Geodetic Systems

V-STARS S8 and PRO-SPOT Demonstration
Measurement Report

February 2005

Table of Contents

Objects Measured

One small antenna was measured as part of the V-STARS and PRO-SPOT demonstration. The objective of the measurement was to measure the surface of the antenna with the PRO-SPOT target projection system. The object is shown on the cover of this report.

Equipment Used

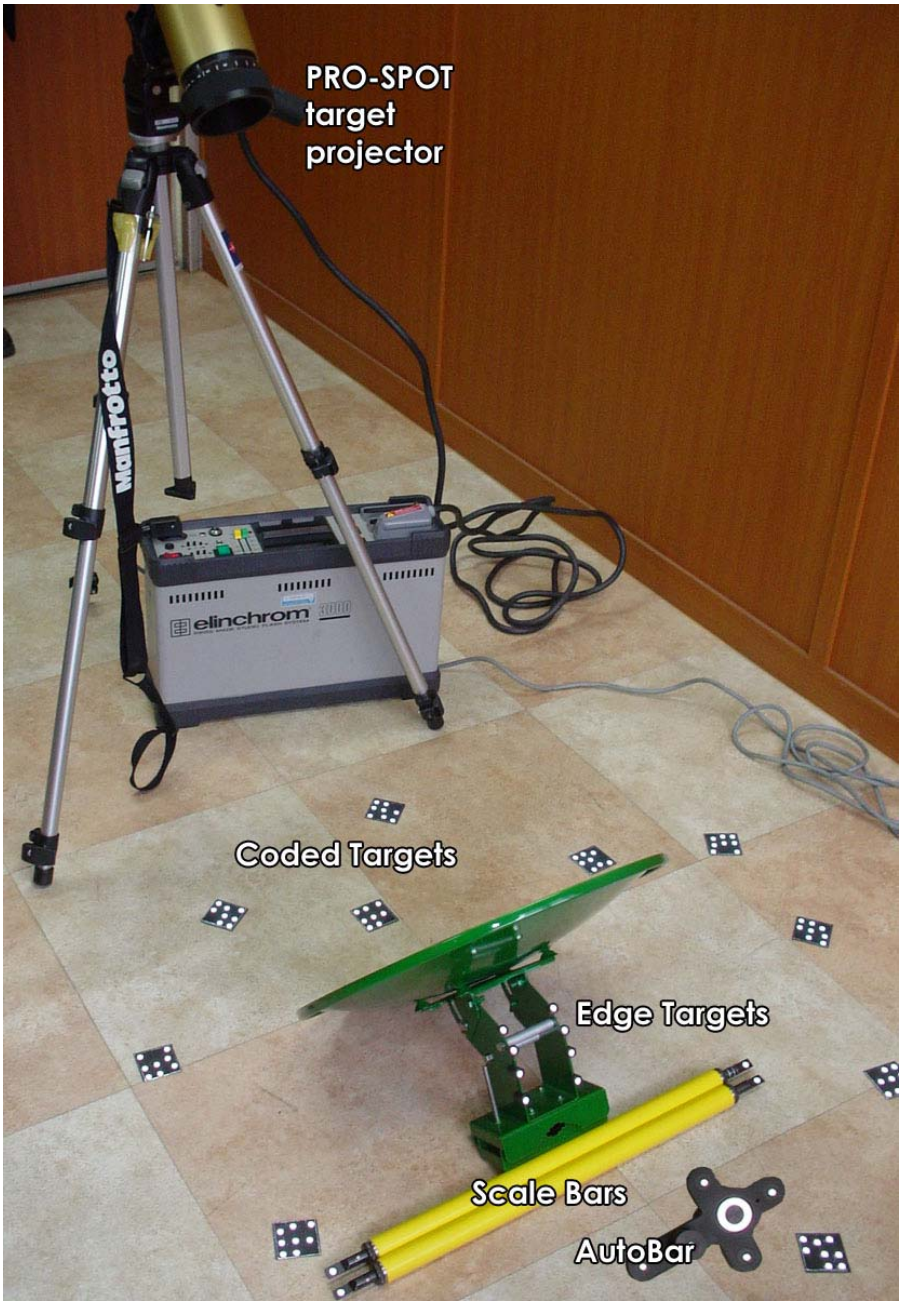
1. V-STARS S6 Camera System (S8 shown below)
2. Scale Bars
3. PRO-SPOT Target Projector
4. Edge targets

