846	DRILL ELE 1/4IN PORTABLE		0	1	1	
51305961062	ETCHER ELE PN-11-085		0	1	1	
5133L000133	COLLET SET 1/32 THRU 1/2IN W/STAP GAUGE FIXTURE		0	1	1	
5136L000134	TABLE HAND TAP TYPE RA 16X19X32IN		0	1	1	
51363577494	TAP & DIE SET (NC)		0	2	2	
51363577504	THREADING SET (NF & NS)		0	2	2	
5140C306617	CABINET TOOL		0	1	1	
5210L000139	MICROMETER INSIDE PN-7008		0	1	1	
5210L002006	MICROMETER CARBIDE TIP		0	1	1	
52102211918	CALIPER MICROMETER INSIDE		0	1	1	
52102224564	CALIPER VERNIER PN-123		0	1	1	
52102567518	GAGE VERNIER PN-454-18		0	1	1	
52102874912	MICROMETER DEPTH PN-445A-6RL		0	1	1	
5210S400142	BLOCK GAGE SET # 51567SA-31AC		0	1	1	
52108495776	CALIPER MICROMETER PN-S5436E-P		0	1	1	
5220L001596	GAGE HEIGHT #1599-58712		0	1	1	

FIGURE 3-7 (CONT'D)

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31 July 2014

FIGURE 3-7 (CONT'D)

EQUIPMENT INVENTORY

ACCOUNT CODE G – RESEARCH DIV

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMD EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
5220L001597	PLATE BLACK GRANITE 24X36IN	[redacted]	0	1	1	[redacted]
5950L000161	DEMAGNITIZER		0	1	1	
6625L001605	METER RECORDING PRECISION SOUND LEVEL MDL -1561		0	1	1	
6625L001606	ANALYZER NOISE OCTAVE BAND MDL-1558-BP		0	1	1	
6625L001607	ANALYZER NOISE IMPACT MDL-1556-B		0	1	1	
6625L001608	RECORDER GRAPHIC LEVEL BENCH MDL-1521-B		0	1	1	
6625L001609	VIBRATION PICKUP MONITOR MDL-1560-P118		0	1	1	
6625L001610	MICROMETER DISC TYPE PN-256RL		0	1	1	
6625L001748	ANALYZER SOUND & VIBRATION MDL-1564-A		0	1	1	
6625L001749	CALIBRATOR SOUND LEVEL MDL-1562-A		0	1	1	
6625L001750	CALIBRATOR VIBRATION TYPE PN-1557-A		0	1	1	
6625L001782	VOLTMETER AMPROBE MDL-RS-1000		0	1	1	
6625L001947	MULTIMETER DIGITAL HICOK MDL -3300		0	1	1	
6625L002765	MULTIMETER DIGITAL PN-3300A		0	1	1	
66255398539	OSCILLISCOPE TEKTRONIC MDL-535		0	1	1	
66256083538	DOLLY OSCILLOSCOPE		0	1	1	
66256786637	PLUG-IN UNIT TYPE-CA TEKTRONIKS		0	1	1	
6640L000235	TEMPERATURE TEST CHAMBER TYPE TC2A		0	1	1	
6640L002066	METER RADIATION ELECTROMAGNETIC MDL-8100		0	1	1	
6675L000295	TABLE DRAWING L-SHAPE MDL-RH 37.5X20IN		0	1	1	
6675L000301	COMPASS BEAM PARAGON 42IN PN-55-1060		0	1	1	
6675L000304	DRAFTING MACHINE		0	1	1	
6685L000312	PYROMETER SIMPSON MDL-388		0	1	1	
6685L001971	THERMOMETER INFRARED DUAL RANGE NIKRON 100		0	1	1	
6740L000474	APPLICATION ASSY FILM PN-AG-3864		0	1	1	
6760L001740	DENSITOMETER MDL-TD203ADR W/DIGITAL READOUT		0	1	1	
7125L001862	RACK STORAGE STEEL		0	2	2	
7195L000535	TABLE WORK PN-2908		0	1	1	
7195L000536	STAND TOOL W/4DWRS PN-3145		0	1	1	
81202683357	CYLINDER GAS OXYGEN		1	0	1	
81202683360	CYLINDER COMPRESSED GAS		0	1	1	
	TOTAL FOR ACCOUNT CODE G		2	109	111	[redacted]

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE H – SHIPPING

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3540L002593	TAPER ELECTRIC W/2-C TAPE CODER PN-3FH	[redacted]	0	2	2	[redacted]
3910L003116	CONVEYOR SYSTEM RAPID WHEELI-25'4-10'2-5'1-4' CURVE		0	1	1	
3920L000078	TRUCK LIFT PLATFORM MDL 6712-65		0	2	2	
3920L000079	SKID SEMI-LIVE MDL 6720-65 (PULL CART)		0	5	5	
6670S266483	SCALE 0-500LBS CAPACITY		0	1	1	
6740L001538	CABINET 2DWR PN-802		0	1	1	
6740L003006	DESPOOLER FILM ADJUSTABLE WIDTH		0	1	1	
7110270983B	DESK TYPIST 60X30IN		1	0	1	
7110270984O	DESK FLAT DBL PED 60X34IN		1	0	1	
7110273879З	CHAIR SWIVAL W/ARMS		1	0	1	
7110286379B	CABINET FILE 5DWRS LETTER SZ W/LOCK		1	0	1	
7125L001954	DESK SHOP 34X30X53IN PN-2254		0	1	1	
7125269853Ч	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	2	2	
7195L000531	COUNTER STEEL WORK 84X42X36IN 4 SLIDING DOOR		0	2	2	
7430267345б	TYPEWRITER ELEC		1	0	1	
7440L003117	RACK CONTROL FILE(FOR IBM LISTINGS)NATIONAL 901		0	1	1	
	TOTAL FOR ACCOUNT CODE H		5	19	24	

FIGURE 3-8

[redacted]

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[redacted]

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE I — REFRIG & AIR CONDITION DIV

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3020L002138	HOIST MODEL M-505063 BLGIT 2 TON	[redacted]	0	1	1	[redacted]
3415L002762	PIPE CUTTING AND THREADING MACHINE RIOGID		0	1	1	
3431L003111	WELDEP ARC WESTINGHOUSE TYPE UW-235		0	1	1	
34332158457	TORCH KIT		0	1	1	
3680L002093	SANDBLASTER PORTABLE		0	1	1	
3680L002337	CABINET SANDBLASTER		0	1	1	
3920L003112	TRUCK HAND ALUMINUM APPLIANCE W/STRAPS		0	1	1	
3950L002209	HOIST 200LB TO 14 MDL 2009-10-A UNIVERSAL GANTRY		0	1	1	
41402033782	FAN FLOOR MDL 30IN		1	0	1	
43109004794	COMPRESSOR AIR W/ELECT MOTOR 3.7CFM		0	1	1	
49101036820	DETECTOR GAS LEAK		0	1	1	
51102889300	CUTTER CIRCLE		0	1	1	
51103411930	CUTTER DEXION PORTABLE		0	1	1	
5120L002688	HAMMER AIR POWER PN-9-1488		0	1	1	
5120L002772	PULLER SET JUMBO MDL-50 TON		0	1	1	
51200828503	PULLER SLEEVE 5F20-902		1	0	1	
51202231945	VISE MACH S-BASE 6IN JAW		1	0	1	
51202930110	VISE BENCH & PIPE		1	0	1	
51208924952	VISE & STAND, PIPE		0	1	1	
51302265387	SANDER ELECT MILWAUKEE PN-6020 SER45112		0	1	1	
51302931849	DRILL ELE 1/2IN PORTABLE		0	1	1	
51305611389	DRILL KIT 1/4IN		0	6	6	
5133L002335	DIE SET PIPE 1/8 THRU 2IN NPT		0	1	1	
51363577494	TAP & DIE SET INC)		0	1	1	
51363577504	THREADING SET (NF & NS)		0	1	1	
51400306617	CABINET TOOL KENNEDY KITS STYLE NO.294		0	4	4	
51400306617	CABINET TOOL		0	4	4	
51805663456	BLOCK SET LAPPING		1	0	1	
51805961474	KIT TOOL BOX SERVICE REFRIGERATION		4	0	4	
5210L001794	DRILL AIR POWER		0	1	1	
5210L001825	HYDRAULIC MAINT KIT		0	1	1	
544DL003084	LADDER 28 FT EXTENSION ALUMINUM		0	1	1	
54405852480	LADDER EXTENSION 40FT I EA ALUM / I EA WOOD		1	1	2	
582DL003128	TRANSCEIVER CM 2 CHAN CITIZENS BAND		0	2	2	
5830L001804	FIELD PHONE KIT		0	2	2	

FIGURE 3-9

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE I — REFRIG & AIR CONDITION DIV

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
62308731710	LAMP FLOURESCENT W/MAGNIFIER MOL LFM-1A	[redacted]	C	1	1	[redacted]
6625L002094	GAGE MANIFOLD SET	[redacted]	0	1	1	[redacted]
66259514472	AMPROBE SNAP-ON MOL-PS-3	[redacted]	0	1	1	[redacted]
6640L000217	TABLE CLEANROOM 8FT X30IN MDL-80830	[redacted]	0	1	1	[redacted]
6670L002419	SCALE PENN UNION TYPE PN-24DP	[redacted]	0	1	1	[redacted]
6680L000306	ANEMOMETER THERMO ALNCR 8500 W/PROBE # 1520	[redacted]	0	1	1	[redacted]
6680L000309	METER ALNOR TRIPLE RANGE	[redacted]	0	1	1	[redacted]
6685L000313	HYDROGROMETER ELEC PN-16867 PYSCHOMETER BATTERY	[redacted]	0	1	1	[redacted]
6685L000315	METER HUMIDITY RECORDER	[redacted]	0	2	2	[redacted]
6685L001508	TESTER TEMPERATURE MOL-12860	[redacted]	0	1	1	[redacted]
66856935009	GAUGE TESTER KIT, HYDRALIC	[redacted]	0	1	1	[redacted]
7110L002222	DRAWER UNIT 19 3/4X18IN 12DWR	[redacted]	0	4	4	[redacted]
7110L002223	DRAWER UNIT 19 3/4X18IN 18DWR	[redacted]	0	4	4	[redacted]
7110L002224	DRAWER UNIT 10 3/4X11IN 32DWRS	[redacted]	0	4	4	[redacted]
7110L002225	DRAWER UNIT 10 3/4X11IN 24DWRS	[redacted]	0	4	4	[redacted]
71101326477	CABINET FILE 4 DRW W/C LOCK	[redacted]	1	0	1	[redacted]
71101430830	DESK SINGLE PED	[redacted]	0	1	1	[redacted]
71102050821	FILE MAP CAB 5DWRS	[redacted]	1	1	2	[redacted]
71102709838	DESK TYPIST 63 X 30IN	[redacted]	1	0	1	[redacted]
71102709840	DESK FLAT DBL PED 60X34IN	[redacted]	2	0	2	[redacted]
71102738785	CHAIR STR W/OUT ARMS	[redacted]	4	0	4	[redacted]
71102738793	CHAIR SWIVAL W/ARMS	[redacted]	3	C	3	[redacted]
71105515492	CABINET 2 DRW W/WHEELS GREY MTL	[redacted]	0	1	1	[redacted]
7125L001954	DESK SHOP 34X30X53IN PN-2254	[redacted]	0	1	1	[redacted]
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES	[redacted]	9	0	9	[redacted]
71252855921	BIN STORAGE 36X12X87"	[redacted]	1	0	1	[redacted]
71254973115	BIN STORAGE & DISPLAY ROTARY 65 1/2X34IN DIA	[redacted]	0	2	2	[redacted]
71255437123	LOCKER SINGLE 18X21X78"	[redacted]	0	14	14	[redacted]
7195L001765	TABLE WORK W/AERIAL SHELF 28X60X34IN	[redacted]	0	1	1	[redacted]
74201621470	CALCULATOR REMINGTON	[redacted]	1	0	1	[redacted]
74306345062	TYPEWRITER MANUAL	[redacted]	1	0	1	[redacted]
7910L000457	VACUUM CLEANER MOL-620 CLARKE SN662537	[redacted]	0	1	1	[redacted]
79105509105	CLEANER VACUUM WET/DRY MASTERCRAFT D6510LB	[redacted]	0	1	1	[redacted]
79106808296	POLISHER FLOOR 1 DISK	[redacted]	0	1	1	[redacted]
81202683357	CYLINDER GAS OXYGEN	[redacted]	1	0	1	[redacted]
81202683360	CYLINDER COMPRESSED GAS	[redacted]	2	C	2	[redacted]
	TOTAL FOR ACCOUNT CODE I		37	94	131	[redacted]

FIGURE 3-9 (CONT'D)

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE J – TEST & EVAL DIV

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3610L003022	POWER SUPPLY ILLUMINATCR MOL CA75/100	[redacted]	0	1	1	[redacted]
36109848637	COPIER 3M MDL-209		0	1	1	
3920L000071	TRUCK ERECTA-SHELF T-2433		0	2	2	
3920L000074	TRUCK HEAVY DUTY 18X36X54 IN		0	3	3	
3920L000075	TRUCK HEAVY DUTY ST1474 18X48X78		0	3	3	
39201837423	TRUCK HAND 2WHL GENERAL PURPOSE		1	0	1	
39203294288	TRUCK SHELF 4 STEEL TRAYS		1	0	1	
4110L000098	FREEZERATOR SS EXTERICR ALUM INTERIOR		0	1	1	
5860L003021	LASER METROLOGIC MDL 310		0	1	1	
6110L000180	CONTROL MASTER MODEL E600M		0	1	1	
6625L001853	METER PH EXPANDOMATIC PN-7147-A		0	1	1	
6625L002010	METER POWER MDL-900		0	1	1	
6625L002980	MICROVOLTMETER BY MEDISTOR		0	1	1	
6625L002981	RADIOMETER YSI		0	1	1	
6625L002982	RECORDER HP DUAL CHANNEL		0	1	1	
6625L003020	METER PH CENTURY SS-1		0	1	1	
6640L000201	CART CLEAN ROOM 304SS WA-4		0	1	1	
6640L000207	TABLE CLEANROOM 4FT X30IN MDL-BD430L		0	1	1	
6640L000209	TABLE CLEANROOM 5X3FT MDL-BD536		0	2	2	
6640L000211	TABLE CLEANROOM 6FT X30IN MDL-BD630		0	4	4	
6640L000218	TABLE CLEANROOM 8X3FT MDL-BD836		0	2	2	
6640L002064	STIRRER LAMP COMBINATICN PN-9236-P20		0	1	1	
6645L000251	TIMER INTERVAL PN-TM8		0	3	3	
66455565537	TIMER INTERAL MDL 300		0	4	4	
6670L000280	SCALE MDL-4791		0	1	1	
6670L002065	BALANCE METRIC SCALE 2600 GRAM/TRIPLE BEAM		0	1	1	
6670L002988	BALANCE METRIC SCALE 2000 GRAM/OHAUS		0	1	1	
6680L000308	TACHOMETER W/STOP WATCH		0	1	1	
6685L000316	THERMOMETER 42SC YSI		0	1	1	
6730L001611	PROJECTOR OVERHEAD 3M-MDL-521ALF		0	1	1	
67304065868	SCREEN PROJECTION 70X70IN		0	2	2	
6740L000213	TABLE EDITING 30IN PN-1-218-R-001		0	1	1	
6740L000346	TABLE LIGHT RICHARDS TYPE-GFL940MC PN-910454		0	2	2	
6740L000347	TABLE LIGHT RICHARDS TYPE-GFL918 PN-910106		0	1	1	
6740L000376	ENLARGER CAMERA MDL-184		0	1	1	

FIGURE 3-10

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE J – TEST & EVAL DIV

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6740L000393	MIXER PORTABLE 15GAL 110V 60CYC	[redacted]	0	3	3	[redacted]
6740L000415	TABLE DENSITOMETER MDL-III PN-1-237-R-001		0	1	1	
6740L001582	PRECISION THERMOSTATIC HIGH TEMP BATH		0	1	1	
6740L001602	PROCESSOR HIGH CAP SILVER DRY 3M		0	1	1	
6740L001831	DRYER FILM TABLE TOP TYPE-316L OSCAR FISHER		0	1	1	
6740L001837	SINK SS PHOTO PROCESSING		0	2	2	
6740L002134	MICROSCOPE AC DUO-STAR COMPARISON MDL-K1567A		0	2	2	
6740L002140	TABLE VIEWING TWO STRAND PN-1-242-E-001		0	1	1	
6740L002582	SINK KREONITE MDL 2455-449		0	1	1	
6740L002949	DENSITOMETER CONTROL SYSTEM AIL W/PDP-8L COMPUTER		0	1	1	
6740L002950	SCANNER DYNAMIC COLOR SYSTEM ITT		0	1	1	
6740L002951	SENSITOMETER HIGH-INTENSITY EK#836-001		0	1	1	
6740L002952	TABLE OPTICAL SELF LEVELING MODERN OPTICS		0	1	1	
6740L002953	PROCESSOR FREE-RADICAL FILM HEAT MDL-F1001PN1253A1		0	1	1	
6740L002954	PROCESSOR SENSITOMETETRIC SPRAY MDL-SP-6707-A		0	1	1	
6740L002977	MIXER LIGHTNING MDL F		0	1	1	
6740L002978	MIXER LIGHTNING MDL NC-4		0	2	2	
6740L002979	TANK PORTABLE MIXING 50 GAL		0	2	2	
6740L002989	SINK KREONITE MDL 2477-109		0	1	1	
6740L003016	SINK KREONITE MDL 24-8-514		0	1	1	
6740L003017	TANK MIXING PORTABLE 30GAL MDL E122080-2 W/MOTOR		0	2	2	
6740L003018	PRINTER CONTACT 9.5IN (FREE RADICAL) SN 209		0	1	1	
6740L003019	PRINTER CONTACT 9.5IN 3M MODIFIED) SN 305		0	1	1	
67401069032PK	PRINTER RAINBOW PN-1-032-E-200		0	1	1	
67401784784	PROCESSOR EKTACHROME MDL-1811MG		0	1	1	
67405140987	TABLE SPLICER PN-FM16-3		0	1	1	
67407635224	PRINTER CONTACT 9.5IN NIAGARA SN 404		0	1	1	
67407665280	PROCESSOR PN-11CM VERSAMAT		0	1	1	
6760L000497	DENSITOMETER PLOTTER QUANTANSCAN MDL-101A		0	1	1	
71101326477	CABINET FILE 4 DRW W/C LOCK		1	0	1	
71102050821	FILE MAP CAB 50WRS		3	0	3	
71102626663	TABLE OFFICE 60X34IN		6	7	13	
71102709838	DESK TYPIST 60X30IN		2	0	2	
71102709840	DESK FLAT DBL PED 60X34IN		16	0	16	
71102738793	CHAIR SWIVAL W/ARMS		18	0	18	

FIGURE 3-10 (CONT'D)

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE J – TEST & EVAL DIV

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
71102739444	CABINET FILE 5DWRS LETTER SZ W/OUT LOCK	[redacted]	4	1	5	[redacted]
71102863797	CABINET FILE 5DWRS LEGAL SZ		5	3	8	
71105515259	CABINET FILE 4DWRS W/COMBINATION LOCK		5	0	5	
71106341407	SAFE EXPLOSIVE RESIST 2DOOR		1	0	1	
71106636360	CABINET 2DWR SAFE TYPE		1	0	1	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	15	15	
71255596383	BIN STORAGE & DISPLAY		5	0	5	
7420L002355	CALCULATOR WANG MDL-154		0	1	1	
7420L002356	CALCULATOR WANG MDL132		0	2	2	
74201621469	CALCULATOR REMINGTON		1	0	1	
74302673456	TYPEWRITER ELEC		2	0	2	
7440L003092	COMPUTER NOVA 1220/ELECTRONICS/INTERFACE RACK		0	1	1	
7910L001801	VACUUM CLEANER INDUSTRIAL BLACK & DECKER		0	1	1	
79106808296	POLISHER FLOOR 1 DISK		0	1	1	
	TOTAL FOR ACCOUNT CODE J		72	118	190	[redacted]

FIGURE 3-10 (CONT'D)

[redacted]

BYE 15254-76
Handle via Byeman / Talent-Keyhole Controls Only

[redacted]

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EQUIPMENT INVENTORY

ACCOUNT CODE K – ELECTRONIC MAINT

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3430L000017	GUN HEATRAX MODEL #HG_103	[redacted]	0	1	1	[redacted]
4940L000110	CLEANING UNIT ULTRASONIC MDL-D-100		0	1	1	
5120L002205	TOOL WIRE WRAP MDL-14XA2-B-2		0	1	1	
6110L003125	VOLTAGE REGULATOR,STABILINE TYPE EMT4106CW EV-C		0	2	2	
6110L003126	VOLTAGE REGULATOR,STABILINE TYPE EM4106GA EVA		0	1	1	
6110L003127	VOLTAGE REGULATOR,STABILINE TYPE IES9106 (EVA)		0	2	2	
6625L000177	PROBE HIGH VOLTAGE PN-010-106		0	1	1	
6625L000178	TEST SET W/LEAD PN-114533 TAYLOR TEST I		0	1	1	
6625L000179	OSCILLATOR PN-HP202C		0	1	1	
6625L000184	TESTER DECADE SWITCH RANGE MDL-8178		0	1	1	
6625L000189	VOLTMETER VACUUM TUBE MDL 400L		0	1	1	
6625L001806	PREAMPLIFIER DIFFERENTIAL TYPE-G		0	1	1	
6625L002032	GENERATOR PULSE MDL-114		0	1	1	
6625L002627	VOLTMETER MDL-320A		0	1	1	
6625L002764	ATTENTUATOR PN-350D		0	1	1	
6625L002765	MULTIMETER DIGITAL PN-3300A		0	2	2	
6625L002930	OSCILLOSCOPE HEATH KIT MDL10105 SER45112		0	1	1	
6625L003002	PROBE LOGIC LP-520 SN9425		0	1	1	
6625L003093	GENERATOR TEST DISPLAY TEKTRONIKS		0	1	1	
6625L003094	GAUGE DIGITAL PRESSURE (FOR PNEUMATIC SYSTEMS)		0	1	1	
6625L003095	LOGIC TROUBLE SHOOTING KIT (COMPUTER)		0	1	1	
6625L003096	GENERATOR AEROSOL AGS 255/256(ROYCO P.COUNTER)		0	1	1	
6625L003097	TEST BENCH TAYLOR		0	1	1	
66251186736	GENERATOR FUNCTIONAL H/P-3300A		0	1	1	
66251312751	OSCILLOSCOPE MDL-163D TEKTRONIC 453		0	1	1	
66251920866	AMPLITUDE CALIBRATOR & COMPARATOR TEKTRONIKSS		0	1	1	
66252433476	AMMETER MDL-155		0	1	1	
66254745292	MICROVOLTER AUDIO FEQ TYPE 546C		0	1	1	
66255853152	RESISTOR BOX DECADE RADIC TYPE PN-1432-P		0	1	1	
66255935358	PRE-AMPLIFIER TYPE-D		0	2	2	
66255935360	PRE-AMPLIFIER TYPE-B		0	1	1	
66256069727	GENERATOR SQUARE WAVE TYPE 105		0	1	1	
66256083538	DOLLY OSCILLOSCOPE		0	4	4	
66256206366	MULTIMETER PN-TS5050/U		0	1	1	
66256431686	TEST SET MDL-AN/PSM6		0	4	4	

FIGURE 3-11

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EQUIPMENT INVENTORY

ACCOUNT CODE K – ELECTRONIC MAINT

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMD EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
66256488340	GENERATOR SIGNAL MDL 211A	[redacted]	0	1	1	[redacted]
66256488346	TEST SET PN-T/V-7B/U		0	1	1	
66256493566	MICRDAMMETER DC MDL-622		0	1	1	
66256495276	STROBOSCOPE MDL 510-AL		0	1	1	
66256786637	PLUG-IN UNIT TYPE-CA TEKTRONIKS		0	5	5	
66256912576	TESTER TUBE PN-AN/USM-118B		0	1	1	
66256916529	TRACER TRANSISTOR CRUVE TYPE-575		0	1	1	
66257143992	OSCILLOSCOPE TYPE-545A		0	1	1	
66258216688	VOLTMETER TYPE-VTVM412A		0	1	1	
66258216778	OSCILLOSCOPE DUALBEAMTYPE-555		0	1	1	
66258276225	OSCILLOSCOPE MDL-1805		0	1	1	
66258881495	POTENTIOMETER TYPE-K3		0	1	1	
66259821543	GENERATOR TIME MARK TEKRONIKS		0	1	1	
66259980722YA	PROBE CURRENT CLIP-ON MDL-P6021		0	1	1	
6740L000366	CAMERA OSCILLOSCOPE TYPE-C12		0	1	1	
6740L001679	IMPEDANCE BRIDGE MDL-4260A		0	1	1	
7110L002973	CHAIR EXEC SWIVAL/GREEN CONFERENCE		0	1	1	
71101326477	CABINET FILE 4 DRW W/C LOCK		1	0	1	
71102626663	TABLE OFFICE 60X34IN		1	0	1	
71102709840	DESK FLAT DBL PED 60X34IN		2	0	2	
71102738793	CHAIR SWIVAL W/ARMS		1	0	1	
71102863798	CABINET FILE 5DWRS LETTER SZ W/OUT LOCK		1	0	1	
7125L001812	BIN STORAGE V-GRIP 18X38X76IN		0	2	2	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	6	6	
7195L000536	STAND TOOL W/4DWRS PN-3145		0	2	2	
7195L001765	TABLE WORK W/AERIAL SHELF 28X60X34IN		0	3	3	
74306345062	TYPEWRITER MANUAL		1	0	1	
	TOTAL FOR ACCOUNT CODE K		7	79	86	

FIGURE 3-11 (CONT'D)

BYE 15254-76
Handle via Byeman / Talent-Keyhole Controls Only

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EQUIPMENT INVENTORY

ACCOUNT CODE L – SPECIAL ACTIVITY

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3610L000056	DUPLICATING MACH THERMOFAX MOL 33 W/CABINET	[redacted]	0	1	1	[redacted]
3610L002099	CUTTER DIE FOR LAMINATED PRODUCTS PN-1087LA		0	1	1	
3610L002100	LAMINATOR MINI LAM		0	1	1	
5820L000148	CAMERA CHANNELMASTER MDL-7150		0	1	1	
5820L000149	MONITOR SET 12 CC-TV		0	1	1	
6630L002211	READER MICROFILM MDL-275AAR		0	1	1	
66455266266	TIME STAMP STROMBERG MDL-B		0	1	1	
67207C40663	CAMERA POLAROID MDL-1108		0	1	1	
71102709838	DESK TYPIST 60X30IN		3	0	3	
711027C9840	DESK FLAT OBL PED 60X34IN		2	0	2	
71102738793	CHAIR SWIVAL W/ARMS		6	0	6	
71102739459	CABINET FILE 18M CARD 10 DRW GREY METAL JEBCO		0	1	1	
71102863797	CABINET FILE 5DWRS LEGAL SZ		3	0	3	
71106636360	CABINET 2DWR SAFE TYPE		1	0	1	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	1	1	
74302673456	TYPEWRITER ELEC		1	0	1	
74306345062	TYPEWRITER MANUAL		1	0	1	
	TOTAL FOR ACCOUNT CODE L		17	10	27	

FIGURE 3-12

BYE 15254-76
Handle via Byeman / Talent-Keyhole Controls Only

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EQUIPMENT INVENTORY

ACCOUNT CODE N – ANALYSIS

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3610L000059	CUTTER PAPER NIKOR 16X16 PN-3201	[redacted]	0	1	1	[redacted]
3610L000675	POWER SUPPLY SHORT ARC MERCURY LAMP BY IONICS	[redacted]	0	1	1	[redacted]
4110L000098	FREEZERATOR SS EXTERIOR ALUM INTERIOR	[redacted]	0	1	1	[redacted]
5815L000147	PUNCH PAPERTAPE FRIDEN MDL 2	[redacted]	0	1	1	[redacted]
5830L000152	INTERCOM 2WAY MDL-FW40	[redacted]	0	1	1	[redacted]
5835L000154	RECORDER TAPE 3 3/4 SPEED MDL-T-1500	[redacted]	0	1	1	[redacted]
5950L003051	TRANSFORMER SOLA	[redacted]	0	1	1	[redacted]
6230873171O	LAMP FLOURESCENT W/MAGNIFIER MOL LFM-LA	[redacted]	0	1	1	[redacted]
65307027000	CABINET SURGICAL INSTRUMENT 16X36X72IN	[redacted]	0	1	1	[redacted]
6625L000173	MICROMANIPULATOR DEFCN BRUNE PN-V58090	[redacted]	0	1	1	[redacted]
6625L000174	BIOLOGICAL INSTRUMENT SET PN-V38058	[redacted]	0	1	1	[redacted]
6625L000175	TRANSISTOR INSTRUMENT SET PN-V38059	[redacted]	0	1	1	[redacted]
6625L000669	RECORDER STRIP CHART MOSELY MDL-83	[redacted]	0	1	1	[redacted]
6625L000672	MICROANALYZER D W MANN DATA W/PAPER TAPE DIGITIZER	[redacted]	0	1	1	[redacted]
6625L001943	MICROSCOPE A O SPENCER MDL 367 CYCLOPS SCOPE	[redacted]	0	1	1	[redacted]
6630L000190	COLORMETER PN-1104 HATCH	[redacted]	0	1	1	[redacted]
6630L000194	METER W/HYDRO-ELE CELL & TEMP BLOCK PN-101900BECM	[redacted]	0	1	1	[redacted]
6630L003049	CALIBRATION SET HYDROMETER	[redacted]	0	1	1	[redacted]
6635L000199	IMPACT TESTER TINUS OLSEN	[redacted]	0	1	1	[redacted]
6635L000200	FOLDING ENDURANCE TESTER MDL-2	[redacted]	0	1	1	[redacted]
6640L000203	TABLE BALANCE MDL-8-315	[redacted]	0	2	2	[redacted]
6640L000207	TABLE CLEANROOM 4FT X30IN MDL-BD430L	[redacted]	0	2	2	[redacted]
6640L000220	TABLE UTILITY MOD-UT152	[redacted]	0	2	2	[redacted]
6640L000221	TABLE UTILITY MOD-B310X	[redacted]	0	6	6	[redacted]
6640L000222	TABLE UTILITY MOD-B300X	[redacted]	0	4	4	[redacted]
6640L000224	TABLE UTILITY MOD-UT151	[redacted]	0	5	5	[redacted]
6640L000226	TABLE UTILITY MDL-UT152	[redacted]	0	5	5	[redacted]
6640L000671	HOTPLATE CYRTHPEM II	[redacted]	0	1	1	[redacted]
6640L002945	TESTER STIFFNESS MDL1508 TABER INSTR	[redacted]	0	1	1	[redacted]
6640L002946	TESTER-SCRATCH MDL502 TABER INSTR	[redacted]	0	1	1	[redacted]
66404902715	MICROSCOPE W/BUILT IN ILLUMINATOR A.O.S.MONOCULAR	[redacted]	0	2	2	[redacted]
6645L000249	MONOCHROMATOR GRATING 500MM 600 GROOVE	[redacted]	0	1	1	[redacted]
6650L000256	ROLLOSCOPE DEPTH MEASURING MDL-DMRM	[redacted]	0	1	1	[redacted]
6650L000257	MICROSCOPE UNITRO BINOCULAR MDL-BU11	[redacted]	0	1	1	[redacted]
6650L000258	SPECTROPHOTOMETER GRATING INFRARED MDL-237	[redacted]	0	1	1	[redacted]

FIGURE 3-13

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EQUIPMENT INVENTORY

ACCOUNT CODE N – ANALYSIS

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6650L000260	EYE PIECE COOKE AEI IMAGE SPLITTING	[redacted]	0	1	1	[redacted]
6650L000261	MICROTOME MDL-820A		0	1	1	
6650L000262	SPECTROMETER PHOTO RECCROING PN-14CARY		0	1	1	
6650L000267	OBJECTIVE 10X16MM DISPERSION STAINING		0	1	1	
6650L001483	MICROSCOPE UNIVERSAL ZEISS		0	1	1	
6650L001628	MICROSCOPE MICRO-STAR A.O. SPENCER		0	1	1	
6650L001944	OBJECTIVE MICROSCOPE PLANACHROMAT		0	1	1	
6650L003044	EYEPIECE DUAL BEAM DEMONSTRATION		0	1	1	
6650L003052	CALIBRATION SET ND FILTER(28XS TO A SET)		0	2	2	
6650L003053	FILTER SET NBP OPTICS TECHNOLOGY STANDARD SET		0	2	2	
6650L003054	FILTER SET NEUTRAL DENSITY B&L		0	1	1	
6650L003055	MICROSCOPE ORTHOLUX LEITZ		0	1	1	
6650L003056	EYEPIECE FILAR MICROMETER		0	3	3	
66505409018	ILLUMINATOR MDL-350 AMERICAN OPTICAL		0	1	1	
6670L000270	BALANCE METTLER PN-H16		0	1	1	
6670L000276	BALANCE METRIC MICROMETER MDL-1950		0	1	1	
6675L000302	MICROCOMPARATOR W/DATA LOGGER & TYPEWRITER		0	1	1	
6680L000307	BAROMETER WILLS PN-4116		0	1	1	
6680L000310	TESTING SET ABRASER PN-10100		0	1	1	
6695L003046	CALIBRATION SET NBS PRECISION WEIGHTS		0	1	1	
6720L000674	CAMERA 35MM ZIESS		0	1	1	
6740L000337	SENSITOMETER SPECTRO EE, HF		0	1	1	
6740L000344	FOCATRON MDL-P-122		0	1	1	
6740L000357	SENSITOMETER DW MANN TYPE-1215 EDGE		0	1	1	
6740L000363	PROCESSOR SENSIMETERIC SPRAY		0	1	1	
6740L000369	CHAMBER CONTROLLED RELATIVE HUMIDITY PN-6170		0	1	1	
6740L000380	DRYER FILM PN-2598K		0	1	1	
6740L000386	PROCESSOR SENSITOMETRIC STRIPS IMMERSION		0	1	1	
6740L000388	ENLARGER OMEGA DE2V		0	1	1	
6740L000392	SINK OSCAR FISHER #FP-3810 36X96X10IN		0	1	1	
6740L000421	SENSITOMETER AUTO INTENSITY SCALE EK TYPE 1B 2037		0	1	1	
6740L000424	PROCESSOR EKTACOLOR MDL-16K		0	1	1	
6740L000427	DRYER COLOR PRINT MDL-1620 (16X20IN PRINTS)		0	1	1	
6740L000431	MICROCAMERA MDL-510-0418R		0	1	1	
6740L000436	HOOD EDGEGUARD PN-EG6420 72X48X24IN LAMINAR FLOW		0	2	2	

FIGURE 3-13 (CONT'D)

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31 July 2014

EQUIPMENT INVENTORY

ACCOUNT CODE N – ANALYSIS

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6740L000437	SINK W/REFRIGIRATED CABINET PN-71-RC-SS	[redacted]	0	1	1	[redacted]
6740L000452	LAMPHOUSE ASSY CHROMEGA		0	1	1	
6740L000673	CALIBRATION INST SYS PHOTO & RADIO METRIC EGG		0	1	1	
6740L001694	DENSITOMETER PROTOTYPE MOR-001 AEROFLEX PRECISION		0	1	1	
6740L001748	SENSITOMETER SPECULAR LIGHT PN-EG0438		0	1	1	
6740L001855	PROCESSOR COLOR FILM MARK-III SICKLE CIRCLE 'S'		0	1	1	
6740L002210	TABLE LIGHT RICHARDS MIM-2 ZOOM 70 MDL W/A.O.SCOPE		0	1	1	
6740L002947	PHOTOMETER AUTO MDL2900 GANNA SCIENTIFIC		0	1	1	
6740L002948	COLOR IMETER KOLL MORGAN KCS-18 TFC-1 MACBETH		0	1	1	
6740L003045	DENSITOMETER MRL-001 1/2MM APER MACBETH		0	1	1	
6740L003048	TANK MIXING SS 25GAL W/LIGHTNING MIXER		0	1	1	
67402098038	PROCESSING UNIT 70MM AUTOMATIC		0	1	1	
67404918505	ANALYZER PHOTO MDL-877 WESTON		0	1	1	
67405256471	LAMP ASSY INDIRECT LIGHT BOX PN-8900433500SAFELITE		0	10	10	
6760L000488	DENSITOMETER TRANSMISSION MOL-T02170R		0	1	1	
6760L000499	DENSITOMETER DBL BEAM AUTO JOYCE LOEBL MARK-IIIB		0	1	1	
6760L002623	TRIMMER NIKOR 16X16IN PN-82-022-HT KNIFE		0	1	1	
6760L002944	DENSITOMETER W/TELETYPE KOLL MORGAN TDA1000		0	1	1	
67608857157	DENSITOMETER WELSH MOL-38530		0	1	1	
6780L000502	DEVELOPER NIKOR PROCESSING KIT		0	1	1	
71101326477	CABINET FILE 4 DRW W/O LOCK		2	0	2	
71102709840	DESK FLAT DBL PED 60X34IN		4	0	4	
71102738785	CHAIR STR W/OUT ARMS		0	2	2	
71102738793	CHAIR SWIVAL W/ARMS		2	0	2	
71102739444	CABINET FILE 5DWRS LETTER SZ W/OUT LOCK		0	1	1	
7125L003043	CABINET GLASS DOORS GREEN WALL ECONOMY		0	2	2	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	7	7	
7195L001692	PANEL VISUAL AID EBERHARD BOARD 46PD 4X6FT		0	1	1	
7195L001693	PANEL VISUAL AID EBERHARD BOARD 48PD 4X8FT		0	1	1	
74202051087	CALCULATOR FRIDEN MECHANICAL		1	0	1	
74306345062	TYPEWRITER MANUAL		2	0	2	
7440L000544	ERASER ELECTRIC FOR MAGNETIC TAPE		0	1	1	
7440L003047	CABINET FILE MTL SINGLE DRW IBM		0	1	1	
7530L003050	PUNCH TAPE PROGRAM SINGER		0	1	1	
7610L003057	PHAMPLETS ANSI STANDARDS 5 VOLUMES		0	1	1	
7610L003058	BOOKS ASTEM STANDARDS (6 BOOK SET)		0	1	1	
79105261775	VACUUM CLEANER HOOVER MDL-V11C7		0	1	1	
	TOTAL FOR ACCOUNT CODE N		11	144	155	[redacted]

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EQUIPMENT INVENTORY

ACCOUNT CODE O – QUALITY ASSURANCE

STOCK NUMBER	NCMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3442L003060	PRESS MANUAL HYDRALIC	[redacted]	0	1	1	[redacted]
361CL000060	TRIMMER ALL METAL NIKOR 15X15 PN-3201		C	1	1	
3610L003070	TRIMMER PAPER 16 X 16" PREMIER		0	1	1	
3610L003071	TRIMMER PAPER 14 X 16" OMEGA		0	2	2	
4110L000098	FREEZERATOR SS EXTERIOR ALUM INTERIOR		C	1	1	
4110L001698	FREEZER CHEST 4.1CU FT		0	1	1	
41102990408	FREEZERATOR 12 CU FT		0	1	1	
4310L001001	PUMP VACUUM MDL 150		0	1	1	
5841L000159	GENERATOR AEROSOL MDL-255 ROYCO RHEOSTAT		0	1	1	
5905L002113	RECORDER POTENTIOMETER MDL-W L & N		0	2	2	
6515L003069	EYEBATHE		0	1	1	
6520L003061	MIXER WIG-L-BUG CRESCENT DENTAL Y56900		0	1	1	
6625L000171	METER PN-11-9000 CL ANALYSER		0	1	1	
6625L001853	METER PH EXPANDOMATIC PN-7147-A		0	1	1	
6630L000192	DETERMINATOR PN-AE-6441-2 SILTING INDEX		0	1	1	
663CL000195	METER DIGITAL ORION PN-801		0	1	1	
6630L000197	METER MOD-310F PN-13-636-50V2 BECKMAN PH METER		0	2	2	
6630L000236	BALANCE METTLER P3		0	1	1	
6630L001712	VISCOMETER 8 SPEED MDL-LVT		0	1	1	
6635L003005	PARTICLE COUNTER ROYCO MDL264 DIGITL DISPLAY&PRINT		0	2	2	
6640L000102	DRYER PIPET SS		0	1	1	
6640L000204	TABLE CLEANROOM 3X2FT MDL-BD324		0	1	1	
6640L000206	TABLE CLEANROOM 4X2FT MDL-BD424		0	3	3	
6640L000207	TABLE CLEANROOM 4FT X30IN MDL-BD430L		0	2	2	
6640L000215	TABLE CLEANROOM 6X3FT MDL-BD636		0	1	1	
6640L000227	OVEN ISOTEMP PN-13-245		0	1	1	
6640L000228	STIRRER MAGNETIC PN-14-511-1 (MODIFIED)		0	1	1	
6640L000229	OVEN FORCED DRAT THELCC MDL-18		0	1	1	
6640L000237	STIRRER MAGNETIC MARK I PN-CP4800 SMALL SIZE		0	3	3	
6640L000238	CENTRIFUGE LAB PN-5-111V1		0	1	1	
6640L000239	TABLE GAVETT BALANCE PN-03783		0	1	1	
6640L000240	HOLDER FILTER MICROANALYSIS PN-XX5002500		0	1	1	
6640L000241	HOLDER FILTER PN-XX5004740		0	1	1	
6640L000242	HOLDER FILTER PN-XX20-017-00		0	1	1	
6640L000243	HOLDER FILTER PN-XX6602550		0	1	1	

FIGURE 3-14

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EQUIPMENT INVENTORY

ACCOUNT CODE O - QUALITY ASSURANCE

STOCK NUMBER	NCMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6640L000286	STIRRER MAGNETIC PN-AC-14-51-2	[redacted]	0	1	1	[redacted]
6640L000533	HOLDER FILTER HYDROSOL PN-XX502004720	[redacted]	0	1	1	[redacted]
6640L001002	STIRRER MDL-1270	[redacted]	0	1	1	[redacted]
6640L001004	FURNACE THERMOLYNE MDL-F-B1315M	[redacted]	0	1	1	[redacted]
6640L001986	TESTER FLASH CONTROL MDL	[redacted]	0	1	1	[redacted]
6640L002031	STIRRER VARIBLE SPEED PN-GT-21	[redacted]	0	1	1	[redacted]
6640L003062	DISTILLATION APPARATUS BELLO INC	[redacted]	0	1	1	[redacted]
66407353661	APPARATUS SLIDING INDEX PN-XX68-01300	[redacted]	0	1	1	[redacted]
6645L000245	APPARATUS MELTING POINT PN-17747	[redacted]	0	1	1	[redacted]
66452861019	TIME STAMP MDL-7800-5 IABM	[redacted]	0	2	2	[redacted]
6650L000263	SPECTRONIC PHOTO RECORDING PN-20	[redacted]	0	1	1	[redacted]
6650L003063	SPECTROPHOTOMETER GRATING INFRARED MDL 467 P.ELMER	[redacted]	0	1	1	[redacted]
6665L000268	AEROSOL ANALYSIS KIT PN-XX73-037-00	[redacted]	0	1	1	[redacted]
6670L000282	BALANCE ANALYTICAL DIGITAL READOUT PN-1H10TW	[redacted]	0	1	1	[redacted]
6675L000305	STEROMICROSCOPE WILD MODEL	[redacted]	0	1	1	[redacted]
6685L003064	BAROMETER A.H. THOMAS	[redacted]	0	1	1	[redacted]
6730L000332	VIEWER RESIDUAL HYPO PN-123-133	[redacted]	0	1	1	[redacted]
6740L000346	TABLE LIGHT RICHARDS TYPE-GFL940MC PN-910454	[redacted]	0	1	1	[redacted]
6740L000372	COUNTER PARTICLE MANUAL PN-4476	[redacted]	0	1	1	[redacted]
6740L000425	SEPERATOR THREE STRAND PN1-600-R-001 SN 600-3	[redacted]	0	1	1	[redacted]
6740L000426	TRIMMER 70MM PN1-601-R-001 SN 601-3	[redacted]	0	1	1	[redacted]
6740L000438	PROCESSOR SENSISTRIP GILLER MDL-2	[redacted]	0	1	1	[redacted]
6740L000470	LABORATORY POLAROGRAPH PN-EUW-402M	[redacted]	0	1	1	[redacted]
6740L001590	ANALYZER WATER & CHEMICAL MDL-DR-EL	[redacted]	0	1	1	[redacted]
6740L001665	SHAKER VORTEX GENIE ADJ SPEED	[redacted]	0	1	1	[redacted]
6740L001981	BATH CONSTANT TEMP	[redacted]	0	1	1	[redacted]
6740L002913	FUME HOOD	[redacted]	0	2	2	[redacted]
6740L002914	CHROMATOGRAPH GAS PERKIN-ELMER #990	[redacted]	0	2	2	[redacted]
6740L002915	SPECTROPHOTOMETER ATOMIC ABSORPTION P & E # 403	[redacted]	0	1	1	[redacted]
6740L002959	SENSITOMETER INTENSITY SCALE MD5 PN824-001W/FILTER	[redacted]	0	2	2	[redacted]
6740L003065	BATH CONSTANT TEMPERATURE	[redacted]	0	1	1	[redacted]
6740L003066	MICROFORMS READER 1212/22X	[redacted]	0	1	1	[redacted]
6740L003067	SINK CALUMET SS CONTRACT NO. AF30(602)-1814	[redacted]	0	1	1	[redacted]
6760L000497	DENSITOMETER PLOTTER QUANTANSCAN MDL-101A	[redacted]	0	3	3	[redacted]
6760L000498	DENSITOMETER QUANTALOG MDL-TD102	[redacted]	0	1	1	[redacted]

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EQUIPMENT INVENTORY

ACCOUNT CODE O – QUALITY ASSURANCE

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6760L000500	DENSITOMETER QUANTALOG MDL-TD203	[redacted]	0	1	1	[redacted]
6760L002944	DENSITOMETER W/TELETYPE KOLL MORGAN TDA1000		0	1	1	
71102676981	TABLE OFFICE 45X34IN		1	0	1	
71102709838	DESK TYPIST 63 X 30IN		1	0	1	
71102709840	DESK FLAT OBL PED 60X34IN		0	3	3	
71102738785	CHAIR STR W/OUT ARMS		0	1	1	
71102738793	CHAIR SWIVAL W/ARMS		0	5	5	
71102739444	CABINET FILE 5DWRS LETTER SZ W/OUT LOCK		0	1	1	
71102863797	CABINET FILE 5DWRS LEGAL SZ		0	2	2	
7125L000529	CABINET 82"X 47"X 16" FN D13-120		0	1	1	
7125L003068	CABINET WALL HANGING 4X2 1/2' W/2 SLIDING GLASDOOR		0	14	14	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	4	4	
7310L000538	HOTPLATE 2 BURNER MDL-HP5211ST		0	1	1	
7310L001005	HOTPLATE THERMDLYNE MDL-HP-A1915B		0	1	1	
74201042653	CALCULATOR FRIDEN SN-11055		1	0	1	
74302673456	TYPEWRITER ELEC		1	0	1	
	TOTAL FOR ACCOUNT CODE 0		4	120	124	

FIGURE 3-14 (CONT'D)

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EQUIPMENT INVENTORY

ACCOUNT CODE P – COMM CENTER

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
66457330667	TIME STAMP PN-NA18G	[redacted]	0	1	1	[redacted]
6740L001538	CABINET 2OWR PN-802		0	1	1	
71101326496	FILE CAB 3 1/4X7 3/8IN CARD 11 DWRS		0	1	1	
71102626663	TABLE OFFICE 60X34IN		1	0	1	
71102709838	OESK TYPIST 60X30IN		1	0	1	
71102738793	CHAIR SWIVAL W/ARMS		1	0	1	
71109764852	CABINET FILE 4DWRS W/CCMB LOCK		1	0	1	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	2	2	
74306345062	TYPEWRITER MANUAL		1	0	1	
79105261775	VACUUM CLEANER MDL 61-67 SEARS		0	1	1	
	TOTAL FOR ACCOUNT COOE P		5	6	11	

FIGURE 3-15

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EQUIPMENT INVENTORY

ACCOUNT CODE Q – D.E. ADMIN

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6675L002137	LETTERING SET LEROY PN-61-290	[redacted]	0	1	1	[redacted]
6675526221	TABLE DRAFTING 84X42 IN	[redacted]	0	1	1	[redacted]
6740L001751	REPRODUCTION BLUEPRINT MACHINE	[redacted]	0	1	1	[redacted]
7110L000516	TABLE HAMILTON L CONTCUR 37 1/4X50IN	[redacted]	0	1	1	[redacted]
71101326477	CABINET FILE 4 DRW W/C LCCK	[redacted]	1	0	1	[redacted]
71102050821	FILE MAP CAB 5DWRS	[redacted]	3	0	3	[redacted]
71102626663	TABLE OFFICE 60X34IN	[redacted]	1	0	1	[redacted]
71102709838	DESK TYPIST 60X30IN	[redacted]	3	0	3	[redacted]
71102709840	DESK FLAT DBL PED 60X34IN	[redacted]	1	0	1	[redacted]
71102738785	CHAIR STR W/OUT ARMS	[redacted]	3	0	3	[redacted]
71102738793	CHAIR SWIVAL W/ARMS	[redacted]	3	0	3	[redacted]
71102863797	CABINET FILE 5DWRS LEGAL SZ	[redacted]	2	0	2	[redacted]
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES	[redacted]	2	0	2	[redacted]
	TOTAL FOR ACCOUNT CODE Q		19	4	23	[redacted]

FIGURE 3-16

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EQUIPMENT INVENTORY

ACCOUNT CODE R – ELEC POWER PRODUCTION

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
34152231982	GRINDING BUFF MACHINE UTILITY 1/2HP	[redacted]	1	0	1	[redacted]
3950L0C3114	HOIST 1 TON ELECTRIC COFFING JF-1		0	1	1	
49102945057	TESTER CYLINDER COMPRESSION K-100		1	0	1	
49107560934	CABINET TOOL		0	1	1	
49304909154	PUMP LUB MIL PA45050		1	0	1	
4940L0C1690	CLEANING UNIT STEAM HVY DTY PN-3552M3		0	1	1	
4940L003113	DEGREASER CLEAN-O-MATIC MDL-800-A SN-B-73		0	1	1	
51100154460	COMMUTATOR HAND 821 SLOTTER & SCRAPPER		1	0	1	
51200812308	SOCKET SET 3/4IN DRIVE WRENCH 28 PIECE		0	1	1	
51200812309	SOCKET SET 1"DRIVE WRENCH 27 PIECE		0	1	1	
51300513714	WRENCH IMPACT 1/2IN DRIVE 120VOLT		1	0	1	
51302931849	DRILL ELE 1/2IN PORTABLE		0	1	1	
51302933456	DRILL ELEC 3/8IN PORTABLE		0	1	1	
52104941776	GAGE CRANKSHAFT DISTORTION 2 3/8		1	0	1	
54400618898	LADDER STEP 8FT		1	0	1	
6625L0C179D	MULTIMETER SIMPSON 260VCM		0	1	1	
66955080546	TESTER PYROMETER 8657C POTENTIOMETER		1	0	1	
7110L002224	DRAWER UNIT 10 3/4X11IN 32DWRS		0	3	3	
71101326477	CABINET FILE 4 DRW W/C LOCK		1	0	1	
711027C9840	DESK FLAT D8L PED 60X34IN		2	0	2	
71102738785	CHAIR STR W/OUT ARMS		1	0	1	
71102738793	CHAIR SWIVAL W/ARMS		2	0	2	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	12	12	
71255437123	LOCKER SINGLE 18X21X78"		0	2	2	
74302472047	TYPEWRITER IBM-19		1	0	1	
	TOTAL FOR ACCOUNT CODE R		15	26	41	

FIGURE 3-17

[redacted]

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EQUIPMENT INVENTORY

ACCOUNT CODE S – SUPPLY

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
3610984863 7	COPIER 3M MDL-209	[redacted]	0	1	1	[redacted]
392DL000072	LEVER JOHNSON BAR #C-72		0	1	1	
392DL000077	TRUCK BARREL COLSOM PN 6055-65		0	1	1	
3920L000078	TRUCK LIFT PLATFORM MOL 6712-65		0	2	2	
3920L000083	LEVER TRUCK FAIRBANKS #C-60		0	2	2	
3920L000084	LEVER TRUCK FAIRBANKS #C-74		0	1	1	
3920L000091	TRUCK HAND OPERATED PALLET LIFT(PALLET JACK)		0	2	2	
39205540078	TRUCK HAND PLATFORM NCN-TILT TYPE(4 WHEEL CART)		0	2	2	
41109264159	REFRIGERATOR COLD STORAGE WALK-IN BREAKDOWN		0	1	1	
5440L003123	LADDER 12 STEP ALUM,ROLL-TYPE W/WHEELS 15HHIGH		0	1	1	
6130L000364	CHARGER,BATTERY LAMARCHE MOO #A45-70-18L		0	1	1	
71101326477	CABINET FILE 4 DRW W/C LOCK		1	0	1	
71102626663	TABLE OFFICE 60X34IN		0	1	1	
71102676981	TABLE OFFICE 45X34IN		2	0	2	
71102709838	DESK TYPIST 60X30IN		2	0	2	
71102709840	DESK FLAT DBL PEO 60X34IN		5	0	5	
71102738793	CHAIR SWIVAL W/ARMS		4	0	4	
71102863798	CABINET FILE 5DWRS LETTER SZ W/OUT LOCK		1	0	1	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES		0	3	3	
74201621469	CALCULATOR REMINGTON		1	0	1	
74302673456	TYPEWRITER ELEC		1	0	1	
74601415340	FILE VISIBLE INDEX		4	1	5	
	TOTAL FOR ACCOUNT CODE S		21	20	41	

FIGURE 3-18

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EQUIPMENT INVENTORY

ACCOUNT CODE T – WATER AND WASTE

STOCK NUMBER	NOMEMCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6530L003031	STOOL STAINLESS STEEL ROTARY	[redacted]	0	1	1	[redacted]
6625L002958	METER PORT MDL532T1 R-0-5000PPM SN 044212 MYRON L		0	1	1	
674DL003090	SILVER RECOVERY & HYPO CONSERV.SYSTEM FMC-4792705		0	1	1	
6740L003091	SILVER RECOVERY ELECTROLYTIC AND TAILING SYSTEM		1	0	1	
71102709838	OESK TYPIST 60X30IN		1	0	1	
71102709840	DESK FLAT DBL PED 60X34IN		1	0	1	
71102738793	CHAIR SWIVAL W/ARMS		0	1	1	
71252698534	CABINET STORAGE SET-UP 6 ADJ SHELVES					
	TOTAL FOR ACCOUNT CODE T		3	5	8	

FIGURE 3-19

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TOP SECRET - HEXAGON / GAMBIT

EQUIPMENT INVENTORY

ACCOUNT CODE U – UTILITIES

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
1377L000001	FASTENER UNIT POWER ACTUATED RAMSET # 11722	[redacted]	0	1	1	[redacted]
3220L000004	FINISHING MACHINE ABRASIVE DISK 12UN PN_82310		0	1	1	
3220L000005	SAW CIRCULAR TABLE TYPE TILTING ARBOR MODEL 34_450		0	1	1	
34135287840	DRILL PRESS FLOOR MODEL PN_20_400		0	1	1	
3419L000013	SAW HACK POWER FLOOR MODEL PN_3114		0	1	1	
3419L000014	GRINDER INDUSTRIAL PED TYPE PN_23_405		0	1	1	
3431L000018	WELDER ARC HYDROMOUNT CAT# TR301		0	1	1	
3432L000019	WELDER SPOT PORTABLE MODEL #166A28_5		0	1	1	
3439L000025	WELDING KIT PN_NE_927		0	1	1	
3439L001836	SAW PORTA_BAND MODEL 725K		0	1	1	
34412418261	BRAKE MACHINE S_M BENDER SR#93231		0	1	1	
34415290952	BENDER PIPE HYD LT WT BLACKHAWK S130		0	1	1	
34445164964	WELDING CUTTING MACH W/REGULATORS TORCHES HOSES		0	1	1	
3455L000030	SAW SABRE ELECTRIC BLACK AND DECKER		0	1	1	
3540L000044	DRILL ASSY CEMENT DIAMOND BIT FOR BORING		0	1	1	
3895L002783	MIXER CEMENT PORTABLE		0	1	1	
39201746732	TRUCK HAND		0	1	1	
5110L000111	SHEAR PN-8-1		0	1	1	
5110L000196	PUNCH SET KNOCKOUT DRIVE PN-7306		0	1	1	
51105709017	CUTTER TILE 9 TO 12IN		0	1	1	
5120L000120	VISE DRILL PRESS #68		0	1	1	
51202423956	STAND W/VISE REED MDL #1		0	1	1	
51202771481	WRENCH PIPE 36IN LONG ALUM		0	1	1	
5130L000123	HAMMER ELECTRIC PN-104012		0	1	1	
5130L000125	SAW AIR POWERED		0	1	1	
5130L000126	SAW SABRE PN-28285		0	1	1	
5130L000127	SHEARS METAL CUTTING #216		0	1	1	
5130L000128	DRILL HVY DTY 1/2IN #425		0	1	1	
5130L000130	HAMMER ELECTRIC PN-718		0	1	1	
5130L000132	ROUTER 3/4HP PN-350		0	1	1	
5130L003087	DRILL 3/8" VARIABLE B & D		0	1	1	
51302344877	WRENCH IMPACT 3/4 DRIVE		0	1	1	
51302424508	SANDER BELT TYPE		0	1	1	
51302931605	SAW ELECTRIC PORTABLE		0	1	1	
51302933456	DRILL ELEC 3/8IN PORTABLE		0	1	1	

FIGURE 3-20

[redacted]

TOP SECRET - HEXAGON / GAMBIT

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EQUIPMENT INVENTORY

ACCOUNT CODE U – UTILITIES

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
51305969727	SANDER OSCILLATING	[redacted]	0	1	1	[redacted]
51400306617	CABINET TOOL		0	6	6	
521DL001820	LEVEL MAGNESIUM 48IN LONG		0	1	1	
5340L001970	HINGE BUTT KIT		0	1	1	
6130L000168	POWER-DRIVE TOLEDC MDL-58		0	1	1	
6625L000176	AMMETER RECORDING 7DAYS		0	1	1	
6625L000187	VOLTMETER RECORDING AMPROBE LAV8600		0	1	1	
66259514472	AMPROBE SNAP-ON MDL-RS-3		0	1	1	
6645L000244	AMMETER AMPROBE RECORDING MDL-LAA81		0	4	4	
71105846251	DESK FLAT RIGHT PED 40X30IN		1	0	1	
7195L000535	TABLE WORK PN-2908		0	1	1	
7195L000536	STAND TOOL W/4DWRS PN-3145		0	2	2	
7195L001763	TABLE WORK EQUIPTO W/2 SLIDING DOORS PN-276-6		0	1	1	
7195L001765	TABLE WORK W/AERIAL SHELF 28X60X34IN		0	1	1	
71952855925	TABLE WORK 72X20X23IN		0	1	1	
81205385320	CYLINDER COMPRESSED GAS		2	0	2	
	TOTAL FOR ACCOUNT CODE U		3	58	61	[redacted]

FIGURE 3-20 (CONT'D)

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FIGURE 3-21

EQUIPMENT INVENTORY

ACCOUNT CODE X - WAREHOUSE STOCK

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	FMO EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
1730L002215	ADAPTER HORIZONTAL HOIST D/L COMPLEX	[redacted]	0	1	1	[redacted]
3610L000061	DUPLICATING & MARKING KIT MARK VIII		0	1	1	
3610L003023	POWER SUPPLY 3KV		0	1	1	
42308925745	DECONTAMINATION MACHINE SHOE CLEANER		0	1	1	
5210L000136	RULER MICRO#2190 6"		0	1	1	
5210L000137	RULER MICRO PN-2191 12IN		0	3	3	
5210L000138	RULER MICRO PN-2192 18IN		0	1	1	
5815L000146	INTERCOM 2 STATION FX2B		0	1	1	
5820L002495	PAN/TILT ADAPTER FOR KINTEL C.C. TV MOUNT		0	5	5	
5820L002496	RECEIVER TV GE MOD 2501 C.C. MONITOR		0	1	1	
58204508291	CAMERA CCTV KINTEL MOD 20/20		0	5	5	
582D4711276	RECEIVER CCTV MIRATEL L14M		0	1	1	
6110L003124	VOLTAGE REGULATOR,STABILINE TYPE EMT6243YB		0	1	1	
6625L0C2920	SIMULATOR DENSITOMETER HEAD AIL PROC.CONTR.SYS		0	1	1	
6625L002921	TEST SET PRINTER CIRCUIT BOARD AIL PROC.CONTR.SYS		0	1	1	
6625L0C2922	COMPUTER SIMILATOR AIL PROCESS CONTROL SYSTEM		0	1	1	
6640L000231	TITRATOR MDL-K AUTOMATIC BECKMAN		0	1	1	
6645L000254	TIME STAMP STROMBERG PN-12AM		0	7	7	
667DL002941	SCALE PLATFORM 1000 LB		0	1	1	
6670C599511	BALANCE ANALYTIC CHRISTIAN BECKER AB-2		0	1	1	
6675L0C3133	SURVEYORS TRANSIT & ENGINEERING KIT		0	1	1	
66759556158	MICROSCOPE STEREOSCOPE MDL-ZOOM 70 B & L		0	1	1	
6680L000311	TACHOSCOPE HASSLER MDL-B		0	6	6	
6740L000401	IRON TACKING FOR MOUNTING 8 X 10 TISSUE		0	1	1	
6740L000442	ENLARGER P&E MDL 8200/ MICROCAMERA		0	1	1	
6740L000453	PROCESSOR DRY PRINT CONTACT 3M MDL 179-A2		0	1	1	
6740L000478	KIT UNIMAK TITLER		0	1	1	
6740L001700	DENSITOMETER STATION PROCESS CONTROL SYSTEM		0	6	6	
6740L001701	PRINTER STATION PROCESS CONTROL SYSTEM		0	2	2	
674DL001702	QUANTISCAN STATION PROCESS CONTROL SYSTEM		0	2	2	
674DL002123	ADAPTER MAGAZINE VERSAMAT		0	1	1	
6740L002385	KIT TAKE UP ASSY APPL TO MIN2 TABLE		0	2	2	
674DL003042	SINK SS 3 X 2 OSCAR FISHER		0	1	1	
674DL003115	TABLE LIGHT RICHARDS 940 MCE/ W/O OPTICS		0	1	1	
67401059640PK	LACQUERER LACROSSE, W/ INTERLEAF		0	1	1	
67409118711	CLINTON CLEANER/WAXER CAT # 1-504-E001		0	1	1	
6750L000484	COPIER 3M DRY SILVER # 7C-DS		0	1	1	
6760L000485	DENSITOMETER MDL-TOL00		0	1	1	
6760L001930	CAMERA POLAROID		0	1	1	
7110L0C1600	DESK 26 X 19 X 28		0	1	1	
	TOTAL FOR ACCOUNT CODE X		0	69	69	

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FIGURE 3-22

EQUIPMENT INVENTORY

ACCOUNT CODE Y – TEMPORARY LOAN ITEMS

STOCK NUMBER	NOMENCLATURE	UNIT PRICE	EMD EQUIP	FAC EQUIP	TOTAL EQUIP	TOTAL COST
6630L000191	SCALE BECKMAN EXPNDED PH METER MDL76 (FROM"C")	[redacted]	0	1	1	[redacted]
66404902715	MICROSCOPE MICROSTAR W/BUILT IN ILLUMINATOR(FRM"J"		0	1	1	
66759556158	MICROSCOPE STEREOSCOPE MDL-ZOOM 70 8 & L		0	2	2	
6720L001913	CAMERA 70MM HASSELBLAD W/ACCESSORIES (FROM"C")		0	1	1	
6720L002067	CAMERA NIKON AUTO REFLEX W/FISH EYE LENS		0	5	5	
6740L000212	*ASSEMBLY VERSAMAT ROLL TAKE-UP PORT PN119-001		0	2	2	
6740L000213	TABLE EDITING 30" P/N 1-218-R001 SN 121		0	1	1	
6740L000347	TABLE LIGHT RICHARDS MDL GFL 918 (FROM"J")		0	1	1	
6740L000393	MIXER OSCAR FISHER 15GAL PORTABLE #21325 (FROM"J")		0	1	1	
6740L001575	LASER ARGON (FROM"J")		0	1	1	
6740L001576	TRANSFORMER STEP-UP (FROM"J")		0	1	1	
6740L001577	POWER SUPPLY ARGON LASER (FROM"J")		0	1	1	
6740L001579	PRINTER HIGH REDUCTION OPTICLE(WRHOUS STK)		0	1	1	
6740L001761	KIT COLOR NIAGARA PRINTER W/COLOR HEAD WRHOUS STK		0	1	1	
6740L001996	*PRINTER SENECA STOP & REPEAT PN1-020-E-001		0	1	1	
6740L002501	FIND-R-SCOPE PN-80045N W/ILLUMINATOR PN-80104N		0	1	1	
6740L002612	PRINTER SELECT AREA BAIRO ATOMIC 3PCS (FROM"J")		0	1	1	
6740L002720	TABLE LIGHT PN-1540-I HIL (FROM 'J')		0	1	1	
6740L002975	POWER SUPPLY OPTICAL MODULE (FROM"J")		0	1	1	
6740L002976	SPOOL TAKE-UP ADAPTER (COMPONENT PART)		0	2	2	
6740L003099	MONITOR DISPLACEMENT UDT 30A (FROM J)		0	1	1	
6740L003100	MODULATED LIGHT SOURCE W/POWER SUPPLY & MISC PRTS		0	1	1	
67401069032	*PRINTER CONTACT COLOR SN 202		0	1	1	
67402249967	*PRINTER CONTACT CONTINOUS 35MM MOL"0"SN#1832		0	1	1	
67404699365	TABLE LIGHT LASER SCIENCE IND		0	2	2	
67407635224	PRINTER NIAGARA SN 215 (FROM"J")		0	1	1	
67407635224P	PRINTER NIAGARA SN#406 (FROM"J")		0	1	1	
67409118711	*CLINTON CLEANER WAXER PN1-504-001 SN113		0	1	1	
67409419808	*TITLER DELAWARE FILM PORTABLE		0	2	2	
6760L001740	DENSITOMETER MCBETH QUANTALOG MOL203A (FROM"G"")		0	1	1	
	TOTAL FOR ACCOUNT CODE Y		0	39	39	

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FIGURE 3-23

MONTHLY INVENTORY

—PCAM EQUIPMENT (EVD) PLN 01 —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	AOPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
124	00	029	B22	A1569	IBM	Q			10 01 67	$0	P	[redacted]	$0.00	N	[redacted]
	01		9677	SPEC CHAR ARRANGEMENT					10 01 67	$0	P		$0.00		$0.00
								COMPONENT TOTAL		$0			$0.00		[redacted]
125	00	029	C22	36713	IBM	Q			19 07 66	$111	L	$0.00	$0.00	N	$0.00
	01		9677	SPEC CHAR ARRANGEMENT					19 07 66	$0	F	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$111		$0.00	$0.00		$0.00
128	00	557	80	15671	IBM	Q			28 06 68	$127	L	$0.00	$0.00	N	$0.00
								COMPONENT TOTAL		$127		$0.00	$0.00		$0.00
								PLN TOTAL		$238		[redacted]	$0.00		[redacted]

TOP SECRET - HEXAGON / GAMBIT
[redacted]
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TOP SECRET - HEXAGON / GAMBIT
[redacted]

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31 July 2014

MONTHLY INVENTORY

—PCAM EQUIPMENT (PDC) PLN 01—

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
160	00	1710	4	14924	UNI	Q		73 01	16 01 73	$110	L	$0.00	$0.00	N	[redacted]
	01		1526-1	RELEASE/EJECT KEY					16 01 73	$5	L	$0.00	$0.00		$0.00
	02		C1339	9000 KEYBOARD/PRINTWHEEL					16 01 73	$0	F	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$115		$0.00	$0.00		[redacted]
161	00	1710	4	2304	UNI	Q		73 01	16 01 73	$110	*****	DISCONTINUED ON	01/04/74		*****
	01		1526-1	RELEASE/EJECT KEY					16 01 73	$5	*****	DISCONTINUED ON	01/04/74		*****
	02		C1339	9000 KEYBOARD/PRINTWHEEL					16 01 73	$0	*****	DISCONTINUED ON	01/04/74		*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
									PLN TOTAL	$115		$0.00	$0.00		[redacted]

FIGURE 3-23 (CONT'D)

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31 July 2014

FIGURE 3-23 (CONT'D)

MONTHLY INVENTORY

— IBM SYSTEM 360/40 PLN 02 —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
015	00	2701	1	11100	IBM	Q			13 06 66	$200	I	$0.00	$0.00	Y	$0.00
	01		X-4	F14186 PLOTTER ADAPTER					13 06 66	$135	L	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$335		$0.00	$0.00		$0.00
022	00	1627	1	10143	IBM	Q			12 11 64	$0	P	[redacted]	$0.00	N	$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
023	00	1403	N1	41211	IBM	Q			23 09 70	$735	*****	DISCONTINUED ON	01/04/74		*****
	01		8640	UNIVERSAL CHARACTER SET					23 09 70	$8	*****	DISCONTINUED ON	01/04/74		*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
024	00	1052	7	55778	IBM	Q			23 09 70	$63	*****	DISCONTINUED ON	01/04/74		*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
028	00	2314	B1	17126	IBM	Q			23 09 70	$1243	L	$0.00	$0.00	Y	$0.00
								COMPONENT TOTAL		$1243		$0.00	$0.00		$0.00
029	00	2540	1	10580	IBM	Q			23 09 70	$710	*****	DISCONTINUED ON	01/04/74		*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
034	00	2821	1	18365	IBM	Q			23 09 70	$915	*****	DISCONTINUED ON	01/04/74		*****
	01		1990	COLUMN BINARY FEATURE					23 09 70	$84	*****	DISCONTINUED ON	01/04/74		*****
	02		3615	1100 LPM PRINTER ADAPT					23 09 70	$63	*****	DISCONTINUED ON	01/04/74		*****
	03		8637	UNIVERSAL CHARACTER SET					23 09 70	$13	*****	DISCONTINUED ON	01/04/74		*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
040	00	2040	H	23935	IBM	Q			03 10 72	$10600	*****	DISCONTINUED ON	01/04/74		*****
	01		3237	DECIMAL ARITHMETIC					23 09 70	$119	*****	DISCONTINUED ON	01/04/74		*****
	02		4427	FLOATING POINT ARITHMETIC					23 09 70	$104	*****	DISCONTINUED ON	01/04/74		*****
	03		6980	1ST SELECTOR CHANNEL					23 09 70	$365	*****	DISCONTINUED ON	01/04/74		*****
	04		7520	STORAGE PROTECTION					23 09 70	$156	*****	DISCONTINUED ON	01/04/74		*****
	05		7920	1052 CONSOLE ADAPTER					23 09 70	$235	*****	DISCONTINUED ON	01/04/74		*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
041	00	1416	1	16868	IBM	Q			21 09 71	$97	L	$0.00	$0.00	N	$0.00

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31 July 2014

FIGURE 3-23 (CONT'D)

MONTHLY INVENTORY

—IBM SYSTEM 360/40 PLN 02—

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
								COMPONENT TOTAL		$97		$0.00	$0.00		$0.00
042	00	2319	B1	30592	IBM	Q		72 10	05 11 72	$840	L	$0.00	$0.00	N	$0.00
								COMPONENT TOTAL		$840		$0.00	$0.00		$0.00
044	00	3803	1	12402	IBM	Q		72 11	14 11 72	$567	L	$0.00	$0.00	Y	$0.00
	01		3551	DUAL DENSITY					14 11 72	$63	L	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$630		$0.00	$0.00		$0.00
046	00	3420	3	36489	IBM	Q		72 11	14 11 72	$298	L	$0.00	$0.00	Y	$0.00
	01		3550	DUAL DENSITY					14 11 72	$92	L	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$390		$0.00	$0.00		$0.00
047	00	3420	3	36490	IBM	Q		72 11	22 11 72	$298	L	$0.00	$0.00	Y	$0.00
	01		3550	DUAL DENSITY					22 11 72	$92	L	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$390		$0.00	$0.00		$0.00
048	00	3420	3	36491	IBM	Q		72 11	18 11 72	$298	L	$0.00	$0.00	Y	$0.00
	01		3550	DUAL DENSITY					18 11 72	$92	L	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$390		$0.00	$0.00		$0.00
049	00	3420	3	36492	IBM	Q		72 11	18 11 72	$298	L	$0.00	$0.00	Y	$0.00
	01		3550	DUAL DENSITY					18 11 72	$92	L	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$390		$0.00	$0.00		$0.00
090	00	1403	N1	30818	IBM				01 04 74	$0	P	[redacted]	$0.00	Y	[redacted]
	01		8640	UNIVERSAL CHARACTER SET					01 04 74	$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
091	00	1052	7	53769	IBM				01 04 74	$0	P		$0.00	Y	
								COMPONENT TOTAL		$0			$0.00		
092	00	2540	1	18835	IBM				01 04 74	$0	P		$0.00	Y	
								COMPONENT TOTAL		$0			$0.00		

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31 July 2014

MONTHLY INVENTORY

— IBM SYSTEM 360/40 PLN 02 —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
093	00	2821	1	16580	IBM				01 04 74	$0	P	[redacted]	$0.00	Y	[redacted]
	01		3615	1100 LPM PRINTER ADAPT					01 04 74	$0	P	[redacted]	$0.00		[redacted]
	02		8637	UNIVERSAL CHARACTER SET					01 04 74	$0	P	[redacted]	$0.00		[redacted]
								COMPONENT TOTAL		$0		[redacted]	$0.00		[redacted]
094	00	2040	H	22057	IBM				01 04 74	$0	P	[redacted]	$0.00	Y	[redacted]
	01		3237	DECIMAL ARITHMETIC					01 04 74	$0	P	[redacted]	$0.00		[redacted]
	02		4427	FLOATING POINT ARITHMETIC					01 04 74	$0	P	[redacted]	$0.00		[redacted]
	03		4478	1410 COMPATIBILITY					01 04 74	$0	P	[redacted]	$0.00		[redacted]
	04		6980	1ST SELECTOR CHANNEL					01 04 74	$0	P	[redacted]	$0.00		[redacted]
	05		6981	2ND SELECTOR CHANNEL					01 04 74	$0	P	[redacted]	$0.00		[redacted]
	06		7520	STORAGE PROTECTION					01 04 74	$0	P	[redacted]	$0.00		[redacted]
	07		7920	1052 CONSOLE ADAPTER					01 04 74	$0	P	[redacted]	$0.00		[redacted]
								COMPONENT TOTAL		$0		[redacted]	$0.00		[redacted]
									PLN TOTAL	$4705		[redacted]	$0.00		[redacted]

FIGURE 3-23 (CONT'D)

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31 July 2014

MONTHLY INVENTORY

— IBM 1130 SYSTEM (PD) PLN 04 —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
001	00	1131	2C	10446	IBM	Q		67 02	28 02 67	$0	P	[redacted]	$0.00	Y	[redacted]
	01		3616	1132 MDL 1 ATTACHMENT					22 03 68	$0	P		$0.00		
	02		3854	EXPANSION ADAPTER					22 03 68	$0	P		$0.00		
	03		4454	1442 MDL 6 ATTACHMENT					28 02 67	$0	P		$0.00		
	04		F1493A	RPQ %40 COMM CHANNEL W164					28 02 67	$0	P		$0.00		
	05		F1493B	RPQ %80 COMM CHANNEL 8354					28 02 67	$0	P		$0.00		
	06		F15657	RPQ INTERVAL TIMER					28 02 67	$0	P		$0.00		
	07		S50068	RPQ CORE STORAGE					22 09 70	$0	P		$0.00		
	08		7490	STORAGE ACCESS CHANNEL					22 09 70	$0	P		$0.00		
	09		7187	1627 PLOTTER ATTACHMENT					26 08 70	$0	P		$0.00		
	10		7923	1055 PAPER TAPE ATTACHMNT					26 08 70	$0	P		$0.00		
	11		835514	1627 PLOTTER CABLE					22 09 70	$0	P		$0.00		
	12		642164	3.6 SEC INT TIMER					28 02 67	$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
002	00	1031	A2	11383	IBM	Q		67 02	28 02 67	$0	P		$0.00	N	
	01		4652	INDIVIDUAL SLIDE LOCK					28 02 67	$0	P		$0.00		
	02		4652	INDIVIDUAL SLIDE LOCK					28 02 67	$0	P		$0.00		
	03		4652	INDIVIDUAL SLIDE LOCK					28 02 67	$0	P		$0.00		
	04		4652	INDIVIDUAL SLIDE LOCK					28 02 67	$0	P		$0.00		
	05		766210	RPQ PEDESTAL					28 02 67	$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
003	00	1031	B2	22932	IBM	Q		67 02	28 02 67	$0	P		$0.00	N	
	01		766210	RPQ PEDESTAL					28 02 67	$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
004	00	1031	B2	23302	IBM	Q		67 02	28 02 67	$0	P		$0.00	N	
	01		766210	RPQ PEDESTAL					28 02 67	$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
005	00	1031	B2	23301	IBM	Q		67 02	28 02 67	$0	P		$0.00	N	
	01		766210	RPQ PEDESTAL					28 02 67	$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
006	00	1031	B2	23389	IBM	Q		67 02	28 02 67	$0	P		$0.00	N	
	01		766210	RPQ PEDESTAL					28 02 67	$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		

FIGURE 3-23 (CONT'D)

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31 July 2014

FIGURE 3-23 (CONT'D)

MONTHLY INVENTORY

— IBM 1130 SYSTEM (PD) PLN 04 —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
007	00	1031	B2	23390	IBM	Q		67 02	28 02 67	$0	P	[redacted]	$0.00	N	[redacted]
	01		766210	RPQ PEDESTAL					28 02 67	$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
015	00	1442	6	70504	IBM	Q		67 02	28 02 67	$0	P		$0.00	Y	
								COMPONENT TOTAL		$0			$0.00		
018	00	1133	1	70838	IBM	Q		70 12	08 12 70	$39	L	$0.00	$0.00	Y	$0.00
	01		1865	CHANNEL MULTIPLEXER					08 12 70	$110	L	$0.00	$0.00		$0.00
	03		3201	DISK CONTROL 2310 - #1					08 12 70	$44	L	$0.00	$0.00		$0.00
	04		4424	1403 MDL 6 (340 LPM)					23 01 73	$435	L	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$628		$0.00	$0.00		$0.00
019	00	2310	B1	21200	IBM	Q		70 12	08 12 70	$262	L	$0.00	$0.00	Y	$0.00
								COMPONENT TOTAL		$262		$0.00	$0.00		$0.00
020	00	1403	6	20371	IBM	Q		71 12	23 12 71	$0	U	[redacted]	$0.00	Y	[redacted]
								COMPONENT TOTAL		$0			$0.00		
021	00	1055	1	12338	IBM	Q		71 11	16 11 71	$0	P		$0.00	N	
								COMPONENT TOTAL		$0			$0.00		
								PLN TOTAL		$890			$0.00		

