

*Laser-Scan Ltd.*

*CONVERT PACKAGE*

*IFFNTF Reference*

*Issue 2.7 - 4-March-1997*

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**IFFNTF - Change Record**  
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**Version 1.0    S Townrow   17-June-1991**

Module IFFNTF        - Reorganised package documentation.  
-----

**Version 1.1 (Interim release)    S Gupta   26-June-1991**

Module NTF2I        - NTF2I rewritten to give greater compatibility with  
NTF level 3. Outward behaviour of NTF2I is  
unchanged since the changes made were to the  
structure of the program and not its  
functionality. Restrictions on positions of  
records with level 3 NTF files, have been removed.  
Reference documentation updated.  
-----

**Version 1.2        S Gupta   05-August-1991**

Module NTF2I        - NTF2I enhanced to give complete compatibility with  
NTF level 3. This includes [CPOLY] and [COLLECT]  
records, but excludes [NODEREC] records.  
Reference documentation updated.  
-----

**Version 1.3        J Cadogan   05-August-1991**

Module I2NTF        - Entry for /Z\_LEN qualifier corrected in the I2NTF  
reference documentation.  
-----

**Version 1.4        S Townrow   03-October-1991**

Module NTF2I        - New qualifier /IFF\_POINTSIZE and an explanation of  
point feature handling added to the NTF2I  
reference documentation.  
-----

**Version 1.5        S Townrow   08-May-1992**

Module NTF2I        - Four new warning messages have been added which  
inform the user of a discrepancy between the NTF  
range and the true IFF range. These are BADXMIN,  
BADXMAX, BADYMIN and BADYMAX and are described in  
the messages section.

- Module I2NTF            - Two messages have been removed which notified the user of a problem writing the range entries to the NTF header. These messages were TOONARROW and SUGGEST and will no longer be produced because the range is no longer written to the NTF header.

---

**Version 1.6        S Townrow   21-Dec-1992**

- Module DATA PREPARATION        - A new section has been added which describes the lookup table intended for use with Ordnance Survey CITF map headers. This includes a new message section describing the messages capable of being produced by the Map Header library, OSMHLIB.

- Module NTF2I            - A new section has been added to the reference manual which describes the conversion of Ordnance Survey CITF data into IFF. The message section has been revised to include new CITF specific messages.

- Module I2NTF            - A new section has been added to the reference manual which describes the conversion of IFF files into Ordnance Survey CITF data. The message section has been revised to include new CITF specific messages.

---

**Version 1.7        S Townrow   14-Jan-1993**

- Module NTF2I            - The CITF section has been modified to correct some mistakes and document the handling of date attributes and text features.

- Module I2NTF            - The CITF section has been modified to correct some mistakes and document the handling of date attributes and text features.

---

**Version 1.8        S Townrow   4-Feb-1993**

- Module NTF2I            - The CITF section has been modified to clarify that all IFF/CITF attributes should be present in the ATTRIBUTE\_FILE and ACD section of the FRT.

- Module I2NTF            - The CITF section has been modified to clarify that all IFF/CITF attributes should be present in the ATTRIBUTE\_FILE and ACD section of the FRT.
-

**Version 1.9      S Townrow   1-Mar-1993**

- Module I2NTF      - The message section has been modified to remove two warning messages, CITFDIFEXTENT and CITFIGNSECTREF which were deemed to be unnecessary.
- Module I2NTF      - The message section has been modified to include a new message, RANGEOVER, which is reported when the CITF range value would exceed the maximum size that will fit into a 4 byte integer.
- Module NTF2I      - The message section has been modified to include a new message, NOSECHREC, which occurs when the CITF file being read does not contain a [SECHREC] record.

-----  
**Version 2.0      S Townrow   20-Apr-1993**

- Module I2NTF      - The CITF section has been altered to document that certain alphanumeric feature level attributes are now read from the value field of ACs rather than the optional text string.
- Module NTF2I      - The CITF section has been altered to document that certain alphanumeric feature level attributes are now written to the value field of ACs rather than the optional text string.

-----  
**Version 2.1      S Townrow   3-Aug-1993**

- All chapters      - All chapters have been revised to cover the support of version 2.0 NTF (BS7567).
- Module I2NTF      - The CITF section has been altered to document new default attribute, `AM'. Attribute `HT' is not present but implied.
- Module NTF2I      - The CITF section has been altered to document new default attribute, `AM'. Attribute `HT' is not present but implied.

-----  
**Version 2.2      S Townrow   16-Dec-1994**

- Module NTF2I      - Three new qualifiers, /OSCAR, /OSCAR\_START\_AC and /OSCAR\_END\_AC have been added. They are used to convert OSGB OSCAR level information from nodes onto links.

- Module NTF2I            - A new message, BADVALUE, has been added which is reported when the value supplied to qualifier /OSCAR\_START\_AC or /OSCAR\_END\_AC is invalid. Also message NODE has been altered as [NODEREC] records are not always ignored.
- 

**Version 2.3      J Barber    10-Oct-1995**

- Module I2NTF           - The qualifiers /DDATE, /DDNAME, /DBNAME, /FCNAME and /FCDATE can now take their values with or without enclosing double quotes.
- 

**Version 2.4      T Mulcahy   23-May-1996**

- Module I2NTF           - The qualifier /CITF now has an optional parameter for selecting the desired CITF version. /CITF=93 selects OS93 data structures and /CITF=96 selects OS96 data structures. The use of /CITF without a parameter defaults to /CITF=96.
- 

**Version 2.5      C C Brunt    2-Oct-1996**

- Module NTF2I           - The qualifier /CITF now has an optional parameter for selecting the CITF version to be read. /CITF=93 selects OS93 data structures and /CITF=96 selects OS96 data structures. The use of /CITF without a parameter defaults to /CITF=96.
- 

**Version 2.6      M Wenham    6-Dec-1996**

- Module DATA PREPARATION    - A new section has been added which describes the lookup table used to convert feature codes during translation.
- Module I2NTF           - New qualifier /FC\_LOOKUP and a description of its use added to the I2NTF reference documentation.
- Module NTF2I           - New qualifier /FC\_LOOKUP and a description of its use added to the NTF2I reference documentation.
- 

**Version 2.7      M Wenham    4-Mar-1997**

- Module I2NTF           - New qualifier /ROUND and a description of its use added to the I2NTF reference documentation.
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## PREFACE

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### Intended audience

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

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### Structure of this document

This document is composed of 2 major sections.

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

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

- |                    |  |
|--------------------|--|
| MODULE             | - the name of the CONVERT module.  |
| FORMAT DESCRIPTION | - a description of the data format written or read by the utility programs in this conversion module.            |
| DATA PREPARATION   | - guidance on how to digitise or prepare the IFF and other data required by the utility programs in this module. |

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

- |                    |   |
|--------------------|---|
| UTILITY            | - the name of the utility.  |
| FUNCTION           | - a synopsis of what the utility does.  |
| FORMAT             | - a summary of the utility command format and command qualifiers. Default qualifier settings are indicated.               |
| PROMPT             | - how it prompts the user.  |
| PARAMETERS         | - description of expected command parameters.   |
| COMMAND QUALIFIERS | - description of all command qualifiers. Qualifiers are ordered alphabetically and default argument values are indicated. |
| RESTRICTIONS       | - a summary of restrictions on the use of   |



|             |   |
|-------------|---|
|             | qualifiers  |
| DESCRIPTION | - the definitive description of the utility action.   |
| COMMANDS    | - for interactive utilities only, a description of all commands. Commands are ordered alphabetically and default argument values are indicated.   |
| EXAMPLES    | - annotated examples of utility useage.   |
| MESSAGES    | - all classes of message are listed and described and suggested user action given. The messages are divided into sections according to message severity within which the messages are ordered alphabetically by message mnemonic. |

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## Conventions used in this document

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

---

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

## CHAPTER 1

### NTF FORMAT DESCRIPTION

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## FORMAT DESCRIPTION

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### Introduction

The National Transfer Format (NTF) is the UK standard format for transferring spatially referenced data. Further information about the format may be obtained by contacting

The NTF Secretariat  
c/o Research & Deveopment  
Ordnance Survey  
Romsey Road  
Maybush  
Southampton SO9 4DH  
England

### NOTE

The programs described in this chapter support version 1.1 of NTF up to and including the modifications released in April 1989 and version 2.0 of NTF (BS7567) with some restrictions. For a copy of the British Standard document BS7567 contact

The Director  
Standard Technical  
BSI Standard  
Linford Wood  
Milton Keynes MK14 6LE  
England

NTF is a relatively simple format. The default transfer method is 9 track magnetic tape at 1600bpi. The blocksize is fixed (at 2000 bytes), and each block is regarded as a sequence of up to 80 character records. Each record starts with a 2 character identifying field, and ends with a single character which indicates whether it is continued. The data held in a record (and its continuations) is determined by the identifying field at the start of the record. All data is held as ASCII characters.

The data stored in NTF is divided into a hierarchical structure. Everything being transferred is called a **Transfer Set**, which is composed of several **Volumes** - one volume per magnetic tape. The software detailed in the rest of this chapter does not support multivolume transfer sets - all of the data must be on a single physical medium. Each transfer set is also divided into **Databases** - in the NTF sense, this can mean true databases, or may just be a convenient way of dividing the data in the transfer set. Each database is then divided into a sequence of **Sections**, and it is these that correspond to the IFF files being transferred.

There are five **levels** of NTF at version 1.1.

- level 0: is used to transfer raster data
- level 1: is used to transfer simple vector data, with limited attribute representation (compare this to the Ordnance Survey (GB) format OSTF).
- level 2: is used to transfer simple vector data, with an unlimited number of attributes per feature.
- level 3: is used to transfer topologically structured data - this may be as simple as link & node, or as complex as full object structuring.
- level 4: is used to transfer vector data, but the producer of the data may use a data dictionary to redefine the fields present in records, and even to define new records.

At version 2.0 the **levels** are as follows

- level 1: is used to transfer simple vector data, with limited attribute representation (compare this to the Ordnance Survey (GB) format OSTF).
- level 2: is used to transfer simple vector data, with an unlimited number of attributes per feature.
- level 3: is used to transfer a limited level of topologically structured data including complex features and a link & node mechanism.
- level 4: is used to transfer topologically structured data - this may be as simple as link & node, or as complex as full object structuring.
- level 5: provides the ability to use a data dictionary to redefine the fields present in records or to define new records and can be used to supply raster data (eg Ordnance Survey's 50000 DTM data).

The following points should be noted concerning the current implementation of the translation programs:

- o The programs are written to conform to version 1.1 of the NTF standard and a subset of support for version 2.0 (BS7567).
- o Multivolume transfer sets are not supported when using I2NTF. When using NTF2I to directly read from unformatted tape, the program will prompt the user to mount the next continuation volume when the tape mark after the first volume is detected. If separate volumes are supplied on formatted media, the individual files should be appended together into one large disk file.

- o Only levels 1, 2 and 3 are supported.
- o At the moment, three dimensional coordinate data may be output using I2NTF, but may not be read using NTF2I. Per point attributes are not supported in either direction.
- o At level 1, the only attributes (values) recognised are orientation (OR) and height (HT).
- o At levels 2 and 3, full attribute transfer is possible in both directions. A file containing the destinations for attributes must be given together with an FRT defining the IFF AC's.
- o The NTF version 1.1 specification has various predefined attributes which need not be defined in the header of the NTF file, but this is not the case at NTF version 2.0 where all attributes must be defined.
- o At level 3, topologically structured data may be output using I2NTF, but will be read as unstructured data using NTF2I.
- o Projection information for each IFF file will be written as comments to the appropriate section in the NTF.

## CHAPTER 2

### NTF DATA PREPARATION

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## DATA PREPARATION

---

### Comparison of NTF and IFF

It is possible to represent IFF files fairly closely in NTF. Each IFF file to be transferred is treated as an NTF section, and features are mapped onto the relevant [LINEREC], [POINTREC], [NAMEREC] or [TEXTREC] records, with their associated data. Layers are not present in NTF, but if necessary an IFF file could be split by layer before output.

NTF identifies the form of an item by feature code, which means that IFF feature codes can generally be used for this purpose.

---

### Requirements for outputting IFF files to NTF

All IFF files to be translated must include a fully set type 2 map descriptor (MD) entry. If this is not the case, use the IMP utility ITRANS/DESCRIPTOR to set the map descriptor.

If OS map header data is required by the customer, then the IFF file must include a correctly set OS style map header (MH) entry, and the /OS qualifier must be specified when using I2NTF. The CONVERT utility OSMHED may be used to set the OS map header correctly. Use of the /OS qualifier will also cause all text heights to be read as OS point sizes and to be converted to mm as required in NTF.

NTF does not support IFF layers. Any data in layer 0 will be ignored, and the data in all other layers will be output in the order in which it is found, ignoring the layer structure.

IFF feature serial numbers (FSNs) are not used within the NTF output. NTF identity numbers are generated for each feature as it is output. This means that the IFF file does not need to be sorted or otherwise processed before outputting to NTF.

I2NTF distinguishes graphical type by the bits set in the feature status (FS) entry. This allows it to recognise lines, symbols and text. Other forms of data should not be present in the IFF file being output, or they will be incorrectly transferred.

Per point attributes are not supported, and will be ignored - IFF files are read at IFF revision level 0.

Texts longer than 99 characters will be truncated.

Composite texts may be present, but they will be split into separate text features on output to NTF.



---

### **The IFF files produced from NTF**

The IFF file names will be taken from the section reference field in the section header.

The file created will have a history (HI) entry, and a type 2 map descriptor, with the spheroid set to "Airy" and the projection to 101 (UK National grid). If this is not correct, then use ITRANS/DESCRIPTOR to change it.

If the /OS qualifier was used, then the NTF section header will be assumed to contain OS map header data, and an OS map header (MH) entry will be created. Otherwise, the map header will be unset.

All data will be output to layer 1 - NTF does not provide the concept of layers.

Feature serial numbers (FSNs) will be generated from 1 upwards - the ID numbers within the NTF data will not be used.

Only lines, symbols and texts will be created. The text/symbol bits in the feature status (FS) entry will be set appropriately. Note that 3 dimensional coordinates are not supported.

Line features may not contain more than 10,000 points. Symbols will have a rotation (RO) entry if it is defined in the FRT as being of the appropriate graphical type. For text features, the text category is taken from the NTF font field, and may thus be inappropriate.

At version 2.0, all attributes which are present in the NTF that are required in the output IFF should be defined in the attribute description record in the NTF header and in the NTF2I attribute definition file. There are no default attributes as for version 1.1 (eg 'FC', 'OR', 'HT' etc).

---

### **Support for Ordnance Survey's Common Internal Transfer Format (CITF)**

I2NTF and NTF2I have the ability to read and write CITF files (as defined in the OS document Mod 7/C dated October 1992) which are based on level 5, revision 2.0 NTF as defined by BS 7567.

This includes the need to copy map headers to and from IFF as ASCII character blocks which can be interfaced with map header editors developed by Ordnance Survey (Great Britain).

Refer to the I2NTF and NTF2I documentation for details of the conversion to and from CITF.

### **Warning**

Map headers in this form are not intended to be used outside OS, and Laser-Scan recommend that other users use type 2 map headers which can be edited using OSMHED.

NTF2I also has the facility to change CITF feature codes which would be invalid in IFF (i.e. greater than 32767) into valid IFF feature codes. I2NTF has the opposite facility. These facilities are invoked through the use of a feature code lookup table, which lists the corresponding NTF/CITF and IFF feature code pairs.

The conversion facility may also be used with conventional NTF data should users wish to change feature codes during translation, so long as valid IFF and NTF feature codes are listed in the lookup table.

---

### OS Map Header Translation Table

In order to facilitate the future expansion of OS map header fields, a translation table in the form of a parameter file is used which contains two sections. These sections define the positions and sizes of various fields within a type 3 (OSTF) or type 4 (CITF) OS Map Header. Type 4 map headers only are interpreted and written by I2NTF/CITF and NTF2I/CITF.

Each line of the file is prefixed with a command which identifies the line as belonging to that section. The lines are free format and their position within the file is not important. However, entries on a given line must occur in a fixed order. Commands may be in upper or lower case.

A maximum of 255 commands will be allowed per parameter file.

Any text starting with the "!" character is regarded as a comment, and is ignored. Comments can appear on the same lines as commands, or on separate lines.

The header positions and sizes given in the table must accurately reflect that of the actual map header, particularly when converting between IFF and OSTF/CITF.

In OSTF, note that the field positions start at character position 1 and are continuous through both the -1 and -20 headers. ie. the -20 header positions do not begin from character position 1 but follow on from the -1 header. Note also that the character positions within the header are equivalent to those within the file; position 1 is the first space in the OSTF record containing the -1 entry and is the same position as that used for the byte count.

Note also that, in CITF, the character positions within the header are not equivalent to those within the file as other records precede the header. The offsets for CITF are within the Section Header (SECHREC) record of a CITF file.

The logical LSL\$OS\_MH\_TABLE must be defined to point to the translation table and any part of the file specification not defined will be taken from the default file specification LSL\$LOOKUP:OSMH\_NEW\_TABLE.DAT

The translation table will take the form:

|                      |            |          |          |          |
|----------------------|------------|----------|----------|----------|
| OSTF_MH_ONE          | <fileposn> | <size>   |          |          |
| OSTF_MH_TWENTY       | <fileposn> | <size>   |          |          |
| !                    |            |          |          |          |
| OSTF_MD_X_ORIG       | <posn>     | <size>   | <format> |          |
| OSTF_MD_Y_ORIG       | <posn>     | <size>   | <format> |          |
| OSTF_MD_SCALE        | <posn>     | <size>   | <format> |          |
| !                    |            |          |          |          |
| OSTF_MH_BGI          | <posn>     | <size>   | <format> |          |
| OSTF_MH_CAP_SCALE    | <posn>     | <size>   | <format> |          |
| OSTF_MH_JOB_NUMBER   | <posn>     | <size>   | <format> |          |
| OSTF_MH_CHANGE_IND_A | <posn>     | <size>   | <format> |          |
| OSTF_MH_CHANGE_IND_B | <posn>     | <size>   | <format> |          |
| OSTF_MH_CHANGE_IND_C | <posn>     | <size>   | <format> |          |
| OSTF_MH_CHANGE_IND_D | <posn>     | <size>   | <format> |          |
| OSTF_MH_CHANGE_IND_E | <posn>     | <size>   | <format> |          |
| OSTF_MH_CHANGE_IND_F | <posn>     | <size>   | <format> |          |
| OSTF_MH_CHANGE_IND_G | <posn>     | <size>   | <format> |          |
| OSTF_MH_CHANGE_IND_H | <posn>     | <size>   | <format> |          |
| OSTF_MH_CHECK_VALUES | <posn>     | <size>   | <format> |          |
| OSTF_MH_BYTE_COUNT   | <posn>     | <size>   | <format> |          |
| !                    |            |          |          |          |
| CITF_MH_LENGTH       | <size>     |          |          |          |
| !                    |            |          |          |          |
| CITF_MD_X_ORIG       | <line>     | <offset> | <size>   | <format> |
| CITF_MD_Y_ORIG       | <line>     | <offset> | <size>   | <format> |
| CITF_MD_SCALE        | <line>     | <offset> | <size>   | <format> |
| !                    |            |          |          |          |
| CITF_MH_DIFF_HT_LEN  | <divs>     | <offset> | <size>   | <format> |
| CITF_MH_CHANGE_IND_A | <divs>     | <offset> | <size>   | <format> |
| CITF_MH_CHANGE_IND_B | <divs>     | <offset> | <size>   | <format> |
| CITF_MH_CHANGE_IND_C | <divs>     | <offset> | <size>   | <format> |
| CITF_MH_CHANGE_IND_D | <divs>     | <offset> | <size>   | <format> |
| CITF_MH_CHANGE_IND_E | <divs>     | <offset> | <size>   | <format> |
| !                    |            |          |          |          |

where

|            |  |
|------------|--|
| <fileposn> | is a character position of the OSTF or CITF header within the file and must be a positive integer  |
| <posn>     | is a character position of a field within the OSTF or CITF header and must be a positive integer   |
| <size>     | is the number of characters this value occupies and must be a positive integer   |
| <format>   | is the datatype in OSTF or CITF (uppercase I or A) of the field  |
| <line>     | is the line number within the Section Header Record (SECHREC) of a CITF header in which the field is to go. Since the header size is 10000 bytes, the maximum line number is 125 (ie 10000/80) and should ideally be a multiple of 80. |
| <divs>     | is the number of CITF DIVIDER characters (usually a backslash '\') after which the field is to be located. This only applies to the variable change indicator fields CITF_MH_CHANGE_IND_n and the CITF_MH_DIFF_HT_LEN field.           |
| <offset>   | is the number of countable characters after the number of CITF DIVIDERS defined by <divs> at which the field is to be located.   |

This also only applies to the variable change indicator fields  
CITF\_MH\_CHANGE\_IND\_n and the CITF\_MH\_DIFF\_HT\_LEN field.

and the commands **OSTF\_MH\_ONE** and **OSTF\_MH\_TWENTY** define where the map header  
block fits into an OSTF file. The order of these commands is important and must  
be as specified above. Hence these commands do not have a **<format>** entry.

-----  
**Example OS Map Header Translation Table**

An example of the translation table, LSL\$OS\_MH\_TABLE, is given here:

```

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!
!      OS Map Header Translation Table
!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!
!      Copyright Laser-Scan Laboratories Ltd., Cambridge, England.
!
!      Created                      ST      20-Oct-1992
!
! Field                      Offset  Size   Type
!
OSTF_MH_ONE                  1       56
OSTF_MH_TWENTY              57      440
!
OSTF_MD_X_ORIG               9        8      I
OSTF_MD_Y_ORIG              17        8      I
OSTF_MD_SCALE               33        8      I
!
OSTF_MH_BGI                  25        8      I
OSTF_MH_CAP_SCALE           49        8      I
OSTF_MH_JOB_NUMBER          41        8      I
OSTF_MH_CH_IND_A            161        1      A      ! OSTF Change indicator flags
OSTF_MH_CH_IND_B            162        1      A      ! must be of format A1 and
OSTF_MH_CH_IND_C            163        1      A      ! contiguous for compatibility
OSTF_MH_CH_IND_D            164        1      A
OSTF_MH_CH_IND_E            165        1      A
OSTF_MH_CH_IND_F            166        1      A
OSTF_MH_CH_IND_G            167        1      A
OSTF_MH_CH_IND_H            168        1      A
OSTF_MH_CHECK_VALUES        137        8      A
OSTF_MH_BYTE_COUNT          145        8      I
!
!
CITF_MH_LENGTH              4000                      ! Minimum 320, Maximum 10000
!
! Field                      Line  Offset  Size   Type
!
CITF_MD_X_ORIG               1       47      10      I
CITF_MD_Y_ORIG               1       57      10      I
CITF_MD_SCALE                3       31       9      I
!
! Field                      Number of  Offset  Size   Type
!                        Dividers
CITF_MH_DIFF_HT_LEN          8         1       5      I
CITF_MH_CH_IND_A              8        34       1      A      ! posn of NONEXT_FLAG
CITF_MH_CH_IND_B              8        35       1      A      ! posn of OSCAR_FLAG
CITF_MH_CH_IND_C              8        36       1      A      ! posn of CA_FLAG
CITF_MH_CH_IND_D              8        37       1      A      ! posn of APP_FLAG
CITF_MH_CH_IND_E              8        38       1      A      ! posn of SUPPLY_FLAG

```

!  
! The above CITF\_MH\_CH\_IND field positions are used by the LITES2 OPERATION  
! command thus:  
!  
! CITF\_MH\_CH\_IND\_A position is used for LITES2 OPERATION flag 1  
! CITF\_MH\_CH\_IND\_B position is used for LITES2 OPERATION flag 2  
! CITF\_MH\_CH\_IND\_C position is used for LITES2 OPERATION flag 3  
! CITF\_MH\_CH\_IND\_D position is used for LITES2 OPERATION flag 4  
! CITF\_MH\_CH\_IND\_E position is used for LITES2 OPERATION flag 5  
!!

It is suggested that this layout is adhered to as closely as possible to avoid spurious errors caused by accessing incorrect header fields, although some flexibility is permitted as described earlier.

-----  
**OS Map Header Translation Table Error Messages**

The following is a list of error messages which may occur in utilities that access type 3 or 4 map headers or in reading the translation table.

For each message, the message name and text are listed. The message name is the name of the message parameter, without the OSMHLIB\_\_ prefix.

---

**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.

LINEINPAR, line 'number' of parameter file

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

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

-----  
**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.

BLANKLINE, Blank CITF header line found

**Explanation:** A line of the CITF header was found to be totally blank which is used as the criteria which denotes the end of the header. When searching for CITF divider characters in order to located variable fields, is is possible that the header size defined in the lookup table is greater than the true header size which will result in the search running off the end of the header.

**User action:** This message should not occur as it is used to identify the end of the CITF header.

INTSIZ, Value 'integer' truncated to fit into header field of 'integer' bytes.

**Explanation:** A value was truncated to fit into a header field whose size is determined by the <size> column of the translation table, LSL\$OS\_MH\_TABLE.

