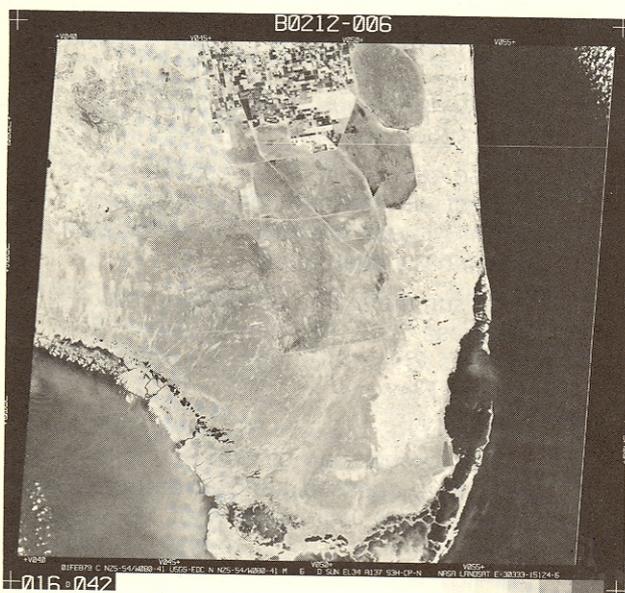


## LANDSAT PHOTOGRAPHIC PRODUCTS TO HAVE BLACK BORDERS

Landsat photographic products produced by the Earth Resources Observation Systems (EROS) digital image processing system (EDIPS) will soon feature a black border with white lettering instead of the familiar white background with black lettering that has been used since 1972. Black borders are more economical to produce, and the change will have the additional advantage of making Landsat images more consistent in appearance with aircraft images (the borders on both color infrared and black-and-white aerial photographs are black).

This change will not affect image content or any other aspect of the Landsat products produced by the EROS Data Center (EDC). The new borders will start appearing sometime in June.

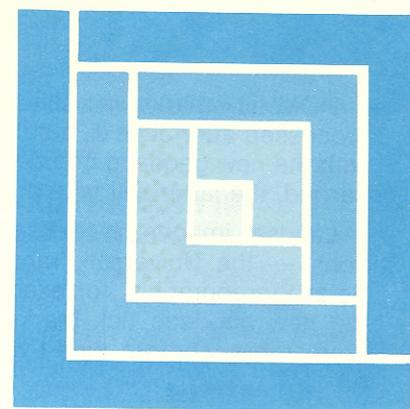


Example of New Black-Border Landsat Image

## LANDSAT PRODUCTS TO INCLUDE LATITUDE/LONGITUDE TICK MARKS

Starting June 1, 1981, all Landsat products produced by EDIPS will include geodetic tick marks along the image border. The new tick marks will indicate, to the nearest 0.25 degree, the latitude and longitude of the scene center.

Before this change, the borders on Landsat imagery have included *U, V* coordinates which designate locations relative to the Hotine Oblique Mercator (HOM) map projection system. Although *U, V* coordinates can be correlated to latitude and longitude, the user community's preference has been to work directly with latitude and longitude coordinates whenever possible.



# Landsat Data Users NOTES

ISSUE NO. 18  
MAY 1981



# NASA

U.S. GEOLOGICAL SURVEY  
EROS DATA CENTER  
Sioux Falls, S. Dak. 57198

HOM tick marks will still be included on imagery processed after June 1, but if this presents a conflict with the new geodetic coordinates that are also to be carried, the latter will take precedence.

Landsat imagery processed to other map projections — the Universal Transverse Mercator or the Polar Stereographic, for example — will not include the new geodetic tick marks. Products made from data archived before June 1 will also remain unchanged.

## EDC PRODUCT LINES RESCHEDULED

As a cost-saving measure, certain non-Landsat product lines offered by EDC have been placed on a reduced production schedule. The product types that have been affected are those that historically have been in very low demand by users and include Skylab, Apollo, and Gemini image products, as well as some selected types of aerial photography products.

