Laser-Scan Ltd.

CONVERT PACKAGE

IFFCEDD Reference

Issue 1.0 - 17-June-1991

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IFFCEDD - Change Record

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Module IFFCEDD - Reorganised package documentation.

PREFACE

Intended audience

This manual is intended for users of a specific utility of the Laser-Scan CONVERT package running under the VAX/VMS operating system. Each manual contains the documentation for a particular CONVERT utility and a site will only receive new or updated documentation for those utilities which they have purchased.

Structure of this document

This document is composed of 2 major sections.

The Introduction is an overview of the CONVERT package and its purpose.

There then follow the User Guides for the individual modules which comprise CONVERT. Each individual module contains the same basic categories of information. These are:

MODULE - the name of the CONVERT module.

FORMAT DESCRIPTION - a description of the data format written or read by the utility programs in this conversion module.

DATA PREPARATION - guidance on how to digitise or prepare the IFF and other data required by the utility programs in this module.

For each utility program in the module, there will then be the following categories:

UTILITY - the name of the utility.

FUNCTION - a synopsis of what the utility does.

FORMAT - a summary of the utility command format and command qualifiers. Default qualifier settings are indicated.

PROMPT - how it prompts the user.

PARAMETERS - description of expected command parameters.

COMMAND QUALIFIERS - description of all command qualifiers. Qualifiers are ordered alphabetically and default argument values are indicated.

RESTRICTIONS - a summary of restrictions on the use of

qualifiers

DESCRIPTION - the definitive description of the utility action.

COMMANDS - for interactive utilities only, a description of all commands. Commands are ordered alphabetically and default argument values are indicated.

EXAMPLES - annotated examples of utility useage.

MESSAGES - all classes of message are listed and described and suggested user action given. The messages are divided into sections according to message severity within which the messages are ordered alphabetically by message mnemonic.

Conventions used in this document

Convention	Meaning
<CR>	The user should press the carriage control key on the terminal
<CTRL/x>	The phrase <CTRL/x> indicates that the user must press the key labelled CTRL while simultaneously pressing another key, for example, <CTRL/Z>.
$ **IFF2SIF<CR>**	Command examples show all user entered commands in **bold** type.
$ **IFF2SIF<CR>** . . .	Vertical series of periods, or ellipsis, mean either that not all the data that CONVERT would display in response to the particular command is shown or that not all the data that the user would enter is shown.
file-spec...	Horizontal elipsis indicates that additional parameters, values or information can be entered.
[logical-name]	Square brackets indicate that the enclosed item is optional. (Square brackets are not, however, optional in the syntax of a directory name in a file-specification, or in the syntax of a substring specification in a VMS assisnment statement).

Convention	Meaning
'integer'	An integer number is expected in the specified input or output field. (See "Command line data types" below).
'real'	A real number is expected in the specified input or output field. (See "Command line data types" below).
'file-spec'	A VMS file specification is expected in the specified input or output field.
'device-name'	A VMS device specification (for instance, MTA0:) is expected in the specified input or output field.

CHAPTER 1

CEDD FORMAT DESCRIPTION

FORMAT DESCRIPTION

Introduction

CEDD is a format devised by the Committee for the Exchange of Digital Data as a tape transfer format for the International Hydrographic Organisation (I.H.0.), derived in the search for a versatile electronic chart transfer mechanism. There are two types of data structure supported at present: sequential, and chain-node or structured. At present IFF files are sequential in format and therefore only permit the exchange of this format to and from IFF files, although chain-node structured CEDD files can be read to IFF.

This section gives a brief description of the CEDD data format. Further details may be found in the I.H.O. Format for the Exchange of Digital Hydrographic Data, November 1986.

Format of CEDD data

The CEDD format stores the feature descriptions and the coordinate information separately to permit multiple association between features and coordinates, and to facilitate the modification of the dataset. The format allows up to 999,999 separate features, each referencing up to 999 of the 999,999 allowable separate segments of coordinate information. Each segment can belong to up to 99 features, and consist of either two (x,y) or three (x,y,z) dimensional data, depending on the existence of a vertical units qualifier in the header record. This means that all the data in the file must be three dimensional even if most of the third coordinates are unused and left blank.

If the dataset contains sequential data there must a one-to-one correspondence between feature and segment, both of which will usually have the same ID numbers, except for depth soundings in which a single feature can be associated with up to 999 segments, each segment containing up to 99,999 points of separate depth soundings. (A different feature is required only for soundings from each separate source). Soundings should therefore be the last features and segments in a dataset, or be included in a separate dataset.

If the dataset contains chain-node structured data there is no longer any requirement for the one-to-one relationship, and a feature will consist of several (up to 999) segments, and a segment will belong to several (up to 99) features.

Tape files must be on 9 track, 6250 or 1600 bpi, with a ANSI (X3.27-1978) structure that should enable the files on tape to be treated as if they were normal files obeying the usual VMS commands, so that files may be copied to disc with the COPY command, and processed from disc, one file at a time. I2CEDD creates variable-length record blocks so that each logical record block is preceded by a 4-byte record control word (RCW) giving the length in bytes of the record, including the 4 bytes of the RCW.

The VOLUME, HEADER and EOF label records are those created by the operating system when copying to tape. Tape files may contain many datasets, each enclosed by a HEADER and EOF label, with the last dataset followed by the EOT marker of two tapemarks.

The CEDD data structure consists of a basic 1980 character logical data record which is filled with ASCII 7 bit (ISO Standard 646) characters. All alphabetic characters are upper case except for text fields in the feature records and text records.

There are four types of data logical record: DSI (DataSet Identifier), FEAture records, SEGment records and an optional TXT text record. Each is composed of as many 1980 character blocks as are required to contain all the data. They must exist in the order given above. Each block in the record is preceded by a 8 character header comprising a 3 character block identifier label of DSI, FEA, SEG, TXT for each of the 4 types of data record, followed by a 5 digit block identifier number, numbered in sequence through all the blocks belonging to that record. The remaining 1972 characters (9-1980) contain the CEDD data, which is continued into character 9 of the next block if required.

The last block in each record type is padded with ASCII 'DEL' (Octal 177) padding character. Any unused fields in any block are filled with ASCII blank/space (Octal 40) characters. All numeric fields are right justified with either leading spaces or zeroes, with any minus sign immediately preceeding the first digit. All alphabetic fields are left justified with trailing spaces.

An example of the tape file structure is given below:

```
BOT

VOL                          Volume record
-----------------------------------------
HDR                          Header records
*                            Tape mark

Data Set Identifier (DSI) Logical Record
Feature (FEA) Logical Record
Segment (SEG) Logical Record
Text (TXT) Logical Record (optional)

*
EOF                          End of file
*
-----------------------------------------
*

EOT
```

A CEDD file on disc, or on a tape MOUNTed non-foreign so that any tape labels become transparent to the user, will just consist of the four types of logical data record.

The records between the lines may be repeated multiple times on a tape for each dataset on the tape between the VOL label and the final tapemarks. A Header (HDR1) record indicates the start of a new dataset. The tape header labels are followed by a string of logical data records: DSI, FEA, SEG and TXT (optional).

The DSI record contains all the dataset specific information such as dataset latitude and longitude origin, extents, projection information, dataset generation, preparation and history, and the units of measurement. It also contains any (optional) registration points relating latitude and longitude coordinates to control or registration points, and accuracy outlines containing further accuracy data pertaining to different areas of the map.

All geographic coordinates are stored as (D)DDMMSSSSH, where (D)DD is the degrees, MM is the minutes and SSSS is the number of hundredths of seconds, followed by a hemisphere character (N,S,E,W). This format applies to the file origin, extents, and any registration point and accuracy outline coordinates that may be present. The location of the file origin is always to the South West of all points in the dataset. The segments contain coordinates which are always stored as delta values which are the positive difference between this file origin (or zero if not specified) and the datapoint.

This record must be followed by a series of FEAture records containing information on the structure and descriptive attributes for each CEDD feature, together with a list of references to the coordinate segments belonging to each feature in the record. Each feature has a feature sub-record consisting of the feature ID, its type (point, line or area), a header block count (at present equal to 4), the actual header block consisting of 4x40 characters, the number of segments belonging to the feature and finally, for each segment, the segment direction and ID. At present there are 6 feature codes used for IFF files created from CEDD data: FC = 1 for the layer 0 enclosing feature, FC = 2 for registration points in layer 0, FC = 3 for accuracy outlines in layer 0, FC = 4 for any point features, FC = 5 for any line features and FC = 6 for any area features. Point features are treated as symbol strings rather than simple points because of the way CEDD can accommodate many point objects in a single feature.

The feature header blocks contain information relevant to the particular feature such as its history, generation, accuracy and scale. It also contains the feature's FACS (Feature Attribute Coding Scheme) code which describes the type of feature it is, which together with the values in the feature FACS attribute fields giving further information on the feature, describes how to display it. There are also text fields in which to store further descriptive information.

The feature records are followed by the SEGment records containing the actual coordinates of the features, and a list of references to the features to which the coordinates belong. Each segment has a segment subrecord consisting of the segment ID, the number of features to

which the segment belongs, followed by, for each feature, the feature ID and its orientation. Next comes the actual coordinate values consisting of the number of points and then the x, y, (z) delta values. Z values will only occur if the vertical units field in the DSI record contains an entry, otherwise all points in the dataset will have only x, y coordinates. If this a geographic dataset the x, y coordinates are delta latitude and longitude values referenced to the file origin in the DSI record. Any Z values represent the elevation with respect to the vertical datum in the DSI record.

An optional text record (TXT) is provided to contain any textual information relevant to the entire dataset, with the number of text characters followed by the actual text.

CHAPTER 2

CEDD DATA PREPARATION

DATA PREPARATION

Comparison of CEDD and IFF

IFF is a feature oriented data format - data is separated into features, and each feature represents one 'thing' on the map. An integer feature code is used to say what type of thing it is that the feature represents. A feature might thus be a contour, or a house, or a river, depending on the type of map being digitised, and the way that the data is to be used.

A CEDD file similarly contains graphical data on a per-feature basis, primarily devised for hydrographic information in data records, which are similar in concept to IFF features.

Format of IFF Files for Transfer To and From CEDD

A CEDD file contains header information, held in one or more header blocks, and logical data records, each one holding information about the features, and further records for the coordinate information belonging to these features. There is a further optional text record to contain information relevant to the whole dataset.

In an IFF file, as created by CEDD2I or to be read by I2CEDD, information is held in features. Every feature, whether it corresponds to the CEDD header or the logical data record features, contains a number of Ancillary Code (AC) entries, as well as the coordinates in ST (for two dimensional data) or ZS (for three dimensional data) entries. There must be for each feature type an entry in the FRT table descibing how each feature is to be displayed. Each AC entry must have an ACD entry in this same FRT, with a descriptive name by which the programs refer to the AC cross-referenced to the AC type number. Any AC may one be of five types: integer, real, character (containing up to 4 characters), date (containing an integer number of days which will be converted to a VMS standard date format) or time (not used in IFFCEDD). If a CEDD field contains more than 4 characters to be stored in an AC entry, the optional text string field for the AC will be used which can contain a maximum of 20 characters. Note that the CEDD FRT contains approximately 250 ACD entries, and so before any programs that access the CEDD FRT are run, a logical name must be set up: "DEFINE LSL$FRT_ACDMAX 300" to set a number large enough to accommodate all the entries.

To create a full CEDD file the contents of the DSI header block information should be held in the AC's belonging to a single enclosing area feature in layer 0 of the IFF file. For this header feature, the ST coordinate entry should contain the coordinates that enclose the entire map. Geographic IFF units allowed are radians, degrees, seconds or tenths of seconds, and to create an IFF file that is suitable for ITRANS input, the CEDD units for a geographic map are converted into one of these units.

Also in layer 0 can be put any registration point features with their AC's containing the alignment information relating real world coordinates (eg. latitude and longitude) to map or digitising points. If the map is geographic (ie. latitude and longitude) the registration point feature ST entry contains the lat/long values converted into IFF units. Otherwise the ST or ZS entries contain the actual registration coordinates in the original CEDD file units. There may also be accuracy outline area features which describe further accuracy information for selected regions of the map, with their AC's containing the accuracy information and whose ST coordinates contain the positions of the region boundary in lat/long. converted into IFF units.

The contents of features for the CEDD data records are held in separate features in layer 1 (or greater) of the IFF file, and their AC entries should contain all the attribute information necesary for the CEDD feature header blocks if a full CEDD file is to be created. If these entries do not exist in either the normal features, or the layer 0 features, the CEDD file will be created by I2CEDD, but will have most of its data fields left blank.

The AC Entries Used to Hold CEDD Information in IFF

The contents of CEDD header and data record fields, with the exception of longitude and latitude values, are held in Ancillary Code (AC) entries when they are transferred to IFF files.

The programs I2CEDD and CEDD2I always refer to the ACs by the same names, so allowing the user to determine which code is used in the AC entries in the IFF file by supplying a suitable Feature Representation Table (FRT) file. The FRT file will be read by the programs, which then use it to determine the AC codes corresponding to each AC name. Full details of the preparation and use of FRT files can be found in the Laser-Scan 'FRT User Guide'.

Some fields, for example those containing ID numbers in the feature and segment records are not transferred to the IFF file because their contents are invariant or because they are made superfluous by the nature or structure of an IFF file.

The fields of the CEDD header are listed below, with the names and types of the AC entries in which they are held in an equivalent IFF file:

AC's for the enclosing feature header blocks.

