# AAG TPoint Mapper (Version 1.40)

AAG\_TPointMapper works together with Maxim DL, Pinpoint, TheSky6 and TPoint to automate the process of building a TPoint model for a GOTO telescope connected to TheSky6.

A TPoint model is built by recording the coordinates reported by the telescope and the exact coordinates of the position to where it is pointing, for a large number of points spread arbitrarily over the sky.

After building a model, TPoint and TheSky6 work together to improve the telescope's pointing accuracy.

Note: One should read the TPoint manual to be able to improve the model by adjusting its mathematical terms.

🥶 AAG TPoi	nt Mappe	r	_ 🗆 🗵
TPoint Run	Settings	Points Definition   Points List   Help   About	
		Initializing Maxim DL version 4.56 Camera : Simulator is ready.	
Run			

Initial screen - TPoint Run TAB

The following should be checked before running the software:

- The correct camera is selected in Maxim DL and is turned ON;
- The correct telescope is selected in TheSky6 and it has been initialized;
- A TPoint model is available in TheSky6. Note that, if a new model is used in TheSky6, the telescope should be synchronized over a known star;

When running the software for the first time, the Camera and Pinpoint engine parameters should be verified and correctly set under the Settings TAB.

## Settings TAB

🜐 AAG TPoint Mapper			
TPoint Run Settings Poi	nts Definition Points List Help About		
TPoint Run Settings Point Camera Exposure 10 sec 	nts Definition       Points List       Help       About         Astrometric engine         Reference Catalog       GSC 1.1 corrected         Catalog Path :       f:\Databases_Astronomy\GSC11         Path         Minimum star magnitude       -2 •         Maximum star magnitude       20 •         Search area as percentage of the image       256 •		

Settings TAB

The Camera parameters **Exposure**, **Filter** and **Binning** parameters are used by Maxim DL to obtain sky images.

Note:

- shorter exposures time and higher binning will decrease the total image acquisition time;
- a clear filter (or no filter) will improve the image signal;
- these parameters may be adjusted while the model is being built;
- the image quality must be sufficiently good for Pinpoint to be able to calculate its center's coordinates;

Focal Length (mm) corresponds to that of the telescope setup being used.

Pixel Size (microns) corresponds to the physical dimensions of the CCD pixels.

The program uses the Pinpoint Astrometric Engine to calculate the exact coordinates of the image center.

**Note:** The Pinpoint full version must be installed seeing that the version LE automatically installed with Maxim DL, is limited in its capabilities.

The full version can be obtained from <u>http://pinpoint.dc3.com/</u> and it is distributed as a shareware program with full capabilities for a 60 day trial period.

**Reference catalog** to be used must be defined as well as the directory containing the respective catalog files.

Note: The GSC v1.1 (corrected) catalog usually produces faster results. It can be obtained via internet from <u>http://gsc.dc3.com/</u>.

**Catalog path** may be entered directly in the respective field or, alternatively, through the button **Path** which will display the *Select Path* window to choose the directory:

Select Path	×
f: [AAG_F]	•
Carlot Control	
f:\Databases_Astronomy	GSC11
OK	Cancel

Select Path window

The default values for the star magnitudes correspond to the largest range available in Pinpoint, i.e. from -2 to 20.

The default **Search Area** corresponds to the image area increased by a surrounding border corresponding to 30% of the image dimensions as illustrated below. This border dimensions can go up to a maximum of 80% of the image dimensions yielding a search area corresponding to 676% of the image area.



Diagram illustrating the Pinpoint Search Area (light gray area)

# **Points Definition TAB**



Points Definition Screen

Points Definition TAB is used to define the set of points to build the TPoint model.

The Number of Points are spread over a region (highlighted in pink) delimited by

- Minimum and Maximum Altitudes
- Minimum and Maximum Azimuths

The **Star Distribution** option forces the points to be spread over lines of equal azimuth producing a radial star pattern. The distribution is based on the fact that the angular separation between adjacent points is identical in altitude and in azimuth.

When not checked, the distribution is based on the criteria that the arc separation (i.e. distance) between adjacent points is identical in altitude and in azimuth.

When **East First** option is checked, the telescope moves from East to West in azimuth, after mapping points of identical azimuth. Otherwise, the telescope will move from West to East, after mapping points of identical azimuth.

