Laser-Scan Ltd.

CONVERT PACKAGE

IFFSXF Reference

Issue 1.0 - 17-June-1991

Science Park, Milton Road, Cambridge, England CB4 4FY tel: (01223) 420414

Document "IFFSXF REFERENCE", Category "REFERENCE"
Document Issue 1.0   S Townrow (modified 17-Jun-1991)

CONTENTS

IFFSXF - Change Record

Version 1.0 S Townrow 17-June-1991

Module IFFSXF - 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

SXF FORMAT DESCRIPTION

FORMAT DESCRIPTION

Introduction

SXF stands for Scandinavian Transfer Format, Laser-Scan's term for ....

I2SXF provides a translation from Laser-Scan's Internal Feature Format (IFF) to a subset of SXF. For a brief comparison of the way IFF and SXF regard data, see the section on DATA PREPARATION below.

Disk file output

I2SXF output is made to disk file.

Each disk file contains the output from one IFF file.

These files may then be output to magnetic tape using either of the VAX programs BACKUP or EXCHANGE - the former is intended for transfer between VAXes, and the latter provides an ANSI standard tape format (it replaces the RSX utility FLX on VAXes with VMS version 4.0 and up). Consult the relevant Digital manuals for more details of these utilities.

The SXF subset supported

The data is output using only a subset of SXF. This section describes what may be expected in the output.

CHAPTER 2

SXF DATA PREPARATION

DATA PREPARATION

Comparison of SXF 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.

In contrast, SXF has no concept of a 'feature', ...

Preparation for digitising data to be output to SXF

The customer should supply a list of how the various forms of data on the map(s) are to be output. This should describe for each type of data what line weight, style and colour should be used, what text fonts and sizes are required, what symbols (cells) are to be used, and how to digitise them, and so on.

For digitising within IFF, feature codes must be assigned to all of these data-types, and an FRT file (together with SRI and TRI files) created.

Care should be taken in considering what graphical type the IFF features should have - see the section 'Comparison of SXD and FRT files' below.

In some cases, there may not be an obvious linkage between the way the data-type is specified in the customer specification, and the way it would most naturally be digitised. Sometimes it may be necessary to use a small program to post-process the data before outputting to SXF. The small program would be written purely for a particular application, in order to make the digitising and editing operations easier.

Since customer requirements for SXF are likely to vary by quite a lot, care must be taken in designing the flowline for producing the data to be output to SXF, and small programs to process the data before output may often be required.

Three-dimensional and contour data

Three-dimensional SXF output

Contour data

Offsetting data

Within the IFF file, coordinates are stored relative to the bottom left hand corner of the sheet, the local origin. This allows more accuracy within the IFF file. In modern IFF files, the coordinates of that local origin are then stored in the map descriptor (MD) entry, and the absolute coordinates of a feature can be obtained by adding the value stored in the IFF file to the value taken from the map descriptor.

The default action of I2SXF is to ....

Digitising texts - composite text features

I2SXF will output composite text features (text features which contain more than one text component). It outputs such text components as if they were separate text features, using the feature code and descriptive data in the TS entry for each component, instead of the data in the FS entry for the feature as a whole.

Digitising texts - text size

The SXF Parameter File

The SXD table in the parameter file tells I2SXF what each feature code in the IFF file means in terms of SXF data.

Feature code definitions

The SXD table contains one line for each feature code used in the IFF file, and these are composed as follows:

fc trf

where:

fc is the feature code
trf is the corresponding SXF transfer code

Comments

Comment lines are indicated by a '!' character - any line starting with this is ignored. Also, any data on the end of a line is currently ignored, although it is still good practice to start a comment at the end of the line with a comment character.

Example SXF layout

For example:

```
!
! some example SXD lines:
!
!       FC      TRF
!
SXD     25      1240330
SXD     55      1222150                 ! here is a comment
SXD     76      9060420                 ! and another
```

CHAPTER 3

I2SXF UTILITY

UTILITY I2SXF

FUNCTION

I2SXF reads an IFF file and outputs the data to SXF. The program is driven by a parameter file which describes each feature code. Options exist to select only particular layers or feature codes for translation.

FORMAT

$ I2SXF IFF-file-spec SXF-file-spec

Command qualifiers	**Defaults**
/FC=(integer[,...])	All feature codes
/[NO]FRT[=file-spec]	/NOFRT
/LAYER=(integer[,...])	All layers
/[NO]LOG	/NOLOG
/PARAMETER=file-spec	None

PROMPT

_IFF-file:	IFF-file-spec
_SXF-file:	SXF-file-spec

PARAMETERS

IFF-file-spec

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

SXF-file-spec

- specifies the name of the output SXF file. Any part of the file-spec which is not supplied will be taken from the default specification 'LSL$SXF:SXF.SXF'. If a file with the specified name already exists a new file will be created with the version number incremented by one. Note that the logical name LSL$SXF should be defined.

