

Laser-Scan Ltd.

POLYGONS - Acceptance Tests

Issue 2.0 (mod) - 02-Oct-1992

Copyright (C) 2019 Laser-Scan Ltd
Science Park, Milton Road, Cambridge, England CB4 4FY tel: (0223) 420414

"POLYGONS Acceptance"	Category: Acceptance Tests
Issue 2.0 Adrian Cuthbert	19-Sep-1988
Issue 1.0 Tim Hartnall, Martin Reid	15-Oct-1987
Issue 1.0 (mod) K M Sutherland	02-Oct-1992

CONTENTS

1	Introduction	3
2	Preparing for the Acceptance Tests	3
3	Invoking the Acceptance Tests	4
4	The Acceptance Sequence	4
4.1	IPOLYGON - Generation Of Left/right Labelled Links	4
4.2	ISTSEL - Selective Re-labelling And Elimination Of Links	5
4.3	POLMERGE - Selective Polygon Elimination And Merging	6
4.4	IPOLYGON - Generation Of Closed Polygon Features .	6
5	FINAL VERIFICATION	8
6	Conclusions	9

1 Introduction

This document describes the acceptance test procedure for the Laser-Scan POLYGONS (IFF polygons package) which is part of the Laser-Scan LAMPS automated mapping system. It assumes that the user is familiar with digital cartography, with the POLYGONS modules, with the LITES2 map editor, the STRUCTURE package module ILINK, with LAMPS and with the VMS operating system. See the "POLYGONS User Guide", and the "POLYGONS Reference Manual" for further information on POLYGONS.

The relevant data files and command files for the acceptance tests are supplied by Laser-Scan on installation of the package.

Note that Laser-Scan reserve the right to make minor modifications to this acceptance procedure to match their policy of continued software development.

2 Preparing for the Acceptance Tests

Check that the Laser-Scan-supplied package initialisation command file LSL\$COM:POLYGONSINI.COM has been invoked. This has probably been done automatically on your behalf at login time. A good check is to use the DCL command:

```
$ SHOW SYMBOL POLMERGE
```

to verify that the DCL symbol for one of the POLYGONS package modules, POLMERGE, exists and points to the program image file of the main POLYGONS module "LSL\$EXE:POLMERGE.EXE". If symbol POLMERGE is not defined then invoke the package initialisation command file by giving the DCL command:

```
$ @LSL$COM:POLYGONSINI
```

then repeat the check for the existence of DCL symbol POLMERGE.

The acceptance test command procedure will check for the existence of the required acceptance test data files in the directory defined by logical name LSL\$IF. Checks will also be made for the existence of other required acceptance test data files in their usual directory on the Laser-Scan software distribution directory tree. It will set up a logical name LSL\$POLYGONS_ACCEPT to point to the public tree directory. It will also copy the initial IFF data file into the working directory pointed at by LSL\$IF.

The files used for the POLYGONS acceptance tests are:

1. LSL\$IF:POLYGONSACCEPT.IFJ

This file contains junction-structured linework defining a set of polygon boundaries. The links within this file are unlabelled.

2. LSL\$IF:POLYGONSACCEPT.SEED

This file contains single point text features used by the POLYGONS utility IPOLYGON as polygon seed points, from which polygon labels are derived.

3 Invoking the Acceptance Tests

Invoke the acceptance test command procedure by giving the DCL command

```
$ @LSL$COM:POLYGONS_ACCEPT
```

The test command procedure explains briefly the various phases of the acceptance procedure.

After copying the relevant IFF files to LSL\$IF:, it offers you the option of using the LITES2 map editor to inspect the initial data. This is a set of unlabelled links. After each phase it offers you the option of using the LITES2 map editor to inspect the results of the processing. Remember to EXIT LITES2 in order to rejoin the acceptance tests.

4 The Acceptance Sequence

At the start of these tests, the original data file contains junction structured links. The acceptance procedure steps exercise all three POLYGONS package modules in 4 stages.

1. **IPOLYGON** - creates polygons and assigns seed points to output links having left/right polygon labels.
2. **ISTSEL** - selectively relabels left/right labelled links and removes left/right labelled links on the basis of user specified label combinations.
3. **POLMERGE** - internally generates polygons from left/right labelled links. These polygons are then selectively eliminated and merged on the basis of polygon area and user specified polygon label combinations.
4. **IPOLYGON** - creates closed polygon features, which include first order nested polygons, from the left/right labelled links output by POLMERGE

4.1 IPOLYGON - Generation Of Left/right Labelled Links

In this phase, IPOLYGON is used to combine the junction structured links file with the data in the seed point file to create junction structured links having left/right polygon labels.

The command line specified is:

```
$ IPOLYGON/LOG/LITES2/SEGMENTS=(JUNCTIONS,LABEL, -
_$      OUTPUT:POLYGONS_ACCEPT.LNK) -
_$      /SEED=(FC:28,FILE:POLYGONS_ACCEPT.SEED) -
_$      POLYGONS_ACCEPT.IFJ
```

Note that IPOLYGON offers a LITES2 guidance file option to facilitate semi-automatic correction of data errors.

Note the output from IPOLYGON showing progress through the operation, and the polygon formation statistics. 86 segments and 33 seed points are read in. One of these seed points is disregarded because of multiple seed points in the same polygon. All polygons contain at least one seed point. Three passes are required to resolve polygon nesting.

Note that \$STATUS is returned as "%SYSTEM-S-NORMAL, normal successful completion".

You are then asked if you wish to inspect the results of this phase using LITES2. If you answer yes, then the IFF data file is read in to LITES2 and displayed (assuming LITES2 and suitable graphics hardware are available).