Series designator or product type
AC Name : Product_type
AC Type : integer = no. of characters in text field

Unique reference name/number
AC Name : Dataset_ID
AC Type : integer = no. of characters in text field

Edition number
AC Name : Edition_no
AC Type : integer

Compilation_date
AC Name : Compilation_date
AC Type : date

Revision date
AC Name : Revision_date
AC Type : date

Format date of I.H.O. format
AC Name : IHO_Format_date
AC Type : date

Format date of FACS format
AC Name : FACS_Format_date
AC Type : date

Map data type
AC Name : Data_type
AC Type : character

Horizontal measurement units
AC Name : Horiz_units
AC Type : character

Horizontal resolution
AC Name : Horiz_resn
AC Type : real

Geodetic datum code
AC Name : Geodetic_datum
AC Type : character

Ellipsoid or spheroid code
AC Name : Ellipsoid
AC Type : character

Vertical measurement units
AC Name : Vert_units
AC Type : character

Vertical resolution
AC Name : Vert_resn
AC Type : real

Vertical reference system code
AC Name : Vert_ref_code
AC Type : character

Sounding or vertical datum code
AC Name : Sounding_datum
AC Type : character

X false origin
AC Name : X_false_origin
AC Type : integer

Y false origin
AC Name : Y_false_origin
AC Type : integer

Z false origin
AC Name : Z_false_origin
AC Type : integer

Projection code
AC Name : Projection
AC Type : character

Projection parameter
AC Name : Projn_parameter_A
AC Type : integer = no. of characters in text field

Projection parameter
AC Name : Projn_parameter_B
AC Type : integer = no. of characters in text field

Projection parameter
AC Name : Projn_parameter_C
AC Type : integer = no. of characters in text field

Projection parameter
AC Name : Projn_parameter_D
AC Type : integer = no. of characters in text field

Recompilation count
AC Name : Compn_count
AC Type : integer

Revision count
AC Name : Revn_count
AC Type : integer

Producer specification stock number
AC Name : Product_spec
AC Type : integer = no. of characters in text field

Product specification date
AC Name : Product_spec_date
AC Type : date

Product spec amendment number
AC Name : Spec_change_number
AC Type : integer

Country
AC Name : Country
AC Type : character

Agency
AC Name : Agency
AC Type : character

Branch
AC Name : Branch
AC Type : character

Digitising system
AC Name : Dig_system
AC Type : integer = no. of characters in text field

Processing system
AC Name : Proc_system
AC Type : integer = no. of characters in text field

Grid system code
AC Name : Grid_code
AC Type : character

Absolute horizontal accuracy
AC Name : Abs_horiz_acc
AC Type : integer

Absolute vertical accuracy
AC Name : Abs_vert_acc
AC Type : integer

Relative horizontal accuracy
AC Name : Rel_horiz_acc
AC Type : integer

Relative vertical accuracy
AC Name : Relative_vert_acc
AC Type : integer

Heighting accuracy
AC Name : Height_acc
AC Type : integer

Data generalisation
AC Name : Data_gen
AC Type : integer

North match-merge number
AC Name : N_mm_number
AC Type : integer

East match-merge number
AC Name : E_mm_number
AC Type : integer

South match-merge number
AC Name : S_mm_number
AC Type : integer

West match-merge number
AC Name : W_mm_number
AC Type : integer

North match-merge date
AC Name : N_mm_date
AC Type : date

East match-merge date
AC Name : E_mm_date
AC Type : date

South match-merge date
AC Name : S_mm_date
AC Type : date

West match-merge date
AC Name : W_mm_date
AC Type : date

Earliest source date
AC Name : Earliest_source_date
AC Type : date

Latest source date
AC Name : Latest_source_date
AC Type : date

Data collection code
AC Name : Data_colln_code
AC Type : integer

Data collection criteria
AC Name : Data_colln_criteria
AC Type : integer

Registration ID number
AC Name : Registration_ID
AC Type : integer

X control or registration point
AC Name : Control_X
AC Type : integer

Y control or registration point
AC Name : Control_Y
AC Type : integer

Z control or registration point
AC Name : Control_Z
AC Type : integer

Registration latitude (seconds/100)
AC Name : Registration_lat
AC Type : integer

Registration longitude (seconds/100)
AC Name : Registration_long
AC Type : integer

Registration elevation
AC Name : Registration_elev
AC Type : integer

Accuracy region absolute horizontal accuracy
AC Name : ACC_abs_horiz_acc
AC Type : integer

Accuracy region absolute vertical accuracy
AC Name : ACC_abs_vert_acc
AC Type : integer

Accuracy region relative horizontal accuracy
AC Name : ACC_rel_horiz_acc
AC Type : integer

Accuracy region relative vertical accuracy
AC Name : ACC_rel_vert_acc
AC Type : integer

AC's for each feature header block.

Source code
AC Name : Source_code
AC Type : integer

Source scale
AC Name : Source_scale
AC Type : integer

Source collection date
AC Name : Source_date
AC Type : date

Collection system code
AC Name : Collection_system
AC Type : integer

Source maintenance date
AC Name : Maintenance_date
AC Type : date

Feature horizontal accuracy
AC Name : Feature_horiz_acc
AC Type : integer

Feature vertical accuracy
AC Name : Feature_vert_acc
AC Type : integer

Base product code
AC Name : Base_product
AC Type : integer

Security class
AC Name : Security_class
AC Type : character

Data handling code
AC Name : Data_handling
AC Type : character

Portrayal code
AC Name : Portrayal
AC Type : integer

FACS code prefix (1 - 9)
AC Name : FACS_Prefix
AC Type : character

FACS code
AC Name : FACS_code
AC Type : character

AC's for each feature integer attribute: A to I and N to V.

FACS integer attribute
AC Name : I_FACS_attribute_A
AC Type : integer

AC's for each feature real attribute: J to M and W to Z.

FACS real attribute
AC Name : R_FACS_attribute_J
AC Type : real

AC's for each feature real value attribute: A to L.

Value attribute
AC Name : Value_attribute_A
AC Type : real

AC's for each feature text attribute.

Text attribute
AC Name : Text_attribute
AC Type : integer = no. of characters in text field

A Typical FRT File for use with CEDD Data Held in IFF

The following is a listing of a typical FRT file which might be used with CEDD2I, I2CEDD and other utilities to prepare and process an IFF file from a CEDD format file:

```
!
! FRT Table for the conversion to and from IFF, and the display in IFF,
! of CEDD data.
!
! Created: J Barber                    26-July-1988
!
! Copyright: Laser-Scan Ltd.,Cambridge, CB4 4FY, ENGLAND
!
!
! Attribute codes:
! ================
!

ACD     TABLE   1

! AC's for the dataset as a whole

!     type    number    name                minimum   maximum


ACD     I       1       Product_type
ACD     I       2       Dataset_ID
ACD     I       3       Edition_no              0       999
ACD     D       4       Compilation_date
ACD     D       5       Revision_date
ACD     D       6       IHO_Format_date
ACD     D       7       FACS_Format_date
ACD     C       8       Data_type
ACD     C       9       Horiz_units
ACD     R       10      Horiz_resn
ACD     C       11      Geodetic_datum
ACD     C       12      Ellipsoid
ACD     C       13      Vert_units
ACD     R       14      Vert_resn
ACD     C       15      Vert_ref_code
ACD     C       16      Sounding_datum
ACD     I       17      X_false_origin
ACD     I       18      Y_false_origin
ACD     I       19      Z_false_origin
ACD     C       20      Projection
ACD     I       21      Projn_parameter_A       0       10
ACD     I       22      Compn_count             0       99
ACD     I       23      Revn_count              0       9
ACD     I       24      Product_spec
ACD     D       25      Product_spec_date
ACD     I       26      Spec_change_number      0       999
ACD     C       27      Country
ACD     C       28      Agency
ACD     C       29      Branch
```

```
ACD     I       30      Dig_system
ACD     I       31      Proc_system
ACD     C       32      Grid_code
ACD     I       33      Abs_horiz_acc           0       9999
ACD     I       34      Abs_vert_acc            0       9999
ACD     I       35      Rel_horiz_acc           0       9999
ACD     I       36      Rel_vert_acc            0       9999
ACD     I       37      Height_acc              0       9999
ACD     I       38      Data_gen                0       1
ACD     I       39      N_mm_number             0       9
ACD     I       40      E_mm_number             0       9
ACD     I       41      S_mm_number             0       9
ACD     I       42      W_mm_number             0       9
ACD     D       43      N_mm_date
ACD     D       44      E_mm_date
ACD     D       45      S_mm_date
ACD     D       46      W_mm_date
ACD     D       47      Earliest_source_date
ACD     D       48      Latest_source_date
ACD     I       49      Data_colln_code         0       9
ACD     I       50      Data_colln_crit         0       999
ACD     I       52      Registration_ID         0       999999
ACD     I       53      Control_X               0       999999
ACD     I       54      Control_Y               0       999999
ACD     I       55      Control_Z               0       999999
ACD     I       56      Registration_lat
ACD     I       57      Registration_long
ACD     I       58      Registration_elev
ACD     I       59      ACC_abs_horiz_acc       0       9999
ACD     I       60      ACC_abs_vert_acc        0       9999
ACD     I       61      ACC_rel_horiz_acc       0       9999
ACD     I       62      ACC_rel_vert_acc        0       9999

!  AC's for each feature

ACD     I       70      Source_code             0       99
ACD     I       71      Source_scale
ACD     D       72      Source_date
ACD     I       73      Collection_system       0       99
ACD     D       74      Maintenance_date
ACD     I       75      Feature_horiz_acc       0       9999
ACD     I       76      Feature_vert_acc        0       9999
ACD     I       77      Base_product            0       999
ACD     C       78      Security_class
ACD     C       79      Data_handling
ACD     I       80      Portrayal               0       99
ACD     C       81      FACS_prefix
ACD     C       82      FACS_code

ACD     I       101     I_FACS_attribute_A      0       99
ACD     I       102     I_FACS_attribute_B      0       99
ACD     I       103     I_FACS_attribute_C      0       99
ACD     I       104     I_FACS_attribute_D      0       99
ACD     I       105     I_FACS_attribute_E      0       99
ACD     I       106     I_FACS_attribute_F      0       99
ACD     I       107     I_FACS_attribute_G      0       99
```

ACD	I	108	I_FACS_attribute_H	0	99
ACD	I	109	I_FACS_attribute_I	0	99
ACD	R	110	R_FACS_attribute_J	0.0	999.0
ACD	R	111	R_FACS_attribute_K	0.0	999.0
ACD	R	112	R_FACS_attribute_L	0.0	999.0
ACD	R	113	R_FACS_attribute_M	0.0	999.0
ACD	I	114	I_FACS_attribute_N	0	99
ACD	I	115	I_FACS_attribute_O	0	99
ACD	I	116	I_FACS_attribute_P	0	99
ACD	I	117	I_FACS_attribute_Q	0	99
ACD	I	118	I_FACS_attribute_R	0	99
ACD	I	119	I_FACS_attribute_S	0	99
ACD	I	120	I_FACS_attribute_T	0	99
ACD	I	121	I_FACS_attribute_U	0	99
ACD	I	122	I_FACS_attribute_V	0	99
ACD	R	123	R_FACS_attribute_W	0.0	999.0
ACD	R	124	R_FACS_attribute_X	0.0	999.0
ACD	R	125	R_FACS_attribute_Y	0.0	999.0
ACD	R	126	R_FACS_attribute_Z	0.0	999.0
ACD	R	201	Value_attribute_A		
ACD	R	202	Value_attribute_B		
ACD	R	203	Value_attribute_C		
ACD	R	204	Value_attribute_D		
ACD	R	205	Value_attribute_E		
ACD	R	206	Value_attribute_F		
ACD	R	207	Value_attribute_G		
ACD	R	208	Value_attribute_H		
ACD	R	209	Value_attribute_I		
ACD	R	210	Value_attribute_J		
ACD	R	211	Value_attribute_K		
ACD	R	212	Value_attribute_L		
ACD	I	300	Text_attribute	10	20

CHAPTER 3

I2CEDD UTILITY

UTILITY I2CEDD

FUNCTION

I2CEDD is a utility to write onto disc or magnetic tape an International Hydrographic Organisation (IHO) Committee for the Exchange of Digital Data (CEDD) format file from an Internal Feature Format (IFF) disc file.

FORMAT

$ I2CEDD Input-IFF-file-spec Output-CEDD-file-spec

Command qualifiers	**Defaults**
/[NO]DIAGNOSTICS	/NODIAGNOSTICS
/FRT = file-spec	/see text
/TEXT [=file-spec]	/NOTEXT

PROMPT

_Input-IFF-file: Input-IFF-file-spec

_Output-IFF-file: Output-CEDD-file-spec

PARAMETERS

Input-IFF-file-spec

- specifies the input IFF file. Any part of the file specification which is not supplied will be taken from the default specification: 'LSL$IF:IFF.IFF'.

Output-CEDD-file-spec

- specifies the output CEDD file. Any part of the file specification which is not supplied will be taken from the default specification: 'LSL$IF:CEDD.FILE'.

COMMAND QUALIFIERS

/DIAGNOSTICS
/NODIAGNOSTICS (default)

- selects the output of diagnostic messages, describing the progress of the IFF file to CEDD conversion.

/FRT = file-spec

- specifies the FRT file which the program will use to interpret the feature codes (FC), together with any attribute codes (AC). Any part of the FRT file specification not provided will be taken from the default: 'LSL$FRT:CEDD.FRT'.

