Laser-Scan Ltd.

CONVERT PACKAGE

IFFKERNCAM Reference

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Document Issue 1.0   S Townrow (modified 17-Jun-1991)

CONTENTS

IFFKERNCAM - Change Record

Version 1.0 S Townrow 17-June-1991

Module IFFKERNCAM - 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

KERNCAM FORMAT DESCRIPTION

FORMAT DESCRIPTION

Introduction

The program I2KERNCAM provides a translation from Laser-Scan's Internal Feature Format (IFF) to the KERN CAM format. KERNCAM2I provides a translation from a KERN CAM file to IFF. For a brief comparison of the way IFF and KERN CAM regard data, see the section on 'Data Preparation' below.

The programs read and produce the KERN CAM ASCII format, as described in the document KERN MAPS 200 - User's Guide, published June 1987, and other documentation supplied by Kern & Co. Ltd. Mechanical, Optical and Electronic Precision Instruments, CH-5001 Aarau, Switzerland.

Disc file output

The programs read from and write to disc file in KERN CAM format in ASCII code. Each disc file contains the output from one IFF file.

The KERN CAM Format

The data is output to and read from a KERN CAM file with the expected format as defined in this summary.

The broad structure of the file comprises an optional 4 record 'header', followed by the main body of 'data'. The data section begins with a START record and the file is terminated by a QUIT record.

Records are of various lengths and mainly consist of either CHANGE TO commands or 3D coordinate strings. Other records used are the MAP INDEX coordinates for the map origin, and the START and QUIT commands. All other records are considered to be User Messages which are 40 characters of free text.

A 3D coordinate string contains the easting, northing and height values for a point feature or points along a linear feature. There can be a fourth optional field of up to 16 characters describing the point or specifying a contour label.

The following CHANGE TO records (code words) are read and written:

CHANGE TO MAP SCALE
CHANGE TO MAP INDEX
CHANGE TO LINETYPE
CHANGE TO SYMBOL
CHANGE TO SCALE
CHANGE TO SYMBOL ROTATION
CHANGE TO TEXT ROTATION
CHANGE TO HOUR

CHANGE TO PEN DOWN
CHANGE TO PEN UP
CHANGE TO STRAIGHT
CHANGE TO CURVE
CHANGE TO CONTOUR
CHANGE TO ARC
CHANGE TO OBJECT

The following CHANGE TO code words are treated specially when read:

CHANGE TO MAP ROTATION

The value for the rotation is ignored when read, as there is no appropriate entry in the IFF file Map Header for this information. The IFF file may be transformed by the IMP utility ITRANS if required. The map rotation is always given a value of zero when a KERN CAM file is written.

CHANGE TO SPOT HEIGHT

Ignored when read and only written when there is an AC 'Height' entry in the IFF file. (See I2KERNCAM user guide below).

CHANGE TO NETWORK

When read, in order to create the full representation of a network line, additional symbol features are generated at the data points of the line feature. They are not written to a KERN CAM file.

CHANGE TO START HATCHING
CHANGE TO END HATCHING

These code words and all the records between them, actually defining the hatch lines, are not transferred to the IFF file. The hatching of buildings is achieved instead by defining the feature codes for buildings as 'fill areas' in the FRT table. The hatching will then be produced only when the file is plotted. These code words are not written to a KERN CAM file.

The following CHANGE TO code words are not written, and ignored when read, as they are only relevant to the functioning of a KERN MAPS 200 system.

CHANGE TO CLIP POINT
CHANGE TO CLIP LINE

See the 'extend' and 'edge matching' commands in LITES2 for equivalent feature correlation functions.

```
CHANGE TO GROUP ON
CHANGE TO GROUP OFF
CHANGE TO SAME SEGMENT
```

See the 'region' and 'layer' commands in LITES2 for equivalent feature grouping functions.

```
CHANGE TO MARKER ROTATION
CHANGE TO MARKER HEIGHT
```

See the symbol and text 'size' and 'orientation' commands in LITES2 for equivalent functions.

```
CHANGE TO PEN n
```

The 'pen number' for the plotting of IFF features is defined in an FRT table.

```
CHANGE TO SQUARE
```

See the 'squaring' commands in LITES2 for equivalent functions.

The KERN CAM file structure

A KERN CAM file will optionally begin with a 'header' of the form:

```
CHANGE TO MAP SCALE 99999999.9999 99999999.9999
CHANGE TO MAP ROTATION 999.999999 999.999999
CHANGE TO MAP INDEX
 99999999.999 99999999.999
```

START is then required, followed by line features and point features in any order.

Line features take the form:

```
(CHANGE TO NETWORK)
(CHANGE TO SCALE          9.999999)
CHANGE TO LINETYPE n                (16 chars. description)
CHANGE TO STRAIGHT/CURVE/CONTOUR/ARC
(CHANGE TO HOUR           9.99)
CHANGE TO PEN UP
 9999999.999 9999999.999 9999999.999 (description)
CHANGE TO PEN DOWN
 9999999.999 9999999.999 9999999.999
      |           |           |
 9999999.999 9999999.999 9999999.999
```

Point features take the form:

```
(CHANGE TO SCALE          9.999999)
CHANGE TO SYMBOL 999                (16 chars. description)
(CHANGE TO SYMBOL ROTATION 99.999999)
(CHANGE TO TEXT   ROTATION 99.999999)
CHANGE TO OBJECT/SPOT HEIGHT
(CHANGE TO HOUR           9.99)
 9999999.999 9999999.999 9999999.999 (description)
```

NOTES:

Commands in parentheses are not mandatory.

