

Laser-Scan Ltd.

DTMPREPARE

Reference Manual

Issue 1.7 - 9-December-1992

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Document "DTMPREPARE", Category "REFERENCE"
Document Issue 1.7 Jamie Hulme (modified 9-Dec-1992)

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DTMPREPARE Reference Documentation Change Record

Version 1.0 A.L.Bennetton, D.R.Catlow 04-Jun-1988

First issue of DTMPREPARE reference documentation.

Version 1.1 Andrew Morris 16-Feb-1989

Changes to module I3D. New commands ENABLE MODE INTERSECT, SET CLIP_TOLERANCE and SET INTS_PER_LINK added. Old commands ENABLE MODE ONEARM, SET MEMORY_SCALE, SET NETWORK_COMPONENTS and SET STACK_LEVELS removed. I3D now clips away unheighted river and ridgeline free ends where these are greater than the CLIP_TOLERANCE parameter value away from the nearest pre-heighted point along the river or ridgeline. This results in a considerable reduction in the work involved in using I3D for river and ridgeline heighting. I3D now also does its own link-node structuring, so there is no longer any need to use ILINK to structure the input river/ridgeline data - although ILINK must still be used to break features where they touch or cross, and to form precise junctions.

Version 1.2 John Cadogan 1-Nov-1989

Changes to module I3D. New error message generated by the SET INTS_PER_LINK command when number of intersections exceeds memory allocation.

Version 1.3 Tim Hartnall 15-Mar-1990

Changes to module I3D. SET INTS_PER_LINK and SET CLIP_TOLERANCE command descriptions expanded and missing parameter descriptions added.

Version 1.4 Catherine Biggs 17-May-1990

Changes to module ITCHECK. It is now not necessary to input index interval and supplementary interval for CHECK 1, these default to the contour interval.

Changes to module I3D documentation. General corrections made.

Version 1.5 Jon Barber

25-Feb-1991

Changes to module I3D. New messages NOLITESOUT and NOCHECKOUT to warn that no LITES2 guidance file or check plot file is produced for mode INTERSECT, and documentation made more explicit about this.

Message ONLYONEPNT changed to more general CBPNTER for any unexpected vertex count in a coordinate block entry.

Changes to module I3D documentation. Changes to some error exits described, and some minor general corrections made.

Changes to module ITCHECK documentation. PROFILE_INTERVAL parameter more fully explained.

Version 1.6 Clarke Brunt

26-Mar-1992

Changes to module I3D. The list of errors is now that generated from the program source code, so there are slight changes.

Version 1.7 Jamie Hulme, Jon Barber

9-Dec-1992

Changes to module ITCHECK. The default map limits are now defined by the bounding rectangle derived from the control point (CP) entry. The category 2 link checks description in the **DESCRIPTION** section has been amended, as has the **BORDER** command description.

The default LIST output file is now ITCHECK.LIS.

Version 1.8 John Cadogan

15-Apr-1993

Changes to module I3D. The SET MAX_INTERVAL command is now documented as not implemented.

PREFACE

Intended audience

This manual is intended for all users of the Laser-Scan DTMPREPARE package running under the VAX/VMS operating system.

Structure of this document

This document is composed of one section.

The section contains the User Reference Guides for the individual modules which comprise DTMPREPARE. Each individual module contains the same basic categories of information. These are:

MODULE	- the name of the DTMPREPARE module.
REPLACES	- which older Laser-Scan programs it replaces.
FUNCTION	- a synopsis of what the modules does
FORMAT	- a summary of the module 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.
DESCRIPTION	- the definitive description of the module action.
EXAMPLES	- annotated examples of module 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 return 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>.
\$ GO <CR>	Command examples show all user entered commands in bold type.
25 columns complete . . .	Vertical series of periods, or ellipsis, mean either that not all the data that DTMPREPARE displays 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 indicate 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 assignment statement).
'integer'	An integer number is expected in the specified input or output field.
'real'	A real number is expected in the specified input or output field.

Command line interpretation

DTMPREPARE utilities use the LSLLIB Command Interpreter (CMDLIB) to get and parse the program command lines.

CHAPTER 1

INTRODUCTION

DTMPREPARE Package Utilities

DTMPREPARE is a Laser-Scan package containing a number of modules that have been designed to prepare and validate vector data prior to input into the DTM creation package DTMCREATE. A module is provided to convert unheighted river and ridge-line strings into 3 - dimensional strings by overlay on contour and associated terrain data, and a module to validate the geometry and height of the vector data.

Full details on each module and its associated qualifiers; example runs, and details of all messages associated with a module, are contained in the relevant chapter of the DTMPREPARE Reference Manual.

DTMPREPARE Package Initialisation

Before use, the DTMPREPARE package must be initialised. Package initialisation involves assigning DCL symbols which allow the user to successfully run the modules. This is done using a command procedure DTMPREPAREINI.COM which is supplied as part of the DTMPREPARE package.

The DTMPREPAREINI command procedure will define a DCL symbol (the module name) for each of the DTMPREPARE modules, so that after its execution, the user need only type the symbol name to activate the module of his choice.

After initialisation the following symbols will be defined:

I3D

ITCHECK

At most sites, the DTMPREPAREINI command will be placed in the users login file, or in the site dependent default login file.

CHAPTER 2

I3D

MODULE I3D

REPLACES DTMPREPARE module RIV3D

FUNCTION

I3D is a DTMPREPARE utility for generating heightened river or ridgeline strings in IFF format files by overlaying unheighted strings with heightened terrain data.

FORMAT

\$ I3D

PROMPT

I3D is command driven. Command input is expected when the following prompt is issued:-

I3D>

DESCRIPTION

General

I3D is the DTMPREPARE package 3D string generation module. Its purpose is to generate heightened river or ridgeline strings in IFF format files by overlaying unheighted strings with heightened terrain data.

I3D is designed to be used in conjunction with the STRUCTURE package module ILINK and the LITES2 interactive cartographic editor. ILINK is used to break unheighted river/ridgeline features where they cross and to ensure that river and ridgeline junctions are precise.

*** WARNING ***

If river or ridgeline features are not broken into separate features where they touch or cross, or river or ridgeline junctions are not precisely defined as a single point, then the I3D heighting process - W I L L N O T W O R K !!

The LITES2 cartographic editor is used to edit heights into river and/or ridgeline features in areas of a river or ridgeline network where terrain data alone provides insufficient control. I3D offers the user a LITES2 guidance file option to enable LITES2 edit sessions to be partly automatically driven; the user has only to supply an appropriate Z-value for the new feature within LITES2.

I3D enables the user to apply IFF layer and feature code selection criteria to the incoming strings to identify each as a river string, a ridge string, a contour string or a spot height.

Processing Modes

The I3D utility provides for three distinct modes of operation. Each mode of operation will start by performing the following tasks:

1. Perform tests to ensure that certain preconditions hold.
2. Scan the input river and/or ridgeline IFF file(s) to obtain an estimation of virtual memory requirements needed by the processing sequence.
3. Allocate virtual memory.
4. Load river/ridgeline network into work arrays, based on the selected layers, feature serial numbers and feature codes. By default all layers and all FSNs are selected, and all feature codes defined in the group definition table. See section under "Group Definition Table" for more information on feature code selection.

Mode INTERSECT Heights river/ridgelines at terrain intersections.

This mode is selected using the ENABLE MODE INTERSECT command. The following tasks are performed by this processing mode:

1. The terrain data (contours, spot heights etc.) is loaded and overlaid onto the river/ridgeline data. A terrain height is inserted into each river/ridgeline at every terrain intersection.

If a terrain intersection location is within 'node_tolerance' of a river/ridgeline junction, the terrain height is assigned to the node point, rather than inserting a new heightened point into the river/ridgeline network.

3. A new IFF file is created for each of the input river/ridgeline IFF files, with the resulting heightened river/ridgelines.

Mode INTERPOLATE Directs network flow and heights each node, then interpolates a height for each point, and produces the 3D IFF output.

This mode is selected using the ENABLE MODE INTERPOLATE command. The following tasks are performed by this processing mode:

1. All of the river/ridgeline data is loaded into memory.
2. Unheighted free ends which are closer than the 'clip tolerance' to the nearest heightened point along the river/ridge are clipped off back to this heightened point.

3. During the INTERPOLATE (and FLOW) process(es), the following checks are made to the terrain-intersected river/ridgeline data. If any of the rules checked for are broken, and if the LITES2 command was used, LITES2 commands are written to facilitate the interactive heighting of nodes for which a height could not be estimated automatically, using the LITES2 interactive cartographic editor.

1. All river and ridgeline one-arm (end-point, not junction-) nodes must be heighted.

It is not possible to interpolate a height for such nodes, and realistic height extrapolation is not possible.

2. No river links may contain a height inflection.
3. The river network must not contain any implicit height inflections.
4. The river network must not contain any implicit flow loops.

If there is a flow loop, it is far more likely that there has been a digitising error than that a genuine flow loop was intended.

5. All river sources (river nodes from which there is a flow out and no flow in) and sinks (river nodes into which there is a flow in and no flow out) must be at terminal (source or sink) nodes.

This rule is enforced in order to ensure that I3D can reliably identify potential river source and sink nodes by equating them with terminal nodes. This is important because the flow directing algorithm depends on this knowledge.

6. All river terminal links must have their direction of flow uniquely determined by heighted points within the river network, together with rule 5 above.

This rule forces the user to decide which way all river terminal links should flow, and also allows the user to force the overall river flow as determined automatically along all non terminal river links to be quite different from what it would have been if the program had guessed the flow direction in river terminal links at random.

7. Minimum and maximum heights in each river network component must be at terminal nodes.
8. The maximum height must be significantly greater than the minimum height in each river network component.

This rule is enforced because horizontal river networks can safely be assumed to be incorrect.

4. A direction of flow is calculated for each link and a height is estimated for each node throughout every river network component. If any links cannot be directed immediately from heights found set along the link itself, a direction will be guessed for each undirected link until either a flow is found which is compatible with all of the heights set in the river network, or all possible flows are exhausted.
5. A height is estimated for every ridgeline node.
6. A check plot IFF file is created if the CHECKPLOT command is given. The purpose of this file is to provide a mechanism of checking the flow derived. This can be a powerful tool when overlaid on river/ridgeline data to enhance the information displayed.
7. If a height was successfully estimated for every node, a height will now be interpolated for each original river/ridgeline point.
8. If a height was successfully estimated for every point, a 3D river/ridgeline output file is created to correspond to each river/ridgeline input file.

Mode FLOW As for mode INTERPOLATE, but stops before producing any IFF output.

This mode is selected using the ENABLE MODE FLOW command. This processing mode is identical to the INTERPOLATE mode, except that even if a complete legal flow is found and all nodes are successfully heighted, processing will stop before the last stages of interpolating a height for each original river/ridgeline point and producing the 3D river/ridgeline IFF output. The only output produced by this mode are check-plot IFF and LITES2 guidance files which can be specified using the CHECKPLOT and LITES2 commands.

This mode is optional, but provides a standalone mechanism for generating a check plot IFF file showing the direction of flow determined by I3D in each river/ridgeline link. This can be used, for quality control purposes, to check the flow determined by I3D, before the final 3D IFF files are created. If the flow is incorrect, LITES2 can be used to add extra heights into the river/ridgeline network, and the FLOW process repeated, until the flow determined is satisfactory.

The check plot IFF file is generally displayed with river, ridgeline and terrain data in LITES2, or output to a hardcopy device.

Parameters

This section explains how the various parameters are used within the heighting process. The SET command provides a mechanism of modifying these parameters from the default value.

'ARROW_FEATURE_CODE'

The 'arrow_feature_code' parameter is used to define the feature code of the arrow symbol output to the check plot IFF file. The check plot IFF file is only created if the CHECKPLOT command and either the ENABLE MODE FLOW or ENABLE MODE INTERPOLATE commands have been given.

The SET ARROW_FC command can be used to modify the 'arrow_feature_code' parameter.

'BOX_FEATURE_CODE'

The 'box_feature_code' parameter is used to define the feature code of the box symbol output to the check plot IFF file. The check plot IFF file is only created if the CHECKPLOT command and either the ENABLE MODE FLOW or ENABLE MODE INTERPOLATE commands have been given.

The SET BOX_FC command can be used to modify the 'box_feature_code' parameter.

'CLIP_TOLERANCE'

All free-end river/ridgeline links with length from free-end to the nearest heighted point less than that specified by the 'clip_tolerance' parameter, will be ignored during the INTERPOLATE process. If the LITES command is used, all free-ends longer than this will be flagged in a LITES2 guidance file, created if either the ENABLE MODE FLOW or ENABLE MODE INTERPOLATE commands have been given, which can then be used in conjunction with the LITES2 interactive cartographic editor to assist in the heighting of each of these remaining unheighted free-ends, and unheighted nodes to which any whole free-end links may have been clipped, before going on to the next mode in I3D.

The SET CLIP_TOLERANCE command can be used to modify the 'clip_tolerance' parameter.

'MAX_INTERVAL'

The 'max_interval' parameter is used to constrain the direct flow algorithm described under section "Processing Modes" above. As a rule of thumb the 'max_interval' should be set equal to the contour interval.

The 'max_interval' parameter can be modified using the SET MAX_INTERVAL command.

Please note that the SET MAX_INTERVAL command is not currently implemented.

'LAYER'

The 'layer' parameter is used to assign the layer number in the output check plot IFF file which will contain the arrow and box symbols. The check plot IFF file is only created if the CHECKPLOT command and either the ENABLE MODE FLOW or ENABLE MODE INTERPOLATE commands have been given.

The SET LAYER command can be used to modify the 'layer' parameter.

'NODE_TOLERANCE'

The 'node_tolerance' parameter is used to specify the minimum distance between terrain intersection points and the nearest node along the intersected link. If the distance between the node and the intersection point is within the node tolerance value, then the node is considered to be at the intersection location and will be assigned the height value associated with the intersection point without inserting a new point into the link.

The SET NODE_TOLERANCE command provides a mechanism of modifying the 'node_tolerance' parameter.

'SYMBOL_SCALE'

The 'symbol_scale' parameter is used to scale the size of the arrow and box symbols output if the CHECKPLOT command has been given, and either the ENABLE MODE FLOW or ENABLE MODE INTERPOLATE commands have been given.

The SET SYMBOL_SCALE command provides a mechanism of modifying the 'symbol_scale' parameter.

'TOUCH_TOLERANCE'

The 'touch_tolerance' parameter provides a mechanism of backward projecting the start vector within a river or ridgeline feature and forward projecting the end vector within a river or ridgeline feature. This may be required to increase the probability of the ends intersecting with a terrain feature. The parameter is also used to test whether the shortest distance from a spot height to a river or ridgeline vector is within the distance defined by the 'touch_tolerance' parameter.

The SET TOUCH_TOLERANCE command provides a mechanism of modifying the 'touch_tolerance' parameter.

Input river/ridgeline files

I3D allows up to 2 input river/ridgeline IFF files to be specified by the user. Typically each input file will contain features relating to a particular group, eg. rivers may be contained in one file, while ridgelines may be held in the other file. Alternatively, a single IFF file containing all river and ridgeline map features may be supplied. All input IFF files specified using either the FILEIN command or the TERRAIN command must have an identical local origin. If this is not the case, I3D will display an error message, and abandon the current IFF file. This prevents the user from inadvertently specifying IFF files which are not part of the same geographic area.

I3D is designed to be compatible with the "new" type IFF files introduced in conjunction with the IMP (IFF Map Processing) package. Although downwards compatibility with "old" type IFF files is maintained, a warning message is issued if an IFF file is found not to contain a type 2 MD (Map Descriptor) entry.

Input Terrain files

I3D will allow up to 5 input terrain IFF files to be specified by the user. Typically each input file will contain features relating to a particular group, eg. contours may be contained in one file while spot heights may be held in a separate file. Alternatively, a single IFF file containing all terrain map features may be supplied. All input IFF files specified using either the TERRAIN command or the FILEIN command must have an identical local origin. If this is not the case, I3D will display an error message, and abandon the current IFF file. This prevents the user from inadvertently specifying IFF files which are not part of the same geographic area.

I3D is designed to be compatible with the "new" type IFF files introduced in conjunction with the IMP (IFF Map Processing) package. Although downwards compatibility with "old" type IFF files is maintained, a warning message is issued if an IFF file is found not to contain a type 2 MD (Map Descriptor) entry.

Output river/ridgeline files

One output river/ridgeline IFF file must be specified corresponding to each input river/ridgeline IFF file. Features not selected for processing will be copied across to the corresponding output file.

Check plot IFF file

A check plot IFF file may optionally be produced. This is achieved using the CHECKPLOT command if either the ENABLE MODE FLOW or ENABLE MODE INTERPOLATE commands have been given. The check plot IFF file is used as an overlay file on the river/ridgeline network. The file will contain arrow (directed) and box (undirected) symbols for each feature selected for processing in I3D. The check plot file allows the user to visualise the flow derived by the I3D utility.

LITES2 Command (Guidance) File

A LITES2 command file may be optionally produced. This is achieved using the LITES command if either the ENABLE MODE FLOW or ENABLE MODE INTERPOLATE commands have been given, and LITES2 commands are output to this file to assist with the input of supplementary height data using the LITES2 cartographic editor.

Group definition table

A group definition table is used by I3D to define which feature codes belong to a given group for the purpose of vector heighting. For example, which features are rivers. The group definition table must be initialised before the I3D module can do any processing. This is achieved using the LOOKUP command.

The group definition table is defined in an ASCII text file and can be easily generated using a text editor such as EDT. The format of this file is given as follows:-

```
group_name feature_code[,...]
```

The 'group_name' describes a class of map feature eg. RIVERS. The following group names are recognised by the program:

```
CLIFFS  
COASTLINES  
CONTOURS  
INDEX_CONTOURS  
LAKES  
RIDGE_LINES  
RIVERS  
SPOT_HEIGHTS  
SUPPLEMENTARY_CONTOURS
```

Note, that the same group name may appear more than once in the table. An invalid group name will be ignored by the program, and a warning message will be displayed.

The 'feature_code' is a feature identifier specified as an integer value in the range 0 to 32767. A single feature code, or a list or range of feature codes may be supplied for each group. Multiple feature codes are specified separated by commas or spaces, while a range of feature codes is specified by means of a colon ':'.

It is not permissible for more than one group to share the same feature code. A group definition file containing two or more groups sharing the same feature code will cause the LOOKUP command to display an error message and terminate.

The following are examples of group definition files:-

Example 1

```
CONTOURS 5,10:15
LAKES 100
SPOT_HEIGHTS 27
RIVERS 7
```

Example 2

```
CONTOURS 6
INDEX_CONTOURS 4
SUPPLEMENTARY_CONTOURS 5
CONTOURS 100:200
```

In example 2 the CONTOURS 'group_name' was specified twice. This is perfectly valid and feature codes 100 to 200 will be loaded to the group definition table along with feature code 6. However, a warning message will be issued indicating a possible problem.

Once a group definition table has been read, it is possible to include or exclude a group of map features from the heighting process, using the commands SELECT FC and DESELECT FC. By default I3D will include all groups of features that are present in an input IFF file in the heighting process.

