N O T I C E

THIS DOCUMENT HAS BEEN REPRODUCED FROM MICROFICHE. ALTHOUGH IT IS RECOGNIZED THAT CERTAIN PORTIONS ARE ILLEGIBLE, IT IS BEING RELEASED IN THE INTEREST OF MAKING AVAILABLE AS MUCH INFORMATION AS POSSIBLE

IMPLEMENTATION SPECIFICATION DOCUMENT
FOR
MERGE OF BTREAD, PHASE 1, AND PHASE 2
ACCURACY ASSESSMENT PROGRAMS
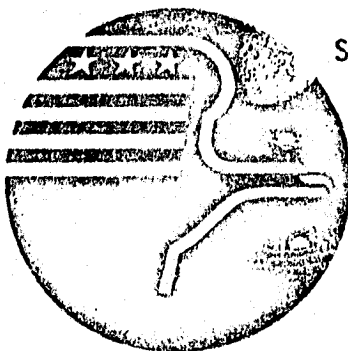
Job Order 73-783

Prepared By

Lockheed Electronics Company, Inc.

Systems and Services Division

Houston, Texas

Contract NAS 9-15200

For

EARTH OBSERVATIONS DIVISION

SPACE AND LIFE SCIENCES DIRECTORATE

National Aeronautics and Space Administration

LYNDON B. JOHNSON SPACE CENTER

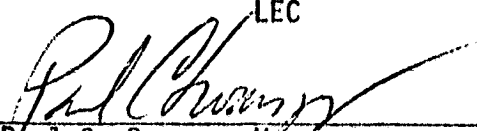*Houston, Texas*

May 1978

LEC-12348

IMPLEMENTATION SPECIFICATION DOCUMENT FOR

MERGE OF BTREAD, PHASE 1, AND PHASE 2

ACCURACY ASSESSMENT PROGRAMS

Job Order 73-783
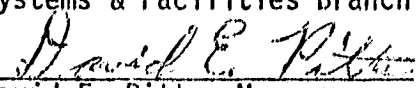
PREPARED BY

F. Fragni
Data Facilities Department

APPROVED BY

LEC

Paul C. Swanzy, Manager
Data Facilities Department

John F. Potter, Project Leader
Accuracy Assessment

NASA

James M. Sulester,
Technical Monitor
Systems & Facilities Branch

David E. Pitts, Manager
Accuracy Assessment

Prepared By

Lockheed Electronics Company, Inc.

For

Earth Observations Division

Space and Life Sciences Directorate

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS

May 1978

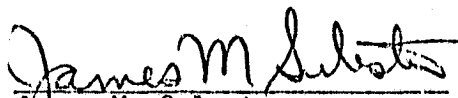| 1. Report No. JSC-14277	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Implementation Specification Document for Merge of BTREAD, Phase 1, and Phase 2 Accuracy Assessment Programs		5. Report Date May 1978
		6. Performing Organization Code
7. Author(s) F. Tragni		8. Performing Organization Report No. LEC-12348
9. Performing Organization Name and Address Lockheed Electronics Company, Inc. Systems and Services Division 1830 NASA Road 1 Houston, Texas 77058		10. Work Unit No.
		11. Contract or Grant No. NAS 9-15200
12. Sponsoring Agency Name and Address		13. Type of Report and Period Covered Technical Report
		14. Sponsoring Agency Code

15. Supplementary Notes

Reference As-Built Design Specification for PDP 11/45 Accuracy Assessment Disk Data File, JSC-13893.

16. Abstract

PDP 11/45 program modules convert digitized ground truth data to a line and sample image format which is in registration with LACIE blind site segments. These registered line and sample ground truth data are then used to generate reports which are required to access the accuracy of the CAMS classification and proportion estimates.

This document then defines the requirements necessary to merge three PDP 11/45 modules into one efficient operating program.

17. Key Words (Suggested by Author(s)) LACIE Accuracy Assessment Subpixel Digitize	18. Distribution Statement		
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages	22. Price

1. PURPOSE

This document defines the requirements necessary for the merge of program modules BTREAD, Phase 1 and Phase 2. These three program modules convert the ground truth data to a subpixel image format which has been preregistered with pixels in the LACIE blind site segments. The merge of these programs will expedité the formatting of a Universal ground truth data file by providing a more efficient operating environment.

2. BACKGROUND

Program modules BTREAD, Phase 1 and Phase 2, were designed and imple-
mented to satisfy research and test requirements for LACIE Phase 3
Accuracy Assessment processing. The initial research and test
requirement was to convert the nine-track Bendix-100 tape to a
nine-track Universal format image tape. This initial requirement
was completed and acceptance tested in August 1977. Since acceptance,
scientists and engineers from the Accuracy Assessment Team have
provided the necessary operations expertise. With this hands-on
operations experience as a background, the requirements to merge
these programs so that the generation of a ground truth data file
can be performed by Data Techniques Laboratory (DTL) operations
personnel as developed.

3. GENERAL REQUIREMENTS

The following subsection defines the general requirements and various modifications that should be implemented in the merge of BTREAD, Phase 1 and Phase 2. The merge of these programs should dictate the use of only one input control file and require only one run command.

3.1 BTREAD

There are three special subroutines in BTREAD. These are RADER, FSORT, and LABEL.

Subroutine RADER converts the NOVA floating point data recorded on the B-100 tape to DEC PDP 11/45 integer equivalents. FSORT arranges the fields in numerical order, checking for duplicate field numbers and tracking the number of fields. LABEL produces files of crop classes.