#### 🜐 AAG TPoint Mapper \_ 🗆 🗙 TPoint Run Settings Points Definition Points List Help About Point # 001 Az = 355.00000 Alt = 030.00000 ٠ Az = 355.00000 Point # 002 Alt = 048.33333 Point # 003 Az = 355.00000 Alt = 066.66667 Alt = 085.00000 Point # 004 Az = 355.00000 Point # 005 Az = 320.00000 Alt = 030.00000 Point # 006 Az = 320.00000 Alt = 048.33333 Point # 007 Az = 320.00000 Alt = 066.66667 Point # 008 Alt = 085.00000 Az = 320.00000 Point # 009 Az = 285.00000 Alt = 030.00000 Point #010 Az = 285.00000 Alt = 048.33333 Point # 011 Az = 285.00000 Alt = 066.66667 Point # 012 Az = 285.00000 Alt = 085,00000Az = 250.00000 Point # 013 Alt = 030.00000 Point # 014 Az = 250.00000 Alt = 048.33333 Point # 015 Az = 250.00000 Alt = 066.66667 Az = 250.00000 Point # 016 Alt = 085,00000 Point # 017 Az = 215.00000 Alt = 030.00000 Point # 018 Az = 215.00000 Alt = 048.33333 Point # 019 Az = 215.00000 Alt = 066.66667 Point # 020 Az = 215.00000 Alt = 085.00000

### **Points List TAB**

Points List Screen

The Points List TAB simply displays the full set of points arranged in order of execution.

Note that all the parameters are recorded in the file **AAG\_TPointMapper.dat** in the directory where the AAG\_TPointMapper.exe file is installed and they will become the default values in the subsequent use of the program.

The positions of the different program windows are also recorded in this file.

The **AAG\_TPointMapper.dat** file can be deleted to reset the default values to those present after the program is installed for the first time.

# Setup procedure

Run Setup.exe

1	AAG TPoint Mapper Setup	×
	Welcome to the AAG TPoint Mapper installation program.	
	Setup cannot install system files or update shared files if they are in use. Before proceeding, we recommend that you close any applications you may be running.	
-	OK Exit Setup	

Welcome screen

AAG TPoint Ma Begin the installa	pper Setup tion by clicking the button below.		×
	Click this button to install AAG TPoint M destination directory.	apper software to the specified	
-Directory: C:\Program Files\AAG_TPointMapper\		Change Directory	
	E <u>x</u> it Setup		

The default directory where the files will be installed, is c:\Program Files\AAG\_TPointMapper\

🔀 AAG TPoint Mapper - Choose Program Group	×
Setup will add items to the group shown in the Program Group box. You can enter a new group name or select one from the Existing Groups list.	
Program Group:	
AAG Software	
Existing Groups:	
AAG Software Accessories Active@ UNDELETE Administrative Tools ArtIcons GetRight Microsoft Web Publishing PinPoint Engine PixInsight LE 1.0 RCOS TCC	
ContinueCancel	

The default program group

After installation, two new menu options will be available under AAG Software in the Start / Programs menu:

- AAG\_TPointMapper Information
- AAG\_TPointMapper

# **Essential Settings of TheSky6**

Under menu *Telescope / Server Settings* ... option Allow map (using Orchestrate or RASCOM) must be checked.

Telescope Help	Server Settings	?
Setup Link	Allow remote connections	OK
Digital Setting Girdes Telescope Line Editor Motion Controls Alt+M	URL of local horizon:	Cancel
Options +	Example:	
Leb Minor Ursa Mar	Remote client capabilities           Allow sync         Allow set park           Allow goto         Allow park           Allow focus control         Allow map (using Orchestrate or RASC)	ng rate OM)
	Remote clients use Orchestrate's "ImageThenSlewTo" command	DEC
		RE E

Under menu option *Telescope / Setup* ... option *Enable TPoint telescope modeling* must be checked and option *Confirm mapping* must be unchecked.

уб		Telescope Setup	?   ×
Tools	Setup	Telescope or control system	
is I	Digital Setting Circles Telescope Line Editor Motion Controls Alt+M	Paramount ME by Software Bisque	•
	Options  Server Settings	Settings	
Leo		Software options  Confirm slews Confirm syncs Confirm mapping Impose slew limits (destination coordinates only) Attempt to stop slews in progress through slew limits Switch to Night Vision Mode upon link Show the number of packets, retries and failures Close Object Information dialog box upon slew Close Object Information dialog box upon slew Close hair update frequency (ms): 500  Close	

Under menu option Edit / Insert New Object ... Create New TPoint Model.