Obligatory command sequence

The following 4 commands are obligatory for every mode in I3D:

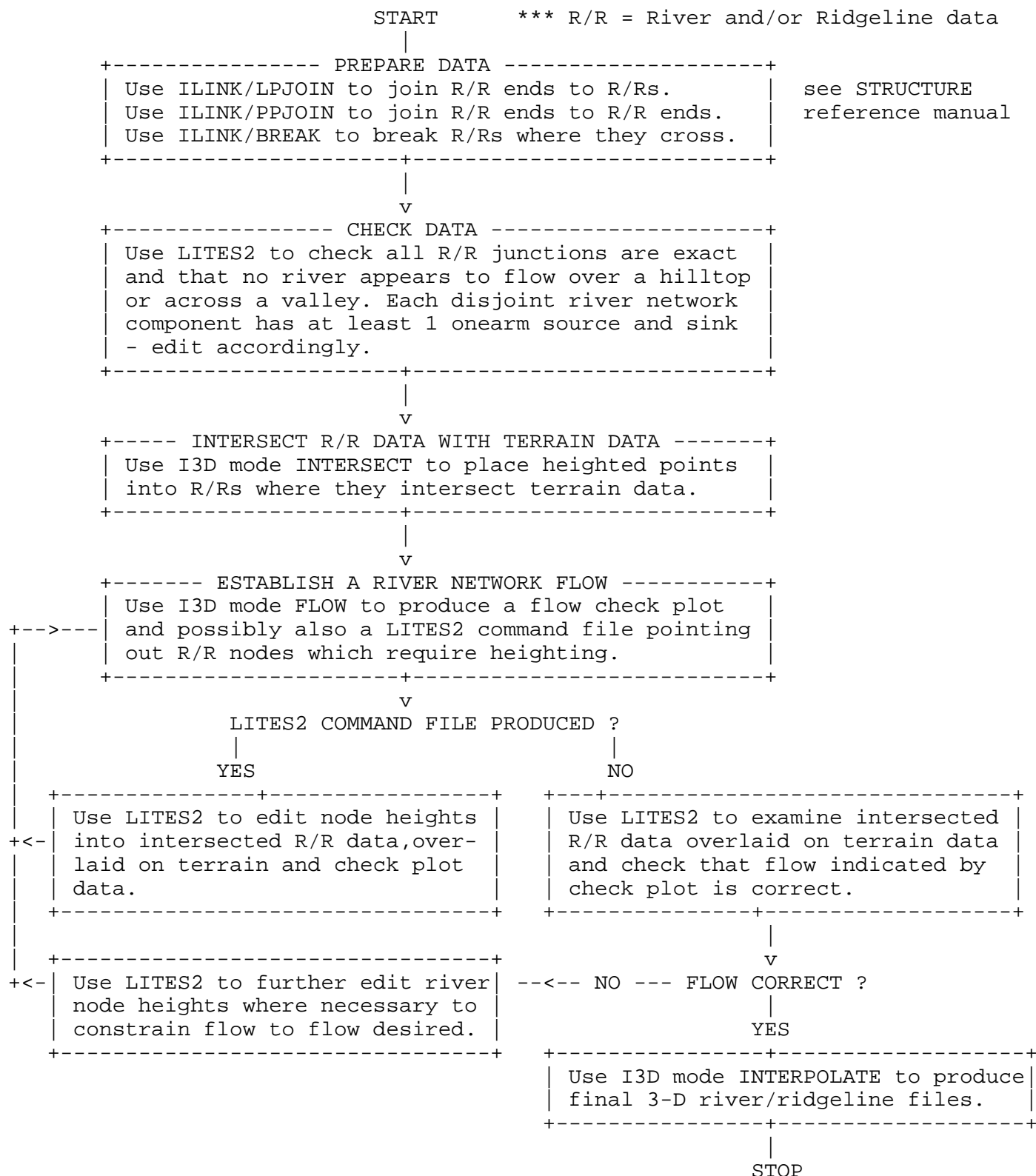
LOOKUP	'file-spec'	! opens a group definition table file
FILEIN	'file-spec'	! input river/ridgeline IFF data file
ENABLE MODE	'mode'	! selects processing mode
GO		! start processing

The TERRAIN command is required if mode INTERSECT is selected.

The FILEOUT command is required if mode INTERPOLATE or mode INTERSECT is selected.

Standard procedure

The flow diagram below shows the standard, recommended procedure which should be followed to use I3D to its best advantage.



I3D commands

@

Take command input from the specified file.

FORMAT: @file-spec

Command parameters:

file-spec

The file to be opened and used for command input.

Any parts of the file-spec not supplied for the @ command will be taken from the default specification 'SYS\$DISK:[].COM;0'.

DESCRIPTION:

I3D offers the facility of command input from an indirect command file. The '@' character preceding a file-spec will cause I3D to open and read commands from the specified file until:

1. a RETURN command is detected and command input is returned to SYS\$COMMAND.
2. end-of-file is detected. This provokes a warning message and command input is returned to SYS\$COMMAND, unless the last command was GO, when I3D will exit.
3. an unknown command is detected in the command file, or there was some other processing error with one of the commands, and I3D is aborted.

Nested command files are not supported (i.e. a command file containing an '@' command), although sequential '@' commands are supported when read from SYS\$COMMAND.

As an aid to batch log interpretation I3D will echo all commands read from an indirect command file.

Messages:

The following messages are specific to the @ command:

*** WARNING *** "@" must precede a file-spec

*** ERROR *** Indirect file error - exit from I3D

*** ERROR *** Can't open indirect command file 'file-spec'

Examples:

```
I3D> @PRESETS_INTERSECT<CR>
I3D> LOOKUP GROUP1
I3D> DESELECT FC 27
I3D> ENABLE MODE INTERSECT
I3D> RETURN
I3D>
```

!

Treat all text to the right of the '!' as a comment.

FORMAT: ! [comment text]

Command parameters:

comment text

text that is to be treated as a comment and which will be excluded from command interpretation.

DESCRIPTION:

An exclamation mark is the standard DTMPREPARE package comment delimiter. All text (and numbers) which lie to the right of a '!' character are excluded from command interpretation. Comments are useful for annotating command procedures used in batch processing etc.

Messages: None.

Examples:

I3D> ! a comment for the sake of it<CR>
I3D> ENABLE MODE INTERSECT<CR>
I3D>

CHECKPLOT

Opens an output IFF (Internal Feature Format) check plot file.

FORMAT: **CHECKPLOT file_spec**

Command parameters:

file_spec

The specification of the output IFF check plot file to receive the flow symbols output for mode FLOW or INTERPOLATE.

Any part of the file_spec not supplied for the CHECKPLOT command will be taken from the default file specification 'LSL\$IF:IFF.IFF'.

DESCRIPTION:

The CHECKPLOT command specifies the name of an output Internal Feature Format check plot file. The check plot file contains symbols output in the form of line features. The check plot IFF file can be displayed with the input river/ridgeline IFF file(s) to assist in quality control.

The check plot file can contain two types of symbols: the arrow (directed flow) and the box (undirected flow). The feature code number for these symbols can be modified from the default value using the SET ARROW_FC and SET BOX_FC commands.

The SHOW FILES command will display the file specification of the output IFF check plot file.

Messages:

The following error messages are specific to the CHECKPLOT command:

*** WARNING *** You must specify a file-spec argument to the CHECKPLOT command

*** ERROR *** Unable to interpret output file-spec

Example:

I3D> **CHECKPLOT AREA1_CHECKPLOT<CR>**
I3D>

CLOSE CHECKPLOT

Closes an output IFF check plot file that was opened using the CHECKPLOT command.

FORMAT: **CLOSE CHECKPLOT**

Command parameters:

none

DESCRIPTION:

The CLOSE CHECKPLOT command is used to close an opened output IFF check plot file. The output IFF check plot file can be re-specified using the CHECKPLOT command.

The command SHOW FILES may be used to list all files specified.

Messages:

The following error messages are specific to the CLOSE and the CLOSE CHECKPLOT commands:

*** ERROR *** Specifying command CLOSE
Available CLOSE command qualifiers are:
CHECKPLOT FILEIN FILEOUT LITES TERRAIN

*** ERROR *** Specifying command CLOSE CHECKPLOT
No output check plot file opened

Examples:

I3D> **CLOSE CHECKPLOT<CR>**
I3D>

CLOSE FILEIN

Closes **all** opened input river/ridgeline IFF files.

FORMAT: **CLOSE FILEIN**

Command parameters:

none

DESCRIPTION:

The CLOSE FILEIN command is used to close all opened input river and/or ridgeline IFF files.

The command is generally used when an input river or ridgeline IFF file is opened in error.

The command SHOW FILES may be used to list all opened input river and/or ridgeline IFF files.

Messages:

The following error messages are specific to the CLOSE and the CLOSE FILEIN commands:

*** ERROR *** Specifying command CLOSE
Available CLOSE command qualifiers are:
CHECKPLOT FILEIN FILEOUT LITES TERRAIN

*** ERROR *** Specifying command CLOSE FILEIN
No input river/ridgeline IFF files opened

Examples:

I3D> **CLOSE FILEIN <CR>**
All input river/ridgeline IFF files have been closed
I3D>

CLOSE FILEOUT

Closes **all** opened output river/ridgeline IFF files.

FORMAT: **CLOSE FILEOUT**

Command parameters:

none

DESCRIPTION:

The CLOSE FILEOUT command is used to close all opened output river and/or ridgeline IFF files.

The command is generally used when an output river or ridgeline IFF file is opened in error.

The command SHOW FILES may be used to list all opened output river and/or ridgeline IFF files.

Messages:

The following error messages are specific to the CLOSE and the CLOSE FILEOUT commands:

*** ERROR *** Specifying command CLOSE
Available CLOSE command qualifiers are:
CHECKPLOT FILEIN FILEOUT LITES TERRAIN

*** ERROR *** Specifying command CLOSE FILEOUT
No output river/ridgeline IFF files opened

Examples:

I3D> **CLOSE FILEOUT <CR>**
All output river/ridgeline IFF files have been closed
I3D>

CLOSE LITES

Closes a LITES command file that was opened using the LITES command.

FORMAT: CLOSE LITES

Command parameters:

none

DESCRIPTION:

The CLOSE LITES command is used to close the LITES2 command file. The LITES2 command file can be re-specified using the LITES command.

The command SHOW FILES may be used to list all files specified.

Messages:

The following error messages are specific to the CLOSE and the CLOSE LITES commands:

*** ERROR *** Specifying command CLOSE
Available CLOSE command qualifiers are:
CHECKPLOT FILEIN FILEOUT LITES TERRAIN

*** ERROR *** Specifying command CLOSE LITES
No LITES2 command file opened

Examples:

I3D> CLOSE LITES<CR>
I3D>

CLOSE TERRAIN

Closes **all** opened input terrain IFF files.

FORMAT: **CLOSE TERRAIN**

Command parameters:

none

DESCRIPTION:

The CLOSE TERRAIN command is used to close all opened input terrain IFF files.
The command is generally used when an input terrain IFF file is opened in error.
The command SHOW FILES may be used to list all opened input terrain IFF files.

Messages:

The following error messages are specific to the CLOSE and the CLOSE TERRAIN commands:

*** ERROR *** Specifying command CLOSE
Available CLOSE command qualifiers are:
CHECKPLOT FILEIN FILEOUT LITES TERRAIN

*** ERROR *** Specifying command CLOSE TERRAIN
No input terrain IFF files opened

Examples:

I3D> **CLOSE TERRAIN <CR>**
All input terrain IFF files have been closed
I3D>

DESELECT FC

Excludes an IFF feature from the heighting process on the basis of feature code.

FORMAT: **DESELECT FC feature_code [,...]**

Command parameters:

feature_code

An integer feature code in the range 0 to 32767. Multiple feature codes may be specified separated by commas or spaces, while a range of feature codes may be specified by means of a colon ':'. eg. Deselect FC 10:13 excludes feature codes 10,11,12 and 13.

Alternatively a group name supplied by the group definition table may be specified. eg. Deselect FC ridgeline

DESCRIPTION:

The Deselect FC command is used to exclude IFF features from the river/ridgeline heighting process. Features are excluded on the basis of their feature code. The command operates on both the features to be heighted (eg rivers) and terrain features (eg contours) used in the heighting process.

This is useful if particular terrain features are known to be in error, since they can be deselected from the heighting process.

By default I3D will use all features defined in the group definition table.

The SHOW GROUP command can be used to display feature selections for each of the groups defined.

Messages:

The following error messages are specific to the Deselect and Deselect FC commands:

*** ERROR *** Specifying command Deselect
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command Deselect FC
Unexpected character 'char' at this point

*** ERROR *** Specifying command Deselect FC
Illegal feature code 'fc'

*** ERROR *** Specifying command Deselect FC
No group definitions loaded
Therefore no feature codes available for selection

Use command LOOKUP to load group definition table

*** ERROR *** Specifying command DESELECT FC
Invalid group name 'group_name'

*** ERROR *** Specifying command DESELECT FC

Group not defined

Therefore no feature codes available for selection

Use command LOOKUP to load group definition table containing required group

Examples:

I3D> DESELECT FC 1<CR>

I3D> DESELECT FC INDEX_CONTOURS<CR>

I3D> DESELECT FC 7:10,56:78<CR>

I3D>

DESELECT FSN

Excludes an IFF feature from the heighting process on the basis of feature serial number.

FORMAT: **DESELECT FSN fsn [,...]**

Command parameters:

fsn

An integer feature serial number in the range 0 to 65534. Multiple feature serial numbers may be specified separated by commas or spaces, while a range of numbers may be specified by means of a colon ':'. eg. Deselect FSN 10:13 excludes feature serial numbers 10,11,12 and 13.

DESCRIPTION:

The Deselect FSN command is used to exclude IFF features from the river/ridgeline heighting process. Features are excluded on the basis of their feature serial number. The command operates on both the features to be heighted (eg rivers) and terrain features (eg contours) used in the heighting process.

This is useful if a particular terrain feature is known to be in error, since it can be deselected from the heighting process.

By default I3D will use all FSN's within an overlay.

The SHOW SELECTION command may be used to display which FSN's are currently selected.

Messages:

The following error messages are specific to the Deselect and Deselect FSN commands:

*** ERROR *** Specifying command Deselect
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command Deselect FSN
Unexpected character 'char' at this point

*** ERROR *** Specifying command Deselect FSN
Illegal FSN number 'fsn'

Examples:

```
I3D> Deselect FSN 4<CR>
I3D> Deselect FSN 7:10,56:78<CR>
I3D>
```

DESELECT LAYER

Excludes an IFF feature from the heighting process on the basis of layer number.

FORMAT: **DESELECT LAYER layer [,...]**

Command parameters:

layer

An integer layer number in the range 1 to 32767. Multiple layer numbers may be specified separated by commas or spaces, while a range of layer numbers may be specified by means of a colon ':'. eg. **DESELECT LAYER 10:13** excludes all features in layers 10,11,12 and 13.

DESCRIPTION:

The **DESELECT LAYER** command is used to exclude IFF features from the river/ridgeline heighting process. Features are excluded on the basis of IFF layer. The command operates on both the features to be heighted (eg rivers) and terrain features (eg contours) used in the heighting process.

By default I3D will use all features within an IFF file.

The **SHOW SELECTION** command may be used to display which layers are currently selected.

Messages:

The following error messages are specific to the **DESELECT** and **DESELECT LAYER** commands:

*** ERROR *** Specifying command **DESELECT**
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command **DESELECT LAYER**
Unexpected character 'char' at this point

*** ERROR *** Specifying command **DESELECT LAYER**
Illegal layer number 'layer number'

Examples:

I3D> **DESELECT LAYER 7<CR>**
I3D> **DESELECT LAYER 1,7:10<CR>**
I3D>

DISABLE DIAGNOSTICS

Disables a previous ENABLE DIAGNOSTICS command.

FORMAT: DISABLE DIAGNOSTICS

Command parameters: None.

DESCRIPTION:

DISABLE DIAGNOSTICS allows the user to disable a previous ENABLE DIAGNOSTICS command.

Messages:

The following error message is specific to the DISABLE command:

*** ERROR *** Specifying command DISABLE
Available DISABLE qualifiers are:
DIAGNOSTICS MODE PME

Examples:

I3D> **ENABLE DIAGNOSTICS**<CR>
I3D> **DISABLE DIAGNOSTICS**<CR>
I3D>

DISABLE MODE

Disables a previous ENABLE MODE command.

FORMAT: DISABLE MODE

Command parameters: None.

DESCRIPTION:

DISABLE MODE allows the user to disable a previous ENABLE MODE command.

Messages:

The following error message is specific to the DISABLE command:

*** ERROR *** Specifying command DISABLE
Available DISABLE qualifiers are:
DIAGNOSTICS MODE PME

Examples:

I3D> **ENABLE MODE INTERPOLATE<CR>**
I3D> **DISABLE MODE<CR>**
I3D>

DISABLE PME

Disables a previous ENABLE PME command.

FORMAT: DISABLE PME

Command parameters: None.

DESCRIPTION:

DISABLE PME allows the user to disable a previous ENABLE PME command.

Messages:

The following error messages are specific to the DISABLE and DISABLE PME commands:

*** WARNING *** You are not using PME !

*** ERROR *** Specifying command DISABLE

Available DISABLE qualifiers are:

DIAGNOSTICS MODE PME

Messages:

Examples:

I3D> **ENABLE PME**<CR>

I3D> **DISABLE PME**<CR>

I3D>

ENABLE DIAGNOSTICS

ENABLE DIAGNOSTICS allows the user to enable diagnostic printout.

FORMAT: ENABLE DIAGNOSTICS

Command parameters: None.

DESCRIPTION:

ENABLE DIAGNOSTICS allows the user to enable diagnostic printout.

Since I3D is usually used in a batch processing environment, by default minimal diagnostic printout is produced. If however, the user wishes to receive an indication of processing progress, diagnostic printout may be selected with the ENABLE DIAGNOSTICS command.

On a heavily loaded computer it may be reassuring to ENABLE DIAGNOSTICS for the processing stage to indicate progress through the input data.

Messages:

The following error message is specific to the ENABLE command:

```
*** ERROR *** Specifying command ENABLE
Available ENABLE qualifiers are:
DIAGNOSTICS  MODE  PME
```

Examples:

```
I3D> ENABLE DIAGNOSTICS<CR>
I3D>
```

ENABLE MODE FLOW

Enables FLOW mode, as described in module I3D, paragraphs Processing Modes.

FORMAT: ENABLE MODE FLOW

Command parameters: None.

DESCRIPTION:

ENABLE MODE FLOW command enables FLOW mode, as described in module I3D, paragraphs Processing Modes.

The currently enabled mode of processing may be examined using the SHOW ENABLE command.

Messages:

The following error messages are specific to the ENABLE and the ENABLE MODE commands:

*** ERROR *** Specifying command ENABLE
Available ENABLE qualifiers are:
DIAGNOSTICS MODE PME

*** ERROR *** Specifying command ENABLE MODE
Available ENABLE MODE sub-command qualifiers are:
INTERSECT FLOW INTERPOLATE

Examples:

```
I3D> ENABLE MODE FLOW<CR>
I3D> SHOW ENABLE<CR>
ENABLE:
  Diagnostics disabled
  ENABLE MODE FLOW specified
  PME disabled
I3D>
```

ENABLE MODE INTERPOLATE

Enables INTERPOLATE mode, as described in module I3D, paragraphs Processing Modes.

FORMAT: ENABLE MODE INTERPOLATE

Command parameters: None.

DESCRIPTION:

ENABLE MODE INTERPOLATE command enables INTERPOLATE mode, as described in module I3D, paragraphs Processing Modes.

The currently enable mode of processing may be examined using the SHOW ENABLE command.