Measurement Objectives

1. Demonstrate camera use and object targeting
2. Determine surface points on the surface using PRO-SPOT
3. Use surface data to compute best-fit parabola
4. Determine edge location of bracket on rear face

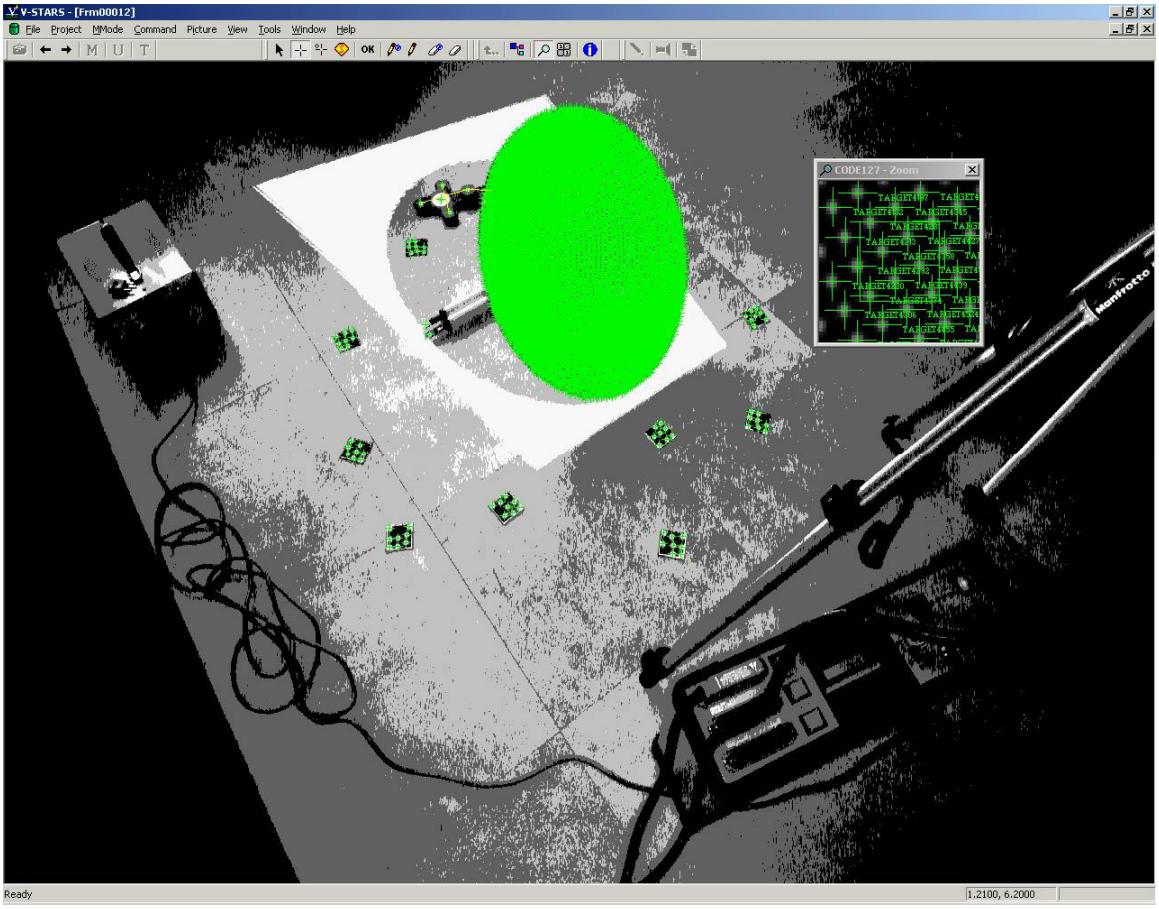
Targeting

1. AutoBar for initial coordinate system
2. Coded targets to tie photography together
3. PRO-SPOT projected targets
4. Two scale bars
5. Edge targets on rear bracket



