Laser-Scan Ltd.

Software Product Specification

CONVERT package

For LAMPS V5.0

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1 *DESCRIPTION*

CONVERT is the Laser-Scan map data translation package. It contains modules to
convert data from IFF to other formats, and/or from those formats into IFF.

IFF stands for **I**nternal **F**eature **F**ormat and is the Laser-Scan vector file format
generated by LASERAID and other Laser-Scan digitising systems and used as the
data structure throughout the Laser-Scan LAMPS system.   The CONVERT package
allows the user to translate data captured with LAMPS (**L**aser-Scan **A**utomated **M**ap
Production **S**ystem) into another form for output, or to convert data from other
systems into IFF for manipulation within LAMPS.

The CONVERT package operates on Digital Equipment VAX and Alpha AXP series
computers running the VMS operating system. See below for hardware and software
prerequisites.

This document briefly describes the utilities available in all of the modules in
the CONVERT package. In most circumstances, however, a customer will only have
purchased some of the modules within the package - those for which that site has
an actual requirement.   Thus the presence of a module description in this
document does not mean that the module is available at a particular site.

All the utilities have common command syntax which is decoded using the Command
Line Interpreter as used by the VMS utilities. CONVERT utilities all generate
VMS format messages and set VMS DCL symbol $STATUS on image exit.   In command
files the success of a preceding CONVERT utility may be tested using $STATUS
before proceeding.   All CONVERT modules and utilities are comprehensively
documented in the CONVERT User Guide and the documentation includes an
explanation of messages output by the modules together with suggested user
action.

2 *FACILITIES*

The facilities offered by the CONVERT modules are described   below   in
alphabetical order of module. Note that customers purchase particular modules
as required, so that the presence of a module within this list does not mean
that a customer will automatically receive that module.

* IFFARCINFO (Support for ESRI ARC/INFO)

        IFFARCINFO provides support for the transfer of data to the ARC/INFO
        uncompressed ASCII version of their EXPORT format defined by the
        Environmental Systems Research Institute (ESRI) of Redlands, California.
        The utilities provided are:

    o   ARC2I - reads an uncompressed ASCII ARC/INFO EXPORT file on tape or
        disk and creates an IFF disk file. Attributes may be included in
        the translation by means of parameter file to describe the attribute
        names.   This utility can only read the standard .AAT and .PAT
        attribute tables and will ignore the .IAC and .RAC attribute tables
        produced by I2ARC. The program has the ability to read version 6.0
        text features but not their corresponding attributes.

o I2ARC - reads an IFF file and outputs the data to an ARC/INFO EXPORT
format disc file. Attribute information can be put in the .IAC and
.RAC tables by default or in the .AAT and .PAT standard ARC/INFO
tables by using the parameter file mechanism. Text features are not
output in version 6.0 form but in the form previous to this version
of ARC/INFO.

* **IFFCEDD** (Support for IHO CEDD)

IFFCEDD provides support for the production and reading of CEDD data as
defined in the document **Format for the Exchange of Digital Hydrographic
Data**, published by the International Hydrographic Organisation (IHO),
Committee on the Exchange of Digital Data (CEDD), November 1986 The
utilities provided are:

o I2CEDD - reads an IFF file and outputs CEDD formatted data to
magnetic tape or disk. Only the sequential form of CEDD is
supported.

o CEDD2I - reads CEDD formatted data from magnetic tape or disk and
outputs an IFF file. Either sequential or chain-node forms of CEDD
can be read, but in the latter case, the structure will not be
maintained in the IFF file.

* **IFFDCW** (Support for the Digital Chart of the World)

IFFDCW provides support for the creation of IFF files from Digital Chart
of the World CD-ROM data defined in the DCW Product Specification
(MIL-D-89009) available from the Defence Mapping Agency (DMA). DCW is
based on the Vector Product Format (MIL-STD-600006) also available from
DMA. The utilities provided are:

o DCW2I - will read the DCW CD-ROMs containing VPF database tables and
create IFF files for each tile of each coverage in a library, based
on the selections made.

DCW2I has large resource requirements which should be taken into
consideration before attempting to perform the conversion.
Recommendations for the use of DCW2I are as follows:

o As the program is very computationally expensive, a high
performance workstation or server is recommended although not
essential.

o The minimum page file quota for the machine should be at least
150Mb to ensure trouble-free conversion of all coverages.

o Allow approximately 2Mb of disk space for the storage of all IFF
files that will be generated from the 4 CD-ROMs covering the
world.

o   Due to errors in the DCW data the conversion process may
    encounter some problems when creating IFF area features and
    these require manual checking in LITES2.

* IFFDIGIT (Support for Scitex DIGIT)

IFFDIGIT provides the production of Scitex DIGIT data as supported on
Scitex operating system version 6.9.2.   Only DIGIT file type 310 is
supported.   The utilities provided are:

o   I2DIGIT - reads an IFF file and outputs DIGIT formatted data to
    magnetic tape only.