The field extents are only indicative - see KERN documentation for the precise formats.

QUIT is required to mark the end of the data.

CHAPTER 2

KERNCAM DATA PREPARATION

DATA PREPARATION

Comparison of KERN CAM and IFF

IFF is a feature orientated 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.

KERN CAM format shares this concept of a 'feature', and the simple form of CAM produced is essentially an ASCII representation of an IFF file on a feature by feature basis.

KERNCAM2I considers a feature in a KERN CAM file to be limited by pen up moves and feature definition code words. A linear feature in a KERN CAM file containing segments separated by pen up instructions will be broken into separate features, of the same kind, in the IFF file. Multiple coordinates contained in a single KERN CAM point feature are converted into separate point features in IFF format by KERNCAM2I.

The plotted shape of symbols and the line styles produced by MAPS 200 software from the KERN CAM file can be reproduced by appropriate entries in an SRI file and in FRT table pattern definitions.

The IFF format does not represent 'network' lines in the same way as KERN, they are converted by KERNCAM2I into a linear feature - possibly a patterned line - and point symbols at every coordinate with the FC equal to that of the line plus 5000.

Spot heights in KERN CAM files are translated into single point features where the height is held in the Z value of the IFF coordinate. This may be displayed by labelling these features with their Z attribute in LITES2.

The hatching of buildings is achieved by defining the building feature code as 'fill areas' in an FRT table (GT 12). The hatching specifically drawn in the KERN CAM file is therefore discarded in favour of software hatching produced only at plot time from the IFF file.

The IFF format does not support changes to the plotting colour for subsequent features as indicated by the CHANGE TO PEN code word in CAM format. This code word is ignored by KERNCAM2I. A feature's colour is determined by its specification in the FRT file.

The IFF format does not support changes to the scale for subsequent features as indicated by the CHANGE TO SCALE code word in CAM format. This code word is recorded in an AC entry in the IFF file by KERNCAM2I, and reiterated on output by I2KERNCAM. A point feature's size is determined by its size in the FRT file.

The IFF format has no equivalent to CHANGE TO CLIP LINE, CLIP POINT, GROUP ON, GROUP OFF, SQUARE, SAME SEGMENT, MARKER ROTATION, AND MARKER HEIGHT code words and these are ignored by KERNCAM2I and not written by I2KERNCAM. Some of these functions can be emulated within the LITES2 editor, such as joining of lines, selecting subsets of features and squaring.

'User Messages' in KERN CAM format are displayed if the DIAGNOSTICS qualifier is specified, as are all KERN CAM file records, but otherwise ignored.

The subset of KERN CAM format produced by I2KERNCAM does not contain any facility for the transmission of IFF map level entries, layers, text, line thickness, scaled symbols, symbol strings, clockwise and anti-clockwise arcs or multiple attribute coding of IFF features.

I2KERNCAM is thus best suited for use with an IFF containing symbols, contour strings or 3 dimensional strings (held in IFF ZS entries). 2 dimensional IFF strings held in ST entries may have a height value taken from an AC entry. By default this AC will be of type 3, which carries the height value as a floating point number. If there is no type 3 AC entry in the feature a default value of 0.0 is used. Any AC's of type 3 in IFF features which consist of 3D strings (IFF ZS entries) will be ignored.

Map Header Data

KERNCAM2I will by default construct an IFF Type 2 Map Descriptor and include in the Map Descriptor the arguments for CHANGE TO MAP SCALE in the Scale, and for CHANGE TO MAP INDEX into the Origin Offset. The arguments to CHANGE TO MAP ROTATION are ignored as there is no appropriate IFF record in which to hold them. Other entries in the Map Descriptor are unset. If there are no CHANGE TO code words before START in the KERN CAM file then the scale is set to 1.0 and the origin offset to 0.0, 0.0 The IFF Map Header entry is unset.

I2KERNCAM will extract the scale and origin offset from an IFF Type 2 Map Descriptor and write the header records to the KERN CAM file including a Map Rotation of 0. If the IFF file has a Type 1 Map Descriptor then no header details are output and the KERN CAM file begins with the START code word. The IFF Map Header entry is ignored.

Feature Code Translation

The transmission of the feature code for any particular feature is obviously between the KERN CAM format CHANGE TO LINETYPE argument or CHANGE TO SYMBOL argument and the IFF Feature Status (FS) entry. However, the IFF FRT file mechanism allows only a single occurrence of a feature code with a unique graphical type, whereas the KERN CAM feature may have one of several graphical types for a single value (between 1 and 999) of LINETYPE or SYMBOL argument. A direct correlation is therefore not possible between the 2 formats.

The transmission of the feature code is achieved by expanding the KERN CAM value by multiples of 1000 by graphical type in KERNCAM2I and an equivalent reduction by I2KERNCAM. Basically all LINETYPE features that are not STRAIGHT (GT = 1) are treated as interpolated curves with GT = 6 (CHANGE TO CURVE or CONTOUR), or as full circumcircles (GT 5) or part arcs (GT 4) for CHANGE TO ARC, the difference between the latter two depending on whether the feature coordinates are closed (first point = last point) or not, respectively. There are a few special linear features that are best suited by a GT = 12 (fill-area) if closed, which replaces the HATCHING facility in KERN CAM.

Most SYMBOLS are treated as oriented symbols with GT = 8, including the symbol features added to reproduce a NETWORK at the vertices of a linear feature. There are some special SYMBOL features with GT 10 in the FRT file used for text string transmission. The text is taken from the ZS name field in the KERN CAM coordinate lines, or from the FC name field in the CHANGE TO SYMBOL line if not. The transmission of the feature codes are defined in the following table.