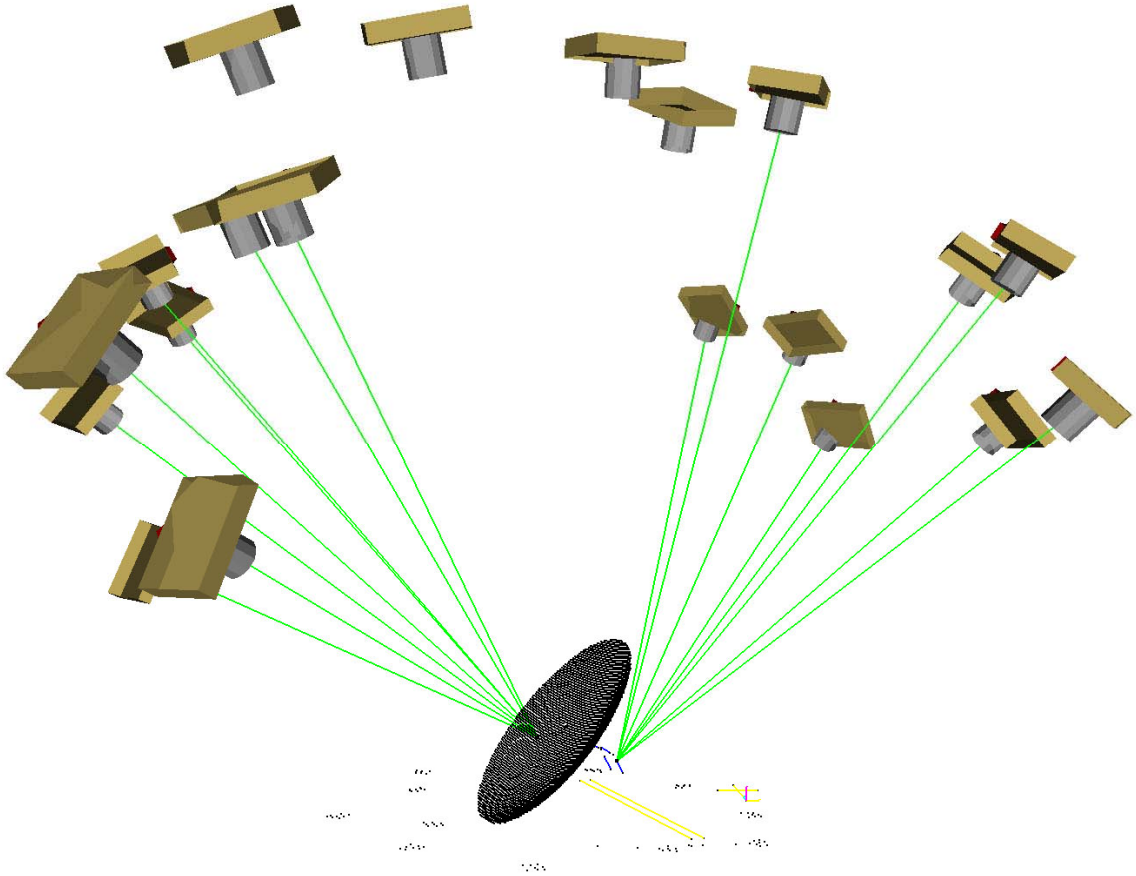
Measurement Statistics

No. of photos	20	
No. of points	6193	
Accuracy RMS X,Y,Z	X	0.013
	Y	0.014
	Z	0.010
Scale Agreement	0.022mm	



