RADC IMAGERY DATA BASE

Raytheon Company

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Rome Air Development Center
Air Force Systems Command
Griffiss Air Force Base, New York

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13. ABSTRACT

The "RADC Imagery Data Base" program was accomplished to enhance, maintain and update a multisensor data base with exploitation of materials to support research and development programs. This Data Base consisted of a reconnaissance oriented technical document library, multisensor film library and files of associated collateral data.

In addition to maintaining these resource bases, this program prepared from the data on hand end products aimed at facilitating data base operations to improve this resource. This report contains complete documentation of the work accomplished during the performance of the contract.

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RADC IMAGERY DATA BASE

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II

FOREWORD

This final report describes the work carried out by Raytheon Company/Autometric Operation, Equipment Division, Boston Post Road, Wayland, Massachusetts 01778, for Rome Air Development Center, Griffiss Air Force Base, New York, under contract F30602-70-C-0165, Job Order No.11530000.

During the course of this contract, Jack Kaczanowicz, Captain Thomas Fortin, Major Ann Hughes and Ellsworth Hicks acted as overall contract monitors for the government at separate intervals of the contract. David Gaucher was program manager for Autometric.

The Engineering Services portion of this contract was performed from 1 February 1970 to 28 February 1972. An augmentation team consisting of three interpreters and one photo technician was added to original contract manning for the period from 22 March 1971 through termination of contract.

This document has been reviewed by the Office of Information (OI) and is releasable to the National Technical Information Service (NTIS).

This technical report has been reviewed and is approved.

Approved: Robert W. Shearer
ROBERT W. SHEARER
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Colonel, USAF
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ABSTRACT

The "RADC Imagery Data Base" program was accomplished to enhance, maintain and update a multisensor data base with exploitation of materials to support research and development programs. This Data Base consisted of a reconnaissance oriented technical document library, multisensor film library and files of associated collateral data.

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for
RADC Imagery Data Base
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1. The subject report is acceptable. It provides sufficient information regarding the work accomplished. The Data Base is a continuing effort and the information contained is constantly being expanded, updated and automated where feasible.

2. Historically, the Data Base has provided important source material for airborne reconnaissance R&D efforts. It has received considerable usage by DoD personnel and their associated contractors. As it continues to progress it will provide considerably more useful textual and graphical R&D materials. Furthermore, the ease and timeliness of obtaining information from the Data Base will continue to improve with time.

Robert W. Shearer

ROBERT W. SHEARER
Project Engineer
Recon Operations

1. INTRODUCTION

The RADC/IRRO Reconnaissance Data Base is a source of reconnaissance related information which can be exploited by agencies researching data for use in reconnaissance R&D efforts. The value of the Data Base is built upon the responsible screening of the volume of raw data received, the skillful manipulation of that data to produce a useful data bank of coordinated information, and the timely retrieval of all data in response to user requests.

The routine functions of data collection, data reduction, and storage and retrieval activities are of prime importance to Data Base operation. The growth of the importance of the RADC/IRRO Data Base as an invaluable reconnaissance oriented research source is dependent on the highly qualified personnel who not only perform routine Data Base maintenance, but develop methods to improve the quality and quantity of refined data which can be obtained in the Data Base.

The following sections of this report not only outline the basic tasks which were accomplished under contract F30602-70-C-0165, but also describe the expanded programs that were initiated to enhance Data Base resourcefulness.

2. DATA BASE OPERATIONS

2.1 General Statement of the Problem

The objective of this effort, as stated in the Research and Technology Work Statement, is to enhance, maintain and update a multisensor data base with exploitation of materials to support research and development programs and preparation of multisensor test photos and other associated photographic products.

In order to accomplish these objectives, Autometric personnel have carried out three basic functions: (1) data collection, (2) data reduction, and (3) data maintenance. Routine individual tasks within the above categories include photographic laboratory support; mission planning; processing, logging, screening, targeting, plotting, analyzing and storing imagery; filling imagery requests and duplicating imagery; receiving, encoding, abstracting and microfilming documents; generating document printouts and accession lists; ordering and maintaining charts; ensuring adherence to security procedures; destroying classified matter; and filling special work orders.

In addition to the routine operational tasks, Data Base personnel have expanded basic tasks to derive from data on hand and periodically acquired new materials, end products which facilitate Data Base operations and enhance this resource both qualitatively and quantitatively.

Descriptions of major Data Base maintenance and enhancement programs completed under this contract are outlined in the following sub-paragraphs.

2.2 RADC Reconnaissance Data Base Maintenance

Data Base maintenance pertains to the routine tasks of data collection, data reduction, storage and retrieval, user services and special projects. These activities comprise the major thrust of this contract to provide optimum use to the majority of users.

2.2.1 Data Collection and Reduction

2.2.1.1 Imagery Collection and Reduction

A wide spectrum of multisensor imagery was received at the Data Base during the course of this 25 month contract. The extent to which this incoming imagery was refined for incorporation into the Data Base system was determined by

priorities set by the customer as well as by the degree of collateral documentation that was received with the imagery.

Primary consideration was given to imagery obtained from sensors flown in aircraft from the RADC Flight Test Division. The collection efforts were in direct support of RADC R&D programs or in support of requests received from other DOD agencies. All of these primary collection efforts were coordinated through the Reconnaissance Operations Center (ROC).

A total of 2,543 missions was received at the Data Base from February 1970 through February 1972. The graph in Figure 1 illustrates the frequency of incoming imagery in twelve month segments as compared to the same twelve months of the previous contract. Rates shown for the majority of months are for imagery resulting from RADC Flight Test Division. The high rate depicted for January 1971, is a result of receipt of 1,228 rolls of original imagery collected during Project Ampirt, and 281 rolls of original Project Brainstorm imagery. These two projects were completed several years earlier and finally made their way to the Data Base for final disposition during the course of this contract.

Another high rate of incoming imagery was reached in July 1971, when 522 rolls of D-Series imagery was received from Texas Instruments, Inc. This imagery was resultant data from many of Texas Instruments' in-house studies over the past several years, and was incorporated into the Data Base at the request of IRRO because of the wealth of useful information contained in the imagery.

All the imagery from these three programs was well documented or previously referenced in documents already filed in the Data Base. The imagery was logged, labelled and put into the Data Base storage and retrieval system.