COMMAND QUALIFIERS

/FC=(integer[,...])

- causes I2SXF to output only those IFF features which have the specified feature code(s). The /FC qualifier will accept single, multiple or ranges of feature code arguments. Ranges may be specified with starting and ending feature codes that are separated by a colon, for example /FC=56:58. When specifying more than one range of feature codes, separate each range with a comma, for example /FC=(1:5,56:89). The maximum number of feature codes which may be specified is 1024.

/FRT[=file-spec]
/NOFRT

- specifies an FRT file which the program will read and use to interpret non-standard CB attributes in IFF revision 1 input files. /FRT is not necessary for IFF revision 0 input files. The FRT file-spec is parsed against the default LSL$FRT:'name'.FRT where 'name' is the name specified with /PARAMETER.

/LAYER=(integer[,...])

- causes I2SXF to output only those IFF features which are in the specified layer(s). The /LAYER qualifier will accept single, multiple or ranges of layer arguments. Ranges may be specified with starting and ending layers that are separated by a colon, for example /LAYER=3:5. When specifying more than one range of layers, separate each range with a comma, for example /LAYER=(1:5,12:14). The maximum number of layers which may be specified is 1024.

/LOG
/NOLOG

- causes supplementary messages to be sent to SYS$OUTPUT. Supplementary messages are generated when a file is successfully opened, and a reassuring message is output each time a new IFF layer is encountered in the input file.

/PARAMETER=file-spec

- specifies the IFF parameter file, which defines the transformation of feature codes in the IFF data to TRF codes in the output SXF data. This qualifier is mandatory, and the parameter file-spec is parsed from the default LSL$LOOKUP:I2SXF.I2SXF_PAR.

RESTRICTIONS

- /PARAMETER must be specified

DESCRIPTION

I2SXF reads an IFF file containing a single map and produces an SXF output file. It deduces the translation necessary by using a parameter file.

IFF file

The IFF file should conform to the standards set out in the DATA PREPARATION section under the heading 'Preparation for digitising data to be output to SXF'.

The revision level of the IFF files can be 0 or 1. Note, however that an FRT file should also be specified if any of the input files are revision level 1.

Parameter file

This file contains the feature description table which describes the translations required to produce SXF data from IFF data. The file can also contain ..... The format of the table is described in the DATA PREPARATION section under the heading 'The SXF Parameter File', and it will probably have been set up by the LAMPS system manager and remain relatively static at most installations.

Using the program

Normal use of the program is in batch mode - that is, running it via a batch command file, submitted with the SUBMIT command. However, it is also possible to run the program interactively, although since it can take a long time to translate an IFF file this is not necessarily the best method.

It is probable that the symbol I2SXF will have been set up to include at least the /PARAMETER and possibly the /FRT qualifiers, so you may only need to give the input IFF file and output SXF file.

How the program works

Once the program has been invoked and the command line successfully read, a summary of the inputs and outputs is typed. The parameter file is then read in, and if that was successful the IFF file is opened.

When all applicable data has been output to the drawing file, the program will exit.

The SXF file

EXAMPLES

```
$ I2SXF/PAR=HERE:VIAK/LOG TEMPLATE SCRATCH <CR>

Parameter file      : HERE:VIAK.I2SXF_PAR
IFF input  file     : LSL$IF:TEMPLATE.IFF
SXF output file     : LSL$SXF:SCRATCH.SXF
Outputting supplementary messages

%I2SXF-I-READPAR, reading parameter file
%LSLLIB-I-IFFOPENED, LSL$DATA_ROOT:[LSL.IFF]TEMPLATE.IFF;1 opened for read
%I2SXF-I-IFFCLOSED, IFF file closed
 ELAPSED:    0 00:00:01.58  CPU: 0:00:00.24  BUFIO: 15  DIRIO: 5  FAULTS: 102
$
```

This example illustrates normal execution of I2SXF. The parameter file directory and name have been specified, but the extension has defaulted. Only the name part of the IFF file-spec has been given, defaults being filled in for the directory and extension. The same applies to the SXF file-spec. All IFF feature codes are converted to the appropriate TRF codes, except those which have not been defined in the parameter file. A warning message is output for each feature whose feature code is undefined, and the feature is ignored. The /LOG qualifier causes the extra informational messages to be output.

MESSAGES (INFORMATIONAL)

These messages give information only, and require no immediate action by the user. They are used to provide information on the current state of the program, or to supply explanatory information in support of a warning or error message.

IFFCLOSED, IFF file closed

Explanation: This message appears if /LOG was specified on the command line, and confirms that the IFF file has been successfully closed.

User action: None.

LAYER, layer 'number' found

Explanation: This message appears if /LOG was specified on the command line, and informs the user that the given layer in the IFF file has been found.

User action: None.

LINEINPAR, line 'number' of parameter file

Explanation: This message always appears after an error has occurred while decoding a line in the parameter file, and it informs the user of the offending line number. The previous message will have been generated either by LSLLIB or by the program itself, and the line in question will be ignored.

User action: If the error message was generated by LSLLIB, it most likely indicates an error in the parameter file which should be amended. Otherwise, see the relevant error message explanation.

READPAR, reading parameter file

Explanation: This message appears if /LOG was specified on the command line, and informs the user that the parameter file is being read.

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.

BADFC, feature code 'fc' out of range

Explanation: An invalid feature code (outwith the range 0 to 32767) has been read from the parameter file. The LINEINPAR message indicating the parameter file line number will follow, and the program will continue to read the file, ignoring this line.

User action: Amend the feature code in the parameter file, and if necessary run the program again.

ENDINMAP, end of IFF file inside map

Explanation: The end of the IFF file was reached unexpectedly, before the end of map (EM) entry had been found. The map data will have been correctly processed, but this message may indicate that the IFF file had been improperly closed by a previous process, and some data may be missing.

User action: Examine the file using LITES2 to determine the integrity of the data, and run the IMP utility IINFO to look at the history of the file. If none of the data is missing, run IMEND on the IFF file to insert the missing entries at the end. Otherwise, the history may indicate at what stage things went wrong.

UNKCMD, unknown command "'command'"

Explanation: The given command in the parameter file was not recognised. The LINEINPAR message indicating the parameter file line number will follow, and the program will continue to read the file, ignoring this line.

User action: This message is most likely due to an error in the program and should be reported to Laser-Scan.

UNKFC, FC 'fc' has not been defined, FSN 'fsn' ignored

Explanation: The given feature code in the IFF file was not recognised because it has not been defined in the parameter file. The feature is ignored and processing continues.

User action: If the feature code is wanted, it should be defined in the parameter file and the program run again.

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.

ERRCLOPAR, error closing parameter file 'file-spec'

Explanation: The parameter file could not be closed. An additional LSLLIB message will follow, giving the reason for the failure. If this is due to a system error, the system error message will also appear. The program exits immediately.

User action: Ascertain the cause of the failure from the messages given, and take the appropriate remedial action. If the error is due to a serious problem such as a system failure, the System Manager should be informed.

ERROPNPAR, error opening parameter file 'file-spec'

Explanation: The parameter file could not be opened. An additional LSLLIB message will follow, giving the reason for the failure. If this is due to a system error, the system error message will also appear. The program exits immediately.

User action: Ascertain the cause of the failure from the messages given. There may be a simple remedy, e.g. a change in the directory specification. Alternatively, this error could be due to a more serious problem such as a system failure, and in that case the System Manager may have to be informed.

ERRRDFRT, error reading FRT file 'file-spec'

Explanation: An error occurred while reading in the FRT file. A message output by the Feature Representation Library (FRTLIB) will appear before this message, giving further information as to what has gone wrong. For example, the specified FRT file may not exist, or it may be in another directory.

User action: Dependent upon the associated error messages.

ERRRDPAR, error reading from parameter file 'file-spec' at line 'number'

Explanation: The given line could not be read from the parameter file. An additional LSLLIB message will follow, giving the reason for the failure. If this is due to a system error, the system error message will also appear. The program exits immediately.

User action: Ascertain the cause of the failure from the messages given, and take the appropriate remedial action. If the error is due to a serious problem such as a system failure, the System Manager should be informed.

IFFCLOERR, cannot close IFF file

Explanation: The IFF file could not be closed. This may be due to a previous IFF error, or it may indicate a more serious system error. The message will be preceded by an IFF library message which will give more details, including a two-character code.

User action: Look up the IFF error code in the IFFLIB Reference Manual (part of the MAPPING package documentation) and take the appropriate action.

NORA, cannot find RA entry in IFF file

Explanation: Before processing the map data, I2SXF has to set the output limits. These values are obtained from the RAnge entry in the IFF file, and if the entry is not found this message appears, indicating that the IFF file is invalid and therefore cannot be used. The program exits immediately.

User action: Look at the IFF file using the IMP utility IPATCH, in order to ascertain the level of corruption. The HIstory entry may indicate how the IFF file came to have no RA entry.

TABLEFULL, translation table full (maximum entries 'number')

Explanation: The stated limit has been reached while reading in translation table entries from the parameter file.

User action: Amend the translation table in the parameter file, so that the number of entries does not exceed the maximum. If a larger translation table is an ongoing requirement, please submit an SPR to Laser-Scan, requesting an increase in the limit.

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.