* IFFDLG (Support for USGS DLG)

IFFDLG provides support for the transfer of data from IFF to the U.S.
Geological Survey Standard **D**igital **L**ine **G**raph (DLG) format, as described
in the document **National Mapping Program, Technical Instructions, Data
Users Guide 1, US GeoData, Digital Line Graphs from 1:24,000-Scale Maps**,
of 1986 (Department of the Interior, U.S. Geological Survey, National
Mapping Division).   Optional DLG is not supported by this module. The
utility provided is:

o   I2DLG - reads an IFF file and outputs either to magnetic tape or
    disc in Standard DLG Distribution format at Level 3.

* IFFDXF (Support for Auto-CAD **D**igital e**X**change **F**ormat)

IFFDXF provides support for the transfer of data to and from ASCII DXF
format, as described in Appendix C of the Auto-CAD manual. However, DXF
files to be converted to IFF must contain no more than 16 levels.   The
graphic portrayal of symbols is not honoured by conversion of data in
either direction.   The utilities provided are:

o   DXF2I - reads DXF as input and produces an IFF file as output.

o   I2DXF - reads IFF as input and produces a DXF file as output.

* IFFGDB (Support for SICAD/GDB)

> IFFGDB provides support for the transfer of data to the SICAD/GDB (Geographical Data Base) format defined by the Siemens Ltd. Data Systems of Feltham, Middlesex. The utilities provided are:
>
> o I2GDB - reads an IFF file and outputs the data to a SICAD/GDB format ASCII disc file.

* IFFIMAP (Support for Informap)

> IFFIMAP provides support for the transfer of data to and from Informap, a Mapping Information Management System produced by Synercom Technology, Inc., USA. The utilities are also provided as native versions on the AXP platform and are described thus:
>
> o I2IMAP - reads an IFF file and outputs the data to an Informap database.
>
> o IMAP2I - extracts data from an Informap database and outputs it to an IFF
>
> o I2IMAP_AXP - as above but on the AXP platform running OpenVMS v6.1 and INFORMAP v3.6.2.
>
> o IMAP2I_AXP - as above but on the AXP platform running OpenVMS v6.1 and INFORMAP v3.6.2.

* IFFKERNCAM (Support for Kern CAM)

> IFFKERNCAM provides support for the transfer of data to and from the KERN CAM ASCII format used by Kern & Co. Ltd. of Aarau, Switzerland. The utilities provided are:
>
> o I2KERNCAM - reads an IFF file and outputs the data to a Kern CAM format disc file.
>
> o KERNCAM2I - reads a Kern CAM format disc file and outputs it to an IFF file.

* IFFMAPDATA (Support for MapData)

      IFFMAPDATA provides support for the production and reading of disk based MapData data. The utilities provided are:

      o I2MAPDATA - reads an IFF file and outputs a MapData file.

      o MAPDATA2I - reads MAPDATA data and creates an output IFF file.

* IFFMGD (Support for MGD77)

      IFFMGD provides support for the production and reading of MGD77 data on magnetic tape as defined in the document **The Marine Geophysical Data Exchange Format - 'MGD77' (Bathymetry, Magnetics, and Gravity)** written September 1977 and revised December 1981, published by the U.S. Department of Commerce as 'Key to Geophysical Records Documentation No 10 (revised)'. The utilities provided are:

      o I2MGD - reads an IFF file and outputs MGD77 formatted data to magnetic tape.

      o MGD2I - reads MGD77 formatted data from magnetic tape and outputs an IFF file.

* IFFMSDS (Support for reading MSDS data)

      IFFMSDS provides support for the reading of data in the Military Survey Data Structure (MSDS) exchange format on magnetic tape.

      The Military Survey Data Structure (MSDS) exchange format is a UK interim format for the exchange of topologically structured vector digital data. It will be replaced when the NATO Digital Geographic Information Working Group (DGIWG) standards are complete. The MSDS format is an ASCII text format and is described to Laser-Scan in the document "MIL SVY DATA STRUCTURE (MSDS) EXCHANGE FORMAT".

      The IFF files produced are intended for processing directly to produce graphic output. The utilities provided are:

      o MSDS2I - reads MSDS formatted data from magnetic tape and outputs an IFF file.

* IFFNTF (Support for NTF v1.1 and 2.0 (BS7567), levels 1, 2 & 3 and CITF 1.0)

IFFNTF provides support for the production and reading of **N**ational **T**ransfer **F**ormat (NTF) data. NTF is the UK National Transfer Format for spatially referenced data. Currently, only levels 1, 2 and 3 are supported at version 1.1 but with some restrictions at version 2.0. Also supported is the conversion of Ordnance Survey CITF data version 1.0 based on NTF level 5 version 2.0.