KERN CAM format			IFF format	
Library	Number	Form	Feature Status l	Graphical Type
LINETYPE	1-999	STRAIGHT	1 - 999	1
		CURVE	1001 - 1999	6
		CONTOUR	2001 - 2999	6
		ARC (part arc)	3001 - 3999	4
		ARC (circle)	4001 - 4999	5
		NETWORK	5001 - 5999	8

Some linear feature codes require a Graphical Type 12 if they are to be treated as fill areas.

SYMBOL	1-999	OBJECT	6001 - 6999	8
		SPOT HEIGHT	6001 - 6999	8

Some symbol feature codes require a Graphical Type 10 if they are to display a text string.

ACD Table

Several fields in the KERN CAM format contain relevant data that should be conserved in any translation by I2KERNCAM and KERNCAM2I but for which no specific entries exist in IFF format to hold. These fields are held as AC entries on a per feature basis.

The KERN CAM fields held as AC entries are the arguments to the code words CHANGE TO SCALE and CHANGE TO HOUR, and the additional 16 characters of text appended to the code words CHANGE TO LINETYPE or CHANGE TO SYMBOL, and to the first coordinate line. The latter AC's

are output only if the text information is not used for any text feature TX entry to prevent duplication of information within the IFF file.

The programs I2KERNCAM and KERNCAM2I 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'.

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

CHANGE TO HOUR argument
AC Name : Kern_Hour
AC Type : Real, between 0.0 and 999999.99.

CHANGE TO SCALE argument
AC Name : Kern_Scale
AC Type : Real, between 0.0 and 999999.999999.

Linetype/Symbol Description
AC Name : Kern_FC_Name
AC Type : Integer, between 1 and 16,
- indicates length of Additional Text holding the description.

Coordinate Description
AC Name : Kern_ZS_Name
AC Type : Integer, between 1 and 16,
- indicates length of Additional Text holding the description.