[redacted]

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MONTHLY INVENTORY

—IBM 1800 SYSTEM (PD) PLN 05—

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
001	00	1801	2CR	10400	IBM	Q		69 11	07 11 68	[redacted]	*****	DISCONTINUED ON		04/04/74	*****
	01		1231	ANALOG DIGITAL CONVERTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	02		1233	ANALOG INPUT DATA CH ADPT					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	03		1234	ANALOG INPUT DATA CH ADPT					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	05		3222	DATA CHANNEL					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	06		3222	DATA CHANNEL					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	07		3222	DATA CHANNEL					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	08		3222	DATA CHANNEL					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	09		3222	DATA CHANNEL					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	11		3290	CHANL ADAPT DIG/ANAL O/P					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	12		3291	CHANL ADAPT DIGITAL INPUT					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	13		3295	DIGITAL OUTPUT ADAPTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	14		3296	DIGITAL OUTPUT CONTROL					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	15		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	16		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	17		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	18		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	19		4430	1442 ADAPTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	20		4431	1443/1627 ADAPTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	21		4432	1443 CONTROL					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	22		5256	MULTIPLEXER RELAY CONTROL					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	41		7188	PLOTTER CONTROL					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	44		3703	1803 ADAPTER					15 07 70		*****	DISCONTINUED ON		04/04/74	*****
	45		5487	OUTPUT PRINTER ADAPTER					30 10 69		*****	DISCONTINUED ON		04/04/74	*****
	46		5710	PROCESS INTERRUPT ADAPTER					20 04 73		*****	DISCONTINUED ON		15/02/74	*****
	47		5715	PROCESS INTERRUPT CONTACT					20 04 73		*****	DISCONTINUED ON		15/02/74	*****
	48		5715	PROCESS INTERRUPT CONTACT					20 04 73		*****	DISCONTINUED ON		15/02/74	*****
	49		5715	PROCESS INTERRUPT CONTACT					20 04 73		*****	DISCONTINUED ON		15/02/74	*****
	51		3295	DIGITAL OUTPUT ADAPTER					09 05 73		*****	DISCONTINUED ON		04/04/74	*****
	52		3612	ELECTRONIC CONTACT OPER					10 05 73		*****	DISCONTINUED ON		04/04/74	*****
	53		3612	ELECTRONIC CONTACT OPER					10 05 73		*****	DISCONTINUED ON		04/04/74	*****
	54		3612	ELECTRONIC CONTACT OPER					10 05 73		*****	DISCONTINUED ON		04/04/74	*****
	55		3612	ELECTRONIC CONTACT OPER					10 05 73		*****	DISCONTINUED ON		04/04/74	*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
002	00	1826	2	10202	IBM	Q		69 11	10 11 69	[redacted]	*****	DISCONTINUED ON		04/04/74	*****
	01		3262	DIGITAL INPUT ADAPTER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	02		3262	DIGITAL INPUT ADAPTER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	03		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	04		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	05		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	06		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	07		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****

FIGURE 3-23 (CONT'D)

NRO APPROVED FOR RELEASE
31 July 2014

MONTHLY INVENTORY

— IBM 1800 SYSTEM (PD) PLN 05 —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
	08		3286	DIGITAL INPUT VOLTAGE					10 11 69	[redacted]	*****	DISCONTINUED ON		04/04/74	*****
	09		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	10		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	11		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	12		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	13		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	14		3286	DIGITAL INPUT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	15		3295	DIGITAL OUTPUT ADAPTER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	16		3295	DIGITAL OUTPUT ADAPTER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	17		3295	DIGITAL OUTPUT ADAPTER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	18		3296	DIGITAL OUTPUT CONTROL					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	19		3612	ELECTRONIC CONTACT OPER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	20		3612	ELECTRONIC CONTACT OPER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	21		3612	ELECTRONIC CONTACT OPER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	22		3612	ELECTRONIC CONTACT OPER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	23		3612	ELECTRONIC CONTACT OPER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	24		3612	ELECTRONIC CONTACT OPER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	28		5710	PROCESS INTERRUPT ADAPTER					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	29		5716	PROCESS INTERRUPT VOLTAGE					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	30		5715	PROCESS INTERRUPT CONTACT					15 02 74		*****	DISCONTINUED ON		04/04/74	*****
	31		5863	PULSE OUTPUT					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	32		5863	PULSE OUTPUT					10 11 69		*****	DISCONTINUED ON		04/04/74	*****
	33		9091	ATTACH TO 1826 MOD 2					10 11 69	$0	*****	DISCONTINUED ON		04/04/74	*****
	34		5863	PULSE OUTPUT					10 11 69	[redacted]	*****	DISCONTINUED ON		04/04/74	*****
	35		5716	PROCESS INTERRUPT VOLTAGE					06 03 73		*****	DISCONTINUED ON		15/02/74	*****
	36		5863	PULSE OUTPUT					13 03 73		*****	DISCONTINUED ON		04/04/74	*****
	37		5863	PULSE OUTPUT					13 03 73		*****	DISCONTINUED ON		15/02/74	*****
	38		6125	REGISTER OUTPUT					13 03 73		*****	DISCONTINUED ON		15/02/74	*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
003	00	1826	2	L0317	IBM	Q		68 11	07 11 68	[redacted]	*****	DISCONTINUED ON		04/04/74	*****
	01		3295	DIGITAL OUTPUT ADAPTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	02		3295	DIGITAL OUTPUT ADAPTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	03		3295	DIGITAL OUTPUT ADAPTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	04		3296	DIGITAL OUTPUT CONTROL					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	05		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	06		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	07		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	08		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	09		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	10		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	11		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	12		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****

FIGURE 3-23 (CONT'D)

Handle via Byeman / Talent-Keyhole Controls Only
BYE 15254-76

NRO APPROVED FOR RELEASE
31 July 2014

MONTHLY INVENTORY

— IBM 1800 SYSTEM (PD) PLN 05 —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
	13		3612	ELECTRONIC CONTACT OPER					07 11 68	[redacted]	*****	DISCONTINUED ON		04/04/74	*****
	14		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	15		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	16		3612	ELECTRONIC CONTACT OPER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	17		5861	PULSE COUNTER ADAPTER					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	18		5861	PULSE COUNTER ADAPTER					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	19		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	20		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	21		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	22		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	23		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	24		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	25		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	26		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	27		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	28		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	29		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	30		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	31		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	32		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	33		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	34		5867	PULSE COUNTER - 16 BIT					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	35		7710	SELECTOR CHANNEL					13 11 70		*****	DISCONTINUED ON		04/04/74	*****
	36		3262	DIGITAL INPUT ADAPTER					20 03 73		*****	DISCONTINUED ON		04/04/74	*****
	37		3287	DIGITAL INPUT VOLT HI SPD					20 03 73		*****	DISCONTINUED ON		04/04/74	*****
	38		3287	DIGITAL INPUT VOLT HI SPD					20 03 73		*****	DISCONTINUED ON		04/04/74	*****
	39		3287	DIGITAL INPUT VOLT HI SPD					20 03 73		*****	DISCONTINUED ON		15/02/74	*****
	40		3287	DIGITAL INPUT VOLT HI SPD					20 03 73		*****	DISCONTINUED ON		15/02/74	*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
004	00	1826	1	11106	IBM	Q		68 11	07 11 68	[redacted]	*****	DISCONTINUED ON		04/04/74	*****
	01		3295	DIGITAL OUTPUT ADAPTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	02		3295	DIGITAL OUTPUT ADAPTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	03		3295	DIGITAL OUTPUT ADAPTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	04		3295	DIGITAL OUTPUT ADAPTER					07 11 68		*****	DISCONTINUED ON		04/04/74	*****
	05		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	06		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	07		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	08		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	09		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	10		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	11		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	12		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****

FIGURE 3-23 (CONT'D)

[redacted]

BYE 15254-76
Handle via Byeman / Talent-Keyhole Controls Only

NRO APPROVED FOR RELEASE
31 July 2014

MONTHLY INVENTORY

— IBM 1800 SYSTEM (PD) PLN 05 —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
	13		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	14		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	15		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	16		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	17		3296	DIGITAL OUTPUT CONTROL					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	18		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	19		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	20		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	21		3612	ELECTRONIC CONTACT OPER					07 11 69		*****	DISCONTINUED ON		04/04/74	*****
	22		5861	PULSE COUNTER ADAPTER					09 03 73		*****	DISCONTINUED ON		15/02/74	*****
	23		5867	PULSE COUNTER - 16 BIT					09 03 73		*****	DISCONTINUED ON		15/02/74	*****
	24		5867	PULSE COUNTER - 16 BIT					09 03 73		*****	DISCONTINUED ON		15/02/74	*****
	25		5867	PULSE COUNTER - 16 BIT					09 03 73		*****	DISCONTINUED ON		15/02/74	*****
	26		5867	PULSE COUNTER - 16 BIT					09 03 73		*****	DISCONTINUED ON		15/02/74	*****
	27		5867	PULSE COUNTER - 16 BIT					09 03 73		*****	DISCONTINUED ON		15/02/74	*****
	28		5867	PULSE COUNTER - 16 BIT					09 03 73		*****	DISCONTINUED ON		15/02/74	*****
	29		5867	PULSE COUNTER - 16 BIT					09 03 73		*****	DISCONTINUED ON		15/02/74	*****
	30		5867	PULSE COUNTER - 16 BIT					09 03 73		*****	DISCONTINUED ON		15/02/74	*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
005	00	1851	1	10214	IBM	Q		68 11	07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	01		3246	DIFFERENTIAL AMPLIFIER					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	02		3597	FILTER ELEMENT					07 11 68		P		$0.00		$0.00
	03		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	04		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	05		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	06		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
								COMPONENT TOTAL		$0			$0.00		$0.00
006	00	1851	1	10787	IBM	Q		68 11	07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	01		3597	FILTER ELEMENT					07 11 68		P		$0.00		$0.00
	02		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	03		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	04		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
	05		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON		15/02/74	*****
								COMPONENT TOTAL		$0			$0.00		$0.00
007	00	1828	2	10134	IBM	Q		68 11	07 11 68		*****	DISCONTINUED ON		04/04/74	*****
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00

FIGURE 3-23 (CONT'D)

Handle via Byeman / Talent-Keyhole Controls Only

NRO APPROVED FOR RELEASE
31 July 2014

MONTHLY INVENTORY

— IBM 1800 SYSTEM (PD) PLN 05 —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
008	00	1442	6	73489	IBM	Q		68 11	07 11 68	[redacted]	*****	DISCONTINUED ON	04/04/74	*****	
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
009	00	1851	1	10832	IBM	Q		68 11	07 11 68	[redacted]	*****	DISCONTINUED ON	04/04/74	*****	
	01		3597	FILTER ELEMENT					07 11 68		P	[redacted]	$0.00		$0.00
	02		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON	04/04/74	*****	
	03		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON	04/04/74	*****	
	04		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON	04/04/74	*****	
	05		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON	04/04/74	*****	
	06		3246	DIFFERENTIAL AMPLIFIER					15 02 74		*****	DISCONTINUED ON	04/04/74	*****	
								COMPONENT TOTAL		$0		[redacted]	$0.00		$0.00
010	00	1851	1	10788	IBM	Q		68 11	07 11 68	[redacted]	*****	DISCONTINUED ON	15/02/74	*****	
	02		3597	FILTER ELEMENT					07 11 68	$0	P	[redacted]	$0.00		$0.00
	03		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON	15/02/74	*****	
	04		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON	15/02/74	*****	
	05		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON	15/02/74	*****	
	06		5252	MULTIPLEXER RELAY					07 11 68		*****	DISCONTINUED ON	15/02/74	*****	
								COMPONENT TOTAL		$0		[redacted]	$0.00		$0.00
012	00	1816	1	13190	IBM	Q		68 11	07 11 68	[redacted]	*****	DISCONTINUED ON	04/04/74	*****	
	01		9104	CHARACTER SPACING					07 11 68	$0	*****	DISCONTINUED ON	04/04/74	*****	
	02		9162	LINE SPACE 6 IN WRG LINE					07 11 68	$0	*****	DISCONTINUED ON	04/04/74	*****	
	03		9435	LINE FEED 6 INCH					07 11 68	$0	*****	DISCONTINUED ON	04/04/74	*****	
	04		9509	PIN FEED PLATEN					07 11 68	$0	*****	DISCONTINUED ON	04/04/74	*****	
	05		9902	208V AC 1PH 60CY					07 11 68	$0	*****	DISCONTINUED ON	04/04/74	*****	
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
013	00	1816	1	13051	IBM	Q		69 10	29 10 69	[redacted]	*****	DISCONTINUED ON	04/04/74	*****	
	01		9104	CHARACTER SPACING					29 10 69	$0	*****	DISCONTINUED ON	04/04/74	*****	
	02		9162	LINE SPACE 6 IN WRG LINE					29 10 69	$0	*****	DISCONTINUED ON	04/04/74	*****	
	03		9435	LINE FEED 6 INCH					29 10 69	$0	*****	DISCONTINUED ON	04/04/74	*****	
	04		9509	PIN FEED PLATEN					29 10 69	$0	*****	DISCONTINUED ON	04/04/74	*****	
	05		9902	208V AC 1PH 60CY					29 10 69	$0	*****	DISCONTINUED ON	04/04/74	*****	
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
014	00	1443	1	11484	IBM	Q		68 11	07 11 68	[redacted]	*****	DISCONTINUED ON	04/04/74	*****	
	01		5569	PRINTER CONTROL					07 11 68		*****	DISCONTINUED ON	04/04/74	*****	

FIGURE 3-23 (CONT'D)

TOP SECRET - HEXAGON/GAMBIT [redacted]
BYE 15254-76
Handle via Byeman / Talent-Keyhole Controls Only

NRO APPROVED FOR RELEASE
31 July 2014

[redacted]

MONTHLY INVENTORY

—IBM 1800 SYSTEM (PD) PLN 05—

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	AOPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
015	00	1627	1	10659	IBM	Q		68 11	07 11 68	$0	P	[redacted]	$0.00	M	$0.00
								COMPONENT TOTAL		$0		[redacted]	$0.00		$0.00
049	00	2311	1	12184	IBM	Q		70 12	01 12 70	[redacted]	*****	DISCONTINUED ON	04/04/74	*****	
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
051	00	1803	2C	30112	IBM	Q		73 02	27 12 73	[redacted]	*****	DISCONTINUED ON	04/04/74	*****	
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
052	00	1856	1	10570	IBM	Q		70 04	08 04 70	[redacted]	*****	DISCONTINUED ON	04/04/74	*****	
	01		1227	ANALOG DRIVER AMPLIFIER					08 04 70		*****	DISCONTINUED ON	04/04/74	*****	
	02		1227	ANALOG DRIVER AMPLIFIER					08 04 70		*****	DISCONTINUED ON	04/04/74	*****	
	03		3252	DIGITAL ANALOG CONVERTER					08 04 70		*****	DISCONTINUED ON	04/04/74	*****	
	04		5527	PRECISION VOLTAGE REF - 1					08 04 70		*****	DISCONTINUED ON	04/04/74	*****	
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
053	00	2311	1	33204	IBM	Q			10 07 72	$0	*****	DISCONTINUED ON	04/04/74	*****	
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
056	00	2841	1	35193	IBM	Q			11 10 73	$0	*****	DISCONTINUED ON	04/04/74	*****	
	01		9160	NOISE ABATEMENT ATCH					11 10 73	$0	*****	DISCONTINUED ON	04/04/74	*****	
	02			TROS GATE SER # 32695					11 10 73	$0	*****	DISCONTINUED ON	04/04/74	*****	
								COMPONENT TOTAL		$0		$0.00	$0.00		$0.00
								PLN TOTAL		$0		[redacted]	$0.00		$0.00

FIGURE 3-23 (CONT'D)

[redacted]

Handle via Byeman / Talent-Keyhole
Controls Only

NRO APPROVED FOR RELEASE
31 July 2014

MONTHLY INVENTORY

— IBM SYSTEM 7 (PD) PLN 06 —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
004	00	5028	1	10932	IBM	0		73 01	01 03 73	$0	P	[redacted]	$0.00	N	$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
								PLN TOTAL		$0			$0.00		$0.00
								LOCATION TOTAL		[redacted]			$0.00		[redacted]

FIGURE 3-23 (CONT'D)

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FIGURE 3-24

MONTHLY INVENTORY

—PDP 11/40 SYSTEM —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
001	00	11/40	BC	1-8054	DEC	P	MC	75 01		$0	P	[redacted]	$0.00		[redacted]
	01		MM11-U	16K MEMORY						$0	P		$0.00		
	02		MF11-U	16K MEMORY W/32K 8K PANEL						$0	P		$0.00		
	03		KT11-D	MEMORY MANAGEMENT						$0	P		$0.00		
	04		KW11-L	LINE FREQUENCY CLOCK						$0	P		$0.00		
	05		KE11-E	EXTENDED ARITHMETIC OPT						$0	P		$0.00		
	06		KE11-F	FLOATING POINT UNIT						$0	P		$0.00		
	07		MR11DB	BOOTSTRAP LOADER						$0	P		$0.00		
	08		LA36CA	SERIAL DECWRITER # 2-5524						$0	P	$0.00	$0.00		$0.00
	09		DL11-A	SERIAL LINE INTERFACE						$0	P	$0.00	$0.00		$0.00
	10		32K ADDITIONAL CORE MEMORY					*****	ARRIVE APPROX. 30 JUNE 75			*****			
	11		PERIPHERAL SYSTEM UNIT					*****	ARRIVE APPROX. 30 JUNE 75			*****			
								COMPONENT TOTAL		$0		[redacted]	$0.00		[redacted]
002	00	RK11	DE	2-8317	DEC	P	MC	75 01		$0	P		$0.00		
				CONTROL & RK05 # 2-12961						$0		$0.00	$0.00		$0.00
								COMPONENT TOTAL		$0		[redacted]	$0.00		[redacted]
003	00	RK05	AA	2-8498	DEC	P	MC	75 01		$0	P		$0.00	N	
								COMPONENT TOTAL		$0			$0.00		
004	00	PC11		59476	DEC	P	MC	75 01		$0	P		$0.00	N	
	01			INCLUDES PC05 # 2-13715						$0	P	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$0		[redacted]	$0.00		[redacted]
005	00	TM11	EA	2-7229	DEC	P	MC	75 01		$0	P		$0.00	N	
	01			INCLUDES TU10M # 2-7378						$0	P	$0.00	$0.00		$0.00
	02			INCLUDES TU10 # 2-8621						$0	P	$0.00	$0.00		$0.00
								COMPONENT TOTAL		$0		[redacted]	$0.00		[redacted]
006	00	VT05	BA	2-8828	DEC	P	MC	75 01		$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
007	00	VT05	BA	2-8827	DEC	P	MC	75 01		$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		

[redacted]

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FIGURE 3-24 (CONT'D)