Messages:

The following error messages are specific to the ENABLE and the ENABLE MODE commands:

*** ERROR *** Specifying command ENABLE
Available ENABLE qualifiers are:
DIAGNOSTICS MODE PME

*** ERROR *** Specifying command ENABLE MODE
Available ENABLE MODE sub-command qualifiers are:
INTERSECT FLOW INTERPOLATE

Examples:

I3D> **ENABLE MODE INTERPOLATE**<CR>
I3D> **SHOW ENABLE**<CR>
ENABLE:
 Diagnostics disabled
 ENABLE MODE INTERPOLATE specified
 PME disabled
I3D>

ENABLE MODE INTERSECT

Enables INTERSECT mode, as described in module I3D, paragraphs Processing Modes.

FORMAT: ENABLE MODE INTERSECT

Command parameters: None.

DESCRIPTION:

ENABLE MODE INTERSECT command enables INTERSECT mode, as described in module I3D, paragraphs Processing Modes.

The currently enable mode of processing may be examined using the SHOW ENABLE command.

Messages:

The following error messages are specific to the ENABLE and the ENABLE MODE commands:

*** ERROR *** Specifying command ENABLE
Available ENABLE qualifiers are:
DIAGNOSTICS MODE PME

*** ERROR *** Specifying command ENABLE MODE
Available ENABLE MODE sub-command qualifiers are:
INTERSECT FLOW INTERPOLATE

Examples:

I3D> **ENABLE MODE INTERSECT**<CR>
I3D> **SHOW ENABLE**<CR>
ENABLE:
 Diagnostics disabled
 ENABLE MODE INTERSECT specified
 PME disabled
I3D>

ENABLE PME

ENABLE PME enables the PME performance monitor.

FORMAT: ENABLE PME

Command parameters: None.

DESCRIPTION:

The ENABLE PME and DISABLE PME commands are reserved for Laser-Scan use. PME is a code optimisation tool and should be invoked by LSL software personnel only.

ENABLE PME causes the PME_INIT routine to be invoked.

Messages:

The following error messages are specific to the ENABLE and the ENABLE PME commands:

*** WARNING *** You are already using PME!

*** ERROR *** Specifying command ENABLE
Available ENABLE qualifiers are:
DIAGNOSTICS MODE PME

Examples:

I3D> **ENABLE PME**<CR>
I3D>

FILEIN

Specifies the name of an Internal Feature Format file, containing river/ridgeline data that is to be heighted.

FORMAT: **FILEIN file_spec**

Command parameters:

file_spec

The specification of the input river or ridgeline IFF file to be opened.

Any part of the file_spec not supplied for the IFF command will be taken from the default file specification 'LSL\$IF:IFF.IFF'.

DESCRIPTION:

The FILEIN command specifies the name of an Internal Feature Format file, containing river/ridgeline data that is to be heighted. This file must have been processed by ILINK so that all river and ridgeline junctions are precise.

Two files may be specified by repeating the FILEIN command. Note: all the input IFF files specified with either the FILEIN command or the TERRAIN command must share a common local origin.

The SHOW FILES command will display the file specification of the input river/ridgeline IFF files currently opened.

Messages:

The following error messages are specific to the FILEIN command:

*** WARNING *** You must specify a file-spec argument to the FILEIN command

*** WARNING *** Specifying command FILEIN
River/ridgeline IFF file 'file_spec' does not contain a type 2 MD (Map Descriptor)

*** ERROR *** You must specify a file-spec argument to the FILEIN command

*** ERROR *** Unable to interpret input file-spec

*** ERROR *** Specifying command FILEIN
Maximum of 2 files already opened

*** ERROR *** Opening river/ridgeline input IFF file 'file_spec'

*** ERROR *** With river/ridgeline input IFF file 'file_spec'
Has a different local origin than the first file opened
Local origin of this file is : X = 'x_coord' Y = 'y_coord'
Local origin of first file is : X = 'x_coord' Y = 'y_coord'

Example:

I3D> **FILEIN AREA1_RIVER<CR>**
River/ridgeline IFF file LSL\$IF:AREA1_RIVER selected as input
I3D> **FILEIN AREA1_RIDGE<CR>**
River/ridgeline IFF file LSL\$IF:AREA1_ridgeline selected as input
I3D>

FILEOUT

Specifies the name of an output river/ridgeline Internal Feature Format file.

FORMAT: **FILEOUT file_spec**

Command parameters:

file_spec

The specification of the output river or ridgeline IFF file to be opened.

Any part of the file_spec not supplied for the IFF command will be taken from the default file specification 'LSL\$IF:IFF.IFF'.

DESCRIPTION:

The FILEOUT command specifies the name of an Internal Feature Format file, to be output from any process.

Output river/ridgeline IFF file(s) will always be created if the ENABLE MODE INTERSECT command was given; will be produced if the ENABLE MODE INTERPOLATE command was given only if this process was successful; will not be produced if the ENABLE MODE FLOW command was given.

The SHOW FILES command will display the file specification of the output river/ridgeline IFF files currently opened.

Messages:

The following error messages are specific to the FILEOUT command:

*** ERROR *** You must specify a file-spec argument to the FILEOUT command

*** ERROR *** Unable to interpret input file-spec

*** ERROR *** Specifying command FILEOUT
Maximum of 2 files already opened

*** ERROR *** Opening output IFF file 'file_spec'

Example:

I3D> **FILEOUT INTERSECT_OUT<CR>**
I3D>

GO

Starts the process.

FORMAT: GO

Command parameters: None

DESCRIPTION:

The GO command is used to start the processing. Before the processing takes place, the following tests will be carried out to ensure that certain preconditions hold:-

1. Sufficient input IFF file(s) have been opened. An error message will be displayed and the command terminated if this test fails.
2. A group definition table was loaded using the LOOKUP command. An error message will be displayed and the command terminated if this test fails.
3. A processing mode was enabled using the ENABLE MODE command. Processing mode can be either INTERSECT, FLOW or INTERPOLATE. An error message will be displayed and the command terminated if this test fails.
4. Depending on the mode enabled, tests are carried out to ensure that mandatory parameters for that mode have been specified. An error message will be displayed and the command terminated if any of these tests fail.

The GO command can be run in one of three ways depending on which mode was enabled using the ENABLE MODE command. See section under "Processing Modes" in the I3D utility description for more information on processing.

Upon successful completion of the processing the I3D module will terminate with control returned to the DCL prompt. Should an error be detected within any of the processing phases, then an error message will be displayed and the processing will terminate. If the error results from insufficient information within the data files then a LITES2 command file will be generated if the LITES command was given.

Messages:

The following messages are specific to the GO command:

*** ERROR *** Specifying the command GO
Insufficient input IFF file(s) open >> Execute command FILEIN

*** ERROR *** Specifying the command GO
No group definition table loaded >> Execute command LOOKUP

*** ERROR *** Specifying the command GO

Mode not enabled >> Execute command ENABLE MODE

*** ERROR *** Specifying the command GO
Insufficient output IFF file(s) open >> Execute command FILEOUT

*** ERROR *** Specifying the command GO
No input terrain IFF file(s) open >> Execute command TERRAIN

*** ERROR *** exit from I3D

Examples:

```
I3D> FILEIN RIVERS<CR>
I3D> LOOKUP A LOOKUP_FILE<CR>
I3D> TERRAIN A TERRAIN_FILE<CR>
I3D> ENABLE MODE INTERSECT<CR>
I3D> GO<CR>
Loading river/ridgeline file no. 1
Writing feature data with 3D CB strings for file no. 1
I3D>
```

HELP

Give help on a subject

FORMAT: HELP subject

Command parameters:

subject

The subject on which help is required.

Description:

The HELP command looks the rest of the line up in the DTMPREPARE HELP library. This library contains a brief summary of the operation of each command.

The information is looked up in the I3D section of the DTMPREPARE help library, LSL\$HELP:DTMPREPARE.HLB.

Messages:

Where required, warning messages are output via the VMS LBR\$OUTPUT_HELP utility.

Examples:

I3D> **HELP CLOSE CHECKPLOT<CR>**

I3D

CLOSE

LIST

The CLOSE CHECKPLOT command is used to close the check plot file which has been previous specified by the CHECKPLOT command.

I3D>

LITES

Specifies the name of an output LITES2 command file.

FORMAT: **LITES file_spec**

Command parameters:

file_spec

The specification of the LITES2 command file.

Any part of the file_spec not supplied for the LITES command will be taken from the default file specification 'LSL\$LITES2CMD:LCM.LCM'.

DESCRIPTION:

The LITES command specifies the name of the output LITES2 command or guidance file.

The LITES2 command file will only be generated if the LITES command is given for mode FLOW or INTERPOLATE.

If either the ENABLE MODE FLOW command or the ENABLE MODE INTERPOLATE command is given then the LITES2 command file will contain the position of unheighted free-ends (remaining after unheighted links ends shorter than the clip tolerance from the nearest heighted point have been removed); of unheighted nodes from which any whole links may have been deleted during the clipping process; and of any other points which need to be brought to the user's attention for any reason so that the river/ridgeline data can have points heighted or other edits made so that the I3D heighting process can succeed next time.

The resulting command file can be used in conjunction with the LITES2 cartographic editor to assist in the interactive editing of point height data at points where I3D was not able to estimate these heights automatically. You will be taken to each point where the problem will be described. You will then be able to use LITES2 commands freely until you have obtained an estimate for what the point's height should be. You should then give the CONTINUE command, when you will be prompted for a height value, which will be edited into some point at the position indicated. If two or more features meet at this point, it is not predictable which feature the heighted point will belong to, but this makes no difference to I3D. It is possible to exit from within a LITES2 guidance command file at any time when it is expecting a CONTINUE command by typing <CTRL/C> followed by <CR>.

The SHOW FILES command will display the name of the currently specified LITES2 command file.

Messages:

The following error messages are specific to the LITES command:

*** WARNING *** You must specify a file-spec argument to the LITES command

*** ERROR *** Unable to interpret input file-spec

Example:

```
I3D> ENABLE MODE INTERSECT<CR>
I3D> LITES RIV_RID_INTERSECT<CR>
I3D>
```

LOOKUP

Specifies the name of an I3D group definition file.

FORMAT: LOOKUP file_spec

Command parameters:

file_spec

The specification of the file containing the group definitions.

Any part of the file_spec not supplied for the LOOKUP command will be taken from the default file specification 'LSL\$LOOKUP:I3D.DAT'.

DESCRIPTION:

The LOOKUP command specifies the name of the file containing the I3D group definitions. The loading of a group definition table is a mandatory requirement of the I3D module.

The SHOW FILES command will display the last group definition file loaded using the LOOKUP command. The SHOW GROUPS command may be used to examine the group definitions.

Messages:

The following error messages are specific to the LOOKUP command:

*** WARNING *** You must specify a file-spec argument to the LOOKUP command

*** WARNING *** Unrecognised group name 'group_name'

*** WARNING *** No feature codes with group name 'group_name'

*** WARNING *** Group 'group_name' previously defined
Feature codes will be added to the group definition table

*** ERROR *** You must specify a file-spec argument to the LOOKUP command

*** ERROR *** Unable to interpret input file-spec

*** ERROR *** Specifying command LOOKUP
Unable to open file 'file_spec'

*** ERROR *** Specifying command LOOKUP
While reading file 'file_spec'

*** ERROR *** Specifying command LOOKUP
Unable to close file 'file_spec'

*** ERROR *** in LOOKUP file 'file_spec'
Unexpected character 'char' at this point

*** ERROR *** in LOOKUP file 'file_spec'
Illegal feature code 'feat_code'
Feature code must be between 0 - 32767

*** ERROR *** in LOOKUP file 'file_spec'
New feature code 'feat_code' in group 'group_name' is not unique

Example:

```
I3D> LOOKUP GROUP_DEF2.DAT<CR>
I3D> SHOW GROUPS<CR>
GROUPS:
    CONTOURS have been defined
The following feature codes are currently selected:
5:10,55
    RIVERS have been defined
The following feature codes are currently selected:
2
I3D>
```

PAUSE

Pauses I3D execution.

FORMAT: PAUSE

Command parameters: None.

DESCRIPTION:

Pauses I3D execution and issues a prompt for a carriage return to continue execution. This command is designed for use in software demonstration situations.

Messages: None.

Examples:

I3D> **PAUSE<CR>**

Press <RETURN> to continue<CR>
I3D>

QUIT

Quit from I3D.

FORMAT: QUIT

Command parameters: None.

Description:

The QUIT command causes I3D to exit immediately, closing all input and output files.

<CTRL/Z> (pressing the Ctrl and Z keys together) may also be used to quit from the program.

Messages: None.

Examples:

I3D> **QUIT<CR>**

ELAPSED: 00:05:25.84 CPU: 0:00:05.71 BUFIO: 281 DIRIO: 46 FAULTS: 263
\$

RETURN

Restores command input from an indirect file to SYS\$COMMAND.

FORMAT: RETURN

Command parameters: None.

DESCRIPTION:

Restores command input from an indirect file to SYS\$COMMAND.

A typical application is to allow the user to use an indirect command file to set up those run time defaults which are constant within a flowline and then return to input from the terminal (or batch stream) for the run specific commands. To do this RETURN must be the last command in the indirect command file.

Messages:

The following messages are specific to the RETURN command:

RETURN command detected - returning to terminal input

RETURN command ignored - command input is already from terminal

Examples:

```
I3D> @INIT_INTERSECT<CR>
I3D> LOOKUP GROUP_DEF.DAT
I3D> ENABLE MODE INTERSECT
I3D> LITES INTERSECT
I3D> RETURN
I3D>
```

SELECT FC

Select IFF features for the heighting process on the basis of feature code.

FORMAT: **SELECT FC feature_code [,...]**

Command parameters:

feature_code

An integer feature code in the range 0 to 32767. Multiple feature codes may be specified separated by commas or spaces, while a range of feature codes may be specified by means of a colon ':'. eg. SELECT FC 10:13 includes feature codes 10,11,12 and 13 if they are in a particular group definition table. Alternatively a group name from the group definition table may be specified eg SELECT FC RIVERS.

DESCRIPTION:

The SELECT FC command is used to include IFF features for the heighting process. Features are included on the basis of their feature code. The feature code must be defined in one of the group definition tables for it to be used in the heighting process.

By default I3D will use all features within the group definition table loaded using the LOOKUP command.

The SHOW GROUP command can be used to display feature selections for each of the groups defined.

Messages:

The following error messages are specific to the SELECT and SELECT FC commands:

*** ERROR *** Specifying command SELECT
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command SELECT FC
Unexpected character 'char' at this point

*** ERROR *** Specifying command SELECT FC
Illegal feature code 'fc'

*** ERROR *** Specifying command SELECT FC
No group definitions loaded
Therefore no feature codes available for selection
Use command LOOKUP to load group definition table

*** ERROR *** Specifying command SELECT FC
Invalid group name 'group_name'

*** ERROR *** Specifying command SELECT FC
Group not defined
Therefore no feature codes available for selection
Use command LOOKUP to load group definition table containing required group

Examples:

I3D> SELECT FC 1<CR>
I3D> SELECT FC RIVERS<CR>
I3D> SELECT FC 7:10,56:78<CR>
I3D>

SELECT FSN

Include an IFF feature for use in the heighting process on the basis of feature serial number.

FORMAT: **SELECT FSN fsn [,...]**

Command parameters:

fsn

An integer feature serial number in the range 0 to 65534. Multiple feature serial numbers may be specified separated by commas or spaces, while a range of numbers may be specified by means of a colon ':'. eg. SELECT FSN 10:13 includes feature serial numbers 10,11,12 and 13.

DESCRIPTION:

The SELECT FSN command is used to include IFF features in the heighting process. Features are included on the basis of their feature serial number.

By default I3D will use all IFF features.

The SHOW SELECTION command may be used to display which features are currently selected.

Messages:

The following error messages are specific to the SELECT and SELECT FSN commands:

*** ERROR *** Specifying command SELECT
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command SELECT FSN
Unexpected character 'char' at this point

*** ERROR *** Specifying command SELECT FSN
Illegal FSN number 'fsn'

Examples:

I3D> **SELECT FSN 4<CR>**
I3D> **SELECT FSN 7:10,56:78<CR>**
I3D>

SELECT LAYER

Includes an IFF feature for use in the heighting process on the basis of layer number.

FORMAT: **SELECT LAYER layer [,...]**

Command parameters:

layer

An integer layer number in the range 1 to 32767. Multiple layer numbers may be specified separated by commas or spaces, while a range of layer numbers may be specified by means of a colon ':'. eg. SELECT LAYER 10:13 excludes all features in layers 10,11,12 and 13.

DESCRIPTION:

The SELECT LAYER command is used to include IFF features for the heighting process. Features are included on the basis of IFF layer.

By default I3D will use all features within an IFF file.

The SHOW SELECTION command may be used to display which layers are currently selected.

Messages:

The following error messages are specific to the SELECT and SELECT LAYER commands:

*** ERROR *** Specifying command SELECT
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command SELECT LAYER
Unexpected character 'char' at this point

*** ERROR *** Specifying command SELECT LAYER
Illegal layer number 'layer'

Examples:

I3D> SELECT LAYER 7<CR>
I3D> SELECT LAYER 1,7:10<CR>
I3D>

SET ARROW_FC

Specifies the feature code number to be used for the arrow (directed) symbols in the output IFF check plot file.

FORMAT: **SET ARROW_FC feature_code**

Command parameters:

feature_code

The feature code for arrow symbols in the output IFF check plot file. An integer number in the range 1 to 32767 is required.

DESCRIPTION:

The SET ARROW_FC command specifies the feature code number to be used for the arrow symbols in the output IFF check plot file.

If the SET ARROW_FC command is not given then a default value of 1 is assigned.

The current value of the arrow feature code may be examined using the SHOW PARAMETERS command.

Messages:

The following error messages are specific to the SET ARROW_FC command:

*** ERROR *** Specifying command SET ARROW_FC
Command requires feature code

*** ERROR *** Specifying command SET ARROW_FC
Parameter 'feature_code' not in range 1 - 32767

Example:

I3D> SET ARROW_FC 2003<CR>

I3D> SHOW PARAMETERS<CR>

PARAMETERS:

Arrow symbol feature code set to 2003
Box symbol feature code is set to 2
Clip tolerance is set to 0
Check plot layer number is set to 2
Maximum height interval is set to 10.0
Node tolerance is set to 0.1
Touch tolerance is set to 0.1

I3D>

SET BOX_FC

Specifies the feature code number to be used for the box (undirected) symbols in the output IFF check plot file.

FORMAT: **SET BOX_FC feature_code**

Command parameters:

feature_code

The feature code for box symbols in the output IFF check plot file. An integer number in the range 1 to 32767 is required.

DESCRIPTION:

The SET BOX_FC command is used to specify the feature code number to be used for the box symbols in the output IFF check plot file.

If the SET BOX_FC command is not given then a default value of 2 is assigned.

The current value of the box feature code may be examined using the SHOW PARAMETERS command.

Messages:

The following error messages are specific to the SET BOX_FC command:

*** ERROR *** Specifying command SET BOX_FC
Command requires feature code

*** ERROR *** Specifying command SET BOX_FC
Parameter 'feature_code' not in range 1 - 32767

Example:

I3D> SET BOX_FC 2004<CR>
I3D>

SET CLIP_TOLERANCE

Sets the 'CLIP_TOLERANCE' parameter used to set the tolerance for clipping unheighted free ends to the nearest heighted point along the river/ridge.

FORMAT: SET CLIP__TOLERANCE clip__tolerance

Command parameters:

clip_tolerance

A real (floating-point) value which defines the tolerance within which unheighted river/ridgeline free ends are truncated to the nearest heighted point along the river/ridgeline. This tolerance is measured in IFF map units.