At level 1, the only attributes (values) recognised are orientation (OR) and height (HT). At levels 2 and 3 , full attribute transfer (except for per-point attributes) is possible in both directions. The utilities provided are:

o I2NTF - reads a series of IFF files, each containing a single map sheet, and outputs NTF or CITF data to file or magnetic tape. Three dimensional coordinate data may be output, but per point attributes are not supported. At level 3, structured IFF files can be output to NTF (this includes link and node data and complex objects, but excludes polygons). I2NTF is also able to change feature codes on a one-to-one basis during conversion, through the use of a feature code conversion lookup table.

o NTF2I - reads NTF or CITF data from magnetic tape or file, and outputs a series of IFF files. Three dimensional data and per point attributes are supported only for CITF. Although NTF level 3 data can be read, any structure information will not be present in the IFF file produced. NTF2I will read Ordnance Survey NTF version 2.0 Landline, OSCAR, 1:625000, 1:250000 and 1:50000 (contour) data products. As NTF2I will currently not read CHAIN, POLYGON, COMPLEX POLYGON and COLLECT records at NTF v2.0 it will not read Ordnance Survey's Boundary-Line data. NTF2I is also able to change feature codes on a one-to-one basis during conversion, through the use of a feature code conversion lookup table.

* IFFOSTF (Support for Ordnance Survey (GB) OSTF)

IFFOSTF provides support for the production and reading of OSTF data. OSTF is the **O**rdnance **S**urvey **T**ransfer **F**ormat, and is sometimes also called DMC (**D**igital **M**apping **C**ustomer format). The utilities provided are:

o I2OSTF - reads a series of IFF files, each containing an Ordnance Survey (OS) style map, and outputs OSTF format data to file or magnetic tape.

o OSTF2I - reads input data on magnetic tape or from disk, in OS DMC or OSTF formats, and produces an IFF file for each map sheet in the input data.

o OSMHED - edits an Ordnance Survey style map header. Individual fields in the header can be edited either sequentially by stepping through them, or explicitly through the use of simple commands. The program also has its own built in help facility.

o OSPIF - prints out the contents of an IFF file in summary format.
   The information produced includes the identity of the map sheet,
   feature codes and descriptions, texts, and start and end points of
   each feature.

* **IFFSIF** (Support for Intergraph SIF)

IFFSIF provides support for the output of IFF data in Intergraph
Standard **I**nterchange **F**ormat (SIF). The ASCII text form of SIF, version
8.8.2 and earlier is supported, as described in the document **Standard**
Interchange Format (SIF) Command Language Implementation Guide (8.8.2)
of 12-May-1985 (Intergraph document DIXD4110). The binary SIF format is
not supported. The utilities provided are:

o IFF2SIF - reads IFF data as input, and outputs to the ASCII text
   form of SIF.   An option in IFF2SIF also provides support for the
   SCITEX version of SIF.

o SIF2IFF - reads the ASCII text form of SIF as input, and outputs IFF
   data.

* **IFFTDST** (Support for SysScan ASCII DST)

IFFTDST provides support for the production and reading of the ASCII
text form of DST, as described in the document **GINIS I/O Reference**
Manual (4.1) of March-1988 (SysScan document RM-025). DST is the file
extension used by SysScan to identify GINIS data files, their main data
format. TDST is the term used by Laser-Scan to describe SysScan's
otherwise unnamed ASCII version of DST. The utilities provided are:

o I2TDST - outputs IFF data to ASCII DST.

o TDST2I - reads ASCII DST as input and produces an IFF file as
   output.

* **LSLIMI** (Laser-Scan Informap Interface)

LSLIMI consists of a translation menu interface which allows the user to
read data from magnetic tape or disk file into Informap, and to write
from Informap to tape or file, the following formats:

o OSTF - the OS transfer format, sometimes also called DMC

o NTF - the UK National Transfer Format for spatially referenced data

The menu system allows the user to specify what is to be read or
written, and then runs the appropriate programs.

Modules IFFIMAP, IFFOSTF and IFFNTF are prerequisites.

LSLIMI is intended for a system running Informap, and does not require a standard Laser-Scan LAMPS environment.

3   *PREREQUISITES*

3.1   *Computer Hardware Prerequisites*

The following computer hardware requirements are needed to run CONVERT.

* Any DEC VAX, MicroVAX, VAXstation, or Alpha AXP computer supported by the current version of VMS.

* At least 10MB available disc space for software, plus sufficient for data files.

* Any DEC-compatible alphanumeric terminal.

* Any DEC-supported magnetic tape or cartridge tape drive

* At least a 4096 pages working set per process is needed for efficient operation of the larger utilities.

3.2   *Software Prerequisites*

CONVERT utilities run under OpenVMS VAX Version 5.5-2, or OpenVMS AXP V1.5 (or higher, assuming upwards compatibility by DEC) concurrently with other interactive and batch processes.

Laser-Scan provides the IFF and FRT interface libraries as part of the prerequisite MAPPING support package. The IMP map processing package is usually used for preliminary map processing associated with the CONVERT package. Laser-Scan's LITES2 interactive digitising and editing software running on the same host computer is recommended for digitising vector input data. LASERAID or VTRAK automated digitising is recommended for large numbers of input documents.

It is recommended that the reader becomes familiar with the LAMPS Environment Guide which outlines in greater detail the hardware and software environment required by the LAMPS software suite as a whole (of which the CONVERT package is one part).

3.3   *Growth Considerations*

The minimum hardware and software requirements for any future version of this product may be different from the minimum hardware and software requirements for the current version.

4 *SUPPORT LEVEL*

All modules of the CONVERT package are fully supported Laser-Scan standard software products.