MONTHLY INVENTORY

— PDP 11/40 SYSTEM —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
008	00	DJ11	AC	1-5215	DEC	P	MC	75 01		$0	P	[redacted]	$0.00		[redacted]
								COMPONENT TOTAL		$0			$0.00		
009	00	BA11	ES	1-7339	DEC	P	MC	75 01		$0	P		$0.00	N	$0.00
	01		H720-E	POWER SUPPLY						$0	P		$0.00		[redacted]
	02		DL11-C	SERIAL LINE INTERFACE #1						$0	P		$0.00		
	03		DL11-C	SERIAL LINE INTERFACE #2						$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
010	00	DD11	B	12064	DEC	P	MC	75 01		$0	P		$0.00	N	$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
011	00	DD11	B	12065	DEC	P	MC	75 01		$0	P		$0.00	N	$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
012	00	LP11	VA	2-5394	DEC	P	NG	75 01		$0	P		$0.00		[redacted]
								COMPONENT TOTAL		$0			$0.00		
013	00	UDC11		1-5119	DEC	P	NG	75 01		$0	P		$0.00		
	01		H964AA	CAB W/ACCESSORIES FOR UDC						$0	P		$0.00		
	02		1AA11A	MULTI-RANGE 8 CHAR A TO D						$0	P		$0.00		
	03		1DA11B	16 CONTACT INTRUPT TERMS						$0	P		$0.00		
	04		1DA11B	16 CONTACT INTRUPT TERMS						$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
014	00	DD02		1-5685	DEC	P	NG	75 01		$0	P		$0.00		
								COMPONENT TOTAL		$0			$0.00		
015	00	RT01	BA	605071	DEC	P	NG	75 03		$0	P		$0.00		
	01		RT01NC	12-DIGIT NIXIE DISPLAY						$0	P		$0.00		$0.00
								COMPONENT TOTAL		$0			$0.00		[redacted]
016	00	RT01	BA	605072	DEC	P	NG	75 03		$0	P		$0.00	N	$0.00
	01		RT01NC	12-DIGIT NIXIE DISPLAY						$0	P		$0.00		$0.00

[redacted]

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[redacted]

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MONTHLY INVENTORY

— PDP 11/40 SYSTEM —

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	ADPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
								COMPONENT TOTAL		$0		[redacted]	$0.00		$0.00
017	00	RT01	BA	605109	DEC	P	NG	75 03		$0	P		$0.00	N	$0.00
	01		RT01NC	12-DIGIT NIXIE		DISPLAY				$0	P		$0.00		$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
018	00	RT01	BA	605152	DEC	P	NG	75 03		$0	P		$0.00	N	$0.00
	01		RT01NC	12-DIGIT NIXIE		DISPLAY				$0	P		$0.00		$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
019	00	RT01	BA	605153	DEC	P	NG	75 03		$0	P		$0.00	N	$0.00
	01		RT01NC	12-DIGIT NIXIE		DISPLAY				$0	P		$0.00		$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
020	00	RT01	BA	605154	DEC	P	NG	75 03		$0	P		$0.00	N	$0.00
	01		RT01NC	12-DIGIT NIXIE		DISPLAY				$0	P		$0.00		$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
021	00	RT01	BA	605170	DEC	P	NG	75 05		$0	P		$0.00	N	$0.00
	01		RT01NC	12-DIGIT NIXIE		DISPLAY				$0	P		$0.00		$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
022	00	RT01	BA	605171	DEC	P	NG	75 05		$0	P		$0.00	N	$0.00
	01		RT01NC	12-DIGIT NIXIE		DISPLAY				$0	P		$0.00		$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
023	00	RT01	BA	605190	DEC	P	NG	75 05		$0	P		$0.00	N	$0.00
	01		RT01NC	12-DIGIT NIXIE		DISPLAY				$0	P		$0.00		$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
024	00	RT01	BA	605192	DEC	P	NG	75 05		$0	P		$0.00	N	$0.00
	01		RT01NC	12-DIGIT NIXIE		DISPLAY				$0	P		$0.00		$0.00
								COMPONENT TOTAL		$0			$0.00		$0.00
025	00	RT01	BA	605195	DEC	P	NG	75 05		$0	P		$0.00	N	$0.00
	01		RT01NC	12-DIGIT NIXIE		DISPLAY				$0	P		$0.00		$0.00

FIGURE 3-24 (CONT'D)

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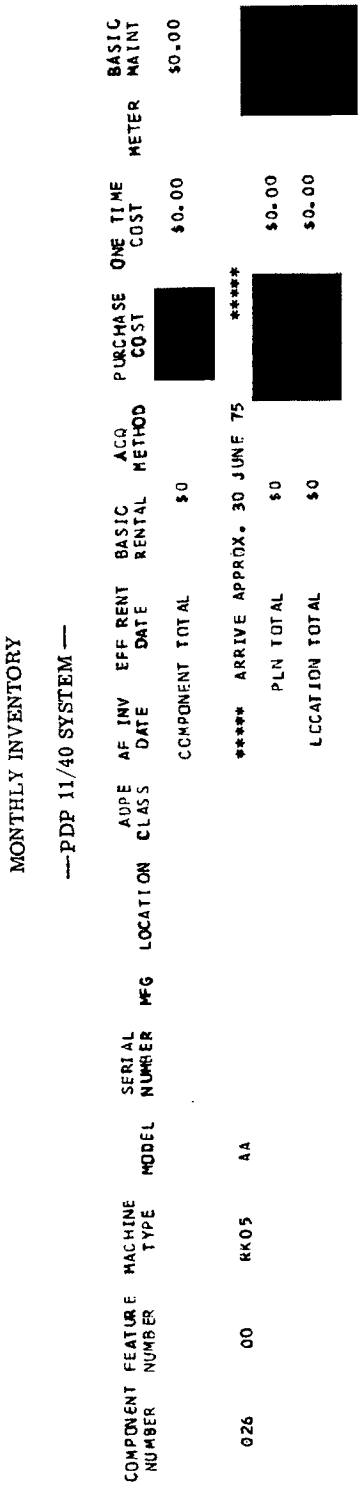

MONTHLY INVENTORY

—PDP 11/40 SYSTEM—

COMPONENT NUMBER	FEATURE NUMBER	MACHINE TYPE	MODEL	SERIAL NUMBER	MFG	LOCATION	AUPE CLASS	AF INV DATE	EFF RENT DATE	BASIC RENTAL	ACQ METHOD	PURCHASE COST	ONE TIME COST	METER	BASIC MAINT
									COMPONENT TOTAL	$0		[redacted]	$0.00		$0.00
026	00	KK05	AA					*****	ARRIVE APPROX. 30 JUNE 75			*****		[redacted]	
									PLN TOTAL	$0		[redacted]	$0.00		
									LOCATION TOTAL	$0			$0.00		

FIGURE 3-24 (CONT'D) ~~TOP SECRET~~ - HEXAGON / GAMBIT [redacted]

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HEADQUARTERS

AIR FORCE SPECIAL PROJECTS PRODUCTION FACILITY

REPORT OF SYSTEM UTILIZATION FOR JUN 1975

DEFINITION OF TERMS

TOTAL PROGRAM TIME REQUIREMENTS:	THE SUMMATION IN HOURS OF THE DEMAND PLACED ON THE COMPUTER BY ALL PROGRAMS IN BOTH PARTITIONS FOR THIS REPORTING PERIOD.
PRODUCTION TIME:	THOSE HOURS DEVOTED TO THE ACCOMPLISHMENT OF THE MISSION OF THE DIVISION WHICH REPRESENT THE MINIMUM MISSION REQUIREMENTS OF THE SYSTEM.
NON-PRODUCTION TIME:	THOSE HOURS DEVOTED TO THE REACCOMPLISHMENT OF WORK ALREADY PROCESSED, THE TEST AND DEVELOPMENT OF NEW OR MODIFIED PROGRAMS, AND MISCELLANEOUS ACTIVITIES IN SUPPORT OF THE SYSTEM ITSELF.
STAFFING TIME OF COMPUTER:	THOSE HOURS IN WHICH PERSONNEL ARE AVAILABLE TO OPERATE THE COMPUTER.
OPERATIONAL USE TIME/SYSTEM TIME:	THE ACTUAL METER READING IN HOURS TAKEN FROM THE COMPUTER.
SYSTEM IDLE TIME:	THOSE HOURS THAT THE SYSTEM WAS AVAILABLE BUT WAS NOT UTILIZED, WHERE COMPUTER PERSONNEL WERE BUSY WITH PROGRAMMING, KEYPUNCHING, SORTING, AND ADMINISTRATIVE TASKS.
BACKGROUND IDLE TIME:	THAT PORTION OF THE SYSTEM TIME IN WHICH THE BACKGROUND PARTITION WAS NOT BEING UTILIZED.
FOREGROUND 2 IDLE TIME:	THAT PORTION OF THE SYSTEM TIME IN WHICH THE FOREGROUND 2 PARTITION WAS NOT BEING UTILIZED.

FIGURE 3-25

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FIGURE 3-25 (CONT'D) — MACHINE TIME REQUIREMENTS BY PROGRAM CLASS —

G MISSION DARE SUPPORT			
01	DARE DENSITY PREPARATION	0.25	
02	DARE DENSITY DATA BASE	0.60	
03	DARE DENSITY DATA DISPLAY	0.0	
04	DARE DENSITY SPECIAL PROJECTS	0.0	
05	OPEN	0.0	0.86
G MISSION MICRO-D SUPPORT			
06	MICRO-D PREPARATION	0.90	
07	MICRO-D ANALYSIS	0.98	
08	MICRO-D DISPLAY	0.0	
09	OPEN	0.0	
10	OPEN	0.0	1.88
H MISSION SUPPORT			
41	VISUAL EDGE MATCHING	0.0	
42	OPEN	0.0	
43	OPEN	0.0	
44	OPEN	0.0	
45	OPEN	0.0	0.0
H MISSION MICRO-D SUPPORT			
46	MICRO-D PREPARATION	0.0	
47	MICRO-D ANALYSIS	1.19	
48	MICRO-D DISPLAY	0.0	
49	OPEN	0.0	
50	OPEN	0.0	1.19
CONVERSION			
15	JR DS SYS OPERATIONS	0.0	
16	OPEN	0.0	0.0
PRE MISSION H READINESS DYNAMIC TESTING			
17	RESOLUTION	5.84	
18	SYNC-FLASH	21.64	
19	FOCUS ANALYSIS	14.89	
20	COMBINED FOCUS/MOTION	0.0	
21	OPEN	0.0	42.36
	SUBTOTAL ONE		46.30

PROJECTS			
22	MAGTPPOR/POLYFIT/FOCUS EDIT	18.28	
23	ONE TIME SPECIAL PROJECTS	2.50	
24	GENERAL MISSION SUPPORT	7.76	28.54
CONTRACTOR UTILIZATION			
25	EIKONIX: NON-LINEAR	0.0	
26	EIKONIX: STAT SMOOTHING	0.0	
27	EIKONIX: FOCUS STUDY	7.58	
28	EIKONIX: D.B. SUPPORT	14.50	
29	EIKONIX: GENERAL OPERATIONS	10.56	
30	MEAD CORPORATION	1.13	33.77
FACILITY SUPPORT			
31	SECURITY	1.83	
32	ADMINISTRATION	0.0	
33	RESEARCH AND DEVELOPMENT	3.04	
34	PRODUCTION SUPPORT	0.70	
35	CIVIL ENGINEERING	0.0	
36	MATERIAL EQUIPMENT ACCOUNTING	0.41	
37	MATERIAL NON-FILM ACCOUNTING	0.0	
38	MATERIAL FILM ACCOUNTING	0.0	5.97
MISCELLANEOUS SUPPORT			
39	TRAINING	0.46	
40	MISC. DP SUPPORT	20.49	20.95
OPEN			
11	TECH OPS CORP	0.0	
12	OPEN	0.0	
13	OPEN	0.0	
14	OPEN	0.0	0.0
	SUBTOTAL TWO		89.24
	SUBTOTAL ONE		46.30
	TOTAL PROGRAM TIME REQUIREMENT		135.53

THE PROGRAM CLASSES ABOVE REFLECT BOTH PRODUCTION AND NON-PRODUCTION TIME CHARGED TO EACH OF THE CLASSES.

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—SUMMARY OF SEPARATE CHARGES FOR JUN 1975

SUPPORT BY DIRECTORATE —

DIRECTORATE OF EVALUATION		
DARE SUPPORT	0.86	
MICRO - D SUPPORT	3.08	
GEN MISSION SUPPORT	7.76	
READINESS TESTING	42.36	
CONTRACTOR SUPPORT	33.77	
CONVERSION (CS OPS)	0.0	
SPECIAL PROJECTS	20.78	108.61
SECURITY		1.83
ADMINISTRATION		0.0
DIRECTORATE OF RESEARCH AND DEVELOPMENT		3.04
DIRECTORATE OF PRODUCTION		0.70
DIRECTORATE OF CIVIL ENGINEERING		0.0
DIRECTORATE OF MATERIAL		0.41
MISCELLANEOUS D. P. SUPPORT		20.95

FIGURE 3-25 (CONT'D)

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FIGURE 3-25 (CONT'D)

— TIME BY FUNCTION —

DESCRIPTION	HOURS	PER CENT OF TOTAL	OTHER
PRODUCTION TIME	88.63	65.39	
RERUN TIME CHARGEABLE TO EVA	0.0	0.0	0.0 PERCENT OF PRODUCTION PLUS RERUN TIME
DATA PROCESSED EXACTLY BY INSTRUCTION PROVIDED WHERE THOSE INSTRUCTIONS WERE LATER MODIFIED DUE TO HUMAN ERROR OR EXTERNAL CONDITIONS BEYOND THE CONTROL OF EVA.			
RERUN TIME CHARGEABLE TO EVO	0.0	0.0	0.0 PERCENT OF PRODUCTION PLUS RERUN TIME
DATA INPUTED INCORRECTLY INTO THE SYSTEM DUE MAINLY TO HUMAN ERROR.			
PROGRAM DEVELOPMENT	35.87	26.46	
HOUSEKEEPING	11.04	8.15	
TOTAL PROGRAM REQUIREMENTS	135.53	100.	

MULTIPROGRAMMING OVERLAP	
TOTAL PROGRAM REQUIREMENTS (FROM ABOVE)	135.53
TOTAL SYSTEM TIME FOR THE MONTH (METER) -	91.38
HOURS GAINED DUE TO MULTIPROGRAMMING	44.15
OVERLAP PER CENT	48.32

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— IDLE TIME —

ENTIRE SYSTEM	
STAFFING TIME OF COMPUTER	240.00
OPERATIONAL USE TIME	91.38
SCHEDULED MAINTENANCE	3.60
UNSCHEDULED MAINTENANCE	0.0
SYSTEM IDLE TIME	145.02
IDLE TIME PER CENTAGES	60.42

BACKGROUND	
SYSTEM TIME	91.38
BG TIME	53.54
BG IDLE TIME	37.84
	41.41

FOREGROUND TWO	
SYSTEM TIME	91.38
F2 TIME	38.28
F2 IDLE TIME	53.10
	58.11

PAPER AND CARD UTILIZATION DATA		
SINGLE PART PAPER USED	20.07	BOXES
THREE PART PAPER USED	0.42	BOXES
PUNCHED CARDS USED	18.31	BOXES

1136 JOBS WERE RUN DURING THE MONTH OF JUN .

FIGURE 3-25 (CONT'D)

[redacted]

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BYE 15254-76

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EQUIPMENT COST ACCOUNTING REPORT

FOR JUN 1975

— PCAM EQUIPMENT - (IBM) PLN 01 —

TYPE	SERIAL	DOWN TIME	ACTUAL HOURS	HOURS AVG	NON BILL HOURS	NET BILL HOURS	E/S HOURS	E/S RATE	E/S RENTAL COST	BASIC RENTAL COST	TOTAL RENTAL COST	BASIC MAINT COST	E/S MAINT COST
	029	A1569 WAS DISCONTINUED ON 30 JUN 1975											
029	A1569	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.75	0.0
029	36713	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	111.00	111.00	0.0	0.0
						SYSTEM / AREA TOTAL			0.0	111.00	111.00	29.75	0.0

FIGURE 3-26

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EQUIPMENT COST ACCOUNTING REPORT

FOR JUN 1975

— PCAM EQUIPMENT - (UNI) PLN 01 —

TYPE	SERIAL	DOWN TIME	ACTUAL HOURS	HOURS AVG	NON BILL HOURS	NET BILL HOURS	E/S HOURS	E/S RATE	E/S RENTAL COST	BASIC RENTAL COST	TOTAL RENTAL COST	BASIC MAINT COST	E/S MAINT COST
1710	14924	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	115.00	115.00	48.00	0.0
					SYSTEM / AREA TOTAL				0.0	115.00	115.00	48.00	0.0
					SUB TOTAL FOR SECTION				0.0	226.00	226.00	77.75	0.0

FIGURE 3-26 (CONT'D)

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FIGURE 3-26 (CONT'D)

EQUIPMENT COST ACCOUNTING REPORT

FOR JUN 1975

— IBM 360/40 (EVD) PLN 02 —

TYPE	SERIAL	DOWN TIME	ACTUAL HOURS	HOURS AVG	NON BILL HOURS	NET BILL HOURS	E/S HOURS	E/S RATE	E/S RENTAL COST	BASIC RENTAL COST	TOTAL RENTAL COST	BASIC MAINT COST	E/S MAINT COST
2701	11100	0.0	20.7	20.7	0.0	20.7	0.0	0.190340	0.0	335.00	335.00	0.0	0.0
1627	10143	0.0	20.7	20.7	0.0	20.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2314	17126	0.0	91.4	91.4	0.0	91.4	0.0	0.0	0.0	1243.00	1243.00	0.0	0.0
2319	30592	0.0	91.4	91.4	0.0	91.4	0.0	0.0	0.0	840.00	840.00	0.0	0.0
3420	36489	0.0	25.8	27.2	0.0	27.2	0.0	0.221590	0.0	390.00	390.00	0.0	0.0
3420	36490	0.0	28.0	27.2	0.0	27.2	0.0	0.221590	0.0	390.00	390.00	0.0	0.0
3420	36491	0.0	25.3	27.2	0.0	27.2	0.0	0.221590	0.0	390.00	390.00	0.0	0.0
3420	36492	0.0	29.7	27.2	0.0	27.2	0.0	0.221590	0.0	390.00	390.00	0.0	0.0
3803	12402	0.0	91.4	91.4	0.0	91.4	0.0	0.087500	0.0	630.00	630.00	0.0	0.0
1416	32688	0.0	47.8	47.8	0.0	47.8	0.0	0.0	0.0	97.00	97.00	0.0	0.0
2040	22057	0.0	91.4	91.4	0.0	91.4	0.0	0.0	0.0	0.0	0.0	356.75	0.0
2821	16580	0.0	91.4	91.4	0.0	91.4	0.0	0.0	0.0	0.0	0.0	48.50	0.0
2540	18835	0.0	34.7	34.7	0.0	34.7	0.0	0.0	0.0	0.0	0.0	124.00	0.0
1052	53769	0.0	91.4	91.4	0.0	91.4	0.0	0.0	0.0	0.0	0.0	18.00	0.0
1403	30818	0.0	47.8	47.8	0.0	47.8	0.0	0.0	0.0	0.0	0.0	198.75	0.0
						SYSTEM / AREA TOTAL			0.0	4705.00	4705.00	746.00	0.0
						SUB TOTAL FOR SECTION			0.0	4705.00	4705.00	746.00	0.0
						GRAND TOTAL FOR MONTH			0.0	4931.00	4931.00	823.75	0.0

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BYE 15254-76

— COST SUMMARY FOR JUN 1975 —

ADPE RENTAL			ADPE MAINTENANCE		
SYSTEM	PLN	RENT	DELIVERY ORDER	REGULAR	PER CALL
PCAM EQUIPMENT	01	226.00	F19617-73-M-2707	29.75	0.0
IBM 360/40 (EVD)	02	4705.00	F19617-74-M-0002	746.00	0.0
			F19617-73-M-1362	48.00	0.0

COSTS COVERED BY SEPARATE PR'S.	0.0
COSTS FOR TRANSPORTATION IN/OUT.	0.0
COSTS FOR INSTALLATION OF EQUIP.	0.0

THERE WERE NO DOWNTIME CREDITS THIS MONTH.

