Aiman Co., Inc.
36938 Chancey Rd.
Zephyrhills, FL 33541
Est. 1985
Mechanical Surveyors
Providers of High Accuracy 3D Alignment and
Inspection Services
James Aiman
(813)-715-4600 office
(813)-997-7762 cell
aimanci@verizon.net
www.aimanalignment.com
We measure and align big things

Ships

Mining equipment

Bridges

Civil structures
We measure and align small things

Bearings

Crank shaft

Motor to pump alignment

10,000 HP DC motor
Mechanical / Industrial Surveying

- Close range – Less than 1,200 ft
  Most Cases 200 ft or less
- High accuracy – Standard unit of measure, machinist grade
  $\pm 0.001$ inch or $\pm 0.00001$ foot
- High precision – Repeatability, High Confidence Index
  Better than 2 Sigma (+ 95.5%) standard variance
Optical alignment is based on square line work.
Optical tooling came on to the mechanical scene about 1940 and is still widely used today.

- K&E .1 sec micro alignment telescopes
- Optical scales and targets
K&E tilting levels with micrometer

Wild T2 1 sec theodolite with micrometer

Brunson .5 sec jig transits with micrometer
Describing a point’s location

Cartesian coordinate
90° intersection

Spherical coordinate
Horizontal angle
Vertical angle
Radius

Right hand rule

Cylindrical coordinate
Horizontal angle
Elevation
Radius
Sokkia .5 sec Total Station

6’ – 1,200’

Retro-Reflective Targets

Horizontal angle  Vertical angle  Radius
Sokkia .5 sec Total Station

700 lb instrument stand

Bridge crane rails
Faro CMM Arm

Encoder at the joint

Collects data from rotary encoders at joints
CMM Arm 3D Mapping and Alignment

Machined part to be inspected with CMM Arm

Mapping flange holes
CMM Arm 3D Mapping and Alignment

Measuring bore for out of round

Measuring seal face for flatness
Close Range Photogrammetry & 3D Mapping
Close Range Photogrammetry & 3D Mapping

Photogrammetry camera

Dot targets

Coded targets

Scale bars
Close Range Photogrammetry & 3D Mapping

QA INSPECTION OF 3000 HP MOTOR USING 3D CAMERA

BORE INSPECTION USING PHOTOGRAHAMMETRY TOL. +/- .025MM
Line Bore Field Machining
Slab Field Machining
Gear Alignment
Port Spud Wrench
After Bull Gear Shaft Alignment
As Left, Saturday October 8th 2011

Port Side Bull Gear Bearing is High .004" and to Aft .013"
Reference, Stbd Side Bull Gear Bearing and Pinion Shaft

Stbd Side Pinion Shaft
Y: 51.765
Z: 0.000

Bull Gear Shaft: Stbd Bearing
Y: 0.000
Z: 0.000

Bull Gear Shaft: Port Bearing
Y: -0.013
Z: 0.004
Installing Targets
Boom Layed Down For Repairs
The survey was conducted between the hours of 1 am. and 6 am.
Tip of A-Frame Pins to Boom Feet Pins
Tip of Mast Pins to Mast Foot Pins
Tip of Mast Pins to Tip of Boom Pins

Tol. +/- 0.125"

UNITS: Inches
USACE Dredge Wheeler Repower Project at Signal Ship, Mobile, AL 2012-2013
Engine Room Lay Out
Dry-dock Complete
Carnival Cruise Ship Triumph vs. USACE Dredge Wheeler
Red spikes indicate the rail surface is closer to the hull (inboard)
Blue spikes indicate the rail surface is farther from the hull (outboard)

Units: 1.000'
Moore Haven Lock Gate Repair Project
East Gates
Line Bore