Typical V-STARS measurement image

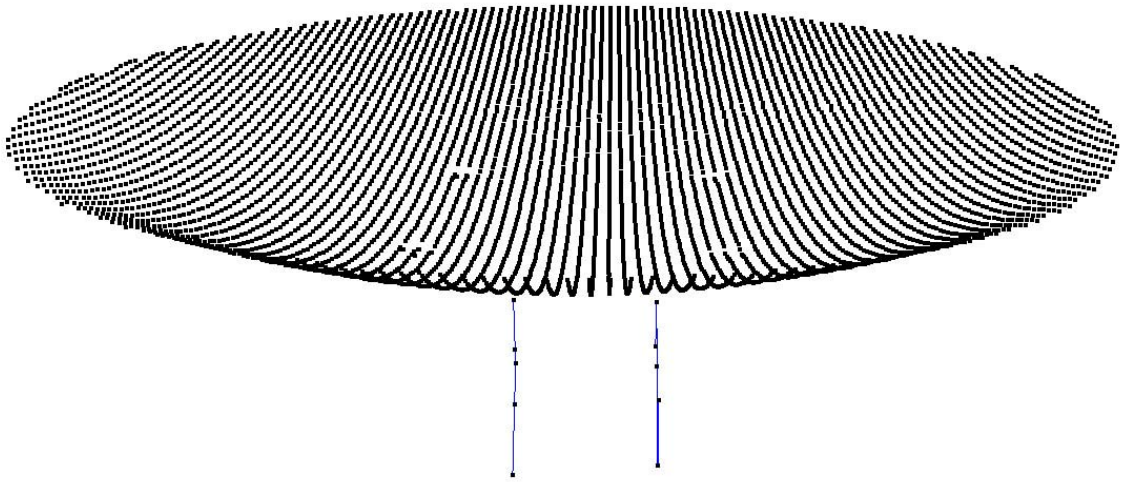
The diagram below illustrates the geometry used to create the control network point cloud.