/TEXT [= file-spec]
/NOTEXT (default)

- specifies the text file which the program will use to insert into the TXT record at the end of all the CEDD data. Any part of the filename not supplied will be taken from the default specification: 'LSL$IF:IFF.TXT'. If the /TEXT qualifier is given without any filename, the file with the same name as the input IFF file with a .TXT extension is expected to exist. If no /TEXT qualifier is given no text file will be used and no TXT record created.

DESCRIPTION

Command line

The symbol I2CEDD is normally set up as:

```
I2CEDD == "$lsl$exe:I2CEDD"
```

and the program may then be used as if it were a normal VMS utility.

Input IFF file

The input is an IFF file on disc, possibly containing CEDD data. It is also necessary to supply an FRT file containing the feature codes in the IFF file and the attribute codes containing any data to be used in the CEDD file. To completely specify the DSI record in the CEDD file, there should be a layer 0 in the IFF file containing some or all of three types of feature.

The enclosing feature (FC = 1) describes the whole map, and contains the AC's containing the data to be inserted into the DSI record. Registration points (FC = 2) contain the data to align map coordinates to real world coordinates in the AC's, and Accuracy outlines (FC = 3) are area features containing further accuracy data in the AC's. There may be up to 999 registration points, and up to 99 accuracy outlines each with up to 99 coordinate pairs. Any layer 0 features not conforming to this structure will be ignored.

To enable a FACS (Feature Attribute Coding Scheme) feature code to be given to the output CEDD file, it must be supplied in the two ACD types as specified in the CEDD FRT file for each feature in the IFF file, and the rest of the information for the CEDD feature header blocks must exist in the AC entries for each feature.

Output file

The output file will be a CEDD file on disc or magnetic tape depending on the supplied output file specification. The default action is to output a single CEDD file from a single IFF file, selected by the input and output command line parameters.

Program action

After decoding the command line, opening any required files and initialising the supplied FRT file, the program reads the IFF entries in sequence.

Most of the IFF header entries are skipped over, except the RA range giving the map extents, and the MD2 entry for all the required file information. If either of these two entries are absent, serious errors will occur, resulting in major absences from the CEDD file. The first NO new overlay entry determines the programs next action, whether to process layer 0 or to process the features.

Any layer 0 is scanned for the expected three feature types, and their addresses stored. Any other feature types here will give a warning and be ignored. The enclosing feature is first processed, and the AC entries read and their information output to the relevant fields in the DSI record of the CEDD file. Some of the information about vertical measurements is only available at this stage as IFF files have no provision for this type of information.

The information from the IFF RA and MD2 entries is used to output further information to the DSI record, eg. the latitude and longitude extents from the range, and the dataset origin, file units, projection etc. from the MD2. Also from the range is calculated an offset to ensure that there are no negative coordinates output to the segment records later, and a scaling factor by which the offset coordinate values are multiplied to fit into the 6 digit coordinate field with as much dynamic range as possible. After scanning the remaining features in the IFF file to determine whether we are dealing with a two or three dimensional map, and finding the minimum and maximum z coordinate value if relevant, similar origin shift and scaling is calculated for the vertical coordinates. If the IFF file is three dimensional without having any vertical information, vertical units of metres are assumed.

With the main components of the DSI record now constructed, the registration points and accuracy regions in layer 0 are read and appended to the DSI. For the registration points the x,y geographic AC coordinate values stored in integer IFF units are converted into latitude and longitude and output with the x, y (and z) map registration coordinates. The accuracy region x and y values in IFF units are converted into latitude and longitude values. The DSI

record is then completed by padding with 'DEL' characters to the end of the 1980 character block.

Having completed all the header information for CEDD, the IFF features are again read in sequence, ignoring any further layer structuring, and the AC entries for each feature used to construct the feature header block. The graphical type defined by the feature's feature code (FC) in the FRT file determines whether the feature is of type point, line or area giving feature codes of 4, 5, 6 respectively. The feature's position in the IFF file determines the ID number, and as there is no chain-node structure in a IFF file, the segment ID is identical to the feature ID with one segment per feature.

The SEGment record must follow the FEAture record to contain the x, y (and z) coordinate values belonging to the features. The segment ID is the same as the feature ID to which it belongs, and is equal to the feature sequence number in the IFF file.

Any specified text file is translated into the TXT record and appended to the segment record. All files are then closed.

The program produces messages giving information about the transfer, and any errors or difficulties that may be encountered. If the /DIAGNOSTICS qualifier is supplied, more detailed information on the transfer will be produced.

The program checks that the IFF file is valid, and any discrepancies are reported, and will in most cases cause the program to abandon the transfer of data.

EXAMPLES

```
$  I2CEDD/TEXT NEWCEDD0002 MUA0:REREAD0002<CR>

%LSLLIB-I-IFFOPENED, LSL$DATAROOT:[LSL.IFF]NEWCEDD0002.IFF;1 opened for read

 Reading from IFF file LSL$DATAROOT:[LSL.IFF]NEWCEDD0002.IFF;1

 Outputting data to CEDD file MUA0:REREAD0002.FILE

 Horizontal units of CEDD file are: SEC
  With resolution:    0.001

  (IFF coordinates are being scaled by: 100.000)

  File Origin is:
   Latitude   36  52  30.87 N
   Longitude 076  24  09.54 W

 Vertical units of CEDD file are: M
  With resolution:    0.001

  (IFF coordinates are being scaled by: 100.000)

%CEDD2I-S-NORMAL, CEDD2I normal successful completion'
 ELAPSED:    0 00:04:13.11  CPU: 0:00:20.61  BUFIO: 27  DIRIO: 333  FAULTS: 313
```

In this example is shown a straight conversion from IFF to CEDD, in this case to a file on tape (MUA0:) but the tape is mounted non-FOREIGN and looks like a normal VMS file. Because the /TEXT qualifier is given with no filename argument, the contents of the file 'LSL$IF:NEWCEDD0002.TXT' are used for the TXT record of the CEDD file.

```
$ I2CEDD/TEXT/DIAGNOSTICS NEWCEDD0003 MUA0:REREAD0003<CR>

.Command line was:
I2CEDD/FRT=LSL$FRT:CEDD.FRT/TEXT/DIAGNOSTICS NEWCEDD0003 MUA0:REREAD0003

%LSLLIB-I-IFFOPENED, LSL$DATAROOT:[LSL.IFF]NEWCEDD0003.IFF;1 opened for read

 Reading from IFF file LSL$DATAROOT:[LSL.IFF]NEWCEDD0003.IFF;1
```

```
 Outputting data to CEDD file MUA0:REREAD0003.FILE

 IFF file header entries read

   Range of coordinates is  (in IFF units:
       0.00   1260.00         0.00    830.00
   Origin: 1328030.0, -2748970.0


 Scanning layer 0 features

 Processing enclosing feature
 Enclosing feature ACs read

 Horizontal units of CEDD file are: SEC
  With resolution:    0.001

  (IFF coordinates are being scaled by: 100.000)

 File Origin is:
  Latitude   36  53  23.00 N
  Longitude 076  21  37.00 W

 IFF header information output
.Reading Registration point 1
.Registration point 1 completed
.Reading Registration point 2
.Registration point 2 completed
.Reading Registration point 3
.Registration point 3 completed
.Reading Registration point 4
.Registration point 4 completed
.Outputting block with label DSI00001

.Writing FEA entry for feature FSN 1
.Writing FEA entry for feature FSN 2
.Writing FEA entry for feature FSN 3



.Writing FEA entry for feature FSN 140
.Writing FEA entry for feature FSN 141
.Writing FEA entry for feature FSN 142
.Outputting block with label FEA00013

.Writing SEG entry for feature FSN 1
.Writing SEG entry for feature FSN 2
.Writing SEG entry for feature FSN 3
.Writing SEG entry for feature FSN 4
.Writing SEG entry for feature FSN 5
.Outputting block with label SEG00001

.Writing SEG entry for feature FSN 6
.Writing SEG entry for feature FSN 7
.Writing SEG entry for feature FSN 8
```

```
.Writing SEG entry for feature FSN 139
.Writing SEG entry for feature FSN 140
.Writing SEG entry for feature FSN 141
.Outputting block with label SEG00008

.Writing SEG entry for feature FSN 142
.Outputting block with label SEG00009


 Processing text file LSL$IF:NEXCEDD0003.TXT;0
.Outputting block with label TXT00001


%CEDD2I-S-NORMAL, CEDD2I normal successful completion'
 ELAPSED:   0 00:01:32.59  CPU: 0:00:26.20  BUFIO: 381  DIRIO: 290  FAULTS: 312
```

In this example is shown another conversion from IFF to CEDD, again to a file on tape, with the /TEXT qualifier. Also the /DIAGNOSTICS qualifier is given to give further information on the progress of the IFF to CEDD conversion.

MESSAGES (SUCCESS)

These messages are used to indicate that the program has succeeded in performing some action, and do not require any user action.

NORMAL, Normal, successfull completion

Explanation: I2CEDD has completed successfully.

User action: None.

MESSAGES (WARNING)

These messages are output when an error has occurred that can be corrected immediately by the user or that the program will attempt to overcome.

ACDFNDERR, AC type 'integer' not found in FRT file

Explanation: An unexpected AC type has been encountered in the IFF file that does not have an entry in the ACD section of the FRT file, or could not be processed into the ACD common block.

User action: Check the IFF file and the FRT file.

ACLENERR, text attribute AC 'integer' found with odd length 'integer'

Explanation: The text attribute AC had an unexpected entry in the AC value field as the number of characters in the text string, and the AC has been ignored.

User action: Check the IFF file.

ACMISSING, no AC entry in feature FSN 'integer' (ISN 'integer')

Explanation: None of expected AC entries were found in the feature of the IFF file.

User action: Check the data in the IFF file.

ACNOTFOUND, AC entries missing from IFF feature

Explanation: None of expected AC entries were found in the feature of the IFF file.

User action: Check the data in the IFF file.

ACWRONGFTR, AC type 'AC type' is in the wrong feature

Explanation: The AC type is in the wrong feature, and will be ignored.

User action: Check the data in the IFF file.

FRTFNDERR, FC type 'integer' not found in FRT file

Explanation: An unexpected FC has been encountered in the IFF file that does not have an entry in the FRT file.

User action: Check the IFF file and the FRT file.

FSMISSING, no FS in feature FSN 'integer' (ISN 'integer')

Explanation: The expected FS entry was not found in the feature of the IFF file.

User action: Check the data in the IFF file.

IGNOREDMH, Map Header entry ignored

Explanation: There was a MH map header entry that was not an unset one, and it has been ignored.

User action: None.

INVALPROJN, projection 'integer' invalid for coordinate type

Explanation: The MD2 projection code given in the IFF file is inconsistent with the map coordinate units being geographic, and has been reset to be 100, ie. geographic.

User action: Check the data in the IFF file.

MIXSTZS, ZS and ST entries in the same feature, FSN 'integer'

Explanation: A mixture of ZS and ST entries has been found in the same feature. Since it is not possible to have a feature which is both 2 and 3 dimensional, this is not allowed.

User action: The user should take steps to ensure that the feature contains either entirely ZS or entirely ST entries, before retrying the transfer with I2CEDD.

NOCOORD, No ST or ZS entries found in feature FSN 'integer'

Explanation: A feature has been found with no ST or ZS entries. Hence it contains no coordinates for output to the CEDD SEG record.

User action: The user should check that the input IFF file has been properly constructed and processed. Some editing of the file may be needed to correct the problem before retrying the transfer.

STNOTFOUND, ST entries missing from IFF feature

Explanation: None of expected ST entries were found in the feature of the IFF file.

User action: Check the data in the IFF file.

TOOMNYPNTS, Too many points in ZS or ST in feature FSN 'integer'

Explanation: A ZS or ST entry has been found with more than the recommended number of points (200).

User action: Amend the IFF feature by breaking the offending ZS or ST entry into several such entries each with a smaller number of points.

UNEXPENTRY, unexpected entry 'char' in IFF file

Explanation: There was an unexpected entry encountered in the IFF file.

User action: Check the data in the IFF file.

MESSAGES (ERROR)

These messages indicate an error in processing which will cause the program to terminate. The most likely causes are a corrupt or otherwise invalid input file, or an error related to command line processing and file manipulation.

BADIFFUNITS, IFF file units not of permitted geographical types

Explanation: The units of the IFF file coordinates, as specified in the map descriptor are not of the permitted types. These legal units are radians, degrees, seconds, minutes or tenths of seconds.

User action: The user should check that an appropriate IFF input file is being used, and that the file has not been corrupted, before retrying the command.

CMDLINERR, error in reading command line

Explanation: There was an error decoding the command line specified to run the program.

User action: Respecify the command line.

DMSCONVERR, error turning 'real' to degrees, minutes, sec/100

Explanation: An error has occurred while converting angle fields into lat/longitude.

User action: Check the data in the IFF file.

EXPFLNERR, error extracting filename 'filename' from /FILENAME/

Explanation: There was an error extracting a filename from /FILENAME/ while creating new filenames.

User action: Check the validity of the supplied filename.

FILCLOERR, unable to close file 'filename'

Explanation: There was an error that prevented the closure of the file, and will be left in a strange state.

User action: Check for any system errors that might have caused the error.

FILOPNERR, unable to open file 'filename'

Explanation: There was an error that prevented the opening of the file for writing.

User action: Check for any system errors that might have caused the error.

FRTINTERR, error opening FRT file 'filename'

Explanation: There was an error initialising the required FRT file.

User action: Check the FRT file.