A plan to eliminate these products altogether (with the exception of contact transparencies) is currently under consideration and may be implemented later this summer. Complete details will follow in the next issue of the Landsat Data Users NOTES.

## EDC DIGITAL ARCHIVES OF LANDSAT DATA

EDC began archiving digital Landsat data in the first quarter of calendar year 1975. Since that time this archive has grown considerably in size and variety. At present, EDC digital holdings can be conveniently grouped into three categories.

1. Multispectral scanner (MSS) data in band-interleaved-by-pixel-pair format (BIP-2), otherwise known as X-format computer compatible tapes (CCT's) as described by National Aeronautics and Space Administration (NASA) document no. X-563-75-223.
2. Fully processed ("P") high-density tapes (HDT's) of both MSS and return beam vidicon (RBV) data.
3. Partially processed, or archival ("A"), HDT's of both MSS and RBV data.

### CCT BIP-2 ARCHIVES FROM CUSTOMER ORDERS

The EDC digital archive originally began as a collection of MSS CCT's in BIP-2 format. These data were obtained as EDC received customer requests for digital products. At that time, orders for digital products had to be routed back to the NASA Goddard Space Flight Center (GSFC) where CCT's were generated. When the CCT's arrived at EDC, the data were verified and an archival master tape was made

from which the customer product was reproduced. More than 12,000 Landsat scenes have been processed and archived in this manner.

### CCT BIP-2 ARCHIVES FROM HISTORICAL SELECTION

Because of concern over continued reliability of the wideband video tape archive at GSFC (the ultimate source of all Landsat products, both digital and film), EDC and GSFC agreed in the fall of 1979 to begin a joint project to convert selected historical scene data to BIP-2 CCT's. This project is well underway and is expected to continue for the next 5 years. Selections are being made with consideration for both temporal and geographic coverage.

EDC has identified 30,600 MSS scenes to be processed as BIP-2 CCT's covering the period from launch of Landsat 1 to January 1977. At this time, approximately 2,000 of these scenes have been sent to EDC where they are now archived.

GSFC and EDC have discussed the possibility of extending this historical selection project to include data acquired from January 1, 1977, to January 31, 1979. These data could be processed as BIP-2 CCT's (consistent with the historical data from the earlier phases of the project) or as HDT's. At this date, no final decisions have been made.

In summary, the Landsat archive of BIP-2 CCT's will increase over the next 5 years from 14,000 MSS scenes to approximately 50,000 scenes, all acquired before February 1, 1979.

### FULLY PROCESSED HDT ARCHIVE

The second part of the EDC digital archive consists of fully processed Landsat data stored on HDT-P's. This archive will contain all MSS scenes acquired from February 1, 1979, to May 31, 1981, in addition to all RBV scenes acquired from September 1, 1980, to May 31, 1981. Approximately 65,000 scenes of MSS data and 22,000 scenes of RBV data will be included. At present, about 10,000 MSS scenes and 2,000 RBV scenes are backlogged at GSFC, but current throughput rates indicate that this backlog will be processed in the near future. RBV data acquired before September 1, 1980, are generally not available in digital form.

Through EDIPS, the HDT-P archive can be processed to a variety of output products. These products can be ordered as either digital or photographic products and can be processed with contrast stretch, edge enhancement, haze removal, or any combination of these algorithms applied to either. Digital tape products can also be ordered in either band-interleaved-by-line (BIL) or band-sequential (BSQ) format.

### PARTIALLY PROCESSED HDT ARCHIVE

The third part of the EDC digital archive consists of

(continued on page 7)

## INDEX TO ARTICLES FROM THE LANDSAT NOTES

This index is organized by keyword. Under each, the titles of related articles that have appeared in the Landsat NOTES are listed, along with the appropriate issue and page number. The issue numbers correspond to the following dates of publication:

<b>No. 3 November 1978</b>	<b>No. 11 March 1980</b>
<b>No. 4 January 1979</b>	<b>No. 12 May 1980</b>
<b>No. 5 March 1979</b>	<b>No. 13 July 1980</b>
<b>No. 6 May 1979</b>	<b>No. 14 September 1980</b>
<b>No. 7 July 1979</b>	<b>No. 15 November 1980</b>
<b>No. 8 September 1979</b>	<b>No. 16 January 1981</b>
<b>No. 9 November 1979</b>	<b>No. 17 March 1981</b>
<b>No. 10 January 1980</b>	

For convenience, detach from binding and post on a bulletin board.

