AgRISTARS

EW-L0-00703
JSC-16375

A Joint Program for Agriculture and Resources Inventory Surveys Through Aerospace Remote Sensing

Early Warning and Crop Condition Assessment

September 1980

LIMITED AREA COVERAGE/HIGH RESOLUTION PICTURE TRANSMISSION (LAC/HRPT) DATA VEGETATIVE INDEX CALCULATION PROCESSOR USER'S MANUAL

S. O. O'Brien

Lockheed Engineering and Management Services Company, Inc.
Houston, Texas 77058

Lyndon B. Johnson Space Center
Houston, Texas 77058

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
JSC-16375; EW-LO-00703		

4. Title and Subtitle	5. Report Date
Limited Area Coverage/High Resolution Picture Transmission (LAC/HRPT) Data Vegetative Index Calculation Processor User's Manual	August 1980
	6. Performing Organization Code
7. Author(s) S. O. O'Brien Lockheed Engineering and Management Services Company, Inc.	8. Performing Organization Report No. LEMSCO-15327
	10. Work Unit No.
9. Performing Organization Name and Address Lockheed Engineering and Management Services Company, Inc. 1830 NASA Road 1 Houston, Texas 77058	11. Contract or Grant No. NAS 9-15800
	13. Type of Report and Period Covered Procedures
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Lyndon B. Johnson Space Center Houston, Texas 77058 J.D. Erickson, Tech. Mon.	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

The program, LACVIN, calculates Vegetative Index Numbers on Limited Area Coverage/High Resolution Picture Transmission (LAC/HRPT) Data for selected IJ grid sections. The IJ grid sections have previously been extracted from the full resolution data tapes and stored on disk files.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Vegetative Index Numbers, VIN IJ grid User's Manual	

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	14	

*For sale by the National Technical Information Service, Springfield, Virginia 22161

EW-LO-00703
JSC-16375

LIMITED AREA COVERAGE/HIGH RESOLUTION PICTURE TRANSMISSION (LAC/HRPT) DATA VEGETATIVE INDEX CALCULATION PROCESSOR USER'S MANUAL

Job Order 73-368

PREPARED BY

S. O. O'Brien

APPROVED BY

J. K. Oney, Project Manager
Early Warning Project Office

J. E. Wainwright, Manager
Development and Evaluation Department

LOCKHEED ENGINEERING AND MANAGEMENT SERVICES COMPANY, INC.

Under Contract NAS 9-15800

For

Earth Observations Division
Space and Life Sciences Directorate
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS

August 1980 LEMSCO-15327

CONTENTS

Section		Page
1.	GENERAL INFORMATION	.1-1
	1.1 SYSTEM NAME	.1-1
	1.2 PRIMARY USER	.1-1
	1.3 DEVELOPING ORGANIZATION	.1-1
	1.4 COMPUTER FACILITY	.1-1
	1.5 REFERENCES	.1-1
	1.5.1 NOAA POLAR ORBITER DATA (TIROS N) USERS GUIDE PRELIMINARY VERSION--JANUARY 1979	.1-1
	1.5.2 DEC-11-LMFUA-B-D FORTRAN IV USERS GUIDE	.1-1
2.	DESCRIPTION	.2-1
	2.1 PURPOSE	.2-1
	2.2 USAGE	.2-1
3.	INPUT	.3-1
	3.1 TYPES OF INPUT	.3-1
	3.1.1 TAPE	.3-1
	3.1.2 DISK	.3-1
	3.1.3 CARDS	.3-2
4.	PROCESSING	.4-1
	4.1 INTERACTIVE	.4-1
	4.2 BATCH	.4-1
	4.3 PROCESSING FLOW	.4-2
5.	OUTPUT	.5-1
	5.1 TYPES OF OUTPUT	.5-1
	5.1.1 TAPE	.5-1

Section Page

5.1.2 DISK 5-1

5.1.3 PAPER 5-1

6. SPECIAL INSTRUCTIONS OR RESTRICTIONS 6-1

FIGURES

Figure Page

1. Deck Setup Example 3-3

LIMITED AREA COVERAGE/HIGH RESOLUTION PICTURE TRANSMISSION (LAC/HRPT) DATA VEGETATIVE INDEX CALCULATION PROCESSOR

1. GENERAL INFORMATION

1.1 SYSTEM NAME

LACVIN Processor

1.2 PRIMARY USER

Early Warning/Crop Condition Assessment Project personnel.

