



United States Department of the Interior

GEOLOGICAL SURVEY  
EROS Data Center  
Sioux Falls, South Dakota 57198

IN REPLY REFER TO:

OC 7-18

July 20, 1987

Mr. Joseph L. Bishop  
NASA Headquarters  
Code TS  
Washington, DC 20546

Dear Joe:

As you recall, during the telecon July 7, 1987, EDC took an action to further document our recommendation to ship the pre-1979 Landsat MSS Wide Band Video Tapes (WBVT's) and necessary processing system components to EDC for long term preservation and conversion of limited WBVT scenes to CCT. Enclosed is our proposal regarding this subject which includes recommended NASA and EDC responsibilities, cost estimates for data storage and limited throughput processing at EDC, and the list of processing system components needed at EDC. It is assumed that NASA is further defining the costs for prepping the WBVT's and system components for shipment, and shipment to EDC and developing reliability or confidence numbers for reinstalling and bringing the processing system back up at EDC.

Please contact me or Gary Metz if you have any questions or comments.

Sincerely,

Allen H. Watkins  
Chief, EROS Data Center

Enclosure

cc: Shelby Tilford, NASA HQ  
Bob Murphy, NASA HQ  
Mike Mahoney, NASA GSFC  
John Hussey, NOAA/NESDIS, Suitland  
Henry Phillips, NOAA/NESDIS, GSFC  
Howard Warriner, NOAA/EDC

bcc: R. Thompson  
AHW Chron  
AHW Subj  
GGM Chron  
GGM Subj  
EDC Chron

GGMetz/mle/x6125/7-20-87

TRANSFER OF HISTORICAL  
WIDE BAND VIDEO TAPE (WBVT)  
DATA AND PROCESSING SYSTEM

to the

EROS DATA CENTER

7/15/87

## INTRODUCTION

From the launch of ERTS-1 in 1972 until implementation of all-digital processing in January, 1979, the Landsat program acquired more than 400,000 scenes of mss data coverage world wide. Since the early processing systems were directed primarily toward generation of film images, only a small subset of this data was converted to digital tapes. Therefore, many valuable scenes of MSS data exist in analog Wide Band Video Tape (WBVT) form which is not a reasonable long-term archival media. Further, the systems that process this media are difficult to maintain and expensive to operate. Current Landsat Program funding does not exist for continuing access to the WBVT archive, and the equipment to support archival conversion is being dismantled to provide space for other, higher priority programs. This paper presents an alternative for disposition of that archive and supports continued access to and conversion of data in WBVT form to a conventional, more usable computer compatible tape (cct) form.

## SCOPE

This paper recommends transfer of all Landsat data, acquired in the 1972-1978 period and archived in WBVT form, to the EROS Data Center, which incidentally is consistent with legislative requirements for establishment of a national satellite land remote sensing data archive at EDC. This recommendation includes transfer of appropriate equipments necessary to access the analog WBVT archive and convert selected scenes to 1600/6250 bpi tape format, thus allowing for generation of digital data sets that are acceptable both for long-term archival storage and for use in customer product generation.

Specific equipment referenced in this proposal is described in Attachment A.

## PRODUCTION EQUIPMENT REQUIREMENTS

Several separate computer systems currently installed at GSFC are required to support the WBVT-to-CCT-X production process. A brief description of each system's function follows.

The SIGMA V processing system ingests Spacecraft Location Annotation Tape (SLAT) or Daily Image Annotation Tape (DIAT) files, generates formatted SLAT or DIAT tapes, and produces work orders for tracking scenes through the production process.

The Initial Image Generation System (IIGS) ingests the appropriate image data from the WBVT and uses the SLAT or DIAT tape generated by the SIGMA V to create an intermediate high density digital tape (H Tape).

The Digital Image Generation System ingests the H tape generated by the IIGS and the SLAT or DIAT generated by the SIGMA V and produces the appropriate CCT-X. In this step, each of the MSS bands are written to a separate 800 bpi magnetic tape.

The following systems are currently installed at the EDC and could be used to support CCT-X production.

The GOULD 32/9750 ingests the 4 tapes containing the MSS bands and associated annotation data and produces a formatted CCT-X. During this process, multiple MSS scenes are stacked on a single 6250 bpi tape for archival storage, and a programmatic quality control check is performed.

The VAX 11/780 ingests the final CCT-X tape and displays the image data on a DeAnza display device. This step is performed for 5 % of the scenes to be archived as a final QC step prior to entry of the data tape into the permanent archive.

## NASA RESPONSIBILITIES

NASA will maintain operational readiness of the IIGS, DIGS and SIGMA V systems until a transfer date is established.

NASA will segregate the WBVT archive and associated DIAT and SLAT files into separate collections based on whether historical scene extraction has been completed or not (i.e. isolate the WBVTs that contain the remaining approximately 14,000 scenes to be processed from WBVT to CCT).

NASA will provide 1 week of training at GSFC for EDC production control personnel and assist in defining the required work flow.