FIGURE 3-26 (CONT'D)

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COMPUTER UTILIZATION

NOV 1973 THRU APR 1975

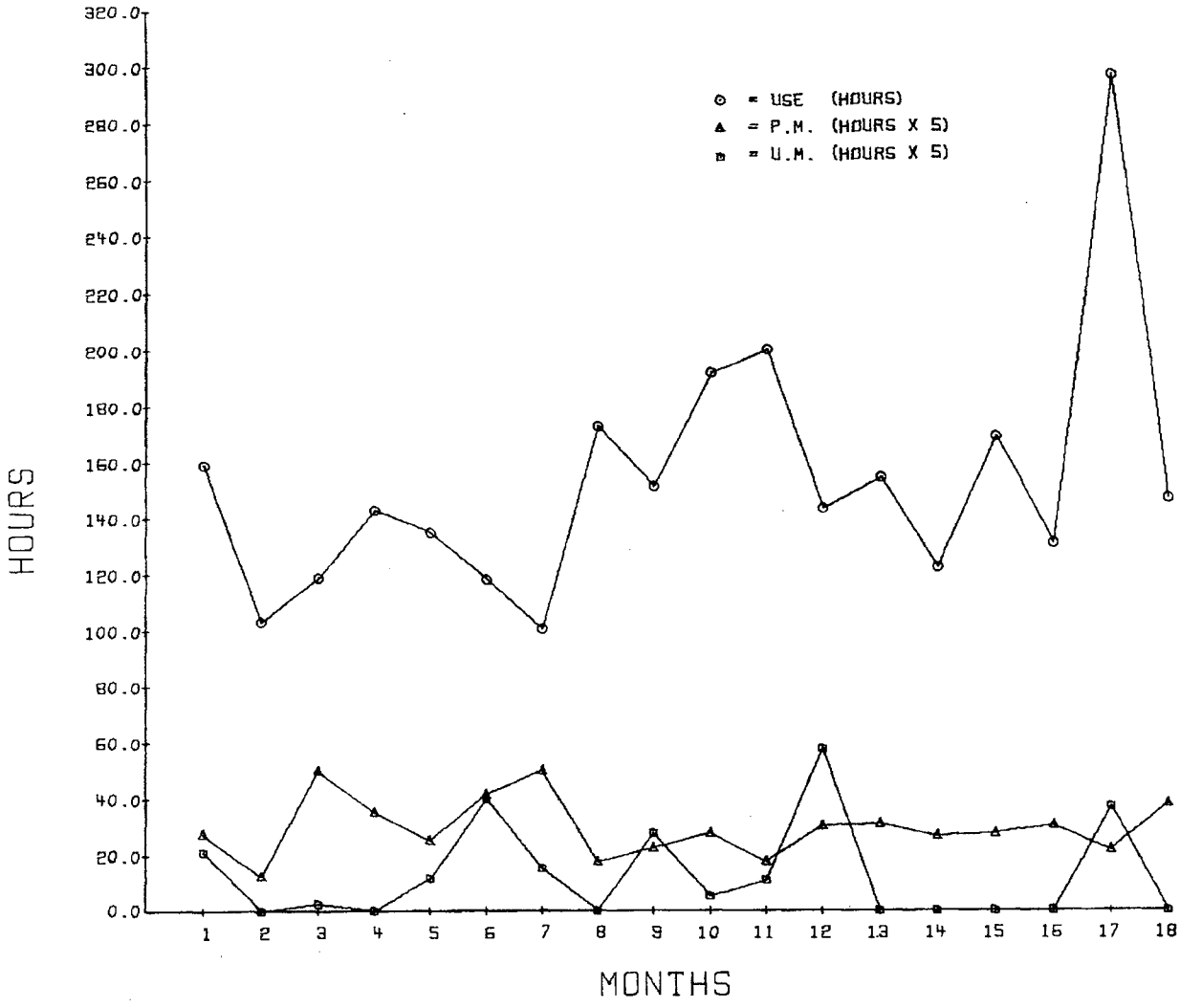

FIGURE 3-27

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AFSPPF HISTORY
Volume II

SECTION IV

PLANT

The primary operational building, P-1900, was designed and constructed in May 1956 as a reconnaissance technical facility. The original tenant, the 8th Reconnaissance Technical Squadron, was joined in the building by AFSPPL in December 1960. Initially, the Facility occupied approximately 7,000 square feet of floor space in Building P-1900 and was totally dependent upon the 8RTS and the 814th Base Civil Engineers (BCE) for utilities support. In the next 13 years, the Facility grew to encompass 178,811 square feet of plant space. This included the two major operations buildings (P-1900 and P-1875), several warehouses on Westover AFB, refrigerated storage vans, and bomb storage igloos. Along with this acquired space was a virtual self sufficient utility operation which was developed over this same period. In the 12 years from 1961 to 1973 approximately [redacted] was spent on construction projects and building modifications. Table 4-1 presents a chronological listing and cryptic description of the major projects during this period.

TABLE 4-1

SUMMARY OF AFSPPF PLANT CONSTRUCTION PROJECTS

Year	Project	Cost
1961	Modify Bldg P-1900 (Photo Lab area)	[redacted]
1961 - 1964	Modification to Bldg P-1900 (new cooling towers, mechanical rooms & air conditioning units in plenum)	
1963 - 1964	Augmentation to modification of Bldg P-1900 (change walls in lab, addition of plenum & mechanical equipment)	
1964	Alter Bldg P-1900 (change walls, extend ducts in Rooms 64 & 88)	
1965	Alter Bldg P-1900 (combine Rooms 125 & 126)	
1965	Install Security Lighting around Perimeter of Bldg P-1900	
1966	Alter Bldg P-1900 (add air filter & water pump)	
1966	Modify Bldg P-1900 (construct Computer Room)	
1966	Expand Security Alarm System in Bldg P-1900 (EV)	
1966	Modify Bldg P-1900 (Phase III, Modification Part I, Silver Recovery)	
1967	Modify Bldg P-1900 (Phase III, Modification Part II, reconfigure Lab)	

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31 July 2014

TABLE 4-1 (CONT'D)

Year	Project	Cost
1967	Alter Bldg P-1900 (refinish Rooms 118, 132, 120, 121, & 123)	[redacted]
1968	Alter Bldg P-1900 (raise floors in Computer area)	
1968	Modify Bldg P-1900 (Comm/Film Environmental Facility)	
1968	Modify Bldg P-1900 (Electrical Emergency Power Plant)	
1968	Install Mulcher-Incinerator System	
1970	Alter Bldg P-1900 (install Fire Alarm & Sprinkler System)	
1970	Alter Bldg P-1900 (reinforce hallways & walls)	
1971	Alter Bldg P-1900 (update utility system, remove two generators)	
1971	Alter Bldg P-1900 (rehabilitate Photo Lab)	
1972	Construct Water Storage and Booster Pump Station	
1972	Alter Bldg P-1875 (rehabilitate T&E area)	
1973	Alter Bldg P-1900 (Feasibility Section addition)	
1973	Construct Industrial Waste Treatment Facility	
1973	Install Fire Sprinkler System in Bldg P-1875	

Table 4-2 summarizes the different types of environmental and closed storage areas utilized during the 16 years' existence of this organization.

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31 July 2014

TABLE 4-2

SUMMARY OF AFSPPF STORAGE AREAS

Storage Area	Date Acquired	Total Area (square feet)	Storage Use	Date Turn-in
Bldg at Cowan Street/Inner Drive	January 1961	800	Miscellaneous administrative and production supplies	1966
Bldg 1831	August 1963	7,500	NER Equipment, dry chemicals, spare parts	1970
Two Bomb Storage Igloos (Stonybrook)	September 1963	7,500	Film	1971
Six Refrigeration Vans	September 1963	1,920	Small size films (35mm, etc.)	1969
Two Butler Bldgs (Stonybrook)	September 1963	3,300	Processing equipment	1969
P-1900 Environmentally Controlled Area	Constructed 1968	6,400	Film, chemicals	1977
Bldg 3500	October 1970	7,500	NER Equipment, administrative supplies	1971
Bldg 7400	September 1969	15,000	NER, RD, & Lab equipment	1972
Bldg 7504 (Nosedock #7), Bldg 7502 (Nosedock #5)	June 1971	60,800	NER Equipment, chemicals, cans, spools, administrative supplies	1973
P-1900 (New Feasibility Addition)	Constructed 1973	5,202	Operational mission supplies	1977
Bldg 2404	March 1973	12,000	NER & RD equipment, cans, spools	1977

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31 July 2014

AFSPPF HISTORY
Volume II

The purpose of this section will be to textually summarize the tremendous growth of the physical facilities of AFSPPF.

The original Secretary of the Air Force Order stipulated that the "physical space and some resources will be taken from the 8th Reconnaissance Technical Squadron." With the publication of that Order, the Facility established an Administrative Section and moved into the area that had been the 8RTS Precision Processing Section. AFSPPL also acquired the majority of the 8RTS Exploitation Branch, which at that time was the only vaulted area in P-1900. It was in this vaulted area that the Facility established the security and operations functions. Initial research and development efforts were accomplished in the office space adjacent to the 8RTS Cartographic Branch. The areas occupied by AFSPPL in the early 1960s were carefully negotiated between 8RTS, the 8AF Director of Intelligence (DI), and the Command Section of this Facility.

In early 1961, the Facility's Supply function was located in two buildings. One of these was a wooden frame structure located at the corner of Cowan Street and Inner Drive where the Industrial Waste Treatment Plant now stands. This temporary (T) building had 800 square feet of storage space. The Facility also shared Building 1831 with the 8RTS. AFSPPL utilized approximately 3,500 square feet to store hardware, spare parts, and chemicals and the 8RTS occupied the remaining 4,000 square feet.

The first construction effort of significance was an extension of an existing project (40-8) under contract to Discenza Company of Springfield, Massachusetts. The initial contract had been let to accomplish general building maintenance such as painting. This contract was extended by the Facility to include the relocation and expansion of the Chemical Mix function and the installation of a 200 KW Generator. The Chemical Mix area was expanded to accommodate the increased needs for chemistry due to the installation of four Houston Fearless HTA-4 Processors. The generator was installed to provide backup power to the processing and printing equipment when the Facility commenced its nationally tasked processing support of the SAMOS Program. This construction project was begun in October 1961 and completed in January of the following year.

Even before the Chemical Mix project, Facility personnel were preparing plans for a large scale modification to Building P-1900. Despite the fact that the project was ready to go on contract in mid-summer of 1961, there was a long delay in getting funds approved. The architectural-engineering work was accomplished by Anderson-Nichols & Company of Boston thus beginning a relationship that was to last over the next 13 years. The prime contractor was the Franchi Construction Company of Newton, MA and the major subcontractors were Harry Grodsky & Company, Inc. of Springfield, MA for the plumbing and the Valley Electric & Heating Company, Longmeadow, MA for the major portion of the electrical and wiring work. This project which was to ultimately cost [redacted] can be divided into three phases.

NRO APPROVED FOR RELEASE
31 July 2014

AFSPPF HISTORY
Volume II

A. Phase I

This phase consisted of the modifications to provide an interim processing capability until the main rehabilitation of the lab could be completed. These alterations included the installation of the plumbing and power for the new generation processors. The interim processing area also required the construction of a temporary Chemical Mix area and the installation of a 500 KW power panel. The interim facility was completed in September 1964.

B. Phase II

This phase involved the construction of a mechanical equipment room to provide environmental control for the planned permanent photo laboratory. Two refrigeration machines were installed in the mechanical equipment room in April 1962, and a third added in November 1964. Air handling equipment was installed on the roof and a new 750 KVA electrical substation was added. This phase of the project was completed in November 1964.

C. Phase III

The final phase centered around the modification of the main photographic laboratory area. This alteration became popularly known as the "Clean Lab Modification" and consisted of designing and building an environmentally controlled laboratory which would become the state-of-the-art Government facility for photographic processing. The construction began in March 1962 and was completed in the summer of 1964.

In addition to the air handling equipment and electrical substation, this project included the installation of an Electronic Control System made by Taylor Instruments to hold temperatures to within ± 1/4 degree, and humidity within 5% of a desired level. The Electronic Control System also included a wet-dry central vacuum, oil-free compressed air, and instrument compressed air. To accommodate much of the air handling equipment, a plenum was constructed directly over the Photo Laboratory. The total area added to the building under this contract was 29,950 square feet.

Even before these modifications were completed, another Military Construction Project (MCP) was approved and a second contract let with the Franchi Construction Company to accomplish other major modifications to the building. To distinguish this contract from the one already in existence, it was called "Augmentation to the Modification of Building P-1900." This project was generated by the purchase of three Dalton Processors and the replacement of the two Eltrons by Trenton Processors. The installation of this equipment required extensive alterations and modification to the precision photographic laboratory. The most significant changes were the construction of a new 3,840 square foot Chemical Mix Section and the rehabing of the old Chemical Mix area to provide individual rooms for the Dalton and Trenton Processors. Other additions included the Pneumatic Tube Carrier System connecting the processors with the quality

NRO APPROVED FOR RELEASE
31 July 2014

control and chemical analysis areas and the installation of four new air conditioning/handling systems (AC-6, 7, 8, and 9). This project was completed in December 1964 at a cost of [redacted]

Building P-1900 was not the only plant capability being expanded. The warehouse storage space also increased substantially. The Facility took over Building 1831 in its entirety in the summer of 1963. Different types of dry chemistry, spare parts, and excess equipment were stored in this building. Six refrigerated vans were acquired and stocked with the most commonly used films. This capability gave the Facility an immediate environmentally controlled forward supply point. The trailers were located in the parking lot of Building P-1830, approximately two blocks from P-1900. Bulk film and excess equipment were stored in bomb storage igloos and Butler buildings at Stonybrook, approximately three miles from the Facility. By late 1963, the total square footage of external warehouse space had grown to 19,800.

Although there were continual internal modifications in progress during 1965, these projects were relatively small, i.e., room alterations, security lighting system affixed around the complete outer perimeter of P-1900, etc.

In 1966, the south corner of Building P-1900 was modified to a Class A vault area to house the Data Division's IBM 360 Computer System. The construction, which was designed by Anderson-Nichols & Company and performed by Valley Electric, began in May 1966. This project required architectural, mechanical, and electrical modifications to approximately 1,100 square feet of space. During this same time frame, the "Phase III Modification to P-1900" started; this project was completed in December 1967. These modifications included the installation of an Ion Exchange Silver Recovery System, a series of internal alterations within the precision processing laboratory, and the reconfiguration construction of additional vaulted rooms in the Evaluation, Production, and Special Activities areas.

The following projects which ran from October 1963 to September 1969 not only improved the security of AFSPPF, but significantly increased the physical space of this Facility.

A. Shipping

The first was the construction of a much needed Shipping area. The packaging, controlling, and shipping of the ever increasing volume of reproduced imagery products had become a major bottleneck in the Facility's production cycle. However with this 1,900 square foot addition of the Shipping area and the installation of a conveyor belt, the Facility greatly improved its capability to handle and temporarily store mission materials.

B. Classified Waste Destruction

A contract was let in August 1968 to install a classified waste destruction system which consisted of a mulcher and an incinerator. Although the original purpose of this type mulcher was for

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31 July 2014

wood, it was modified by its designer and manufacturer, the Jackson Blowpipe Company of Jacksonville, Florida, to accept film. On the other hand, the Fairchild-Hiller incinerator was specifically designed to burn large quantities of film and recover the silver from the ash. This system was installed in an area of the newly constructed Shipping Section. After considerable delays in developing/modifying and testing the mulcher, the Classified Waste Destruction System became operational in December 1970.

C. Communications/Film Environmental Control

In 1968, an Emergency Construction Project (ECP) was approved for the construction of a Communications/Film Environmental Control Facility. This project provided for a 1,300 square foot vaulted, air conditioned area to house the communications support personnel and equipment. The other segment of this project was the construction of a 6,400 square foot environmentally controlled area which would allow storage of large volumes of film within P-1900. This storage area included a loading dock for ease of receipt and shipment of bulk film and chemicals. The interior design also facilitated inventory control/inspection and a better organized storage system through the palletization of film by type and emulsion batch. Upon the completion of the environmentally controlled storage area in May 1969, the flow/handling of essential film and chemicals was greatly improved. The film and chemicals were then moved from the igloos and refrigerated vans located in different areas on base into this new storage facility.

After the transfer of 8th Air Force Headquarters from Westover in 1970, the Facility obtained Building 1875 which had been used as the 8th AF Target Intelligence Simulation Section, the 8th Reconnaissance Technical Squadron, and finally as 99th Bomb Wing Target Intelligence Center. This permanent, brick structure consisted of 10,245 square feet of office space and work areas and was ideally suited for the ever expanding efforts being pursued by the Research and Development Directorate. The interior of this building has been modified slightly over the years to provide sufficient environmental, security, power, and plumbing capability for the development, test, and evaluation of photographic reproduction/quality control/analysis equipment and processes.

The operational buildings continued to undergo modifications (hallways and photo lab floors were resurfaced with a special resin to aid in environmental control) during the early 1970s. In 1973, the Facility was further expanded with the construction of the Feasibility Addition to P-1900. This project was completed in May 1974 and resulted in an addition of 5,202 square feet of environmentally controlled space. However with the announcement of the closure of the Facility on 24 October 1973, the Commander changed the original plan to relocate the Feasibility Section into this new area (Room 40). Instead, due to the phasedown and related reduction in many stock levels, this area was utilized as a transshipment point for "fast moving" supplies. This was the first time that AFSPPF was able to consolidate all film and chemical storage in an environmentally controlled area in one location.

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31 July 2014

AFSPPF's concern with attaining self sufficient utilities, logistics, maintenance, analytical, and processing capabilities in a secure environmentally controlled complex had the biggest effect on construction/modification projects in this era. The first of the self sufficiency projects was the construction of the Emergency Power Plant which was started in June 1969 and completed in January 1972. The requirement for this dedicated backup plant was based on periodic failures of the power provided by the Base. The mission of this organization demanded stable power during processing and image evaluation operational periods. Even the tiniest surge or shortest "brown-out" caused precision equipment, processing data, and/or photo reproduction product variations. For these reasons AFSPPF requested and received a 100% backup generator power/switch gear capability. This equipment was located at the back (east side) of Building P-1900 and installed in a 4,420 square foot inclosed area.

In addition to the problems with Base electrical power, the Facility also experienced difficulties with the Base water system. In the peak summer months of July and August, the water pressure fell to the point where the Facility was not getting sufficient water for its photo processors. In an effort to gain its own water system five water wells were drilled in 1967 and early 1968; however, the cost of the filtering system to upgrade the purity of the water was too great to make this option realistic. A booster pump was then attached to the portion of the Base Water System which supplied AFSPPF in an attempt to maintain adequate pressure. However, the vacuum created by the pump affected the water pressure within the local housing area, and that option was also terminated. Finally it was decided that the most feasible method of assuring the right quality, temperature, and pressure for the water used in photo processing was to build a storage tank and booster station. A contract was let to build a two million gallon water storage tank with a booster pump station. This work was completed in June 1973. The size of the pump station was 806 square feet. The support facility is located 100 feet from the northwest side of Building P-1900.

The growing concern of the Facility over pollution abatement led to the last major construction program, the Industrial Waste Treatment Facility. This project, which was started in July 1972 and accepted from the contractor in August 1974, cos[redacted] It was a rectangular, permanent brick/cement structure located approximately 150 feet diagonally across from the north end of Building P-1900. This building has 5,800 square feet of interior working area which is mainly configured with recycling and processing equipment.