By default a clip tolerance of 0.0 is assumed.

DESCRIPTION:

The SET CLIP_TOLERANCE command is used to set the tolerance for clipping unheighted free ends to the nearest heighted point along the river/ridge.

All free-end river/ridgeline links with length from free-end to the nearest heighted point less than that specified by the 'clip_tolerance' parameter, will be ignored during the INTERPOLATE process. If the LITES2 command is used, all free-ends longer than this will be flagged in a LITES2 guidance file, which can then be used in conjunction with the LITES2 interactive cartographic editor to assist in the heighting of each of these remaining unheighted free-ends, and unheighted nodes to which any whole free-end links may have been clipped, before going on to the next mode in I3D.

Messages:

The following error messages are specific to the SET and the SET CLIP_TOLERANCE commands:

*** ERROR *** Specifying command SET CLIP__TOLERANCE
Command requires clip tolerance value

*** ERROR *** Specifying command SET CLIP__TOLERANCE
Value is less than or equal to 0.0

Examples:

I3D> SET CLIP_TOLERANCE 2.5 <CR>
I3D>

SET INTS_PER_LINK

Enables the user to allocate additional memory for datasets having a large number of river/ridgeline link intersections with contours.

FORMAT: SET INTS_PER_LINK ints_per_link

Command parameters:

ints_per_link

A real (floating-point) value which defines the average number of intersections expected between river/ridgeline links and contours. By default a value of 50.0 is assumed.

DESCRIPTION:

The SET INTS_PER_LINK command enable the user to override the default estimate of the average number of intersections expected between river/ridgeline links and contours. This enables the user to allocate more virtual memory to cope with datasets where rivers tend to have long links relative to the complexity of the contour pattern underneath them.

It should only be necessary to use the SET INTS_PER_LINK command if I3D has found more intersections between river/ridgeline links and contours than it can hold in memory. I3D will report this occurrence by generating the message:

%I3D-E-INTOVERFLOW, No. of intersections exceeds memory allocation

Re-start I3D and use the SET INTS_PER_LINK command to specify a larger average number of intersections per link. Remember that the default value is 50. Specification of too large a value may result in I3D attempting to allocate more virtual memory than your process quotas can support. Therefore increase the INTS_PER_LINK parameter by a modest increment, say 15 and try again. If I3D still fails, increase INTS_PER_LINK further and try again.

Messages:

The following error messages are specific to the SET and the SET INTS_PER_LINK commands:

*** ERROR *** Specifying command SET INTS_PER_LINK
Command requires real factor

*** ERROR *** Specifying command SET INTS_PER_LINK
Value is less than or equal to 0.0

Examples:

```
I3D> SET INTS_PER_LINK 50.0<CR>
I3D>
```

SET LAYER

Specifies the initial layer number in the output IFF check plot file.

FORMAT: **SET LAYER layer**

Command parameters:

layer

This specifies the first layer number in the output IFF check plot file.
An integer number in the range 1 to 32767 is required.

DESCRIPTION:

The SET LAYER command is used to specify the number of the layer in the output IFF check plot file to store the arrow and the box symbols.

If the SET LAYER command is not given then layer 2 is created in the output IFF check plot file.

The current value of the layer number may be examined using the SHOW PARAMETERS command.

Messages:

The following error messages are specific to the SET LAYER command:

*** ERROR *** Specifying command SET LAYER
Command requires initial layer number

*** ERROR *** Specifying command SET LAYER
Parameter 'layer' not in range 1 - 32767

Example:

I3D> SET LAYER 5<CR>
I3D>

SET MAX_INTERVAL

Specifies the maximum height interval.

FORMAT: **SET MAX_INTERVAL height_interval**

Command parameters:

height_interval

This specifies the maximum height interval between adjacent terrain features. The value must be a positive number greater than zero.

DESCRIPTION:

The MAX_INTERVAL command is used to specify the maximum height interval between adjacent terrain features. The height interval is used to constrain the direct flow algorithm.

This command must be given before the GO command if ENABLE MODE FLOW or ENABLE MODE INTERPOLATE has been requested.

The currently defined height interval may be examined using the SHOW PARAMETERS command.

Messages:

The following error messages are specific to the SET MAX_INTERVAL command:

*** ERROR *** Specifying command SET MAX_INTERVAL
Command requires max height interval

*** ERROR *** Specifying command SET MAX_INTERVAL
Value 'height interval' is less than or equal to 0.0

Example:

I3D> SET MAX_INTERVAL 50<CR>
I3D>

Please note that the SET MAX_INTERVAL command is not currently implemented.

SET NODE_TOLERANCE

Specifies the node tolerance value.

FORMAT: SET NODE_TOLERANCE node_tolerance

Command parameters:

node_tolerance

The node tolerance value. A real number greater than 0.0 is required.

DESCRIPTION:

The SET NODE_TOLERANCE command specifies the node tolerance value.

The value defined by this command is used to specify the minimum distance between terrain intersection points and the nearest node along the intersected link. If the distance between the node and the intersection point is within the node tolerance value, then the node is considered to be at the intersection location and will be assigned the height value associated with the intersection point without inserting a new point into the link.

If the SET NODE_TOLERANCE command is not given then a default value of 0.1 is assigned.

The currently defined node tolerance value may be examined using the SHOW PARAMETERS command.

Messages:

The following error messages are specific to the SET NODE_TOLERANCE command:

*** ERROR *** Specifying command SET NODE_TOLERANCE
Command requires node tolerance value

*** ERROR *** Specifying command SET NODE_TOLERANCE
Value 'node_tolerance' is less than or equal to 0.0

Example:

I3D> SET NODE_TOLERANCE 0.2<CR>
I3D>

SET SYMBOL_SCALE

Specifies the value which is used to scale the check plot flow symbols.

FORMAT: SET SYMBOL_SCALE symbol_scale

Command parameters:

symbol_scale

This specifies the check plot symbol scale. A positive real number greater than 0.0 is required

DESCRIPTION:

The SET SYMBOL_SCALE specifies the value which is used to scale the check plot flow symbols. This command allows the user to scale the symbols if a check plot file is to be created. The symbol diameter is 10symbol_scale IFF units.

If the SET SYMBOL_SCALE command is not given then a default value of 1.0 is assigned.

The currently defined symbol scale value may be examined using the SHOW PARAMETERS command.

Messages:

The following error messages are specific to the SET SYMBOL_SCALE command:

*** ERROR *** Specifying command SET SYMBOL_SCALE
Command requires symbol scale value

*** ERROR *** Specifying command SET SYMBOL_SCALE
Value 'symbol_scale' is less than or equal to 0.0

Example:

I3D>SET SYMBOL_SCALE 0.5<CR>
I3D>

SET TOUCH_TOLERANCE

Specifies the touch tolerance value.

FORMAT: SET TOUCH_TOLERANCE touch_tolerance

Command parameters:

touch_tolerance

This specifies the touch tolerance value. A real number greater than 0.0 is required.

DESCRIPTION:

The SET TOUCH_TOLERANCE command specifies the touch tolerance value.

The value defined by this command is used to test whether the ends of a terrain feature touch a river/ridgeline feature. If it does, then the point of contact will be processed in the same way as intersections are processed.

If the SET TOUCH_TOLERANCE command is not given then a default value of 0.1 is assigned.

The currently defined touch tolerance value may be examined using the SHOW PARAMETERS command.

Messages:

The following error messages are specific to the SET TOUCH_TOLERANCE command:

*** ERROR *** Specifying command SET TOUCH_TOLERANCE
Command requires touch tolerance value

*** ERROR *** Specifying command SET TOUCH_TOLERANCE
Value 'touch_tolerance' is less than or equal to 0.0

Example:

I3D> SET TOUCH_TOLERANCE 0.2<CR>
I3D>

SHOW ENABLE

Displays enabled parameters.

FORMAT: SHOW ENABLE

Command parameters: None.

DESCRIPTION:

The command SHOW ENABLE displays the currently enabled parameters

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW
Available show command qualifiers are:
 ENABLE FILES GROUPS PARAMETERS SELECTION

Examples:

I3D> **SHOW ENABLE**<CR>
ENABLE:
 Diagnostics disabled
 Mode disabled
 PME disabled
I3D>

SHOW FILES

Displays file specification of all I3D input and output files.

FORMAT: SHOW FILES

Command parameters: None.

DESCRIPTION:

The command SHOW FILES displays the files specification for all currently specified input and output I3D files. The file specification of input river/ridgeline IFF files, the output river/ridgeline IFF files, the input terrain IFF files, the output check plot IFF file, the LITES2 command file and the group definition file lookup is displayed. Refer to the following commands for the file name specification:-

FILEIN for input river/ridgeline IFF files.
FILEOUT for output river/ridgeline IFF files.
TERRAIN for input terrain IFF files.
CHECKPLOT for output check plot IFF file.
LITES for LITES2 command file.
LOOKUP for group definition table file.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW
Available show command qualifiers are:
 ENABLE FILES GROUPS PARAMETERS SELECTION

Examples:

```
I3D> LOOKUP GROUP_DEF1<CR>
I3D> FILEIN AREA1_RIVER<CR>
I3D> FILEIN AREA1_RIDGE<CR>
I3D> TERRAIN AREA1_TERRAIN<CR>
I3D> CHECKPLOT AREA1_CHKPLT<CR>
I3D> LITES AREA1_FLOW<CR>
I3D> ENABLE MODE FLOW<CR>
I3D> SHOW FILES<CR>
```

FILES:

River/ridgeline IFF file LSL\$IF:AREA1_RIVER selected for input
River/ridgeline IFF file LSL\$IF:AREA1_ridgeline selected for input
River/ridgeline IFF output files not yet specified
Terrain IFF file LSL\$IF:AREA1_TERRAIN selected for input
LITES file LSL\$LITES2CMD:AREA1.LCM selected
Check plot IFF file LSL\$IF:AREA1_CHKPLT selected for input
LOOKUP file LSL\$LOOKUP:GROUP_DEF1.DAT loaded the last group definition table

SHOW GROUPS

Displays the name of all currently defined groups, together with the selected feature codes.

FORMAT: SHOW GROUPS

Command parameters: None.

DESCRIPTION:

The command SHOW GROUPS displays the name of all groups defined in the group definition table. The command also lists the currently selected feature codes under the defined groups. The group definition table can be loaded by using the LOOKUP command. If the SHOW GROUPS command is given before the LOOKUP command a message is displayed indicating that no group definition table was loaded.

Messages:

The following message is specific to the SHOW command:

```
*** ERROR *** Specifying the command SHOW
Available show command qualifiers are:
    ENABLE  FILES  GROUPS  PARAMETERS  SELECTION
```

Examples:

```
I3D> SHOW GROUPS<CR>
GROUPS:
    No group definition tables loaded
I3D> LOOKUP GROUP_DEF1<CR>
I3D> DESELECT FC RIDGE<CR>
I3D> SHOW GROUPS<CR>
    CONTOURS have been defined
The following feature codes are currently selected:
5,55:60
    INDEX_CONTOURS have been defined
The following feature codes are currently selected:
6
    SUPPLEMENTARY_CONTOURS have been defined
The following feature codes are currently selected:
7
    RIVERS have been defined
The following feature codes are currently selected:
9
I3D>
```

SHOW PARAMETERS

Displays information on the parameters.

FORMAT: SHOW PARAMETERS

Command parameters: None.

DESCRIPTION:

The command SHOW PARAMETERS displays the current values of the module parameters. Refer to the appropriate SET command for information on how to modify a module parameter.

All parameters are initially assigned a default value.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW
Available show command qualifiers are:
 ENABLE FILES GROUPS PARAMETERS SELECTION

Examples:

I3D> SHOW PARAMETERS<CR>
I3D>

SHOW SELECTIONS

Displays current IFF layer, feature code and FSN selections.

FORMAT: SHOW SELECTIONS

Command parameters: None.

DESCRIPTION:

The command SHOW SELECTIONS, displays the currently selected IFF layers, feature codes and FSNs. The layers, feature codes and FSNs required in the processing can be selected and deselected using the appropriate SELECT or DESELECT commands.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW
Available show command qualifiers are:
 ENABLE FILES GROUPS PARAMETERS SELECTION

Examples:

```
I3D> SHOW SELECTIONS<CR>
SELECTIONS
    No group definition tables loaded
I3D> LOOKUP GROUP_DEF1<CR>
I3D> DESELECT LAYER 6:11<CR>
I3D> SHOW SELECTIONS <CR>
SELECTION:
Following layers selected:
0:5,12:32767
Following feature codes selected:
5,7,27,55:60
All FSN's selected
I3D>
```

SPAWN

The SPAWN command enables a subprocess to be created from within I3D.

FORMAT: SPAWN command-line

Command parameters:

command-line

Specifies a DCL command string to be executed as if typed in response to a '\$' prompt. When the command completes, the subprocess terminates and control is returned to I3D. The command line cannot exceed 80 characters.

DESCRIPTION:

The SPAWN command enables you to create a subprocess while within I3D. When the subprocess terminates, control is returned to I3D.

Messages:

The following error messages are specific to the SPAWN command:

*** ERROR *** Specifying command SPAWN
Command requires a valid DCL command line

*** ERROR *** Unable to spawn command, returning to I3D

Examples:

I3D> SPAWN DIRECTORY LSL\$DTI:*.DTI<CR>

Directory DUA3:[LSL.DTI]

TEST1.DTI;1	8/8	18-AUG-1987 07:56	[LSL,DAVEC]
TEST2.DTI;1	7/8	18-AUG-1987 17:17	[LSL,DAVEC]
TEST2.DTI;2	7/8	18-AUG-1987 17:34	[LSL,DAVEC]

Total of 3 files, 22/24 blocks.

I3D>

TERRAIN

The TERRAIN command specifies the name of an Internal Feature Format file, containing unheighted vector data such as contours that is to be used in the heighting process.

FORMAT: **TERRAIN file_spec**

Command parameters:

file_spec

The specification of the input terrain IFF file to be opened.

Any part of the file_spec not supplied for the IFF command will be taken from the default file specification 'LSL\$IF:IFF.IFF'.

DESCRIPTION:

The TERRAIN command specifies the name of an Internal Feature Format file, containing vector data that is to be used in the heighting process.

Five files may be specified by repeating the TERRAIN command. Note: all the input IFF files specified with either the FILEIN command or the TERRAIN command must share a common local origin.

The SHOW FILES command will display the file specification of the input terrain IFF files currently opened.

Messages:

The following error messages are specific to the TERRAIN command:

*** WARNING *** You must specify a file-spec argument to the TERRAIN command

*** WARNING *** Specifying command TERRAIN
Terrain IFF file 'file_spec' does not contain a type 2 MD (Map Descriptor)

*** ERROR *** You must specify a file-spec argument to the TERRAIN command

*** ERROR *** Unable to interpret input file-spec

*** ERROR *** Specifying command TERRAIN
Maximum of 5 files already opened

*** ERROR *** Opening terrain input IFF file 'file_spec'

*** ERROR *** With input IFF file 'file_spec'
Has a different local origin than the first file opened
Local origin of this file is : X = 'x_coord' Y = 'y_coord'
Local origin of first file is : X = 'x_coord' Y = 'y_coord'

Example:

I3D> **TERRAIN AREA1_CONTOUR<CR>**
Terrain IFF file LSL\$IF:AREA1_CONTOUR selected as input
I3D> **TERRAIN AREA1_INDEX<CR>**
Terrain IFF file LSL\$IF:AREA1_INDEX selected as input
I3D>

WAIT

Suspend processing for the specified number of seconds.

FORMAT: WAIT seconds

Command parameters:

seconds

The number of seconds for which I3D processing is to be suspended. An integer value is required

DESCRIPTION:

The WAIT command causes processing to be suspended for a specified number of seconds. It is designed for use in software demonstration situations and is of no value in a production flowline.

Messages:

The following warning message is specific to the WAIT command:

*** WARNING *** You must specify the number of seconds to wait

Examples:

I3D> WAIT 4<CR>
I3D>

I3D examples

\$ I3D
DTMPREPRE module I3D of 17:19:04 1-JUN-88
I3D> **LOOKUP LOOKUP3.DAT<CR>**
I3D> **LITES AREA1_INTERSECT.LCM<CR>**
I3D> **FILEIN AREA1_RIVER<CR>**
River/ridgeline IFF file LSL\$IF:AREA1_RIVER.IFF;0 selected as input
I3D> **FILEOUT AREA1_RIVER_INTERSECT<CR>**
I3D> **ENABLE MODE INTERSECT<CR>**
I3D> **GO<CR>**
ELAPSED: 0 00:02:24.08 CPU: 0:00:20.85 BUFIO: 26 DIRIO: 596 FAULTS: 420
\$

\$ I3D
DTMPREPRE module I3D of 17:19:04 1-JUN-88
I3D> **LOOKUP LOOKUP3.DAT<CR>**
I3D> **LITES AREA1_INTERP.LCM<CR>**
I3D> **CHECKPLOT AREA1_CHECKPLOT<CR>**
I3D> **FILEIN INTERSECT_OUT<CR>**
Combined IFF file LSL\$IF:INTERSECT_OUT.IFF;0 selected as input
I3D> **FILEOUT INTERP_OUT<CR>**
I3D> **SET CLIP_TOLERANCE 20<CR>**
I3D> **SET MAX_INTERVAL 70<CR>**
I3D> **ENABLE DIAGNOSTICS<CR>**
I3D> **ENABLE MODE INTERPOLATE<CR>**
I3D> **SHOW ENABLE<CR>**
ENABLE:
 ENABLE DIAGNOSTICS specified
 ENABLE MODE INTERPOLATE specified
 PME disabled
I3D> **SHOW FILES<CR>**
FILES:
 Combined IFF file LSL\$IF:INTERSECT_OUT.IFF;9 selected for input
 Output IFF file LSL\$IF:INTERP_OUT.IFF selected for output
 LITES2 file LSL\$LITES2CMD:AREA1_INTERP.LCM;0 selected
 Checkplot file LSL\$IF:AREA1CHECKPLOT.IFF selected
 LOOKUP file LSL\$LOOKUP:LOOKUP3.DAT;0 loaded the last group definition table
I3D> **SHOW GROUPS<CR>**
GROUPS:
 CONTOURS have been defined
The following feature codes are currently selected:
5:7
 RIDGELINES have been defined
The following feature codes are currently selected:
9
 RIVERS have been defined
The following feature codes are currently selected:
2
I3D> **SHOW PARAMETERS<CR>**
PARAMETERS:
 Arrow symbol feature code is 1
 Box symbol feature code is 2

Check plot layer number is 2
Clip tolerance is set to 20.0
Maximum height interval set to 70.0
Node tolerance is 0.1
Touch tolerance is 0.1

I3D> **SHOW SELECTIONS**<CR>

SELECTIONS:

All layers selected

Following feature codes selected:

2,5:7,9

All FSNs selected

I3D> **GO**<CR>

Scanning river/ridgeline IFF for file No. 1

Loading feature data for file no. 1

Loading terrain data for file no. 1 and calculating intersections

Directing flow within network

Heighting nodes in network

Creating overlay check plot

Heighting river/ridgeline points

Outputting river/ridgeline IFF for file No. 1

ELAPSED: 0 00:15:23.24 CPU: 0:02:19.12 BUFIO: 40 DIRIO: 990 FAULTS: 695

\$

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.

UNIQUFLOW, flow determined in river network is unique

Explanation: The flow determined in each connected component of the river network using the rules that there must be no junctions which are sources or sinks, and that there must be no flow cycles, is unique. This means that this flow is very probably correct.