The remainder of the imagery received during the past two years (412 rolls) went through Data Base data reduction procedures. All imagery was screened to determine quality and or extent to which it fulfilled mission requirements. Once this was established, those missions retained for Data Base use were logged and labelled. Plots were prepared on transparent overlays for 331 Project 6244 photo and infrared missions during the course of this contract. Transparent overlays were prepared to optimize duplication of the plot on Ozalid to be provided as indexes with future imagery requests. The final plot was then inserted into a mission packet with that mission's flight log and any other mission data available. This packet was then filed in sequential mission number in a plot file.

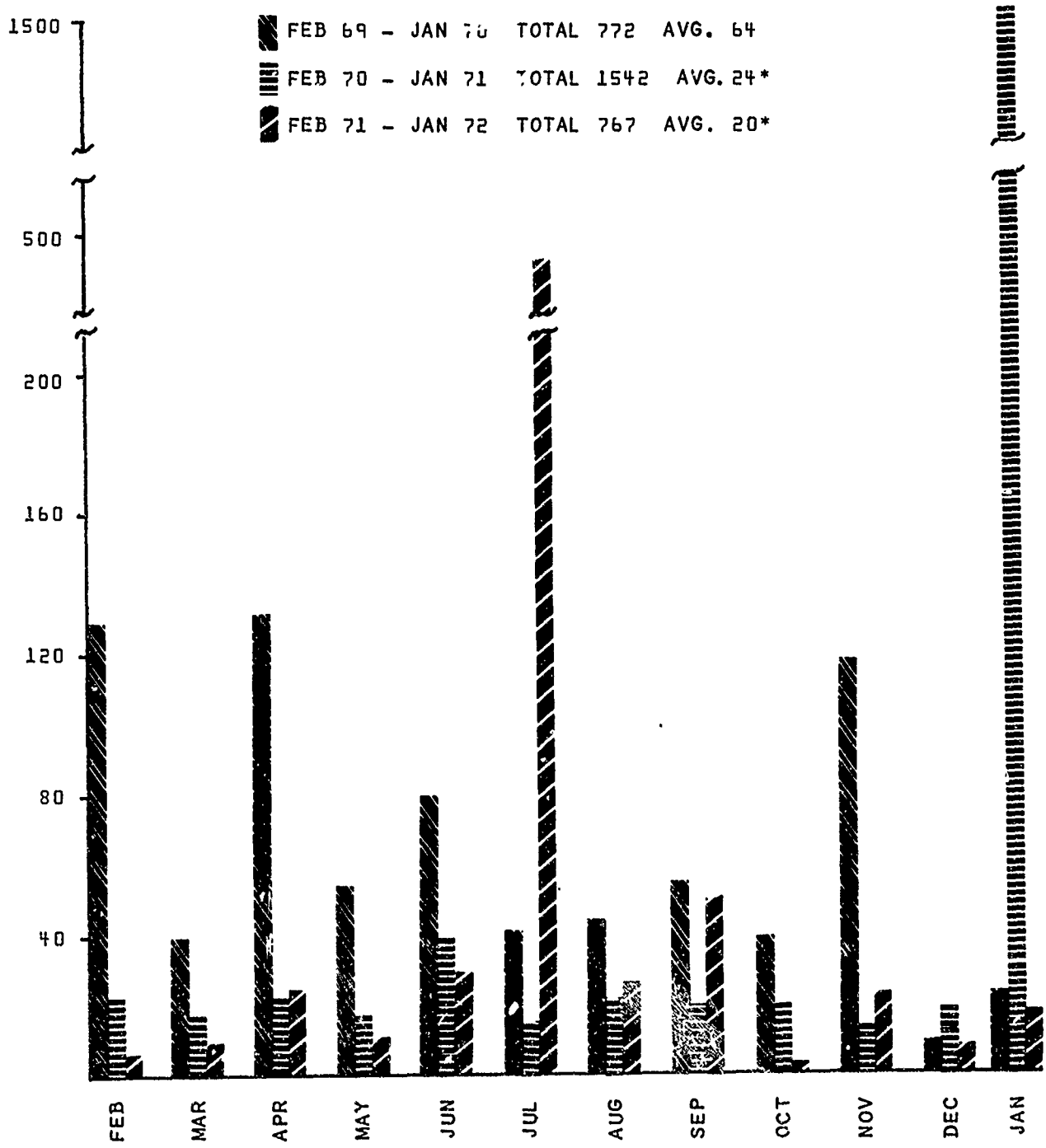


FIGURE 1. MONTHLY COMPARISON OF ROLL FILM LOGGED INTO DATA BASE FROM FEB 1969 THRU JAN 1972

* AVERAGES PER MONTH DO NOT INCLUDE EXCESSIVE HIGHS SHOWN IN JANUARY AND JULY OF 1971

Formerly, once individual plots were completed, they were transferred to master cover traces based on 1:1,000,000 scale ONC's to show at a glance what coverage was available throughout the country. These proved to create a storage problem because of their bulk and did not accurately depict coverage of a scale of less than 1:20,000, which is the scale of the majority of our missions.

This problem was somewhat alleviated by microfilming on 35mm the majority of our side-looking radar plots resulting from collection efforts under previous projects. SLR plots are easily discerned on microfilm because of SLR's small scale/ large area coverage.

An interim method of keying plots to maps for master cover trace reference was initiated by one Autometrician. This is a card file of all the 1:250,000 scale charts on which we have coverage. Each card represents one map sheet. Whenever a mission plot, or any portion of that plot, falls on a particular map sheet, that mission number is added to the corresponding file card. If coverage of a particular area is requested, the file card for the map on which the area appears is pulled, then the individual mission plots for the missions listed on the file card are checked for the desired coverage.

As stated previously, this file card system is an interim system. Study has begun on a computer based coordinate retrieval system which will be discussed later under Data Base enhancement.

2.2.1.2 Document Collection and Reduction

Technical documents dealing with a wide range of reconnaissance and remote sensing applications constitute a second source of important research material held in the Data Base. These documents are acquired as a result of studies conducted by RADC engineers, other DOD agencies, and civil agencies either as a result of in-house studies or in performance of government contracts.

Figure 2 shows the rate of incoming documents received at the Data Base for each month during the past contract as compared to a similar twelve month period during the previous contract. The total number of documents received totalled 1,121. These additions increased Data Base document holdings to 3,118 volumes.