To facilitate verification, the source seed point features are displayed in conjunction with the left/right labelled links. The disgarded seed point is located using the LITES2 guidance file. This can be invoked by typing "@POLYGONS_ACCEPT" at the LITES2 command line.

All the links in the links IFF file will now have type 4 and 5 ACs (Ancillary Codes) which contain the polygon labels for the left and right side of the link respectively. The left/right polygon labels match the source seed point texts.

Pass []/Fail []

4.2 ISTSEL - Selective Re-labelling And Elimination Of Links

In this phase, ISTSEL is used to change the left/right labels of links which have the polygon codes "Lk" and "Kx" to "Replaced code". Where this process results in a link having the same polygon label on both the left and right hand side, the link is omitted from the output file. IFF junction structure is not preserved by this simple, but very quick program.

The command line specified is:

```
$ ISTSEL/LOG/DEF_FILE=LSL$POLYGONS_ACCEPT:POLYGONS_ACCEPT.DAT -  
_$ POLYGONS_ACCEPT.LNK POLYGONS_ACCEPT.SEL
```

Note the speed of execution. 86 segments are analysed, 3 of which are deleted.

Note that \$STATUS is returned as "%SYSTEM-S-NORMAL, normal successful completion".

You are then asked if you wish to inspect the results of this phase using LITES2. If you answer yes, then the IFF data file is read in to LITES2 and displayed (assuming LITES2 and suitable graphics hardware are available).

To facilitate verification, the original left/right labelled links are displayed in conjunction with the re-labelled left/right links.

Pass []/Fail []

4.3 POLMERGE - Selective Polygon Elimination And Merging

In this phase, POLMERGE is used to selectively eliminate and merge polygons defined by the left/right labelled links produced by IPOLYGON. The Lookup file specified defines that polygons with codes "Lk" and "Kx" are merged into neighbouring polygons with codes "Ab" and "Eq" respectively, provided they have an area less than the merge tolerance of 150000 square IFF units. Isolated polygons with codes "Lk" and "Kx" are eliminated if they have area less than 60000 square IFF units.

The command line specified is:

```
$ POLMERGE/LOG/LOOKUP=LSL$POLYGONS_ACCEPT:PMERGE_LOOKUP.DAT-
_$ /ELIMINATE/MERGE=(BY_LOOKUP)/AREA=(MERGE_TOL:150000,ELIM_TOL:60000)-
_$ POLYGONS_ACCEPT.LNK POLYGONS_ACCEPT.PMG
```

Note the log of progress through the operation, and the statistics. One isolation is a candidate for elimination, and is removed. 8 polygons are candidates for merging but coding constraints specified in the lookup file mean that only 7 are actually merged. 62 segments are written to the output junction-structured IFF file.

Note that \$STATUS is returned as "%SYSTEM-S-NORMAL, normal successful completion".

You are then asked if you wish to inspect the results of this phase using LITES2. If you answer yes, then the IFF data file is read in to LITES2 and displayed (assuming LITES2 and suitable graphics hardware are available).

To facilitate verification, the original left/right labelled links are displayed in conjunction with the re-labelled left/right links after polygon merging and elimination.

Pass []/Fail []

4.4 IPOLYGON - Generation Of Closed Polygon Features

In this phase, IPOLYGON is used to form complete closed polygon features from the left/right labelled links produced by POLMERGE. Nested polygons are joined to their 'parent' by means of invisible (or "pen-up") moves.

The command line specified is:

```
$ IPOLYGON/LOG/LRCODE/POLYGONS=(LABEL,FC:4,LAYER:100 -
_$      OUTPUT:POLYGONS_ACCEPT.POL) -
_$      POLYGONS_ACCEPT.PMG
```

Note the log of progress through the operation, and the statistics. 25 polygons boundary features are written to the output IFF file.

Note that \$STATUS is returned as "%SYSTEM-S-NORMAL, normal successful completion".

You are then asked if you wish to inspect the results of this phase using LITES2. If you answer yes, then the IFF data file is read in to LITES2 and displayed (assuming LITES2 and suitable graphics hardware are available).

To facilitate verification, the polygon boundaries are displayed (in a different colour) on top of the original left/right labelled links. This allows the links that have been lost during polygon merging to be identified.

Pass []/Fail []

5 FINAL VERIFICATION

This is the end of the formal acceptance test command procedure. The following files have been created from the original links IFF file:

Original links IFF filename: LSL\$IF:POLYGONS_ACCEPT.IFJ
 Original seed point IFF filename: LSL\$IF:POLYGONS_ACCEPT.SEED

PHASE	FILE CHARACTERISTIC	FILE
IPOLYGON	links given left/right labels	POLYGONS_ACCEPT.LNK
ISTSEL	links re-labelled, some removed	POLYGONS_ACCEPT.SEL
POLMERGE	links selectively removed	POLYGONS_ACCEPT.PMG
IPOLYGON	complete closed polygons	POLYGONS_ACCEPT.POL

These files are available in the directory pointed to by logical name LSL\$IF: for further verification, if required.

The following files can be used to view the output of the acceptance test using LITES2. These can be found in the directory pointed to by the logical name LSL\$POLYGONS_ACCEPT:.

FRT	(feature representation table)	POLYGONS_ACCEPT.FRT
SRI	(feature representation IFF file)	POLYGONS_ACCEPT.SRI
TRI	(text representation IFF file)	POLYGONS_ACCEPT.TRI

6 Conclusions

This completes the acceptance tests for the Laser-Scan POLYGONS software package.

Overall Pass []/Fail []

Comments:

Customer Representative:

Date:

Laser-Scan Representative:

Date: