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FINAL REPORT

ON

NASA CR-

151549

NAS 9-15145, SB 6238(a)77C-219

INDEXING, SCREENING, CODING AND CATALOGING

OF

EARTH RESOURCES AIRCRAFT MISSION DATA



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CODING AND CATALOGING OF EARTH RESOURCES  
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CASPAN

Engineers and Constructors

Houston, Texas



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OF  
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Caspan Corporation  
Engineers & Constructors  
Houston, Texas

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## Final Report on NAS 9-15145

### 1.0 BACKGROUND

1.1 Effective September 1, 1976, Caspan Corporation was awarded contract NAS 9-15145 for Indexing, Screening, Coding and Cataloging of Earth Resources Aircraft Mission Data, following the expiration of contract NAS 9-14702 for similar purposes.

1.2 Tasks begun under NAS 9-14702 and to be continued under contract NAS 9-15145 included the following:

- I) Preparation of LACIE Documents for Data Base Entry;
- II) Preparation of Earth Observations Aircraft Flight Summary Reports for Publication;
- III) Updating of the Aircraft Mission Index Coverage Map and Ames Aircraft Flight Map;
- IV) Preparation of Earth Observations Helicopter Flight Reports for Publication; and
- V) Indexing of LANDSAT Imagery.

1.3 Tasks to begin under NAS 9-15145 in addition to the above included the following:

- VI) Preparation of Key Punch Transmittal Sheets for Plotting and Indexing of Computer Computable Tape Data for Full Frame Imagery;
- VII) Preparation of Cross Indexing Lists of Foot Print Numbers Versus Segment Numbers;
- VIII) Formulation of Phase III BioWindows I, II, III, and IV Listings;
- IX) Preparation of Sample Summary Catalogs of Flight Summary Reports for Aircraft Missions; and
- X) Preparation of an Alaska State Index Coverage Map.

## Final Report on NAS 9-15145

### 1.4 Task I

Preparation of LACIE documents for Data Base Entry was to be performed using procedures outlined by NASA, JSC. Prepared documents and key punch transmittal sheets were to be delivered to NASA, JSC, on a weekly basis.

### 1.5 Task II

Preparation of Earth Observations Aircraft Flight Summary Reports for publication was to be continued as the data included in them was released to Caspan Corporation by NASA, JSC. Procedures utilized in preparation of the reports were to be formulated by Caspan using basic methods derived from cataloging and indexing of previous Earth Observations Aircraft missions.

### 1.6 Task III

Updating of the Aircraft Mission Index Coverage Map and Ames Aircraft Flight Map was to continue under NAS 9-15145 with little or no variation in procedure from NAS 9-14702. Activity under this task was to proceed as the Flight Summary Reports were completed and the Ames Aircraft Flight data was supplied to Caspan by NASA, JSC.

### 1.7 Task IV

Preparation of additional Earth Observations Helicopter Flight Reports for publication was scheduled to continue as data necessary for publication was furnished Caspan by NASA, JSC. The format for the reports was to be developed by Caspan utilizing data furnished by NASA, JSC.

## Final Report on NAS 9-15145

### 1.8 Task V

Indexing of LANDSAT imagery was also to continue under NAS 9-15145 with images and other necessary materials furnished to Caspan by NASA, JSC. Existing procedures developed by NASA for indexing the materials were to be used in preparation by Caspan and the finished product delivered to NASA, JSC on a weekly basis.

### 1.9 Task VI

Caspan was scheduled to develop the format for the preparation of key punch transmittal sheets for plotting and indexing of computer compatible tape data for full frame imagery, utilizing materials and data furnished by NASA, JSC.

### 1.10 Task VII

Preparation of Cross Indexing Lists of Foot Print Numbers versus Segment Numbers and Segment Numbers versus Foot Print Numbers was to be developed and performed by Caspan Corporation during contract NAS 9-15145 and delivered to NASA, JSC upon completion.

### 1.11 Task VIII

Formulation of the Phase III BioWindows I, II, III, and IV Listings was also to be performed and updated by Caspan using data provided by NASA, JSC. In addition, a Full Frame Status Report and Status and Tracking of Full Frame Data Maps were also scheduled for completion by Caspan Corporation.