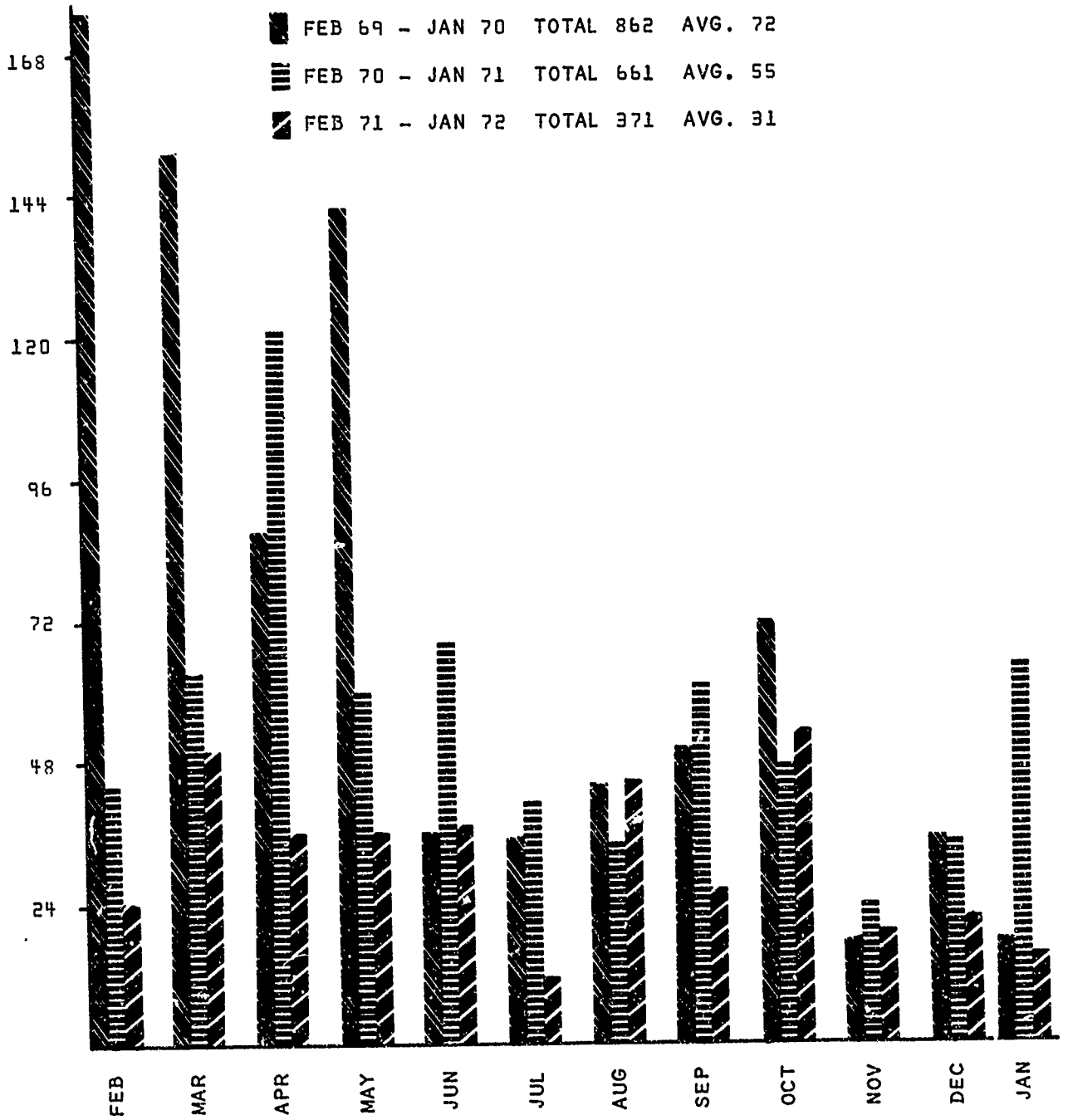


FIGURE 2. MONTHLY COMPARISON OF DOCUMENTS LOGGED INTO THE DATA BASE FROM FEB 69 THRU JAN 72

Once documents were logged into the Data Base, they were assigned a consecutive number and filed on the library shelves in numerical order. Prior to being shelved, abstracts were prepared on each document following a format set forth by Recon Central at Wright-Patterson AFB. Once abstracts were completed, those documents of which we hold only one copy, and which are not diminished in usefulness as a result of miniaturization, were microfilmed on 16mm film and inserted in micro-thin jackets to form microfiche. This enables the Data Base to maintain a miniature back-up file of these documents as well as providing the Data Base with a reproduction capability should a need for further copies arise. Slightly over 78,000 pages of textual materials were microfilmed since this procedure was initiated in January 1971.

After microfilming was completed, incoming documents were encoded and incorporated into the document EDP system. This keypunch card based system yields a series of printouts listing information on various parameters. This system was designed and developed under contracts AF30(602)-3778 and AF30(602)-4358. Printouts are prepared which allow document retrieval under the following listings:

a. Subject Category
b. Contract Number
c. Preparer
d. Publisher
e. Project Number
f. Date

In November 1970, this EDP system was revamped where all information was stored on magnetic tape thus eliminating the need for maintaining and updating a massive master file of keypunch cards. The only requirement for keypunch cards at present is to feed information into the computer to update the master tape. Once the new information has been added to the tape, the punch cards can be discarded. We currently require only one magnetic tape for the new document EDP system as compared with 12,000 punch cards in the old system. A users' guide was also prepared to instruct non-computer programming personnel in the operation of document addition, deletion, and retrieval functions with the use of coded punch card decks keyed to each computer operation which is available to this system.

2.2.1.3 Support Data

Support data consists of any collateral imagery data, ground truth information for individual missions or projects, and charts and maps which are maintained for plotting purposes and for flight planning.

During the past contract, individual mission logs for Project 6244 were received and filed in the individual mission packets. This ensured that all information on imagery collected under the 6244 Flight Test Program was readily accessible and quickly retrieved.

In addition to the mission packets, three categories of ground truth data are maintained in the Data Base. The first category is a file of information on various United States cities requested directly from those cities' chambers of commerce. The data on these cities include street plans as well as industrial listings, and any other pertinent information which is available. This ground truth file is organized alphabetically by state and city. State road maps have been included within this system.