1.3 DEVELOPING ORGANIZATION

Lockheed Engineering and Management Services Company, Inc. - S. O. O'Brien

1.4 COMPUTER FACILITY

The LACVIN Processor runs on a DEC PDP 11/70 computer system under the IAS operating system. It is implemented on the USDA FAS computer facility in Houston, Texas.

1.5 REFERENCES

1.5.1 NOAA Polar Orbiter Data (Tiros N) Users Guide Preliminary Version - January 1979.

1.5.2 DEC-11-LMFUA-B-D Fortran IV Users Guide

2. DESCRIPTION

2.1 PURPOSE

The purpose of LACVIN is to calculate vegetation index numbers on the LAC/HRPT data for selected IJ grid sections which have been stored on disk.

2.2 USAGE

The LACVIN processor is set up to run as a batch job. The input will be a disk file containing pixels selected from the LAC/HRPT tapes by the LACREG processor and a control card deck. The VIN numbers will be calculated according to a user-specified option where

Option 1 VIN = Channel(B) - Channel (A)

and

Option 2 $$VIN = \frac{(\text{Channel (B)} - \text{Channel (A)}) * 100}{\text{Channel (B)} + \text{Channel (A)}}$$

The data will be screened before processing for the VIN as follows:

Channel 1 and 2 data:

Values greater than 500 are set to 251

Values less than 501 are divided by 2 then all values for Channel 1 are screened using an equation of the general form:

$$\cos((Z_1 + Z_2)/2)$$

where Z_1 = solar Zenith anle for start of IJ section

Z_2 = solar Zenith angle for stop of IJ section

This equation is modified when the angles become large.

Channel 3 data:

PIX = (PIX * Slope Coef + Intercept Coef) * 100

All values <20 will be ignored.

Channel 4 data:

PIX = (PIX * Slope Coef + Intercept Coef)

All values <20 will be ignored.

The results of the calculations will be output to the printer.

3. INPUT

3.1 TYPES OF INPUT

3.1.1 TAPE

None

3.1.2 DISK

The data will be stored in a disk file with one 2560 word record for each of the four channels for each IJ grid section. The format of each record is as follows:

Word	Data Type	Contents
1	I	I value
2	I	J value
3	I	Channel number
4	I	Count of number of pixels extracted for this I, J.
5-6	R	Slope coefficient for this channel.
7-8	R	Intercept coefficient for this channel
9-10	R	Latitude for start of search interval for this IJ data on the first line of data for this IJ
11-12	R	Longitude of start of search interval for this IJ data on the first line of data for this IJ
13-14	R	Zenith angle of LATLON point in words 9-10 and 11-12
15-16	R	Latitude of stop point for search interval for this IJ data on the first scan line of data for this IJ
17-18	R	Longitude of stop point for search interval for this IJ data on the first scan line of data for this IJ
19-20	R	Zenith angle of LATLON point in words 15-16 and 17-18
21-24	R	Unused
25-2560	I	Pixel data

3.1.3 CARDS

The processor requires the following system control and data cards. See figure 1 for example.

Col 1
↓

```
$JOB ERLYWARN2 LACVIN 100
$RUN LACVIN
A,B           = A and B are 1 digit channel numbers to be used in VIN
                calculations
N             = One digit option numbers - either 1 or 2 (section 2.2)
XX            = 2 digit number containing count of IJ values in input disk
                file, range is 01 - 20, right justified.
YES or NO     = A histogram of the IJ data section will be given if
                requested.
NNNNNN.TTT;V = File name of disk file input for this processor
$EOJ
```