### Acquisition Schedule

"Scene Center Mismatch" No. 6/p.2; "Landsat Status" No. 13/p.4; "Special-Request Acquisitions" No. 14/p.5.

### Aerial Photography

"EPA Aerial Photography Available" No. 4/p.3; "Aerial Photography Microfiche" No. 7/p.5; "Alaskan Aerial Photography Microfiche Available" No. 13/p.2; "High-Altitude Photography Program" No. 13/p.2; "High-Altitude Photography Program" No. 16/p.1; "Hurricane Allen" No. 16/p.3.

### Agricultural Applications

"AgRISTARS" No. 9/p.2.

### Alaska

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### Australia

"Australian Landsat Station Open for Business" No. 16/p.1.

### AVRI Project

"The AVRI Project: Arizona Vegetation Resources Inventory" No. 14/p.6.

### BLM

"The AVRI Project: Arizona Vegetation Resources Inventory" No. 14/p.6.

### CCT

"Issued: CCT Manual" No. 3/p.2; "CCT Format Revision" No. 4/p.1; "Digital Production Status" No. 5/p.2; "Historical Data" No. 6/p.6; "Cooperative Project with Chinese" No. 7/p.1; "Status of Landsat 3 Availability" No. 7/p.3; "CCT's" No. 7/p.7; "Landsat Data Flow" No. 8/p.4; "Selection Strategy for Preserving Historical Digital Data" No. 9/p.3; "CCT Standards Meeting: Ottawa" No. 9/p.3; "CCT Quality Control" No. 9/p.4; "LGSOWG Tape Format Documentation" No. 15/p.3; "Historical Landsat Data" No. 17/p.2.

### China

"Cooperative Project with Chinese" No. 7/p.1; "Activities with the Chinese" No. 8/p.1.

### Composites, MSS/RBV

"MSS and RBV Compositing Work" No. 11/p.3; "RBV/MSS Composite Available" No. 17/p.4.

### Contrast Stretch

"EDIPS Processing Procedure Changes" No. 8/p.2.

### Correction Grid

"The Correction Process Summarized" No. 8/p.5.

### Custom Products

"Generalized Image Processing System" No. 10/p.4; "Landsat 3 MSS Problem" No. 16/p.3.

### Customer Information

"Landsat Customer Profile" No. 6/p.4; "EDC Data Sales" No. 11/p.2; "Customer Feedback" No. 13/p.5; "Historical CCT Selection Continues" No. 17/p.2.

### DAL

"The Data Analysis Laboratory: A Useful Tool" No. 4/p.6; "Data Analysis Laboratory Upgrades Capability" No. 10/p.7; "Data Analysis Laboratory Upgrade" No. 13/p.2.

### DeNoyer

"Pecora V" No. 7/p.5.

### Density Slicing

"Landsat Classification of Wetlands in the Everglades" No. 15/p.4.

### Digital Applications

"The AVRI Project: Arizona Vegetation Resources Inventory" No. 14/p.6; "Landsat Classification of Wetlands in the Everglades" No. 15/p.4; "Forest Fuels Mapping Project" No. 16/p.4.

### Digital Archives

"Upgrade Planned (EDIPS)" No. 9/p.1.

### Digital Elevation Data

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### Digital Products

"Digital Image Processing Product Prices" No. 4/p.2; "Generalized Image Processing System" No. 10/p.4; "Non-U.S. Data Availability" No. 10/p.5; "Landsat Turn-around Times" No. 11/p.3; "New Methods for MSS Precision-Processed and/or Color Products" No. 14/p.4; "Landsat D Simulation Data Available" No. 17/p.1.