The second category of ground truth which was constantly updated during the past contract is the Project Underbrush file. Daily data sheets describing the ground situations during various overflights were prepared on-site at Eglin AFB by North American Rockwell and forwarded to the Data Base. In addition to the situation sheets prepared for individual missions, period drawings covering six month intervals were forwarded to the Data Base. These period drawings are blueprints of the static target displays maintained at the Underbrush range. They are prepared semi-annually to update information on target array additions or deletions. Ground photos of the various arrays are periodically received and included in the Underbrush ground truth file.

The most voluminous category of support data is the map and chart file. During the course of the past two years, 12,200 charts in scales ranging from 1:12,000 to 1:5,000,000 were ordered by the Data Base. The primary purpose of these charts was to provide plotting bases for our routine imagery reduction. These maps consisted primarily of AMS 1:250,000 scale charts which is our basic plotting scale.

In addition to plotting purposes, charts were ordered to support the R.O.C. in flight planning as well as to support projects carried on by RADC engineers or their contractors. Complete 1:24,000 and 1:62,500 scale map coverage of the Northeast United States was ordered in support of the SEKTA program to provide locational information in target folders for that program's multisensor target folder preparation.

2.3 Data Base Services

Once all raw data has been refined and incorporated into the storage and retrieval systems, the type and amount of information available must be disseminated and used. Data Base personnel not only prepare raw data as a resource base for the reconnaissance community, they aid Data Base users in their retrieval for requested information.

2.3.1 Accession Lists

Each month accession lists were prepared listing titles of all documents received the previous month and all imagery collected during the same time frame. These lists were forwarded to all sections of the RADC Intelligence and Reconnaissance Division as well as to other DOD agencies involved in reconnaissance R&D. These lists were provided to inform user agencies of what was currently available to them in the Data Base and aided them in determining whether or not a visit to our facility would be productive.

2.3.2 Resource Utilization

Figure 3 illustrates the number of visitors who used the Data Base during the course of the past contract in comparison to the final twelve months of the preceding contract. The trend for increased use in succeeding years would indicate that as the amount of refined resource material was accumulated, the value of the Data Base increased accordingly. This increased usage is also a result of improved Data Base products as well as wider dissemination of the availability of resource information. Figure 3 represents a total of 2,274 Data Base visitors from February 1970 to February 1972.

Figure 4 compares the amounts of monthly imagery requests for the past 24 month period as compared to the final 12 months of the previous contract. The rates shown from February 1970 thru January 1972 take into account only those requests which required Data Base personnel to physically select imagery, perform requested operations with the imagery, send materials to the Photo Lab for reproduction, and forward finished materials to requester. The graph does not include imagery which was signed out to visitors to perform their own data selection and reduction. 631 imagery requests were completed by Data Base personnel during the past contract.