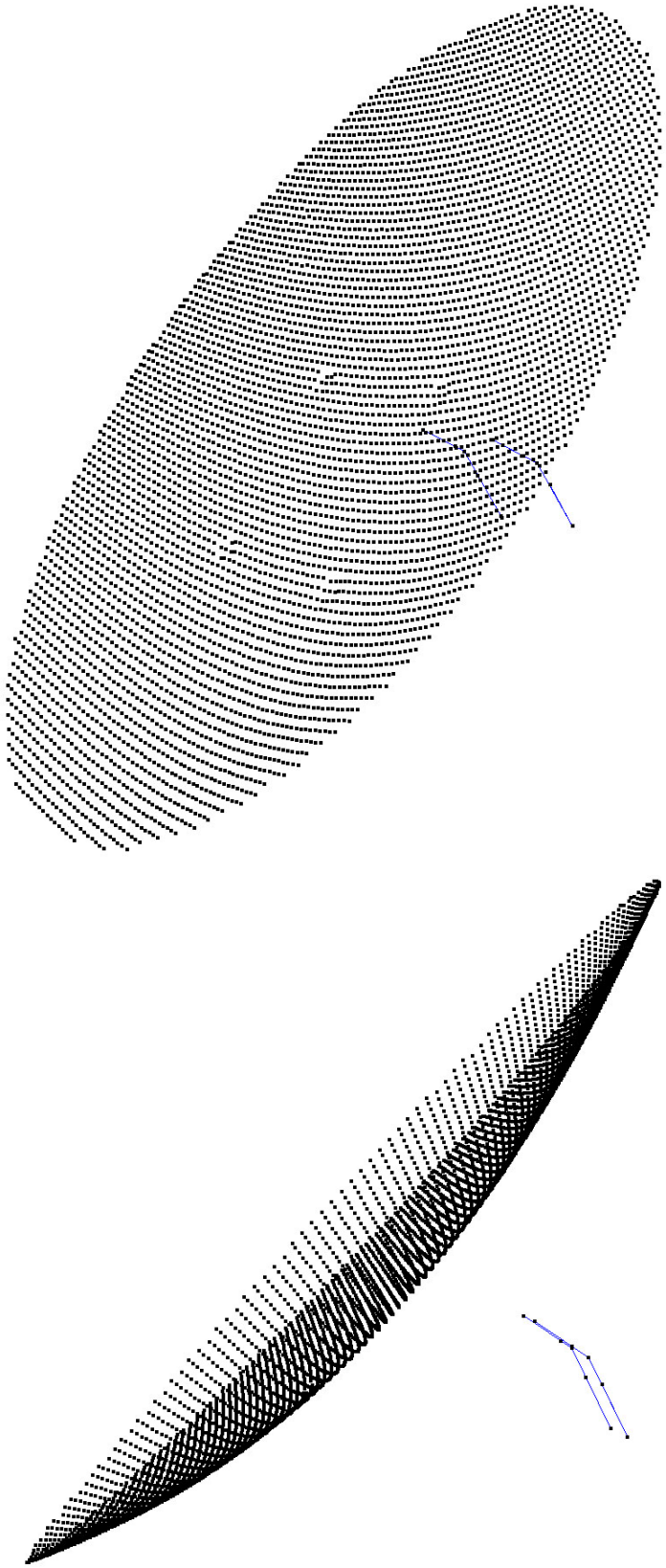


Side View

Point Cloud

The final point cloud from the measurement is shown below.





Alignment

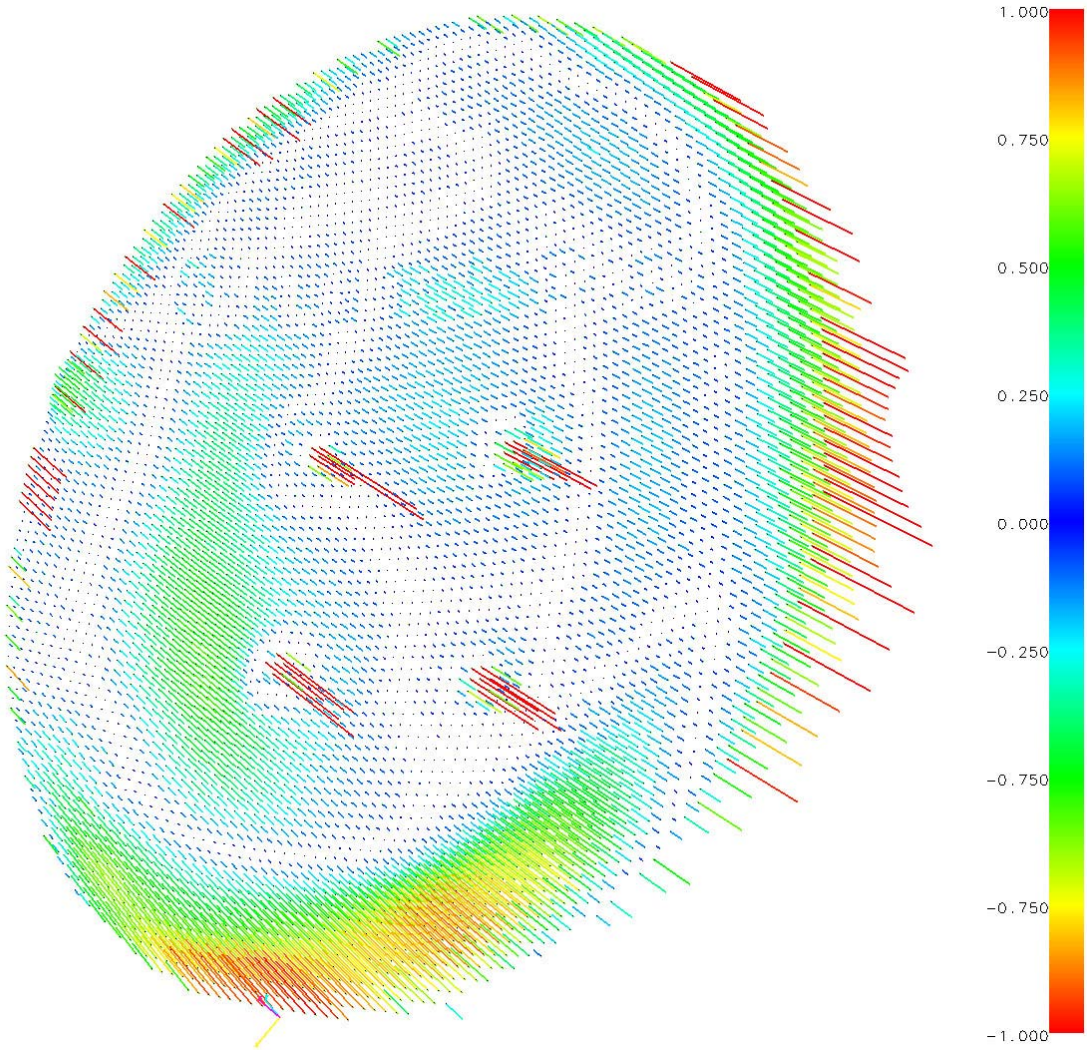
No alignment was used in this measurement. If an alignment is needed then typically points on the antenna are used as reference for this alignment. In this case, the points on the rear of the antenna could have been used to align the antenna into the part coordinate system.