### Domsat

"Earth Station at EDC Planned" No. 3/p.1; "Antenna Activation" No. 6/p.1.

### Earthnet/ESA

"International Landsat Stations" No. 4/p.2.

### EDIPS

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### EPA

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### EROS Field Office

"EROS Alaskan Field Office" No. 7/p.2; "USGS/EROS Field Office in Anchorage" No. 9/p.1; "USGS/EROS Field Office in Alaska" No. 12/p.2; "EROS Field Office - One Year in Alaska" No. 17/p.5.

### Everglades Project

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### Fischer

"William A. Fischer" No. 14/p.6.

### Forestry Applications

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### Geographic Information Systems

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### GIPS

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### High Gain Mode

"MSS High Gain Images" No. 8/p.3.

### Historical Landsat Data

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### HOM Projection

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### HRV Instrument

"French Remote Sensing Satellite Program" No. 8/p.7.

### Hurricane Allen

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### Hybrid Space

"The Correction Process Summarized" No. 8/p.5.

### Hydrologic Applications

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### IDIMS

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### Image Analysis

"Image Analysis Equipment and Services" No. 3/p.5; "The Data Analysis Laboratory: A Useful Tool" No. 4/p.6; "RBV Data Being Studied" No. 5/p.6; "Cooperative Demonstration Projects: Applications of Remote Sensing Data" No. 6/p.5; "Upgrade Planned (EDIPS)" No. 9/p.1; "Data Analysis Laboratory Upgrades Capability" No. 10/p.7; "Data Analysis Laboratory Upgrade" No. 13/p.2.

### Image Annotations

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### Image Processing Facility

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"International Courses at EDC" No. 7/p.7; "Training in Remote Sensing Offered in Foreign Countries" No. 9/p.5; "International Workshop Questionnaire" No. 13/p.3; "1981 International Remote Sensing Workshops" No. 15/p.3.