User action: No need to produce and inspect a flow-check-plot

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.

MANYFLOWS, flow determined in river network is not unique

Explanation: The flow determined in one or more connected components of the river network by the rules that there must be no junctions which are sources or sinks, and that there must be no flow cycles, is not unique. A correct flow has been found by searching all possible flows which fulfil these criteria, and more than one such flow has been found. This means that it is possible that the flow found may not in fact be the true flow.

User action: It is advisable to inspect the flow-check-plot which will now be produced automatically. Any river link on which the flow indicated is incorrect should have heights edited into it sufficient to determine its flow. Note that it is possible that changing the direction of flow along one link may result in changing the direction of flow which is determined by I3D along other links for which the direction of flow is not determined by heights along them alone.

NOCHECKOUT, no output check plot will be produced in mode INTERSECT

Explanation: Mode INTERSECT does not produce an output check plot IFF file.

User action: None.

NOLITESOUT, no output Lites2 guidance file will be produced in mode INTERSECT

Explanation: Mode INTERSECT does not produce an output Lites2 guidance file.

User action: None.

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.

BADHEIGHT, 'integer' river point(s) with height outside network component height range

Explanation: One or more river points were found with height greater than the maximum component source height, or less than the minimum component sink height. This implies a flow path height inflection, which is illegal.

User action: Entries into the LITES2 command file will have been made if the LITES command has been given, to indicate each of these points. These are not node points and are therefore probably due to terrain intersection, which implies that the terrain and/or river digitising is at fault and will need correcting. Use LITES2 to edit input data files as necessary.

CBPNTErr, Less than two vertices found for feature in file 'file-spec', FSN 'integer', FC 'integer'

Explanation: There were less than two vertices found for river or ridgeline feature.

User action: Re-run deselecting the FSN from the heighting process using the DESELECT FSN command.

DIRFLOWERR, data error detected during attempt to determine river network flow

Explanation: One or more data errors have been detected by the flow directing routine which prevents the required processing sequence being completed. Entries into the LITES2 command file will have been made if the LITES command has been given. A check-plot IFF file will be created before terminating if the CHECKPLOT command has been given.

User action: If necessary, repeat the I3D run to generate a LITES2 command file. Use LITES2 with LITES2 command file output from I3D to input additional supplementary height information.

HORIZNET, 'integer' horizontal river network component(s)

Explanation: One or more river network components were found in which the maximum terminal node height was equal to the minimum terminal node height. This would imply a completely horizontal river system which is considered by I3D to be illegal.

User action: Entries into the LITES2 command file will have been made if the LITES command has been given, to request new heights for a minimum and a maximum terminal node in each of the river network components at fault. Use LITES2 to edit in a height for each node indicated.

ILLEGALCYCLE, illegal river cycle

Explanation: Height values in the input river network imply that there is a cycle in the river flow, which is impossible.

User action: This is a fatal error so the FLOW stage will not complete successfully. A message will have been written to the LITES2 command file indicating the location of one of the river nodes through which this cycle passes. You must then edit the river and/or terrain data so that the cause of this inconsistent river heighting is eliminated.

ILLEGALSINK, 'integer' illegal river sink(s) found

Explanation: Height values in the input river network imply that there is a flow in to a river junction for which there is no flow out.

User action: This is a fatal error so the FLOW stage will not complete successfully. A message will have been written to the LITES2 command file for each illegal sink, which will take you to the river junction in question. You must then edit the river and/or terrain data so that the cause of this inconsistent river heighting is eliminated.

ILLEGALSOURCE, 'integer' illegal river source(s) found

Explanation: Height values in the input river network imply that there is a flow out from a river junction for which there is no flow in.

User action: This is a fatal error so the FLOW stage will not complete successfully. A message will have been written to the LITES2 command file for each illegal source, which will take you to the river junction in question. You must then edit the river and/or terrain data so that the cause of this inconsistent river heighting is eliminated.

INDIRECTINFLECT, indirect river height inflection

Explanation: Height values in the input river network suggest that a river changes direction of flow, although the direction of flow may not change within any individual link. Either the terrain data which the river(s) in question intersects is falsely heighted, or else the river and/or terrain data have been inaccurately digitised.

User action: This is a fatal error so the FLOW stage will not complete successfully. A message will have been written to the LITES2 command file which will take you to the point of inflection in question, for which you must then edit the height so as to eliminate this inflection.

INFLECTION, 'integer' height inflection(s) found along 'integer' river link(s)

Explanation: Height values in the input river network suggest that one or more river links change direction of flow, which is of course impossible, so either the terrain data which the river(s) in question intersect is falsely heighted, or else the river and/or terrain data have been inaccurately digitised.

User action: This is a fatal error so the FLOW stage will not complete successfully. A message will have been written to the LITES2 command file for each inflection which will take you to the point of inflection in question, for which you must then edit the height so as to eliminate this inflection.

INTOVERFLOW, no. of intersections exceeds memory allocation

Explanation: I3D has found more intersections between river/ridge line links and contours than it can hold in memory.

User action: Increase the amount of virtual memory I3D allocates for intersections by specifying a large argument to the SET INTS_PER_LINK command.

NOFEATURES, No features selected

Explanation: No features were found in any of the input IFF files which were selected for processing according to the LOOKUP file and SELECT commands used.

User action: Re-run with selections changed.

NOFLOW, No legal flow exists - river network heighting is inconsistent

Explanation: All possible combinations of flow directions have been checked and none gives an overall flow consistent with the principles that no river can have a height inflection along any flow path, and no river nodes can be sources or sinks except for free ends, or nodes from which a free end link has been completely removed.

User action: Flows indicated by the check-plot IFF file may be false. Use LITES2 to correct height inflections along corrected river flow paths. The existing heighting is inconsistent so will have to be changed in some way.

NOTERMINALS, 'integer' network component(s) with no terminal nodes

Explanation: One or more river network components were found which had no terminal nodes. I3D does not allow this because it needs to be able to identify all potential river source and sink nodes in order to establish a legal river network flow.

User action: Entries into the LITES2 command file will have been made if the LITES command has been given, to indicate each of the river network components at fault. Use LITES2 to edit in extra onearm river links as required.

ONEARM, 'integer' unheighted free end(s)

Explanation: One or more unheighted free ends were found, even after free ends overhanging heighted points by less than the tolerance specified by the CLIPTOLERANCE command were removed.

User action: Entries into the LITES2 command file will have been made if the LITES command has been given. Use LITES2 to edit in a height for each end point indicated, then re-run. Alternatively, just re-run with a larger

clip tolerance.

UNDIRTERM, 'integer' undirected river terminal link(s)

Explanation: One or more undirected river terminal links were found.

User action: Entries into the LITES2 command file will have been made if the LITES command has been given. Use LITES2 to edit in a height for each node indicated, then re-run.

UNHEIGHTEDNODES, 'integer' node(s) could not be heighted

Explanation: One or more nodes in the river/ridge network could not be successfully heighted for some reason. All nodes must be heighted before I3D can go on to interpolate a height for each point and produce the final 3D output IFF files.

User action: Entries into the LITES2 command file will have been made if the LITES command has been given, to indicate each node for which a height could not be estimated.

MESSAGES (FATAL)

These messages indicate a severe error in processing, or some form of system failure, which has caused the program to terminate.

FTRMISCOUNT, Required-feature miscount

Explanation: An internal inconsistency error has been detected which prevents any further processing.

User action: Please submit an SPR to Laser-Scan in Cambridge.

INTRNLERR, Internal inconsistency error 'integer' detected in routine 'string'

Explanation: Something has occurred in the named routine which the algorithm used assumes to be impossible.

User action: Please submit an SPR with the error number and routine name, with all the data files, to Laser-Scan in Cambridge.

SPACE LIM, Insufficient workspace - maximum available is: 'integer' bytes -
amount requested is: 'integer' bytes

Explanation: I3D dynamically allocates the virtual memory for arrays used in the 3D feature heighting process. Unfortunately it has only been able to allocate the specified number of bytes and is unable to continue.

User action: The supplementary message supplied with this message will enable the user to determine the cause of the problem. It may be that you have attempted to exceed your process paging file quota (PGFLQUOTA) or that your working set limit is not large enough to accommodate the increased virtual address space.

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 3

ITCHECK

MODULE **ITCHECK**

DEVELOPED from DTMPREPARE module TCHECK.

FUNCTION

ITCHECK is a utility to detect and tabulate errors in vector data.

FORMAT

\$ ITCHECK

PROMPT

ITCHECK is command driven. Command input is expected when the following prompt is issued:-

ITCHECK>

DESCRIPTION

General

ITCHECK is a utility to detect and tabulate errors in IFF vector data. It may be used to validate a height value associated with a map feature, and to check for errors in the form of a feature. Errors in height or form may arise from data capture or data editing operations.

Typically, the data input for checking will consist of heightened contours and spot heights, and map features, such as rivers and ridge lines. These features are used in the generation of a DTM by modules in the Laser-Scan package DTMCREATE. Validating the map data using ITCHECK is an important aid to controlling the quality and accuracy of the DTM, and in a production situation, may avoid expensive and time consuming problems, resulting from the input into the terrain modelling process of incorrectly heightened or malformed data.

Note, that it is difficult for any utility to detect all possible errors that may be present in digital data derived from a map. The quality and nature of the source document, the data capture system, and in particular the amount of cartographic 'licence' or enhancement applied in the design of the map, greatly influence the success of an automated checking procedure. The ITCHECK tabulation report should, therefore, not be considered an authoritative statement on the errors present in the file. The report is a guide, which will allow a user to effectively investigate areas of potential error, either in conjunction with a plot of the data, or with a LITES2 guidance file produced by ITCHECK.

The checks performed by ITCHECK are grouped into six categories. A single category or a number of categories of checks, may be selected using the CHECK command. The following checks are performed in each category:

Category 1 Height checks

Supplementary contour heights are divisible by the supplementary contour interval.

Contour heights are divisible by the contour interval.

Index contour heights are divisible by the index contour interval.

All heights lie within a specified range.

Contour values between lower and upper range limits are present.

Index contour values between lower and upper range limits are present.

Coastline features have zero height.

Cliff AC 80 and AC 81 lie within a specified range.

Category 2 Link checks

Features lie within a map border, as defined by the bounding rectangle derived from the control point (CP) entry, or via the BORDER command.

Loop features are correctly closed.

Connecting line features have the same height.

Line features such as contours are connected to two other items.

Category 3 Intersection checks

River features do not cross line features more than once.

Line features do not cross other line features.

Category 4 Profile height checks

The heights of neighbouring features are consistent with the contour interval.

Category 5 Loop, duplicate points and spot height single coordinate checks.

Spot heights have a valid CB (one coordinate in CB entry).

Line feature ends do not cross.

Line features do not contain internal loops.

Line features do not have duplicate points.

Category 6 Validity of spot heights checks

Spot heights are consistent with neighbouring contours.

Category 1 checks are applied to all map features that may be assigned a single height value (eg. contour). The height is derived by ITCHECK from an AC 2 (integer height) or AC 3 (floating point height) entry associated with each feature. Map features for which it is not appropriate to hold a constant height, such as rivers and ridge-lines, even if they are defined by three-dimensional coordinates, are excluded from the check.

The checks in this category ensure contours are divisible by the appropriate contour interval, and that the height of a feature is within a specified height range. Contour interval height range parameters are defined using the relevant ITCHECK commands.

Checks in category 2 are designed to detect errors in the geometry of a feature resulting from digitising, and errors in the heights of linked or connecting features. For example, features are checked that they lie within a map area, and that a contour feature which is a continuation of another contour feature has the same height. The latter check is often required because a single map contour line may have been digitised as a number of separate IFF features, or may have been broken into separate features on the map to allow for contour labelling. Tolerance values, which allow for cartographic elements such as labelling, and for variation in the quality of the digitising, are specified using relevant ITCHECK commands.

Checks are made in category 3 to detect map features that incorrectly intersect other map features. Such errors may arise during data capture, particularly if the map data have been derived from a number of different map sources. ITCHECK will determine the number of times a feature intersects another feature and, depending on the type of feature, will report an error. For example, a contour should not cross or touch another contour, while a river should cross the same contour line only once.

The check in category 4 is used to verify height trends in the digital data, ie. the accuracy of a feature height relative to a neighbouring feature. The check involves taking a series of profiles or sections through the map data. Profiles are taken at regular intervals, separated by a distance parameter (in IFF units) specified with the PROFILE_INTERVAL command, and are constructed from the top to the bottom of the map border. The intersection of a profile with each map feature is calculated, so that the relevant positions of features may be determined. The heights of neighbouring features are checked against each other using an appropriate height interval.

The profile interval, and hence the number of profiles constructed, should be selected according to the density and distribution of features on the map. Too large an interval leaves the risk of the profiles missing small features, while an interval that is too small will result in a lot of time being wasted duplicating checks unnecessarily.

Checks in category 5 are applied to all types of map features. They are designed to detect errors in the geometry of a feature resulting from digitising. For example, features with duplicate points or with loops. Spot heights are checked to ensure they are defined by only one coordinate pair. Any height value associated with a feature is not used in these series of checks.

The category 6 check is designed to verify the value of a map spot height. The spot height is compared with the height of adjacent map features, and is verified using an appropriate height interval. For example, a spot height of value 105 metres, that is completely contained in a contour of height 50 metres, on a map with a contour interval of 10 metres, will be reported in error.

Note the amount of processing required to perform the checks will vary from category to category. Checks on all the coordinates defining a feature will take longer than checks on the heights of the features, or checks that use just the feature's start and end points. Checks that

require the intersection of feature coordinate strings are the most computationally intensive.

Performing all categories of checks may not always be required. Which checks are relevant, is dependent on how the data was captured, and on the map features that are input into ITCHECK. The following table shows the checks that are performed on different map features.

GROUP NAMES	CHECKS					
	1	2	3	4	5	6
CLIFF	*	*	*		*	
COASTLINES	*	*	*	*	*	
CONTOURS	*	*	*	*	*	*
INDEX_CONTOURS	*	*	*	*	*	*
LAKES	*	*	*	*	*	*
RIDGES		*	*		*	
RIVERS		*	*		*	
SPOT_HEIGHTS	*	*			*	*
SUPPLEMENTARY_CONTOURS	*	*	*	*	*	*

Group definition table

A group definition table is used by ITCHECK to define which feature codes belong to a given group for the purpose of vector checking. For example, which features are rivers. The group definition table must be initialised before the ITCHECK module can do any vector checking. This is achieved using the LOOKUP command.

The group definition table is defined in an ASCII text file and can be easily generated using a text editor such as EDT. The format of this file is given as follows:-

```
group_name feature_code[,...]
```

The 'group_name' describes a class of map feature eg. RIVERS. The following group names are recognised by the program:

```
CLIFFS
COASTLINES
CONTOURS
INDEX_CONTOURS
LAKES
RIDGE_LINES
RIVERS
SPOT_HEIGHTS
SUPPLEMENTARY_CONTOURS
```

Note, that the same group name may appear more than once in the table. An invalid group name will be ignored by the program, and a warning message will be displayed.

The 'feature_code' is a feature identifier specified as an integer value in the range 0 to 32767. A single feature code, or a list or range of feature codes may be supplied for each group. Multiple feature codes are specified separated by commas or spaces, while a range of feature codes is specified by means of a colon ':'.

It is not permissible for more than one group to share the same feature code. A group definition file containing two or more groups sharing the same feature code will cause the LOOKUP command to display an error message and terminate.

The following are examples of group definition files:-

Example 1

```
CONTOURS 5,10:15
LAKES 100
SPOT_HEIGHTS 27
RIVERS 7
```

Example 2

```
CONTOURS 6
INDEX_CONTOURS 4
SUPPLEMENTARY_CONTOURS 5
CONTOURS 100:200
```

In example 2 the CONTOURS 'group_name' has been specified twice. This is perfectly valid and feature codes 100 to 200 will be loaded to the group definition table along with feature code 6. However, a warning message will be issued indicating a possible problem.

Once a group definition table has been read, it is possible to include or exclude a group of map features for checking, using the commands SELECT FC and DESELECT FC. By default ITCHECK will include all groups of features that are present in an input IFF file in the checking process.

Tolerance

This section explains how the tolerance parameters are used within the vector checking process. The module requires three tolerance parameters to be specified for category 2 checking. These parameters are 'border_tolerance' 'maximum_tolerance' and 'minimum_tolerance' supplied using TOLERANCE commands BORDER, MAXIMUM and MINIMUM respectively. The 'minimum_tolerance' and 'maximum_tolerance' are applied as follows:

<----->	'minimum_tolerance'
<----->	'maximum_tolerance'
.....	
.....	Features are considered to be linked, since the gap is less than the minimum tolerance. A minimum tolerance is required to take into account small inaccuracies in junctions etc.
.....	
.....	Features are considered to be unlinked, since the gap is greater than the minimum tolerance and less than the maximum tolerance. This is not a genuine gap in the linework. The condition will cause an error to be reported.
...	
....	Features are considered to be unlinked, but are acceptable since the gap is greater than the maximum tolerance. This may be due to a genuine gap for a contour label. No error is reported.

The 'border_tolerance' is applied as follows:-

<----->	<----->	'border_tolerance'
.....		
.....		
.....		These features are treated as though they touch the sheet border.
.....		
		This feature is considered to fall short of the sheet border, and will be reported as being in error. Either the message 'Links to only 1 item' or 'Links to no other item' will be output

Input IFF files

ITCHECK will allow up to 5 input IFF files to be specified by the user. Typically each input file will contain features relating to a particular group, eg. contour lines may be contained in one file while rivers and ridge lines may be held in a separate file. Alternatively, a single IFF file containing all map features may be supplied. If multiple files are specified it is important that they have an identical local origin. If this is not the case, ITCHECK will display an error message, and abandon the current IFF file. This prevents the user from inadvertently specifying two or more IFF files which are not part of the same geographic area.

For a number of applications the user may wish to restrict checking to a particular section of the map. This may be performed using the WINDOW command. This command is used to define a rectangular area. Any map features that lie entirely outside this rectangular area will be excluded from the checks. Note that if any part of a feature passes through the rectangle, the whole of the feature will be used in the error checking process.

The height of a feature is determined from an ancillary code entry. An AC 2 entry holds an integer height, and an AC 3 entry a floating point height value. If a feature which would normally be expected to have a height value is found to have no AC entry, ITCHECK will remove this feature from the checking process. A warning message will be displayed with the FSN and FC of the unheighted feature.

All contours, spot heights, lakes and coastline features are expected to be heightened. Rivers and ridges in the input file may be defined by three-dimensional strings, however, ITCHECK will perform no checks on the height values.

ITCHECK has a maximum IFF string length restriction of 50000. If this maximum string length is exceeded, a message is issued and the offending feature is excluded from all checks. Users are advised to break features having more than 50000 points into 2 or more smaller ones each having not more than 50000 points.

Error Report

If errors are found in a feature during a check process, ITCHECK will produce a tabulation error file. By default, this file is given the name ITCHECK.LIS and is created in the user's current directory. An alternative file specification may be supplied using the LIST command.

The first page of the tabulation error file contains general information about the check process. This will include the file specifications of the input and output files, parameter information such as intervals and tolerances and information on any window that may have been defined. Subsequent pages of the report contain a table of the detected errors under the following headings:-

MAP	FSN	FC	HEIGHT	XCOORD	YCOORD	VECTOR	ERROR DESCRIPTION
-----	-----	----	--------	--------	--------	--------	-------------------

The coordinate value output will depend on the category of check. The coordinates will normally represent a point closest to the detected error. For example, intersection checks will output the intersection coordinates, geometry checks will output the coordinates of the end of the feature in error and height checks will output the first coordinates of the feature. Note: missing contours features within range can be detected but due to the nature of this error no coordinate data is available.