The ability to establish this extensive and self sufficient plant again centered around the direct influence of the Office of the Secretary of the Air Force (OSAF). A good example of this influence was the acquisition of Building P-1875. In 1970, when this building became available with the transfer of 8th AF, SAC wanted possession of it for a training installation. AFSPPF desired this building to house its expanding RD function which included equipment T&E and development, a Feasibility Section, and contract monitoring. The

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31 July 2014

AFSPPF HISTORY
Volume II

Commander, Colonel Ralph Swofford, presented this operational justification for the use of P-1875 to the Base Commander; however because Westover at that time was still a SAC Base, the parent command decided to keep this permanent structure brick building consisting of 10,245 square feet of space. The OSAF had been briefed on AFSPPF's plan and had fully concurred. When apprised of the Base's decision, the OSAF sent a message to SAC emphasizing support of AFSPPF's requirement. In May 1970, P-1875 was assigned to this Facility. It was the intention of the OSAF and its subordinate organizations [Special Projects (SP), National Reconnaissance Office (NRO), etc.] to build AFSPPF into an organization with the inherent capability to perform research and development, production photographic processing, and image analysis and evaluation of reconnaissance satellite camera systems and products. Throughout the history of this organization variations and growth in plant space occurred because of: (1) modifications/ additions to P-1900, (2) more suitably located and controlled buildings becoming available on Westover AFB, (3) changes in operational requirements, and (4) support responsibilities, i.e., NER, etc.

Upon the complete transfer of all the Facility's operational functions, the Logistics and Civil Engineering personnel will turn Buildings P-1900 (Operations), P-1875 (RD), P-3102 (Industrial Waste Treatment Plant), P-3101 (Pump Station), P-3100 (Water Storage Tank), and T-2404 (Warehouse) back to Westover Air Force Base. This action will take place approximately 1 January 1977. Figures 4-1 thru 4-6 show pictures of these buildings taken in July 1976.

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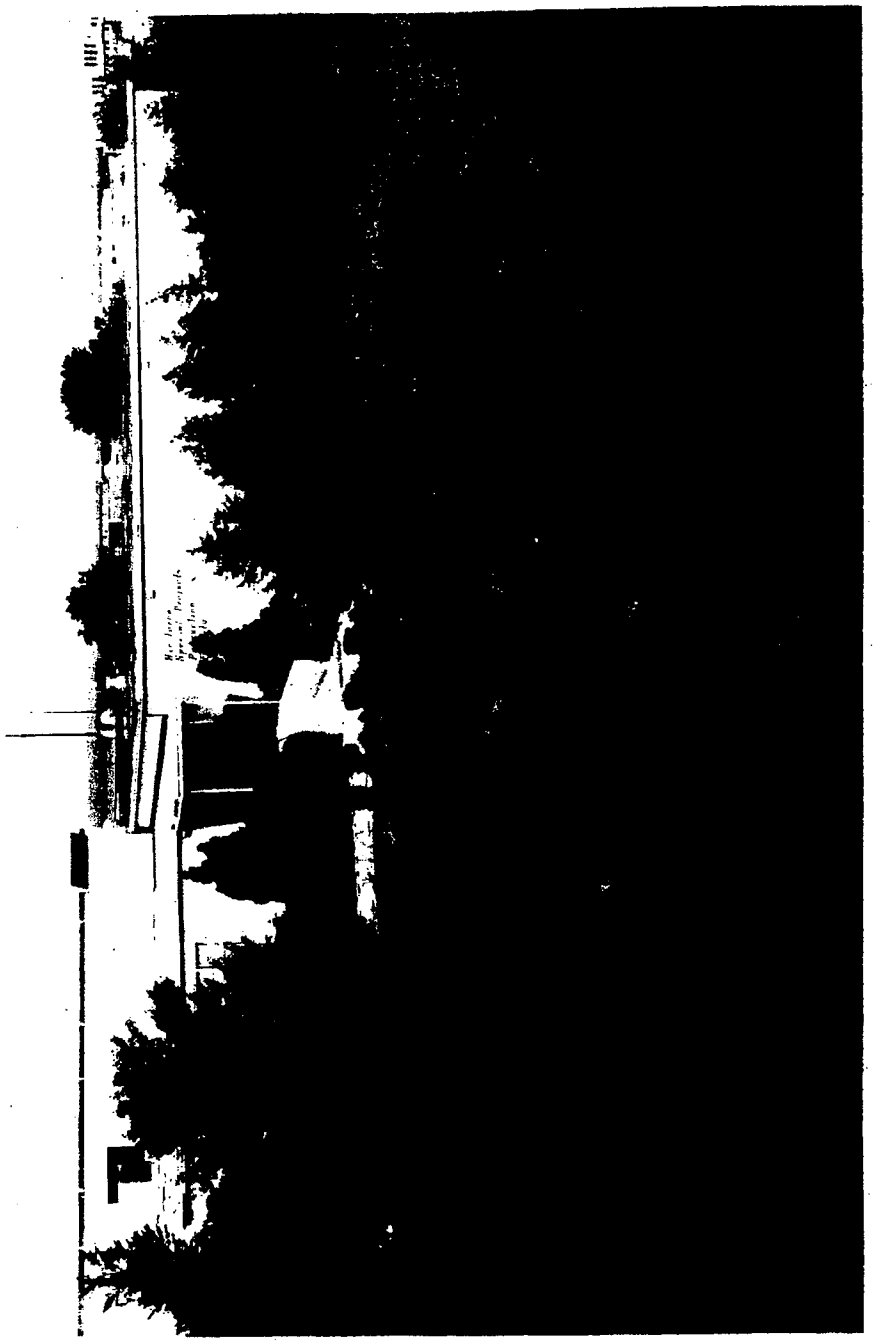
31 July 2014



P-1900, MAIN OPERATIONS BUILDING
(106, 960 square feet)

FIGURE 4-1

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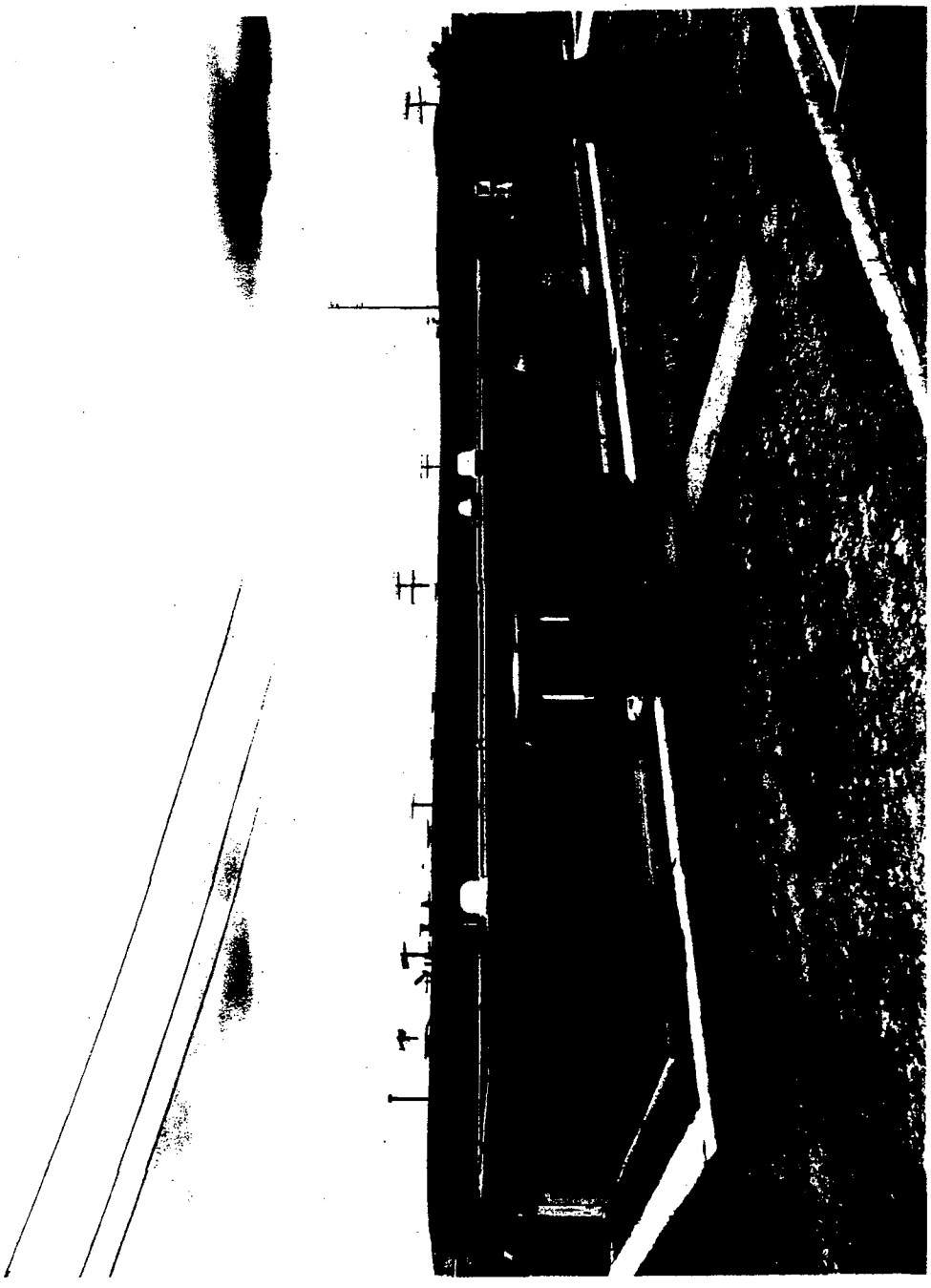

P-1875, RESEARCH & DEVELOPMENT BUILDING
(10,245 square feet)

FIGURE 4-2

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P-3102, INDUSTRIAL WASTE TREATMENT PLANT
(5, 800 square feet)

FIGURE 4-3

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P-3101, WATER STORAGE BOOSTER PUMP STATION
(806 square feet)

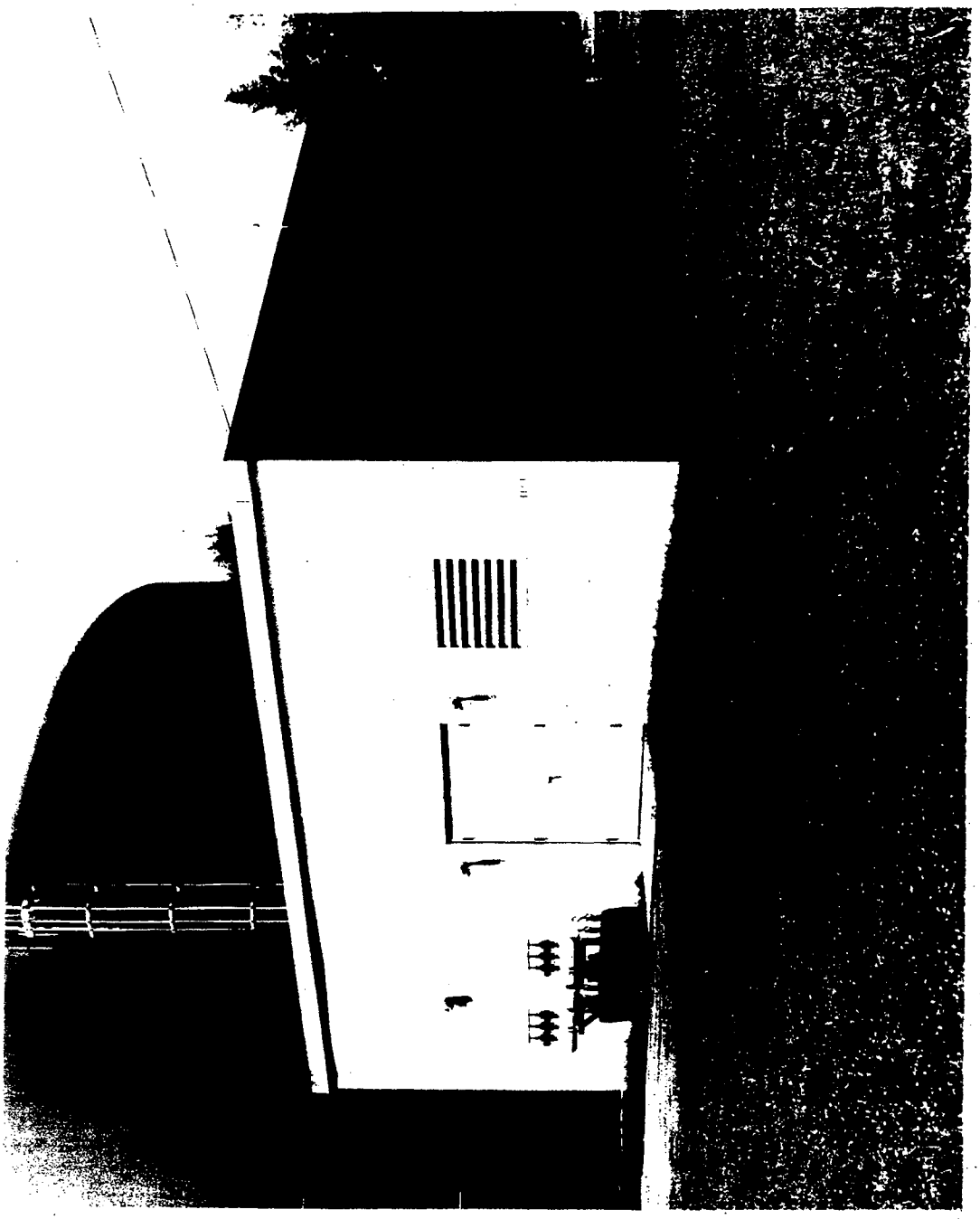

FIGURE 4-4

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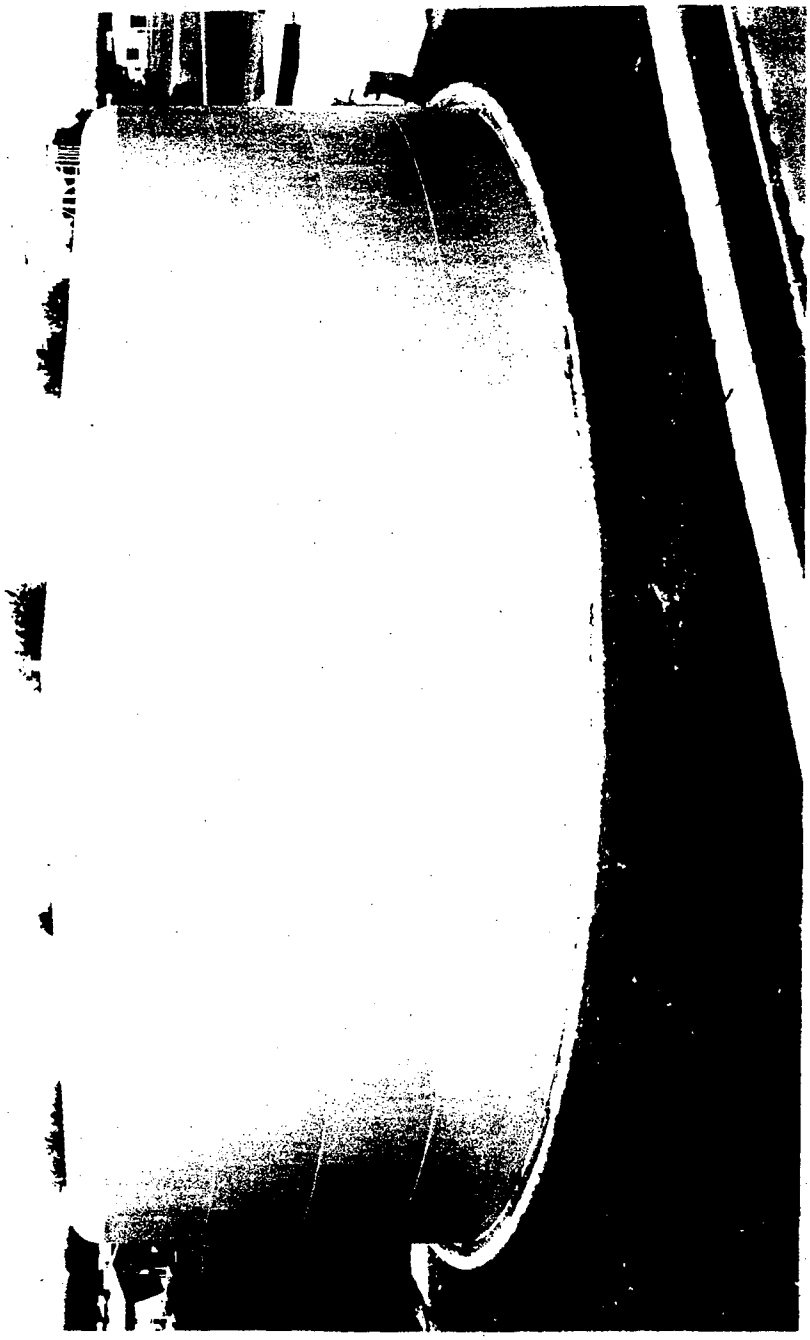

P-3100, WATER STORAGE TANK
(2,000,000 gallon capacity)

FIGURE 4-5

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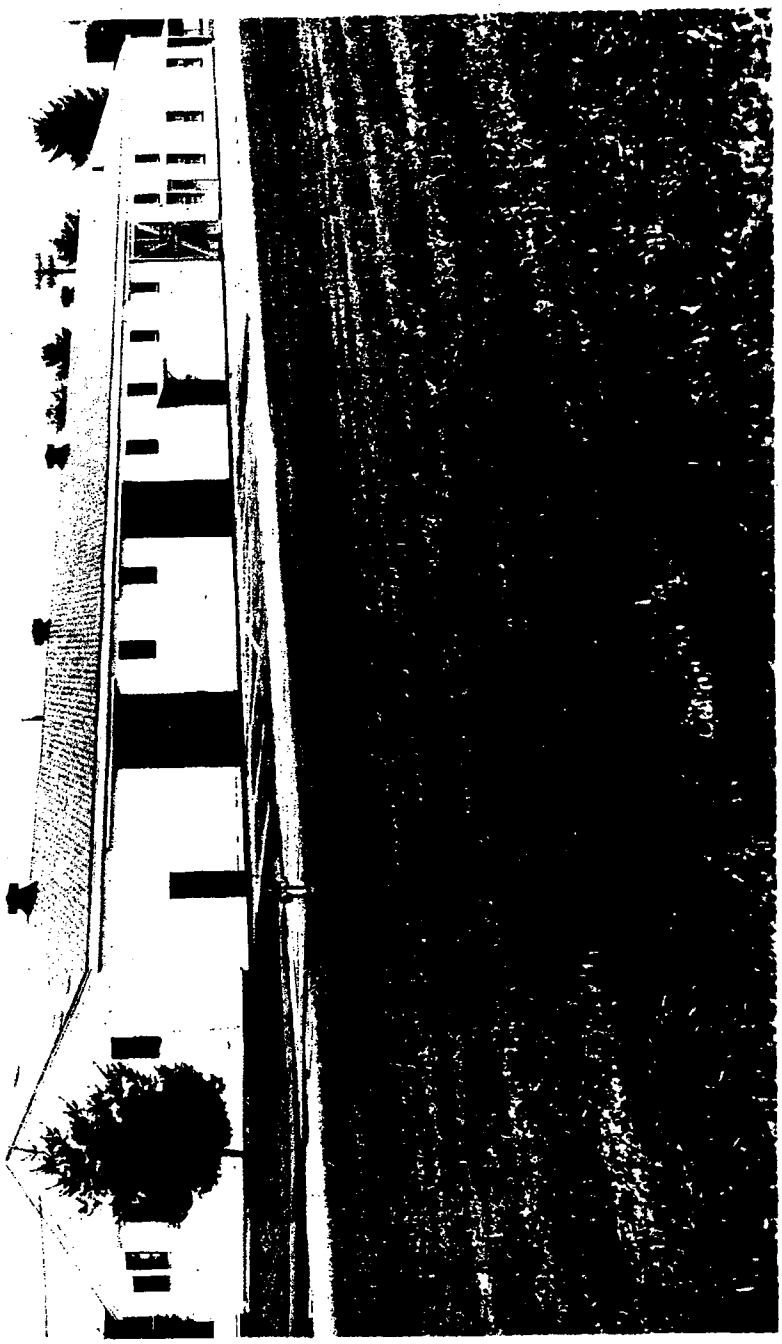

T-2404, WAREHOUSE BUILDING
(12,000 square feet)

FIGURE 4-6

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