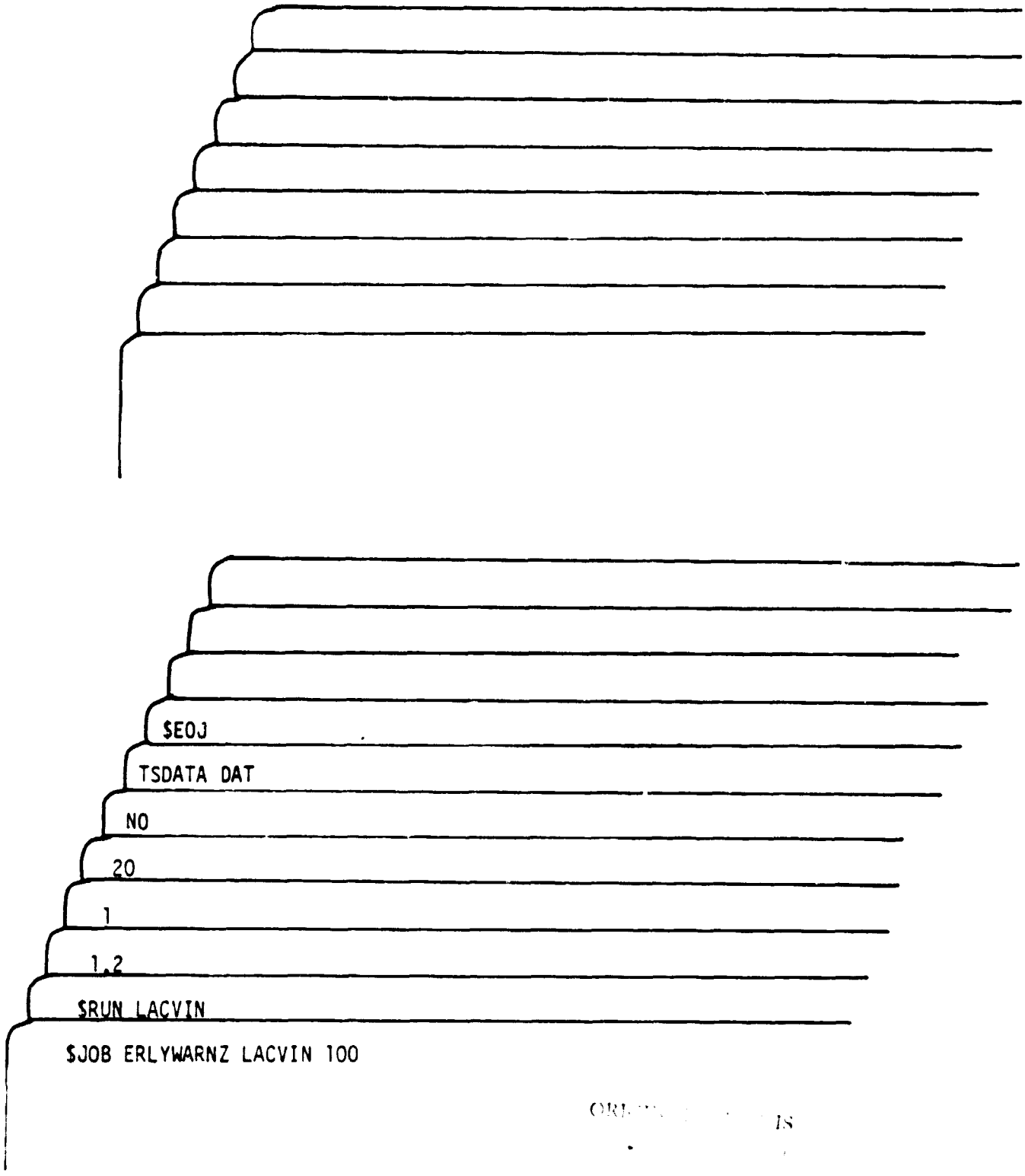


Figure 1. Deck Setup Example

4. PROCESSING

4.1 INTERACTIVE

Not applicable.