Output Error File

An output error IFF file may be optionally produced. This is achieved using the OUTPUT command. The file will contain portions of the input IFF data found to be in error. At most 10 points will be output defining the first 10 points of a feature, or the section of the line at which the error occurs. The created output error file will maintain the original FSN etc. Data relating to different checks will be output to separate layers. By default the first layer will be 2, although, this may be defined using the LAYER command. ITCHECK will automatically increment the layer number between checks.

The output file may be displayed on a graphics device or plotted on a hardcopy device. The plot may be annotated with the feature's FSN to assist in correction of the data.

LITES2 Guidance File

A LITES2 guidance file may be optionally produced. This is achieved using the LITES command. LITES2 commands are output to this file to assist correction or investigation of the features that have been detected in error, using the LITES2 cartographic editor.

Example

A typical command sequence is:

LOOKUP ITCHECK	(file is LSL\$LOOKUP:ITCHECK.DAT)
DESELECT FC 10:15	(deselect FC 10 through 20)
IFF MAP1	(input file 1 is LSL\$IF:MAP1.IFF)
IFF MAP2	(input file 2 is LSL\$IF:MAP2.IFF)
CONTOUR_INTERVAL 20	(contour interval to use)
INDEX_INTERVAL 100	(index contour interval to use)
SUPPLEMENTARY_INTERVAL 5	(supplementary contour interval to use)
ZLIMITS 100 600	(the upper and lower contour limits)
CHECK 1,3:5	(perform checks 1,3,4 & 5)
PROFILE 5	(profile interval for use in check 4)
LIST SYS\$LOGIN:AREA1.LIS	(name of tabulation file)
GO	(start to process)

This series of commands will set up to perform checks 1, 3, 4 & 5 on two IFF files LSL\$IF:MAP1.IFF and LSL\$IF:MAP2.IFF. Mandatory parameters to control the checking process are also specified. Detected errors being reported in text error tabulation file SYS\$LOGIN:[]AREA1.LIS.

Note, in this example, feature codes 10 through 15 have been deselected from the checking process.

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DESCRIPTION

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ITCHECK command defaults.

No command defaults have been set on program startup.

ITCHECK commands

@

Take command input from the specified file.

FORMAT: @file-spec

Command parameters:

file-spec

The file to be opened and used for command input.

Any parts of the file-spec not supplied for the @ command will be taken from the default specification 'SYS\$DISK:[].COM;0'.

DESCRIPTION:

ITCHECK offers the facility of command input from an indirect command file. The '@' character preceding a file-spec will cause ITCHECK to open and read commands from the specified file until:

1. a RETURN command is detected and command input is returned to SYS\$COMMAND.
2. end-of-file is detected. This provokes an error message and command input is returned to SYS\$COMMAND.

Nested command files are not supported (i.e. a command file containing an '@' command), although sequential '@' commands are supported when read from SYS\$COMMAND.

As an aid to batch log interpretation ITCHECK will echo all commands read from an indirect command file.

Messages:

The following messages are specific to the @ command:

*** WARNING *** "@" must precede a file-spec

*** WARNING *** Indirect file error - returning to terminal input

*** ERROR *** Can't open indirect command file 'file-spec'

Examples:

```
ITCHECK> @PRESETS<CR>
ITCHECK> LOOKUP GROUP1
ITCHECK> DESELECT FC 27
ITCHECK> CHECK 1,3:5
ITCHECK> CONTOUR_INTERVAL 10
ITCHECK> INDEX_INTERVAL 50
ITCHECK> SUPPLEMENTARY_INTERVAL 2
ITCHECK> PROFILE_INTERVAL 5
ITCHECK> RETURN
ITCHECK>
```

!

Treat all text to the right of the '!' as a comment.

FORMAT: ! [comment text]

Command parameters:

comment text

text that is to be treated as a comment and which will be excluded from
command interpretation.

DESCRIPTION:

An exclamation mark is the standard DTMPREPARE package comment delimiter. All
text (and numbers) which lie to the right of a '!' character are excluded from
command interpretation. Comments are useful for annotating command procedures
used in batch processing etc.

Messages: None.

Examples:

ITCHECK> ! a comment for the sake of it<CR>
ITCHECK> CHECK 1:5<CR>
ITCHECK>

BORDER

Defines the coordinates of the map border.

FORMAT: **BORDER** sw_xcoord sw_ycoord ne_xcoord ne_ycoord

or

FORMAT: **BORDER** sw_xcoord sw_ycoord nw_xcoord nw_ycoord
 ne_xcoord ne_ycoord se_xcoord se_ycoord

Command parameters:

sw_xcoord sw_ycoord

The coordinates of the south-west (bottom lefthand)

nw_xcoord nw_ycoord

The coordinates of the north-west (top lefthand)

ne_xcoord ne_ycoord

The coordinates of the north-east (top righthand)

se_xcoord se_ycoord

The coordinates of the south-east (bottom righthand)

The coordinates are specified in IFF units, as real (floating point) values.

DESCRIPTION:

BORDER is used to define the map limits of the IFF file. By default, the bounding rectangle derived from the CP entry values is used.

The BORDER command can be given in one of two ways. The first method requires that the south-west followed by the north-east coordinates be supplied to define the rectangle. The second method requires that the south-west, north-west, north-east and south-east corners be supplied, in that order to define the area of interest.

This command is normally used when the values in the IFF file CP entry are known not to correspond to the actual map area ie. when the control points do not define the corners of the map. Care should be taken when inputting parameters with this command, as it may lead to the generation of erroneous messages when category 2 (link checks) checks are carried out.

The command SHOW BORDER may be used to examine the border coordinate values.

Messages:

The following error messages are specific to the BORDER command:

*** ERROR *** Specifying command BORDER
Command requires either:
 2 x,y coordinate pairs (SW and NE)
or
 4 x,y coordinate pairs (SW, NW, NE and SE)

*** ERROR *** Specifying command BORDER
Real argument not found

*** ERROR *** Specifying command BORDER
NE x coordinate > SW x coordinate

*** ERROR *** Specifying command BORDER
NE y coordinate > SW y coordinate

*** ERROR *** Specifying command BORDER
SE x coordinate < SW x coordinate

*** ERROR *** Specifying command BORDER
NE x coordinate < NW x coordinate

*** ERROR *** Specifying command BORDER
NW y coordinate < SW y coordinate

*** ERROR *** Specifying command BORDER
NE y coordinate < SE y coordinate

Examples:

ITCHECK>BORDER 0.0 0.0 300.0 350.0 <CR>
ITCHECK>

CHECK

Specifies which category or categories of checks are to be performed.

FORMAT: **CHECK category[,...]**

Command parameters:

category

An integer number in the range 1 to 6. Multiple categories may be specified separated by commas or spaces, while a range of categories may be specified by means of a colon ':'. eg. CHECK 1,3:5 includes categories 1,3,4 and 5. Alternatively keywords 'ALL' may be specified, to request that all checks are to be carried out.

DESCRIPTION:

The CHECK command is used to specify which category or categories of checks are to be performed by the ITCHECK process. When two or more categories are specified by the CHECK command the lowest category number is always processed first. The checks are performed when the GO command is given.

The following categories of checks may be specified by using the the CHECK command (see utility description for more information):

Category 1 Height checks.

Category 2 Link checks.

Category 3 Intersection checks.

Category 4 Validity of neighbouring height checks.

Category 5 Loop, duplicate points and spot height single coordinate.

Category 6 Validity of spot heights checks.

The SHOW CHECK command can be used to display which checks are currently selected.

Messages:

The following error messages are specific to the CHECK command:

*** ERROR *** Specifying command CHECK
Unexpected character 'char' at this point

*** ERROR *** Specifying command CHECK
Command requires check number or range of check numbers

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CHECK command

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*** ERROR *** Specifying command CHECK
Illegal check 'number' number
Checks must be between 1 - 6

Examples:

ITCHECK>CHECK 6,1:3<CR>
ITCHECK>

CLOSE IFF

Closes all opened input IFF files.

FORMAT: **CLOSE IFF**

Command parameters:

none

DESCRIPTION:

The CLOSE IFF command is used to close all opened input IFF files. The command is generally used to close a set of input IFF files after checking has been performed, before specifying a new set of IFF files for a new series of checks.

The command is also useful when an IFF file is opened in error.

The command SHOW FILES may be used to list all opened input IFF files.

Messages:

The following error message is specific to the CLOSE IFF command:

*** ERROR *** Specifying command CLOSE IFF
No input IFF files opened

Examples:

ITCHECK>**CLOSE IFF <CR>**
All input IFF files have been closed
ITCHECK>

CLOSE LIST

Closes an error tabulation file that has been opened using the LIST command.

FORMAT: CLOSE LIST

Command parameters:

none

DESCRIPTION:

The CLOSE LIST command is used to close the error tabulation file. The error tabulation file can be re-specified using the LIST command.

The command SHOW FILES may be used to list all files specified.

Messages:

The following error message is specific to the CLOSE LIST command:

*** ERROR *** Specifying command CLOSE LIST
No LIST file opened

Examples:

ITCHECK>CLOSE LIST<CR>
ITCHECK>

CLOSE LITES

Close a LITES command file that has been opened using the LITES command.

FORMAT: **CLOSE LITES**

Command parameters:

none

DESCRIPTION:

The CLOSE LITES command is used to close the LITES2 command file. The LITES2 command file can be re-specified using the LITES command.

The command SHOW FILES may be used to list all files specified.

Messages:

The following error message is specific to the CLOSE LITES command:

*** ERROR *** Specifying command CLOSE LITES
No LITES2 file opened

Examples:

ITCHECK>**CLOSE LITES**<CR>
ITCHECK>

CLOSE OUTPUT

Closes an output IFF error file that has been opened using the OUTPUT command.

FORMAT: **CLOSE OUTPUT**

Command parameters:

none

DESCRIPTION:

The CLOSE OUTPUT command is used to close an opened output IFF error file. The output IFF error file can be re-specified using the OUTPUT command.

The command SHOW FILES may be used to list all files specified.

Messages:

The following error message is specific to the CLOSE OUTPUT command:

*** ERROR *** Specifying command CLOSE OUTPUT
No OUTPUT file opened

Examples:

ITCHECK>**CLOSE OUTPUT**<CR>
ITCHECK>

CONTOUR_INTERVAL

Specifies the contour interval.

FORMAT: CONTOUR_INTERVAL contour_interval

Command parameters:

contour_interval

This specifies the height interval between adjacent contour lines. The value must be a positive number greater than zero.

If SUPPLEMENTARY_INTERVAL command has been executed then:

contour_interval >= supplementary_interval

If INDEX_INTERVAL command has been executed then:

contour_interval <= index_interval

DESCRIPTION:

The CONTOUR_INTERVAL command is used to specify the height interval between adjacent contours. The contour interval is used to check that all normal contours (as opposed to supplementary or index contours) are divisible by the contour interval.

The parameter is also used to check that all contours are present between the lower and upper contour limits as specified by the ZLIMITS command.

The contour interval must be specified before the GO command if CHECK 1 and/or CHECK 4 have been requested.

The currently defined contour interval may be examined using the SHOW INTERVALS command.

Messages:

The following error messages are specific to the CONTOUR_INTERVAL command:

*** ERROR *** Specifying command GO

Command requires contour interval

*** ERROR *** Specifying command CONTOUR_INTERVAL
Value is less than previously specified SUPPLEMENTARY_INTERVAL
'supplementary_interval'

*** ERROR *** Specifying command CONTOUR_INTERVAL
Value is greater than previously specified INDEX_INTERVAL 'index_interval'

Example:

```
ITCHECK>CONTOUR_INTERVAL 10<CR>
ITCHECK>SHOW INTERVALS<CR>
INTERVALS:
    Contour interval is 10.00
    No index interval specified
    No supplementary interval specified
    No profile interval specified
ITCHECK>
```

DESELECT FC

Excludes an IFF feature from checking on the basis of feature code.

FORMAT: **DESELECT FC feature_code [,...]**

Command parameters:

feature_code

An integer feature code in the range 0 to 32767. Multiple feature codes may be specified separated by commas or spaces, while a range of feature codes may be specified by means of a colon ':'. eg. Deselect FC 10:13 excludes feature codes 10,11,12 and 13.

Alternatively a group name supplied by the group definition table may be specified. eg. Deselect FC LAKES

DESCRIPTION:

The Deselect FC command is used to exclude IFF features from checking. Features are excluded on the basis of their feature code. This is useful if particular features are known to be in error, since they can be deselected from the error checking process.

By default ITCHECK will use all features defined in the group definition table.

The SHOW GROUP command can be used to display feature selections for each of the groups defined.

Messages:

The following error messages are specific to the Deselect and Deselect FC commands:

*** ERROR *** Specifying command Deselect
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command Deselect FC
Unexpected character 'char' at this point

*** ERROR *** Specifying command Deselect FC
Illegal feature code 'fc'

*** ERROR *** Specifying command Deselect FC
No group definitions loaded
Therefore no feature codes available for selection
Use command LOOKUP to load group definition table

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DESELECT FC command

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*** ERROR *** Specifying command DESELECT FC
Invalid group name 'group_name'

*** ERROR *** Specifying command DESELECT FC
Group not defined
Therefore no feature codes available for selection
Use command LOOKUP to load group definition table containing required group

Examples:

ITCHECK>DESELECT FC 1<CR>
ITCHECK>DESELECT FC SPOT_HEIGHTS<CR>
ITCHECK>DESELECT FC 7:10,56:78<CR>
ITCHECK>

DESELECT FSN

Excludes an IFF feature from checking on the basis of feature serial number.

FORMAT: **DESELECT FSN fsn [,...]**

Command parameters:

fsn

An integer feature serial number in the range 0 to 65534. Multiple feature serial numbers may be specified separated by commas or spaces, while a range of numbers may be specified by means of a colon ':'. eg. Deselect FSN 10:13 excludes feature serial numbers 10,11,12 and 13.

DESCRIPTION:

The Deselect FSN command is used to exclude IFF features from checking. Features are excluded on the basis of their feature serial number. This is useful if a particular feature is known to be in error, since it can be deselected from the error checking process.

By default ITCHECK will use all FSN's within an overlay.

The SHOW SELECTION command may be used to display which FSN's are currently selected.

Messages:

The following error messages are specific to the Deselect and Deselect FSN commands:

*** ERROR *** Specifying command Deselect
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command Deselect FSN
Unexpected character 'char' at this point

*** ERROR *** Specifying command Deselect FSN
Illegal FSN number 'fsn'

Examples:

ITCHECK>DESELECT FSN 4<CR>
ITCHECK>DESELECT FSN 7:10,56:78<CR>
ITCHECK>

DESELECT LAYER

Excludes an IFF feature from checking process on the basis of layer number.

FORMAT: **DESELECT LAYER layer [,...]**

Command parameters:

layer

An integer layer number in the range 1 to 32767. Multiple layer numbers may be specified separated by commas or spaces, while a range of layer numbers may be specified by means of a colon ':'. eg. **DESELECT LAYER 10:13** excludes all features in layers 10,11,12 and 13.

DESCRIPTION:

The **DESELECT LAYER** command is used to exclude IFF features from the checking process. Features are excluded on the basis of IFF layer.

By default **ITCHECK** will use all features within an IFF file.

The **SHOW SELECTION** command may be used to display which layers are currently selected.

Messages:

The following error messages are specific to the **DESELECT** and **DESELECT LAYER** commands:

*** ERROR *** Specifying command **DESELECT**
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command **DESELECT LAYER**
Unexpected character 'char' at this point

*** ERROR *** Specifying command **DESELECT LAYER**
Illegal layer number 'layer number'

Examples:

ITCHECK>DESELECT LAYER 7<CR>
ITCHECK>DESELECT LAYER 1,7:10<CR>
ITCHECK>

EXIT

Exit from ITCHECK.

FORMAT: EXIT

Command parameters: None.

Description:

The EXIT command is used to exit from ITCHECK. Any opened files are closed.

<CTRL/Z> (pressing the Ctrl and Z keys together) may also be used to exit from the program.

Messages: None.

Examples:

ITCHECK> **EXIT<CR>**

ELAPSED: 00:00:20.04 CPU: 0:00:04.71 BUFIO: 281 DIRIO: 46 FAULTS: 263
\$

GO

Starts the vector checking process.

FORMAT: GO

Command parameters: None

DESCRIPTION:

The GO command is used to start the processing and the error checking of the input IFF files. Before the check processing takes places, the following tests will be carried out to ensure that certain preconditions hold:-

1. At least one input IFF file has been opened. An error message will be displayed and the command terminated if this test fails.
2. A group definition table has been loaded using the LOOKUP command. An error message will be displayed and the command terminated if this test fails.
3. A CHECK command has been given to define the category or categories of vector checks to be performed. An error message will be displayed and the command terminated if this test fails.
4. Depending on the categories of vector checks selected, tests are carried to ensure than mandatory parameters for those checks have been specified. An error message will be displayed and the command terminated if this any of these tests fail.

Detected errors in the vector data will be reported in the tabulation error file. Optionally the detected errors, will be output to a LITES2 command file if the LITES command has been given. If the OUTPUT command has been specified then a portion of the coordinate data in the vicinity of detected error will be output to an IFF error file.

Upon successful completion of the checks the ITCHECK command prompt will be displayed. Any opened files apart from the input IFF files will be closed. The category parameter, specified with the CHECK command, will be undefined. Before another GO command can be given it will be necessary to re-specify the new sequence of checks using the CHECK command. This is to avoid running the same sequence of checks accidentally.

Messages:

The following messages are specific to the GO command:

```
*** ERROR *** Specifying the command GO
No input IFF files open                >> Execute command IFF

*** ERROR *** Specifying the command GO
```

```
No group definition table loaded      >> Execute command LOOKUP

*** ERROR *** Specifying the command GO
No checks selected                    >> Execute command CHECK

*** ERROR *** Specifying the command GO
Contour interval not specified        >> Execute command CONTOUR_INTERVAL

*** ERROR *** Specifying the command GO
Index interval not specified          >> Execute command INDEX_INTERVAL

*** ERROR *** Specifying the command GO
Supplementary interval not specified  >> Execute command SUPPLEMENTARY_INTERVAL

*** ERROR *** Specifying the command GO
Contour limits not specified          >> Execute command ZLIMITS

*** ERROR *** Specifying the command GO
Border tolerance not specified        >> Execute command TOLERANCE BORDER

*** ERROR *** Specifying the command GO
Maximum tolerance not specified       >> Execute command TOLERANCE MAXIMUM

*** ERROR *** Specifying the command GO
Minimum tolerance not specified       >> Execute command TOLERANCE MINIMUM

*** ERROR *** Specifying the command GO
Profile interval not specified        >> Execute command PROFILE_INTERVAL

*** ERROR *** No feature code match found
Either:-  FC has been deselected      >> Execute SELECT command
or        lookup file is invalid       >> Execute LOOKUP command
```

Examples:

```
.
.
.
.
ITCHECK> CHECK ALL<CR>
ITCHECK> GO<CR>
<PROCESSING CHECK 1> 100% complete
<PROCESSING CHECK 2> 100% complete
<PROCESSING CHECK 3> 100% complete
<PROCESSING CHECK 4> 100% complete
<PROCESSING CHECK 5> 100% complete
<PROCESSING CHECK 6> 100% complete
ITCHECK>
```

HELP

Give help on a subject

FORMAT: HELP subject

Command parameters:

subject

The subject on which help is required.