An FRT File for use with KERN CAM Data Held in IFF

The following is a listing of a typical FRT file which might be used with KERNCAM2I, I2KERNCAM and other utilities to prepare and process an IFF file from an KERN CAM format disc file. This FRT file is normally supplied with KERNCAM2I and I2KERNCAM for acceptance testing as the file:
LSL$PUBLIC_ROOT:[CONVERT.ACCEPT]KERN_CAM.FRT

```
!
! Feature Representation Table for use in the development and acceptance
! testing of CONVERT programs KERNCAM2I and I2KERNCAM.
!
! Author: F J Brown
! Date: 6 October 1988
! Copyright:    Laser-Scan Ltd, Cambridge Science Park,
!               Milton Road, Cambridge CB4 4FY, England.
!
! Use SRI OS, TRI OS in LITES2 as this is based on Ordnance Survey FRT
!
!
!       FC      GT      COL     WIDTH   SIZE    SC          DESCRIPTION
!
! STRAIGHT:
!
FRT     0       1       1       0       0.0     0       ! Corner Marks
!
FRT     1       1       2       0       0.0     0       ! Paved ROAD
FRT     2       1       2       0       0.0     0       ! Kerb ROAD
FRT     3       1       2       0       0.0     1       ! Footpath ROAD
FRT     4       1       2       0       0.0     0       ! Main ROAD
FRT     10      12      2       0       2.0     104     ! House BLDG
FRT     15      1       2       0       0.0     2       ! Railway ROAD
FRT     40      12      2       0       2.0     104     ! House BLDG
FRT     61      1       2       0       0.0     4       ! Fence BDY
FRT     80      1       1       0       0.0     0       ! Tree Outline CLT
FRT     111     1       1       0       0.0     3       ! Pond DRAIN
FRT     120     1       2       0       0.0     0       ! Contour ELEV
!
! CURVE
!
FRT     1001    6       2       0       0.0     0       ! Paved ROAD
FRT     1002    6       2       0       0.0     0       ! Kerb ROAD
FRT     1003    6       2       0       0.0     1       ! Footpath ROAD
FRT     1004    6       2       0       0.0     0       ! Main ROAD
FRT     1010    6       2       0       0.0     0       ! House BLDG
FRT     1015    6       2       0       0.0     2       ! Railway ROAD
FRT     1040    6       2       0       0.0     0       ! House BLDG
FRT     1061    6       2       0       0.0     4       ! Fence BDY
FRT     1080    6       1       0       0.0     0       ! Tree Outline CLT
FRT     1111    6       1       0       0.0     3       ! Pond DRAIN
FRT     1120    6       2       0       0.0     0       ! Contour ELEV
!
! CONTOUR
!
FRT     2001    6       2       0       0.0     0       ! Paved ROAD
```

```
FRT     2002    6       2       0       0.0     0       ! Kerb ROAD
FRT     2003    6       2       0       0.0     1       ! Footpath ROAD
FRT     2004    6       2       0       0.0     0       ! Main ROAD
FRT     2010    6       2       0       0.0     0       ! House BLDG
FRT     2015    6       2       0       0.0     2       ! Railway ROAD
FRT     2040    6       2       0       0.0     0       ! House BLDG
FRT     2061    6       2       0       0.0     4       ! Fence BDY
FRT     2080    6       1       0       0.0     0       ! Tree Outline CLT
FRT     2111    6       1       0       0.0     3       ! Pond DRAIN
FRT     2120    6       2       0       0.0     0       ! Contour ELEV
!
! ARC (arc)
!
FRT     3001    4       2       0       0.0     0       ! Paved ROAD
FRT     3002    4       2       0       0.0     0       ! Kerb ROAD
FRT     3003    4       2       0       0.0     1       ! Footpath ROAD
FRT     3004    4       2       0       0.0     0       ! Main ROAD
FRT     3010    4       2       0       0.0     0       ! House BLDG
FRT     3015    4       2       0       0.0     2       ! Railway ROAD
FRT     3040    4       2       0       0.0     0       ! House BLDG
FRT     3061    4       2       0       0.0     4       ! Fence BDY
FRT     3080    4       1       0       0.0     0       ! Tree Outline CLT
FRT     3111    4       1       0       0.0     3       ! Pond DRAIN
FRT     3120    4       2       0       0.0     0       ! Contour ELEV
!
! ARC (circle)
!
FRT     4001    5       2       0       0.0     0       ! Paved ROAD
FRT     4002    5       2       0       0.0     0       ! Kerb ROAD
FRT     4003    5       2       0       0.0     1       ! Footpath ROAD
FRT     4004    5       2       0       0.0     0       ! Main ROAD
FRT     4010    5       2       0       0.0     0       ! House BLDG
FRT     4015    5       2       0       0.0     2       ! Railway ROAD
FRT     4040    5       2       0       0.0     0       ! House BLDG
FRT     4061    5       2       0       0.0     4       ! Fence BDY
FRT     4080    5       1       0       0.0     0       ! Tree Outline CLT
FRT     4111    5       1       0       0.0     3       ! Pond DRAIN
FRT     4120    5       2       0       0.0     0       ! Contour ELEV
!
! ORIENTED SYMBOL for NETWORKing of linear features
!
FRT     5001    8       2       0       2.0     1       !
FRT     5002    8       2       0       2.0     1       !
FRT     5003    8       2       0       2.0     1       !
FRT     5004    8       2       0       2.0     1       !
FRT     5010    8       2       0       2.0     1       !
FRT     5015    8       2       0       2.0     1       !
FRT     5040    8       2       0       2.0     1       !
FRT     5061    8       2       0       2.0     1       !
FRT     5080    8       1       0       2.0     1       !
FRT     5111    8       1       0       2.0     1       !
FRT     5120    8       2       0       2.0     1       !
!
! ORIENTED SYMBOL
!
FRT     6001    10      2       0       2.0     1       ! Free Annot. ROAD
```

```
FRT     6081    8       1       0       0.0     6       ! Tree CLT
FRT     6092    8       1       0       0.0     6       ! Banana CLT
FRT     6094    8       1       0       0.0     6       ! Rubber CLT
FRT     6111    8       1       0       2.0     1       ! Water DRAIN
FRT     6120    10      2       0       2.0     1       ! Free Annot. ELEV
FRT     6121    8       2       0       2.0     1       ! Spot Height ELEV
!
! Pattern Definition Table
!
PATTERN 1       0       0       0       0       5.0     4.0  0.0  0.0  0.0
PATTERN 2       0       1       0       0       9.0     6.0  0.0  0.0  1.0
PATTERN 3       0       0       0       0       6.0     4.0  0.0  0.0  0.0
PATTERN 4       0       0       0       0       6.0     4.5  0.0  0.0  0.0
!
!
! KERN CAM AC's
!
ACD     TABLE   1
!
ACD     R       1       Kern_hour
ACD     R       2       Kern_scale
ACD     I       3       Kern_FC_name    0       16      ! no. of characters
ACD     I       4       Kern_ZS_name    0       16      ! no. of characters
!
!
!       FC      GT      Colour  Width   Size    SC      Description
SCT     0       1       0       0       0       0       ! LINEAR
SCT     1       1       0       0       0       0       line
SCT     2       2       0       0       0       0       clockwise arc
SCT     3       3       0       0       0       0       anticlockwise arc
SCT     4       4       0       0       0       0       circumcircle arc
SCT     5       5       0       0       0       0       full circumcircle
SCT     6       6       0       0       0       0       interpolated curve
!
!SCT    5       6       0       0       0       0       ! INTERPOLATED CURVE
SCT     65      2       0       0       0       0       ! CLOCKWISE ARC
SCT     66      3       0       0       0       0       ! ANTICLOCKWISE ARC
SCT     67      4       0       0       0       0       ! CIRCUMCIRCLE ARC
SCT     68      5       0       0       0       0       ! FULL CIRCUMCIRCLE
```

CHAPTER 3

I2KERNCAM UTILITY

UTILITY I2KERNCAM

FUNCTION

I2KERNCAM reads an Internal Feature Format (IFF) file, and produces a file on disc in KERN CAM format.

FORMAT

$ I2KERNCAM input-IFF-file-spec output-KERNCAM-file-spec

Command qualifiers	**Defaults**
/[NO]DIAGNOSTICS	/NODIAGNOSTICS
/FRT=file-spec	/FRT=LSL$FRT:KERN_CAM.FRT

PROMPT

_Input-IFF-file:	input-IFF-file-spec
_Output-KERNCAM-file:	output-KERNCAM-file-spec

PARAMETERS

input-IFF-file-spec

- This parameter specifies the name of an IFF file, and is compulsory. The data written to the output file are read from this file. Only one filename may be specified for each run of the program.
  The default device and extension LSL$IF:filename.IFF are applied to the input file specification when it is parsed.

output-KERNCAM-file-spec

- This parameter specifies the name of a KERN CAM data file, and is compulsory. The data read from the input file are written to this file. Only one filename may be specified for each run of the program.
  The default device and extension SYS$DISK:[]KERN_CAM.DAT are applied to the output file specification when it is parsed.