FSREPOSERR, error repositioning to FS entry at 'integer'

Explanation: There was an error repositioning to the known position of the FS entry.

User action: Check the data in the IFF file.

IFFOPNERR, unable to open IFF file 'filename'

Explanation: An error has occurred in the opening of the IFF file. Further information is given in the accompanying error messages. The most likely cause of failure is an invalid file specification, or invalid system status for the creation of disc files.

User action: Check that the file specification used in the parameter of the DCL command line is valid for your local system, and that there are no access or protection violation problems. Resubmit the command line with a valid file specification.

INVALDAYS, invalid days given: 'integer'

Explanation: The value given to be converted into a date was out of range.

User action: Check the data in the IFF file.

NOFEA, No features found in the IFF file

Explanation: No data features (features other than those in layer 0) have been found in the input IFF file.

User action: The user should add any features required to the input IFF file, in layers other than layer 0, before retrying the transfer with I2CEDD.

NOREPOSERR, error repositioning to FS entry at 'integer'

Explanation: There was an error repositioning to the known position of the NO entry.

User action: Check the data in the IFF file.

OPNFILERR, Error while opening files

Explanation: An error has occurred in the opening of the disc files. The most likely reasons for the failure are an incorrectly specified file specification in the DCL command line parameter, or invalid file creation status. The accompanying error messages give further information about the failure.

User action: Resubmit the command line with a valid file specification, or check user status.

PUTFLNERR, error putting filename 'filename' into /FILENAME/

Explanation: There was an error priming /FILENAME/ with the required filename prior to creating new filenames.

User action: Check the validity of the supplied filename

RAMISSING, no RA entry in IFF file

Explanation: The Range RA entry was missing from the IFF file.

User action: Check the data in the IFF file.

UNEXPENDFTR, unexpected end of feature FSN 'integer' (ISN 'integer')

Explanation: An unexpected EF end of feature entry was encountered.

User action: Check the data in the IFF file.

UNEXPENDIFF, unexpected end of IFF

Explanation: The IFF file being read has come to an unexpected end.

User action: Check the data in the IFF file.

UNEXPFC, unexpected FC feature code 'integer'

Explanation: An unexpected feature code was encountered.

User action: Check the data in the IFF file.

UNFINDFEALAY, Unable to locate non-zero layers in IFF file

Explanation: The program I2CEDD has been unable to locate the layers, other than layer 0, containing the features for transfer to the FEA and SEG records of the CEDD tape.

User action:

UNSETMD, The MD entry is unset or not type 2

Explanation: The MD entry is either not type 2 or has an unrecognised length, and therefore left unset and some required entries missed from the CEDD file.

User action: Check the data in the IFF file.

YMDCONVERR, Error turning 'integer' days to day/month/year in AC 'AC type'

Explanation: The integer number of days given from the AC specified could not be converted into the form day/month/year.

User action: Check the data in the relevant AC.

MESSAGES (OTHER)

In addition to the above messages which are generated by the program itself, other messages may be produced by the command line interpreter (CLI) and by Laser-Scan libraries. In particular, messages may be generated by the IFF library and by the Laser-Scan I/O library, LSLLIB. IFF library messages are introduced by '%IFF' and are documented in the IFF library users' guide. In most cases IFF errors will be due to a corrupt input file, and this should be the first area of investigation. If the cause of the error cannot be traced by the user, and Laser-Scan are consulted, then the output file should be preserved to facilitate diagnosis. LSLLIB messages are introduced by '%LSLLIB' and are generally self-explanatory. They are used to explain the details of program generated errors.

CHAPTER 4

CEDD2I UTILITY

UTILITY CEDD2I

FUNCTION

CEDD2I is a utility to transfer a dataset from an International Hydrographic Organisation (IHO) Committee for the Exchange of Digital Data (CEDD) format magnetic tape or disc file to an Internal Feature Format (IFF) disc file.

FORMAT

$ CEDD2I Input-CEDD-file-spec Output-IFF-file-spec

Command qualifiers	**Defaults**
/[NO]DIAGNOSTICS	/NODIAGNOSTICS
/[NO]DUMP [=file-spec]	/NODUMP
/FRT = file-spec	/LSL$FRT:CEDD.FRT
/[NO]FULL_DIAGNOSTICS	/NOFULL_DIAGNOSTICS
/LATITUDE = DDMMSS.SSH	see text
/LONGITUDE = DDDMMSS.SSH	see text
/[NO]REWIND	/NOREWIND
/[NO]SELECT [=integer (list)]	see text

PROMPT

_Input-CEDD-file: Input-CEDD-file-spec

_Output-IFF-file: Output-IFF-file-spec

PARAMETERS

Input-CEDD-file-spec

- specifies the input CEDD file, either a tape or disc file. Any part of the file specification which is not supplied will be taken from the default specification: 'LSL$IF:CEDD.FILE'.

Output-IFF-file-spec

- specifies the output IFF file. Any part of the file specification which is not supplied will be taken from the default specification: 'LSL$IF:CEDD.IFF'.

COMMAND QUALIFIERS

/DIAGNOSTICS
/NODIAGNOSTICS (default)

- selects the output of selected basic diagnostic messages, describing the progress of the CEDD to IFF file conversion.

/DUMP [= file-spec]
/NODUMP (default)

- if specified, a dump of each tape block is output to the specified file, or to SYS$OUTPUT if no file specification is supplied. The data records are output as a series of hexadecimal longword values. The qualifier is used to verify the tape structure.

/FRT = file-spec

- specifies the FRT file specification containing the normal FRT entries and the attribute code definitions (ACD) entries. Any part of the file spec which is not supplied is taken from the default definition: 'LSL$FRT:CEDD.FRT'.

/FULL_DIAGNOSTICS
/NOFULL_DIAGNOSTICS (default)

- selects the output of full diagnostic messages, describing the progress of the CEDD to IFF file conversion. This will probably take a long time.

/LATITUDE = string

- specifies that CEDD2I is to search for a dataset on the tape with the required latitude origin, or a dataset with the required latitude and longitude origin if the /LONGITUDE qualifier has also been specified. The tape must have been mounted FOREIGN for the /LATITUDE qualifier to be operative.

  The latitude value is specified in the form DDMMSS.SSH where DD is the number of degrees, MM is the number of minutes, SS.SS is the number of seconds, and H is the hemisphere (either N or S).

  The /LATITUDE qualifier must not be specified with the /SELECT qualifier.

/LONGITUDE = string

- specifies that CEDD2I is to search for a dataset on the tape with the required longitude origin, or a dataset with the required latitude and longitude origin if the /LATITUDE qualifier has also been specified. The tape must have been mounted FOREIGN for the /LONGITUDE qualifier to be operative.

The longitude value is specified in the form DDDMMSS.SSH where DDD is the number of degrees, MM is the number of minutes, SS.SS is the number of seconds, and H is the hemisphere (either E or W).

The /LONGITUDE qualifier must not be specified with the /SELECT qualifier.

/SELECT [= integer (list)]

- if specified, the tape is searched for the required dataset, or datasets. The tape must have been mounted FOREIGN for the /SELECT qualifier to be operative.

  The /SELECT qualifier has a number of options:

  /SELECT with no argument list will cause the program to transfer the next dataset on the tape, using the specified Output-IFF-file-spec for output.

  /SELECT = (integer list) will search for all the requested datasets by their number on the tape (the tape will be REWOUND for the numbers to make sense), and, if more than one file is requested, the datasets will be transferred to a set of IFF files whose file-specs are derived from the specified Output-IFF-file-spec by adding the extension _000n to the name part of the file-spec (a maximum of 1024 numbers can be requested in any one line). The default output file-spec will therefore be 'LSL$IF:CEDD_0001.IFF' for the first file on tape.

  If no /SELECT is given, all the datasets remaining on tape will be copied to output file-specs derived in the same way as for the /SELECT = list option.

  It makes no sense to request /SELECT = 0.

  This qualifier must not be specified with either the /LATITUDE or /LONGITUDE qualifiers.

/REWIND
/NOREWIND (default)

- if present, the tape is rewound prior to reading. Any dataset search will therefore start from the BOT. By default no tape rewind is performed, and dataset search begins from the current tape position.

RESTRICTIONS

- /MANUSCRIPT and /LATITUDE is not allowed
- /MANUSCRIPT and /LONGITUDE is not allowed

DESCRIPTION

Command line

The symbol CEDD2I is normally set up as:

```
CEDD2I == "$lsl$exe:cedd2i"
```

and the program may then be used as if it were a normal VMS utility.

Input file

If the input files are on magnetic tape on a standard tape drive without a ANSI structure that would enable the tape to be read as a normal file with the usual VMS commands, then the tape should be mounted/FOREIGN, for example:

```
$ MOUNT/FOREIGN MSA0:
```

The program may then be run with the tape device specified as the input file spec, which will be tested for FOREIGN mounting (and any filename ignored). With FOREIGN mounting any search qualifiers may be used to retrieve the required dataset.

If a valid ANSI structure has been imposed on the tape, it may be mounted not-FOREIGN and treated as a normal ANSI file obeying all the usual VMS utilities, and the file(s) preferably COPIED to disc to facilitate the CEDD to IFF transfer. In this case only one file may be converted at one time with CEDD2I, with its file name used as the normal input file-spec. The file select mechanisms no longer apply.

If for some reason the tape ANSI structure has become corrupted, or is in compatible with the operating system and CEDD2I fails to read the file, the tape should always be able to be read by mounting it FOREIGN and the program will read it block by block extracting the relevant data.

The input is expected to be valid CEDD data, possibly composed of several files. If the tape structure is visible by mounting FOREIGN, there will a VOLume label at the start of the tape, and each dataset is preceeded by header labels and tapemark, and terminated by another tapemark, any EOF trailers and then a single tapemark, or two tapemarks to signal the end of all data on the tape. The actual data records within the tape markers consist of the DSI, FEAture, SEGment and optional TXT text records. If mounted non-FOREIGN, it is only these last four block types that will be visible to the user, all others having been made transparent by the operating sytem. For further description of the CEDD data structure see the accompanying FORMAT chapter, or the International Hydrographic Organisation Format for the Exchange of Digital Hydrographic Data (November 1986).

Output file

The default action is to output one dataset to a single IFF file, the required dataset having been selected by the appropriate command line qualifier(s), or input filename. As many datasets as are required can be output by suitable choice of command line qualifiers, if mounted FOREIGN, selecting by file number on tape, or latitude/longitude origin.

Program action

After decoding the command line, and opening any DUMP file if requested, and initialising the supplied FRT file, the program reads the CEDD data records in sequence.

First the DSI record is read and any relevant information, if present, is used to create the IFF file header entries (RA, MD type 2, CP) that need this map specific data. The file origin origin is converted into IFF units and used for the MD2LOC origin offset, and the extents also converted, if present, are used for the RA range entry. Two of these entries (RA, CP) need the extent of the map which may not be present here and their address in the IFF file is stored for future reference. The other IFF header entries are output at this stage as well (HI, MH (unset), NS, CC).

Any information not transferable to these header entries is put into AC entries belonging to an enclosing area feature (feature code FC = 1) that describes the whole map, as it is known at this stage, in layer 0. If the full coordinate extent information is not available at this stage, or has different values to those stated here by the end of reading the entire dataset, the program will reposition to those entries (RA, CP) and update them, together with the coordinates of the enclosing feature in its ST entry, at the end of the program.

Any subsequent Registration points and Accuracy regions that may be present are also output to Layer 0 as point (FC = 2) and area (FC = 3) features respectively, with their values output to the feature's AC entries. If the CEDD dataset is geographic, the latitude and longitude coordinates converted into IFF units are used as the x,y coordinate positions for the registration points, and if not geographic the x,y (and z) registration values are used for the x,y (z) ST/ZS coordinates. All the geographic and map coordinates are stored in the feature's AC entries, the latitude and longitude being converted into integer hundredths of seconds. The x, y, z control points are converted into integer IFF units. If the map is not geographic the accuracy region coordinates will be unreadable, and the regions if there will be ignored.

The FEAture records come next, indexed by a feature Identification Number, containing all the descriptive information on each feature, and a list of references to the coordinate segments belonging to it. As each feature is encountered, a new feature is created in a temporary storage IFF file 'LSL$IF:TEMP.FEA' into which is output the same IFF header entries as the main IFF file, followed by, in layer 2, any relevant feature information in AC entries necessary for the later

recreation of the final IFF file features.

The FSN field of the NF entry contains the number of segments which belong to this feature, and which wiil be read later in the SEGment records.

Next the FS entry contains the feature FC (feature code) derived from the feature type, at present defined simply as point, line, or area. Point features are stored with symbol string feature coding (FC = 4) due to the possibility of storing many points in the same feature. Line features have FC = 5, and area features have FC = 6.

All the per-feature information stored in the feature header blocks is output to AC entries for the feature (see the relevant FRT), including the all important FACS (Feature Attribute Coding Scheme) code. Any FACS attribute field values are inserted into AC types (1100+field number), with the field number between 1 and 26. Fields of width 2 characters are treated as integers, and those of width 3 characters are treated as real. Value attribute fields are put into AC types (1200+field number), with the field number between 1 and 2 for feature headers with 4 blocks of 40 characters, and between 1 and 12 for the maximum 6 block feature headers. Text attributes are put into AC types (1300+field number), with the field number between 1 and 3 and the value field containing the length of the text string which is read into the AC text string field.

These AC attribute entries when combined with the FACS code can be used to create any feature coding scheme to replace the basic one used in this program.