Description:

The HELP command looks the rest of the line up in the DTMPREPARE HELP library. This library contains a brief summary of the operation of each command.

The information is looked up in the ITCHECK section of the DTMPREPARE help library, LSL\$HELP:DTMPREPARE.HLB.

Messages:

Where required, warning messages are output via the VMS LBR\$OUTPUT_HELP utility.

Examples:

ITCHECK> **HELP CLOSE LIST<CR>**

ITCHECK

CLOSE

LIST

The CLOSE LIST command is used to close the tabulation error file which has been previous specified by the LIST command.
ITCHECK>

IFF

The IFF command specifies the name of an Internal Feature Format file, containing vector data that is to be input to the checking process.

FORMAT: **IFF file_spec**

Command parameters:

file_spec

The specification of the input IFF file to be opened for checking.

Any part of the file_spec not supplied for the IFF command will be taken from the default file specification 'LSL\$IF:IF.IFF'.

DESCRIPTION:

The IFF command specifies the name of an Internal Feature Format file, containing vector data that is to be input to the checking process.

Multiple files may be specified by repeatedly giving the IFF command. Up to five input IFF files may be defined. Note: all the input IFF file must share a common local origin.

The SHOW FILES command will display the file specification of the input IFF files currently opened for vector checking.

Messages:

The following error messages are specific to the IFF command:

*** WARNING *** You must specify a file-spec argument to the IFF command

*** ERROR *** You must specify a file-spec argument to the IFF command

*** ERROR *** Specifying command IFF

A GO command with a checking sequence has been performed

No more IFF input files can be opened at this stage

Execute command CLOSE IFF followed by IFF to open a new series of files

*** ERROR *** Specifying command IFF

Maximum of five files already opened

*** ERROR *** Opening input IFF file 'file_spec'

*** ERROR *** With input IFF file 'file_spec'

Has a different local origin than the first file opened

Local origin of this file is : X = 'x_coord' Y = 'y_coord'

Local origin of first file is : X = 'x_coord' Y = 'y_coord'

Example:

```
ITCHECK>IFF AREA1_M1<CR>
IFF file LSL$IF:AREA1_M1 selected as input
ITCHECK>IFF AREA1_M2<CR>
IFF file LSL$IF:AREA1_M2 selected as input
ITCHECK>
```

INDEX_INTERVAL

Specifies the index contour interval.

FORMAT: INDEX_INTERVAL index_interval

Command parameters:

index_interval

This specifies the height interval between index contour lines. The value must be a positive number greater than zero.

If SUPPLEMENTARY_INTERVAL command has been executed then:

index_interval > supplementary_interval

If CONTOUR_INTERVAL command has been executed then:

index_interval >= contour_interval

DESCRIPTION:

The INDEX_INTERVAL command is used to specify the index contour interval. The value is used to check that all index contour features are divisible by the index contour interval.

The parameter is also used to check that all index contours are present between the lower and upper contour limits as specified by the ZLIMITS command. If an index contour is absent and a normal contour present instead then a warning message is entered into the error tabulation file.

This value must be assigned before the GO command is given if CHECK 1 has been requested, otherwise it will be assigned, by default, to the contour_interval, and a warning to this effect will be given.

Messages:

The following error messages are specific to the INDEX_INTERVAL command:

*** WARNING *** Specifying command GO
Index interval not specified. >> Defaulting to previously specified CONTOUR_INTERVAL

*** ERROR *** Specifying command INDEX_INTERVAL
Value is less than previously specified SUPPLEMENTARY_INTERVAL
'supplementary_interval'

*** ERROR *** Specifying command INDEX_INTERVAL
Value is less than previously specified CONTOUR_INTERVAL 'contour_interval'

Example:

```
ITCHECK>INDEX_INTERVAL 50<CR>
ITCHECK>SHOW INTERVAL<CR>
INTERVALS:
    No contour interval specified
    Index interval is 50.00
    No supplementary interval specified
    No profile interval specified
ITCHECK>
```

LAYER

Specifies the initial layer number in the output IFF error file.

FORMAT: **LAYER layer**

Command parameters:

layer

This specifies the first layer number in the output IFF file. An integer number in the range 0 to 32761 is required.

DESCRIPTION:

The LAYER command is used to specify the number of the initial layer in the output IFF error file. The layer number is automatically incremented by 1 between the different checking processes when the GO command is executed.

If the LAYER command is not given then error layer 2 is initially created in the output IFF file.

Messages:

The following error messages are specific to the LAYER command:

*** ERROR *** Specifying command LAYER
Command requires initial layer number

*** ERROR *** Specifying command LAYER
Parameter 'layer' not in range 1 - 32761

Example:

ITCHECK>**LAYER 5**<CR>
ITCHECK>**CHECK 2,3:5**<CR>
ITCHECK>

LIST

Specifies the name of the tabulation error file.

FORMAT: **LIST file_spec**

Command parameters:

file_spec

The specification of the tabulation error file.

DESCRIPTION:

The LIST command specifies the name of a tabulation error file which will contain the list of errors output during the vector checking process.

If the LIST command is not given, the default file-spec will be ITCHECK.LIS on the current directory.

On completion of the GO command any opened tabulation error file will be closed. The LIST command will need to be given again if another series of checks are to be performed and a tabulation error file other than the default is required.

The SHOW FILES command will display the name of the currently specified tabulation error file.

Messages:

The following error messages are specific to the LIST command:

*** WARNING *** You must specify a file-spec argument to the LIST command

*** ERROR *** You must specify a file-spec argument to the LIST command

*** ERROR *** Unable to interpret input file-spec

Example:

ITCHECK>LIST AREA1_CHK14.TXT<CR>
ITCHECK>

LITES

Specifies the name of an output LITES2 command file.

FORMAT: LITES file_spec

Command parameters:

file_spec

The specification of the LITES2 command file.

Any part of the file_spec not supplied for the LITES command will be taken from the default file specification 'LSL\$LITES2CMD:LCM.LCM'.

DESCRIPTION:

The LITES command specifies the name of the output LITES2 command or guidance file.

The LITES2 command file will only be generated if the LITES command is given. During the vector checking process most detected errors will generate entries into this file. The resulting command file can be used in conjunction with the LITES2 cartographic editor to position an error in the IFF files, and to assist correction of the data.

On completion of the GO command any opened tabulation error file will be closed. The LITES command will need to be given again if another series of checks are to be performed and a LITES2 command file is required.

The SHOW FILES command will display the name of the currently specified LITES2 command file.

Messages:

The following error messages are specific to the LITES command:

*** WARNING *** You must specify a file-spec argument to the LITES command

*** ERROR *** You must specify a file-spec argument to the LITES command

*** ERROR *** Unable to interpret input file-spec

Example:

ITCHECK>LITES AREA1_CHK14.LCM<CR>
ITCHECK>

LOOKUP

Specifies the name of an ITCHECK group definition file.

FORMAT: LOOKUP file_spec

Command parameters:

file_spec

The specification of the file containing the group definitions.

Any part of the file_spec not supplied for the LOOKUP command will be taken from the default file specification 'LSL\$LOOKUP:ITCHECK.DAT'.

DESCRIPTION:

The LOOKUP command specifies the name of the file containing the ITCHECK group definitions. The loading of a group definition table is a mandatory requirement of the ITCHECK module.

The SHOW FILES command will display the last group definition file loaded using the LOOKUP command. The SHOW GROUPS command may be used to examine the group definitions

Messages:

The following error messages are specific to the LOOKUP command:

*** WARNING *** You must specify a file-spec argument to the LOOKUP command

*** WARNING *** Unrecognised group name 'group_name'

*** WARNING *** No feature codes with group name 'group_name'

*** WARNING *** Group 'group_name' previously defined
Feature codes will be added to the group definition table

*** ERROR *** You must specify a file-spec argument to the LOOKUP command

*** ERROR *** Unable to interpret input file-spec

*** ERROR *** Specifying command LOOKUP
Unable to open file 'file_spec'

*** ERROR *** Specifying command LOOKUP
While reading file 'file_spec'

*** ERROR *** Specifying command LOOKUP
Unable to close file 'file_spec'

*** ERROR *** in LOOKUP file 'file_spec'
Unexpected character 'char' at this point

*** ERROR *** in LOOKUP file 'file_spec'
Illegal feature code 'feat_code'
Feature code must be between 0 - 32767

*** ERROR *** in LOOKUP file 'file_spec'
New feature code 'feat_code' in group 'group_name' is not unique

Example:

ITCHECK>LOOKUP GROUP_TABLE1.DAT<CR>

ITCHECK>SHOW GROUPS<CR>

GROUPS:

COASTLINES have been defined

The following feature codes are currently selected:

14

CONTOURS have been defined

The following feature codes are currently selected:

5:10,55

INDEX_CONTOURS have been defined

The following feature codes are currently selected:

66

LAKES have been defined

The following feature codes are currently selected:

4

RIVERS have been defined

The following feature codes are currently selected:

2

SPOT_HEIGHTS have been defined

The following feature codes are currently selected:

27

SUPPLEMENTARY_CONTOURS have been defined

The following feature codes are currently selected:

77

ITCHECK>

OUTPUT

Opens an output IFF (Internal Feature Format) error file.

FORMAT: **OUTPUT file_spec**

Command parameters:

file_spec

The specification of the output IFF error file to receive coordinates in error.

Any part of the file_spec not supplied for the OUTPUT command will be taken from the default file specification 'LSL\$IF:IFF.IFF'.

DESCRIPTION:

The OUTPUT command specifies the name of an output Internal Feature Format error file. If any features are found to be in error during the checking process, the coordinates describing the relevant part of the feature will be output to the file. A maximum of 10 coordinates will be written. Which part of the feature these coordinates define is dependent on the nature of the error.

For each category of error checking a new layer within the IFF will be created. The LAYER command may be used to control which layers are created in the file.

The SHOW FILES command will display the file specification of the output IFF error file.

Messages:

The following error messages are specific to the OUTPUT command:

*** WARNING *** You must specify a file-spec argument to the OUTPUT command

*** ERROR *** You must specify a file-spec argument to the OUTPUT command

*** ERROR *** Unable to interpret output file-spec

Example:

ITCHECK>OUTPUT AREA1_OVERLAY<CR>
ITCHECK>

PAUSE

Pauses ITCHECK execution.

FORMAT: PAUSE

Command parameters: None.

DESCRIPTION:

Pauses ITCHECK execution and issues a prompt for a carriage return to continue execution. This command is designed for use in software demonstration situations.

Messages: None.

Examples:

ITCHECK> **PAUSE<CR>**

Press <RETURN> to continue<CR>
ITCHECK>

PROFILE_INTERVAL

Specifies the interval between successive vertical profiles.

FORMAT: PROFILE_INTERVAL profile_interval

Command parameters:

profile_interval

This specifies the distance between vertical profiles. The value must be a positive integer number.

DESCRIPTION:

The PROFILE_INTERVAL command is used to specify the interval distance along the x axis between vertical profiles. The parameter is mandatory for a processing sequence which includes check 4.

Messages:

The following error messages are specific to the PROFILE_INTERVAL command:

*** ERROR *** Specifying command PROFILE_INTERVAL
Command requires profile interval

*** ERROR *** Specifying command PROFILE_INTERVAL
Value is less than 1

Example:

```
ITCHECK>PROFILE_INTERVAL 5<CR>
ITCHECK>SHOW INTERVAL<CR>
INTERVALS:
  No contour interval specified
  No Index interval specified
  No supplementary interval specified
  Profile interval is 5
ITCHECK>
```

RETURN

Restores command input from an indirect file to SYS\$COMMAND.

FORMAT: RETURN

Command parameters: None.

DESCRIPTION:

Restores command input from an indirect file to SYS\$COMMAND.

A typical application is to allow the user to use an indirect command file to set up those run time defaults which are constant within a flowline and then return to input from the terminal (or batch stream) for the run specific commands. To do this RETURN must be the last command in the indirect command file.

Messages:

The following messages are specific to the RETURN command:

RETURN command detected - returning to terminal input

RETURN command ignored - command input is already from terminal

Examples:

```
ITCHECK> @PRESET_INTERVAL<CR>
ITCHECK> CONTOUR_INTERVAL 10.0
ITCHECK> INDEX_INTERVAL 50.0
ITCHECK> SUPPLEMENTARY_INTERVAL 2.0
ITCHECK> PROFILE_INTERVAL 5
ITCHECK> RETURN
ITCHECK>
```

SELECT FC

Select IFF features for checking on the basis of feature code.

FORMAT: **SELECT FC feature_code [,...]**

Command parameters:

feature_code

An integer feature code in the range 0 to 32767. Multiple feature codes may be specified separated by commas or spaces, while a range of feature codes may be specified by means of a colon ':'. eg. SELECT FC 10:13 includes feature codes 10,11,12 and 13 if they are in a particular group definition table. Alternatively a group name from the group definition table may be specified eg SELECT FC RIVERS.

DESCRIPTION:

The SELECT FC command is used to include IFF features for checking. Features are included on the basis of their feature code. The feature code must be defined in one of the group definition tables for it to be used in the checking process.

By default ITCHECK will use all features within the group definition table loaded using the LOOKUP command.

The SHOW GROUP command can be used to display feature selections for each of the groups defined.

Messages:

The following error messages are specific to the SELECT and SELECT FC commands:

*** ERROR *** Specifying command SELECT
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command SELECT FC
Unexpected character 'char' at this point

*** ERROR *** Specifying command SELECT FC
Illegal feature code 'fc'

*** ERROR *** Specifying command SELECT FC
No group definitions loaded
Therefore no feature codes available for selection
Use command LOOKUP to load group definition table

*** ERROR *** Specifying command SELECT FC
Invalid group name 'group_name'

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SELECT FC command

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*** ERROR *** Specifying command SELECT FC
Group not defined
Therefore no feature codes available for selection
Use command LOOKUP to load group definition table containing required group

Examples:

ITCHECK>SELECT FC 1<CR>
ITCHECK>SELECT FC SPOT_HEIGHTS<CR>
ITCHECK>SELECT FC 7:10,56:78<CR>
ITCHECK>

SELECT FSN

Include an IFF feature for checking on the basis of feature serial number.

FORMAT: **SELECT FSN fsn [,...]**

Command parameters:

fsn

An integer feature serial number in the range 0 to 65534. Multiple feature serial numbers may be specified separated by commas or spaces, while a range of numbers may be specified by means of a colon ':'. eg. SELECT FSN 10:13 includes feature serial numbers 10,11,12 and 13.

DESCRIPTION:

The SELECT FSN command is used to include IFF features for checking. Features are included on the basis of their feature serial number.

By default ITCHECK will use all FSNs' within an layer.

The SHOW SELECTION command may be used to display which FSN's are currently selected.

Messages:

The following error messages are specific to the SELECT and SELECT FSN commands:

*** ERROR *** Specifying command SELECT
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command SELECT FSN
Unexpected character 'char' at this point

*** ERROR *** Specifying command SELECT FSN
Illegal FSN number 'fsn'

Examples:

ITCHECK>SELECT FSN 4<CR>
ITCHECK>SELECT FSN 7:10,56:78<CR>
ITCHECK>

SELECT LAYER

Includes an IFF feature for checking on the basis of layer number.

FORMAT: **SELECT LAYER layer [,...]**

Command parameters:

layer

An integer layer number in the range 1 to 32767. Multiple layer numbers may be specified separated by commas or spaces, while a range of layer numbers may be specified by means of a colon ':'. eg. SELECT LAYER 10:13 excludes all features in layers 10,11,12 and 13.

DESCRIPTION:

The SELECT LAYER command is used to include IFF features for checking. Features are included on the basis of IFF layer.

By default ITCHECK will use all features within an IFF file.

The SHOW SELECTION command may be used to display which layers are currently selected.

Messages:

The following error messages are specific to the SELECT and SELECT LAYER commands:

*** ERROR *** Specifying command SELECT
Command qualifiers are FC, FSN or LAYER

*** ERROR *** Specifying command SELECT LAYER
Unexpected character 'char' at this point

*** ERROR *** Specifying command SELECT LAYER
Illegal layer number 'layer'

Examples:

ITCHECK>**SELECT LAYER 7<CR>**
ITCHECK>**SELECT LAYER 1,7:10<CR>**
ITCHECK>

SHOW BORDER

Displays information on the current values which define the map border.

FORMAT: SHOW BORDER

Command parameters: None.

DESCRIPTION:

The command SHOW BORDER displays the x, y coordinates which define the map border. This will display either the SW and NE coordinates or the SW, NW, NE and SE coordinates depending on how the BORDER command was given.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW

Available show command qualifiers are:

BORDER	CHECKS	FILES	GROUPS	INTERVALS
SELECTIONS	TOLERANCES	WINDOWS	ZLIMITS	

Examples:

ITCHECK> **BORDER 10.0 220.0 100.0 375.0<CR>**

ITCHECK> **SHOW BORDER<CR>**

Border setting: SW X = 10.0
SW Y = 220.0
NE X = 100.0
NE Y = 375.0

ITCHECK>

SHOW CHECKS

Displays information on the current series of checks to be performed.

FORMAT: SHOW CHECKS

Command parameters: None.

DESCRIPTION:

The command SHOW CHECKS displays the series of checks that will be performed when the GO command is given.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW

Available show command qualifiers are:

BORDER	CHECKS	FILES	GROUPS	INTERVALS
SELECTIONS	TOLERANCES	WINDOWS	ZLIMITS	

Examples:

ITCHECK> CHECKS 1,3:5<CR>

ITCHECK> SHOW CHECKS<CR>

Current settings are 1 3 4 5

ITCHECK>

SHOW FILES

Displays file specification of all ITCHECK files input and output.

FORMAT: SHOW FILES

Command parameters: None.

DESCRIPTION:

The command SHOW FILES displays the files specification for all currently specified input and output ITCHECK files. File spec data is displayed for input IFF files, the output error IFF, the tabulation error file, the LITES2 command file and the group definition file lookup. Refer to the following commands for the file name specification:-

IFF for input IFF files.
OUTPUT for output IFF error file.
LIST for tabulation error file.
LITES for LITES2 command file.
LOOKUP for group definition table file.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW
Available show command qualifiers are:

BORDER	CHECKS	FILES	GROUPS	INTERVALS
SELECTIONS	TOLERANCES	WINDOWS	ZLIMITS	

Examples:

```
ITCHECK> LOOKUP GROUPDEF1<CR>
ITCHECK> IFF AREA1_LINE_FC<CR>
ITCHECK> IFF AREA1_SPOT_FC<CR>
ITCHECK> LIST AREA1.LIS<CR>
ITCHECK> LITES AREA1<CR>
ITCHECK> SHOW FILES<CR>
FILES:
  IFF file LSL$IF:AREA1_LINE_FC selected for input
  IFF file LSL$IF:AREA1_SPOT_FC selected for input
  LIST file AREA1.LIS selected for tabulated errors
  LITES file LSL$LITES2CMD:AREA1.LCM selected
  LOOKUP file LSL$LOOKUP:GROUPDEF1.DAT loaded the last group definition table
ITCHECK>
```

SHOW GROUPS

Displays the name of all currently defined groups, together with the selected feature codes.

FORMAT: SHOW GROUPS

Command parameters: None.