COMMAND QUALIFIERS

/DIAGNOSTICS
/NODIAGNOSTICS (default)

- When /DIAGNOSTICS is present, the I2KERNCAM utility will output diagnostic messages as it processes the input file.

/FRT=file-spec

- The /FRT command qualifier specifies a Feature Representation Table (FRT) file which the program will read to determine the AC codes to give to the AC entries in the IFF file, created to hold feature attribute information. The program I2KERNCAM always refers to these ACs using the same names, but the user may alter the codes, onto which these names map, by changing the FRT file.
  The default file specification is LSL$FRT:KERN_CAM.FRT. If a file specification is given with /FRT, it is parsed against this default.

RESTRICTIONS

I2KERNCAM does not translate features that are held in IFF format as clockwise arcs, anti-clockwise arcs, scaled symbols or text. Symbol strings are translated into linear features without the symbols to indicate the feature's presence.

DESCRIPTION

Command line

The symbol I2KERNCAM is normally set up as:

```
I2KERNCAM == "$lsl$exe:i2kerncam"
```

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

Program action

I2KERNCAM is a utility to transfer an Internal Feature Format (IFF) disk file to a KERN CAM format disc file written in ASCII code.

Note that only a single dataset may be transferred during a single run of the program.

If the /DIAGNOSTICS qualifier is used on the command line, the program produces messages giving information on the IFF layers found.

If the IFF file has a Type 2 Map Descriptor then the scale and origin offset are extracted and used to write the KERN CAM Map Header records. If the IFF file has a Type 1 Map Descriptor then no KERN CAM

Header details are written. See the section on 'Format Description' for details of the KERN CAM Map Header.

I2KERNCAM always outputs a START record before any data records.

I2KERNCAM then translates each IFF feature record in the input file into the relevant KERN CAM data records. The data features can be contained in any layers from layer 1 onwards of the IFF file and are ordered as in the IFF file. The X, Y and Z co-ordinates of a ZS entry are transfered to the easting, northing and height, respectively, of a data record. All the AC entries contained in the feature are transfered to the relevant CHANGE TO records or attribute fields in the data record. The codes of these AC entries are determined from the FRT file read by the program.

The I2KERNCAM program always refers to the types of the AC entries which it constructs using the same AC names. The user may alter the codes of the AC entries written to the output IFF file by changing the FRT file read by the program. The use of the FRT file is described in the 'Data Preparation' section of the documentation for this module.

I2KERNCAM always outputs a QUIT record after the data records, and closes all files.

The feature codes of the IFF file are converted, according to their graphical type, into the correct KERN CAM library number and geometric form record. The section on 'Data Preparation' gives details of this conversion.

Some quantities may be subject to rounding errors in their final digit when the program transfers them from the input IFF file to the KERN CAM format tape file. This will generally only occur for quantities when all 8 of their potential significant figures (digits) are used (ie. greater than 99.99999 degrees). This rounding error is inherent to VAX/VMS data storage methods.

Details of the structure, content and characteristics of an KERN CAM format tape are to be found in the 'Data Format' section of this modules's documentation.

EXAMPLES

$ **I2KERNCAM/DIAGNOSTICS/FRT=KERN_CAM FTEST11.IFF KERNTEST11<CR>**
%LSLLIB-I-IFFOPENED, LSL$DATA_ROOT:[LSL.IFF]FTEST11.IFF;2 opened for read
%I2KERNCAM-I-CAMOPEN, KERN CAM file SYS$DISK:[]KERNTEST11.DAT;0 opened for output
%I2KERNCAM-I-LAYER, layer 1 found
 ELAPSED: 0 00:00:08.15 CPU: 0:00:01.82 BUFIO: 18 DIRIO: 61 FAULTS: 210

This example shows a normal run of I2KERNCAM using both available qualifiers and successfully converting the IFF file FTEST11 into the KERN CAM file KERN_TEST11.

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, successful completion

Explanation: I2KERNCAM has finished its operations successfully and without problems.

User action: None.

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.

CAMOPEN, KERN CAM file 'file-spec' opened for output

Explanation: The specified KERN CAM file has been opened for writing

User action: None.

LAYER, layer 'integer' found

Explanation: The specified layer has been found in the input IFF file

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.

UNKFCOD, Unknown FC code 'integer' - feature ignored

Explanation: The specified FC code was not found in the FRT table supplied to the program. The IFF feature has been ignored.

User action: Check that the correct FRT table with the complete range of FRT entries was supplied.

UNKGT, Invalid GT code 'integer' - feature ignored

Explanation: The Graphical Type cannot be transferred to KERN CAM format. The IFF feature has been ignored.

User action: Check that the correct FRT table with the complete range of FRT entries with their correct GT entries was supplied. If the FRT is correct then the feature must be altered in LITES2 to one of a valid GT if it is required to be output

UNSETMD, IFF type 2 map descriptor is unset

Explanation: The IFF file must have a type 2 map descriptor entry with valid origin offset

User action: Amend the IFF file using ITRANS and rerun I2KERNCAM on this data.

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.

BADFEAT, error processing feature 'fsn' ('isn')

Explanation: An error - usually with the AC entries - has been encountered while processing the feature. The associated error messages will give further information.

User action: Investigate the cause of the error using IPATCH or LITES2 and rerun I2KERNCAM on the data.

BADFRT, error initialising FRT file 'file-spec'

Explanation: I2KERNCAM has not been able to open the specified FRT file. The associated system error messages will give further information.

User action: Check the spelling of the FRT file-spec and that the required FRT is available in the directory LSL$FRT:

CAMARC, error processing arc feature 'fsn' ('isn')

Explanation: An error has been encountered while processing the circumcircle arc feature. The associated error messages will give further information.