Finally are created ST entries containing in the coordinate fields the Identification Numbers and Directions of all the segments belonging to this feature (the number of ST entries therefore being equal to the number of segments stored in the FSN field of the NF entry).

The following SEGment records contain all the coordinate information which the feature records are expecting, indexed by segment Identification Number, and referenced to the features to which they belong. Again a temporary storage IFF file is created 'LSL$IF:TEMP.SEG' into which is output all the coordinate information as proper ST/ZS entries, the number of which is stored in the FSN field of the NF entry. The address of each NF entry in this IFF file is stored in an array using the segment Identification Number as the array index in order to be able to locate the relevant segments later.

These two temporary files are now merged into the final main IFF file by creating in layer 1 new feature (NF) entries, and then copying directly from the temporary files the FS and all AC entries from the .FEA file, followed by all the ST/ZS entries from the .SEG file which belong to the feature, (reversing any coordinate strings if so specified by the Segment Direction). Any adjacent identical points are removed from coordinate strings going into the same feature, point coordinates belonging to the same feature are merged into the same ST/ZS entry up to the maximum number of 200, and then the final EF is

written. This is done for each feature in the .FEA file, referencing by segment ID all the relevant segments in the .SEG file.

When this merger is completed, it only remains to reposition to any entries in the IFF header dependant on the map extents that may not have been present at the DSI record, or may have been incorrect, and insert the correct values. These are the Range (RA), Corner Points (CP), and the coordinates of the first dummy area feature in its ST entries so that it describes the whole of the map.

There is an optional TXT record containing informational text relevant to the dataset as a whole. This is copied to a file with the same name as the main IFF file with the .TXT extension.

The temporary .FEA and .SEG files are deleted unless the /(FULL_)DIAGNOSTICS qualifier is switched on for examination in case of program errors.

The program produces messages giving information about the files and blocks being read from the tape or disc, and any errors or difficulties that may have been encountered. If the /(FULL_)DIAGNOSTICS qualifier is supplied, more detailed information on the transfer will be produced. The /DUMP qualifier may be used to produce a hexadecimal dump of the dataset records if the tape has been mounted FOREIGN. This option allows the structure of the CEDD tape to be verified.

The program checks that the CEDD tape corresponds to the CEDD specification. Any discrepancies on the tape are reported, and will in most cases cause the program to abandon the transfer of data to disc.

EXAMPLES

```
$ CEDD2I/REWIND MUA0: TESTCEDD<CR>

 Tape MUA0:  has been mounted FOREIGN

Reading from mag tape unit MUA0:
Tape now rewound to BOT

Copying dataset no. 1 from tape
  to output IFF file LSL$IF:TESTCEDD_0001.IFF

 Dataset origin is:

    Latitude    36  52  30.86 N   (13275086)
   Longitude    76  24   9.54 W   (-27504954)

 Geographic coordinates used throughout map

 Coordinates are 3-dim:  0.0100 SEC  by   0.0100 SEC    0.1000 M

 Horiz units are arcsec/100: converting to arcsec/10

 Local Origin is (x,y):  -2750495.4 1327508.6

 Range of map is:
      0.00   6959.00        0.00   5472.00

%CEDD2I-W-PROJNINVAL, projection MC invalid for coordinate type GEO

%CEDD2I-W-STRUCTERR, unexpected structure code:

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TESTCEDD_0001.IFF;2

 8 Registration points

 No Accuracy Regions

 Stopped reading DSI at  DSI End                  at 1067

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TEMP.FEA;7

 End of Feature record at Feature ID Number         2637

 2637 features successfully read
 0 features abandoned

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TEMP.SEG;3

 End of Segment record at Segment ID Number         2637

 Range modified by SEGment coordinates to:
      0.00   6959.30        0.00   5472.00
```

```
2637 segments successfully read
0 segments abandoned

 Feature copying terminated at the 2637th feature

 2637 features successfully copied
 0 features abandoned

 IFF file LSL$IF:TESTCEDD_0001.IFF closed

 Temporary FEAture IFF file LSL$IF:TEMP.FEA deleted

 Temporary SEGment IFF file LSL$IF:TEMP.SEG deleted

Copying dataset no. 2 from tape
  to output IFF file LSL$IF:TESTCEDD_0002.IFF

 Dataset origin is:

    Latitude    36  52  30.87 N   (13275087)
   Longitude    76  24   9.54 W   (-27504954)

 Geographic coordinates used throughout map

 Coordinates are 3-dim:  0.0100 SEC  by   0.0100 SEC    0.1000 M

 Horiz units are arcsec/100: converting to arcsec/10

 Local Origin is (x,y):  -2750495.4 1327508.7

 Range of map is:
      0.00   6959.00        0.00   5472.00

%CEDD2I-W-PROJNINVAL, projection MC invalid for coordinate type GEO

%CEDD2I-W-STRUCTERR, unexpected structure code:

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TESTCEDD_0002.IFF;1

 8 Registration points

 No Accuracy Regions

 Stopped reading DSI at  DSI End                  at 1067

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TEMP.FEA;7

 End of Feature record at Feature ID Number         22

 22 features successfully read
 0 features abandoned

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TEMP.SEG;3
%CEDD2I-E-UNEXPEND, unexpected end of record reading X Value         at 297
%CEDD2I-E-SEGABANDON, Segment no. 3485 in SEG file abandoned
```

```
3484 segments successfully read
1 segments abandoned

%CEDD2I-E-SEGREADERR, error reading SEG record no. 2
 at tape block no. 1215

 Feature copying terminated at the 22th feature

 22 features successfully copied
 0 features abandoned

 IFF file LSL$IF:TESTCEDD_0002.IFF closed

 Temporary FEAture IFF file LSL$IF:TEMP.FEA deleted

 Temporary SEGment IFF file LSL$IF:TEMP.SEG deleted

Copying dataset no. 3 from tape
  to output IFF file LSL$IF:TESTCEDD_0003.IFF

 Dataset origin is:

    Latitude    36  53  23.00 N   (13280300)
   Longitude    76  21  37.00 W   (-27489700)

 Geographic coordinates used throughout map

 Coordinates are 2-dim:  0.1000 SEC  by   0.1000 SEC

 Local Origin is (x,y):  -2748970.0 1328030.0

 Range of map is:
      0.00   1260.00        0.00    830.00

  This is a Chain-Node map

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TESTCEDD_0003.IFF;1

 4 Registration points

 Stopped reading DSI at  DSI End                  at 857

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TEMP.FEA;7

 End of Feature record at Feature ID Number         142

 142 features successfully read
 0 features abandoned

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TEMP.SEG;3

 End of Segment record at Segment ID Number         229

227 segments successfully read
0 segments abandoned
```

```
 Feature copying terminated at the 142th feature

 142 features successfully copied
 0 features abandoned

 IFF file LSL$IF:TESTCEDD_0003.IFF closed

 Temporary FEAture IFF file LSL$IF:TEMP.FEA deleted

 Temporary SEGment IFF file LSL$IF:TEMP.SEG deleted

%CEDD2I-W-ENDOFDSS, end of datasets on tape encountered at block 1243
%CEDD2I-S-NORMAL, CEDD2I successful completion
ELAPSED: 0 00:17:49.69  CPU: 0:08:10.59  BUFIO: 368  DIRIO: 13191  FAULTS: 314
```

In this first example, the tape has been rewound and no /SELECT qualifier given so that all datasets on the tape are copied to IFF files with names generated from the supplied output filename. There is an error in the second dataset where the segment record has prematurely ended, but tape copying has recovered, and the missed data does not affect the final IFF file.

```
$ CEDD2I/SELECT=(2,3)/DIAGNOSTICS MUA0: TESTCEDD<CR>

 Tape MUA0:  has been mounted FOREIGN

.Command line was:
CEDD2I/FRT=LSL$FRT:CEDD2I.FRT/SELECT=(2,3)/DIAGNOSTICS MUA0: TESTCEDD

Reading from mag tape unit MUA0:
Tape now rewound to BOT

.Started tape block 1, block length: 1980
.Reading DSI record
.DSI block (no. 1), block no. 1
.Started tape block 2, block length: 1980
.Reading FEA record
.Started tape block 3, block length: 1980
.Reading FEA record

.Reading FEA record
.Started tape block 242, block length: 1980
.Reading SEG record
.Started tape block 243, block length: 1980

.Started tape block 1129, block length: 1980
.Reading SEG record
.Started tape block 1130, block length: 1980
.Reading TXT record
.Started tape block 1131
```

```
.Started tape block 1132, block length: 1980

.Reading DSI record
.DSI block (no. 2), block no. 1132

Copying dataset no. 2 from tape
  to output IFF file LSL$IF:TESTCEDD_0002.IFF

.Date  1/ 3/1986    (46490  days)
.Date  1/ 6/1986    (46582  days)
.Date 18/ 3/1986    (46507  days)
.Date 30/ 7/1985    (46276  days)

. Latitude is   36  52  30.87 N   (13275087  arcsec/100)

.Longitude is   76  24   9.54 W   (-27504954  arcsec/100)

 Dataset origin is:

    Latitude    36  52  30.87 N   (13275087)
   Longitude    76  24   9.54 W   (-27504954)

 Geographic coordinates used throughout map

 Coordinates are 3-dim:  0.0100 SEC  by   0.0100 SEC    0.1000 M

 Horiz units are arcsec/100: converting to arcsec/10

%CEDD2I-W-DSIPUT0, DSI - outputting zero in False Origin              at 219
%CEDD2I-W-DSIPUT0, DSI - outputting zero in False Origin              at 229
%CEDD2I-W-DSIPUT0, DSI - outputting zero in False Origin              at 239

. Latitude is   36  52  30.87 N   (13275087  arcsec/100)

.Longitude is   76  24   9.54 W   (-27504954  arcsec/100)

. Latitude is   37   1  38.00 N   (13329800  arcsec/100)

.Longitude is   76  12  33.61 W   (-27435361  arcsec/100)

 Local Origin is (x,y):  -2750495.4 1327508.7

 Range of map is:
      0.00   6959.00        0.00   5472.00

%CEDD2I-W-PROJNINVAL, projection MC invalid for coordinate type GEO
.Date  1/10/1985    (46339  days)
%CEDD2I-W-DSIPUT0, DSI - outputting zero in Height Accuracy           at 527
%CEDD2I-W-RDYRERR, missed year value in date field at: 536
.Date  0/ 0/   0    (0  days)


%CEDD2I-W-RDYRERR, missed year value in date field at: 556
.Date  0/ 0/   0    (0  days)
%CEDD2I-W-DSIPUT0, DSI - outputting zero in Data Collection code      at 560
%CEDD2I-W-DSIPUT0, DSI - outputting zero in Data Collection criteria  at 561
```

```
%CEDD2I-W-STRUCTERR, unexpected structure code:

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TESTCEDD_0002.IFF;1
.Header information output

.Layer 0 opened

.Outputting DSI information to area feature ACs in layer 0

.Feature 1 in layer 0 completed

 8 Registration points

.Reading Registration Point no. 1

. Latitude is   36  54   0.00 N   (13284000  arcsec/100)

.Longitude is   76  22   0.00 W   (-27492000  arcsec/100)
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration Elevation    at 678
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration X Value      at 686
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration Y Value      at 692
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration Z Value      at 698
.Feature 2 completed

.Reading Registration Point no. 2


.Reading Registration Point no. 8


. Latitude is   37   0   0.00 N   (13320000  arcsec/100)

.Longitude is   76  18   0.00 W   (-27468000  arcsec/100)
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration Elevation    at 1035
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration X Value      at 1043
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration Y Value      at 1049
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration Z Value      at 1055
.Feature 9 completed

.Registration Points completed

 No Accuracy Regions

 Stopped reading DSI at  DSI End                  at 1067

.Layer 0 closed

.Started tape block 1133, block length: 1980
.Reading FEA record
.FEA block (no. 1), block no. 1133

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TEMP.FEA;7
.Header information output

.Layer 2 opened
```

```
.Feature ID Number         1
%CEDD2I-W-FEAPUT1, FEA - outputting 1 in Source Code              at 18
%CEDD2I-W-RDYRERR, missed year value in date field at: 28
.Date  0/ 0/   0    (0  days)
%CEDD2I-W-RDYRERR, missed year value in date field at: 36
.Date  0/ 0/   0    (0  days)
%CEDD2I-W-FEAPUT0, FEA - outputting zero in Base Product              at 50

.Feature Header finished at Text Attribute Field      at 178
.Outputting Feature Header info to ACs in layer 1

.Feature ACs completed

.Feature 1 completed

.Feature ID Number         2


.Feature ID Number         22
%CEDD2I-W-FEAPUT1, FEA - outputting 1 in Source Code              at 618
%CEDD2I-W-RDYRERR, missed year value in date field at: 628
.Date  0/ 0/   0    (0  days)
%CEDD2I-W-RDYRERR, missed year value in date field at: 636
.Date  0/ 0/   0    (0  days)
%CEDD2I-W-FEAPUT0, FEA - outputting zero in Base Product              at 650

.Feature Header finished at Text Attribute Field      at 778
.Outputting Feature Header info to ACs in layer 1

.Feature ACs completed

.Started tape block 1147

.Feature 22 completed

 End of Feature record at Feature ID Number         22

.Layer 2 closed

 22 features successfully read
 0 features abandoned

.Started tape block 1148, block length: 1980
.Reading SEG record
.SEG block (no. 1), block no. 1148

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TEMP.SEG;3
.Header information output

.Layer 3 opened

.Segment ID Number         1

.Feature 1 in SEGment file completed
```

```
.Segment ID Number         2

.Feature 2 in SEGment file completed

.Segment ID Number         3


.Feature 1023 in SEGment file completed

.Segment ID Number         1024

.Feature 1024 in SEGment file completed

ELAPSED:  0 00:04:48.49  CPU: 0:00:37.15  BUFIO: 6980  DIRIO: 1299  FAULTS: 430
```