3.1.1 BTREAD MODIFICATIONS

The small grains and other file (Label 2 • DAT) created by subroutine label should be deleted. This file was designed for use with module ALLCRP. The analysis data that was provided by module ALLCRP is now available in module MLTCRP. Label 3 • Dat or Label 1 • Dat should be selected by input control data set.

Subroutines used in the generation of a B-tape or the need to write to a scratch tape should be deleted. The deletion of these subroutines will eliminate the need for two digital tape units.

3.2 PHASE 1

Phase 1 is the executive routine that calls the standard system's utility and special subroutines. These routines check the vertices in each field and construct files for use by the follow-on Phase 2 routines.

3.2.1 PHASE 1 INVESTIGATIONS

Phase 1 routines have been designed to check that the digitized input conforms to the restrictions as specified in IDC 643-2055 (attached). Each restriction should be analyzed as to its merit and modified accordingly.

3.2.2 PHASE 1 MODIFICATIONS

The need for tape input (assignment of unit 4) should be deleted and the input statement modified to accept the output of BTREAD, as modified in paragraph 3.1.1 above.

In addition, all subroutines should be modified to handle, by card or operator input, segments that contain any combination of 137,592 pixels. For example, when maximum X equals 2866 samples, Y should equal 48 lines; when maximum Y equals 2866 lines, each line should contain 48 samples. Default should be 392 samples by 351 lines (196 x 2 - 117 x 3).

3.3 PHASE 2

The Phase 2 subroutines use the data as formatted by BTREAD and Phase 1. Phase 2 organizes these data in Universal format and outputs a single channel Universal Ground Truth Tape (UGTT) as an output product.

3.3.1 PHASE 2 MODIFICATIONS

Phase 2 should be modified to output two channels of data. Channel 1 shall be the crop or land use type and channel 2 shall be the field number of the crop or land use type.

In addition, Phase 2 should be modified to produce an UGTT output as a requester option. The default should be to the system disk in the users UIC.

3.4 OUTPUT REPORTS

Provisions must be made in the merge of BTREAD, Phase 1 and Phase 2 to continue to provide all existing line printer reports.

4. SYSTEMS TEST AND INTEGRATION

The following tests shall be performed:

- Verification of disk data and UGTT output product.

- Verification of all line printer reports.

- Verification of error routines and resulting error messages, i.e., maximum number of vertices, duplicate field numbers, field closure, etc.

5. SCHEDULE

The schedule for the merge of these routines shall include:

- Design review
- Coding
- Debug
- Integration test
- Final acceptance
- Documentation

6. DOCUMENTATION

The following documentation is required:

1. Flow diagrams

2. Program listings

3. Description of all subroutines

4. Description of output product formats by byte

5. Acceptance test plan

6. Users document

7. Operators procedures

ATTACHMENT

9

INTERDEPARTMENTAL COMMUNICATION

DATE May 5, 1977

TO   M. L. Rador   DEPT./ORGN. 628-32 BLDG./ZONE J17   PLANT/FAC. LEC/SSD

Ref: 643-2055

FROM   W. G. Eppler   DEPT./ORGN. 626-40   BLDG./ZONE L-VIII   PLANT/FAC. LEC/SSD   EXT. 333-6311

SUBJECT: DIGITIZATION PROCEDURES AND BENDIX TAPE FORMAT

I. General Considerations

1. Deliniate and digitize beyond nominal site boundaries. Extra area does not cause a problem but having too little area does.

2. Later fields (in the sequence of digitization) take precedence over (i.e., overwrite) earlier elds.

3. First boundaries should define the total ground truth area for a photograph. See I-1.

4. There is no restriction on the direction in which fields are digitized. The boundary may even cross itself; e.g., a "figure-eight" is permissible.

II. Digitizing Restrictions

The programs Phase I and Phase II impose certain restrictions on the digitizing process; these restrictions are itemized in Table 1. If any of these restrictions become objectionable, they can be relieved by increasing the size of buffers given by Table 1.

III. Tape Format

Each segment is assumed to have a separate 9-track 800 bpi tape consisting of one file. Each field is recorded as a single, fixed-length (80 words) record. Word 1 gives the field number (1 to 499). Word 2 gives the number of vertices + 2. Words 3, 5, . . ., 79 give the X-coordinates of vertices 1, 2, . . ., 39. Words 4, 6, . . ., 80 give the Y-coordinates of vertices 1, 2, . . ., 39. All of the values are to be in the output coordinate system (i.e., Landsat Samples x 2 and Landsat Lines x 3). The last record (after all fields are recorded) is to have the unique field number 1001. Any desired change to the assumed format can be accomodated by changes to Phase I.

cc: B. L. Carroll
P. L. Kramm
P. C. Swanzy
R. R. Vela

W. G. Eppler

LAC 201

TABLE 1.— DIGITIZING RESTRICTIONS AND THEIR SOURCE

Restriction	Source	
	Phase I	Phase II
1. No more than 39 vertices per field.	BUF(80)	
2. Sum of vertical projections within a field cannot exceed 511 output lines (approximately 25 inches at 1:24,000).	X4(512),Y4(512)	X1(512)
3. Vertical size of field cannot exceed 200 output lines (approximately 10 inches at 1:24,000).	X5(200,11)	
4. Field boundary cannot intersect an output line more than 10 times.	X5(200,11)	
5. No two fields can be assigned the same Field Number. The Field Number must be in the range 1-499; they may be assigned in any order.	YMN(500),YMX(500) FLD(500)	YMN(500),YMX(500) FLD(500),CROP(500)