1.12 Task IX

Caspan Corporation was also scheduled to prepare three (3) Sample Summary Catalogs of Flight Summary Reports for Aircraft Missions, which was to include summaries of all Earth Observations Aircraft Flight Summaries. Mission data contained in Caspan's files was to be used in formulation of the samples.

1.13 Task X

Previous mission data was to be used in preparation of the Alaska State Index Coverage Map with the format to be developed by Caspan Corporation

## 2.0 ACCOMPLISHMENTS

### 2.1 Task I LACIE Documents

This activity consisted of deriving key words from literature abstracts provided, as well as recording author, co-author, title, contract number and subject of materials provided by NASA, JSC.

Caspan prepared a total of four thousand seven hundred and fifty (4,750) LACIE documents for Data Base Entry between September 1, 1976, and August 31, 1977. Each document averaged one (1) manhour in preparation and Caspan Corporation staff produced an average of three hundred ninety-six (396) documents.

### 2.2 Task II Earth Observations Aircraft FSR

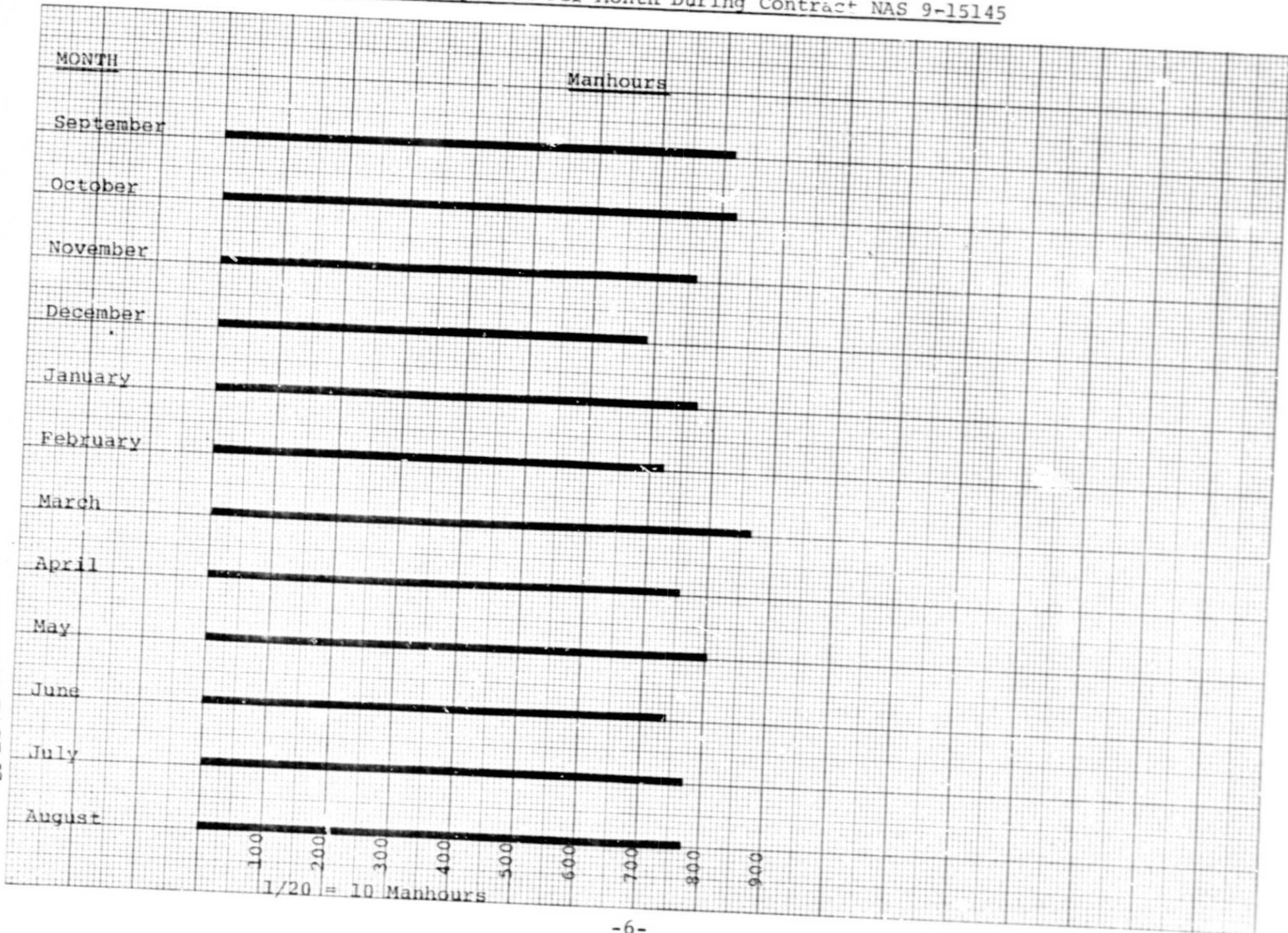
This task consisted of preparation of the following sections:

- 1) General Statement;
- 2) Index Map;
- 3) Sensor Data Listing;
- 4) Flight Line Maps; and
- 5) Listing of Film Rolls Not Cataloged and Indexed.

Caspan staff prepared for publication eleven (11) Earth Observations Aircraft Flight Summary Reports between November 1, 1976, and August 31, 1977. These missions averaged 87 man-hours each in preparation with Mission 356 requiring the least manhours at 19.3.

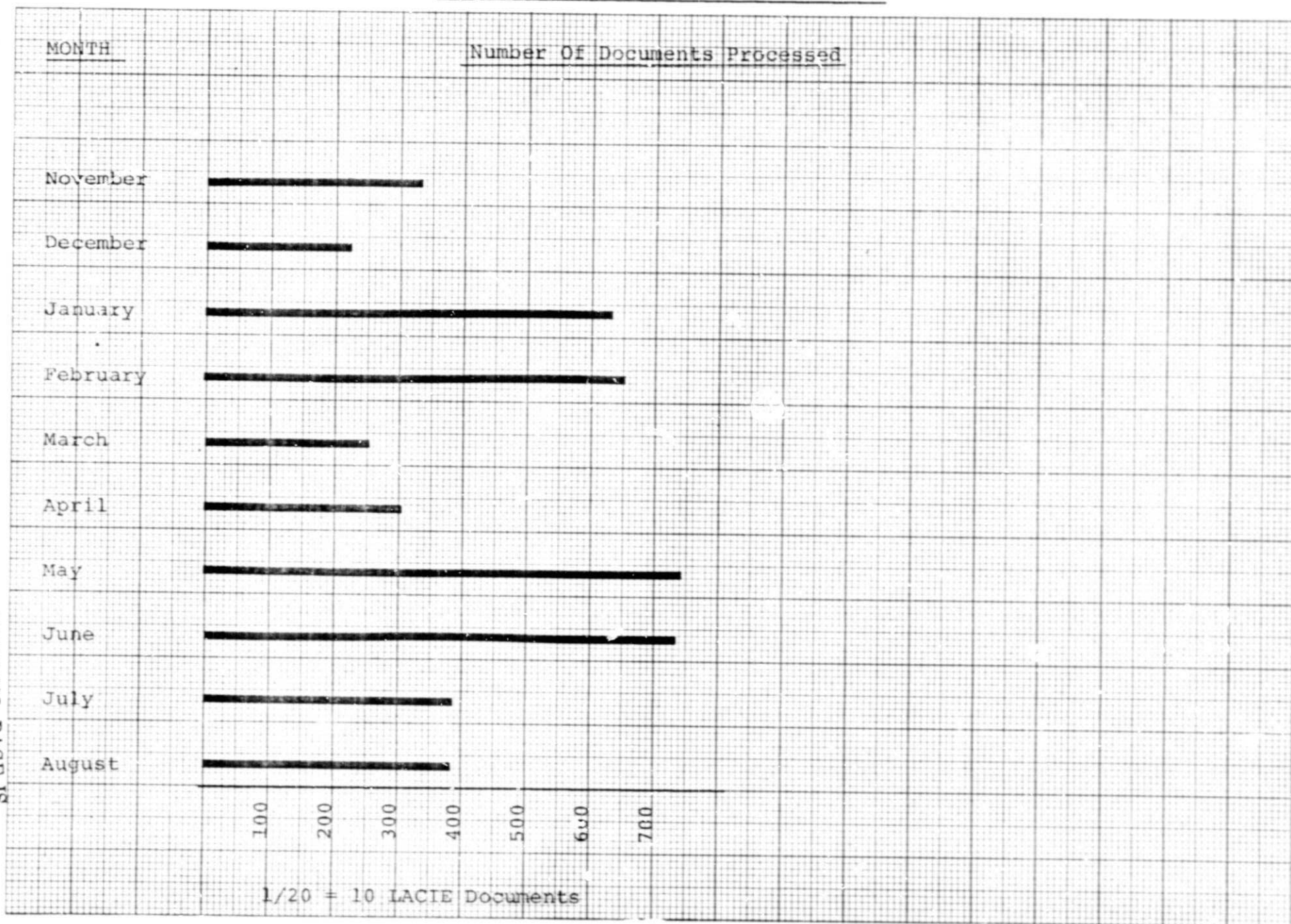
Manhours expended per month of contract NAS 9-15145 are summarized in Table 1. Manhours expended per mission are summarized in Table 2.