In this example, the tape has been searched for the second and third datasets, and therefore rewound to make the search numbers sensible. The file names are again generated from the supplied output filename. The basic diagnostic message output has been requested with the /DIAGNOSTICS qualifier giving information about the various stages of file conversion.

```
$ CEDD2I/REWIND/SELECT/FULL_DIAGNOSTICS MUA0: TESTCEDD <CR>

 Tape MUA0:  has been mounted FOREIGN

.Command line was:
CEDD2I/FRT=LSL$FRT:CEDD2I.FRT/REWIND/SELECT/FULL_DIAGNOSTICS MUA0: TESTCEDD

Reading from mag tape unit MUA0:
Tape now rewound to BOT

.Started tape block 1, block length: 1980
.Reading DSI record
.DSI block (no. 1), block no. 1

Copying dataset no. 1 from tape
  to output IFF file LSL$IF:TESTCEDD.IFF
.Dataset Ident Group       DSIG
.Series Designator/product TEST
.Edition Number            2
.Compilation Date  1/ 3/1986    (46490  days)

.Revision Date     1/ 6/1986    (46582  days)

.IHO Format Date  18/ 3/1986    (46507  days)

.FACS Format Date 30/ 7/1985    (46276  days)

.Ignored - unused                                    DSSGU
.Ignored - unused           OADR  UNCLASSIFIED
```

```
.Ignored - unused
.Dataset Parameter Group   DSPG
.Map Data Type             GEO
.Horizontal resolution     SEC
.Horizontal resolution      0.0100

 MD2 units of IFF file are: 110

.Geodetic Datum            WGC
.Ellipsoid/spheroid        CLK

 MD2 spheroid = 0

.Z measurements unit       M
.Vertical resolution        0.1000
.Vertical reference code   MSL
.Vertical Sounding Datum   MHW

 Vertical measurements referenced to
  vertical sounding datum: MHW

.Origin Latitude  is   36  52  30.86 N   (13275086  arcsec/100)
.Origin Longitude is   76  24   9.54 W   (-27504954  arcsec/100)

 Dataset origin is:

    Latitude    36  52  30.86 N   (13275086)
   Longitude    76  24   9.54 W   (-27504954)

 Geographic coordinates used throughout map

 Coordinates are 3-dim:  0.0100 SEC  by   0.0100 SEC    0.1000 M

 Horiz units are arcsec/100: converting to arcsec/10

%CEDD2I-W-DSIPUT0, DSI - outputting zero in False Origin              at 219
.False Origin              0
%CEDD2I-W-DSIPUT0, DSI - outputting zero in False Origin              at 229
.False Origin              0
%CEDD2I-W-DSIPUT0, DSI - outputting zero in False Origin              at 239
.False Origin              0

.Southernmost Latitude is   36  52  30.86 N   (13275086  arcsec/100)

.Westernmost Longitude is   76  24   9.54 W   (-27504954  arcsec/100)

.Northernmost Latitude is   37   1  38.00 N   (13329800  arcsec/100)

.Easternmost Longitude is   76  12  33.61 W   (-27435361  arcsec/100)

.Map extents               5472 6959 arcsec/10

 Local Origin is (x,y):  -2750495.0 1327508.0

 Range of map is:
      0.00   6959.00        0.00   5472.00
```

```
.Total no. of features     2637
.No. of point features     1128
.No. of linear features    1509
.No. of area features      0
.Total no. of segments     2637
.Ignored - unused
.Dataset Map Projn Group   DSMP
.Projection Code           MC
%CEDD2I-W-PROJNINVAL, projection MC invalid for coordinate type GEO

 MD2 projection = 100

.Projection Parameter      076181700W
.Projection Parameter       36570000N
.Projection Parameter
.Projection Parameter
.Scale Reciprocal          20000  (MD2)
.Ignored - unused
.Dataset History Group     DSHG
.Recompilation Count       1
.Revision Count            0
.Producer Spec Stock No.   CEDD
.Date  1/10/1985    (46339  days)
.Product Spec Stock Date   integer date: 46339

.Spec Amendment Number     1
.Producer                  31DMAHTC
.Digitising System         ACDDS
.Processing System         ACDDS
.Grid System Code
.Absolute Horiz Accuracy   0
.Absolute Vert Accuracy    0
.Relative Horiz Accuracy   0
.Relative Vert Accuracy    0
%CEDD2I-W-DSIPUT0, DSI - outputting zero in Height Accuracy          at 527
.Height Accuracy           0
.Data Generalisation       0
.Match/merge number       1  0
.Match/merge number       2  0
.Match/merge number       3  0
.Match/merge number       4  0
missed year value in date field at: 536
.Match/merge Date  0/ 0/   0    (0  days)

missed year value in date field at: 556
.Latest Source Date  0/ 0/   0    (0  days)

%CEDD2I-W-DSIPUT0, DSI - outputting zero in Data Collection code     at 560
.Data Collection code      0
%CEDD2I-W-DSIPUT0, DSI - outputting zero in Data Collection criteria  at 561
.Data Collection criteria  0
.Data Structure Code

%CEDD2I-W-STRUCTERR, unexpected structure code:
```

```
 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TESTCEDD.IFF;1
.Header information output

.Layer 0 opened

.Outputting DSI information to area feature ACs in layer 0

.Feature 1 in layer 0 completed

.Ignored - unused
.DS Variable Address Group DSVG
.Accuracy Regions Address  1061
.Ignored - unused
.DS Registration Group     DSRG
.No of Registration Points 8

 8 Registration points

.Reading Registration Point no. 1

.Registration Point ID No. 1

.Registration  Latitude is   36  54   0.00 N   (13284000  arcsec/100)

.Registration Longitude is   76  22   0.00 W   (-27492000  arcsec/100)
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration Elevation    at 678
.Registration Elevation    0
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration X Value      at 686
.Registration X Value      0
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration Y Value      at 692
.Registration Y Value      0
%CEDD2I-W-REGPUT0, DSI - outputting zero in Registration Z Value      at 698
.Registration Z Value      0
.Feature 2 completed

.Reading Registration Point no. 2


.Feature 9 completed

.Registration Points completed


.DS Accuracy Region Group  DSAG
.No. of Accuracy Regions   0
 No Accuracy Regions

 Stopped reading DSI at  DSI End                  at 1067

.Layer 0 closed

.Started tape block 2, block length: 1980
.Reading FEA record
.FEA block (no. 1), block no. 2

 Outputting data to IFF file LSL$DATA_ROOT:[LSL.IFF]TEMP.FEA;8
```

```
.Header information output

.Layer 2 opened

.Feature ID Number         1
.Feature Type              L
.Header Record Count       4
%CEDD2I-W-FEAPUT0, FEA - outputting 0 in Source Code              at 18
.Source Code               0
.Source Scale Reciprocal   20000
%CEDD2I-W-RDYRERR, missed year value in date field at: 28
.Date  0/ 0/   0    (0  days)
.Source Date               integer date: 0
.Collection System         1
%CEDD2I-W-RDYRERR, missed year value in date field at: 36
.Date  0/ 0/   0    (0  days)
.Maintenance Date          integer date: 0
.Horizontal Accuracy       0
.Vertical Accuracy         0
%CEDD2I-W-FEAPUT0, FEA - outputting zero in Base Product             at 50
.Base Product              0
.Security                  U
.Data Handling
%CEDD2I-W-FEAPUT0, FEA - outputting zero in Portrayal                at 56
.Portrayal                 0
.FACS Code                 2A010
.FACS reserve
.Attribute Field           no. 1 : 0
.Attribute Field           no. 2 : 0
.Attribute Field           no. 3 : 0
.Attribute Field           no. 4 : 0
.Attribute Field           no. 5 : 9
.Attribute Field           no. 6 : 0
.Attribute Field           no. 7 : 5
.Attribute Field           no. 8 : 0

.Attribute Field           no. 22 : 0
.Attribute Field           no. 23 : 0.000
.Attribute Field           no. 24 : 0.000
.Attribute Field           no. 25 : 0.000
.Attribute Field           no. 26 : 0.000
.Value Attribute Field     no. 1 :      0.000
.Value Attribute Field     no. 2 :      0.000
.Text Attribute Field      no. 1 :
.Text Attribute Field      no. 2 :
.Text Attribute Field      no. 3 :

.Feature Header finished at Text Attribute Field      at 178
.Segment Count             1

.Outputting Feature Header info to ACs in layer 1

.Feature ACs completed
.Segment Direction         F
.Segment ID Number         1
```

```
.Feature 1 completed
```

In this example, the /SELECT qualifier was given without any list value(s) so that the next dataset is copied to the supplied filename, in this the first dataset on the tape because the tape was explicitly rewound with the /REWIND qualifier. The full dignostic message output was requested with the /FULL_DIAGNOSTICS qualifier.

MESSAGES (SUCCESS)

These messages are used to indicate that the program has succeeded in performing some action, and do not require any user action.

NORMAL, CEDD2I successful completion

Explanation: CEDD2I terminated successfully, with no errors.

User action: None

MESSAGES (WARNING)

These messages are output when an error has occurred that can be corrected immediately by the user or that the program will attempt to overcome.

ACMISSING, AC entry missing from FEAture IFF (entry ISN 'integer')

Explanation: None of expected AC entries were found in the intermediate feature IFF file.

User action: Check that previous errors did not prevent the creation of the AC entries in the first place.

BLKIGNORE, block ignored

Explanation: An unprocessable block has been found and ignored, possibly resulting in a corrupted IFF file.

User action: As for UNKNOWNBLK; check the disc/tape for data errors arising from previous writing sessions or subsequent corruption, and proceed if sure that no further errors in the IFF files written to disc will result from ignoring the block(s).

DAYPUT1, days value has been set to 1 at 'integer'

Explanation: An error in reading the days field of a date, or the field being blank unused, has resulted in the value being set to one.

User action: Check the data in the record.

DMSCOORDERR, DSI - cannot convert lat/long to MD2 ('integer') units

Explanation: The geographic latitude/longitude values cannot be converted into the units that are set up in the MD2 entry, and have been set to 0.

User action: Check the data in the record.

DSIPUT0, DSI - outputting 0 in 'string' at 'integer'

Explanation: An error in the reading of the DSI record, or the field being blank unused, has forced the replacement with zero to the IFF file.

User action: Check the data in the record.

DSIPUT1, DSI - outputting 1 in 'string' at 'integer'

Explanation: An error in the reading of the DSI record, or the field being blank unused, has forced the replacement with 1 to the IFF file.

User action: Check the data in the record.

ENDOFDSS, end of datasets on tape encountered at block 'integer'

Explanation: Either the two tapemarks at the end of all datasets on the tape have been encountered, or the BOT has been encountered, and there are no more sensible datablocks to read.

User action: Rewind the tape and finish, or start again.

FEAPUT0, FEA - outputting 0 in 'string' at 'integer'

Explanation: An error in the reading of the FEA record, or the field being blank unused, has forced the replacement with zero to the IFF file.

User action: Check the data in the record.

FEAPUT1, FEA - outputting 1 in 'string' at 'integer'

Explanation: An error in the reading of the FEA record, or the field being blank unused, has forced the replacement with 1 to the IFF file.

User action: Check the data in the record.

FTRMISSED, 'integer' features not read or copied

Explanation: Not all the features given in the DSI record for the total number of features were read from the FEAture record, or copied into the main IFF file.

User action: Check the data for errors causing the failures.

GRIDINVAL, grid type 'string' inconsistent with coordinate type

Explanation: The grid code given in the DSI record is inconsistent with the map being in geographical coordinates.

User action: Check the data in the record.

LASTFEATURE, this is the last feature possible

Explanation: There are no more features allowed to be put in a single IFF file (either of the FSN or ISN are greater than 65535) and processing is terminated.

User action: None with the dataset as it stands.

MONTHPUT1, months value has been set to 1 at 'integer'

Explanation: An error in reading the months field of a date, or the field being blank unused, has resulted in the value being set to one.

User action: Check the data in the record.

NOTINFILE, trying to close a file that is not open: 'integer'

Explanation: The program requested the closure of a file that for some error is not open, or gave a non-existent unit number.

User action: Check that no previous errors have occurred that might have forced the file closure, or been caused by some other system error.

NOTINLAYER, trying to close a layer that has ended: 'integer'

Explanation: The program requested the ending of a layer that for some error is already ended.

User action: Check that no previous errors have occurred that might have forced the layer ending.

NUMPTSCALC, DSI - number of accuracy regions calculated: 'integer'

Explanation: There was an error reading the number of accuracy regions in the DSI record, and the value was calculated from the accuracy group address and the registration group address.

User action: Check the data in the record.

PROJNINVAL, projection 'string' invalid for coordinate type 'string'

Explanation: The projection code given in the DSI record is inconsistent with the map coordinate type.

User action: Check the data in the record.

PROJNUNSET, map projection not specified to IFF MD2

Explanation: The projection of the map has not been specified in a non-geographical coordinate IFF file.

User action: Check the data in the record.

REGPTIDERR, DSI - error reading 'string' at 'integer': replaced with 'integer'

Explanation: There was an error reading the identification number of the registration points in the DSI record, and the value has been replaced with the sequence number of the point within the record.

