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DESIGN SPECIFICATION
FOR

DOT DATA BASE UPDATE DECK CONVERSION PROGRAM (DOTDEC)

Joint Order 81-127

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DATA BASE UPDATE DECK CONVERSION PROGRAM
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FOR

EARTH OBSERVATION DIVISION
SPACE AND LIFE SCIENCES DIRECTORATE



National Aeronautics and Space Administration
LYNDON B. JOHNSON SPACE CENTER
Houston, Texas

June 1977

LEC-10790



JSC-12958

DESIGN SPECIFICATION
FOR
DOT DATA BASE UPDATE DECK CONVERSION PROGRAM (DOTVEC)

Job Order 81-127

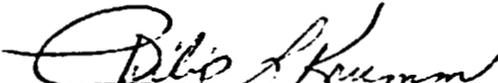
PREPARED BY


Jeannie Gor

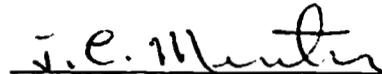
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ORIGINAL PAGE IS
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1. SCOPE

This specification establishes the proposed design for a computer program to convert the LACIE Procedure 1 Dot Data Base Update Deck to an EOD-LARSYS "field definition" deck.

The requirements specification for the program was provided by the Research, Test, and Evaluation (RT&E) Branch of the Earth Observations Division of NASA/JSC.

2. APPLICABLE DOCUMENTS

The following documents, of exact issue shown, form a part of this specification to the extent specified herein.

- "Coding for Procedure 1 Data," provided by S. Yao/LEC
- User Procedures EOD-LARSYS, LEC-3984
- Task Agreement 77-2, Job Order 81-127

3. SYSTEM DESCRIPTION

3.1 HARDWARE DESCRIPTION

N/A

3.2 SOFTWARE DESCRIPTION

The purpose of the program is to convert LACIE Procedure 1 Dot Data Base Update deck(s) into EOD-LARSYS compatible "field definition" decks. The program will be coded in the IBM 360 Fortran IV Language for operation under the Cambridge Monitor System (CMS) on the IBM 360/67 at Purdue University.

3.2.1 SOFTWARE COMPONENT NO. 1 (DOTDEC)

DOTDEC is an independent program. The function of DOTDEC is to read cards punched in the format for updating the dot data base file on the PDP 11/45 in JSC building 17, and to output (punch) "field definition" cards compatible with input requirements of the Univac 1108 EOD-LARSYS program. For example, the punched card(s) output by DOTDEC may be used for dot input to the DOT LABEL processor or the DOT DATA processor of EOD-LARSYS.

3.2.1.1 Linkages

DOTDEC does not require any subprograms, and is not referenced by any other program.

3.2.1.2 Interfaces

The program is accessed via the LARS/Purdue terminal in JSC building 17. The interface between the program and the user is the LARS/Purdue IBM 360/67 Control Program (CP) and an associated operating system, the Cambridge Monitor System (CMS).

The card reader/punch adjacent to the terminal in building 17 will be the program's primary input/output interface.

3.2.1.3 Inputs

DOTDEC requires as input the LACIE Procedure 1 Dot Data Base Update deck(s) in the following format with specified information:

<u>Column</u>	<u>Description</u>
1-4	Segment number
5-10	Blank
11-12	Line grid coordinate (from 01-11)
13	Blank
14-15	Column grid coordinate (from 01-19)

<u>Column</u>	<u>Description</u>
16*	Boundary pixel decision
17*	Ground truth label
18	Blank
19-23	Analyst information (not needed by DOTDEC)
24	Dot type ("S" or blank)
25-80	Additional information not utilized by DOTDEC

Only the following columns from the input cards are used by DOTDEC for output of the field definition deck(s):

- Columns 1-4 for the sample segment number
- Columns 11-12 for the line (= line grid coordinate *10)
- Columns 14-15 for the pixel (= column grid coordinate *10)
- Column 17 for a field name to be output on the field definition card
- Column 24 for dot type ("S" in column 24 will represent type 1 and anything else will represent type 2)

*Column 17 will be considered as the identification of the dot or the most likely identification, in the case of a boundary decision.