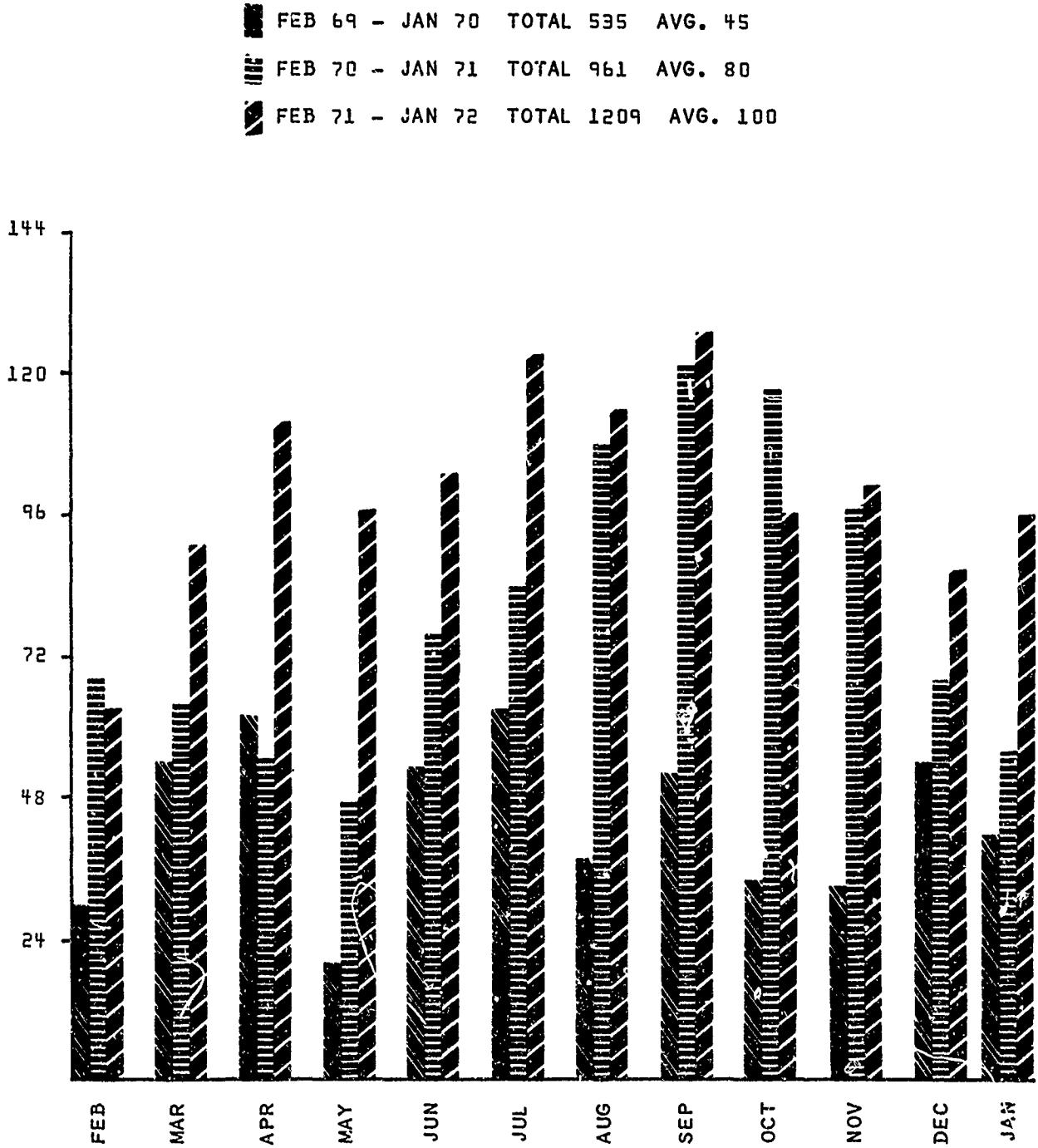


FIGURE 3. MONTHLY COMPARISON OF DATA BASE VISITORS FROM FEB 1969 THRU JAN 1972

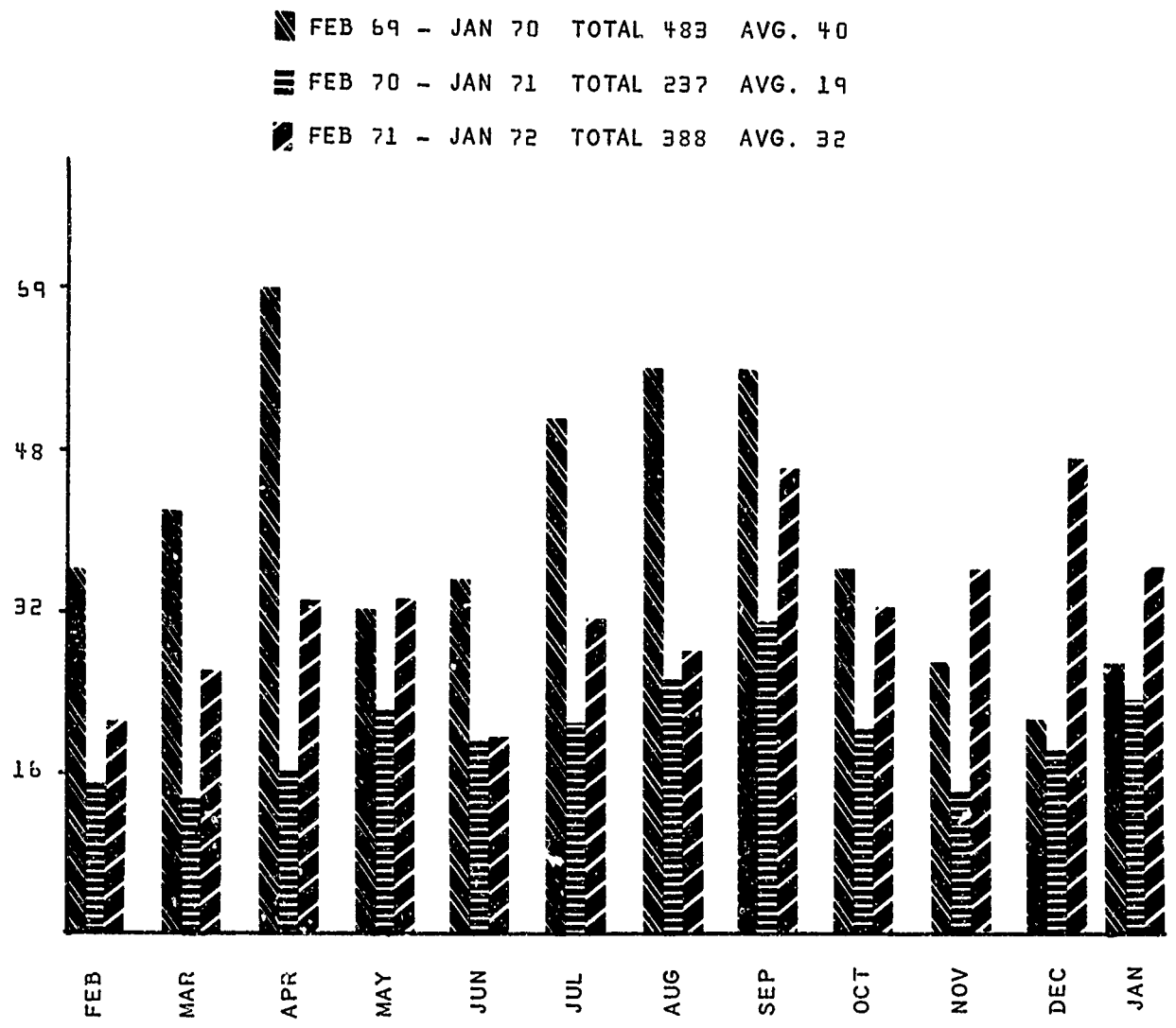


FIGURE 4. MONTHLY COMPARISON OF IMAGERY REQUESTS FROM FEB 1969 THRU JAN 1972

Figure 5 illustrates document use during the past contract as compared to the previous contract. Document use has diminished during the last twelve months of the contract because of Air Force regulations which limit the scope of our document dissemination, and a customer decision that documents can no longer be forwarded in answer to a request by mail. All documents must be researched within the purview of the Data Base. The number of documents used represented by this graph totals 2,749.

2.4 Special Projects

The value of the Data Base does not stand alone on the amount and quality of its refined resource data. The highly skilled image interpreters, engineering clerk, and photo technicians who perform on the contract proved to be an invaluable resource which has been called upon by the customer to perform special tasks. The following paragraphs will outline special projects levied by the customer as they occurred in chronological sequence.

2.4.1 Lost Aircraft Search

In April 1971, two rolls of color aerial photography were received at IRR from government authorities in Pennsylvania with a request for interpreter support to attempt to locate a downed light aircraft somewhere on the imagery. Two interpreters from the Data Base were assigned the task. They spent several days plotting and scrutinizing the film intensively for a clue to the aircraft's whereabouts. After double checking each other's interpretations, it was determined and reported that the aircraft was not imaged on the photography they had studied. Subsequent notification from Pennsylvania authorities stated that the aircraft was found in an area not covered by the interpreted photography.

2.4.2 Project Ulrich

During the month of April 1971, IRRE requested that the Data Base perform as a coordination center for imagery received under Project Ulrich. One individual from Autometric was assigned the responsibility of logging and plotting imagery as it was received during the project. This individual also performed image truth of tactical displays imaged at Ft. Hood, Texas, and prepared vu-graphs and other reproducibles as required by the project engineer of IRRE.