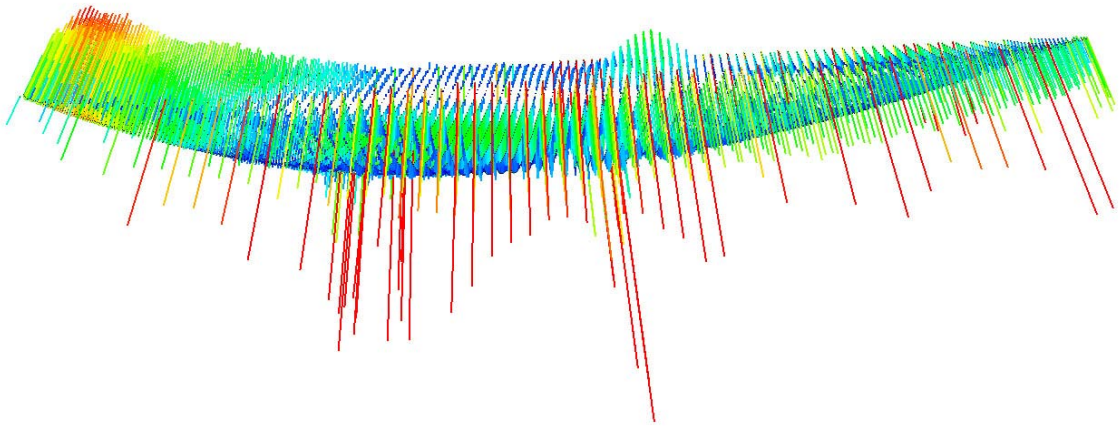
Antenna Analysis

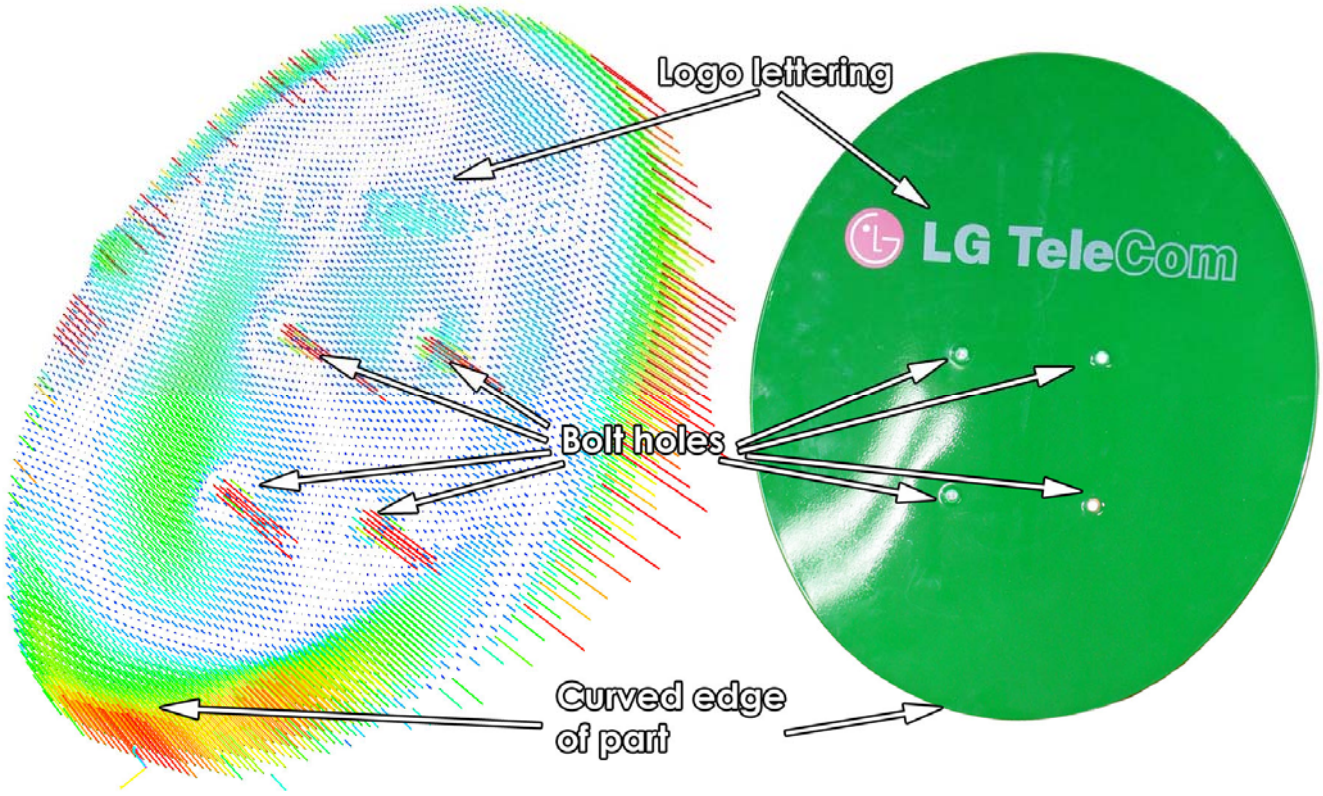
The point data collected was used to create the best-fit parabolic surface. The results of this best-fit are tabulated below.

FOCUS = 222.291mm
RMS = 0.133mm

The results are shown graphically below:






Logo lettering
LG TeleCom
Bolt holes
Curved edge
of part

Time Summary

Initial Investigation	2 minutes
Targeting	2 minutes
Photography	2 minutes
Processing	1 minute
Analysis	1 minute
Total	**8 minutes**

Concluding Remarks

The measurement undertaken has shown that the V-STARS S8 system can be a very powerful measurement tool. The results of the measurement undertaken were very accurate and produced quickly. The PRO-SPOT target projection system generated over 6,000 points on the antenna surface. For larger surfaces, up to 22,000 points could be projected in a single set up.