**User action:** Check that the field size for the value in question is correct in the translation table pointed to by LSL\$OS\_MH\_TABLE.

STRSIZ, String 'string' truncated to fit into header field of 'integer' bytes.

**Explanation:** A string was truncated to fit into a header field whose size is determined by the <size> column of the translation table, LSL\$OS\_MH\_TABLE.

**User action:** Check that the field size for the string in question has the correct value in the translation table pointed to by LSL\$OS\_MH\_TABLE.

UNKCMD, unknown command "'command'"

**Explanation:** The given command in the parameter file was not recognised. The LINEINPAR message indicating the parameter file line number will follow, and this line will be ignored.

**User action:** This message is most likely due to an error in the translation table, LSL\$OS\_MH\_TABLE which should be amended to contain correct commands.

UNKFLG, unknown flag

**Explanation:** Unknown map header flag in translation table. Must be MH\_ONE or MH\_TWENTY.

**User action:** This message is most likely due to an error in the translation table, LSL\$OS\_MH\_TABLE which should be amended to contain correct commands.



-----  
**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.

BADCALL, Invalid function call. Map header not type 3 or 4.

**Explanation:** A file with an MH header entry of type 3 or 4 was expected.

**User action:** Ensure that the file has the correct header type.

BADLINESIZE, Tried to write a bad line to header.

**Explanation:** An attempt was made to write a line to the header which was less than 4 characters or greater than 80. This error should not occur under normal conditions since the application program will call the routine to write the line should ensure that the line is a sensible length.

**User action:** If this error occurs, it indicates that something is wrong with the application program and the user should contact Laser-Scan.

BADOFFSET, Offset lies outside header

**Explanation:** The position of a variable field was calculated as being outside the header defined by size CITF\_MH\_LENGTH in the lookup table. It is therefore impossible to extract or insert a value into that position.

**User action:** Ensure that the number of dividers and offset of all variable fields are defined correctly into the lookup table so that all fields lie within the header.

ERRCHFLG, Change indicator flag not format A1 in lookup table

**Explanation:** A change indicator flag defined in the lookup table was not defined as alphanumeric and of field width 1. This message will be followed by another which reports the offending line number in the file.

**User action:** Ensure that all change indicator <size> and <type> values are defined as '1' and 'A' respectively in the lookup table.

ERRCIMHSIZ, CITF header size outside valid range 'integer' to 'integer'

**Explanation:** Header size read from the table defined by LSL\$OS\_MH\_TABLE is outside the range specified. The maximum size for the header is 10000 bytes and the minimum is 320 in order to accommodate the first 4 lines of the CITF [SECHREC] record.

**User action:** Correct the CITF\_MH\_LENGTH entry so that its <size> parameter inside the range reported.

ERRCISIZ, CITF field size is greater than CITF header size 'CITF header size'

**Explanation:** CITF field read from the table defined by LSL\$OS\_MH\_TABLE is larger than CITF header.

**User action:** Check that the sum of the <posn> and <size> parameters for each CITF\_ field in the table is less than or equal to the <size> parameter in the CITF\_MH\_LENGTH entry.

ERRCLOPAR, error closing parameter file 'file-spec'

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

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

ERRFMT, error reading format from table file 'file-spec'

**Explanation:** A problem was encountered reading the table defined by LSL\$OS\_MH\_TABLE. An additional LSLLIB message will follow, giving the reason for the failure.

**User action:** Ascertain the cause of the failure from the messages given, and take the appropriate remedial action. Examine the translation table and ensure that the format field is correct.

ERRGETCITF, error getting CITF line from header.

**Explanation:** This message will be preceded by one giving a reason for the failure.

**User action:** Depends upon the details of the message preceding this one.

ERRGETFLD, error getting field from header.

**Explanation:** This message will be preceded by one giving a reason for the failure.

**User action:** Depends upon the details of the message preceding this one.

ERRINI, error initialising translation table LSL\$OS\_MH\_TABLE.

**Explanation:** This message will be preceded by one giving a reason for the failure.

**User action:** Depends upon the details of the message preceding this one.

ERRNOTCONT, OSTF change indicator flags are not contiguous

**Explanation:** One or more change indicator flags defined in the lookup table are not contiguous which is essential for OSTF as they are mapped onto an 8 character string. This message will be followed by another which reports the offending line number in the file.

**User action:** Ensure that all change indicator flags have <offset> fields which are contiguous.

ERROFFSIZ, CITF offset size is outside valid range

**Explanation:** The CITF offset value must be less than 2 because the first two characters of each CITF line are reserved for the record descriptor. The sum of the offset and field size must also be less than 79 to allow for a continuation and end-of-record character at the end of the line.

**User action:** Ensure that the <offset> and <size> values are defined so that the field inside the valid range.

ERROPNPAR, error opening parameter file 'file-spec'

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

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

ERROSMHSIZ, OSTF header size greater than maximum size 'max header size'

**Explanation:** Header size read from the table defined by LSL\$OS\_MH\_TABLE is too large.

**User action:** Correct the OSTF\_MH\_ONE and OSTF\_MH\_TWENTY entries so that their <size> parameters add up to less than or equal to the maximum size.

ERROSSIZ, OSTF field size is greater than OSTF header size 'OSTF header size'

**Explanation:** OSTF field read from the table defined by LSL\$OS\_MH\_TABLE is larger than OSTF header.

**User action:** Check that the sum of the <posn> and <size> parameters for each OSTF\_ field in the table is less than or equal to the sum of the <size> parameters of the OSTF\_MH\_ONE and OSTF\_MH\_TWENTY entries.

ERRPUTCITF, error inserting CITF line into header.

**Explanation:** This message will be preceded by one giving a reason for the failure.

**User action:** Depends upon the details of the message preceding this one.

ERRPUTINT, error inserting integer field into header.

**Explanation:** This message will be preceded by one giving a reason for the failure.

**User action:** Depends upon the details of the message preceding this one.

ERRPUTSTR, error inserting string field into header.

**Explanation:** This message will be preceded by one giving a reason for the failure.

**User action:** Depends upon the details of the message preceding this one.

ERRRDCH, error reading character value from the header.

**Explanation:** An error occurred while trying to read a value of type string from the header. The value of MH\_STRLEN will be zero.

**User action:** Ensure that the position and size of the field in the translation table are correct.

ERRRDINT, error reading integer value from the header.

**Explanation:** An error occurred while trying to read a value of type integer from the header. The contents of MH\_I\_VALUE will be zero.

**User action:** Ensure that the position and size of the field in the translation table are correct.

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

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

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

FLDNOTINT, Field for insertion into header expected as integer.

**Explanation:** An attempt was made to insert an integer field into the header that was not declared as an integer in the translation table LSL\$OS\_MH\_TABLE.

**User action:** Check that the fields specified in the translation table are of the type expected.

FLDNOTSTR, Field for insertion into header expected as string.

**Explanation:** An attempt was made to insert a string field into the header that was not declared as a string in the translation table LSL\$OS\_MH\_TABLE.

**User action:** Check that the fields specified in the translation table are of the type expected.

NOCONTCHAR, No continuation flag ending CITF header line 'integer'

**Explanation:** The reported line of the CITF header did not have a continuation character (0 or 1) in the penultimate position before the end of record {EOR} character.

**User action:** Examine the header at the line reported and try to establish why the continuation character is missing. Use the OS Map Header Editor to correct the header if possible or convert the file to text and do so.

NOEORCHAR, No {EOR} character ending CITF header line 'integer'

**Explanation:** The reported line of the CITF header was not terminated by the end of record {EOR} character (usually the '%' character).

**User action:** Examine the header at the line reported and try to establish why the {EOR} character is missing. Use the OS Map Header Editor to correct the header if possible or convert the file to text and do so.

NOFILE, file pointed to by LSL\$OS\_MH\_TABLE does not exist

**Explanation:** The logical name LSL\$OS\_MH\_TABLE has been defined as referencing a file that cannot be found.

**User action:** Check that the logical points to a valid table filename.

NOLOG, logical LSL\$OS\_MH\_TABLE undefined

**Explanation:** The logical name LSL\$OS\_MH\_TABLE defined to reference the translation table has not been defined.

**User action:** Set up the logical using VMS command DEFINE.

NOSECHREC, no SECHREC record descriptor found in header

**Explanation:** The line numbers and offsets defined in the lookup table start from the SECHREC (the 07 record) which may not necessarily be at the start of the file. The map header was scanned and no '07' records descriptor denoting the Section Header Record was found.

**User action:** All type 4 Map Headers intended to have fields extracted from them must have a Section Header Record present.

NOSUCHFIELD, invalid header field - not defined in lookup table.

**Explanation:** An attempt was made to extract or insert a field from the header. Either the routine was called with a bad header field or one of the fields in the lookup table is not defined.

**User action:** Check that the field specified as the argument is one of those in the lookup table and that the lookup table has all of the required commands defined.

ODDSIZE, CITF line too short at header line 'integer'

**Explanation:** The reported line of the CITF header was not a sensible size. The minimum permissible size for a line is 4 character, albeit a strange one. Each line must have 2 characters at the start denoting the record descriptor, and 2 at the end for the continuation flag and end of record {EOR} character.

**User action:** Examine the header at the line reported and try to establish why the line is so short. Use the OS Map Header Editor to correct the header if possible or convert the file to text and do so.

TOOFEWDIVS, Too few dividers in SECHREC

**Explanation:** When searching the SECHREC record for the CITF DIVIDER characters (usually a backslash) to determine the offset of variable fields, the end of the header was encountered before all the dividers were found. Only as many lines as defined by the CITF header size in the lookup table will be used to search for divider characters.

**User action:** Ensure that the header has the correct number of dividers delimiting the variable length fields and that the entries in the lookup table defining the change indicator flags have a sensible number for the number of dividers. Also ensure that the CITF header length is correct to the nearest line.

---

**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.

-----  
**Feature Code Conversion Lookup Table**

I2NTF and NTF2I both have the facility to change feature codes on a one-to-one basis through the use of a feature code lookup table read from a parameter file. The facility is invoked by using the /FCLOOKUP qualifier with either I2NTF or NTF2I.

Each line of the lookup file should start with "FC", followed by two feature codes. Any text starting with the "!" character is regarded as a comment, and is ignored. Comments can appear on the same lines as commands, or on separate lines.

The first of the pair of feature codes to appear on the line is the NTF/CITF feature code, the second is the IFF feature code.

When using I2NTF with a feature code lookup table, any instances of the IFF feature codes listed in the table will be converted into the corresponding NTF/CITF feature code when they appear in the output file. The converse is true when using NTF2I.

-----  
**Example Feature Code Lookup Table**

An example of a feature code lookup table follows:

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!                                                                                               !
!      Example Feature Code Lookup Table                                                         !
!                                                                                               !
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!
!      NTF FC      IFF FC
!
FC      101234      1234
FC      101235      1235
FC      101236      1236
FC      101237      1237
FC      101238      1238
FC      101239      1239
FC      101240      1240
FC      101241      1241
```



## CHAPTER 3

### I2NTF UTILITY



---

## UTILITY I2NTF

---

### FUNCTION

I2NTF reads a series of IFF files and outputs NTF data to file or magnetic tape. The user may select which NTF level or version is to be output use of qualifiers on the command line.

---

### FORMAT

\$ I2NTF input-file-spec,... output-file-spec

#### Command qualifiers

#### Defaults

The following qualifiers may be entered on the command line

|                             |                       |
|-----------------------------|-----------------------|
| /[NO]CITF='integer'         | /NOCITF               |
| /DENSITY='integer'          | /DENSITY=1600         |
| /FRT='file-spec'            | See description below |
| /INPUT_LIST='file-spec'     | See description below |
| /[NO]LOG                    | /NOLOG                |
| /[NO]OS                     | /NOOS                 |
| /[NO]WATER_DISTRIB          | /NOWATER_DISTRIB      |
| /[NO]OUTPUT='file-spec'     | /NOOUTPUT             |
| /PARAMETER_FILE='file-spec' | No parameter file     |
| /[NO]SERIAL_MAGTAPE         | /NOSERIAL_MAGTAPE     |

The remaining qualifiers may be entered either on the command line or in the parameter file

|                             |                          |
|-----------------------------|--------------------------|
| /ATTRIBUTE_FILE='file-spec' | See description below    |
| /COPYRIGHT='yyyymmdd'       | /COPYRIGHT=00000000      |
| /DONOR="'text'"             | /DONOR="Laser-Scan Ltd." |
| /DBNAME="'text'"            | /DBNAME='RECIPIENT'      |
| /DDNAME="'text'"            | /DDNAME="DEFAULT_02.00"  |
| /DDATE="'yyyymmdd'"         | /DDATE="19890401"        |
| /DIFF_HT_LEN                | /DIFF_HT_LEN=5           |
| /FCNAME="'text'"            | /FCNAME=" "              |
| /FCDATE="'yyyymmdd'"        | /FCDATE=" "              |
| /FC_LOOKUP='file-spec'      | No lookup file           |
| /FEATCLASS_FILE='file-spec' | No classification file   |
| /FIXED                      | /NOFIXED                 |
| /LEVEL='integer'            | /LEVEL=2                 |
| /POINT_SIZE                 | /NOPOINT_SIZE            |
| /RECIPIENT="'text'"         | Required                 |
| /ROUND                      | /NOROUND                 |
| /SERIAL='integer'           | /SERIAL=0000             |
| /VERSION='real'             | /VERSION=2.0             |
| /XY_LEN='integer'           | /XY_LEN=10               |
| /XY_MULT='real'             | /XY_MULT=.001            |
| /Z_DATUM='integer'          | /Z_DATUM=0               |
| /Z_LEN='integer'            | /Z_LEN=6                 |

|                   |                    |
|-------------------|--------------------|
| /Z_MULT='real'    | /Z_MULT=1.0        |
| /Z_UNIT='integer' | /Z_UNIT=2 (metres) |

---

#### PROMPT

|                      |                     |
|----------------------|---------------------|
| _Input IFF files:    | input-file-spec,... |
| _Output destination: | output-file-spec    |

If /INPUT\_LIST is specified instead of an input IFF file, then the file given as argument to the qualifier will be opened, and the IFF file-specs will be read from the file, one per line, with a maximum of 500 files. Note that /INPUT\_LIST must be specified before the output-file-spec

---

#### PARAMETERS

##### input-file-spec

- specifies the input file or files to be translated to NTF. No more than eight files may be specified in this manner - if more files are to be translated in one program run, then the /INPUT\_LIST qualifier must be used. Any part of the first file-spec that is not specified will be completed from the default of "LSL\$IF:IFF.IFF;0". Each file-spec after that will be completed using the appropriate parts of the previous file-spec (as for the VMS COPY utility). IFF files are read and output in the order in which they are specified.

##### output-file-spec

- specifies where the NTF data is to be written. This may be either the name of a magnetic tape drive (e.g. MTA0:), or the name of a file on disk (e.g. TEST.NTF). If the output is to tape then the colon at the end of the device name must be provided. The default output filespec is SYS\$DISK:[].NTF

---

#### COMMAND QUALIFIERS

The qualifiers accepted by I2NTF fall into two categories. The first of these are commands relating to the environment in which the conversion will take place such as the /DENSITY and /PARAMETER\_FILE qualifiers. These may be entered on the command line when the program is called. The second group of qualifiers includes those qualifiers directly relating to fields in the NTF file format such as the /RECIPIENT, /LEVEL and /X\_MULT qualifiers. These commands may also be entered on the command line but, in addition, may be included in a parameter file indicated by the /PARAMETER\_FILE parameter. See the /PARAMETER\_FILE entry below for further information.

## Command Line Qualifiers

The following qualifiers may be entered on the command line only.

/CITF='integer'  
/NOCITF (default)

- specifies which version of CITF is to be created.

/CITF=93 specifies that the CITF file to be created must use OS93 data structures.

/CITF=96 specifies that the CITF file to be created must use OS96 data structures.

The use of /CITF with no parameter defaults to /CITF=96.

Any NTF lines in the Map Header (type 4) are to be read and copied to the NTF file (which has file extension .CITF) after checking for any inaccuracies as far as is possible, and warnings output if an error is encountered.

See the separate section below for a full description of the differences between CITF and other NTF output.

/DENSITY='integer'

- selects the density at which the magnetic tape will be written. It is ignored if output is not to a magnetic tape. The default density is 1600 bpi and the other supported densities are 800 and 6250 bpi.

/INPUT\_LIST='file-spec'

- specifies a file containing the names of the IFF files to be processed. If this qualifier is given, then all input IFF files must be specified within the input list file - any input file-specs on the command line will not be recognised. This qualifier must occur before the output file-spec, if it is used.

The input list file contains the names of the IFF files to be used for input, one per line, in the order they are to be read. The standard default of "LSL\$IF:IFF.IFF;0" is applied to each filename. There is a maximum of 500 files allowed in this list file.

The default file-spec for the input list file is SYS\$DISK:[].I2NTF\_LIS

/LOG  
/NOLOG (default)

- specifies that additional information is to be written to the terminal. When the program starts up the names of the IFF files being read, and of the device to which the NTF data is being written, are logged. Various messages summarising the form of NTF being output will also be produced. If output to tape is selected then a message detailing the number of blocks written is given on exit.

/OS  
/NOOS (default)

- specifies that OS(GB) map header information is to be output in the free text area of the section header relating to each IFF file. The layout of the map header information in the free text area is defined by OS. Note that this use of free text space is allowable within the standard. All IFF files transferred using the /OS qualifier must contain a valid OS style map header entry. It also causes all text heights to be read as OS point sizes and converted to mm. as required for NTF.

/WATER\_DISTRIB  
/NOWATER\_DISTRIB (default)

- specifies that output is to match the specification given in the document "Specification for representation of North West Water's digitised distribution overlays in NTF level 3 format", produced by ISTEEL (Jan 1990). At present, this qualifier cannot be used when outputting version 2.0 (BS7567) data.

/OUTPUT='file-spec'  
/NOOUTPUT (default)

- specifies that information about the files being output in NTF, together with the form of NTF being produced, should be written to the specified log file. All comment records output will also be copied to the file, prefixed with "//". This output file may then be printed and used as documentation for the data on the magnetic tape. The default file-spec for the log file is SYS\$DISK:[ ]I2NTF.LOG

/PARAMETER\_FILE='file-spec'

- indicates that a parameter file exists containing additional qualifiers. Qualifiers given on the command line override those specified in the parameter file. For example, if NTF level 1 is selected in the parameter file but /LEVEL=2 is requested on the command line then all output will be to NTF level 2. Note that not all qualifiers are allowed in the parameter file - see below.

It is advised that only one qualifier is entered on each line in the parameter file so that it can be read and edited easily. Comments may be used freely - any data after an exclamation mark (!) is treated as comment and ignored.

The default file-spec for the parameter file is SYS\$DISK:[ ].I2NTF\_PAR.

/SERIAL\_MAGTAPE  
/NOSERIAL\_MAGTAPE (default)

- indicates that the standard output for the program is a magnetic tape drive connected via a DIL serial controller interface. The qualifier is ignored if output is to a device which is mounted /FOREIGN (in which case output is to a standard magnetic tape drive). If output is requested to a terminal device then it will be assumed that this is the DIL controller.

## Command Line Or Parameter File Qualifiers

The following qualifiers may be entered either on the command line or in the parameter file.

/ATTRIBUTE\_FILE='file-spec'

- gives the file in which NTF attribute mnemonics are associated with IFF AC names. If this qualifier is not given then no attributes are transferred.

/COPYRIGHT='yyyymmdd'

- specifies an overriding copyright date for all files being output to NTF, in the form yyyymmdd (for instance, 19870218 for 18th February 1987). This copyright date will be used for all files being output.

If /COPYRIGHT is not specified, and /OS is specified, then the copyright date for each file will be taken from its (OS style) map header. If /OS is not specified, a copyright of 00000000 will be used.

/DONOR="'text'"

- specifies the name of the sender of the data. The donor name may be up to 20 characters long with truncation occurring if this is exceeded. The default is "Laser-Scan Ltd.".

/DBNAME="'text'"

- specifies the name of the database. The name may be up to 20 characters long with truncation occurring if this is exceeded. The default is the name given for the recipient of the data.

/DDNAME="'text'"

- specifies the name of the data dictionary. The name may be up to 20 characters long with truncation occurring if this is exceeded. The default is "DEFAULT\_02.00".

/DDATE="'yyyymmdd'"

- specifies the date associated with the data dictionary. The default is "19890401".

/DIFF\_HT\_LEN='integer'

- specifies the width of the field used to store DIFF\_HT fields in GEOMETRY2 records, only valid in CITF. The default value is 5.

/FCNAME="'text'"

- specifies the name of the feature classification scheme. The name may be up to 20 characters long with truncation occurring if this is exceeded. The default is " ".

/FCDATE="'yyyymmdd'"

- specifies the date associated with the feature classification scheme. The default is " ".

/FC\_LOOKUP='file-spec'

- specifies the feature code lookup table parameter file to be used. If this qualifier is not given, all feature codes are translated verbatim.

/FEATCLASS\_FILE='file-spec'

- gives the file from which a feature classification scheme is to be read. If this file is present [FEATCLASS] records will be output.

/FIXED

/NOFIXED (default)

- specifies that the NTF file is to be output in fixed length records of 80 characters. The default option is for the records to be only as long as they need to be with a maximum length of 80 characters. This can result in considerable space savings.

/FRT='file-spec'

- this qualifier gives the name of the Feature Representation Table (FRT) which holds information about IFF attributes. If this is not given no attributes are transferred. The qualifier may only be entered on the command line and should not be used inside a parameter file.

/LEVEL='integer'

- specifies the NTF level that is to be output. This may be either 1, 2 or 3, and defaults to 1.

/POINT\_SIZE

/NOPOINT\_SIZE (default)

- specifies that the IFF file text heights are to be interpreted as point sizes (for CITF only).

/RECIPIENT="'text'"

- specifies the name of the recipient of the data. The recipient name may be up to 20 characters long and truncation will occur if this is exceeded. The recipient name is required - it must be specified either within the parameter file or on the command line.



/ROUND  
/NOROUND (default)

- specifies that output co-ordinates should be explicitly rounded to seven significant figures if needed. Figures after the seventh are padded with zeroes. This facility may be useful to maintain data integrity with small-scale data.

/SERIAL='integer'

- specifies the volume serial number. This should be an integer between 1 and 9999. If the qualifier is not given then a default value of zero is used.

/VERSION='real'

- specifies the version of the NTF file to be created. If the qualifier is not given then a default value of 2.0 is used which will result in the output of NTF version 2.0 (BS7567) data. Acceptable values for this qualifier are 1.1 and 2.0.

/XY\_LEN='integer'

- specifies the width of the field used to store X and Y coordinate data in NTF. If a value is chosen that is not large enough to store some values in the file (as determined by inspecting the file's range entry) then an error message is output and an alternative value is suggested. The default value is 10.

/XY\_MULT='real'

- all X and Y coordinates are divided by the value specified with this qualifier before being output to NTF. This qualifier is thus used to specify the precision of planimetric data in the NTF output. The default value is 0.001, meaning that X and Y coordinates are stored as thousandths of an IFF unit.

/Z\_DATUM='integer'

- this qualifier is used to specify the 'notional' origin of Z values in the IFF files being output. This datum value is stored in the section header for each sheet - it is not actually subtracted from the Z value. The default Z datum is 0.

/Z\_LEN='integer'

- specifies the width of the field used to store Z coordinate data in NTF. If a value is chosen that is not large enough to store some values in the file (as determined by inspecting the file's range entry) then an error message is output and an alternative value is suggested. The default value is 6. This qualifier may not be used at level 1.

/Z\_MULT='real'

- all Z values are divided by the value specified with this qualifier before being output to NTF. This qualifier is thus used to specify the precision of height data in the NTF output. The default value is 1.0, meaning that Z values are stored using the same units as in the IFF file.

/Z\_UNIT='integer'

- specifies the units in which height data is stored. The value may be any of:
  - 1= degrees,
  - 2= metres,
  - 3= feet.

The default units are metres, ie a value of 2.

---

## RESTRICTIONS

- o Restrictions on qualifiers
  - o Both /CITF and /OS are not allowed together on the command line.
  - o If /CITF has been requested, the /FRT qualifier must be given for the attribute names required in the CITF translation.
  - o If the /INPUT\_LIST qualifier is used, any qualifiers or file-specs occurring before it will be ignored. Thus the /INPUT\_LIST qualifier should always be the first item on the command line.
  - o The /RECIPIENT qualifier is required, either on the command line or in the parameter file.
  - o The /Z\_LEN qualifier requires transfer level 2 or 3.
  - o If a qualifier is used both on the command line and in the parameter file, the value specified on the command line is used.
  - o /FRT, /ATTRIBUTE\_FILE and /LEVEL=2 or /LEVEL=3 must all be given if attribute transfer is required. If any one is missing no attributes will be transferred. However, at level 1, a single attribute (AC 2 or 3) can be transferred without the use of /ATTRIBUTE\_FILE since this qualifier is only intended to be used at levels 2 and 3.
- o The IFF files
  - o The IFF files being input must have a type 2 map descriptor (MD) entry, which must be correctly set. If this is not the case, use ITRANS/DESCRIPTOR to create a valid type 2 map descriptor.
  - o The coordinates in the IFF file must be in either feet, metres or degrees. If the data is not in one of these units, then use ITRANS to transform the IFF file.
  - o The program will ignore all data in layer 0, and output all other layers without distinction.
  - o Each IFF file is output to a separate NTF section, with the section reference taken from the IFF file name (truncated to 10 characters).
  - o Features are output as lines, symbols or text, using the text/symbol bits in the feature status (FS) entry to distinguish the different forms. Thus the IFF file should have these bits set correctly (reading an IFF file into LITES2 with the correct FRT file will set the text/symbol bits

correctly).

- o The original IFF feature serial numbers (FSNs) are not used in the NTF data being produced.
- o At NTF level 1 only contour height ACs (types 2 and 3) are translated. All other types of AC are ignored (with a warning message). This is done automatically and the /ATTRIBUTE\_FILE qualifier should not be given.
- o At NTF level 3 the attribute mnemonics FC and OR are used to output the feature code and orientation of a feature in its attribute record. These mnemonics should therefore not be used to refer to any other attributes.
- o If /WATER\_DISTRIB is specified any point features with FC 999 will be output with attribute records of the form "14nnnnnnACxx" (where "nnnnnn" is the record identifier and "xx" is a 2 character mnemonic). This is a requirement of the ISTEEL specification document. Note that /WATER\_DISTRIB is currently not permitted when outputting version 2.0 NTF data.
- o Composite texts are output as a sequence of simple texts, with no connection between them.
- o Texts of more than 99 characters in length will be truncated before output.
- o The NTF text font is taken from the text category in the IFF text feature.
- o If an IFF AC is required then it must be included in the ATTRIBUTE file together with it's destination NTF mnemonic.
- o Any AC's to be transferred must be defined in the FRT either by default or explicitly in ACD entries.
- o There is currently no mechanism to direct an AC attribute value to go into the {VALUE} field of a [LINEREC], [POINTREC] or [NAMEREC] and similarly for NTF v2.0 (level 1 & 2) CHG\_TYPE and CHG\_DATE attributes.
- o NTF output
  - o Only levels 1, 2 and 3 of NTF are supported.
  - o The section header field {COPYRIGHT} (ie copyright date) is only set if the data is being output /OS, or if the /COPYRIGHT qualifier has been specified.
  - o Multivolume datasets are not supported - all of the data being output must fit onto one magnetic tape.

---

## DESCRIPTION

I2NTF converts one or more maps from IFF (Laser-Scan's Internal Feature Format) into NTF (National Transfer Format) levels 1, 2 or 3. The NTF output maybe to disk, magnetic tape or a serial tape drive depending on the qualifiers given on the command line. The input IFF files may be specified either on the command line or in a text file pointed to by the /INPUT\_LIST qualifier. All of the qualifiers may be given on the command line, or alternatively, qualifiers giving values corresponding directly to NTF fields may be entered in a parameter file.

Before outputting any data, each input IFF file is opened to check that it exists and is readable. If /OS has been specified, each file is also checked for the presence of an OS(GB) style map header entry.

The NTF data file starts as follows:

- o volume header - with the NTF version number set to 1.1 or 2.0 as appropriate.
- o comment - this repeats the donor, and states that the data was produced using Laser-Scan's I2NTF conversion utility.
- o database header - with the {DBNAME} (database name), {DDNAME} (data dictionary) and {DDATE} (data dictionary date) fields set to their default values, or to values specified in the appropriate qualifiers.
- o feature classification records - these records will be output if a feature classification file is specified. The values will be taken directly from the file, one record being output for each feature. An example of a feature classification file is shown below. Note that any unused fields should contain the value "NONE". The field widths are of 4, 10, 20 and variable length characters for FCODE, CODECOM, STCLASS and FEATDES respectively.