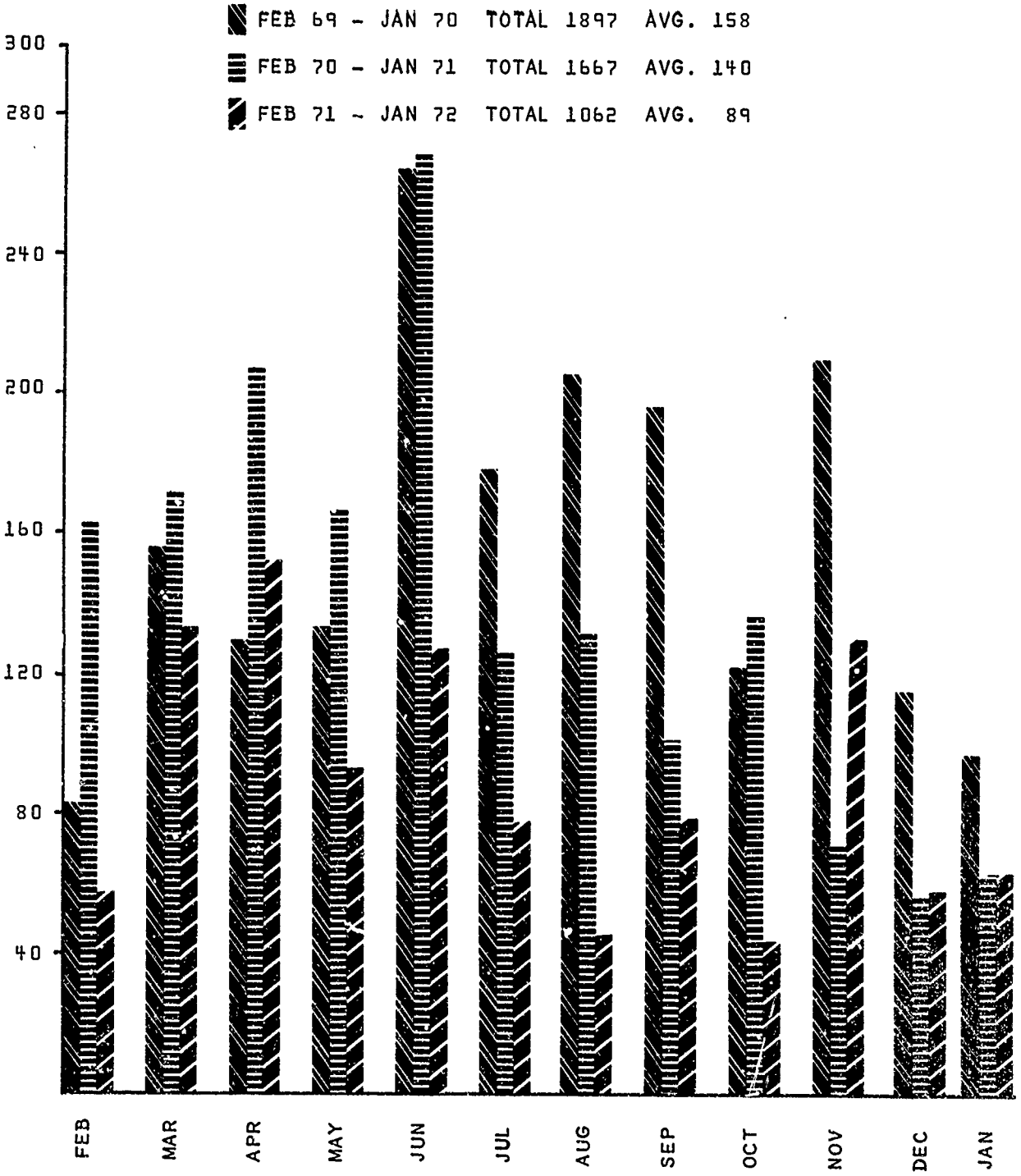


FIGURE 5. MONTHLY COMPARISON OF DOCUMENT USE FROM FEB 1969 THRU JAN 1972

2.4.3 Rigid Rhomboid Evaluation

At the request of IRD, with prior approval of Data Base contract monitor, three interpreters were requested to perform an evaluation of stereo viewing equipment. One interpreter performed initial target selection to be used in testing the two viewing systems. The remaining two interpreters performed as test subjects in an exercise to determine the relative merits of the Quick Stereo System versus the Rigid Rhomboid Stereo System. This project was completed with the submission to IRD of critiques of the tested equipment.

2.4.4 Cornell Color Study

Between June and August 1971, two man months were expended on interpretation support to IRRC by two Data Base interpreters. They were required to interpret sets of stereo pairs consisting of Ektachrome and Infrared Ektachrome photography of 70mm format over a variety of strategic target complexes. The interpreters established the EEI for the target types according to NATO guidelines and commenced to do in-depth interpretation of the complexes. This interpretation was the initial interpretation in a program which eventually involved enhancement of photography and a second interpretation of the imagery to determine the effectiveness of enhancement.

2.4.5 Vandenberg Study

In June 1971, IRR was requested by Vandenberg AFB to lend support in determining procedures for tracking exhaust clouds produced by the test firing of missiles at the Vandenberg range. RADC Flight Test aircraft were sent to Vandenberg to track and photograph the clouds from a missile firing in June. The resultant IR Ektachrome KC-1B photography was plotted by Data Base personnel and clouds detected thereon were plotted on charts. The purpose of tracking the cloud was to determine the direction that the cloud travelled over the Vandenberg area and to obtain an overall view of the eventual dispersion of the cloud. The first mission proved quite unsatisfactory in its objectives because the photography was collected at too low an altitude. This had the net result of providing pictures of a very small percent of the cloud so that the location of the main mass could not accurately be determined.

A second missile firing was monitored by RADC aircraft in February 1972. This collection effort was quite successful as the aircraft altitudes were high enough to image the major cloud mass on one frame thus allowing accurate tracking of the cloud over the Vandenberg area. Detailed plots of

the imagery and the movement of the cloud were prepared, providing an over-view of the direction the cloud followed as well as its dispersion characteristics. All findings were put in report form with prints of the original imagery and presented to Vandenberg project engineers.

More exercises of this type are planned for the future and Data Base personnel are prepared to accomplish such tasks as they arise.

2.4.6 Search and Rescue Operations

In July 1971, a requirement was levied on RADC/IRR which has resulted in Data Base personnel performing studies on the capability of infrared sensors used for personnel detection.

During July, RADC was charged with providing support to New York State Police and Conservation Department personnel in the search for eight year old Douglas Legg, who had been reported lost in the Adirondacks. During the week of the 19th, Flight Test aircraft collected photographic and infrared imagery over the search area. Data Base personnel plotted, mosaicked and interpreted resultant imagery to attempt to gain clues as to the whereabouts of the boy. Mosaics were provided to search teams as supplements to outdated maps of the area.