NASA will conduct a performance test of all hardware components scheduled for transfer.

NASA will disassemble, ship and reassemble the necessary components of the IIGS, DIGS and SIGMA V systems.

NASA will assist in acceptance testing at EDC of the installed systems, to insure capability for CCT-X production, and will conduct operations training for EDC personnel.

NASA will provide 2 weeks of hardware maintenance training for EDC staff, to be conducted at EDC if at all possible.

NASA will provide all available documentation regarding SIGMA V processing and related software, and assist in installation of systems software upon delivery of the defined systems to EDC.

NASA will provide all available spares and special test equipment utilized in the maintenance of equipment that is transferred.

## EDC RESPONSIBILITIES

EDC will send electronics maintenance staff to monitor disassembly activities.

EDC will provide space for appropriate storage of all data, including WBVT, DIAT and SLAT data sets remaining in the historical archive of MSS data.

EDC will provide space for operation of all equipment necessary for extraction of data from a WBVT and creation of a CCT-X.

EDC will define an acceptable data conversion scenario (output and schedule) and provide appropriate staff to support that scenario.

EDC will assume responsibility for archival storage and management of all data to be maintained as a component of the National Archive.

EDC will provide appropriate staff for operations and maintenance training, to be conducted at GSFC and/or EDC as required to support CCT-X production.

EDC will provide necessary funding for GSFC maintenance staff to visit EDC in order to conduct extended on-site maintenance training (beyond the 2 week period specified above), if such action is deemed necessary.

## TENTATIVE OPERATIONAL SCENARIO

Active DIATS & SLATS will be stored in the EDC tape library (est. 4000 tapes).

Active WBVTs will be stored adjacent to operations area (est. 14000 tapes).

Remaining historical data (WBVT, DIAT, & SLAT) will be stored in conditioned archival storage.

All work scheduling will be performed at EDC, with work order and associated tape transfer to the operations facility supported by daily courier.

Staff allocation of 3 FTE will support one shift/day, five days/week, plus 1 FTE required for maintenance support.

Current estimates indicate that throughput of approximately 50 scenes/week/shift can be achieved.

## STORAGE REQUIREMENT

Conditioned storage space will be provided for the following tapes:

WBVT	29773 volumes
DIAT/SLAT	8406 volumes

Conditioned operational environment will be provided for setup and operation of the following equipment:

SIGMA V  
Initial Image Generation System(IIGS)  
Digital Interface System(DIGS)

## SPACE

### Minimum operational scenario

equipment	1000 sq ft
work area	300 sq ft
storage for active WBVTs	3000 sq ft
storage for deep archive	1000 sq ft

## COST ESTIMATE

### One-time

facility-raised floor	15k
-A/C	15k
-furniture	4k
supplies-tape straps	4k
equipment-HDT cleaner	15k
<u>Total</u>	<u>53k</u>

### Recurring

facility-floor space(\$9/sq ft)	36k
-utilities	10k
-deep archive rental	5k
staff-courier(existing,no cost)	n/c
-operational support(3 FTE)	48k
-maintenance support(1 FTE)	30k
on-call maintenance	30k
<u>Total</u>	<u>159k</u>

#### **FUNDING SOURCE**

NOAA and NASA staff will work with USGS to identify appropriate sources of funds for tape and system shipment to EDC and to support the operational/archival scenario described above.

APPENDIX A

EXISTING EQUIPMENT TO BE TRANSFERRED

from

NASA OPERATIONS

SIGMA V

1. CPU Sigma 5		1 ea.
2. disk controller	mdl 7270	2 ea.
3. disk drives	mdl 7271	4 ea.
4. disk controller	mdl 7240	1 ea.
5. disk drive	mdl 7246	1 ea.
6. mag tape drive	mdl 7320/7322	1 ea.
7. mag tape drive	mdl 7322	4 ea.
8. memory rack	mdl 2516	1 ea.
9. memory rack	mdl 2459	1 ea.
10. memory rack	mdl 2084	1 ea.
11. card reader	mdl 7122	1 ea.
12. card punch	mdl 7165	1 ea.
13. printer	mdl 7440	1 ea.
14. rad/cont.	mdl 7231/7232	1 ea.
15. power cont.	mdl 8251	2 ea.
16. teletype	mdl 7015	2 ea.

INITIAL IMAGE GENERATION SYSTEM (IIGS)

1. CPU Sigma 3 + cciu	2 cabinets	1 ea.
2. MSS processor	4 cabinets	1 ea.
3. Mag. tape drive	1 cabinets	3 ea.
4. HDDTR Ampex	mdl 3025	2 ea.
5. HDDR Honeywell	mdl 1477	2 ea.
6. Teletype		1 ea.
7. VIDIU		1 ea.

DIGITAL IMAGE GENERATION SYSTEM

1. CPU Sigma 3 + assoc. processors(4 cabinets)		1 ea.
2. Card Reader		1 ea.
3. Mag tape drive		7 ea.
4. Line printer		1 ea.
5. Teletype		1 ea.