```
!
!FEATURE          FCODE      CODECOM      STCLASS      FEATDES
!
FEATURE           0004        A10766        NONE          WOOD
FEATURE           0005        B23145        NONE          ROAD
FEATURE           0006          NONE          NONE          WATER
```

If /WATER\_DISTRIB has been specified, an additional field must be included in the feature classification file. A value 'T' or 'F' must be appended to each FCODE in the file, to indicate whether or not the associated feature code should be referenced with a NODEREC record.

```
!
!FEATURE          FCODE      CODECOM      STCLASS      FEATDES
!
FEATURE           0004T        A10766        NONE          WOOD
```

|         |       |        |      |       |
|---------|-------|--------|------|-------|
| FEATURE | 0005F | B23145 | NONE | ROAD  |
| FEATURE | 0006T | NONE   | NONE | WATER |

- o attribute descriptor records - at levels 2 and 3 with attribute transfer these records will be added to give a description of all of the attributes that will occur in the database. Each record contains the NTF mnemonic, the field width, interpretation and null, and maximum and minimum values for an attribute.

Each IFF file is then reopened in turn and output to the NTF file as a separate section. The [SECHREC] (section header) record is output with the following values:

- o {SECT\_REF} - the first 10 characters of the IFF file name
- o {COORD\_TYP} - deduced from the value in the map descriptor
- o {STRUC\_TYP} - always set to 1 for vector data
- o {XYLEN} - taken from the /XY\_LEN qualifier
- o {XY\_UNIT} - deduced from the value in the map descriptor
- o {XY\_MULT} - taken from the /XY\_MULT qualifier
- o {Z\_LEN} - taken from the /Z\_LEN qualifier
- o {Z\_UNIT} - taken from the /Z\_UNIT qualifier
- o {Z\_MULT} - taken from the /Z\_MULT qualifier
- o {X\_ORIG} - taken from the map descriptor
- o {Y\_ORIG} - taken from the map descriptor
- o {Z\_DATUM} - taken from the /Z\_DATUM qualifier
- o {XMIN}, etc - taken from the range entry
- o {XY\_ACC} - left unset
- o {Z\_ACC} - left unset
- o {SURV\_DATE} and {LAST\_AMND} are taken from the map header if /OS is specified. {COPYRIGHT} is taken from the /COPYRIGHT qualifier, or if that is not specified, from the map header if /OS is specified. Otherwise, all three are left unset (ie a value of 00000000).
- o {SQNAME} and {SQDATE} - left unset

If /OS is specified, the following fields are output in the free text area of the section header relating to each IFF file:

- o {STORAGE\_SCALE} - scale at which the map is stored
- o {INITIAL\_DATABANK\_DATE} - when the map was first digitised
- o {EDITION} - current edition of the map
- o {SURVEY\_TYPE} - type of survey of the map
- o {CONTENT\_INDICATOR} - survey accuracy of the data
- o {LATEST\_REVISION\_DATE} - when a full field examination of the continuous field revision process occurred
- o {BOUNDARY\_DATE} - when the boundary information was last checked
- o {DIGITAL\_UPDATE\_DATE} - indicates the currency of the data
- o {SVY\_DATES\_FIRST\_LAST} - dates of first and last surveys of the map
- o {CONTOUR\_VI} - vertical interval of any contours
- o {SPECIFICATION\_NUMBER} - specification number current at OS when the map was digitised
- o {EDGE\_MATCH\_STATUS} - indicates whether the edges have been

- o {MULTI\_YEAR\_HWM\_DATE} - matched or not  
- when the mean HWM dates were last checked
- o {MULTI\_YEAR\_LWM\_DATE} - when the mean LWM dates were last checked
- o {HOUSE\_UNIT\_COUNT} - used by OS to trigger the supply of update information
- o {BOUNDARY\_INFORMATION} - information about the boundaries on the map
- o {DIGITAL\_UPDATE\_COUNT} - number of updates applied to the map

Features are read from the IFF file one by one. They are separated into lines, points (symbols) and names (texts) according to the text/symbol bits in the FS entry. The {LINE\_ID}, {POINT\_ID} and {NAME\_ID} values are maintained independently of the original feature serial numbers (FSNs) in the IFF file. Each type of ID is started at 1 and incremented for each feature of the relevant type that is output. For all features, the {FEAT\_CODE} is taken directly from the IFF feature code (ie from the FS entry). Since there is no {FEAT\_CODE} field in level 3 linear features, at this level the feature code is stored in an [ATTREC] referenced by the {ATT\_ID} field, using the default NTF attribute mnemonic FC. All security and change fields are left unset.

Linear features are output as a [LINEREC] with an associated [GEOMETRY1] or [GEOMETRY2] record and the {NUM\_PARTS} field set to 1. At levels 1 and 2 the [GEOMETRY\*] record immediately follows the [LINEREC] (the {GEOM\_ID} field being identical to the {LINE\_ID} field), whereas at level 3 the [GEOMETRY\*] record is referenced by the {GEOM\_ID} field. If the feature has a height AC associated with it in the IFF file, then, at levels 1 and 2, the {VALUE} field will be set to HT followed by the height as six digits (according to Z\_MULT, etc). At level 3 the {NAME\_ID} field references any text feature which is to be used to annotate the line, if there is no such text the field is set to 0. In the [GEOMETRY\*] record, the {GEOM\_ID} field is set (as expected) to match the {LINE\_ID}. The {GTYPE} field is set to 2 (a line). The {QPLAN} field is set to 0 or 1 for each coordinate pair or triple, indicating pen up or pen down respectively. The {QHT} field is not currently used.

Symbol features are output as a [POINTREC] with an associated [GEOMETRY1] or [GEOMETRY2] record. The procedure is the same as that for a [LINEREC]. If the feature has a rotation, then at level 3 it will be output in an associated [ATTREC] using the default NTF attribute mnemonic OR, whereas at levels 1 and 2 an orientation {VALUE} field will be output as OR, followed by the orientation as six digits in tenths of a degree. The [GEOMETRY\*] record is output with a {GTYPE} of 1 (a point).

At version 1.1, text features are output as a [NAMEREC] followed by a [NAMPOSTN] (or a [CURVTEXT] if the text is curved). In the [NAMPOSTN] record, the {FONT} is taken from the text category (in the FS entry). The {TEXT\_HT} is taken from the TH entry. Since the [NAMEREC] record can only transmit up to 99 characters, text features that are longer than this will be truncated before being output. The text position is

given by a [GEOMETRY] record which will immediately follow the [NAMPOSTN] (or [CURVTEXT]) record. However [CURVTEXT] records are currently not output at version 2.0 NTF.

At version 2.0 level 3, text features are output as a [TEXTREC] record, followed by a [TEXTPOS], [TEXTREP] and [ATTREC] which contains the text itself. The text string will always be written to an attribute called 'TX' which must be defined in the attribute file in order for there to be a corresponding [ATTDESC] attribute description record in the file.

Note that composite texts are transmitted as a sequence of individual text features, with separate {NAME\_ID}s.

Additionally, if NTF level 3 version 1.1 output is requested there may be [CHAIN], [CLINE], [NODEREC] and [COLLECT] records. A [CLINE] (and associated [CHAIN]) is output if an IFF feature consists of several ST entries - one [GEOMETRY\*] record being output for each ST. A [NODEREC] is output for every junction point which occurs in the SH (sector header) entry of the IFJ file. A [COLLECT] record is output for a group of features if each such feature has an appropriate AC (see the section on Attributes for details).

Note that the NTF level 3 records [POLY] and [CPOLY] are not used.



---

## Attributes

NTF version 1.1 and above now has a coherent definition of how attributes are transferred so now IFF AC values can be easily ported to and from NTF. Firstly an IFF attribute must be associated with an NTF mnemonic. This is done via the new attribute file ( given with the /ATTRIBUTE\_FILE qualifier ), this file should contain IFF AC names together with the NTF mnemonic. There are also 3 flags which should be added to the end of each line to specify whether :

1. the AC's optional text field should be read rather than the attribute value
2. the AC is used to link a text to a linear feature so that the text can be used to annotate the feature - only valid at level 3
3. the AC is used to group several features together so that a [COLLECT] record may be output - only valid at level 3

Each flag should have the value T or F to indicate true or false respectively, though the latter two flags may be omitted at level 2. An example of an attribute file is shown below.

```
!
! Command procedure to tell I2NTF/NTF2I which attributes to
! associate with which NTF mnemonic. The IFF name must be
! present in the FRT file.
!
! Format is:
!
!ATTRIBUTE IFF_ATT_NAME NTF_MNEMONIC TEXT ANNOTATE COLLECT
!
ATTRIBUTE LH_BOUNDARY LH T F F
ATTRIBUTE RH_BOUNDARY RH T F F
ATTRIBUTE CONTOUR CO F F T
ATTRIBUTE TEXT TX T T F
ATTRIBUTE COUNTY_LEFT CL T F F
ATTRIBUTE COUNTY_RIGHT CR T F F
ATTRIBUTE COUNTY_LEFT CA F F F
ATTRIBUTE COUNTY_RIGHT CB F F F
```

In the above attribute file the IFF attribute CONTOUR has its AC value transferred whilst the others have the optional text put in the NTF attribute. Note that COUNTY\_LEFT and COUNTY\_RIGHT have both text and value transferred, care must be taken to ensure that they are associated with different NTF attributes. The IFF attribute CONTOUR will be used to group features for [COLLECT] records and the IFF attribute TEXT will be used to link annotated features with their associated texts. The interpretation of the attribute is taken from the FRT file which must be specified on the command line. Any non-standard AC types must be declared in ACD entries in the FRT file. Note also that NTF mnemonics must be 2 characters long.

When an AC is used to form annotated features or [COLLECT] records, the value given to this AC should be common to either a text and a linear feature, or to those features which are to be grouped together

into the [COLLECT] record. Such ACs will not appear in [ATTREC] records. One text feature can be used to annotate several linear features, but each linear feature can only be annotated with one text.

---

## Conversion of Ordnance Survey CITF data

I2NTF will write version 1.0 CITF files which are based upon level 5 of NTF Version 2 as defined by BS7567. Only CITF files of DATA\_MODEL 2 will be created.

### The IFF MH Entry And CITF Header Records

If they are present in a type 4 Map Header entry, the [FEATCLASS], [SECHREC], [TRANSFORM], [MANINFREC] and [EXTREC] header lines will be used to create the appropriate records in CITF. No further FEATCLASS entries will be created if there are any in the map header. This also applies to the TRANSFORM, MANIFORM and EXTREC records, which may therefore only come from the map header.

Certain values are required to be read from the [SECHREC] record to be used when interpreting the CITF file such as {XYLEN}, {XY\_UNIT}, {XY\_MULT}, {ZLEN}, {Z\_UNIT}, {Z\_MULT} and {SCALE}. These fields must contain correct values reflecting the true format of the data for successful conversion.

Warning messages are output if there is any difference between those fields such as map scale, range or map origin which are read directly from the IFF file, and the values contained in the map header, and the map header entries will be ignored.

Any field width values supplied with qualifiers will take precedence over the map header values, and will be written to the map header.

The {DIFF\_HT\_LEN} size is also required and is in the variable part of the [SECHREC] as so must be precisely defined as the program works under the assumption that there will be sufficient divider (//) characters after which it is located. Refer to the DATA PREPARATION section for details of how to set up a correct map header lookup table.

### Feature Level Attributes

CITF feature records, [LINEREC], [POINTREC] and [NAMEREC] have provision for attributes which should come from AC entries in the IFF feature. These attributes are UPDATE\_DATE, UPDATE\_STATUS, SPEC, PROCESS, DATE\_OF\_PROCESS, PHYS\_STAT and MARGINAL\_TXT which must be defined in the ACD section of the FRT if they are to be transferred. These features should not be present in the attribute file as this is intended for attributes which are held in [ATTREC] or [ACRDREC] records.

The alphanumeric feature level attributes UPDATE\_STATUS, PROCESS, PHYS\_STAT and MARGINAL\_TXT will be read from the value field of the AC and the datatype definition in the ACD part of the FRT is ignored by the program. This is in case the LITES2 OPERATION command was used to update these ACs as this action is performed on the value field.

These attributes will always be treated as character values and should be defined as datatype 'C' in the ACD so that programs such as LITES2 and IPATCH will show their true representation. The SPEC attribute which is a variable length alphanumeric string will be read from the optional text string of the AC and the datatype will not matter. The UPDATE\_DATE and DATE\_OF\_PROCESS attributes will be read from the value field of the AC and should be defined as datatype 'D' in the ACD.

### **Per-point Attributes And CBs**

IFF Coordinate Blocks (CB) entries are able to hold 20 columns to represent each point in a feature, which includes the X, Y and Z coordinates.

[GEOMETRY\*] records have various data quality fields attached to every point which are maintained by transferring them from the columns of the CB of the feature, either held as fixed point attributes, or variable column entries. The AC codes of these attributes must be known and so they must be defined in the ACD part of the FRT in the same way as for the feature level attributes and should not be present in the attribute file.

The X\_COORD, Y\_COORD and Z\_COORD should not be defined in the ACD as they have standard AC codes of 91, 92 and 93 respectively.

[GEOMETRY1] records have fields X\_COORD, Y\_COORD, XY\_ACQ\_METH, QPLAN.

[GEOMETRY2] record have fields X\_COORD, Y\_COORD, XY\_ACQ\_METH, QPLAN, Z\_COORD, DIFF\_HT, Z\_ACQ\_METH, QHT and QDIFF\_HT, all of which are maintained in the conversion.

Attributes held in Attribute Coordinate [ACRDREC] records are also attached to points in the CB, after those derived from the [GEOMETRY\*] records.

Since [GEOMETRY1] records result in 4 fields of a CB being used, the others may be used to hold [ACRDREC] attributes.

Similarly, [GEOMETRY2] records result in 9 fields of a CB being used, which leaves 11 which may be used to hold [ACRDREC] attributes.

### **Symbol Features**

The graphical type of point features will be looked up in the FRT in order to determine if distance (DT) or orientation (OR) attributes should be output. Points with a graphical type (GT) of 9 will result in the output of the DT and OR attributes, points with GT of 8 will only have an OR attribute and GT 7 points will not have either.

### **Text Features**

I2NTF/CITF will write all text features to CITF with two points; the first being the digitised position and the second being the plotting position calculated using {DIG\_POSTN}. If the value of {DIG\_POSTN} is zero then plotting position will be the same as the digitised position.

Text feature codes will be generated from the Category of the Feature Status (FS) entry. NTF2I generates text features with feature codes of 28 and stores enough information in the Category field for I2NTF to recalculate it. The feature code generated will be the value held in the Category field plus 1000.

### Attribute File

It is intended that all of the CITF default attributes listed in the CITF Specification Mod 7/C are defined in the ATTRIBUTE\_FILE and ACD section of the FRT. This will ensure that a stable list of attribute definitions exists so that all CITF files created will have consistent attribute translation. Any IFF/CITF attributes undefined in the ATTRIBUTE\_FILE and FRT will not be converted.

Only [ATTREC] attribute mnemonics should be defined in the attribute file. The feature level (UPDATE\_DATE, UPDATE\_STATUS, etc.) and per-point level (XY\_ACQ\_METH, QPLAN, etc.) attributes should not be defined, since they are looked up directly in the ACD part of the FRT file.

Here is an example of an attribute file defining the default attributes intended for use with CITF. Note that any text attributes have the 'TEXT' option defined as true, denoting that value is to come from the optional text string of the AC. In this case, the type of the AC as defined in the ACD part of the FRT is irrelevant.

Any integer, real, or date attributes should have the 'TEXT' option set to false. Note also that the 'ANNOTATE' and 'COLLECT' options are not used for CITF and are set to false.

The default set of CITF attributes as defined in the CITF Specification (Mod 7/C) date October 1992 will not be written to [ATTDESC] records but any others will be in order that their interpretation is defined.

```
!
! Default CITF attributes
!
!ATTRIBUTE   IFF_ATT_NAME   NTF_MNEM   TEXT   ANNOTATE   COLLECT
!
ATTRIBUTE    ADDR_ONE       A1         T       F         F
ATTRIBUTE    ADDR_TWO       A2         T       F         F
ATTRIBUTE    POSTAL_ADDR    AD         T       F         F
ATTRIBUTE    ACCENTS_MASK   AM         T       F         F
ATTRIBUTE    ADDR_QUAL      AQ         F       F         F
ATTRIBUTE    ADDR_STAT      AS         F       F         F
ATTRIBUTE    BUILD_NAME     BD         T       F         F
ATTRIBUTE    BUILD_NUM      BN         F       F         F
ATTRIBUTE    CONCAT_FLAG    CF         T       F         F
ATTRIBUTE    COUNTY_NAME    CN         T       F         F
ATTRIBUTE    CHANGE_TYPE    CT         T       F         F
..
..
[lines deleted]
..
```

```

..
ATTRIBUTE      SETTLEMENT      SN      T      F      F
ATTRIBUTE      DATE_OF_SURV     SY      F      F      F
ATTRIBUTE      TYPE_OF_CONSTR   TC      T      F      F
ATTRIBUTE      THOROUGHFARE     TN      T      F      F
ATTRIBUTE      CITFTEXT         TX      T      F      F
ATTRIBUTE      UORN             UN      T      F      F

```

### FRT ACD Section

Here is an example of the ACD part of an FRT suitable for use with CITF data whose ACD TABLE 4 reflects the IFF\_ATT\_NAME field of the above attribute file.

The feature level attributes in ACD TABLE 2 must be defined exactly as shown and should not be defined in the attribute file. While I2NTF ignores the datatype of ACs in the ACD (except for dates, which should be 'D'), it is advised that attributes are defined to be of the correct type so that programs such as LITES2 and IPATCH will display their true representation.

The per-point attributes in ACD TABLE 3 must also be defined exactly as shown and should not be defined in the attribute file. The AC codes of the X, Y and Z coordinates that will appear in the CB entry will be the default ones of 91, 92 and 93 respectively and should not be present in the ACD section.

```

!
! Feature level attributes
!
ACD TABLE 2
!
ACD D 1 UPDATE_DATE
ACD C 2 UPDATE_STATUS
ACD C 3 SPEC
ACD C 4 PROCESS
ACD D 5 DATE_OF_PROCESS
ACD C 6 PHYS_STAT
ACD C 7 MARGINAL_TXT
!
! Per-point attributes
!
ACD TABLE 3
!
ACD C 1 XY_ACQ_METH
ACD C 2 QPLAN
ACD R 3 DIFF_HT
ACD C 4 Z_ACQ_METH
ACD C 5 QHT
ACD C 6 QDIFF_HT
!
! Default attribute codes
!
ACD TABLE 4
!

```

```
ACD C 1 ADDR_ONE
ACD C 2 ADDR_TWO
ACD C 3 POSTAL_ADDR
ACD C 4 ACCENTS_MASK
ACD I 5 ADDR_QUAL
ACD I 6 ADDR_STAT
ACD C 7 BUILD_NAME
ACD I 8 BUILD_NUM
ACD C 9 CONCAT_FLAG
ACD C 10 COUNTY_NAME
..
..
[lines deleted]
..
..
ACD C 60 SETTLEMENT
ACD C 61 DATE_OF_SURV
ACD C 62 TYPE_OF_CONSTR
ACD C 63 THOROUGHFARE
ACD C 64 CITFTEXT
ACD C 65 UORN
```

### **Changing Feature Codes During Translation**

I2NTF allows feature codes to be changed during translation through the use of a feature code lookup table parameter file. This facility is invoked by using the /FC\_LOOKUP qualifier. It is useful for converting IFF feature codes into CITF feature codes which are invalid in IFF (i.e. greater than 32767). Refer to the DATA PREPARATION section for details of how to set up a feature code lookup table.

-----  
**EXAMPLES**

```
$ MOUNT/FOREIGN MSA0:<CR>
%MOUNT-I-MOUNTED, mounted on MSA0:
$ I2NTF/RECIPIENT="TJ Ibbs"/LOG FILE1 MSA0:<CR>
%I2NTF-I-NTFOPEN, NTF output opened on "MSA0:.NTF;0"
%LSLLIB-I-IFFOPENED, LSL$IF:FILE1.IFF;0 opened for read
%I2NTF-I-IGNORE, ignoring layer 0
%I2NTF-I-LAYER, processing layer 1
%I2NTF-I-LAYER, processing layer 2
%I2NTF-I-NTFDONE, NTF data written to "MSA0", 15 blocks output
ELAPSED:      0 00:00:16.25 CPU: 0:00:04.52 BUFIO: 23 DIRIO: 40 FAULTS: 175
```

This example shows the user mounting the magnetic tape on drive MSA0:, and then using I2NTF to output data for the customer "TJ Ibbs". The program ignores layer 0, and outputs the data in layers 1 and 2.

```
$ TYPE TRANSYL.I2NTF_LIS<CR>
T1987Q1
T1987Q2
T1987Q3
$ I2NTF/INPUT_LIST=TRANSYL/RECIPIENT="Transylvanian Water" -
$_ /LOG/OUTPUT=TT: MSA0:<CR>
%I2NTF-I-INFILOPN, input list file "TRANSYL.I2NTF_LIS" opened for read
-I2NTF-I-LISTRD, 3 IFF filenames read from list file "TRANSYL.I2NTF_LIS"
%LSLLIB-I-LOGOPNOUT, log file TT:I2NTF.LOG;0 opened for write
===== I 2 N T F =====
```

I2NTF invoked by TONY using terminal RTA1: at 2-JUL-1989 15:36:31.31

Command line:

I2NTF/INPUT\_LIST=TRANSYL/RECIPIENT="TRANSYLVANIAN WATER"/LOG/OUTPUT=TT: MSA0:

```
=====
NTF level 1
Recipient of data is "Transylvanian Water "
Donor of data is      "Laser-Scan Ltd.      "
Name of database is   "Transylvanian Water "
NTF output to MSA0:.NTF;0
Output to magnetic tape at density 1600
```

```
%I2NTF-I-NTFOPEN, NTF output opened on "MSA0:.NTF;0"
// NTF data output by Laser-Scan's CONVERT utility I2NTF
%LSLLIB-I-IFFOPENED, LSL$IF:T1987Q1.IFF;0 opened for read
//
// IFF file          LSL$IF:T1987Q1.IFF;0
// Spheroid          Airy
// Projection         UK national grid
// Scale             2500
// Units             metres
// Height data       metres
```



```
%I2NTF-I-LAYER, processing layer 1
%I2NTF-W-ONEPT, FSN 10 (10) is linear, but only has one point
%LSLLIB-I-IFFOPENED, LSL$IF:T1987Q2.IFF;0 opened for read
//
// IFF file          LSL$IF:T1987Q2.IFF;0
// Spheroid          Airy
// Projection         UK national grid
// Scale             1250
// Units             metres
// Height data       metres
%I2NTF-I-LAYER, processing layer 1
%LSLLIB-I-IFFOPENED, LSL$IF:T1987Q3.IFF;0 opened for read
//
// IFF file          LSL$IF:T1987Q3.IFF;0
// Spheroid          Airy
// Projection         UK national grid
// Scale             2500
// Units             metres
// Height data       metres
%I2NTF-I-LAYER, processing layer 1
%I2NTF-I-NTFDONE, NTF data written to "MSA0", 184 blocks output
ELAPSED:    0 00:02:02.24  CPU: 0:00:49.68  BUFIO: 85  DIRIO: 420  FAULTS: 171
```

The user has created an input list file, TRANSYL.I2NTF\_LIS, containing the names of the IFF files to be translated. I2NTF has then been used to output the data from these files to magnetic tape. Note the use of /LOG and /OUTPUT=TT: to produce an interleaved log of what is being done - the comments written to the NTF tape are output between the relevant log messages.

```
$ I2NTF/RECIPIENT="Laser-Scan Labs"/LOG/XY_LEN=4 SHEET7 MSA0:<CR>
%I2NTF-I-NTFOPEN, NTF output opened on "MSA0:.NTF;0"
%LSLLIB-I-IFFOPENED, LSL$IF:SHEET7.IFF;0 opened for read
%I2NTF-E-TOONARROW, the XYLEN value of 4 given is too small
-I2NTF-I-SUGGEST, suggest the use of /XYLEN=7
ELAPSED:    0 00:00:10.18  CPU: 0:00:00.61  BUFIO: 10  DIRIO: 6  FAULTS: 112
```

In this example, the user has specified that all X,Y coordinates will be output in a field of length 4 characters. The program checks that the file can indeed be output using this field width by inspecting the IFF file's range (RA) entry. In this instance, the field is too narrow, and the program suggests the minimum values that can be used for /XY\_LEN.

```
$ TYPE TRANSYL.I2NTF_PAR<CR>
! Standard parameter file for sending NTF data to
!
!           TRANSYLVANIAN WATER AUTHORITY
!
/recipient="Transylvanian Water"
/xy_len =8           ! use a field of width 8 for X,Y coordinates
/xy_mult=0.01        ! coordinates in hundredths of a metre
/z_unit =3           ! heights are in FEET
$ I2NTF/PARAMETER_FILE=TRANSYL/XYMULT=0.1/SERIAL=1234/LOG/OUTPUT=T1234<CR>
Input IFF file : SHEET1,SHEET2<CR>
Output destination : T1234<CR>
```

```
%I2NTF-I-PARFILOPN, parameter file "TRANSYL.I2NTF_PAR;0" opened for read
%I2NTF-I-PARFILCLO, parameter file "TRANSYL.I2NTF_PAR;0" closed
%LSLLIB-I-LOGOPNOUT, log file T1234.LOG;0 opened for write
%I2NTF-I-NTFOPEN, NTF output opened on "T1234.NTF;0"
%LSLLIB-I-IFFOPENED, LSL$IF:SHEET1.IFF;0 opened for read
%I2NTF-I-LAYER, processing layer 1
%I2NTF-I-LAYER, processing layer 2
%I2NTF-I-LAYER, processing layer 5
%LSLLIB-I-IFFOPENED, LSL$IF:SHEET2.IFF;0 opened for read
%I2NTF-I-LAYER, processing layer 1
  ELAPSED:      0 00:02:57.68  CPU: 0:01:21.65  BUFIO: 88  DIRIO: 466  FAULTS: 282
$ TYPE T1234.LOG<CR>
===== I 2 N T F =====

I2NTF invoked by TONY using terminal RTA1: at 2-JUL-1989 16:20:22.10

Command line:

I2NTF/PARAMETERFILE=TRANSYL/XY_MULT=0.1/SERIAL=1234/LOG/OUTPUT=T1234
SHEET1,SHEET2 T1234

=====

NTF level 1
Recipient of data is "Transylvanian Water "
Donor of data is      "Laser-Scan Ltd.      "
Name of database is   "Transylvanian Water "
NTF output to T1234.NTF;0

// NTF data output by Laser-Scan's CONVERT utility I2NTF
//
// IFF file          LSL$IF:SHEET1.IFF;0
// Spheroid          Airy
// Projection        UK national grid
// Scale             2500
// Units             metres
// Height data       feet
//
// IFF file          LSL$IF:SHEET2.IFF;0
// Spheroid          Airy
// Projection        UK national grid
// Scale             1250
// Units             metres
// Height data       feet
$
```

In this example, a standard parameter file has been prepared for sending data to this customer. I2NTF is run, overriding the coordinate multiplication factor (/XY\_MULT) specified in the parameter file, and specifying a volume serial number to identify this particular tape. The output log is sent to a file, which is typed to show its contents. This file can be printed and used as part of the documentation for the data on the tape.

```
$ I2NTF/RECIPIENT="Ordnance Survey (GB)"/OS/LOG/OUTPUT=OS OSCODES MSA0:<CR>
%LSLLIB-I-LOGOPNOUT, log file OS.LOG;0 opened for write
%I2NTF-I-NTFOPEN, NTF output opened on "MSA0:.NTF;0"
%I2NTF-I-MHREAD, IFF file "LSL$IF:OSCODES.IFF;0" opened and map header read
%LSLLIB-I-IFFOPENED, LSL$IF:OSCODES.IFF;0 opened for read
%I2NTF-I-IGNORE, ignoring layer 0
%I2NTF-I-LAYER, processing layer 1
%I2NTF-I-NTFDONE, NTF data written to "MSA0", 153 blocks output
  ELAPSED:      0 00:01:02.25  CPU: 0:00:39.34  BUFIO: 19  DIRIO: 353  FAULTS: 254
$ TYPE OS.LOG<CR>
===== I 2 N T F =====
```

I2NTF invoked by TONY using terminal RTA2: at 3-JUL-1989 11:52:20.93

Command line:

```
I2NTF/RECIPIENT="ORDNANCE SURVEY (GB)"/OS/LOG/OUTPUT=OS OSCODES MSA0:
```

```
=====
NTF level 1
Recipient of data is "Ordnance Survey (GB)"
Donor of data is      "Laser-Scan Ltd.      "
Name of database is   "Ordnance Survey (GB)"
NTF output to MSA0:.NTF;0
Output to magnetic tape at density 1600
Extra OS header information is being output
```

```
// NTF data output by Laser-Scan's CONVERT utility I2NTF
//
// IFF file          LSL$IF:OSCODES.IFF;0
// Spheroid          Airy
// Projection         UK national grid
// Scale             1250
// Units             metres
// Height data       metres
// Section header record contains OS(GB) map header data
```

In this example, an OS (GB) style IFF file is being processed, and the user has used the /OS qualifier to indicate that OS map header data should be output in the section header record. Note that the log message output when the IFF file is initially opened includes a note that the map header is present, and that the output log file indicates that the extra data has been output to the section header.