User action: Investigate the cause of the error using IPATCH or LITES2 and rerun I2KERNCAM on the data.

CAMCURVE, error processing curve feature 'fsn' ('isn')

Explanation: An error has been encountered while processing the curve interpolated feature. The associated error messages will give further information.

User action: Investigate the cause of the error using IPATCH or LITES2 and rerun I2KERNCAM on the data.

CAMLINE, error processing line feature 'fsn' ('isn')

Explanation: An error has been encountered while processing the line feature. The associated error messages will give further information.

User action: Investigate the cause of the error using IPATCH or LITES2 and rerun I2KERNCAM on the data.

CAMSYMBOL, error processing symbol feature 'fsn' ('isn')

Explanation: An error has been encountered while processing the symbol feature. The associated error messages will give further information.

User action: Investigate the cause of the error using IPATCH or LITES2 and rerun I2KERNCAM on the data.

ERROROUT, writing to the KERN CAM file at the start of layer 'integer'

Explanation: The program is unable to write to the output file. The associated system error messages will give further information.

User action: Check that a valid output file name has been given.

ERROROUTMD, unable to write MD data to the KERN CAM file.

Explanation: The program is unable to write to the output file. The associated system error messages will give further information.

User action: Check that a valid output file name has been given.

NOCOORDS, no coordinate entry found for feature 'fsn' ('isn')

Explanation: An error has been encountered while processing the feature. No coordinates, in either an ST or ZS entry, have been found in the IFF feature. The feature has not been output to the KERN CAM file.

User action: Investigate the cause of the error using IPATCH or LITES2 and rerun I2KERNCAM on the data.

UNEXPEOF, unexpected end of IFF file

Explanation: The IFF file has an incorrect structure or missing entries.

User action: Amend the IFF file using IPATCH and rerun I2KERNCAM.

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

KERNCAM2I UTILITY

UTILITY KERNCAM2I

FUNCTION

KERNCAM2I is a utility to transfer a dataset from a KERN CAM format file on disc to an Internal Feature Format (IFF) disc file.

FORMAT

$ KERNCAM2I Input-KERNCAM-file-spec Output-IFF-file-spec

Command qualifiers	**Defaults**
/[NO]DIAGNOSTICS	/NODIAGNOSTICS
/FRT = file-spec	/LSL$FRT:KERN_CAM.FRT

PROMPT

_Input-KERNCAM-file:	Input-KERNCAM-file-spec
_Output-IFF-file:	Output-IFF-file-spec

PARAMETERS

Input-KERNCAM-file-spec

- specifies the input KERN CAM disc file and is compulsory. Any part of the file specification which is not supplied will be taken from the default specification: 'SYS$DISK:[]KERN_CAM.DAT;0'. Only one filename may be specified for each run of the program.

Output-IFF-file-spec

- specifies the output IFF file and is compulsory. Any part of the file specification which is not supplied will be taken from the default specification: 'LSL$IF:KERN_CAM.IFF'. Only one filename may be specified for each run of the program.

COMMAND QUALIFIERS

/DIAGNOSTICS
/NODIAGNOSTICS (default)

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

/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:KERN_CAM.FRT'.

DESCRIPTION

Command line

The symbol KERNCAM2I is normally set up as:

```
KERNCAM2I == "$lsl$exe:kerncam2i"
```

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

Input file

The input is expected to be a valid KERN CAM data file. For further description of the KERN CAM data structure see the accompanying 'Format Description' section.

Output file

The default action is to output one dataset to a single IFF file, the required file having been selected by input filename.

Program action

KERNCAM2I is a utility to transfer a KERN CAM format disc file to an Internal Feature Format (IFF) disk file.

Note that only a single dataset may be transferred during a single run of the program.

KERNCAM2I writes a Type 2 Map Descriptor to the output IFF file, and if the relevant 'MAP SCALE' and 'MAP INDEX' records are present at the start of the input KERN CAM file the arguments are inserted in the IFF header as map scale and origin offset. See the section on 'Format Description' for details of the KERN CAM Map Header.

After a START code word has been read from the KERN CAM file subsequent records are translated into IFF features. All IFF features are constructed in layer 1 of the IFF file.

The argument to the CHANGE TO LINETYPE code word is expanded into the feature code (FS entry) in the IFF file depending on the geometric nature of the feature. See the table in the 'Data Preparation' section for details of this conversion. These feature codes reference appropriate graphical types which are defined in the FRT file LSL$FRT:KERN_CAM.FRT.

The easting, northing and height record(s) of the KERN CAM feature are translated into 3D strings (ZS Entries) in the IFF file. The coordinates of linear features are translated literally where 'PEN UP' moves become invisible moves and 'PEN DOWN' moves become visible moves.

The textual descriptions which may be appended to the CHANGE TO LINETYPE/SYMBOL code word and to the first coordinate record are put into AC entries within the relevant feature. Similarly, AC entries are constructed for the arguments to the CHANGE TO SCALE and CHANGE TO HOUR code words, if they are present.

The KERNCAM2I program always refers to the types of the AC entries which it constructs using the same AC names. The user may alter the codes of the AC entries written to the output IFF file by changing the FRT file read by the program. The use of the FRT file is described in the 'Data Preparation' section of the documentation for this module.

KERNCAM2I will close the IFF file on reading a QUIT record after the data records.

Some quantities may be subject to rounding errors in their final digit when the program transfers them from the input IFF file to the KERN CAM format tape file. This will generally only occur for quantities when all 8 of their potential significant figures (digits) are used (ie. greater than 99.99999 degrees). This rounding error is inherent to VAX/VMS data storage methods.