Several teams of Data Base personnel travelled to the search area to perform on-site interpretation of the imagery, to coordinate RADC efforts to meet the requests of the organized search parties and to ground check areas of interest detected on the imagery.

Although the efforts put forth on the Douglas Legg search did not find the boy, a whole new area of reconnaissance applications was opened for development. Several Data Base personnel took the initiative to pursue the capabilities of infrared sensors to detect lost persons. Test plans were prepared and flight plans were filed with the ROC. A field test site was selected near Lee Center, New York. On three separate occasions (twice during nighttime and once in daylight) Data Base personnel, along with explorers from the RRA sponsored Explorer Post, took positions at the test site under various degrees of vegetation cover while Flight Test aircraft flew imaging passes over the area with infrared sensors. The resultant imagery collected was analyzed and interpreted by all interpreters involved.

The personnel detection study is still an active program. More flights are planned over the test site and tabulation of data and findings will be presented in a formal report.

In addition to conducting tests on the ability of infrared to detect personnel, the individuals involved have also made attempts to set up liaison with state and local agencies which are involved in the search for lost persons. An attempt has been made to educate these agencies as to the capabilities available to them at RADC, and to establish procedures which will allow quick and valuable response to any call for support.

Subsequent to the Douglas Legg search and the establishment of the Data Base Search and Rescue program, a call was received to support the Oneida County Sheriff's Department in search for a lost man near Taberg, New York. Infrared and photographic sensors were flown over the area by Flight Test Division. Resultant imagery provided no clue to the man's whereabouts. Photo mosaics, prepared by Data Base personnel, were provided to searchers as map supplements. The man was discovered dead a short time later.

2.5 Data Base Enhancement

Data Base enhancement includes new or improved procedures for accomplishing Data Base data reduction and services as well as physical improvements which provide more efficient and economic use of the facility itself. The major enhancement programs initiated on contract F30602-70-C-0165 are outlined in the following sub-paragraphs.

2.5.1 Peduction of Film Library

In September 1970, it was determined by Data Base personnel, with concurrence of customer, that much of our imagery library consisted of duplicate, outdated, unusable or extraneous film. In addition, our storage shelves were overflowing with no outlet for expansion. Starting in September, imagery was reviewed and determinations were made as to which missions should be retained or discarded. During the course of the following two months, thirty percent (30%) of the roll film was deleted from our system. Representative examples of every sensor system from every project previously on file were retained. Best quality original imagery was of primary importance. This film purge not only gained space for storage of newly acquired imagery, but provided for an extensive re-cataloguing and inventorying of the remainder of the

film library. Film was refiled on shelves alphabetically by project as well as by size of film spools. The latter criterion for storage provided for more economic use of shelf spacing. As a result of the film inventory completed in November 1970, in conjunction with a second inventory completed in November 1971, the following general summary of film holdings is offered:

OVERALL IMAGERY SUMMARY

			FOOTAGE
PHOTOGRAPHY			
FRAMING CAMERAS	-	26	192,530'
PAN CAMERAS	-	17	58,370'
SPECIAL PURPOSE CAMERAS	-	3	7,200'
TOTALS		46 CAMERAS	258,100'
INFRARED IMAGERY			
31 SYSTEMS			87,650'
SIDE-LOOKING AIRBORNE RADAR			
17 SYSTEMS			12,830'
LASER			
7 SYSTEMS			12,270'
ALL SYSTEMS COMBINED			
101 SYSTEMS			370,850'

An in-depth thirty-one page summary of film footage for every project and the sensors flown is available in the Data Base.

2.5.2 Data Base Expansion

During the spring of 1971, the entire area of Vault 918 was made available for the sole function of Data Base activities. This relieved the cramped condition of performing storage and reduction operations in a 30' x 40' area. Having

full use of the entire 60' x 40' vault, individual interpreter stations and visitor work areas were re-located to the front of the vault. Document and film shelves were realigned in the rear portion of the vault. This proved to be an ideal situation as the secluded nature of the storage area reduced traffic, allowing maintenance of cleaner conditions and a tighter control of the materials being removed from the Data Base.

2.5.3 Imagery Plotting Augmentation

During March 1971, a proposal was submitted to the contract monitor concerning the large amount of imagery which had accumulated over past years and had never been plotted. The only locational information available for these missions was project names or geographic place names. No plots were available to delineate the exact extent of ground coverage. It was proposed that the Data Base be augmented from three to six interpreters. The prime duty of the three additional interpreters was to plot the unplotted imagery. The proposal was accepted by the contract monitor and additional funding was negotiated and added to the contract. As a result of the augmentation, two-hundred-eighty (280) missions were plotted thus enlarging the value of the Data Base film library by adding another retrieval parameter.