```
$ I2NTF/RECIPIENT="Baron Greenback"/LOG/FRT=DM/ATTRIBUTE_FILE=DM/LEVEL=2
PENFOLD.IFF PENFOLD.NTF <CR>
```

```
%I2NTF-I-ATTFILOPN, attribute file "DM.NTFATTR;0" opened for read
%I2NTF-I-ATTFILCLO, attribute file "DM.NTFATTR;0" closed
%I2NTF-I-NTFOPEN, NTF output opened on "PENFOLD.NTF;0"
%LSLLIB-I-IFFOPENED, LSL$IF:PENFOLD.IFF;0 opened for read
%I2NTF-I-LAYER, processing layer 1
%I2NTF-I-LAYER, processing layer 2
%I2NTF-I-LAYER, processing layer 3
```

%I2NTF-I-LAYER, processing layer 4  
%I2NTF-I-LAYER, processing layer 5  
%I2NTF-I-LAYER, processing layer 6

ELAPSED: 0 00:00:11.32 CPU: 0:00:02.54 BUFIO: 17 DIRIO: 67 FAULTS: 285

This example shows the use of the /ATTRIBUTE\_FILE and /FRT qualifiers. The files given with these qualifiers were used to transfer attributes from the IFF AC's into NTF attributes. Note that /LEVEL=2 or /LEVEL=3 must be given.

---

**MESSAGES (SUCCESS)**

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

NORMAL, successful function return

**Explanation:** This message is used internally by the program to indicate the success or failure of a subroutine.

**User action:** None.

-----  
**MESSAGES (INFORMATIONAL)**

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

ASSUMEPTSIZ, text heights assumed to be given as OS point sizes

**Explanation:** This message is output if /OS is specified to indicate that any text heights given in the IFF file will be assumed to be OS point sizes.

**User action:** None.

ATTFILCLO, attribute file 'file-spec' closed

**Explanation:** This message is output when the /ATTRIBUTE\_FILE file is closed, if /LOG was specified.

**User action:** None.

ATTFILOPN, attribute file 'file-spec' opened for read

**Explanation:** This message is output when the /ATTRIBUTE\_FILE file is opened, if /LOG was specified.

**User action:** None.

CITFLEVEL5, creating NTF level 5 for CITF

**Explanation:** This message is output if the user requests any level other than 5 if /CITF has been supplied.

**User action:** None.

CONVERT, use ITRANS to convert to metres, feet or degrees

**Explanation:** This message is output after the BADUNIT error message.

**User action:** As for the BADUNIT error message.

DEFZUNIT, default height units (metres) assumed

**Explanation:** This message is output after the BADZUNIT error message.

**User action:** As for the BADZUNIT error message.

FEATFILCLO, featclass file 'file-spec' closed

**Explanation:** This message is output when the /FEATCLASS\_FILE file is closed, if /LOG was specified.

**User action:** None.

FEATFILOPN, featclass file 'file-spec' opened for read

**Explanation:** This message is output when the /FEATCLASS\_FILE file is opened, if /LOG was specified.

**User action:** None.

IGNORE, ignoring layer 'integer'

**Explanation:** This message is output to confirm that the indicated layer is being ignored, if the /LOG qualifier has been selected.

**User action:** None.

INFILOPN, input list file 'file-spec' opened for read

**Explanation:** This message is output when the file specified with the /INPUT\_LIST qualifier is opened, if the /LOG qualifier has been specified.

**User action:** None.

LAYER, processing layer 'integer'

**Explanation:** This message is output to confirm that the current layer of the IFF file is being output, if the /LOG qualifier was specified.

**User action:** None.

LISTRD, 'integer' IFF filename(s) read from list file 'file-spec'

**Explanation:** This message is output after the file specified with the /INPUT\_LIST qualifier has been read, if the /LOG qualifier was specified.

**User action:** None.

LUTFILCLO, FC lookup table file 'file-spec' closed

**Explanation:** This message is output when the FC lookup table file specified by /FCLOOKUP is closed.

**User action:** None.

LUTFILOPN, FC lookup table file 'file-spec' opened for read

**Explanation:** This message is output when the FC lookup table file specified by /FCLOOKUP is opened.

**User action:** None.

MHREAD, IFF file 'file-spec' opened and map header read

**Explanation:** Each IFF file is inspected to check that it has a map header (MH) entry. If the /LOG qualifier is specified, then this message is output as each map header is checked.

**User action:** None.

NTFDONE, NTF data written to 'file-spec', 'integer' block(s) output

**Explanation:** This message is output when the output of the NTF data to magnetic tape has been completed.

**User action:** None.

NTFOPEN, NTF output opened on 'file-spec'

**Explanation:** This message is output when the NTF output file is opened, or tape drive initialised, if /LOG was specified.

**User action:** None.

PARFILCLO, parameter file 'file-spec' closed

**Explanation:** This message is output when the /PARAMETER\_FILE file is closed, if /LOG was specified.

**User action:** None.

PARFILOPN, parameter file 'file-spec' opened for read

**Explanation:** This message is output when the /PARAMETER\_FILE file is opened, if /LOG was specified.

**User action:** None.

TRUNCTXT, text in FSN 'fsn' ('isn') truncated

**Explanation:** This message is output after the LONGTXT error message, and is itself followed by a line containing the text as output to NTF.

**User action:** As for the LONGTXT error message.

USEITRANS, use ITRANS/DESCRIPTOR to convert to a valid map descriptor

**Explanation:** This message is output after the NOTSET or TYPE1MD error messages, to indicate what action the user should take to make the IFF file concerned suitable for output using I2NTF.

**User action:** As the message says.



-----  
**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.

ACIGNORE, AC entry ignored in feature FSN 'fsn' ('isn')

**Explanation:** The AC entry in this feature will be ignored as it is invalid in this type of feature, or at this level.

**User action:** Check the IFF file, and level required.

ACNOTATT, AC 'actype' in feature FSN 'fsn' ('isn') not in the Attribute file

**Explanation:** The specified AC type was missing from the attribute file, and will be ignored.

**User action:** Check the FRT file if this is a problem.

ACNOTFND, AC 'actype' was not found in the FRT file

**Explanation:** The specified AC type was missing from the FRT file, and some feature fields may be left unset.

**User action:** Check the FRT file if this is a problem.

ACTRUNCATE, AC field entry 'string' truncated in feature FSN 'fsn' ('isn')

**Explanation:** The AC entry for the specified field in this feature will be truncated as it is too long.

**User action:** Check the IFF file.

ACTYPES, only height ACs, types 2 and 3, are supported at level 1

**Explanation:** Only contour height ACs are output by I2NTF at level 1 - all other AC types are ignored, and the program outputs this message.

**User action:** Use level 2 if the attributes are required.

BADFRTMAX, bad value in LSL\$FRT\_FRTMAX, default of 'integer' used

**Explanation:** LSL\$FRT\_FRTMAX did not contain an integer value. This logical is used to set the maximum size of the FC lookup table. Default value used.

**User action:** Define LSL\$FRT\_FRTMAX to hold an integer value.

BADLUTLIN, line 'integer' in 'file-spec' invalid

**Explanation:** The FC lookup table file contains an invalid line.

**User action:** Check the FC lookup table file.

BADPTSIZ, unknown point size 'integer', in feature 'integer'

**Explanation:** In OS data, text point sizes must be within the range 1 to 24, although not all values in that range are actually meaningful. This message indicates that the specified feature contained a text with a point size that is not defined. A point size of 24 will be used instead.

**User action:** Edit the IFF file using either IPATCH or LITES2 to correct the offending feature - point sizes are held in the TH entry of a text feature.

BADTEXTPOS, text position outside range 0-8 in FSN 'integer'

**Explanation:** This message is output when the text digitised position in the FS entry is outside the range 0 to 8. It will default to zero.

**User action:** Correct the text position in the Feature Status (FS) entry using IPATCH/WRITE or ignore this message if the default value of zero is acceptable.

BADVER, invalid NTF version given, defaulting to v'real'

**Explanation:** If the /VERSION qualifier is used to select an output NTF version other than 1.1 or 2.0 this message is output, and the program will select the default version.

**User action:** Do not try to output at versions other than 1.1 or 2.0 (the default) as the program does not support them.

BADZUNIT, invalid units specified with /Z\_UNIT

**Explanation:** The value specified with the /Z\_UNIT qualifier is not in the range 1 to 3, and will thus be ignored. The default value of 2 (metres) will be used.

**User action:** If the default is not acceptable, run the program again specifying the correct value for Z\_UNIT (ie 1 for degrees, 2 for metres, 3 for feet).

BOTHATTFRT, both /FRT and /ATTRIBUTE required for attribute transfer

**Explanation:** If attributes are to be transferred to NTF then both an attribute file and an FRT are required. Only one of these was given on the command line so attributes will not be translated.

**User action:** The command line should be re-entered giving both of the required files.

CITFDIFORIG, different origin in SECHREC record in field 'string', value 'string'

**Explanation:** The origin coordinate in the specified field in the current section header record in the CITF Map Header differs from the IFF MD2 origin offset, but will be copied across unaltered.

**User action:** Check the MH entries.

CITFDIFSCALE, different scale in SECHREC record with value 'integer'

**Explanation:** The scale in the section header record in the CITF Map Header differs from the IFF MD2 scale, but will be copied across unaltered.

**User action:** Check the MH entries.

CITFEORERR, invalid end of record in 'string' in the CITF map header

**Explanation:** There was no valid record terminator in the CITF map header record. The proper one will be added.

**User action:** None.

CITFIGNFEAT, not first FEATCLASS record 'string' in the CITF map header

**Explanation:** There was a second FEATCLASS record in the CITF map header, or another IFF file, and will be ignored.

**User action:** None.

CITFIGNSECH, not first SECHREC record 'string' in the CITF map header

**Explanation:** There was a second SECHREC record in the CITF map header, and will be ignored.

**User action:** None.

CITFINVALREC, invalid record 'string' in the CITF map header

**Explanation:** There was an unexpected record in the CITF map header, which will be ignored.

**User action:** None.

CITFNOTCONT, invalid continuation record 'string' in the CITF map header

**Explanation:** There was an unexpected continuation record in the CITF map header, without any record to start with, and will be ignored.

**User action:** None.

CITFNOTVECTOR, value 'string' not vector in SECHREC record in the CITF map header

**Explanation:** The STRUCTYP field in the SECHREC record in the CITF map header was not vector, but will be left unaltered.

**User action:** None.

CITFSECHREC, error reading SECHREC record, in field 'string', value 'string'

**Explanation:** An error occurred in interpreting the contents of the specified field in the section header record in the CITF Map Header. The contents of the offending field will be defaulted, or ignored, depending on its subsequent use.

**User action:** Check the MH entries.

DEGEN, Line feature degenerates to 1 point - FSN 'fsn' deleted

**Explanation:** When converting a line feature to NTF or CITF which has lower precision, duplicate output points are discarded and this has resulted in a line feature reducing to fewer than two points. The implication of this is that no corresponding feature was created in the output file.

**User action:** The IFF feature with the reported FSN may be examined using LITES2 if its removal causes concern.

DUPPTS, duplicated points in feature with FSN 'fsn' (point 'number')

**Explanation:** The duplicated points are the point numbered in the message and the previously accepted point (normally the previous point, unless it was also duplicated). IFF coordinates have a smaller resolution than NTF/CITF coordinates, so points which are very close in IFF may be equal on translation to NTF/CITF. This can happen with lines, and since there is no need for spurious data, the duplicated points are ignored.

**User action:** In the case of lines, determine why successive points are so close. Generated curves, arcs and circles may exhibit this problem if their construction tolerances were very small. The problem can also occur where lines have been clipped to sheet edges, and existing points were already positioned very close to the edge. If many occurrences of this message occur, it may be due to the combination of XY\_LEN and XY\_MULT giving rise to poor output precision and adjusting these may resolve the problem.

FCTOOLARGE, FC 'code' is too large in feature FSN 'fsn' ('isn')

**Explanation:** The FC in the FS entry in this feature is too large for the feature code field (0 to 9999) and will be set to 0. Note that this may have the wrong graphical type for output.

**User action:** Check the IFF file feature.

FEATATT, feature level attribute 'ACDname' undefined in ACD

**Explanation:** The reported feature level attribute was not defined in the ACD part of the given FRT. This attribute is one of the default feature level ones for CITF and any occurrences in the IFF file will not be written to the CITF file.

**User action:** If the reported attribute is required to be in the CITF file, then ensure that a correct definition of the attribute is given in the ACD part of the FRT file.

HASOSMAP, file 'file-spec' has an OS map header

**Explanation:** An OS style map header entry has been detected in the specified file. However, since the /OS qualifier was not specified, the OS header data will not be output in the NTF file.

**User action:** If OS(GB) style output is required, then add the qualifier /OS to the command line.

IFFFCDUPL, FC 'integer' from input file translated as NTF FC 'integer'

**Explanation:** There is a duplicate IFF feature code in the lookup file specified with /FCLOOKUP, making the translation ambiguous. The IFF FC is translated into the smallest NTF FC with which it is associated in the lookup file.

**User action:** You may wish to eliminate duplicate IFF FCs from the FC lookup file.

LINEINATT, error decoding line in attribute file

**Explanation:** The line given in the following message was found in the attribute file but could not be decoded.

**User action:** The line should be changed to contain valid commands.

LINEINFEAT, error decoding line in featclass file

**Explanation:** The line given in the following message was found in the featclass file but could not be decoded.

**User action:** The line should be changed to contain valid commands.

LONGMSG, 'string' qualifier is too long (maximum is 'integer') - truncated

**Explanation:** The character string given for the stated qualifier is too long. The program will truncate the name and continue.

**User action:** If the truncated name is not acceptable, then run the program again with a shorter recipient name.

LONGTXT, standard NTF allows only 99 chars in a text string

**Explanation:** A text entry of length greater than 99 characters has been found, and will be truncated. The information message TRUNCTXT will also be output, to show the text as transferred to NTF.

**User action:** Use LITES2 to find the offending text, and split it into smaller text features of length less than or equal to 99 characters, before running the program again.

MHUPGRADE, cannot fully upgrade IFF map header

**Explanation:** This message appears when a problem has occurred with the upgrade procedure. It is most likely due to one of the old digital update dates or the old selected revision date having been corrupted. The latest of these dates is used for the new digital update date which is stored in the OS map header as ICL binary days. A system message follows for further explanation. The program will not attempt to set the new digital update date.

**User action:** The source of the problem may be a bad digital update date or selected revision date. If this is the case, report the problem to Laser-Scan - supplying details of the command line used to invoke the program, as well as the IFF file.

MISSLNK, link missing from node 'integer'

**Explanation:** The number of arms (radiating links) declared in the sector header for the specified node is greater than the number of corresponding links found. The NODEREC record for the node is output, with zeros in place of the missing links.

**User action:** Examine the .IFJ file to determine whether it is the number of links or the link definitions which are at fault. Then correct the file accordingly.

NOANNOTATE, annotation not available at NTF level 'integer' - command ignored

**Explanation:** The user requested the ANNOTATE option for an AC in the attribute file, but this facility is not available at the level of NTF output specified. The request will be ignored.

**User action:** None.

NOATTR, attribute records are not allowed at level 1

**Explanation:** An attribute file was given on the command file but at level 1 NTF has no attribute descriptor record to store this information so the file was not read.

**User action:** If attribute transfer is required use NTF level 2 or 3.

NOCOLLECT, collect records not available at NTF level 'integer' - command ignored

**Explanation:** The user requested the COLLECT option for an AC in the attribute file, but this facility is not available at the level of NTF output specified. The request will be ignored.

**User action:** None.

NOLEVEL, level 'integer' not available, only 1, 2 or 3 supported

**Explanation:** If the /LEVEL qualifier is used to select NTF levels other than 1, 2 or 3, this message is output, and the program will select level 1.

**User action:** Do not try to output at levels other than 1 (the default), 2 or 3, as the program does not support them.

NOSH, sector header (SH) entry not found in file 'file-spec'

**Explanation:** The specified IFF file does not contain a sector header, and thus it will not be possible to output node records - since there is no junction point information. NTF level 3 will be output, but any junction points will be ignored.

**User action:** Investigate the history of the IFF file, to see why there is no sector header entry.

NOTCITFMAP, file 'file-spec' does not have a CITF map header - default CITF output

**Explanation:** If the /CITF qualifier is specified, the IFF files to be output should contain CITF style map header entries. The files are all checked before any output to CITF is performed, and if one is found without a CITF map header, this message is output and the program will continue.

**User action:** If CITF style output really is required, then correct the relevant file.

NOTEXT, annotation expected for feature 'string' but not found

**Explanation:** The specified NTF feature had an AC indicating that it should be annotated with text. However the required text feature did not occur in the IFF file. The feature will be output unannotated.

**User action:** Investigate the IFF file, to see why the text is missing.

NOWIDTH, field widths may not be specified at level 1 - default used

**Explanation:** The qualifiers /XY\_LEN or Z\_LEN were used at level 1. This is not allowed, the default values of XY\_LEN = 10 and Z\_LEN = 6 were used.

**User action:** If the field widths need to be modified then use level 2, otherwise omit the length qualifiers.

NTFFCTOOLRG, NTF FC 'code' is too large in feature FSN 'fsn' ('isn')

**Explanation:** The NTF FC (translated using the FC lookup table) in the FS entry in this feature is too large for the feature code field (0 to 9999) and will be set to 0. Note that this may have the wrong graphical type for output.

**User action:** Check the FC lookup table file NTF FC column.

ONEPT, FSN 'fsn' ('isn') is linear, but only has one point

**Explanation:** The specified feature appears to be linear (as indicated by the text/symbol bits in the FS entry), but it only has one locating point. The program will output it to NTF as if it were a point feature - ie unoriented symbol.

**User action:** If this problem occurs, it is probable that the text/symbol bits in the IFF file are not set correctly. This may be corrected by reading the file into LITES2 and then outputting it again. Alternatively, the specified feature may actually have been incorrectly digitised or edited, in which case the missing points should be inserted again.

POINTATT, per-point attribute 'ACDname' undefined in ACD

**Explanation:** The reported per-point attribute was not defined in the ACD part of the given FRT. This attribute is one of the default per-point ones for CITF and any occurrences in the IFF file will not be written to the CITF file.

**User action:** If the reported attribute is required to be in the CITF file, then ensure that a correct definition of the attribute is given in the ACD part of the FRT file.

SHMISS, FSN 'integer' has a JP entry but file has no sector header

**Explanation:** The specified IFF file does not contain a sector header, and thus it will not be possible to output the junction point which has been found. The program will continue, but the junction point will be ignored.

**User action:** Investigate the IFF file, to determine any errors in the data.

SHZERO, variable IFSHSZ is zero, using calculated value = 'integer'

**Explanation:** IFSHSZ should contain the number of sectors as specified in the sector header. It can only be zero if the input file does not have a junction structure. To enable the program to continue, the correct value is calculated from the size of the SH entry.

**User action:** Investigate the sector header of the input file to determine why the number of sectors is incorrect.



STRTOOLONG, NTF mnemonic too long, truncated to 'string'

**Explanation:** The NTF attribute mnemonic given in the attribute file was too long and was truncated to 2 characters

**User action:** If the truncated version is unacceptable then the attribute file should be edited and a two character mnemonic inserted

UNKNCOM, unknown command 'string' encountered in attribute file

**Explanation:** The specified command was found in the first field of the attribute file. The command is not valid and was ignored.

**User action:** The manual should be checked and the correct command used.

-----  
**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.

ABORT, erroneous function return

**Explanation:** This message is used internally by the program to indicate the success or failure of a subroutine.

**User action:** None.

ATTNOTFND, attribute 'string' not found in the FRT file

**Explanation:** The IFF attribute name given was not found in the FRT. The program will exit.

**User action:** Check the spelling of the name in the attribute file and add the ACD entry to the FRT if required.

BADEOPTR, EO address in the NO entry is incorrect - layer structure broken

**Explanation:** When the program attempts to ignore a layer (notably layer 0), it will try to 'jump' around the data in the layer using the NO/EO pointer, which points from the start of the layer to the end. This message indicates that the program found such a pointer at the start of the layer, but that the value contained in it was incorrect. The IFF file is thus incorrect, and the program will exit.

**User action:** Inspect the history of the file to attempt to locate the cause of the incorrect NO/EO pointer. If the cause is not obvious, contact Laser-Scan.

BADFEAT, badly formed feature FSN 'fsn' ('isn')

**Explanation:** The specified feature is not correctly formed, and the IFF file is thus incorrect. The program will exit.

**User action:** Inspect the history of the file to attempt to locate the cause of the faulty feature. If the cause is not obvious, contact Laser-Scan.

BADIFFFC, NTF FC 'integer' is invalid in FC lookup file

**Explanation:** An invalid NTF FC appeared in the feature code lookup file specified with /FCLOOKUP.

**User action:** Change the NTF FC in the lookup file to a valid value (0-9999).

BADPRJ, MD (map descriptor) contains unrecognised projection code 'integer'

**Explanation:** The projection code in the map descriptor is not recognised by the program. This means that it is either an incorrect projection code, or that the version of I2NTF in use has not been updated to recognise all of the current projections in use.

**User action:** Report this problem to Laser-Scan.

BADRANGE, IFF RAnge entry is corrupt

**Explanation:** This message is generated when the minimum X value is greater than the maximum X value or the minimum Y value is greater than the maximum Y in the IFF Range entry.

**User action:** This may indicate a corrupt IFF file which may be mended with IPATCH/WRITE.

BADSPH, MD (map descriptor) contains unrecognised spheroid code 'integer'

**Explanation:** The spheroid code in the map descriptor is not recognised by the program. This means that it is either an incorrect spheroid code, or that the version of I2NTF in use has not been updated to recognise all of the current spheroids in use.

**User action:** Report this problem to Laser-Scan.

BADTXT, unexpected entry "'char'" found in text feature

**Explanation:** This message is output after the BADFEAT error message, when a text feature contains an IFF entry that is not understood by the program as being valid in such a feature. The program will exit.

**User action:** Ascertain whether the entry is actually allowed within a text feature. If it is, then report the problem to Laser-Scan, as the program should presumably be able to understand it. Otherwise, investigate why the entry is present in the text feature.

BADUNIT, cannot output data from file 'file-spec' - wrong units

**Explanation:** The specified IFF file contains data whose units are not degrees, metres or feet. Since NTF only supports these three types of unit, the file cannot be output. The CONVERT informational message will also be output, and the program will exit.

**User action:** As for the CONVERT message - ie use ITRANS to convert the data to units that can be output.

BADUNT, MD (map descriptor) contains unrecognised unit code 'integer'

**Explanation:** The units code in the map descriptor is not recognised by the program. This means that it is either an incorrect units code, or that the version of I2NTF in use has not been updated to recognise all of the current units in use.

**User action:** Report this problem to Laser-Scan.

CLOSERR, error closing file 'file-spec'

**Explanation:** An error occurred in closing the specified file.

**User action:** Depends upon the associated error messages.

COPYRT, the /COPYRIGHT date must be an integer of the form yyyymmdd

**Explanation:** The /COPYRIGHT qualifier has been used to specify a copyright date that is not in the correct form (eg 19870218 for 18th February 1987). The program will exit.

**User action:** Specify the copyright date in the required format.

ERRCLOATT, error closing attribute file 'file-spec'

**Explanation:** An error occurred while trying to close file specified with the /ATTRIBUTE qualifier.

**User action:** Depends upon the associated error messages.

ERRCLOFEAT, error closing featclass file 'file-spec'

**Explanation:** An error occurred while trying to close file specified with the /FEATCLASSFILE qualifier.

**User action:** Depends upon the associated error messages.

ERROPNATT, error opening attribute file 'file-spec'

**Explanation:** An error occurred in opening the file specified with the /ATTRIBUTE qualifier

**User action:** Depends upon the associated error messages.

ERROPNFEAT, error opening featclass file 'file-spec'

**Explanation:** An error occurred in opening the file specified with the /FEATCLASSFILE qualifier.

**User action:** Depends upon the associated error messages.

ERROPNFRT, error opening FRT file 'file-spec'

**Explanation:** An error occurred in opening the file specified with the /FRT qualifier.

**User action:** Depends upon the associated error messages.

ERRRDATT, error reading line from attribute file

**Explanation:** An error occurred in reading from the file specified with the /ATTRIBUTE qualifier.

**User action:** Depends upon the associated error messages.

ERRRDFEAT, error reading line from featclass file

**Explanation:** An error occurred in reading from the file specified with the /FEATCLASSFILE qualifier.

**User action:** Depends upon the associated error messages.

FRTFCERR, FC 'integer' not found in FRT file

**Explanation:** The specified FC was not found in the FRT file, while looking for the graphical type in particular.

**User action:** Check the FRT file.

INITERR, error initialising magtape 'file-spec'

**Explanation:** An error occurred initialising the magnetic tape drive.

**User action:** Depends upon the associated error messages. A common mistake is to forget to mount the tape before running the program.

INLINE, error in line 'integer' of file 'file-spec'

**Explanation:** An error occurred in reading the specified line of the /PARAMETER\_FILE file. The file is abandoned, and the program will exit.

**User action:** Edit the parameter file and correct the offending line.

INTCMDLIN, internal version of command line doesn't start with 'string'

**Explanation:** The program parses the command line in several stages. This error message indicates an error in the internal representation of the command line. It should never be produced.

**User action:** Report this problem to Laser-Scan, with full details of the error.

INTCONERR, integer conversion error of 'real' into an integer

**Explanation:** This indicates that a value is too large for an integer, and will cause the program to exit.

**User action:** Check the indicated coordinates and field widths.

INVALIDATT, invalid attribute mnemonic 'string' used

**Explanation:** The NTF attribute mnemonic specified in the attribute file is invalid for use at level 3. This mnemonic is a default NTF attribute and is reserved for use by the program at this level. The attribute file is abandoned, and the program will exit.

**User action:** Edit the attribute file to use a different NTF mnemonic.

LUTLINE, error reading LINE 'integer' of FC lookup file

**Explanation:** An error has occurred reading a line from the FC lookup file. This message will be followed by LSLLIB and system messages describing what went wrong.

**User action:** Depends upon the associated messages.

LUTTOOSMA, FC lookup file too large for the lookup table

**Explanation:** The specified FC lookup file contains too many entries for the lookup table currently being used.

**User action:** Define LSL\$FRTFRTMAX to be larger than the number of entries in the FC lookup file.

MAXINFILE, more than 'integer' filespecs in the /INPUT\_LIST specification file

**Explanation:** The internal buffer for storing IFF filespecs can hold up to 500 filespecs. This error is produced if more than 500 IFF files are specified in the input list file. The program will exit.

**User action:** Do not try to output so many files as one NTF dataset.

MHDATE, error interpreting date in MH ('string')

**Explanation:** The OS(GB) map header stores some date fields in a binary form, as a number of days since 1900. In order to output these dates to the OS specific part of the sector header (SECHREC) record, when the /OS qualifier has been specified, the program must convert them to a year, month and day. This message indicates that something went wrong with the process, and will be followed by a system message indicating the problem.

**User action:** Depends upon the associated message. If the problem is due to the value in the map header, the CONVERT/OS utility OSMHED may be used to inspect and edit the relevant field. If the problem appears to be due to a fault in the program, consult Laser-Scan.

MULTZERO, setting XY\_MULT or Z\_MULT to zero is not a good idea

**Explanation:** If the user specifies the /XY\_MULT or /Z\_MULT qualifier with an argument of zero, then this message will be output and the program will exit. Multiplying all of the coordinates, or all of the heights, by zero before outputting them is not useful.

**User action:** Specify sensible values for XY\_MULT and Z\_MULT, or accept the defaults.

NOCB, no reference to current CB entry in node 'integer'

**Explanation:** A CB entry has been found in a feature which contains junction points, but no reference can be found to the CB in the junction point description obtained from the sector header.

**User action:** Investigate the IFJ file, to see why the error has occurred. If possible amend the file.

NOCITF, CITF version 'integer' not available - only 93 or 96 allowed

**Explanation:** This program only knows about Ordnance Survey CITF specifications OS93 and OS96.

**User action:** Choose one of the supported versions, or accept the default (OS96).

NODENS, density 'integer' not available - only 1600 or 800 allowed

**Explanation:** The program can only write data to magnetic tape at the two specified densities.

**User action:** Choose one of the supported densities, or accept the default (1600 bpi).

NOFS, FS not present after NF in file 'file-spec'

**Explanation:** This message follows the BADFEAT error message, when a feature is found that does not start with the sequence NF,FS. The IFF file concerned is corrupt, and the program will exit.

**User action:** Investigate the history of the IFF file, to see why it is corrupt. If the reason cannot be determined, consult Laser-Scan.

NOIFFATT, IFF attribute name not given in attribute file

**Explanation:** In the attribute file the ATTRIBUTE command was given without the name of an IFF attribute.

**User action:** Check the attribute file to see why this error occurred.

NOMD, map descriptor (MD) entry not found in file 'file-spec'

**Explanation:** The specified IFF file does not contain a map descriptor, and is thus corrupt. The program will exit.

**User action:** Investigate the history of the IFF file, to see why it is corrupt. If the reason cannot be determined, consult Laser-Scan.

NOMH, map header (MH) entry not found in file 'file-spec'

**Explanation:** The specified IFF file does not contain a map header, and is thus corrupt. The program will exit.

**User action:** Investigate the history of the IFF file, to see why it is corrupt. If the reason cannot be determined, consult Laser-Scan.

NONODE, node not found for JP entry in feature 'integer'

**Explanation:** There is no reference to the current JP in the sector header. The IFJ file is considered corrupt and the program will exit.

**User action:** Investigate the IFJ file, to see why the error has occurred. If possible amend the file.

NONTFATT, NTF attribute mnemonic not given in attribute file

**Explanation:** In the attribute file the ATTRIBUTE command was given without the NTF mnemonic into which it should be put.

**User action:** Check the attribute file to see why this error occurred.

NOPOS, no coordinate entry found in feature

**Explanation:** This message follows the BADFEAT error message, when a feature is found that does not contain any coordinate data. The IFF file concerned is corrupt, and the program will exit.

**User action:** Investigate the history of the IFF file, to see why it is corrupt. If the reason cannot be determined, consult Laser-Scan.

NORECIP, /RECIPIENT must be given in the command line or file

**Explanation:** The /RECIPIENT qualifier is required for every run of the program. If it is not specified, this message will be output and the program will exit.

**User action:** Specify the recipient of the data, either on the command line or in a parameter file.



NOSCALE, no scale specified in map descriptor or map header

**Explanation:** Neither the map descriptor entry, nor the map header entry (if /OS mode has been selected) contains a map scale. This is required for output to the section header record. Note that a map descriptor with the scale unset is not actually fully set.

**User action:** Use ITRANS/DESCRIPTOR to set the map descriptor correctly. If output in OS(GB) mode is required, then the map header must be set correctly (using the CONVERT/OS utility OSMHED), which includes the scale of the map.

NOST, no reference to current ST entry in node 'integer'

**Explanation:** An ST entry has been found in a feature which contains junction points, but no reference can be found to the ST in the junction point description obtained from the sector header.

**User action:** Investigate the IFJ file, to see why the error has occurred. If possible amend the file.

NOTINT, an integer value less than 10000 must be supplied with /SERIAL

**Explanation:** If the serial number of the current NTF volume is specified using the /SERIAL qualifier, the value specified must be within the range 1-9999. This message is given if the user requests a serial number outside that range. The program will exit.

**User action:** Specify a value within the range, or accept the default value of 0.

NOTOSMAP, file 'file-spec' does not have an OS map header - unable to do OS output

**Explanation:** If the /OS qualifier is specified, all of the IFF files to be output must contain OS(GB) style map header entries. The files are all checked before any output to NTF is performed. If one is found without an OS(GB) map header, this message is output and the program will exit.

**User action:** If OS(GB) style output really is required, then correct the relevant file. The IMP utility IPATCH can be used to change the map header (MH) entry so that it is flagged as an OS(GB) map header, and the CONVERT/OS utility OSMHED can then be used to set the requisite values within the entry.

NOTSET, map descriptor (MD) not set in file 'file-spec'

**Explanation:** The specified IFF file does not contain a valid map descriptor entry - it is unset. The program will exit.

**User action:** Use the IMP utility ITRANS/DESCRIPTOR to set the map descriptor correctly.

NOTSUPPORTED, /WATER\_DISTRIB qualifier not supported at Version 2.0

**Explanation:** The /WATER\_DISTRIB and /VERSION=2.0 qualifiers were given on the command line which are not allowed since this is not supported at Version 2.0

**User action:** If you use the /WATER\_DISTRIB and require the output of Version 2.0 NTF, please contact Laser-Scan.

NTFLINE, error reading parameter file

**Explanation:** An error has occurred reading the next line from the /PARAMETER\_LIST file. This message will be followed by LSLIB and system messages describing what went wrong.

**User action:** Depends upon the associated messages.

OPENERR, error opening file 'file-spec'

**Explanation:** An error occurred opening the specified file. This message will be followed by LSLIB and system messages describing what went wrong.

**User action:** Depends upon the associated messages.

OUTCONERR, output conversion error of 'real' into field width 'integer'

**Explanation:** This indicates that a value is too large for the field width, and will not be converted.

**User action:** Check the indicated coordinates and field widths.

OUTFILE, error in output specification 'file-spec'

**Explanation:** An error has occurred in parsing the NTF output specification as a filespec.

**User action:** Correct the filespec used.

PARAMER, parsing error in parameter file

**Explanation:** An error has occurred in interpreting one of the lines in the /PARAMETER\_FILE file. This message will have been preceded by a message explaining the problem, and will be followed by the INLINE message. The file will be abandoned and the program will exit.

**User action:** Correct the relevant line of the parameter file.

RANGEOVER, Range overflow when integerised using XY\_MULT

**Explanation:** When the range of the IFF file is converted to integer form using the XY\_MULT value, it overflowed the maximum size that will fit into a 4 byte integer.

**User action:** Ensure that the XY\_MULT value is correct and the IFF range entry contains sensible value which reflect the coordinates and which will not overflow the maximum size for a 4 byte integer.

TOOMNYARMS, node 'integer' has 'integer' arms - no more than 'integer' are allowed

**Explanation:** The specified node has more than the maximum number of radiating links. Such an entry is not allowed, and the program will exit.

**User action:** If a feature of this size is required, consult Laser-Scan to have the limit increased.

TOOMNYCOLL, too many collect objects stored - maximum is 'integer'

**Explanation:** Collect records are formed from several features and are built up as features are read from the IFF file. There is therefore a limit to the number of collect records that can be stored as the features are read. This message indicates that the maximum number of such records have been stored. The program will exit.

**User action:** Consult Laser-Scan to have the limit increased.

TOOMNYFC, too many different FC's - maximum allowed is 'integer'

**Explanation:** The IFF file contains more unique feature codes than are allowed. Such a file cannot be processed, and the program will exit.

**User action:** Consult Laser-Scan to have the limit increased.

TOOMNYFEAT, too many annotated features stored - maximum is 'integer'

**Explanation:** Annotated features are stored until the text to be used to annotate them is found in the IFF file. This message indicates that the maximum number of such features have been stored. The feature will not be annotated.

**User action:** Consult Laser-Scan to have the limit increased.

TOOMNYLNKS, feature 'integer' has too many links - no more than 'integer' allowed

**Explanation:** The specified feature consists of more than the maximum number of links. Such an entry is not allowed, and the program will exit.

**User action:** If a feature of this size is required, consult Laser-Scan to have the limit increased.

TOOMNYNODES, input file has too many nodes - no more than 'integer' allowed

**Explanation:** The input file consists of more than the maximum number of nodes. A file of this size is not allowed, and the program will exit.

**User action:** Consult Laser-Scan to have the limit on the file size increased.

TOOMNYPTS, FSN 'fsn' ('isn') has 'integer' points in an ST/ZS - no more than 'integer' allowed

**Explanation:** The specified feature contains an ST or ZS entry containing more than the maximum number of points. Such an entry is not allowed. The program will exit.

**User action:** Investigate the history of the IFF file, to see why it is corrupt. If the reason cannot be determined, consult Laser-Scan.

TOOMNYTXT, too many annotation texts stored - maximum is 'integer'

**Explanation:** Texts that are to be used to annotate a particular feature are stored until that feature is found in the IFF file. This message indicates that the maximum number of such texts have been stored. The text will not be used to annotate a feature.

**User action:** Consult Laser-Scan to have the limit increased.

TYPE1MD, type 1 map descriptor in file 'file-spec'

**Explanation:** The program requires that all IFF files to be output must have a type 2 map descriptor (MD) entry. If a file does not, this message is output and the program will exit.

**User action:** Use the IMP utility ITRANS/DESCRIPTOR to change the map descriptor from type 1 to type 2.

UNEXPENT, unexpected entry "'char'" found in line/point feature

**Explanation:** This message is output after the BADFEAT error message, when a line or symbol feature contains an IFF entry that is not understood by the program as being valid in such a feature. The program will exit.

**User action:** Ascertain whether the entry is actually allowed within a line or symbol feature. If it is, then report the problem to Laser-Scan, as the program should presumably be able to understand it. Otherwise, investigate why the entry is present in the text feature.

UNEXPEOF, unexpected end of IFF file

**Explanation:** This message is output if the program finds the end of the IFF file, when it is not expecting it. It means that the file is incorrectly terminated, or corrupt in some other way.

**User action:** All IFF files should end with the sequence EO (end of layer) EM (end of map) EJ (end of job). Investigate the offending file to check whether it actually has this structure. If the file appears correct, then consult Laser-Scan. If the file is not correct, then investigate its history and establish what has caused it to be wrong.

VMALLFAIL, virtual memory allocation for FC lookup table failed

**Explanation:** The virtual memory allocation routine failed to allocate sufficient space to contain the FC lookup table.

**User action:** Report this error message to your system manager, along with the associated system error. He may be able to increase your virtual page count to allow the lookup table to be used.

---

**MESSAGES (OTHER)**

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

## CHAPTER 4

### NTF2I UTILITY

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## UTILITY NTF2I

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### FUNCTION

NTF2I reads NTF/CITF data from a file or magnetic tape, and outputs an IFF file for each section.

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### FORMAT

\$ NTF2I input-file-spec

#### Command qualifiers

#### Defaults

|                             |                       |
|-----------------------------|-----------------------|
| /ATTRIBUTE_FILE='file-spec' | See description below |
| /[NO]CITF='integer'         | /NOCITF               |
| /[NO]CONTINUE               | /NOCONTINUE           |
| /FC_LOOKUP='file-spec'      | No lookup file        |
| /FRT='file-spec'            | See description below |
| /[NO]IFF_POINTSIZE          | /IFF_POINTSIZE        |
| /[NO]LOG                    | /NOLOG                |
| /[NO]LOWER_LEFT             | /NOLOWER_LEFT         |
| /[NO]OS                     | /NOOS                 |
| /[NO]OSCAR                  | /NOOSCAR              |
| /OSCAR_START_AC=integer     | Undefined             |
| /OSCAR_END_AC=integer       | Undefined             |
| /[NO]OUTPUT='file-spec'     | /NOOUTPUT             |
| /[NO]SERIAL_MAGTAPE         | /NOSERIAL_MAGTAPE     |

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### PROMPT

\_Input NTF file:                   input-file-spec

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### PARAMETERS

input-file-spec

- specifies where the NTF data is to be read from. This may be either the name of a magnetic tape drive (e.g. MTA0:), or the name of a file on disk (e.g. TEST.NTF). If the input is from tape then the colon at the end of the device name must be provided. The default input file-spec is SYS\$DISK:[].NTF
- 

### COMMAND QUALIFIERS

/ATTRIBUTE\_FILE='file-spec'

- gives the file in which NTF attribute mnemonics are associated with IFF AC names. The qualifier can only be used in conjunction with the /FRT qualifier and if it is not given then no attributes are transferred.



/CITF='integer'  
/NOCITF (default)

- specifies to the program that the input file is an Ordnance Survey Common Internal Transfer Format (CITF) file. This qualifier should not be used with /OS and requires the /ATTRIBUTE\_FILE and /FRT qualifiers. See the section below on the conversion of CITF files.

The optional integer specifies which version of CITF data is to be read.

/CITF=93 specifies that the CITF file uses OS93 data structures.

/CITF=96 specifies that the CITF file uses OS96 data structures.

The use of /CITF with no parameter defaults to /CITF=96.

/CONTINUE  
/NOCONTINUE (default)

- specifies that if an input CITF file of DATA\_MODEL other than 2 is being read, then continue processing as far as possible. Since NTF2I will only convert CITF files where the {DATA\_MODEL} field in the [DBHREC] record is set to 2, the default action is abort if this is not the case. This qualifier is only value when /CITF is used.

/FC\_LOOKUP='file-spec'

- specifies the feature code lookup table parameter file to be used. If this qualifier is not given, all feature codes are translated verbatim.

/FRT='file-spec'

- this qualifier gives the name of the Feature Representation Table (FRT) which hold information about IFF attributes. If this is not given no attributes are transferred and a rotation (RO) entry will be written to all point features in the output IFF file. This may produce inconsistencies if, for example, a feature is intended to be an unoriented symbol but has an orientation. In this instance, LITES2 will give a warning messages reporting that the feature has an unexpected RO entry and the RO will be ignored. The /FRT qualifier is compulsory with /CITF.

/IFF\_POINTSIZE (default)  
/NOIFF\_POINTSIZE

- specifies that text heights will be output to the IFF file as point sizes or in 1/100ths of a millimetre, the default being in point sizes. If the /OS qualifier is used, the heights will be output in points sizes anyway unless overridden using /NOIFF\_POINTSIZE. Non-Ordnance Survey data will always be output in 1/100ths of a millimetre and this qualifier will have no effect.

/LOG  
/NOLOG (default)

- specifies that additional information is to be written to the terminal. When the program starts up, the name of the device from which the NTF data is being read, and the names of the IFF files being written, are logged. Various messages summarising the form of NTF being read will also be produced.

/LOWER\_LEFT  
/NOLOWER\_LEFT (default)

- specifies that all text features should be output by transferring their lower left (i.e. position 0) coordinates. If these coordinates are not present they will be calculated as per the Ordnance Survey digitising specification and a warning message will be output.

/OS  
/NOOS (default)

- specifies that OS(GB) map header information is to be found in the free text area of the section header relating to each file. The layout of the map header information in the free text area is defined by OS. Note that this use of free text space is allowable within the standard. The use of this qualifier will also force the Basic Grid Interval (BGI) to be calculated for Ordnance Survey data and written to the IFF map header. The BGI is specific to OSTF but is acceptable in an OS map header.

/OSCAR  
/NOOSCAR (default)

- specifies that the file or tape being read contains Ordnance Survey's OSCAR data. The data can be read as normal without the qualifier but any [NODEREC] records will be ignored. If the qualifier is given, the level information present in the [NODEREC] record is transferred onto the relevant links at that node. This information is attached to the link as attributes (IFF AC entries) which are defined by qualifiers /OSCAR\_START\_AC and /OSCAR\_END\_AC. The presence of these level attributes is particularly useful to distinguish between valid road junctions and over/under situations. In this situation a LITES2 macro could be written to reconnect those over/under cases at the same level while leaving road junctions unaltered.

/OSCAR\_START\_AC = integer

- specifies the Attribute Code (AC) used to hold the OSCAR level information that is extracted from the [NODEREC] record for the start of a line. If this qualifier is not specified or given an AC out of range, then all [NODEREC] records will be ignored and the data will not be treated as OSCAR.

/OSCAR\_END\_AC = integer

- specifies the Attribute Code (AC) used to hold the OSCAR level information that is extracted from the [NODEREC] record for the end of a line. If this qualifier is not specified or given an AC out of range, then all [NODEREC] records will be ignored and the data will not be treated as OSCAR.

/OUTPUT='file-spec'

/NOOUTPUT (default)

- specifies that information about the files being read from NTF, together with the form of NTF being produced, should be written to the specified log file. All NTF comment records encountered will be written to the file, prefixed with "//". Also, the when the following records are found, information is written to the log file:

- o [VOLHDREC] - the volume header record is summarised.
- o [DBHREC] - the database header record is summarised.
- o [FEATCLASS] - the contents is presented as a table.
- o [DBQUAL] - the contents is reflected.
- o [SECQUAL] - the contents is reflected.
- o [VOLTERM] - the contents is reflected.

The default file-spec for the log file is SYS\$DISK:[ ]NTF2I.LOG

/SERIAL\_MAGTAPE

/NOSERIAL\_MAGTAPE (default)

- indicates that the standard input for the program is a magnetic tape drive connected via a DIL serial controller interface. The qualifier is ignored if input is from a device which is mounted /FOREIGN (in which case input is from a standard magnetic tape drive). If input is requested from a terminal device then it will be assumed that this is the DIL controller.

---

## RESTRICTIONS

- o Only NTF version 1.1 and 2.0 data at levels 1, 2 and 3 and CITF version 1.0 may be read.
- o The NTF version is also identified by a version date in the database header record. This program will cope with any version up to and including the one released in April 1989 for NTF v1.1 and May 1992 for NTF v2.0, any later versions will cause a warning message to be generated although the program will attempt to continue.
- o The IFF files created have the spheroid and projection (in the map descriptor) set to Airy and 101 (UK National Grid) respectively. If this is incorrect, then use ITRANS/DESCRIPTOR to change the IFF file's map descriptor.
- o All data other than collect and complex polygon records are written to IFF layer 1.
- o Collect and Complex Polygon data is written to layer 2.
- o At NTF level 3 the feature code of any point or line feature must occur in an [ATTREC] associated with that feature. It should be specified using one of the default NTF attribute mnemonics FC, LC or ST. Feature codes are assumed to be numerical.
- o In the event of the NTF file containing alphanumeric or alphabetic feature codes, the feature code of the feature being generated will be set to 0 (for line and point records) and 28 (for text records).
- o The feature code read from the NTF file will, in addition to the feature code in the FS entry, be stored as the optional text field of an AC entry of type 1. The correct feature codes associated with the text entry can be set by using the IMP utility IRECODE.
- o No feature may have more than 10,000 points.
- o Curved text - [CURVTEXT] records are not understood. If such a record is found a warning message will be output.
- o Invisible line sections (indicated by the {QPLAN} field in [GEOMETRY\*] records) are not understood. All lines will be output as visible lines, with a warning message if an invisible section is detected.
- o Polygons - [POLY] records are output as line features
- o Complex -Polygon - [CPOLY] records are output as line features with invisible line sections joining the constituent polygons.

- o All attributes which are to be transferred - including NTF default attributes - must be specified in [ATTDESC] records, otherwise they will be ignored. The exception to this is CITF default attributes.
- o Only the contour height (HT) and orientation (OR) {VALUE} fields are recognised at NTF level 1. At level 2 any NTF mnemonic used in the {VALUE} field must be given in the attribute file. At version 2.0, the contours height (HT) must be defined in the attribute file and can be used to direct it to the default AC 2 (Contour) or AC 3 (Height) attribute, depending on the name in the attribute file.
- o If no FRT is given, all symbol features created will have a rotation (RO) entry if an OR {VALUE} attribute was present. If the FRT is specified, the Graphical Type of the output feature is examined to determine whether a rotation is required. No RO entry is output for unoriented symbols (GT 7), oriented symbols (GT 8) will received an RO entry (with a default value of 0.0 if it has no value in NTF) and scaled symbols (GT 9) will not receive an RO entry.
- o At level 2, [NAMEREC] records associated with linear data will be output as type 12 ACs.
- o The original NTF feature ID numbers ({LINE\_ID}, {POINT\_ID}, {NAME\_ID} etc.) are not used in the IFF files being produced.
- o The program does not support raster data - only vector sections may be present on the tape.
- o When using NTF2I to directly read from unformatted tape, the program will prompt the user to mount any continuation volumes when the tape mark after each volume is detected. If separate volumes are supplied on formatted media, the individual files should be appended together into one large disk file. Here is an example of the join between two volumes:

[lines deleted]

000000014412 00000001420000014336 00000001000000014270 00000000610000014224

1%

0000000000410000014204 00000000260000014195 00000000000000014183 0%  
23000477HT00009002010%

99End of Volume 01 Transfer Set Continues on Volume 02 1%

01ORDNANCE SURVEY SAMPLE\_CONTOUR\_DATA 1993030500000210200V \0%

210000002000400000000800000014274 00000000420000014233 00000000150000014211

1%

000000000000000000014204 0%

23000478HT00009002010%

210000002001300000003000000014504 00000003390000014523 00000003750000014537

1%

[lines deleted]

- o NTF 1.1 attributes do not contain a 'date' datatype so if a date is required from an NTF attribute it is assumed that it is written in an NTF text attribute in standard VMS format. If a date conversion fails a warning will be given and it will not attempt

any more.

- o The following restrictions apply to version 2.0 NTF, in addition to the restrictions that exist for 1.1 NTF:
  - No mechanism at present exists to convert level 1 and 2 [LINEREC], [POINTREC] and [NAMEREC] attributes, CHG\_TYPE and CHG\_DATE into ACs.
  - Combined attributes ([ATTCOM] records) are not supported. Therefore each attribute must be defined and used individually.
  - IFF Coordinate Block structures (CBs) not supported, although [GEOMETRY2] records can be read and interpreted.
  - [CHAIN], [COLLECT] and [CPOLY] records are not interpreted. This means that NTF2I will not currently read Ordnance Survey's Boundary-Line data.
  - Only attributes 'HT' and 'OR' can be read from the {VALUE} field of a [POINTREC] and [LINEREC] record.
  - Unlike version 1.1 NTF, there are no default attributes and so any that are present in the NTF file must be defined in [ATTDESC] records, the attribute file and the FRT in order to carry them into IFF.

---

## DESCRIPTION

NTF2I reads NTF data at levels 1, 2 or 3 and CITF version 1.0 from file or magnetic tape into a series of IFF files, one for each section of the NTF.

Any [FEATCLASS] records are read and the contents written to the log file. At level 3 the fields in these records are used to convert feature codes stored as LC or ST attributes to the FC form required in IFF features. If a [FEATCLASS] record does not contain a value in the {FEAT\_CODE} field the [FEATCLASS] record number will be used.

For each section, the [SECHREC] (section header) record is read. The name of the IFF file to be created is taken from the {SECT\_REF} field, with characters that are not allowed in a VMS filename replaced by underlines (\_). If the /OS qualifier has been specified, then the IFF file is created with an OSGB style map header entry with any available data written to it. The map descriptor created is type 2, with the details taken from the section header. The X,Y offset is taken from the {X\_ORIG} and {Y\_ORIG} fields, and the units is deduced from the {XY\_UNIT} field. The spheroid and projection are set to Airy and 101 (UK National Grid) respectively.

The data for the section is output to layer 1 of the IFF file. Point features are output as symbols, line features as lines, and name features as texts. Note that

- o all X and Y coordinates are multiplied by the section header's {XY\_MULT} value before being output.
- o all Z values are multiplied by the section header's {Z\_MULT} value, and then have the {Z\_DATUM} added, before being output.
- o the {SECURITY} and {CHANGE} fields are never used.
- o the {FEAT\_CODE} fields are read as integer values, and these values are then used as the feature code (FC) in the output IFF file's feature status (FS) entry.
- o the feature serial numbers for each file start at 1, and are incremented for each feature output. Thus each FSN is unique within the whole file.
- o the text/symbol bits in the FS entry will be correctly set to indicate whether the feature is a point (symbol), line or name (text) feature.
- o the {GTYPE} field in [GEOMETRY\*] records is ignored - all linear features are assumed to be simple lines.
- o when a [NAMPOSTN] record is encountered, the {FONT} field is extracted and stored as the category for the text feature. If the font value is outside the range 0-63, a category of 1 will be used. The [TEXTREP] record is treated in the same way.
- o the [NAMPOSTN] {TEXT\_HT} field will be extracted and converted to hundredths of a mm - unless /OS is specified, in which case it will be converted to an OS point size - and stored in a TH entry. The [TEXTREP] record is treated in the same way.
- o the [NAMPOSTN] {ORIENT} field will be used to calculate the orientation of the text, and this will be output to an RO entry (in radians, as is usual). The [TEXTREP] record is treated in the same way.
- o [NODEREC], records will be ignored.



## Attributes

NTF version 1.1 and above now has a coherent definition of how attributes are transferred so now IFF AC values can be easily ported to and from NTF. Firstly an IFF attribute must be associated with an NTF mnemonic. This is done via the new attribute file ( given with the /ATTRIBUTE\_FILE qualifier ), this file should contain IFF AC names together with the NTF mnemonic. There are also 3 flags which should be added to the end of each line to specify whether :

1. the AC's optional text field should be read rather than the attribute value
2. the AC is used to link a text to a linear feature so that the text can be used to annotate the feature - only valid at level 3
3. the AC is used to group several features together so that a [COLLECT] record may be output - only valid at level 3

Each flag should have the value T or F to indicate true or false respectively, though the latter two flags are specific to the conversion I2NTF and may be omitted here. An example of an attribute file is shown below.