Column 16 is the comparison boundary identification.

<u>Column 16</u>	<u>Column 17</u>	
	W	"Wheat," single pixel
∅	W	"Wheat" with "other" boundary confusion
B	W	"Wheat" with "barley" boundary confusion
R	A	"Oats" with "rye" boundary confusion
∅	B	"Barley" with "other" boundary confusion
∅	∅	"Other" with "other" boundary confusion
	F	"flax"
	R	"Rye"
	∅	"blank " if unidentified

3.2.1.4 Outputs

DOTDEC will output (punch) field definition deck(s) in the following formats:

<u>CC1</u>	<u>CC11</u>
COMMENT	SAMPLE SEGMENT NO. XXXX
TYPE	1
W 1003	(1,1), (30,100)
W 1701	(1,1), (10,170)
TYPE	2
R 1507	(1,1), (70,150)
B 1511	(1,1), (110,150)
O 1709	(1,1), (90,170)

Each field definition card defines the sample, line coordinates of a dot. The first character of the field name is the identification of the dot read from column 17 of the input Dot Data Base Update Card. The next two digits in the field name are the line grid coordinate taken from columns 11-12 and the last two digits in the field name are the column grid coordinates taken from columns 14-15. The line and pixel points on the output field definition card will be the result of line = line grid coordinate *10 and pixel = column grid coordinate *10. "COMMENT" cards with the sample segment numbers will separate the "field definition" card decks for each of the sample segments and a "TYPE" card will precede the "field definitions" of the set of dots within a given type.

A full printer listing of the output field definition cards is also available. Also, the printer output will contain any error messages generated from the input of incorrectly formatted Dot Data Base update coordinates.

3.2.1.5 Storage Requirements

TBD

3.2.1.6 Description

DOTDEC reads up to 1000 input Dot Data Base update cards at a time and places the pertinent information into BUFF(1000,6). The information extracted and saved from the input cards is:

- (1) Sample segment number (card columns 1-4)
- (2) Line grid coordinate (card columns 11-12)
- (3) Pixel grid coordinate (card columns 14-15)
- (4) Boundary pixel ID (card columns 16)
- (5) Ground truth label (card column 17)
- (6) Dot type (card column 24)

DOTDEC then groups the input information by sample segment number. All dots within a given sample segment are ordered by ascending line number, and ascending pixels for a given line number. Following the ordering of the dots within a given sample segment, DOTDEC performs a grouping by dot type - Type 1 dots or Type 2 dots - depending on the presence of an "S" or not an "S" respectively, in card column 24 of the input cards. After the grouping by sample segment, ordering by line and pixel, and sub-grouping by dot type, DOTDEC creates the punched card output in the following manner:

- (1) Each group of dots under a given sample segment number will have an initial card punched containing the sample segment number. The format of this card is in the EOD-LARSYS "COMMENT" card format (see section 3.2.1.4).
- (2) Each sub-group of dots of a given type will be preceded by a card punched in the format of an EOD-LARSYS (Procedure 1) "TYPE" card, containing the dot type "1" or "2" (see section 3.2.1.4).

- (3) Following the "TYPE" card, each dot of the given type will have a card punched in the format of an EOD-LARSYS "field definition" card (see section 3.2.1.4). The dot ID in columns 1-6 of the card will consist of the set of characters extracted from card column 17 (ground truth label), columns 11-12 (line grid coordiante, and columns 14-15 (pixel grid coordinate). The "field definition" for the dot will contain "(1,1)" for sample, line increment, and the sample, line coordinate of the dot in standard EOD-LARSYS "field definition" card format.

DOTDEC continues to read input cards and punch output cards, in sets of up to 1000 each, until an END-OF-FILE is detected.

DOTDEC also will provide an optional printer listing of the input cards, the output cards, and diagnostic messages pertaining to any errors detected in the input card.

3.2.1.7 Flow Chart

N/A

3.2.1.8 Listing

TBD

4. OPERATION

4.1 USER DOCUMENTATION

Detailed program use instructions will be provided in the Final Design Specification for Program DOTDEC.