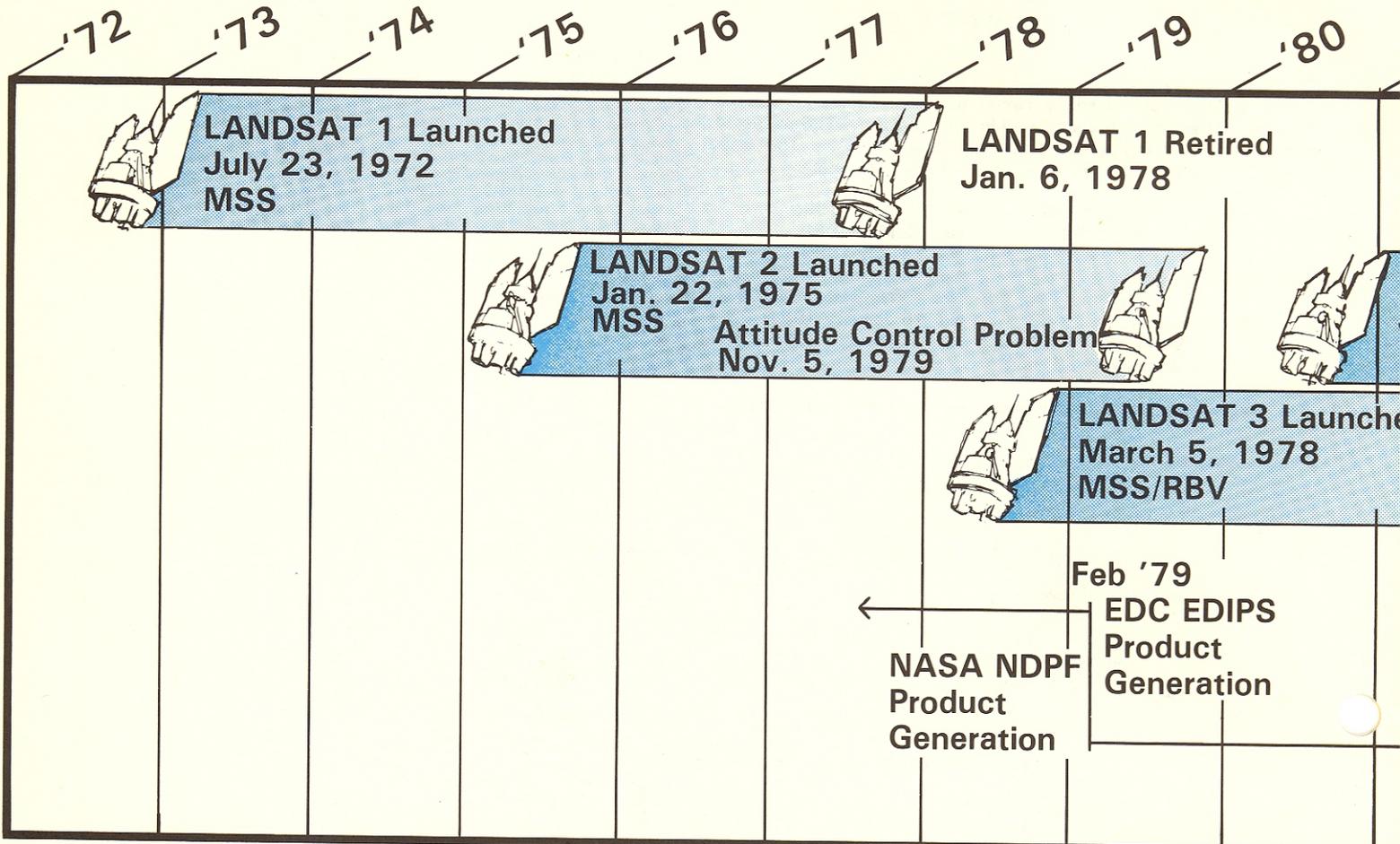
### Land Use Applications

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# LANDSAT



## SCENES IN EDC MAIN IMAGE FILE

	72	73	74	75	76	77	78	79	80
<b>MSS</b>	17,678	56,219	93,117	151,802	192,212	263,469	302,654	329,510	
<b>RBV</b>	1,231	1,231	1,273	1,792	2,311	3,238	8,644	11,390	