```
!
! Command procedure to tell I2NTF/NTF2I which attributes to
! associate with which NTF mnemonic. The IFF name must be
! present in the FRT file.
!
! Format is:
!
!ATTRIBUTE IFF_ATT_NAME  NTF_MNEMONIC  TEXT  ANNOTATE  COLLECT
!
ATTRIBUTE    LH_BOUNDARY          LH      T      F      F
ATTRIBUTE    RH_BOUNDARY          RH      T      F      F
ATTRIBUTE    CONTOUR              CO      F      F      T
ATTRIBUTE    TEXT                  TX      F      T      F
ATTRIBUTE    COUNTY_LEFT          CL      T      F      F
ATTRIBUTE    COUNTY_RIGHT         CR      T      F      F
ATTRIBUTE    COUNTY_LEFT          CA      F      F      F
ATTRIBUTE    COUNTY_RIGHT         CB      F      F      F
```

In the above attribute file the NTF attributes CO and TX are written to the value fields of IFF AC's CONTOUR and TEXT whilst the others are written to the optional text field of the IFF AC. Note that COUNTY\_LEFT and COUNTY\_RIGHT have both text and value written. The interpretation of the attribute is taken from both the [ATTDESC] record and the IFF FRT file. If the two definitions of the attribute type differ then, if possible, the data will be converted. Any non-standard AC types must be declared in ACD entries in the FRT file. Note also that NTF mnemonics must be 2 characters long.

---

## Conversion of Ordnance Survey CITF data

NTF2I will convert version 1.0 CITF files which are based upon level 5 of NTF Version 2 as defined by BS7567. Only CITF files whose {DATA\_MODEL} field in the [SECHREC] record is equal to 2 will be converted, although the /CONTINUE qualifier will override this.

### The IFF MH Entry And CITF Header Records

If they are present, the [FEATCLASS], [SECHREC], [TRANSFORM], [MANINFREC] and [EXTREC] CITF header records will be copied to a type 4 IFF Map Header which will be created to accomodate them.

The size allocated to this header will be taken from the lookup table pointed to by the logical LSL\$OS\_MH\_TABLE. The field is CITF\_LENGTH and must be at least 320 bytes long to accomodate the first 3 lines of a [SECHREC] record and not exceed 10000 bytes. If the size defined in this field is not sufficient for all the records to fit into, then a warning will be given and it will be increased to the size required. If the number of CITF header lines means that the header size will exceed 10000 bytes, then the remaining lines will be lost.

Each line of the CITF header records that is to be copied to the Map Header will be padded with spaces after the {EOR} character (%) in order to locate the record descriptor in the first characters of each line.

Certain values are required to be read from the [SECHREC] record to be used when interpreting the CITF file such as {XYLEN}, {XY\_UNIT}, {XY\_MULT}, {ZLEN}, {Z\_UNIT}, {Z\_MULT} and {SCALE}. These fields must contain correct values reflecting the true format of the data for successful conversion.

The {DIFF\_HT\_LEN} size is also required and is in the variable part of the [SECHREC] as so must be precisely defined as the program works under the assumption that there will be sufficient divider (//) characters after which it is located. Refer to the DATA PREPARATION section for details of how to set up a correct map header lookup table.

### Combined Attributes

Combined attributes are handled providing the components of the [ATTCOM] record have previously been defined in [ATTDESC] or [ATTCOM] records, or are in the list of default CITF attributes which need not be present in the file.

Since combined attributes can consist of components which are themselves combined attributes, there is limit of how many components a combined attribute may have, once fully expanded. This limit is 20 components but if this is insufficient, please contact Laser-Scan to arrange for it to be increased.

All CITF attributes which appear in [ATTREC] or [ACRDREC] records must be separated by a DIVIDER which differs from NTF where DIVIDERS are only present after variable length text fields.

However, when combined attributes appear in [ATTREC] or [ACRDREC] records they should not have DIVIDERS between their component values, except when the value is a variable length string.

### **Feature Level Attributes**

CITF feature records, [LINEREC], [POINTREC] and [NAMEREC] have provision for attributes which, if present, will be written as AC entries to the IFF feature. These attributes are UPDATE\_DATE, UPDATE\_STATUS, SPEC, PROCESS, DATE\_OF\_PROCESS, PHYS\_STAT and MARGINAL\_TXT which must be defined in the ACD section of the FRT if they are to be transferred. These features should not be present in the attribute file as this intended for attributes which are held in [ATTREC] or [ACRDREC] records.

The alphanumeric feature level attributes UPDATE\_STATUS, PROCESS, PHYS\_STAT and MARGINAL\_TXT will be placed into the value field of the AC as characters and the datatype definition in the ACD part of the FRT is ignored by the program. This is so that the LITES2 OPERATION command can be used to update these ACs and this action if performed on the value field.

These attributes will always be treated as character values and should be defined as datatype 'C' in the ACD so that programs such as LITES2 and IPATCH will show their true representation. The SPEC attribute which is a variable length alphanumeric string will be written to the optional text string of the AC and the datatype will not matter. The UPDATE\_DATE and DATE\_OF\_PROCESS attributes will be placed in the value field of the AC and should be defined as datatype 'D' in the ACD.

### **Per-point Attributes And CBs**

IFF Coordinate Blocks (CB) entries are able to hold 20 columns to represent each point in a feature, which includes the X, Y and Z coordinates.

[GEOMETRY\*] records have various data quality fields attached to every point which are maintained by transferring them to the columns of the CB of the feature. The AC codes of these attributes must be known and so they must be defined in the ACD part of the FRT in the same way as for the feature level attributes and should not be present in the attribute file.

The X\_COORD, Y\_COORD and Z\_COORD should not be defined in the ACD as they have standard AC codes of 91, 92 and 93 respectively.

[GEOMETRY1] records have fields X\_COORD, Y\_COORD, XY\_ACQ\_METH, QPLAN which are written to the first 4 fields of a CB.

[GEOMETRY2] record have fields X\_COORD, Y\_COORD, XY\_ACQ\_METH, QPLAN, Z\_COORD, DIFF\_HT, Z\_ACQ\_METH, QHT and QDIFF\_HT all of which are maintained in the conversion.

Attributes held in Attribute Coordinate [ACRDREC] records are also attached to points in the CB, after those derived from the [GEOMETRY\*] records.

Since [GEOMETRY1] records result in 4 fields of a CB being used, the other 16 may be used to hold [ACRDREC] attributes. This limit must take into account any combined attributes when expanded.

Similarly, [GEOMETRY2] records result in 9 fields of a CB being used, which leaves 11 which may be used to hold [ACRDREC] attributes. Again, this limit must take into account any combined attributes when expanded.

When attaching [ACRDREC] attributes to CB entries, the superset of all attributes held in all the [ACRDREC] records in the feature must be determined to define all the columns in the CB. The attributes of each [ACRDREC] record will be written to correct column for the point number to which they belong and the other columns not containing values will be absent. Absent values are represented in IFF with the value IFF\_ABSENT and I2NTF will check for this when determining the output of [ACRDREC] records to the CITF file.

Any [ACRDREC] records which have alphanumeric attributes of more than 4 characters will be truncated as only columns of 4 bytes each may be attached to a row in a CB.

### **Symbol Features**

The feature code of point features will be looked up in the FRT to find it's Graphical Type (GT) in order to determine if an IFF RO entry is required. Any distance (DT) or orientation (OR) attributes found in point features will not be written as IFF ACs under the assumption that their values will be used for scaled symbols or in the IFF RO entry.

If a point feature has a GT of 9 and a distance (DT) and orientation (OR) attribute it is treated as a scalable symbol and the second point will calculate using these values. This second point will not have any per-point attributes present in the CB as it was not captured. The DT and OR attributes themselves have been used and will not be written to an AC in the feature.

If a point feature has a GT of 9 but a missing distance (DT) attribute then it will be treated as an orientated symbol (GT 8) if the OR attribute was present, but as a non-orientated symbol GT 7 if not.

All point feature with a GT of 8 will have an IFF RO entry output containing the value held in the orientation (OR) attribute if it was present, or 0.0 if it was not.

Point features with a GT of 7 will have no IFF RO entry and any DT or OR attributes attached to the feature will be lost.

### **Text Features**

CITF text features which contain two points in the [GEOMETRY\*] record will be transferred into IFF using the first coordinate tuple (the digitised position) only. The plotting position will be lost since it can be calculated from the {DIG\_POSTN} by I2NTF if transferred back to CITF.

All text features will be given a feature code of 28 as done with NTF2I/OS. Text features whose feature code conform to the OS 1991 feature code list (ie lie between 1000 and 1013) will be given a feature code of 28 and the number in excess of 1000 will be held in the Category field of the Feature Status entry. (eg. text feature code 1006 will be given a feature of 28 in IFF and the FS Category will contain 6). I2NTF can then use the FS entry to generate the original feature code if needed.

### **Date Attributes**

Any CITF date attributes of format A8 (eg SD and SY) should be defined in the ACD as of type date ('D') and in the ATTRIBUTE\_FILE with the 'TEXT' option set to false. This will ensure they are converted into 4 byte VAX dates and will therefore fit into a column of a CB.

Any dates which have the day component set to zero (eg 19930200) can not be converted to a VAX date and so the 1st of the month is assumed. (eg 19930201).

### **Attribute File**

It is intended that all of the CITF default attributes listed in the CITF Specification Mod 7/C are defined in the ATTRIBUTE\_FILE and ACD section of the FRT. This will ensure that a stable list of attribute definitions exists so that all CITF files read will have consistent attribute translation. Any CITF/IFF attributes undefined in the ATTRIBUTE\_FILE and FRT will not be converted.

Only [ATTREC] and [ACRDREC] attribute mnemonics should be defined in the attribute file. The feature level (UPDATE\_DATE, UPDATE\_STATUS, etc) and per-point level (XY\_ACQ\_METH, QPLAN, etc) attributes should not be defined, since they are looked up directly in the ACD part of the FRT file.

Here is an example of an attribute file defining the default attributes intended for use with CITF. Note that any text attributes have the 'TEXT' option defined as true, denoting that value is to be placed into the optional text string of the AC. In this case, the type of the AC as defined in the ACD part of the FRT is irrelevant.

Any integer, real, or date attributes should have the 'TEXT' option set to false. Note also that the 'ANNOTATE' and 'COLLECT' options are not used for CITF and are set to false.

```

!
! Default CITF attributes
!
!ATTRIBUTE   IFF_ATT_NAME   NTF_MNEM   TEXT   ANNOTATE   COLLECT
!
ATTRIBUTE     ADDR_ONE       A1         T       F         F
ATTRIBUTE     ADDR_TWO       A2         T       F         F
ATTRIBUTE     POSTAL_ADDR    AD         T       F         F
ATTRIBUTE     ACCENTS_MASK   AM         T       F         F
ATTRIBUTE     ADDR_QUAL      AQ         F       F         F
ATTRIBUTE     ADDR_STAT      AS         F       F         F
ATTRIBUTE     BUILD_NAME     BD         T       F         F
ATTRIBUTE     BUILD_NUM      BN         F       F         F
ATTRIBUTE     CONCAT_FLAG    CF         T       F         F
ATTRIBUTE     COUNTY_NAME    CN         T       F         F
ATTRIBUTE     CHANGE_TYPE    CT         T       F         F
..
..
[lines deleted]
..
..
ATTRIBUTE     SETTLEMENT     SN         T       F         F
ATTRIBUTE     DATE_OF_SURV    SY         F       F         F
ATTRIBUTE     TYPE_OF_CONSTR  TC         T       F         F
ATTRIBUTE     THOROUGHFARE   TN         T       F         F
ATTRIBUTE     CITFTEXT        TX         T       F         F
ATTRIBUTE     UORN            UN         T       F         F

```

### FRT ACD Section

Here is an example of the ACD part of an FRT suitable for use with CITF data whose ACD TABLE 4 reflects the IFF\_ATT\_NAME field of the above attribute file.

The feature level attributes in ACD TABLE 2 must be defined exactly as shown and should not be defined in the attribute file. While NTF2I ignores the datatype of ACs in the ACD (except for dates, which should be 'D'), it is advised that attributes are defined to be of the correct type so that programs such as LITES2 and IPATCH will display their true representation.

The per-point attributes in ACD TABLE 3 must also be defined exactly as shown and should not be defined in the attribute file. The AC codes of the X, Y and Z coordinates that will appear in the CB entry will be the default ones of 91, 92 and 93 respectively and should not be present in the ACD section.