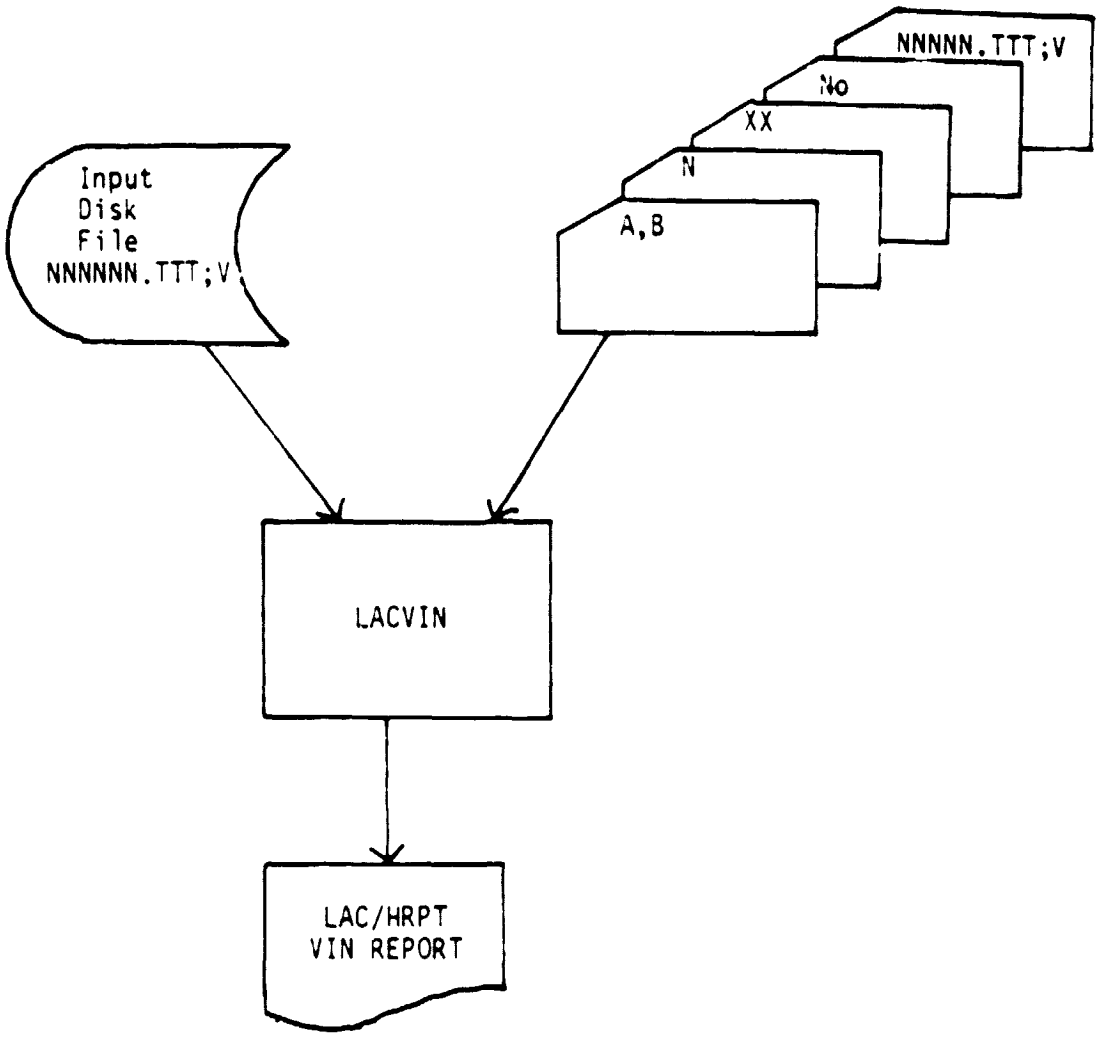
4.2 BATCH

The user must submit the deck of cards as described above with a Batch Job Request form. The request form is as follows:

BATCH JOB REQUEST	NAME: Susanne O'Brien	DATE SUBMITTED 6/6/80
REQUEST INSTRUCTIONS: There are no special instructions.		
COMPLETION DATE	OPERATOR	

FASRS-104 (1-79) NASA-

4.3 PROCESSING FLOW



5. OUTPUT

5.1 TYPES OF OUTPUT

5.1.1 TAPE

None

5.1.2 DISK

None

5.1.3 PAPER

The output will be a LAC/HRPT VIN report. It will have one report line per I, J processed. It will contain the following data

I = XXX J = YYY VIN = ZZ.ZZZ PIXELS AVAILABLE = NNNN PIXELS USED = MMMM

6. SPECIAL INSTRUCTIONS OR RESTRICTIONS

None