### JULY 1972

70mm MSS FILM  
 BROWSE ROLL MICROFILM  
 CCT-"X" FORMAT (UNCORRECTED)  
 SYSTEM CORRECTED IMAGE PRODUCTS

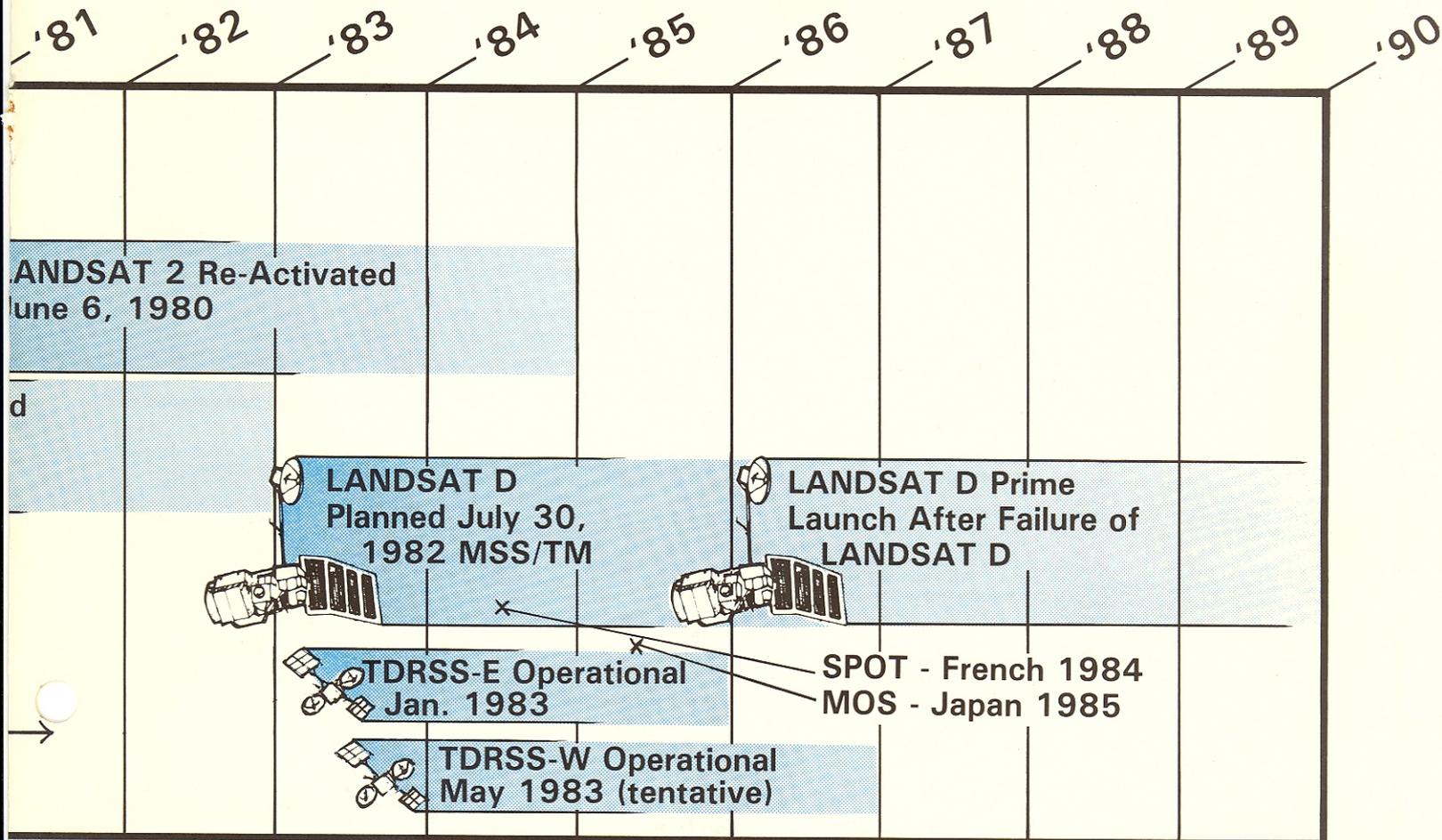
### NOVEMBER 1976

"A" FORMAT CCT's AVAILABLE  
 (SYSTEM CORRECTED)

### FEBRUARY 1979

9" MSS FILM PRODUCTS  
 HDT-"P" (RESAMPLED) MSS DATA AVAILABLE  
 INITIATED GCP CORRECTION TO  
 HOM PROJECTION  
 CCT-"P" FULLY CORRECTED DATA  
 MICROCATALOG LISTINGS BY WRS  
 PATH AND ROW  
 70mm RBV FILM

# TIMELINE



## SEPTEMBER 1980

RBV DIGITAL PRODUCT AVAILABILITY  
9" RBV FILM PRODUCTS

## JUNE 1981

UNSAMPLED OR RESAMPLED MSS AND  
RBV DIGITAL PRODUCTS  
IMAGE AND DIGITAL PRODUCTS CORRECTED  
TO HOM PROJECTION

## JAN 1979

L/S 3 LINE START ANOMALY

## MAR 1979

L/S 3 THERMAL BAND FAILURE

## DEC 1980

L/S 3 MSS FAILURE  
(BEING EVALUATED)