User action: Check the data in the record.

SCALEUNSET, map scale not specified to IFF MD2

Explanation: The scale of the map has not been specified for the IFF file.

User action: Check the data in the record.

SEGMISSED, 'integer' segments not read

Explanation: Not all the segments given in the DSI record for the total number of segments were read from the SEGment record.

User action: Check the data for errors causing the failures.

SEGPUT0, SEG - outputting 0 in 'string' at 'integer'

Explanation: An error in the reading of the SEG record, or the field being blank unused, has forced the replacement with zero to the IFF file.

User action: Check the data in the record.

SEGPUT1, SEG - outputting 1 in 'string' at 'integer'

Explanation: An error in the reading of the SEG record, or the field being blank unused, has forced the replacement with 1 to the IFF file.

User action: Check the data in the record.

SEGPUTLST, SEG - outputting last x,y in 'string' at 'integer'

Explanation: An error in the reading of the SEG record coordinates has forced the use of the last point's x and y values to the IFF file.

User action: Check the data in the record.

SPHERUNSET, map spheroid not specified to IFF MD2

Explanation: The spheroid/ellipsoid of the map projection has not been specified in a non-geographical coordinate IFF file.

User action: Check the data in the record.

STRUCTERR, unexpected structure code: 'string'

Explanation: The structure code given in the DSI record was not C (chain-node) or S (sequential), the only allowable data formats at present.

User action: Check the data in the record.

UNEXPTMK, block 'integer' is an unexpected tapemark

Explanation: The block just read from tape is an unexpected tapemark and should not be there.

User action: Check the tape for mistakes arising from an incorrect writing session, and if necessary rewrite. Proceed when satisfied that the block's existence will not cause problems in any subsequent processing. The block will either be ignored (if searching for a particular dataset), or cause the end of reading and closure of the IFF file (if not).

MESSAGES (ERROR)

These messages indicate an error in processing which will cause the program to terminate. The most likely causes are a corrupt or otherwise invalid input file, or an error related to command line processing and file manipulation.

ACCABANDON, DSI - accuracy region no. 'integer' abandoned

Explanation: Some error has made it necessary to abandon one of the accuracy regions from layer 0.

User action: Check the data in the record.

ACCNTERR, DSI - 'string' at unexpected place in block: 'integer'

Explanation: The accuracy regions were found at an unexpected place while reading the DSI record.

User action: Check the data in the record.

ACCSTRTERR, DSI - accuracy regions address in error: 'integer'

Explanation: The registration points address given in the DSI record is either in error, or has an unexpected value, and consequently the data read subsequently may be incorrect.

User action: Check the data in the record.

ACREPOSERR, 'char' entry found in FEAture IFF (feature ISN 'integer')

Explanation: There was an error repositioning to the AC entry in the feature intermediate IFF file, and an unexpected entry found instead.

User action: Check that previous errors did not prevent the creation of the FS entry in the first place.

BCKSPERR, failed to backspace at block no. 'integer'

Explanation: There was an error while attempting to backspace over the latest read datablock on tape, the block number being given in the error message. Further information is given in the accompanying error messages.

User action: Either try again, or check tape for data errors or corruption.

BUFNUMERR, incorrect number of characters read: 'integer'

Explanation: An incorrect number of characters was read from the disc copy data file, but reading continuing.

User action: Check tape to disc copy or the disc file for errors.

BYTNUMERR, incorrect number of characters read: 'integer'

Explanation: An incorrect number of characters was read from the tape data file record.

User action: Check tape for errors.

CEDDOPNERR, error opening CEDD file 'filespec'

Explanation: There was an error opening the CEDD data file on disc or on tape.

User action: Check tape or disc file.

CMDLINERR, error in reading command line

Explanation: There was an error decoding the command line specified to run the program.

User action: Respecify the command line.

COORDTYPERR, wrong coordinate type for accuracy regions.

Explanation: The map coordinate type was not geographic, which the data in the accuracy regions are expected to be, and they have been ignored.

User action: Check for inconsistencies in the dataset creation.

CPREPOSERR, 'char' entry found instead of CP at 'integer'

Explanation: There was an error repositioning to the required CP corner points entry to insert the new range, and an unexpected entry found. The program will continue without updating the CP entry.

User action: Check file for corruption.

CPREPOSNEOF, unexpected end of IFF file encountered at 'integer'

Explanation: The end of the IFF file was encountered while trying to reposition to the known CP entry at the IFF address given.

User action: Check for previous errors that might have caused the error.

DEVNOTFND, device not found

Explanation: The requested device could not be found on the system, and the program is aborted.

User action: Check the device specification, and rerun with the correct command line.

DFREPOSERR, 'char' entry found instead of ST at 'integer'

Explanation: There was an error repositioning to the required ST coordinate entry to insert the new range, and an unexpected entry found. The program will continue without updating the ST entry.

User action: Check file for corruption.

DFREPOSNEOF, unexpected end of IFF file encountered at 'integer'

Explanation: The end of the IFF file was encountered while trying to reposition to the known ST entry of the dummy area feature in layer 0 holding the DSI information, at the IFF address given.

User action: Check for previous errors that might have caused the error.

DMSCNTERR, DSI - at unexpected place in record: 'integer'

Explanation: The program is at an unexpected place while reading the latitude/longitude field in the DSI record.

User action: Check the data in the record.

DMSCONVERR, DSI - error converting 'string' to arcsec/100 at 'integer'

Explanation: An error has occurred while converting lat/longitude into hundredths of arcsecs from the DSI record, and the arcsec/100 value has been set to zero.

User action: Check the data in the record.

DMSDEGERR, DSI - invalid degree value: 'integer'

Explanation: An invalid value for the degree field has been read in the DSI record.

User action: Check the data in the record.

DMSEWERR, DSI - invalid hemisphere character: 'string'

Explanation: An invalid hemisphere character has been read in the longitude field of the DSI record, ie. not E or W.

User action: Check the data in the record.

DMSMINERR, DSI - invalid minute value: 'integer'

Explanation: An invalid value for the minute field has been read in the DSI record.

User action: Check the data in the record.

DMSNSERR, DSI - invalid hemisphere character: 'string'

Explanation: An invalid hemisphere character has been read in the latitude field of the DSI record, ie. not N or S.

User action: Check the data in the record.

DMSSECERR, DSI - invalid second/100 value: 'integer'

Explanation: An invalid value for the arcsec/100 field has been read in the DSI record.

User action: Check the data in the record.

DSICNTERR, DSI - 'string' at unexpected place in block: 'integer'

Explanation: The program is at an unexpected place while reading the DSI record.

User action: Check the data in the record.

DSIENDERR, DSI - missed characters in 'string' are 'string'

Explanation: There was data where there should have been only spaces or 'DELETE' at the end of the DSI record.

User action: Check the data in the record.

DSIGRPERR, DSI - 'string' at 'integer' has wrong group label: 'string'

Explanation: The program has encountered unexpected characters in the DSI group label.

User action: Check the data in the record.

DSILENERR, DSI - 'string' at 'integer': wrong number of characters 'integer'.

Explanation: An error has occurred in the reading of a particular group of characters in the DSI record, resulting in the wrong number of characters being read.

User action: Check the data in the record.

DSIRDCHERR, DSI - error reading character in 'string' at 'integer'

Explanation: An error has occurred in the reading of a particular group of characters in the DSI record.

User action: Check the data in the record.

DSIREADERR, error reading DSI record no. 'integer'

Explanation: There was an error reading the DSI record (number given) for the reason given in the previous error messages.

User action: Check the data in the record.

EXPFLNERR, error extracting filename 'filespec' from /FILENAME/

Explanation: There was an error extracting a filename from /FILENAME/ common while creating new filenames.

User action: Check the validity of the supplied filename.

FEAABANDON, Feature no. 'integer' in FEA file abandoned

Explanation: There was an error which caused the abondoning and deletion of the feature containing the segment ID;s in the intermediate FEAture IFF file, and therefore of all subsequent features.

User action: Check the data in the record.

FEACNTERR, FEA - 'string' at unexpected place in block: 'integer'

Explanation: The program is at an unexpected place while reading the FEA record.

User action: Check the data in the record.

FEALENERR, FEA - 'string' at 'integer': wrong number of characters: 'integer'

Explanation: An error has occurred in the reading of a particular group of characters in the FEA record, resulting in the wrong number of characters being read.

User action: Check the data in the record.

FEANXTEOF, unexpected end of FEAture IFF in feature 'integer'

Explanation: The feature intermediate IFF file came to an unexpected end while copying to the main IFF file.

User action: Check that previous errors did not corrupt the writing of the file.

FEARDCHERR, FEA - error reading character in 'string' at 'integer'

Explanation: An error has occurred in the reading of a particular group of characters in the FEA record.

User action: Check the data in the record.

FEAREADERR, error reading FEA record no. 'integer'

Explanation: There was an error reading the FEA record (number given) for the reason given in the previous error messages.

User action: Check the data in the record.

FILCLOERR, unable to close file 'filespec'

Explanation: There was an error that prevented the closure of the file, and will be left in a strange state.

User action: Check for any system errors that might have caused the error.

FILENOTFND, required dataset 'integer' not found in 'integer' on tape

Explanation: The required dateset specified using the /SELECT qualifier does not exist on the tape (the actual number of datasets on the tape is given in the error message).

User action: Either rewind the tape and search again, or check that the dataset required actually exists and check the number of datasets on the tape.

FILEOPEN, file 'filespec' already open on unit 'integer'

Explanation: The program requested the opening of a new file which was already open.

User action: Check for a previous error which may have caused the confusion.

FILOPNERR, unable to open file 'filespec'

Explanation: There was an error that prevented the opening of the file for writing.

User action: Check for any system errors that might have caused the error.

FILRDERR, error reading data from disc

Explanation: There was an error reading the data from the disc file.

User action: Check tape to disc copy or the disc file for errors.

FRTINTERR, error opening FRT file 'filespec'

Explanation: There was an error initialising the required FRT file.

User action: Check the FRT file.

FSMISSING, FS entry missing from FEAture IFF (entry ISN 'integer')

Explanation: The expected FS entry was missing from the feature intermediate IFF file, and the feature abandoned.

User action: Check that previous errors did not prevent the creation of the ST entry in the first place.

FSREPOSERR, 'char' entry found in FEAture IFF (entry ISN 'integer')

Explanation: There was an error repositioning to the FS entry in the feature intermediate IFF file, and the an unexpected entry found instead.

User action: Check that previous errors did not prevent the creation of the FS entry in the first place.

FTRHDRERR, error reading the feature headers

Explanation: There an error reading the feature header blocks.

User action: Check the data in the record.

FTRTYPERR, unknown feature type ('string') in ID no. 'integer' at 'integer'

Explanation: The feature type read is unrecognised (not P, L, A) and the feature is abandoned.

User action: Check the data in the record.

HDRCNTERR, FEA - header count ('integer') error (ID 'integer') at 'integer'

Explanation: The value for the count of header blocks is in error and they therefore cannot be read, and the feature abandoned.

User action: Check the data in the record.

HDREQTO4, FEA - header count error in ID no. 'integer' at 'integer'

Explanation: There was an error reading the feature header record block count, and a value of 4 assumed, which may give rise rise to errors later.

User action: Check the data in the record.

IDMISSING, ID's missing from FEAture IFF (entry ISN 'integer')

Explanation: An expected ST entry containing the ID's of the segment(s) belonging to this feature was missing from the segment intermediate IFF file, and as a result some or all of the segments belonging to this feature will be lost, and the feature possibly abandoned.

User action: Check that previous errors did not prevent the creation of the ST entry in the first place.

IDREPOSERR, 'char' entry found in FEAture IFF (entry ISN 'integer')

Explanation: There was an error repositioning to the expected ST entry containing the ID's of the segment(s) belonging to this feature in the feature intermediate IFF file, and an unexpected entry found instead.

User action: Check that previous errors did not prevent the creation of the ST entry in the first place.

IFFOPNERR, unable to open IFF file 'filespec' on unit 'integer'

Explanation: An error has occurred in the opening of the IFF file. Further information is given in the accompanying error messages. The most likely cause of failure is an invalid file specification, or invalid system status for the creation of disc files.

User action: Check that the file specification used in the parameter of the DCL command line is valid for your local system, and that there are no access or protection violation problems. Resubmit the command line with a valid file specification.

INVALDAT, invalid date given: 'day'/'month'/'year'

Explanation: The values given to be converted into an integer number of days were out of range.

User action: Check the data in the record.

INVALDEG, degrees value in 'lat/long'itude invalid: 'integer'

Explanation: The value for the degrees in the latitude or longitude specified in the command line is invalid, ie. <0, or >90 for latitude or >180 for longitude.

User action: Respecify the values in the command line and start again. None of the other command line instructions will have been obeyed.

INVALIDEW, unrecognised longitude hemisphere character: 'char'

Explanation: The character after the seconds field of the longitude qualifier is not E,W or e,w.

User action: Respecify the value in the command line and start again. None of the other command line instructions will have been obeyed.

INVALIDMIN, minutes field 'integer' invalid in 'lat/long'itude

Explanation: The value for the minutes in the latitude or longitude specified in the command line is invalid, ie. >60 or <0.

User action: Respecify the values in the command line and start again. None of the other command line instructions will have been obeyed.

INVALIDNS, unrecognised latitude hemisphere character: 'char'

Explanation: The character after the seconds field of the latitude qualifier is not N,S or n,s.

User action: Respecify the value in the command line and start again. None of the other command line instructions will have been obeyed.

INVALIDNUM, invalid file number search value 'integer'

Explanation: The value for the number of file to be searched for is wrong.

User action: Respecify the value in the command line and start again. None of the other command line instructions will have been obeyed.

INVALIDSEC, seconds field 'real' invalid in 'lat/long'itude

Explanation: The value for the seconds in the latitude or longitude specified in the command line is invalid, ie. >60 or <0.

User action: Respecify the values in the command line and start again. None of the other command line instructions will have been obeyed.

LATNOTFND, dataset with required latitude not found

Explanation: The dataset with the required latitude was not found in the datasets left on the tape after the position at which the search was initiated.

User action: Either check that the dataset actually exists on the tape or rewind and start searching again.

LAYEROPN, layer 'integer' already open

Explanation: The program requested the opening of a new layer which was already open.

User action: Check for a previous error which may have caused the confusion.

LLNOTFND, dataset with required lat and longitude not found

Explanation: The dataset with the required latitude and longitude was not found in the datasets left on the tape after the position at which the search was initiated.

User action: Either rewind the tape and start searching again or check that the dataset actually exists on the tape.

LONGNTFND, dataset with required longitude not found

Explanation: The dataset with the required longitude was not found in the datasets left on the tape after the position at which the search was initiated.

User action: Either check that the dataset actually exists on the tape or rewind and start searching again.

MAPTYPERR, DSI - unknown map coordinate type: "'string'"

Explanation: There was an error in reading the map coordinate type field resulting in an unexpected code.

User action: Check the data in the record.

MISFEATURE, feature copying abandoned (feature no. 'integer')

Explanation: There was an error repositioning to the entries in the intermediate feature IFF file and the feature was deleted from the main IFF file.

User action: Check that previous errors did not corrupt the files.

MISSEGMENT, segment (ID no. 'integer') copying aborted

Explanation: There was an error repositioning to the entries in the intermediate segment IFF file and the segment abandoned, resulting in the feature possibly being deleted from the main IFF file.

User action: Check that previous errors did not corrupt the files.

MISSUNITS, DSI - units of file not read

Explanation: There was an error trying to read the map units in the DSI record.

User action: Check the data in the record.

NFREPOSERR, 'char' entry found in SEGment IFF (segment ID 'integer')

Explanation: There was an error repositioning to the NF known entry for the given segment ID number in the segment intermediate IFF file, and the an unexpected entry found instead.

User action: Check that previous errors did not prevent the creation of the FS entry in the first place.

NFREPOSNEOF, unexpected end of file encountered at 'integer' (ID 'integer')

Explanation: The end of the intermediate segment IFF file was encountered while trying to reposition to a known NF entry at the IFF address given for the segment ID.

User action: Check for previous errors that might have caused the error.

NOREPOSERR, 'char' entry found instead of NO in layer 'integer' at 'integer'

Explanation: There was an error repositioning to the required NO (new layer) entry to insert the EO address, at the address given, and an unexpected entry found. The program will try to continue without updating the NO entry.

User action: Check file for corruption.

NOREPOSNEOF, unexpected end of file encountered at address 'integer'

Explanation: The end of the IFF file was encountered while trying to reposition to a known NO entry at the IFF address given.

User action: Check for previous errors that might have caused the error.

NUMCRDERR, DSI - no. of accuracy coordinates invalid: 'integer'

Explanation: The number of accuracy region coordinates was too large (ie. more than 99) due to a reading error, and the number has been set to 99, or the nember is less than 3 and cannot define a region.

User action: Check the data in the record.

NUMCRDMISS, DSI - no. of accuracy points missing in region 'integer'

Explanation: The number of accuracy region coordinates was missing due to a reading error and the region abandoned.

User action: Check the data in the record.

NUMPTSERR, DSI - no. of registration points in error: 'integer'

Explanation: The number of registration points was invalid (ie. more than 999 or less than 0) due to a reading error, and the number has been set to 999 or 0.

User action: Check the data in the record.

NUMREGERR, DSI - number of accuracy regions invalid 'integer'

Explanation: The number of accuracy regions was too large (ie. more than 99 or less than 0) due to a reading error, and the number has been set to 99 or 0.

User action: Check the data in the record.

OUTOFDATA, no more data of type 'string' found

Explanation: There was no more data of the required record type to continue reading, and reading is abandoned.

User action: Check the data in the record.

PUTFLNERR, error putting filename 'filespec' into /FILENAME/

Explanation: There was an error priming /FILENAME/ common with the required filename prior to creating new filenames.

User action: Check the validity of the supplied filename

RAREPOSERR, 'char' entry found instead of RA at 'integer'

Explanation: There was an error repositioning to the required RA range entry to insert the new range, and an unexpected entry found. The program will continue without updating the RA entry.

User action: Check file for corruption.

RAREPOSNEOF, unexpected end of IFF file encountered at 'integer'

Explanation: The end of the IFF file was encountered while trying to reposition to the known RA entry at the IFF address given.

User action: Check for previous errors that might have caused the error.

RDACCERR, DSI - error reading accuracy regions

Explanation: An error occurred while processing the accuracy regions section of the DSI record.

User action: Check the data in the record.

RDBLKERR, error reading new record/block

Explanation: There was an error getting a new block block off tape or a new data record from disc.

User action: Check the tape or disc for mounting errors or data corruption.

RDDEGERR, unable to read degrees field

Explanation: The value for the degrees in the latitude or longitude specified is missing or not recognised by the program.

User action: If a command line error, respecify the values and start again, if not, check the data in the record. None of the other command line instructions will have been obeyed.

RDMINERR, unable to read minutes field

Explanation: The value for the minutes in the latitude or longitude specified is missing or not recognised by the program.

User action: If a command line error, respecify the values and start again, if not, check the data in the record. None of the other command line instructions will have been obeyed.

RDNSEWERR, hemisphere character not present

Explanation: A hemisphere character (N,S,E,W or n,s,e,w) has either not been specified after the seconds value in the latitude or longitude field, or the record has come to an unexpected end.

User action: If a command line error, respecify the values and start again, if not, check the data in the record. None of the other command line instructions will have been obeyed.

RDREGERR, DSI - error reading registration points

Explanation: An error occurred while processing the registration points section of the DSI record.

User action: Check the data in the record.

RDSECERR, seconds field missing

Explanation: The value for the seconds in the latitude or longitude specified is missing or not recognised by the program.

User action: If a command line error, respecify the values and start again, if not, check the data in the record. None of the other command line instructions will have been obeyed.

REGABANDON, DSI - registration point no. 'integer' abandoned

Explanation: Some error has made it necessary to abandon one of the registration points from layer 0.

User action: Check the data in the record.

REGCNTERR, DSI - 'string' at unexpected place in block: 'integer'

Explanation: The registration points were found at an unexpected place while reading the DSI record.

User action: Check the data in the record.

REGSTRTERR, DSI - registration points address error: 'integer'

Explanation: The registration points address given in the DSI record is either in error, or has an unexpected value, and consequently the data read subsequently may be incorrect.

User action: Check the data in the record.

SEGABANDON, Segment no. 'integer' in SEG file abandoned

Explanation: There was an error which caused the abondoning and deletion of the feature containing the coordinates in the intermediate SEGment IFF file, and therefore of all subsequent coordinates.

User action: Check the data in the record.

SEGCNTERR, SEG - 'string' at unexpected place in block: 'integer'

Explanation: The program is at an unexpected place while reading the SEG record.

User action: Check the data in the record.

SEGLENERR, SEG - 'string' at 'integer': wrong number of characters 'integer'

Explanation: An error has occurred in the reading of a particular group of characters in the SEG record, resulting in the wrong number of characters being read.

User action: Check the data in the record.

SEGRDCHERR, SEG - error reading character in 'string' at 'integer'

Explanation: An error has occurred in the reading of a particular group of characters in the SEG record.

User action: Check the data in the record.

SEGREADERR, error reading SEG record no. 'integer'

Explanation: There was an error reading the SEG record (number given) for the reason given in the previous error messages.

User action: Check the data in the record.

STMISSING, ST not in SEGment (ID 'integer') IFF (entry ISN 'integer')

Explanation: An expected ST entry was missing from the segment intermediate IFF file, and as a result some or all of the segments belonging to this feature will be lost, and the feature possibly abandoned.

User action: Check that previous errors did not prevent the creation of the ST entry in the first place.

STMIXZS, ST and ZS entries in same segment (ID 'integer') no 'integer'

Explanation: An error has caused the creation of ST and ZS entries in the same segment.

User action: Check that an error in the running of the program did not occur and change the 2/3 dimension flag.

STREPOSERR, 'char' entry found in SEGment IFF (entry ISN 'integer')

Explanation: There was an error repositioning to the expected ST entry in the segment intermediate IFF file, and an unexpected entry found instead.

User action: Check that previous errors did not prevent the creation of the ST entry in the first place.

STRTBLKERR, unable to start reading data

Explanation: The program was unable to identify and/or start reading the data record on disc or tape. This is possibly due to the tape losing its position due to an error reading or from a previous write error.

User action: Check the data in the record, or remount the tape and start again.

STRTIFERR, IFF error opening file 'filespec'

Explanation: An error has occurred in the opening of the IFF file on disc. The most likely reasons for the failure are an incorrectly specified file specification in the DCL command line parameter, or invalid file creation status. The accompanying error messages give further information about the failure.

User action: Resubmit the command line with a valid file specification, or check user status.

TAPINTERR, error initialising mag tape unit 'device'

Explanation: An error has occurred in the attempt to initialise the tape device before the first read. The accompanying error messages will give further information relating to the failure. The most likely reasons for failure are that the tape device specified with the qualifier /DEVICE or the default device MTA0: does not exist on the system, the tape device has been allocated to another user, or the tape has not been MOUNTed correctly with the /FOREIGN qualifier.

User action: Check whether the tape device MSA0: or the specified device exists, has been MOUNTED correctly or has not been allocated to another user and use the command SHOW DEVICE/FULL <TAPE DEVICE>.

TAPRDBERR, error reading new block (no. 'integer') from tape

Explanation: An error has occurred in the reading of a block of data (block number given) from the tape. Further information relating to the failure is given in the accompanying error messages. The most likely reasons are an error in the writing of data to the tape, or subsequent corruption, or confusion as to the current position on the tape and trying to read a non-existent block.

User action: Check the tape for data errors having arisen from the initial writing session or subsequent corruption, or rerun the tape reading commands to check the current position on the tape.

TAPRWDERR, error rewinding tape

Explanation: An error has occurred while attempting to rewind the tape to the Beginning Of Tape (BOT) while searching for the required dataset. Further information relating to the failure is given in the accompanying error messages.

User action: Check the tape drive or tape and resubmit tape reading commands.

TOOMNYSTS, too many ST entries

Explanation: There were too many ST entries containing the segment ID's in the intermediate FEAture IFF file, and the rest have been ignored.

User action: Check that previous errors did not cause the creation of the extra ST entry.

TWOLAYERS, a new layer has started without ending the old

Explanation: An error has occurred allowing a new layer being started without ending the previous.

User action: Check for previous errors that might have caused this.

TXTCNTERR, TXT - 'string' at unexpected place in text block: 'integer'

Explanation: The program is at an unexpected place while reading the TXT record.

User action: Check the data in the record.

TXTREADERR, error reading text record (no. 'integer')

Explanation: There was an error reading the TXT text record (number given) for the reason given in the previous error messages.

User action: Check the data in the record.

UNEXPBLK, unexpected record/block type: 'string'

Explanation: An unexpected record or block header was encountered in the wrong position in the data. (If reading from tape the block number is given). It is possible that the wrong ANSI structure has been set up on the tape, and consequently refuses to obey the normal VMS formatting. The tape may be recoverable by mounting it FOREIGN and running the program again.

User action: Check the data on the tape.

UNEXPEND, unexpected end of record reading 'string' at 'integer'

Explanation: The record being read has come to an unexpected end (previous messages will give the reason.

User action: Check the data in the record.

UNEXPEOF, unexpected end of file found

Explanation: An unexpected end of data was encountered while attempting to read further data from disc or tape.

User action: Check tape to disc copy or the disc file for errors.

UNKNOWNBLK, unknown record/block type: 'string'

Explanation: An unknown record or block header was encountered with an unrecognised header label. (If reading from tape the block number is given). The block will be ignored, but may cause the end of reading and closure of the IFF file, and subsequent errors.

User action: Check the data in the record.

VOLSITERR, Volume label at wrong position: at block 'integer'

Explanation: The Volume label label was not the first block on the tape as it should have been.

User action: Check the data on the tape.

YMDCNTERR, at unexpected place in date field: 'integer'

Explanation: The program is at an unexpected place while reading the date field in the record.

User action: Check the data in the record.

YMDCONVERR, date error converting 'string' to days at 'integer'

Explanation: An error has occurred while converting year/month/day into integer days from the record, and the number of days has been set to zero.

User action: Check the data in the record.

MESSAGES (OTHER)

In addition to the above messages which are generated by the program itself, other messages may be produced by the command line interpreter (CLI) and by Laser-Scan libraries. In particular, messages may be generated by the IFF library and by the Laser-Scan I/O library, LSLLIB. IFF library messages are introduced by '%IFF' and are documented in the IFF library users' guide. In most cases IFF errors will be due to a corrupt input file, and this should be the first area of investigation. If the cause of the error cannot be traced by the user, and Laser-Scan are consulted, then the output file should be preserved to facilitate diagnosis. LSLLIB messages are introduced by '%LSLLIB' and are generally self-explanatory. They are used to explain the details of program generated errors.