Details of the structure, content and characteristics of an KERN CAM format tape are to be found in the 'Data Format' section of this modules's documentation.

EXAMPLES

```
 $ KERNCAM2I<CR>

_Input-KERN-File: TEST<CR>
_Output-IFF-File: TESTKERN<CR>

 Reading KERN CAM file SYS$DISK:[]TEST.DAT;0
%LSLLIB-I-IFFOPENED, LSL$DATA_ROOT:[LSL.IFF]TESTKERN.IFF;4 opened for write

 Writing to IFF file LSL$DATA_ROOT:[LSL.IFF]TESTKERN.IFF;4

 ELAPSED:    0 00:00:21.23  CPU: 0:00:02.91  BUFIO: 19  DIRIO: 68  FAULTS: 246
```

This example shows a successful conversion of KERN CAM file TEST.DAT into the IFF file TESTKERN.IFF with default file specifications.

```
 $ KERNCAM2I/FRT=KERN_CAM/DIAGNOSTICS DEMO TESTKERN<CR>

.Command line was: KERNCAM2I/FRT=KERN_CAM/DIAGNOSTICS DEMO TESTKERN

 Reading KERN CAM file SYS$DISK:[]DEMO.DAT;0
%LSLLIB-I-IFFOPENED, LSL$DATA_ROOT:[LSL.IFF]TESTKERN.IFF;2 opened for write

 Writing to IFF file LSL$DATA_ROOT:[LSL.IFF]TESTKERN.IFF;2

 Line read:
 Line ignored:
 Line read: CHANGE TO MAP SCALE     2500.0000     2500.0000
 MD2 scale is:      2500.0000
 Line read: CHANGE TO MAP ROTATION   0.628319     40.0000
 Line ignored: CHANGE TO MAP ROTATION   0.628319     40.0000
 Line read: CHANGE TO MAP INDEX
 Line read:     39500.000     5900.000
 MD2 origin:     39500.000       5900.000
 Line read: START
 IFF header information output

 Line read: CHANGE TO LINETYPE   1            PAVED ROAD
 Linetype FC: 1
 FC Name: PAVED ROAD
 Line read: CHANGE TO STRAIGHT
 Line ignored: CHANGE TO STRAIGHT
 Line read: CHANGE TO HOUR           0.44
 Hour:            0.44
 Line read: CHANGE TO PEN UP
 Line read:    39101.529    6572.268     824.816
 Line read: CHANGE TO PEN DOWN
 Line read:    39155.714    6606.782     821.896
 Line read:    39232.805    6656.333     820.758
```

```
 Line read:    39296.559    6696.514     820.780
 Line read:    39363.887    6738.713     821.730
 Line read: CHANGE TO LINETYPE   1            PAVED ROAD
 Linetype FC: 1
 FC Name: PAVED ROAD
 Line read: CHANGE TO CURVE
 Linetype FC now: 1001
 Line read: CHANGE TO HOUR           0.45
 Hour:            0.45
 Line read:    39370.876    6742.806     821.735
 Line read:    39389.337    6751.621     822.760
 Line read:    39410.962    6764.728     823.243
 Line read:    39428.373    6777.010     823.179
 Line read:    39456.871    6800.456     823.179
 Line read:    39480.603    6823.967     823.184
 Line read:    39497.310    6838.121     823.179
 Line read:    39508.005    6849.248     823.173
 Line read: CHANGE TO LINETYPE   1            PAVED ROAD
 Linetype FC: 1
 FC Name: PAVED ROAD
 Line read: CHANGE TO STRAIGHT
 Line ignored: CHANGE TO STRAIGHT
 Line read: CHANGE TO HOUR           0.45
 Hour:            0.45
 Line read:    39527.887    6868.247     823.206
 Line read:    39547.924    6887.381     823.093
 Line read:    39567.267    6906.112     823.087
 Line read: CHANGE TO LINETYPE   3            FOOTPATH ROAD
 Linetype FC: 3
 FC Name: FOOTPATH ROAD
 Line read: CHANGE TO STRAIGHT
 Line ignored: CHANGE TO STRAIGHT
 Line read: CHANGE TO HOUR           0.45
 Hour:            0.45
 Line read: CHANGE TO PEN UP
 Line read:    39105.141    6566.627     824.816
 Line read: CHANGE TO PEN DOWN
 Line read:    39156.597    6599.573     821.896
 Line read:    39236.397    6650.679     820.758
 Line read:    39300.123    6690.843     820.780
 Line read:    39367.361    6732.985     821.730
 Line read: CHANGE TO LINETYPE   3            FOOTPATH ROAD
 Linetype FC: 3
 FC Name: FOOTPATH ROAD
 Line read: CHANGE TO CURVE
 Linetype FC now: 1003
 Line read: CHANGE TO HOUR           0.45
 Hour:            0.45
 Line read:    39374.015    6736.888     821.735
 Line read:    39392.523    6745.720     822.760
 Line read:    39414.633    6759.121     823.243
 Line read:    39432.437    6771.680     823.179
 Line read:    39461.681    6795.740     823.179
 Line read:    39480.016    6818.946     823.184
 Line read:    39501.601    6832.920     823.179
 Line read:    39512.764    6844.533     823.173
```

```
 Line read: CHANGE TO LINETYPE   3            FOOTPATH ROAD
 Linetype FC: 3
 FC Name: FOOTPATH ROAD
 Line read: CHANGE TO STRAIGHT
 Line ignored: CHANGE TO STRAIGHT
 Line read: CHANGE TO HOUR           0.45
 Hour:            0.45
 Line read:    39530.350    6861.755     823.206
 Line read:    39549.742    6879.913     823.093
 Line read:    39571.916    6901.290     823.087
 Line read: CHANGE TO LINETYPE  15            RAILWAY ROAD
 Linetype FC: 15
 FC Name: RAILWAY ROAD
 Line read: CHANGE TO CURVE
 Linetype FC now: 1015
 Line read: CHANGE TO HOUR           0.49
 Hour:            0.49
 Line read: CHANGE TO PEN UP
 Line read:    39614.709    6897.901     813.588
 Line read: CHANGE TO PEN DOWN
 Line read:    39606.148    6882.455     813.604
 Line read:    39601.193    6873.830     813.631
 Line read: CHANGE TO LINETYPE  15            RAILWAY ROAD
 Linetype FC: 15
 FC Name: RAILWAY ROAD
 Line read: CHANGE TO STRAIGHT
 Line ignored: CHANGE TO STRAIGHT
 Line read: CHANGE TO HOUR           0.50
 Hour:            0.50
 Line read:    39565.383    6818.680     813.631
 Line read:    39533.222    6773.154     813.631
 Line read:    39485.255    6704.336     812.949
 Line read: CHANGE TO LINETYPE  15            RAILWAY ROAD
 Linetype FC: 15
 FC Name: RAILWAY ROAD
 Line read: CHANGE TO CURVE
 Linetype FC now: 1015
 Line read: CHANGE TO HOUR           0.50
 Hour:            0.50
 Line read:    39476.157    6691.497     812.901


 ELAPSED:    0 00:00:17.46  CPU: 0:00:01.03  BUFIO: 190  DIRIO: 18  FAULTS: 333
```