## APRIL 1981

L/S 3 MSS OPERATIONAL

## LANDSAT DATA USERS NOTES

- Landsat Data Users Handbook**  
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- LGSOWG**  
 "Foreign Landsat Holdings to be Listed at EDC" No. 3/p.2; "International Landsat Stations" No. 4/p.2; "Foreign Sites" No. 6/p.3; "International Landsat Stations" No. 7/p.1; "User Services and Data Management Workshop" No. 7/p.2; "CCT Standards Meeting: Ottawa" No. 9/p.3; "Non-U.S. Data Availability" No. 10/p.5; "International Landsat Stations" No. 11/p.6; "LGSOWG Meeting (Buenos Aires)" No. 14/p.4; "Onboard Tape Recorder Backup Plan" No. 16/p.2; "South Africa Signs Agreement" No. 16/p.6.
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- Mapsat**  
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 "Landsat MicroIMAGE System Postponed" No. 9/p.3; "Update on Landsat MicroIMAGE System" No. 10/p.4.
- Microfiche**  
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- MicroIMAGE**  
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- Mount St. Helens**  
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- MRS Sensor**  
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- Photographic Products**  
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- Precision Corrections**  
 "The Correction Process Summarized" No. 8/p.5; "New Methods for MSS Processed and/or Color Products" No. 14/p.4.
- Pricing**  
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- Purdue**  
 "Machine Processing of Remotely Sensed Data/International Symposium on Soil Information" No. 9/p.5.
- Push-broom Scanning**  
 "French Remote Sensing Satellite Program" No. 8/p.7; "Mapsat Feasibility Studied" No. 17/p.2.
- Quality Assurance**  
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- Radiometric Corrections**  
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- RBV Worldwide Land Coverage Project**  
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 "Selection Strategy for Preserving Historical Digital Data" No. 9/p.3; "Landsat Reference Systems" No. 13/p.5.

partially processed Landsat data stored on HDT-A's. All data acquired on or after June 1, 1981, will be archived at EDC in this form. This archival format provides even more flexibility in product generation. In addition to the options noted for the HDT-P archive, products can be generated with different resampling techniques (cubic convolution or nearest neighbor) and map projections (Universal Transverse Mercator, Polar Stereoscopic, or HOM). Also, for serious users who wish to apply their own image processing algorithms, uncorrected CCT products can be generated from HDT-A's.

Orders for any of the digital data described above, or requests for further information on any aspect of the EDC digital archives, may be submitted to the User Services Section, U.S. Geological Survey, EROS Data Center, Sioux Falls, SD 57198, telephone: (605)594-6151.

### EDC TRAINING SCHEDULE

The EROS Data Center's Applications Branch staff will conduct or participate in several training courses and workshops in the coming months.

- June 15 - 19 *Terrain Analysis: Interpretation of Aerial Photographs and Images* (Sioux Falls, S. Dak.) Contact: Coordinator, Continuing Education Program, Harvard Graduate School of Design, Gund Hall L-37, Harvard University, Cambridge, MA 02138, telephone: (617)495-2578.
- July 27 - 31 *Introduction to Remote Sensing for Land Cover Mapping* (Anchorage, Alaska) Open enrollment: Contact: David M. Carneggie, USGS/EROS Field Office, 218 E. Street, Anchorage, AK 99501, telephone: (907)271-4065.
- Aug. 24 - 28 *Remote Sensing for Geology* (Anchorage, Alaska) Open enrollment. Contact: David M. Carneggie, USGS/EROS Field Office, 218 E. Street, Anchorage, AK 99401, telephone: (907)271-4065.
- Aug. 31 - Oct. 21 *International Remote Sensing Workshop: Applications in Vegetation Assessment and Land-Use Planning* (Sioux Falls, S. Dak.) Open to non-U.S. scientists. Contact: Office of International Geology, U.S. Geological Survey, National Center, Mail Stop 917, Reston, VA 22092, telephone: (703)860-6418.
- Oct. 26 - 30 *Applications of Remote Sensing in Geology/Hydrology* (Sioux Falls, S. Dak.) Open enrollment: Contact: Branch of Applications, EROS Data Center, Sioux Falls, SD 57198, telephone: (605)594-6114.
- Nov. 16 - 20 *Advanced Geological Workshop* (Sioux Falls, S. Dak.) Open enrollment, Contact:

Branch of Applications, EROS Data Center, Sioux Falls, SD 57198, telephone: (605)594-6114.