```

!
! Feature level attributes
!
ACD TABLE 2
!
ACD D 1 UPDATE_DATE
ACD C 2 UPDATE_STATUS

```

```
ACD C 3 SPEC
ACD C 4 PROCESS
ACD D 5 DATE_OF_PROCESS
ACD C 6 PHYS_STAT
ACD C 7 MARGINAL_TXT
!
! Per-point attributes
!
ACD TABLE 3
!
ACD C 1 XY_ACQ_METH
ACD C 2 QPLAN
ACD R 3 DIFF_HT
ACD C 4 Z_ACQ_METH
ACD C 5 QHT
ACD C 6 QDIFF_HT
!
! Default attribute codes
!
ACD TABLE 4
!
ACD C 1 ADDR_ONE
ACD C 2 ADDR_TWO
ACD C 3 POSTAL_ADDR
ACD C 4 ACCENTS_MASK
ACD I 5 ADDR_QUAL
ACD I 6 ADDR_STAT
ACD C 7 BUILD_NAME
ACD I 8 BUILD_NUM
ACD C 9 CONCAT_FLAG
ACD C 10 COUNTY_NAME
..
..
[lines deleted]
..
..
ACD C 60 SETTLEMENT
ACD C 61 DATE_OF_SURV
ACD C 62 TYPE_OF_CONSTR
ACD C 63 THOROUGHFARE
ACD C 64 CITFTEXT
ACD C 65 UORN
```

### Changing Feature Codes During Translation

NTF2I allows feature codes to be changed during translation through the use of a feature code lookup table parameter file. This facility is invoked by using the /FCLOOKUP qualifier. It is useful for converting CITF feature codes which are invalid in IFF (i.e. greater than 32767) into valid IFF feature codes. Refer to the DATA PREPARATION section for details of how to set up a feature code lookup table.

-----  
**EXAMPLES**

```
$ MOUNT/FOREIGN MSA0:<CR>
$ NTF2I/LOG/OUTPUT=TRANSYL MSA0:<CR>
%NTF2I-I-NTFOPEN, NTF file MSA0 opened
%LSLLIB-I-LOGOPNOUT, log file TRANSYL.LOG opened for write

%NTF2I-I-MISC, creating temporary files
%NTF2I-I-MISC, closing temporary files
%NTF2I-I-MISC,      18 records read
%NTF2I-I-MISC, reading from temporary files
%NTF2I-I-NTFDATA, NTF data at level 1, version 1.1
%NTF2I-I-MISC, closing and deleting temporary files

%NTF2I-I-MISC, creating temporary files
%NTF2I-I-MISC, closing temporary files
%NTF2I-I-MISC,    1304 records read
%NTF2I-I-MISC, reading from temporary files
%LSLLIB-I-IFFOPENED, LSL$DATAROOT:[CONVERT.IFF]SHEET1.IFF;1 opened for write
%NTF2I-I-MISC, closing and deleting temporary files

%NTF2I-I-MISC, creating temporary files
%NTF2I-I-MISC, closing temporary files
%NTF2I-I-MISC,    2243 records read
%NTF2I-I-MISC, reading from temporary files
%LSLLIB-I-IFFOPENED, LSL$DATAROOT:[CONVERT.IFF]SHEET2.IFF;1 opened for write
%NTF2I-I-MISC, closing and deleting temporary files

%NTF2I-I-MISC, creating temporary files
%NTF2I-I-MISC, closing temporary files
%NTF2I-I-MISC,     445 records read
%NTF2I-I-MISC, reading from temporary files
%LSLLIB-I-IFFOPENED, LSL$DATAROOT:[CONVERT.IFF]SHEET3.IFF;1 opened for write
%NTF2I-I-MISC, closing and deleting temporary files

  ELAPSED:      0 00:04:03.68  CPU: 0:01:23.11  BUFIO: 20  DIRIO: 981  FAULTS: 191
$ TYPE TRANSYL.LOG<CR>
===== N T F 2 I =====

NTF2I invoked by TONY using terminal RTA2: at 3-JUL-1989 11:59:12.52

Command line:

NTF2I/LOG/OUTPUT=TRANSYL MSA0:

=====

Volume header record:
  Data sent by      "Laser-Scan Labs      "
  Data sent to      "Transylvanian Water "
  Date of transfer  "19890703" (ie 03/7/1989)
  NTF level         1
  NTF version       1.1
// NTF data output by Laser-Scan's CONVERT utility I2NTF
```



Database header data:

```
Database name      "Transylvanian Water "  
Data dictionary    "DEFAULT01.10      "  
Database date      "19890401" (ie 01/04/1989)  
Classification scheme "              "  
Classification date "00000000" (ie 00/00/0000)  
Data quality report "              "  
Data quality date  "00000000" (ie 00/00/0000)
```

```
//  
// IFF file        LSL$IF:SHEET1.IFF;0  
// Spheroid        Airy  
// Projection      UK national grid  
// Scale           2500  
// Units           metres  
// Height data     feet  
//  
// IFF file        LSL$IF:SHEET2.IFF;0  
// Spheroid        Airy  
// Projection      UK national grid  
// Scale           2500  
// Units           metres  
// Height data     feet  
//  
// IFF file        LSL$IF:SHEET3.IFF;0  
// Spheroid        Airy  
// Projection      UK national grid  
// Scale           1250  
// Units           metres  
// Height data     feet
```

Volume termination record:  
End of volume

In this example the user mounts the magnetic tape on drive MSA0:, and runs NTF2I. The program reads the sections from tape into temporary files which are then processed to produce IFF files with names taken from the section header's section reference. The temporary files are deleted after they have been processed. An output log file is produced in TRANSYL.LOG, and this is typed to show its contents.

\$ NTF2I/OS/LOG/OUTPUT=SYS\$OUTPUT: MSA0:<CR>

%LSLLIB-I-LOGOPNOUT, log file SYS\$OUTPUT:NTF2I.LOG opened for write

===== N T F 2 I =====

NTF2I invoked by TONY using terminal RTA2: at 3-JUL-1989 11:54:01.80

Command line:

NTF2I/OS/LOG/OUTPUT=SYS\$OUTPUT: MSA0:

=====

```
%NTF2I-I-NTFOPEN, NTF file MSA0 opened  
%NTF2I-I-MISC, creating temporary files  
%NTF2I-I-MISC, closing temporary files  
%NTF2I-I-MISC, 25 records read  
%NTF2I-I-MISC, reading from temporary files
```

%NTF2I-I-NTFDATA, NTF data at level 1, version 1.1

Volume header record:

Data sent by "Laser-Scan Labs"  
Data sent to "Ordnance Survey (GB)"  
Date of transfer "1989703" (ie 03/07/1989)  
NTF level 1  
NTF version 1.1

// NTF data output by Laser-Scan's CONVERT utility I2NTF

Database header data:

Database name "Ordnance Survey (GB)"  
Data dictionary "DEFAULT01.10"  
Database date "19890401" (ie 01/04/1989)  
Classification scheme "  
Classification date "00000000" (ie 00/00/0000)  
Data quality report "  
Data quality date "00000000" (ie 00/00/0000)

%NTF2I-I-MISC, closing and deleting temporary files

%NTF2I-I-MISC, creating temporary files

%NTF2I-I-MISC, closing temporary files

%NTF2I-I-MISC, 2243 records read

%NTF2I-I-MISC, reading from temporary files

//

// IFF file LSL\$IF:COSCODES.IFF;0

// Spheroid Airy

// Projection UK national grid

// Scale 1250

// Units metres

// Height data metres

// Section header record contains OS(GB) map header data

%LSLLIB-I-IFFOPENED, LSL\$DATAROOT:[CONVERT.IFF]OSCODES.IFF;1 opened for write

Volume termination record:

End of volume

%NTF2I-I-MISC, closing and deleting temporary files

ELAPSED: 0 00:00:45.81 CPU: 0:00:35.65 BUFIO: 44 DIRIO: 360 FAULTS: 100

In this example, the /OS qualifier has been used to indicate that OS (GB) map header data is expected in the section header record, and is to be used to create an OS style map header entry in the IFF file. Note the use of /OUTPUT to produce the descriptive data about the tape interleaved with the /LOG informational messages.

\$ NTF2I/LOG LSL\$DATA\_ROOT:[CONVERT.NTF]TEXT<CR>

%NTF2I-I-NTFOPEN, NTF file LSL\$DATA\_ROOT:[CONVERT.NTF]TEXT.NTF opened

%NTF2I-I-MISC, creating temporary files

%NTF2I-I-MISC, closing temporary files

%NTF2I-I-MISC, 15 records read

%NTF2I-I-MISC, reading from temporary files

%NTF2I-I-NTFDATA, NTF data at level 1, version 1.1

%NTF2I-I-MISC, closing and deleting temporary files

%NTF2I-I-MISC, creating temporary files

%NTF2I-I-MISC, closing temporary files