This second example shows a successful conversion of KERN CAM file DEMO.DAT into the IFF file TESTKERN.IFF with default file specifications, with the DIAGNOSTICS switched on to give full information on the progress of the file transfer.

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, successful completion

Explanation: KERNCAM2I 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 not found in FRT file for name 'string'

Explanation: The AC name has not been found in the FRT table.

User action: Check that the correct FRT file has been given.

FRTFNDERR, FC 'integer' not found in FRT file

Explanation: The feature code indicated was not found in the FRT file.

User action: Check that the FRT file given is the correct one, or check for the relevant entry.

KERNPUT0, 'string' replaced with zero

Explanation: A error reading a number has resulted in the replacement with zero to the IFF file.

User action: Check the KERN file for the error causing the read error.

KERNPUT1, 'string' replaced with 1

Explanation: A error reading a number has resulted in the replacement with one to the IFF file.

User action: Check the KERN file for the error causing the read error.

RDINTERR, error reading integer into 'string' from KERN file

Explanation: There was an error trying to read an integer number from the KERN CAM file, and the field will be replaced with the stated number.

User action: Check the KERN file for the cause of the error.

RDREALERR, error reading real no. into 'string' from KERN file

Explanation: There was an error trying to read a real number from the KERN CAM file, and the field will be replaced with the stated number.

User action: Check the KERN file for the cause of the error.

SYMBOLGTERR, unexpected GT for symbol feature with FC 'integer'

Explanation: A symbol feature with the given feature code has an unexpected graphical type in the FRT file (ie. not GT 8 or GT 10), and the feature cannot be created.

User action: Check that the correct FRT file has been given, or that the FRT FC entries are correct.

UNSETHOUR, hour entry is unset for AC entry

Explanation: The hour value is unset due to a read error, and the AC abandoned

User action: Check the data in the KERN file.

UNSETMD2LOC, The MD2 origin entry was unset, and is set to 0,0

Explanation: The MD2 origin entry was unset because of a reading error or the header was missing from the KERN CAM data, and is assumed to be at (0.0, 0.0)

User action: Check the data in the KERN file.

UNSETMD2SCL, MD2 scale entry was unset, and is set to 1.0

Explanation: The MD2 scale entry was unset because of a reading error or the header was missing from the KERN CAM data, and is assumed to be equal to 1.0

User action: Check the data in the KERN file.

UNSETSCALE, scale entry is unset for AC entry

Explanation: The scale value is unset due to a read error, and the AC abandoned

User action: Check the data in the KERN 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.

ARCPTSERR, wrong no. of points for arc feature: 'integer'

Explanation: There were less than 3 points in a feature preceded by CHANGE TO ARC, and no feature can be created.

User action: Check the KERN CAM file.

CIRCPTSERR, wrong no. of points for circle feature: 'integer'

Explanation: There were less than 4 points in a feature preceded by CHANGE TO ARC and which was closed to indicate a full circle, and no feature can be created.

User action: Check the KERN CAM 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.

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 reading.

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.

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.

KERNSTRTERR, program start error

Explanation: There was no START line in the KERN CAM file to signify the end of the KERN header and the beginning of the data, and reading abandoned.

User action: Check the data in the KERN 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.

RDCOORDERR, error reading coordinates from line 'string'

Explanation: There was an error reading the coordinate values from a line which was expected to contain them.

User action: Check the contents of the KERN CAM file.

READLINERR, error reading line from KERN file

Explanation: There was an error trying to read the KERN CAM file (further messages having produced from the program giving further information) and the program abandoned.

User action: Check the KERN file for errors.

UNEXPEOF, unexpected end of file

Explanation: The KERN file has come to a premature end.

User action: Check the data in the file.

UNSETFC, feature code (FC) in the FS entry is unset

Explanation: The feature code (FC) in the FS entry is unset due to a read error, and the feature abandoned

User action: Check the data in the KERN file.

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.