Table I  
Manhours Expended Per Month During Contract NAS 9-15145



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Table II  
LACIE Documents Processed Per Month



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2.3 Task III Cataloging, Indexing of Ames Aircraft Mission Coverage flights and Aircraft Mission Maps

Preparation of the Status of Cataloging and Indexing of Aircraft Mission Map covered missions 331 through 348 and consumed a total of one hundred sixty-three (163) manhours. Statistical data on this task are summarized in Table 3.

Prepared in a similar fashion to the above was the Status of Cataloging and Indexing of Ames Aircraft Mission Coverage Flights. Completed were maps covering flights 75-208 through 76-198. Scheduled for completion during the first portion of F.Y. 78 are maps covering flights 77-002 through current flights.

2.4 Task IV Earth Observations Helicopter Flight Reports

This task consisted of preparation of Earth Observations Helicopter Flight Reports which included the following sections:

- 1) Project Description;
- 2) General Statement;
- 3) Instrument Logs;
- 4) Flight Maps;
- 5) Process Data;
- 6) Sight Location Map;
- 7) Flight Line Map; and
- 8) Map Legend.

Between September 1, 1976, and August 31, 1977, Caspan staff prepared a total of eleven (11) helicopter flight reports, consuming a total of one hundred seventeen (117) manhours in preparation.

Statistical data on Earth Observation Helicopter Flights completed through the ending date of contract NAS 9-15145 are summarized in Table 4.

Table III

MISSION STATISTICAL DATA

	Mission Number	Rec'd by CASPAN	Manhours Per Mission	Date Forwarded To NASA	Current Status
1	340	September 2, 1976	20	September 8, 1976	Published
2	341	September 22, 1976	198	October 5, 1976	Published
3	345	October 22, 1976	139	November 9, 1976	Published
4	343	December 6, 1976	138	December 20, 1976	Published
5	344	December 20, 1976	49	January 5, 1976	Published
6	347	December 21, 1976	33	January 5, 1976	Published
7	348	January 4, 1977	177.7	January 18, 1977	Published
8	349	March 23, 1977	27	April 4, 1977	Published
9	350	April 4, 1977	41	April 14, 1977	Published
10	354	May 9, 1977	80	May 18, 1977	Published
11	356	August 22, 1977	19.3	September 14, 1977	Published

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Table IV

EARTH OBSERVATION HELICOPTER FLIGHT STATISTICAL DATA

	Mission Number	Rec'd by CASPAR	Manhours Per Mission	Date Forwarded To NASA
1	23	September 7, 1976	71	September 16, 1976
2	24	September 14, 1976	30	September 21, 1976
3	25	September 14, 1976	25	September 21, 1976
4	26	September 28, 1976	10	September 30, 1976
5	27	September 16, 1976	20	September 24, 1976
6	28	July 11, 1977	5	July 15, 1977
7	29A	July 11, 1977	4	July 15, 1977
8	30	July 29, 1977	4	August 1, 1977
9	32	July 29, 1977	5	August 1, 1977

## 2.5 Task V LANDSAT Indexing

This task consisted of preparation and delivery of indexed LANDSAT imagery to NASA, JSC, on a weekly basis. This included the following sub-tasks:

- 1) Preparation of an index card for each image to be indexed;
- 2) Preparation of a master index card for each ground track number;
- 3) Labeling each image with pertinent information from its particular index card; and
- 4) Cutting the LANDSAT images to fit standard files.