```
%NTF2I-I-MISC,    2243 records read
%NTF2I-I-MISC, reading from temporary files
%LSLLIB-I-IFFOPENED, LSL$DATAROOT:[CONVERT.IFF]CCB2MD.IFF;1 opened for write
%NTF2I-I-MISC, closing and deleting temporary files
ELAPSED:      0 00:00:32.94  CPU: 0:00:08.59  BUFIO: 7  DIRIO: 133  FAULTS: 138
```

In this example, the NTF data is in a text file on disk.

---

**MESSAGES (SUCCESS)**

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

NORMAL, NTF2I function return was TRUE (ie success)

**Explanation:** This message is used internally by NTF2I to indicate whether a subroutine has completed successfully or not.

**User action:** None.

-----  
**MESSAGES (INFORMATIONAL)**

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

ABASECHREC, abandoning this part of the section header record

**Explanation:** This message is output after an error in reading one of the OS specific fields in the section header record. The current physical record will be abandoned, and the program will attempt to continue. This means that some of the fields in the section header will not have been read, and will thus not be inserted into the map header entry in the IFF file.

**User action:** Investigate the cause of the original message, and check that the IFF file produced is sensible (using OSMHED) before using it further.

ATTFILCLO, attribute file "%S" closed

**Explanation:** This message is output when the /ATTRIBUTE\_FILE file is closed, if /LOG was specified.

**User action:** None.

ATTFILOPN, attribute file "%S" opened for read

**Explanation:** This message is output when the /ATTRIBUTES\_FILE file is opened, if /LOG was specified.

**User action:** None.

ATTIGN, attribute will not be translated

**Explanation:** This message is output to confirm that the attribute mentioned in the earlier warning message will not be translated.

**User action:** Depends on associated messages.

CITFDATA, CITF data at NTF level %N, based on NTF version %F5.2

**Explanation:** This message is output to confirm the form of CITF being read, if the user has specified the /LOG qualifier.

**User action:** None.

DATAMODEL, Data Model field in DBHREC is "%S", not 2

**Explanation:** This message is output to when a Data Model other than 2 was found in the Database Header Record. If the /CONTINUE qualifier was given, the program will continue and attempt to process the file, otherwise it will halt.

**User action:** Use the /CONTINUE qualifier to try and continue reading the file if required.

EORCONFL, EOR field does not match actual record terminator

**Explanation:** The EOR field in the VOLHREC record does not match with the character at the end of the line [position 65]. The actual end of line character is being used as EOR

**User action:** correct the EOR field or the actual EOR characters

LUTFILCLO, FC lookup table file 'file-spec' closed

**Explanation:** This message is output when the FC lookup table file specified by /FCLOOKUP is closed.

**User action:** None.

LUTFILOPN, FC lookup table file 'file-spec' opened for read

**Explanation:** This message is output when the FC lookup table file specified by /FCLOOKUP is opened.

**User action:** None.

MHLEN, Type 4 MH longer than defined in lookup - actually %N bytes

**Explanation:** This message is output when more lines were written to the type 4 Map Header than space was defined for in the lookup table. In this case, as many lines were written to header as there actually were and the value taken from the lookup table is ignored.

**User action:** Prevent this message by defining the header length in the lookup table to be large enough to accomodate all [FEATCLASS], [SECHREC], [MANINFREC], [EXTREC] and [TRANSFORM] records in the CITF file.

MNEM, problem encountered with mnemonic "%S"

**Explanation:** This message is use to accompany others and denotes the attribute mnemonic which caused the problem.

**User action:** None.

NOSTRUC, output will be an unstructured IFF file

**Explanation:** This message confirms that it is only possible to output unstructured data, even if the input data is NTF level 3. Records which define the structure of the data, such as nodes and polygons, will be ignored.

**User action:** None.

NTFDATA, NTF data at level %N, version %F5.2

**Explanation:** This message is output to confirm the form of NTF being read, if the user has specified the /LOG qualifier.

**User action:** None.

NTFOPEN, NTF file %S opened

**Explanation:** This message is output when NTF data is being read from a file on disk, if the user has specified the /LOG qualifier.

**User action:** None.

POSERR, errors may occur as a result

**Explanation:** This message is output after other messages to indicate that something unexpected has arisen and that the results may be unreliable.

**User action:** None.

RETRY, attempting to read another record

**Explanation:** the previous that was read had an unrecognised RECDESCR field. NTF2I is skipping over it and attempting to read a record in its place. possible that the RECDESCR field is valid, but that it is not recognised by the current version of NTF2I

**User action:** check the NTF file at the record number specified. if a badly formed record is found attempt to fix it manually. Otherwise contact Laser Scan for further advice

TRUNCATED, feature has been truncated - first %N points retained

**Explanation:** This message is output after the TOOMNYPTS error message.

**User action:** As for the TOOMNYPTS error message.

USERNAME, using IFF name "%S"

**Explanation:** This message is output after the NOTVMSNAME warning message, to indicate what IFF filename is being used for the current section.

**User action:** None.

-----  
**MESSAGES (WARNING)**

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

ANCIGN, VALUE field of type "%S" ignored, record %N

**Explanation:** This message is output when the program ignores a VALUE field from a LINEREC (linear feature) or POINTREC (symbol feature) record. The program recognises the "OR" (orientation) and "HT" (height) value fields, and ignores all others.

**User action:** None.

ATTCOMDEF, ATTCOM record %S already defined

**Explanation:** The reported ATTCOM mnemonic was already be defined in this volume and a subsequent one of the same name was found. The first one is used.

**User action:** Ensure that the ATTCOM records in the volume have unique mnemonics.

ATTCOMREC, ATTCOM %S recursively defined

**Explanation:** The reported ATTCOM mnemonic was defined as containing a component which was itself. Recursive definitions for ATTCOM records are not permitted. The ATTCOM record has been ignored.

**User action:** Ensure that no ATTCOM records contain recursive definitions.

ATTCOMTWO, ATTCOM %S must be made of at least 2 other attributes

**Explanation:** The reported ATTCOM mnemonic was defined in this volume as have less than two constituent attributes which define it.

**User action:** Ensure that the ATTCOM records consist of at least two attributes.

ATTCOORDNUM, ACRDREC point number %N too large for feature, FSN %N

**Explanation:** The point number of an ACRDREC record denoting the coordinate to which the attributes should be attached is greater than the number of points held in the [GEOMETRY\*] record. This will result in the whole ARDREC being ignored.

**User action:** Check the data and ensure that all ACRDREC point numbers are less than or equal to the number of coordinates in the previous [GEOMETRY\*] record.



ATTDESCIGN, ATTDESC record ignored

**Explanation:** For an attribute descriptor to be read from an NTF file and decoded, both an FRT and an attribute file are required. One or both of these were absent so the record was ignored

**User action:** If attribute transfer is required then an FRT and attribute file should be given

ATTNOTTRA, Attribute %S will not be translated

**Explanation:** The IFF attribute name given was not found in the FRT and so will not be translated into NTF

**User action:** Check the spelling of the name in the attribute file and add the ACD entry to the FRT if required

BADCITFVER, DDNAME "%S" is not defined as CITF version 1.0

**Explanation:** The DDNAME field of the database header record does define the file as being CITF but not of version 1.0. This is the only version supported by NTF2I at present. If the /CONTINUE qualifier was given, the program will continue and attempt to process the file, otherwise it will halt.

**User action:** Check that the file is really a CITF file of version 1.0 or use the /CONTINUE qualifier to try and continue reading the file if required.

BADDIVIDER, illegal field divider "%S" found - default used

**Explanation:** The volume header record contains a field for the user to specify the character to be used as a field divider. The character found in this field was not a sensible choice as it would clash either with data held in the fields or the end of record marker. The default divider of " " will be assumed and the program will attempt to continue.

**User action:** Consult the donor to find out why an illegal character was used.

BADFRTMAX, bad value in LSL\$FRT\_FRTMAX, default of 'integer' used

**Explanation:** LSL\$FRT\_FRTMAX did not contain an integer value. This logical is used to set the maximum size of the FC lookup table. Default value used.

**User action:** Define LSL\$FRT\_FRTMAX to hold an integer value.

BADLUTLIN, line 'integer' in 'file-spec' invalid

**Explanation:** The FC lookup table file contains an invalid line.

**User action:** Check the FC lookup table file.

BADTIME, unable to translate time attribute

**Explanation:** An NTF attribute type was associated with an IFF AC of type time in the attribute file. As time is not a recognised NTF field type the program assumed VMS format i.e. hh:mm:ss.ss, the time was not, however, in this form and an error occurred. No further attempt will be made to translate this attribute

**User action:** None.

BADVALUE, illegal value 'number' for qualifier 'name'

**Explanation:** The value given was out of the range appropriate for the qualfier shown.

**User action:** Respecify the qualifer with a correct value.

BADXMAX, Range conflict - NTF XMAX is %L%I0, coords XMAX is %L%I0

**Explanation:** The XMAX value in the NTF header section does not reflect the maximum X coordinate in the NTF file. The XMAX value is intended as a guide to the user and should not include the X\_ORIG offset as defined by the NTF 1.1 specification.

**User action:** This warning can usually be ignored as the range (RA) entry in the IFF file is written correctly and will reflect exactly the coordinates of every feature in the IFF file. If it appears that the XMAX value includes the origin offset, X\_ORIG, then Laser-Scan suggest that you notify the donor of the NTF data as to the nature of the problem.

BADXMIN, Range conflict - NTF XMIN is %L%I0, coords XMIN is %L%I0

**Explanation:** The XMIN value in the NTF header section does not reflect the minimum X coordinate in the NTF file. The XMIN value is intended as a guide to the user and should not include the X\_ORIG offset as defined by the NTF 1.1 specification.

**User action:** This warning can usually be ignored as the range (RA) entry in the IFF file is written correctly and will reflect exactly the coordinates of every feature in the IFF file. If it appears that the XMIN value includes the origin offset, X\_ORIG, then Laser-Scan suggest that you notify the donor of the NTF data as to the nature of the problem.

BADYMAX, Range conflict - NTF YMAX is %L%I0, coords YMAX is %L%I0

**Explanation:** The YMAX value in the NTF header section does not reflect the maximum Y coordinate in the NTF file. The YMAX value is intended as a guide to the user and should not include the Y\_ORIG offset as defined by the NTF 1.1 specification.

**User action:** This warning can usually be ignored as the range (RA) entry in the IFF file is written correctly and will reflect exactly the coordinates of every feature in the IFF file. If it appears that the YMAX value includes the origin offset, Y\_ORIG, then Laser-Scan suggest that you notify the donor of the NTF data as to the nature of the problem.

BADYMIN, Range conflict - NTF YMIN is %L%I0, coords YMIN is %L%I0

**Explanation:** The YMIN value in the NTF header section does not reflect the minimum Y coordinate in the NTF file. The YMIN value is intended as a guide to the user and should not include the Y\_ORIG offset as defined by the NTF 1.1 specification.

**User action:** This warning can usually be ignored as the range (RA) entry in the IFF file is written correctly and will reflect exactly the coordinates of every feature in the IFF file. If it appears that the YMIN value includes the origin offset, Y\_ORIG, then Laser-Scan suggest that you notify the donor of the NTF data as to the nature of the problem.

BOTHATTFRF, both /FRT and /ATTRIBUTE are required for attribute transfer

**Explanation:** If attributes are to be transferred to NTF then both an attribute file and an FRT are required. Only one of these was given on the command line so attributes will not be translated

**User action:** The command line should be re-entered giving both of the required files

COLLECT, collect records ignored - not supported

**Explanation:** This message is output when a COLLECT record is encountered. The current version of the program does not output structured data, and will ignore the relevant NTF level 3 records.

**User action:** None.

CPOLYGON, complex polygon records ignored - not supported

**Explanation:** This message is output when a CPOLY record is encountered. The current version of the program does not output structured data, and will ignore the relevant NTF level 3 records.

**User action:** None.

CURVTEXT, curved text record ignored - not supported - record %N

**Explanation:** This message is output when a CURVTEXT record is encountered. The current version of the program does not support the curved text datatype, and will ignore the relevant record, and its associated NAMEREC record(s).

**User action:** None.

FCTOOLARGE, FC %N is too large, maximum limit is 32767

**Explanation:** The FC in a CITF96 record for this feature is too large, i.e. it exceeds the IFF limit of 32767. It will be set to 0. Note that this may have the wrong graphical type for output.

**User action:** Ensure that the CITF96 file does not include feature codes which exceed the limit, or use /FLOOKUP to translate to values below the limit.

FEATATT, Feature level attribute %S undefined in ACD

**Explanation:** The reported feature level attribute was not defined the the ACD part of the given FRT. This attribute is one of the default feature level ones for CITF and any occurrences in the CITF file will not be written to the IFF file as an AC.

**User action:** If the reported attribute is required to be in the IFF file as an AC, then ensure that a correct definition of the attribute is given the ACD part of the FRT file.

FIELDTOOLONG, text field truncated in record %N

**Explanation:** The attribute text read from an ATTREC in the given record was longer than expected and was truncated. The expected length was taken either from the attribute description or, if free format was specified, as the maximum IFF text length of 255 characters

**User action:** None.

FONT, text font not in range %N-%N - value %N replaced by 1, record %N

**Explanation:** The NTF text font is stored in the IFF text category. This means that only values in the range 0 to 63 can be accepted. Any value outside this range will produce this message, and result in category 1 being used.

**User action:** None.

ILLEGAL, Record 'descriptor' should not be present in NTF v2.0 (BS7567)

**Explanation:** The British Standard BS7567 for NTF v2.0 specifies that the record reported should not be present in the the file, based on the level.

**User action:** The record is ignored but you should notify the donor of the data of the problem.

INCOMPUNITS, Incompatible units between DT attribute and XY\_UNITS

**Explanation:** The DT (distance) attribute is defined as being in cm on the ground whereas the XY\_UNITS field of the SECHREC is set to degrees (1). The distance is converted to feet if XY\_UNIT is set to 3 but for degrees, no such conversion is done and the point is output with one point.

**User action:** Since it is usual that CITF data will be held in metres, this message should not occur.

INCONT, skipping bad record encountered while seeking continuation record

**Explanation:** A record was flagged as being followed by a continuation record, which, when read was invalid.

**User action:** Check that the input file is not corrupt and contains only valid records.

INVISIBLE, Invisible line section found in GEOMETRY record, id "%S", record %N

**Explanation:** An invisible line section (indicated by QPLAN=0) was found in the specified GEOMETRY record. However the output of invisible lines has not been implemented in this version of the conversion program. The value of QPLAN will be ignored and the line will be output as a visible line.

**User action:** Contact Laserscan to request the implementation of invisible lines.

LINEINATT, Error decoding line in attribute file

**Explanation:** The line given in the following message was found in the attribute file but could not be decoded.

**User action:** The line should be changed to contain valid commands

NESTATTS, Too many nested attributes in ATTCOM %S. Limit is %N

**Explanation:** The reported ATTCOM mnemonic contained other combined attributes which when expanded caused the limit to be exceed. The combined attribute being defined will be ignored since the total number of contained attributes must be known. When the program attempts to read any combined attributes of this name, because its total length is not known and cannot be skipped over, attributes may be lost.

**User action:** It is advisable not to permit the program to continue when this message occurs as attributes may be lost. Ensure that all of the combined attributes will not have more components than permitted by the limit. If this limit is too restricting, please contact Laser-Scan about the possibility of having it increased. Alternatively any combined attributes can be divided into ones containing fewer components.

NOACCODE, Attribute "%S" lost. Not defined in ACD and attribute file

**Explanation:** This message occurs when an attribute in an ATTREC or ACRDREC record was not defined in both the ACD part of the FRT and in the attribute file which implies that no AC code is known for attribute in IFF form. It is usual that the default CITF attributes should be present in the ACD and attribute file. If the reported attribute is DT or OR, this may result in scaled symbols having their distance and orientation attributes lost.

**User action:** If the reported attribute is not required in the output IFF file then this warning can be ignored, otherwise ensure that the attribute has an entry in the ACD part of the FRT and in the attribute file.

NOATTR, Attribute records are not allowed at level 1

**Explanation:** An attribute file was given in the command file but at level 1 NTF has no attribute descriptor record to store this information so the file was not read

**User action:** If attribute transfer is required use level NTF 2

NOCOMPARE, Comparison FC not found for long code 'long code' - FC set to 0

**Explanation:** An LC or ST feature code has been read for which no corresponding FC can be found. This indicates an error in the FEATCLASS records. Feature code will be set to 0 and the program will continue.

**User action:** The data should be amended appropriately.

NODE, [NODEREC] records are being ignored

**Explanation:** This message is output when a NODEREC record is encountered and the data being read is not OSCAR. The current version of the program does not output structured data, and will ignore the relevant NTF level 3 records. However, when the /OSCAR qualifier is given, NODEREC records will be read in order to transfer level information to the lines as attributes.

**User action:** None.

NODIVIDER, no field divider found in record descriptor %S

**Explanation:** In the record specified a divider was expected but not found. The program will attempt to continue but some data may be lost.

**User action:** Consult the donor to find out why no delimiter was included.

NOLEFTPOS, no lower left coordinates for text feature %N

**Explanation:** If /LOWER\_LEFT is specified, the lower left coordinates of text features should be transferred. If such coordinates are not present the above message will appear and the required coordinates will be calculated as per the Ordnance Survey digitising specification.

**User action:** None.

NOSUPPORT, POLYGON records not supported at version 2.0

**Explanation:** This message is output when a POLYGON record is encountered in an NTF version 2.0 (BS 7567) file. The current version of the program does not read polygon data and will ignore the relevant NTF level 3 records.

**User action:** None.

NOTCITF, DDNAME "%S" is not defined as CITF

**Explanation:** The DDNAME field of the database header record did not contain the string 'CITF' denoting the file as CITF. If the /CONTINUE qualifier was given, the program will continue and attempt to process the file, otherwise it will halt.

**User action:** Check that the file is really a CITF file and if the DDNAME does not contain the string, then use the /CONTINUE qualifier to continue reading the file if required.

NOTTRANS, unknown attribute type "%S" encountered

**Explanation:** The specified NTF attribute mnemonic was found but had not previously been defined in the attribute file. This attribute will not be translated

**User action:** If this attribute is required then it should be included, together with an IFF destination, in the attribute file.

NOTVMSNAME, section reference "%S" not valid as an IFF name

**Explanation:** If the IFF name found in the section header record is not acceptable as a VMS filename, then this message is output. The program will attempt to produce a replacement filename, and will output the USERNAME information message to confirm the name it has chosen.

**User action:** None.

NOTX, No TX mnemonic in ATTREC with ID %N - text feature deleted

**Explanation:** At NTF v2.0, level 3, text records point to an ATTREC which contains the actual text string. It is expected to be present in the attribute with mnemonic 'TX' and one was not found.

**User action:** Ensure that the attribute holding the actual text string is a variable length field (terminated by a divider) and is called 'TX'. The definition of this must exist in the ACD part of the FRT and the attribute file.

NTF28NOTTRN, OS or CITF data text FC 28 not translated

**Explanation:** When using an FC lookup table with OS or CITF data, any attempt to translate the NTF/CITF FC of a text feature having FC = 28 is blocked by the program. This is to avoid problems when using the IFF file and translating back to NTF/CITF.

**User action:** The user may wish to delete the NTF FC 28 entry from the FC lookup file.

NTFDATE, unknown NTF version date "%S"

**Explanation:** In addition to NTF version numbers ( e.g. v1.1 ) there exists a version date. If minor changes are made to an NTF format then a new date will be given and version numbers will be reserved for major updates. The version date of the NTF file being read was unknown at time of coding. The program will attempt to continue, although it is possible some data may be lost.

**User action:** Consult Laser-Scan to determine the effect of the new version.

NTFFCDUPL, FC 'integer' from input file translated as IFF FC 'integer'

**Explanation:** There is a duplicate NTF feature code in the lookup file specified with /FCLOOKUP, making the translation ambiguous. The NTF FC is translated into the smallest IFF FC with which it is associated in the lookup file.

**User action:** You may wish to eliminate duplicate NTF FCs from the FC lookup file, but the translation to and from IFF will still work.

POINTATT, Per-Point attribute %S undefined in ACD

**Explanation:** The reported per-point attribute was not defined the the ACD part of the given FRT. This attribute is one of the default per-point ones for CITF and any occurrences in the CITF file will not be written to the IFF file as an AC.

**User action:** If the reported attribute is required to be in the IFF file as an AC, then ensure that a correct definition of the attribute is given the ACD part of the FRT file.

POLYGON, polygon records not supported - replaced by cline records

**Explanation:** This message is output when a POLYGON record is encountered. The current version of the program does not output structured data, and thus will output any polygons as complex line features.

**User action:** None.

SHORTSECH, not enough continuation lines for SECHREC record

**Explanation:** The NTF standard specifies that the section header record is at least two records long and two optional continuation records. This message is output if the section header is shorter than the standard requires. The program will attempt to continue.

**User action:** Report the problem to the donor of the data.

STRTOOLONG, NTF mnemonic too long, truncated to %S

**Explanation:** The NTF attribute mnemonic given in the attribute file was too long and was truncated to 2 characters

**User action:** If the truncated version is unacceptable then the attribute file should be edited and a two character mnemonic inserted

TOOMNYATTCOMS, too many ATTCOM records, maximum is %N

**Explanation:** The current limit on the number of ATTCOM records has been exceeded.

**User action:** If the preset limit seem restricting, consult Laser-Scan to have them increased.



TOOMNYREC, too many %S records,maximum is %N

**Explanation:** Since NTF level 3 can contain records in any order it is necessary to store the contents of certain records in various arrays. Thus there is a preset limit on the number of such records. If this limit is exceeded the program will attempt to continue by overwriting the first records that were stored.

**User action:** If the preset limits seem restricting, consult Laser-Scan to have them increased.

TYPECONFL, attribute type conflict for "%S"

**Explanation:** The NTF attribute as defined in the ATTDSC record was assigned to an IFF AC ( via the attribute file ) of a different type. The program will attempt to convert the data.

**User action:** If the conversion leads to unacceptable results then the attribute file should be edited to send the data to a different IFF AC.

UNEXPREC, unexpected/unrecognised record type "%S", record %N

**Explanation:** Either the specified record type is not expected in that position on the tape (for instance, finding a GEOMETRY1 record before the first SECHREC), or it is not a record type that the program recognises. If this message follows an ERROR message, the program will exit, otherwise it will attempt to continue.

**User action:** Report the problem to the donor of the data.

UNKNCOM, Unknown command %S encountered in attribute file

**Explanation:** The specified command was found in the first field of the attribute file. The command is not valid and was ignored.

**User action:** The manual should be checked and the correct command used.

UNKNFC, unknown feature code string "%S" at record %N

**Explanation:** NTF2I was unable to translate the feature code into a number. It will assume that the value was zero

**User action:** None

VOLHDCONT, unexpected continuation of VOLHDREC being ignored

**Explanation:** According to the NTF standard, the volume header record is not continuable. OS have proposed a modified form of the standard where a form of sheet index is output after the volume header. The program does not use this data, and will produce the VOLHDCONT warning message if such a continuation is found, and the user has not specified the /INDEX qualifier.

**User action:** None - the continuation is ignored.

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**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.

ABORT, NTF2I function return was FALSE (ie error)

**Explanation:** This message is used internally by NTF2I to indicate whether a subroutine has completed successfully or not.

**User action:** None.

ACRDREC, error reading ACRDREC record, record %N

**Explanation:** An error occurred in interpreting the contents of an ACRDREC record, used to translate the per-point attributes. The nature of the error will be given in the associated error messages.

**User action:** Depends on the associated messages.

ATTDESC, error reading ATTDESC record, id "%S", record %N

**Explanation:** An error occurred in interpreting the contents of an ATTDESC record, used to define the contents of the ATTREC records. The nature of the error will be given in the associated error messages.

**User action:** Depends on the associated messages.

ATTREC, error reading ATTREC record, id "%S", record %N

**Explanation:** An error occurred in interpreting the contents of an ATTREC record, used to translate the feature attributes. The nature of the error will be given in the associated error messages.

**User action:** Depends on the associated messages.

BADIFFFC, IFF FC 'integer' is invalid in FC lookup file

**Explanation:** An invalid IFF FC appeared in the feature code lookup file specified with /FCLOOKUP.

**User action:** Change the IFF FC in the lookup file to a valid value (0-32767).

BADIFFNAME, error parsing IFF filespec from name "%S"

**Explanation:** An error occurred trying to calculate the filespec for the IFF file being produced. The program will exit.

**User action:** Depends upon the associated LSLLIB message, which should help determine what the parsing error was.

BADNAMEREC, no GEOMETRY record after a NAMPOSTN

**Explanation:** The CITF specification states that for Data Model 2, the NAMPOSTN or CURVTEXT record should be followed by a GEOMETRY record and this was not the case. Since CURVTEXT records are not supported by NTF2I, this message will not occur if the GEOMETRY is also missing because the presence of the CURVTEXT will be detected first.

**User action:** This message may suggest a corrupted or erroneously produced CITF file which should be corrected.

BADUNIT, unknown value for XY units

**Explanation:** The user has specified an unrecognised value with the /XYUNIT qualifier, or the value found in the map descriptor (MD) entry was not known. The program will exit.

**User action:** If the error was in a user specification, then specify a correct value. If the error was in the map descriptor, then report the problem to Laser-Scan.

CHAIN, error reading CHAIN record, id "%S", record %N

**Explanation:** An error occurred in interpreting the contents of a CHAIN record, used to specify the links of a complex feature. This message will be followed by the ERRORRD error message, and the program will exit.

**User action:** See the ERRORRD error message.

CLINE, error reading CLINE record, id "%S", record %N

**Explanation:** An error occurred in interpreting the contents of a CLINE record. This message will be followed by the ERRORRD error message, and the program will exit.

**User action:** See the ERRORRD error message.

CLOSERR, error closing file "%S"

**Explanation:** Some form of error occurred in closing one of the input or output files. The program will exit.

**User action:** Depends upon the associated LSLIB messages.

EMPTYFILE, NTF file contains no records - no output file created

**Explanation:** The NTF file was opened and immediately the End-of-File marker was detected indicating that the file is empty. Therefore no output file could be created.

**User action:** Only attempt to process NTF files containing feature records.

ERRCLOATT, Error closing attribute file %S

**Explanation:** An error occurred while trying to close file specified with the /ATTRIBUTE qualifier

**User action:** Depends upon the associated error messages.

ERROPNATT, Error opening attribute file %S

**Explanation:** An error occurred in opening the file specified with the /ATTRIBUTE qualifier

**User action:** Depends upon the associated error messages.

ERROPNFRT, Error opening FRT file %S

**Explanation:** An error occurred in opening the file specified with the /FRT qualifier

**User action:** Depends upon the associated error messages.

ERRORRD, error reading the "%S" field

**Explanation:** This message is output to specify the field that was incorrect, and follows a message identifying the record in which the error occurred. The contents of the offending field will be output on the next line. The program will exit.

**User action:** Depends upon the error, and upon the source of the data. It may be necessary to consult the donor of the data, giving details of the offending record and field.

ERRRDATT, Error reading line from attribute file

**Explanation:** An error occurred in reading from the file specified with the /ATTRIBUTE qualifier

**User action:** Depends upon the associated error messages.

FEATCLASS, error reading FEATCLASS record

**Explanation:** An error occurred in interpreting the contents of a FEATCLASS record. The program will exit.

**User action:** Check the contents of the FEATCLASS record and correct if necessary.

FILOPEN, error opening file "%S"

**Explanation:** Some form of error occurred in opening one of the input or output files. The program will exit.

**User action:** Depends upon the associated LSLLIB messages.

GEOMETRY, error reading GEOMETRY record, id "%S", record %N

**Explanation:** An error occurred in interpreting the contents of a [GEOMETRY\*] record, used to specify the points of a linear feature. This message will be followed by the ERRORRD error message, and the program will exit.

**User action:** See the ERRORRD error message.

IFFNAME, error working out IFF name from section reference "%S"

**Explanation:** This message indicates that one of the system routines used in working out the IFF name from the section reference failed. It will be followed by an error message from the system routine, and the program will exit.

**User action:** Depends upon the system routine error message. The problem may need reporting to Laser-Scan.

LINEREC, error reading LINEREC record, id "%S", record %N

**Explanation:** An error occurred in interpreting the contents of a LINEREC record, used to specify a linear feature. This message will be followed by the ERRORRD error message, and the program will exit.

**User action:** See the ERRORRD error message.

LUTLINE, error reading line 'integer' of FC lookup file

**Explanation:** An error has occurred reading a line from the FC lookup file. This message will be followed by LSLLIB and system messages describing what went wrong.

**User action:** Depends upon the associated messages.

LUTTOOSMA, FC lookup file too large for the lookup table

**Explanation:** The specified FC lookup file contains too many entries for the lookup table currently being used.

**User action:** Define LSL\$FRTFRTMAX to be larger than the number of entries in the FC lookup file.

MAGTAPE, error initialising magtape device "%S"

**Explanation:** An error occurred in initialising the magnetic tape drive for reading. The associated LSLLIB and system error messages should clarify the problem.

**User action:** Dependent upon the associated messages. One possible cause of problems is that the tape has not been mounted.

MINSECH, SECHREC must have a minimum of one continuation record

**Explanation:** The NTF standard specifies that the section header record is at two records long (ie one record with one continuations). This message is output if the section header is shorter than the standard requires. The program will exit.

**User action:** Report the problem to the donor of the data.

NAMEREC, error reading NAMEREC record, id %N, record %N

**Explanation:** An error occurred in interpreting the contents of a NAMEREC record, used to specify the text of a text feature. This message will be followed by the ERRORRD error message, and the program will exit.

**User action:** See the ERRORRD error message.

NAMPOSTN, error reading NAMPOSTN record, FC %N, record %N

**Explanation:** An error occurred in interpreting the contents of a NAMEREC record, used to specify the form and position of a text feature. This message will be followed by the ERRORRD error message, and the program will exit.

**User action:** See the ERRORRD error message.

NILXYMULT, XY\_MULT is zero - using a value of 1.0 instead

**Explanation:** The planimetric coordinate multiplication factor (XY\_MULT) read from the section header record is zero. All coordinates are multiplied by this value before being output. A value of 1.0 is substituted to allow at least some form of output. The program will attempt to continue.

**User action:** Contact the donor of the data to determine why the XYMULT value was zero.

NILZMULT, Z\_MULT is zero - using a value of 1.0 instead

**Explanation:** The height multiplication factor (Z\_MULT) read from the section header record is zero. Any height values in the data are multiplied by this value before being output. A value of 1.0 is substituted to allow at least some form of output. The program will attempt to continue.

**User action:** Contact the donor of the data to determine why the ZMULT value was zero.

NOATT, ATTREC not found for current feature

**Explanation:** At level 3 feature codes are stored in ATTREC records. However, for the current feature, the required ATTREC cannot be found. This may be because it does not exist or because the program only looks at previous records and the next record when searching for a particular record. The program will exit.

**User action:** The data should be amended appropriately.

NOATTDESC, No ATTDESC for non-default attribute, 'descriptor'

**Explanation:** An attribute was found which is not defined in an attribute description ([ATTDESC]) record and is not a default attribute. Since its interpretation and width is unknown, the next attribute cannot be located and so the program aborted.

**User action:** Contact the donor of the data to determine why the data was not in the expected form. Ensure that each attribute other than default ones are defined in an [ATTDESC] record, in the attribute file and in the ACD part of the FRT.

NOCHAIN, no CHAIN record after a CLINE

**Explanation:** The NTF standard requires that a chain record must exist for every cline record, the id of this chain record being specified in the cline record. This message is output if the program does not find the expected chain record. The program will exit.

**User action:** Contact the donor of the data to determine why the data was not in the expected form.

NOCITF, CITF version 'integer' not available - only 93 or 96 allowed

**Explanation:** This program only knows about Ordnance Survey CITF specifications OS93 and OS96.

**User action:** Choose one of the supported versions, or accept the default (OS96).

NOFC, no FC given for current feature

**Explanation:** At level 3 feature codes are stored in ATTREC records. However, the current feature does not contain such an entry in its ATTREC. The program will exit.

**User action:** Contact the donor to determine why the data is incorrect.

NOGEOM, no GEOM\_ID given for current feature

**Explanation:** At level 3 geomid's are stored in point and line records. However, for the current feature, such an entry cannot be found. The program will exit.

**User action:** Contact the donor to determine why the data is incorrect.

NOGEOMETRY, no GEOMETRY record after a POINTREC/LINEREC

**Explanation:** The NTF standard requires that, at levels 1 and 2, a point or line record must be followed by a record or records containing the geometry for that point or line. This also applies to CITF Data Model 2. This message is output if the program does not find the expected sequence of entries. The program will exit.

**User action:** Contact the donor of the data to determine why the data was not in the expected form.

NOIFFATT, IFF attribute name not given in attribute file

**Explanation:** In the attribute file the ATTRIBUTE command was given without the name of an IFF attribute

**User action:** Check the attribute file to see why this error occurred

NONAMPOS, no NAMPOSTN record after NAMEREC record number %N

**Explanation:** The NTF standard requires that, at levels 1, 2 and 3, a NAMEREC record must have a corresponding NAMPOSTN record. Additionally, at levels 1 and 2, this record must immediately follow the NAMEREC record. This message is output if the program does not find such an entry. The program will exit.

**User action:** Contact the donor of the data to determine why the data was not in the expected form.

NONTFATT, NTF attribute mnemonic not given in attribute file

**Explanation:** In the attribute file the ATTRIBUTE command was given without the NTF mnemonic into which it should be put

**User action:** Check the attribute file to see why this error occurred

NOPOS, no position given for this NAME

**Explanation:** This message is output after the NAMPOSTN error if there is no positional information for a text. That is, neither the digitised position nor the position of the south-west corner of the text has been specified. The program will exit.

**User action:** Contact the donor to determine why the text was incorrectly transferred.

NOSCALE, Scale not known - /LOWER\_LEFT ignored for text record %N

**Explanation:** The user has specified /LOWERLEFT on the command line and the map scale is required in order to calculate the lower left coordinates of text features. However, the scale cannot be obtained because the IFF filename is not standard OS form (e.g. SP28NE). The program will attempt to continue by outputting the text in its existing form.



**User action:** Amend the NTF file to include a standard OS filename.

NOSECHREC, no SECHREC record found in CITF file

**Explanation:** The CITF file did not contain a SECHREC record which is compulsory and so the program aborted.

**User action:** Ensure that the CITF file contains a valid SECHREC record and run the program again.

NOTALL, no continuation - not all expected points found

**Explanation:** This message is output after the GEOMETRY error if there are insufficient continuation records to contain all of the points required for the current feature, as indicated in the NUM\_COORD field of the parent GEOMETRY1 record. The program will exit.

**User action:** Contact the donor to determine why the feature is incorrectly transferred.

NOTATLEVEL, entry type "%S" is not supported at level %N

**Explanation:** The specified NTF record descriptor belongs to a record that is not allowed at the level of NTF in this dataset. The program will exit.

**User action:** Contact the donor of the data to determine why the record is present, or why the level of the data is incorrectly flagged in the volume header record.

NOTCONTINUE, continuation record not found, for %S, record %N

**Explanation:** The previous record contained a continuation flag, but this record is not a continuation record. The NTF data is thus corrupt, and the program will exit.

**User action:** Contact the donor of the data and report the problem.

NOTERMCR, no terminating carriage return at end of record

**Explanation:** The NTF standard requires that, when variable length records are used they must be terminated with a carriage return. The record specified in the previous record was not.

**User action:** Contact the donor of the data to determine why the data was not in the expected form.

NOTVECTOR, the data in section "%S" is not vector data

**Explanation:** The section header for the relevant section indicates that the section contains non-vector (presumably grid or raster) data. This program does not translate non-vector data, and will exit.

**User action:** Request the donor of the data to separate vector and other forms of data onto separate magnetic tapes.

NOVOLHDREC, first record of NTF must be volume header record

**Explanation:** The NTF standard specifies that the first record on the tape must be the VOLHDREC or volume header record. This error message is generated if this is not the case, and the program will exit.

**User action:** Contact the donor of the data and report the problem.

OPENERR, error opening file "%S"

**Explanation:** An error occurred opening the specified file. This message will be followed by LSLLIB and system messages describing what went wrong.

**User action:** Depends upon the associated messages.

OUTOPEN, error opening /OUTPUT file "%S"

**Explanation:** An error has occurred in trying to open the log file specified with the /OUTPUT qualifier. The associated LSLLIB and system messages should clarify the problem.

**User action:** Dependent upon the associated messages.

POINTREC, error reading POINTREC record, id "%S", record %N

**Explanation:** An error occurred in interpreting the contents of a POINTREC record, used to specify a symbol feature. This message will be followed by the ERRORRD error message, and the program will exit.

**User action:** See the ERRORRD error message.

READBLK, error reading block %N from magtape

**Explanation:** An error has occurred in obtaining the next block of data from the magnetic tape. The associated LSLLIB and system messages should clarify the problem.

**User action:** Dependent upon the associated messages.

READREC, error reading record %N from NTF input file

**Explanation:** An error has occurred in obtaining the next record from the input file. The associated LSLLIB and system messages should clarify the problem.

**User action:** Dependent upon the associated messages.

SECHREC, error reading SECHREC record, in field "%S", record %N

**Explanation:** An error occurred in interpreting the contents of the specified field in the current section header record. The contents of the offending field will be output on the next line. If this error occurs in the OS specific part of the section header record, then the program will attempt to continue, otherwise it will exit.

**User action:** Depends upon the error. It may be necessary to contact the donor of the data, and report the problem.

SHORTBLK, block %N is only %N characters long

**Explanation:** The program has successfully read the next block from the magnetic tape, but its size is wrong. Since the NTF standard specifies the size that blocks must be, this is a serious error. The program will exit.

**User action:** Report the problem to the donor of the data.

SHORTREC, record %N is only %N characters long

**Explanation:** The program has successfully read the next record from the input file, but its length is wrong. Since the NTF standard specifies that all records must be 80 characters long, this is a serious error. The program will exit.

**User action:** Report the problem to the donor of the data.

SHORTXT, no continuation - read %N characters, instead of %N

**Explanation:** This message is output after the NAMEREC error if there are insufficient continuation records to contain all of the text required for the current feature, as indicated in the TEXT\_LEN field of the NAMEREC record. The program will exit.

**User action:** Contact the donor to determine why the feature is incorrectly transferred.

TESTFOR, error testing whether device "%S" is mounted /FOREIGN

**Explanation:** In order to determine whether input is from a magnetic tape or from a disk file, the program tests for whether the input medium is mounted /FOREIGN. This message indicates that something has gone wrong with that test.

**User action:** Depends upon the associated error messages.

TEXTPOS, error reading TEXTPOS record, FC %N, record %N

**Explanation:** An error occurred in interpreting the contents of a TEXTPOS record, used to specify the form and position of a text feature. This message will be followed by the ERRORRD error message, and the program will exit.

**User action:** See the ERRORRD error message.

TEXTREC, error reading TEXTREC record, id %N, record %N

**Explanation:** An error occurred in interpreting the contents of a TEXTREC record, used to define a text feature at level 3 NTF v2.0. This message will be followed by the ERRORRD error message, and the program will exit.

**User action:** See the ERRORRD error message.

TEXTREP, error reading TEXTREP record, id %N, record %N

**Explanation:** An error occurred in interpreting the contents of a TEXTREP record, used to define a text feature at level 3 NTF v2.0. This message will be followed by the ERRORRD error message, and the program will exit.

**User action:** See the ERRORRD error message.

TOOMNYLNKS, chain record "%S", record %N, contains %N links

**Explanation:** Since NTF level 3 can contain records in any order it is necessary to store the contents of certain records in various arrays. Thus there is a preset limit on the number of links that can be stored for a chain record. The program will attempt to truncate the chain to the maximum number of links, but is likely to fail when it does not read the rest of the feature correctly.

**User action:** If the preset limit seems restricting, consult Laser-Scan to have it increased.

TOOMNYPTS, geometry record "%S", record %N, contains %N points

**Explanation:** Since NTF may require that the points in a feature be reversed, the program buffers all of the points for each feature before writing them to the IFF file. The internal buffer can hold up to 10000 points, and this message is output if the current feature contains more than that number of points (as indicated by the NUM\_COORD field in the GEOMETRY1 record). The program will attempt to truncate the feature to 10000 points, but is likely to fail when it does not read the rest of the feature correctly.

**User action:** At some future stage the program will be amended to cope better with very large features. For the moment, request the donor of the data to split all features such that they contain fewer than 10000 points.

VMALLFAIL, virtual memory allocation for FC lookup table failed

**Explanation:** The virtual memory allocation routine failed to allocate sufficient space to contain the FC lookup table.

**User action:** Report this error message to your system manager, along with the associated system error. He may be able to increase your virtual page count to allow the lookup table to be used.

VOLHDREC, error reading VOLHDREC record, in field "%S"

**Explanation:** An error occurred in interpreting the contents of the specified field in the volume header record. The contents of the offending field will be output on the next line. The program will exit.

**User action:** Depends upon the error. It may be necessary to contact the donor of the data, and report the problem.

WRONGLEVEL, this program cannot read data at NTF level %N

**Explanation:** The program currently only recognises NTF levels 1, 2 and 3. Data at any other level (as indicated in the volume header record) will produce this message, and cause the program to exit.

**User action:** Do not attempt to read data at levels other than 1, 2 or 3.

WRONGVERSION, this program cannot read data of NTF version %F5.2

**Explanation:** The program currently only recognises data as specified in version 1.1 of the NTF standard. Data from any other version of the standard (as indicated in the volume header record) will produce this message, and cause the program to exit.

**User action:** Do not attempt to read data that is specified by a version of the NTF standard not supported by the program.

XYLEN, XYLEN incorrectly set this level

**Explanation:** At level 1, if the XYLEN field in the SECHREC is undefined (or zero) it defaults to 10. However, at levels 2 and above the XYLEN field must be explicitly defined.

**User action:** Contact the donor of the data stating that the XYLEN field should be defined for this level or manually edit the field in the SECHREC record to reflect the true size of the X and Y coordinates.

ZLEN, ZLEN incorrectly set this level

**Explanation:** At level 1, if the ZLEN field in the SECHREC is undefined (or zero) it defaults to 10. However, at level 2 and above the ZLEN field must be explicitly defined.

**User action:** Contact the donor of the data stating that the ZLEN field should be defined for this level or manually edit the field in the SECHREC record to reflect the true size of the Z coordinates.

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**MESSAGES (FATAL)**

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

UPDCP, unable to reposition to CP entry to update the corner points

**Explanation:** Similar explanation as UPDRA

**User action:** Report this problem to Laser-Scan. The IFF file may be mendable with the IMP utility IMEND.

UPDRA, unable to reposition to RA entry to update the range

**Explanation:** When all of the data has been output to an IFF file, and it is about to be closed, the program attempts to output a corrected range entry at the start of the IFF file. This requires that it reposition to the start of the file, and this message indicates that something went wrong with this process. The IFF file will be incorrectly terminated, and the program will exit.

**User action:** Report this problem to Laser-Scan. The IFF file may be mendable with the IMP utility IMEND.

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**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.