DESCRIPTION:

The command SHOW GROUPS displays the name of all groups defined in the group definition table. The command also listed the currently selected feature codes under the defined groups. The group definition table can be loaded by using the LOOKUP command. If the SHOW GROUPS command is given before the LOOKUP command a message is displayed indicating that no group definition table has been loaded.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW
Available show command qualifiers are:

BORDER	CHECKS	FILES	GROUPS	INTERVALS
SELECTIONS	TOLERANCES	WINDOWS	ZLIMITS	

Examples:

```
ITCHECK> SHOW GROUPS<CR>
GROUPS:
    No group definition tables loaded
ITCHECK> LOOKUP GROUPDEF1<CR>
ITCHECK> DESELECT FC SHOT_HEIGHTS<CR>
ITCHECK> SHOW GROUPS<CR>
    COASTLINES have been defined
The following feature codes are currently selected:
14
    CONTOURS have been defined
The following feature codes are currently selected:
5,55:60
    INDEX_CONTOURS have been defined
The following feature codes are currently selected:
6
    SUPPLEMENTARY_CONTOURS have been defined
7
    SPOT_HEIGHTS have been defined
No feature codes selected
ITCHECK>
```

SHOW INTERVALS

Displays information on the current interval parameters.

FORMAT: SHOW INTERVALS

Command parameters: None.

DESCRIPTION:

The command SHOW INTERVALS displays the value of the current contour interval, index contour interval, supplementary contour interval and profile interval. These parameters may be varied using the CONTOUR_INTERVAL, INDEX_INTERVAL, SUPPLEMENTARY_INTERVAL and PROFILE_INTERVAL commands.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW

Available show command qualifiers are:

BORDER	CHECKS	FILES	GROUPS	INTERVALS
SELECTIONS	TOLERANCES	WINDOWS	ZLIMITS	

Examples:

ITCHECK> CONTOUR_INTERVAL 10.0<CR>

ITCHECK> INDEX_INTERVAL 50.0<CR>

ITCHECK> SUPPLEMENTARY_INTERVAL 2.0<CR>

ITCHECK> SHOW INTERVALS<CR>

INTERVAL:

Contour interval is 10.00

Index interval is 50.00

Supplementary interval is 2.00

No profile interval specified

ITCHECK>

SHOW SELECTIONS

Displays current IFF layer, feature code and FSN selections.

FORMAT: SHOW SELECTIONS

Command parameters: None.

DESCRIPTION:

The command SHOW SELECTIONS, displays the currently selected IFF layers, feature codes and FSNs. The layers, feature codes and FSNs required in the processing can be selected and deselected using the appropriate SELECT or DESELECT commands.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW

Available show command qualifiers are:

BORDER	CHECKS	FILES	GROUPS	INTERVALS
SELECTIONS	TOLERANCES	WINDOWS	ZLIMITS	

Examples:

ITCHECK> SHOW SELECTIONS <CR>

SELECTIONS

No group definition tables loaded

ITCHECK> LOOKUP GROUPDEF1<CR>

ITCHECK> DESELECT LAYER 6:11<CR>

ITCHECK> SHOW SELECTIONS <CR>

SELECTION:

Following layers selected:

0:5,12:32767

Following feature codes selected:

5,7,27,55:60

All FSN's selected

ITCHECK>

SHOW TOLERANCES

Displays information on the current tolerances parameters.

FORMAT: SHOW TOLERANCES

Command parameters: None.

DESCRIPTION:

The command SHOW TOLERANCES displays information on the current border tolerance, minimum tolerance and maximum tolerance. These parameters may be varied using the appropriate TOLERANCE BORDER, TOLERANCE MINIMUM and TOLERANCE MAXIMUM commands.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW

Available show command qualifiers are:

BORDER	CHECKS	FILES	GROUPS	INTERVALS
SELECTIONS	TOLERANCES	WINDOWS	ZLIMITS	

Examples:

ITCHECK> SHOW TOLERANCES<CR>

No border tolerance specified

No minimum tolerance specified

No maximum tolerance specified

ITCHECK> TOLERANCE BORDER 1.0<CR>

ITCHECK> TOLERANCE MINIMUM 0.5<CR>

ITCHECK> TOLERANCE MAXIMUM 4.0<CR>

ITCHECK> SHOW TOLERANCES<CR>

INTERVALS:

Border tolerance value is 1.00

Minimum tolerance value is 0.50

Maximum tolerance value is 4.00

ITCHECK>

SHOW WINDOW

Displays the current SW and NE coordinates which define the map window.

FORMAT: SHOW WINDOW

Command parameters: None.

DESCRIPTION:

The command SHOW WINDOW displays the SW and NE x, y coordinates which define the map window. The window coordinates are defined using the WINDOW command.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW

Available show command qualifiers are:

BORDER	CHECKS	FILES	GROUPS	INTERVALS
SELECTIONS	TOLERANCES	WINDOWS	ZLIMITS	

Examples:

ITCHECK> WINDOW 50.0 300.0 90.0 350.0<CR>

ITCHECK> SHOW WINDOW <CR>

 window setting: SW X = 50.0
 SW Y = 300.0
 NE X = 90.0
 NE Y = 350.0

ITCHECK>

SHOW ZLIMITS

Displays information on the lower and upper contour levels.

FORMAT: SHOW ZLIMITS

Command parameters: None.

DESCRIPTION:

The command SHOW ZLIMITS displays information on the current lower and upper height limits. These parameters may be varied using the ZLIMITS command.

Messages:

The following message is specific to the SHOW command:

*** ERROR *** Specifying the command SHOW

Available show command qualifiers are:

BORDER	CHECKS	FILES	GROUPS	INTERVALS
SELECTIONS	TOLERANCES	WINDOWS	ZLIMITS	

Examples:

ITCHECK> ZLIMITS 100.0 500.0<CR>

ITCHECK> SHOW ZLIMITS<CR>

ZLIMITS:

Lower contour limit is 100.000

Upper contour limit is 500.000

ITCHECK>

SPAWN

The SPAWN command enables a subprocess to be created from within ITCHECK.

FORMAT: SPAWN command-line

Command parameters:

command-line

Specifies a DCL command string to be executed as if typed in response to a '\$' prompt. When the command completes, the subprocess terminates and control is returned to ITCHECK. The command line cannot exceed 80 characters.

DESCRIPTION:

The SPAWN command enables you to create a subprocess while within ITCHECK. When the subprocess terminates, control is returned to ITCHECK.

Messages:

The following error messages are specific to the SPAWN command:

*** ERROR *** Specifying command SPAWN
Command requires a valid DCL command line

*** ERROR *** Unable to spawn command, returning to ITCHECK

Examples:

ITCHECK> SPAWN DIRECTORY LSL\$DTI:*.DTI<CR>

Directory DUA3:[LSL.DTI]

TEST1.DTI;1	8/8	18-AUG-1987 07:56	[LSL,DAVEC]
TEST2.DTI;1	7/8	18-AUG-1987 17:17	[LSL,DAVEC]
TEST2.DTI;2	7/8	18-AUG-1987 17:34	[LSL,DAVEC]

Total of 3 files, 22/24 blocks.

ITCHECK>

SUPPLEMENTARY_INTERVAL

Specifies the supplementary contour interval.

FORMAT: **SUPPLEMENTARY_INTERVAL supplementary_interval**

Command parameters:

supplementary_interval

This specifies the height interval between any two supplementary contour lines. The value must be a positive number greater than zero.

If CONTOUR_INTERVAL command has been executed then:

supplementary_interval <= contour_interval

If INDEX_INTERVAL command has been executed then:

supplementary_interval < index_interval

DESCRIPTION:

The SUPPLEMENTARY_INTERVAL command is used to specify the supplementary index contour interval. The value is used to check that all supplementary contour features are divisible by the supplementary contour interval.

This value must be assigned before the GO command is given if CHECK 1 has been requested, otherwise it will be assigned, by default, to the contour_interval, and a warning to this effect will be given.

Messages:

The following error messages are specific to the SUPPLEMENTARY_INTERVAL command:

*** WARNING *** Specifying command GO
Supplementary interval not specified. >> Defaulting to previously specified CONTOUR_INTERVAL

*** ERROR *** Specifying command SUPPLEMENTARY_INTERVAL
Value is greater than previously specified CONTOUR_INTERVAL 'contour_interval'

*** ERROR *** Specifying command SUPPLEMENTARY_INTERVAL
Value is greater than previously specified INDEX_INTERVAL 'index_interval'

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SUPPLEMENTARY_INTERVAL command

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Example:

```
ITCHECK>SUPPLEMENTARY_INTERVAL 2<CR>
ITCHECK>SHOW INTERVAL<CR>
INTERVALS:
    No contour interval specified
    No index interval specified
    Supplementary interval is 2.00
    No profile interval specified
ITCHECK>
```

TOLERANCE BORDER

Specifies the border tolerance value.

FORMAT: **TOLERANCE BORDER border_tol**

Command parameters:

border_tol

This specifies the border tolerance value. The value must be a positive real number. Normally this value would be small. Values less than 0.5% of the x or y map extent being typical.

DESCRIPTION:

The TOLERANCE BORDER command is used to specify the border tolerance value. This parameter is mandatory for check 2. The border tolerance is used to determine whether line features touch the map border; and no feature lies partly or wholly outside the map border. See section under "Tolerance" in ITCHECK utility description for more information on tolerance parameters.

Messages:

The following error messages are specific to the TOLERANCE and TOLERANCE BORDER commands:

*** ERROR *** Specifying command TOLERANCE
Command qualifiers are
BORDER MAXIMUM MINIMUM

*** ERROR *** Specifying command TOLERANCE BORDER
Command requires tolerance value

*** ERROR *** Specifying command TOLERANCE BORDER
Value 'border_tol' is less than or equal to 0.0

Example:

ITCHECK>**TOLERANCE BORDER 1**<CR>
ITCHECK>**SHOW TOLERANCE**<CR>
TOLERANCES:
 Border tolerance value is 1.000
 No minimum tolerance specified
 No maximum tolerance specified
ITCHECK>

TOLERANCE MAXIMUM

Specifies the maximum tolerance value.

FORMAT: **TOLERANCE MAXIMUM maximum_tolerance**

Command parameters:

maximum_tolerance

This specifies the maximum tolerance value. The value must be a positive real number. Normally this value should reflect the maximum allowable gap between continuous line features.

DESCRIPTION:

The TOLERANCE MAXIMUM command is used to specify the maximum tolerance value. The command is mandatory for check 2. The value defined by this command is used to test whether a continuous line feature is connected to similar allowing for any valid gaps which may be present. Breaks can occur in contour line features where it is necessary to annotate a height. The maximum tolerance value specifies the maximum width of such gaps. See section under "Tolerance" in ITCHECK utility description for more information on tolerance parameters.

Messages:

The following error messages are specific to the TOLERANCE and TOLERANCE MAXIMUM commands:

*** ERROR *** Specifying command TOLERANCE
Command qualifiers are
BORDER MAXIMUM MINIMUM

*** ERROR *** Specifying command TOLERANCE MAXIMUM
Command requires tolerance value

*** ERROR *** Specifying command TOLERANCE MAXIMUM
Value 'minimum_tolerance' is less than or equal to 0.0

*** ERROR *** Specifying command TOLERANCE MAXIMUM
Value is less than or equal to previously specified TOLERANCE MINIMUM
'minimum_tolerance'

Example:

ITCHECK>TOLERANCE MAXIMUM 1<CR>
ITCHECK>SHOW TOLERANCE<CR>
TOLERANCES:
 No border tolerance specified

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TOLERANCE MAXIMUM command

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Minimum tolerance value is 1.000
No maximum tolerance specified
ITCHECK>

TOLERANCE MINIMUM

Specifies the minimum tolerance value.

FORMAT: **TOLERANCE MINIMUM minimum_tolerance**

Command parameters:

minimum_tolerance

This specifies the minimum tolerance value. The value must be a positive real number. Normally minimum tolerance would be set to have a value which is smaller than the closest distance between any two continuous line features having different heights.

DESCRIPTION:

The TOLERANCE MINIMUM command is used to specify the minimum tolerance value. The command is mandatory for check 2. The value defined using this command is used to test whether a continuous line feature is connected to another continuous line feature of the same height. See section under "Tolerance" in ITCHECK utility description for more information on tolerance parameters.

Messages:

The following error messages are specific to the TOLERANCE and TOLERANCE MINIMUM commands:

*** ERROR *** Specifying command TOLERANCE
Command qualifiers are
BORDER MAXIMUM MINIMUM

*** ERROR *** Specifying command TOLERANCE MINIMUM
Command requires tolerance value

*** ERROR *** Specifying command TOLERANCE MINIMUM
Value 'minimum_tolerance' is less than or equal to 0.0

*** ERROR *** Specifying command TOLERANCE MINIMUM
Value is greater than or equal to previously specified TOLERANCE MAXIMUM
'maximum_tolerance'

Example:

ITCHECK>TOLERANCE MINIMUM 1<CR>
ITCHECK>SHOW TOLERANCE<CR>
TOLERANCES:
 No border tolerance specified
 Minimum tolerance value is 1.000

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TOLERANCE MINIMUM command

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No maximum tolerance specified
ITCHECK>

WAIT

Suspend processing for the specified number of seconds.

FORMAT: WAIT seconds

Command parameters:

seconds

The number of seconds for which ITCHECK processing is to be suspended.
An integer value is required

DESCRIPTION:

The WAIT command causes processing to be suspended for a specified number of seconds. It is designed for use in software demonstration situations and is of no value in a production flowline.

Messages:

The following warning message is specific to the WAIT command:

*** WARNING *** You must specify the number of seconds to wait

Examples:

ITCHECK> WAIT 4<CR>
ITCHECK>

WINDOW

Specifies the rectangle to be used in the checking processes.

FORMAT: WINDOW x_min y_min x_max y_max

Command parameters:

x_min y_min

The coordinates of the bottom left hand corner of the defining rectangle.

x_max y_max

The coordinates of the top right hand corner of the defining rectangle.

DESCRIPTION:

The command is used to define rectangular limits to be used in the error checking process. This is useful if only a small segment of the map needs to be vector checked. If any part of a feature passes through the rectangle defined by the WINDOW command then the whole of the feature will be used in the error checking process. Features that do not intersect the defined rectangle are excluded from checking.

The SHOW WINDOW command will display the current window settings.

Messages:

The following warning messages are specific to the WINDOW command:

*** ERROR *** Specifying command WINDOW
Command requires 2 x,y coordinate pairs (SW and NE)

*** ERROR *** Specifying command WINDOW
NE x coordinate < SW x coordinate

*** ERROR *** Specifying command WINDOW
NE y coordinate < SW y coordinate

Examples:

ITCHECK> WINDOW 100.0 150.0 200.0 200.<CR>
ITCHECK>

ZLIMITS

Specifies the lower and upper contour limits

FORMAT: ZLIMITS min_contour max_contour

Command parameters:

min_contour max_contour

This specifies the lower and upper contour limits. The values can be any real numbers. The upper limit must be greater than the lower limit.

DESCRIPTION:

The ZLIMITS command is used to specify the lower and upper contour limits for height checking. The command is mandatory for a processing sequence which includes check 1. The minimum contour and maximum contour parameters are used to ensure that all contours and index contours are present within the height limits, and that no contours lie outside the height range.

Messages:

The following error messages are specific to the ZLIMITS command:

*** ERROR *** Specifying command ZLIMITS
Command requires lower and upper height limits

*** ERROR *** Specifying command ZLIMITS
lower height = upper height

*** ERROR *** Specifying command ZLIMITS
lower height > upper height

Example:

```
ITCHECK>ZLIMITS 0.0 100.0<CR>
ITCHECK>SHOW ZLIMITS<CR>
ZLIMITS:
  Lower contour limit is 'minimum_contour'
  Upper contour limit is 'maximum_contour'
ITCHECK>
```

ITCHECK examples

```
$ ITCHECK
DTMPREPARE module ITCHECK of 12:20:05 30-MAR-88
ITCHECK> LOOKUP LOOKUP3.DAT<CR>
ITCHECK> LIST LIST3.LIS<CR>
ITCHECK> OUTPUT OUTPUT3.IFF<CR>
ITCHECK> IFF IFF31<CR>
IFF file LSL$IF:IFF31.IFF;0 selected as input
ITCHECK> IFF IFF32<CR>
IFF file LSL$IF:IFF32.IFF;0 selected as input
ITCHECK> IFF IFF33<CR>
IFF file LSL$IF:IFF33.IFF;0 selected as input
ITCHECK> IFF IFF34<CR>
IFF file LSL$IF:IFF34.IFF;0 selected as input
ITCHECK> IFF IFF35<CR>
IFF file LSL$IF:IFF35.IFF;0 selected as input
ITCHECK> TOLERANCE BORDER 1<CR>
ITCHECK> TOLERANCE MAXIMUM 5<CR>
ITCHECK> TOLERANCE MINIMUM 1<CR>
ITCHECK> CONTOUR 10<CR>
ITCHECK> INDEX 50<CR>
ITCHECK> SUPPLEMENTARY 2<CR>
ITCHECK> PROFILE 10<CR>
ITCHECK> ZLIMITS 0 190<CR>
ITCHECK> DESELECT FC 27<CR>
ITCHECK> SHOW GROUPS<CR>
```

GROUPS:

COASTLINES have been defined
The following feature codes are currently selected:
14

CONTOURS have been defined
The following feature codes are currently selected:
5

INDEXCONTOURS have been defined
The following feature codes are currently selected:
6

LAKES have been defined
The following feature codes are currently selected:
4

RIVERS have been defined
The following feature codes are currently selected:
2

SPOTHEIGHTS have been defined
No feature codes selected

SUPPLEMENTARYCONTOURS have been defined
The following feature codes are currently selected:
7

```
ITCHECK> CHECK 1,3:5<CR>
ITCHECK> GO<CR>
```

IFF Feature Code Summary

The following feature codes are currently selected:
14

Group name: COASTLINES number of items: 1

The following feature codes are currently selected:
5

Group name: CONTOURS number of items: 32

The following feature codes are currently selected:
6

Group name: INDEXCONTOURS number of items: 3

The following feature codes are currently selected:
4

Group name: LAKES number of items: 1

The following feature codes are currently selected:
2

Group name: RIVERS number of items: 1

No feature codes selected

Group name: SPOTHEIGHTS number of items: 0

The following feature codes are currently selected:
7

Group name: SUPPLEMENTARYCONTOURS number of items: 2

< PROCESSING CHECK 1> 100% complete

< PROCESSING CHECK 3> 100% complete

< PROCESSING CHECK 4> 100% complete

< PROCESSING CHECK 5> 100% complete

ITCHECK> **EXIT<CR>**

ELAPSED: 0 00:04:27.10 CPU: 0:00:30.52 BUFIO: 286 DIRIO: 587 FAULTS: 384

\$

ITCHECK messages

ITCHECK - Error checking of IFF heightened data.
MESSAGES (WARNING)

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MESSAGES (WARNING) None

ITCHECK - Error checking of IFF heightened data.
MESSAGES (ERROR)

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MESSAGES (ERROR) None

ITCHECK - Error checking of IFF heightened data.
MESSAGES (FATAL)

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MESSAGES (FATAL) None

MESSAGES (OTHER)

In addition to the above messages which are generated by the program itself, other messages may be produced by Laser-Scan libraries. In particular, messages may be generated by the IFF library or by the Laser-Scan I/O library, LSLLIB. IFF library messages are introduced by %IFF and are documented in the IFFLIB Reference manual. LSLLIB messages are introduced by '%LSLLIB' and are generally self-explanatory. They are often used to explain the details of program generated errors.

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.

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