Caspan Corporation staff indexed two thousand five hundred ninety-five (2,595) LANDSAT images between September 1, 1976, and April 4, 1977. A total of eight hundred thirty-nine and nine-tenths (839.9) manhours were expended in their preparation.

## 2.6 Task VI Key Punch Transmittal Sheet Plotting and Indexing

Preparation of Key Punch Transmittal Sheets for plotting and indexing of computer compatible tape data for Full Frame Imagery continued during contract NAS 9-15145 and consisted of the following sections:

- 1) Scene Identification;
- 2) Foot Prints of Imagery;
- 3) Coordinates;
- 4) Accession Date;
- 5) Tape Identification;
- 6) Data Received;
- 7) GSFC Number; and
- 8) Project Identification.

This format was designed by Caspan Corporation using data provided by NASA, JSC.

Caspan completed a total of five hundred eighty (580) Key Punch Transmittal Sheets between August 5, 1976, and September 13, 1976.

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2.7 Task VII Cross Indexing of Segment Numbers versus Foot Prints and Foot Prints versus Segment Numbers

This task consisted of preparation of Cross Indexing Lists of Segment Numbers versus Foot Print Numbers and Foot Print Numbers versus Segment Numbers.

Lists covering the United States, USSR, India, China, Argentina, Australia and Brazil were completed between February 24, 1976, and July 29, 1977. These consumed a total of nine hundred fifty-seven and eight tenths (957.8) manhours by Caspan personnel.

Due to revision of all LACIE site maps during Spring, 1977, Cross Index Listings of all the above countries were revised.

2.8 Task VIII Phase III BioWindows I, II, III, and IV Formulation

This task included formulation of Phase III BioWindows I, II, III, and IV Listings by country, foot print, and acquisition dates.

As the data were received by Caspan Corporation from NASA, JSC, preparation of the Phase III BioWindows I, II, III, and IV Listings progressed, beginning September 24, 1976. Africa, Oceania, Eurasia, North America and South America were processed during contract NAS 9-15145 by Caspan.

After completion of each formulation, a Full Frame Status Report was prepared (BioWindows I, II, III and IV). These reports contained the percentage of coverage as well as the following information for each country/area held by TF-12:

- 1) Country/area;
- 2) Total Allocation;
- 3) Initial Receipts;
- 4) Per Cent Complete; and
- 5) Multiple Coverage of the Same Foot Print.

In conjunction with the formulation of Phase III BioWindow Listings, the Status and Tracking of Full Frame Data was also performed. This activity consisted of identifying images held by TF-12 on an index map of LANDSAT coverage.

2.9 Task IX Summary Catalogs of Flight Summary Reports

Also performed during contract NAS 9-15145 was the preparation of three (3) sample Summary Catalogs of Flight Summary Reports for Missions 279 through 354. These catalogs were begun August 1, 1977, and completed August 12, 1977, and contained the following information:

Sample "A"

- 1) Introduction;
- 2) General Coverage Map (Missions 279 through 354);
- 3) Flight Listings Cross Referenced by State;
- 4) General Statement of Each Mission; and
- 5) Flight Line Maps Outlining Areas Covered in Each Mission.

Sample "B"

- 1) Introduction;
- 2) General Coverage Map (Mission 279 through 354);
- 3) Flight Listings Cross Referenced by State;
- 4) General Statement of Each Mission; and
- 5) General Coverage Maps of Each Mission.

Sample "C"

- 1) Introduction;
- 2) General Coverage Map (Missions 279 through 354);
- 3) Flight Listings Cross Referenced by State;
- 4) General Statement of Each Mission; and
- 5) Flight Line Maps of Each Mission.

2.10 Task X Alaska State Index Coverage Map

This task consisted of preparation of an Alaska State Index Coverage Map containing a General Statement of each mission flown and outlining all photographic coverage of Alaska from Mission 47 to Mission 364.

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2.10 Task X (continued)

The Alaska Index Map was completed and delivered to NASA, JSC, for review August 17, 1977, and was returned to Caspan for revisions August 19, 1977. Revisions were completed and the map redelivered to NASA, JSC, September 2, 1977.