### ADDITIONAL TRAINING IN REMOTE SENSING

- June 22 - 23 *Key Issues in the Machine Analysis of Remote Sensing* (West Lafayette, Ind.) Held in conjunction with the 7th International Symposium on Machine Processing of Remotely Sensed Data. Limited registration. Contact: Phil Swain, LARS, 1220 Potter Drive, West Lafayette, IN 47906, telephone: (317)749-2052.
- June 23 - 26 *7th International Symposium on Machine Processing of Remotely Sensed Data* (West Lafayette, Ind.) Contact: Douglas B. Morrison, Purdue University/LARS, 1220 Potter Drive, West Lafayette, IN 47906, telephone: (317)749-2052.
- Sept. 8 - 10 *International Colloquium on Spectral Signatures of Objects in Remote Sensing* (Avignon, France). Contact: G. Guyot/I.N.R.A., Station de Bioclimatologie, B.P. 91, 84140 Montfavet/France.
- Sept. 14 - Dec. 11 *Remote Sensing of Coastal Environment and Marine Resources* (Newark, Del.) Contact: Dr. V. Klemas, Center for Remote Sensing, College of Marine Studies, University of Delaware, Newark, DE 19711, telephone: (302)738-2336.
- Oct. 5 - Nov. 6 *Advanced Training in Land Use Planning and Environment Applications* (Flagstaff, Ariz.) Open to non-U.S. scientists. Contact: Office of International Geology, U.S. Geological Survey, National Center, Mail Stop 917, Reston, VA 22092, telephone: (703)860-6418.
- Oct. 13 - 24 *International Geologic Correlation Programme (IGCP) Workshop on Remote Sensing and Mineral Exploration* (Nairobi, Kenya) Contact: W. D. Carter or L. C. Rowan, U.S. Geological Survey, National Center, Mail Stop 730, Reston, VA 22092.

### MICROPROCESSOR WORKSHOP AT EDC

A workshop on microprocessor-based remote image processing systems will be held October 22-23, 1981, in Sioux Falls, S. Dak. This workshop, which will be hosted by EDC, will present information about low-cost, state-of-the-art, image analysis and display hardware. Both invited and submitted papers will be presented, and hardware and software demonstrations will be conducted. For further information about this workshop, contact the Applications Branch, U.S. Geological Survey, EROS Data Center, Sioux Falls, SD 57198, telephone: (605)594-6114.

**LANDSAT DATA USERS NOTES**

**LANDSAT PRODUCTION STATISTICS**

	Oct. '80		Nov. '80		Dec. '80		Jan. '81		Feb. '81		Mar. '81		6-Month Total	
	MSS	RBV	MSS	RBV										
Landsat scenes acquired (satellite acquisitions)	3,759	1,487	2,576	1,169	2,298	1,198	1,061	793	1,506	584	2,389	755	13,589	5,986
*Landsat scenes (MSS) sub-scenes (RBV) received at EDC	1,440	2,258	1,620	6,876	3,017	3,825	3,467	3,712	2,394	2,984	2,907	3,000	14,845	22,655
Average time in days from EDC receipt to archive availability	4.2	--	3.1	--	3.8	9.9	5.6	9.0	8.5	12.9	23.8	34.4	--	--
Average delivery time in days from receipt of order at EDC to shipment:														
Standard photographic products		20		19		15		18		12		11		--
Standard digital products		13		9		8		11		10		7		--
Landsat photographic frames sold		19,470		7,741		8,930		9,298		11,790		9,677		66,906
Landsat digital scenes sold		404		364		356		358		439		400		2,321
TOTAL LANDSAT DOLLAR VOLUME		\$294,194		\$175,305		\$183,639		\$206,238		\$228,271		\$220,910		\$1,308,557

\*RBV numbers for October through February corrected by GSFC April 3, 1981.

The Landsat Data Users NOTES is published bi-monthly in order to present information of interest to the user community regarding Landsat products, systems, and related remote sensing developments. There is no subscription charge; individuals and organizations wishing to receive the NOTES should contact the User Services Section, U.S. Geological Survey, EROS Data Center, Sioux Falls, South Dakota 57198, U.S.A., telephone: (605)594-6511.

**UNITED STATES  
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