2.5.4 Imagery Targeting Program

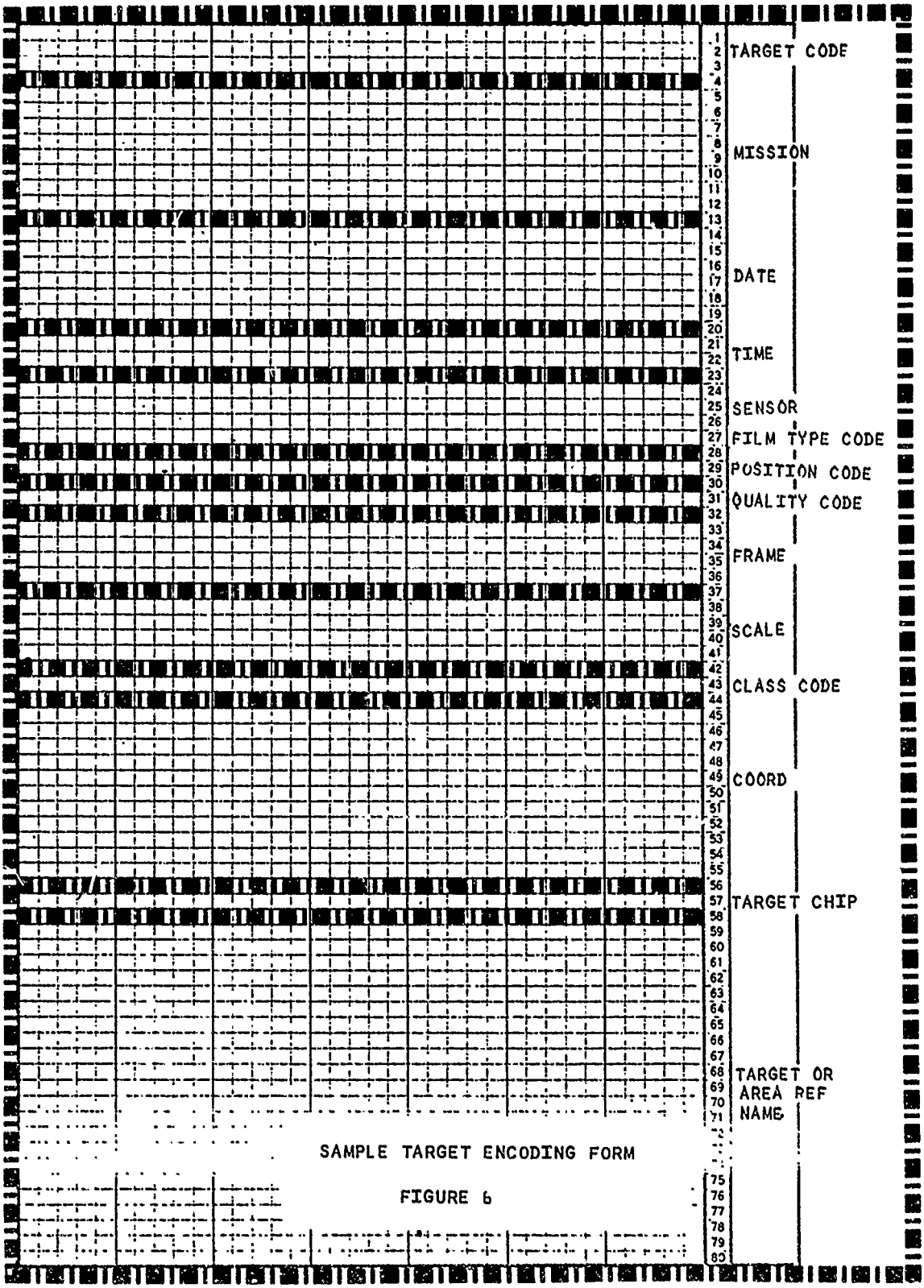
As an indirect result of the plotting performed under the augmentation program, curiosities were aroused to investigate some better means of imagery retrieval other than, or as a supplement to, plots and master cover traces. Plots were good for determination of what gross coverage was available of certain areas. The old 665A target program, though short lived, was suitable for retrieving strategic and tactical targets. After some preliminary investigation it was decided by the interpreters that the best method of improving imagery retrieval was to broaden the scope of the old 665A target list to encompass civilian and earth resource type targets. The targeting idea was presented to the contract monitor who concurred that this type of program should be undertaken by the Data Base with emphasis placed on implementing a computerized target retrieval system rather than a mechanical sort system. Once approval for the project was received, a master target list was prepared which had a broader general scope than the 665A program but was not broken down as much ir specific target detail. The following list presents only basic targeting categories. These general categories are reduced to further sub-categories on the master target list being used in the Data Base.

CODE	TARGET CATEGORIES
100	Army/Navy Installations, Tactical Targets and Military/Civilian Ships and Vessels
200	Aerospace Systems, Air and Missile Installations, Aircraft and Joint Commands
300	Cities, Towns, Places, Government Centers, Medical and Commerce Centers, and R&D Facilities
400	War and Disaster Effects, Search Missions, Terrain Features, Regional and Urban Planning Studies, and Pollution
500	Public Utilities and Services
600	Transportation, Communication (Except Airfields)
700	Manufacturing and Production
800	Basic Processing
900	Earth Resources

The next step which was completed for the target retrieval system was a determination of the computer options available at RADC as well as writing of a program compatible with the computer selected. Upon recommendation of the contract monitor, it was decided that a time sharing system on the GE-635 computer was the optimum system to use.

Following computer selection, a program was written which allowed data input and retrieval by a wide range of target parameters. Figure 6 is an example of a target encoding form showing the various retrieval fields available for this system.

As of 1 January 1972, the targeting program has been in operation and retrieval operations have been performed on the time share station located in the R.O.C. Retrievals have been made on all fields or combinations of fields depicted on the sample encoding form. A time share station is programmed to be installed within the Data Base in the very near future. This will allow us to perform immediate target searches when requests are received.



SAMPLE TARGET ENCODING FORM

FIGURE 6

2.5.5 Coordinate Retrieval System

In addition to the targeting program, Data Base personnel were directed to work with IRR engineers in developing a computerized plot retrieval system. This would allow retrieval of imagery coverage based on the area covered by individual sensor missions. Inputs for the program have been provided to IRR engineers in terms of corner coordinates of each mission plot flown since 1 January 1972. Once a program has been written to implement this retrieval system, it is felt that this system in conjunction with the target retrieval system, will provide optimum retrieval capabilities for the imagery Data Base.

2.5.6 Mission Summaries

Another on-going program which was adopted in January 1972 upon the recommendation of the contract monitor, is the production of individual mission summaries for all missions flown under the 6244 flight test program. This report is prepared by interpreters during the plotting operation. The report includes all mission parameters, sensor information, processing information and an evaluation of the mission with regard to quality and the degree to which mission objectives were met. Short descriptions of the major targets covered are also included in the summary together with 8 x 10 reductions of the mission plot. This summary is produced in triplicate with original copy retained by the Data Base, and duplicates forwarded to the R.O.C. and agency for whom the mission was flown.

2.5.7 Photographic Research

Work carried out by photo laboratory personnel under this contract was directed primarily at processing incoming multisensor imagery collected under the 6244 flight test program. Optimum quality was maintained through the application of sensitometric, quality control, precision processing and color processing and printing techniques. These techniques were applied not only to processing original imagery but in reproduction work such as duping, contact printing, copying and enlarging imagery to satisfy the many user requests received at the Data Base.

In order to improve the photographic expertise of photo laboratory personnel, they were urged to attend schools pertaining to operation of new equipment and refresher courses to maintain high standards in photo laboratory processing techniques.

3. SUMMARY

All of the tasks defined in the contract statement of work have been accomplished with the results being described in Section 2 of this report. To achieve these requirements, contract hours were applied 100% to RADC Imagery Data Base Maintenance. Emphasis was placed on those programs which were assigned the highest priorities by the contract monitor. Data Base management and personnel maintained the flexibility to respond to all requirements in accordance with the priorities assigned.