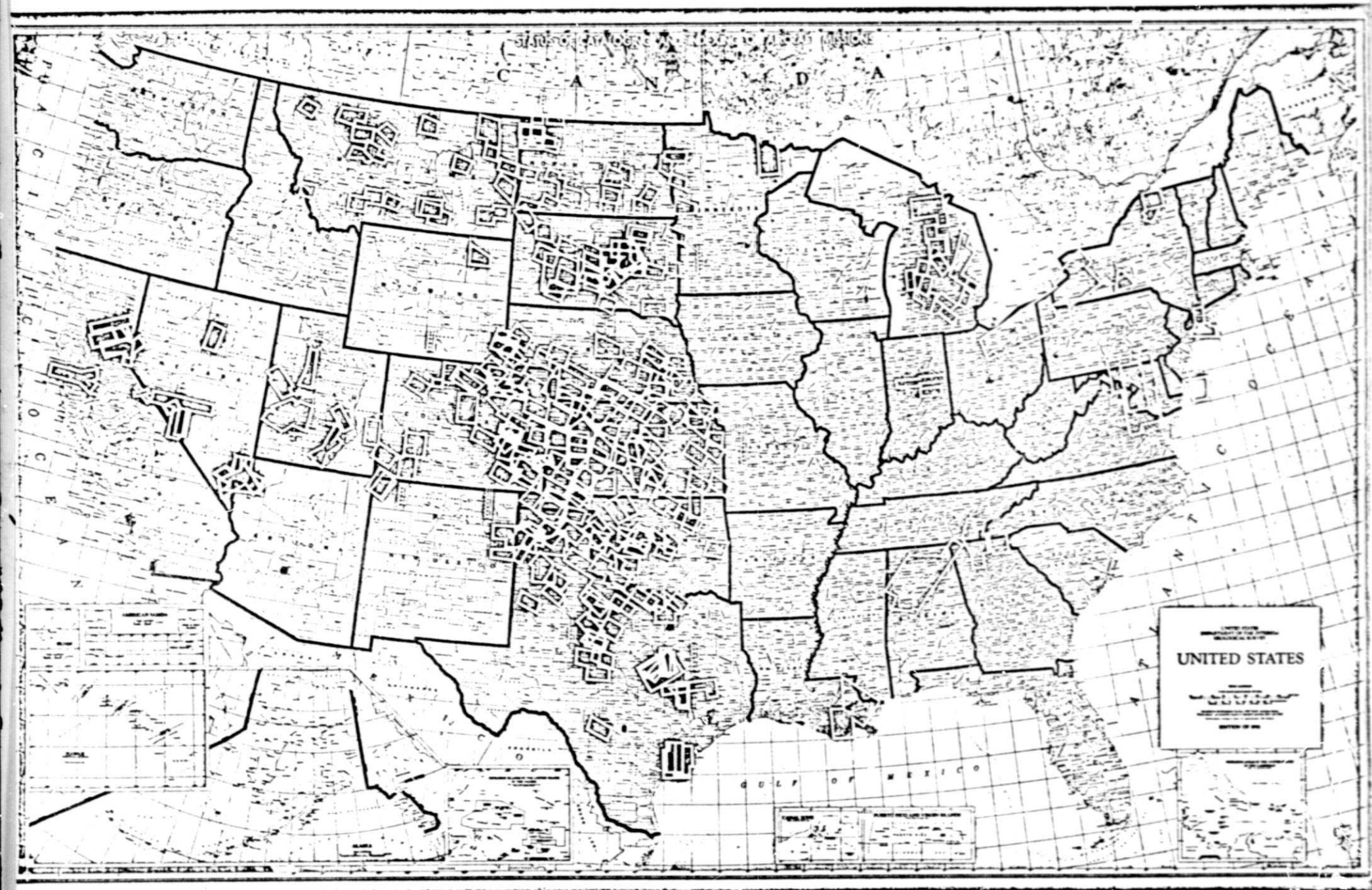
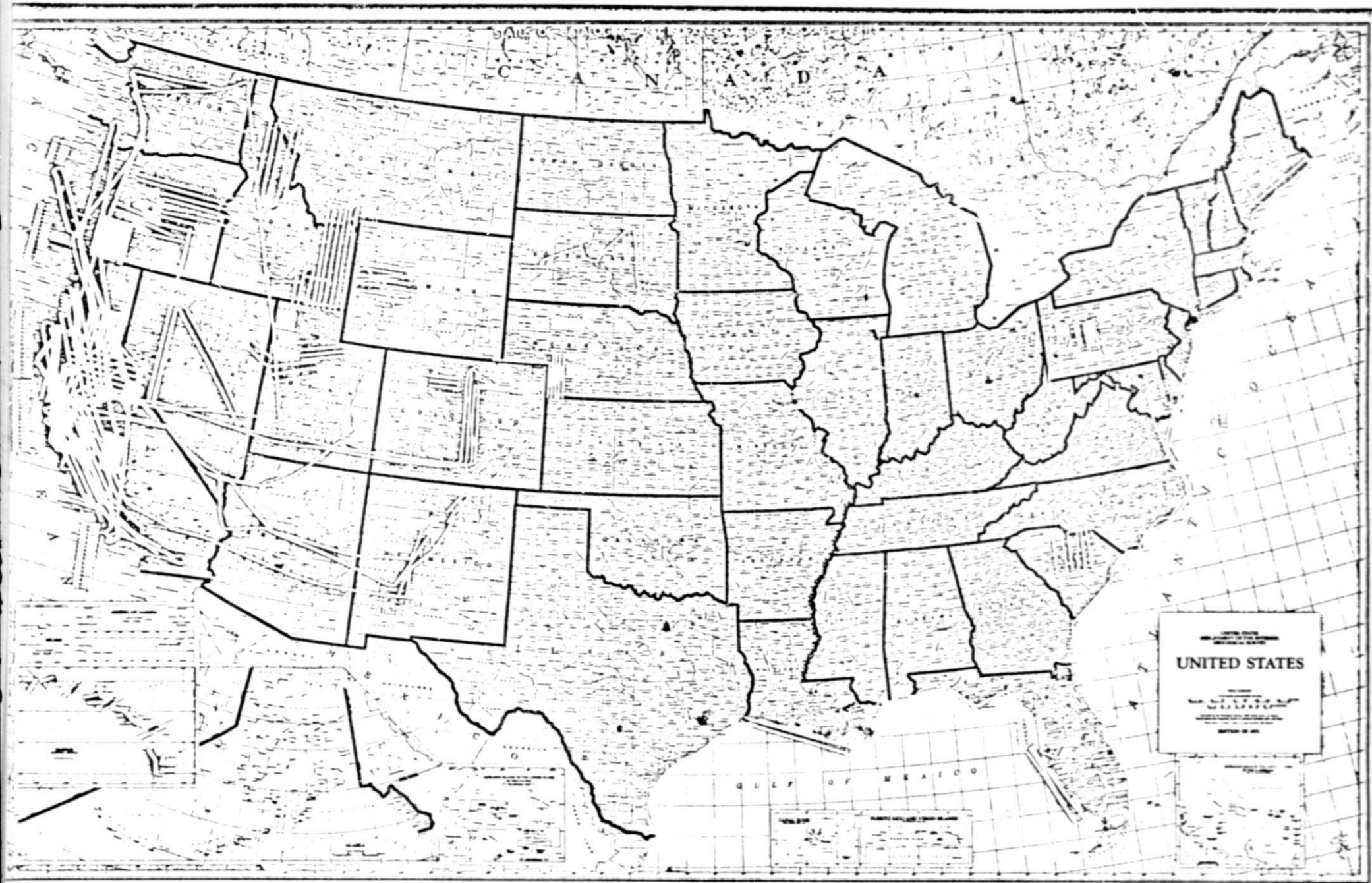


Figure I: Status of Cataloging and Indexing of Aircraft Missions

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Figure II: Status of Cataloging and Indexing of Ames Aircraft Flights



3.0 CONCLUSIONS/RECOMMENDATIONS

3.1 Conclusions

Overall, Caspan Corporation believes this was a successful contract, run in an efficient manner and resulting in high quality work meeting NASA requirements.

Everyone involved in this contract exhibited a high degree of professionalism and determination to do the best job possible.

3.2 Recommendations

Caspan Corporation believes everyone involved with this contract deserves a commendation for a job well done.