

 **MOTION
SOLUTIONS**
Confidence. Engineered.



OUR MISSION

We partner with innovators to push the limits of motion technology to make the world a better place.



MEET **MOTION SOLUTIONS**

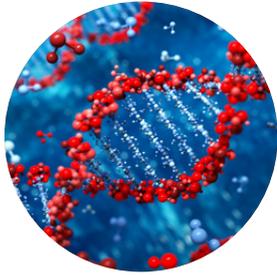
Motion Solutions provides custom, application-specific engineered systems to OEMs and industrial customers in the medical, life sciences, semiconductor, and industrial automation sectors. We offer a complete selection of services, including electro-mechanical design, prototype and volume manufacturing, and engineering services.

COLLABORATION, THE WAY YOU WANT

We engage with you from initial concept to understand how we can work together to make your project a success. Have an idea you don't know how to implement? Call us. Have a working prototype that needs just a bit more performance or design for manufacturing? We can help with that, too.



OUR CUSTOMERS BUILD SYSTEMS THAT **MAKE A DIFFERENCE**



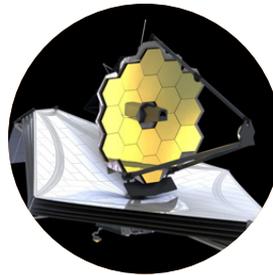
GENOME SEQUENCERS
to develop life-saving drugs



PRECISION PATHOLOGY
tools for top diagnostic accuracy



PATIENT PLATFORMS
for more highly targeted radiotherapy



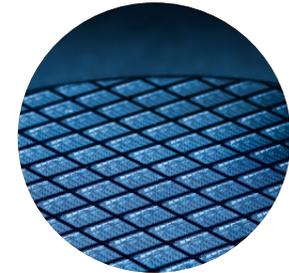
**SATELLITES AND SPACE
TELESCOPES**
to explore our universe



PRECISION SURGICAL ROBOTS
for improved patient outcomes



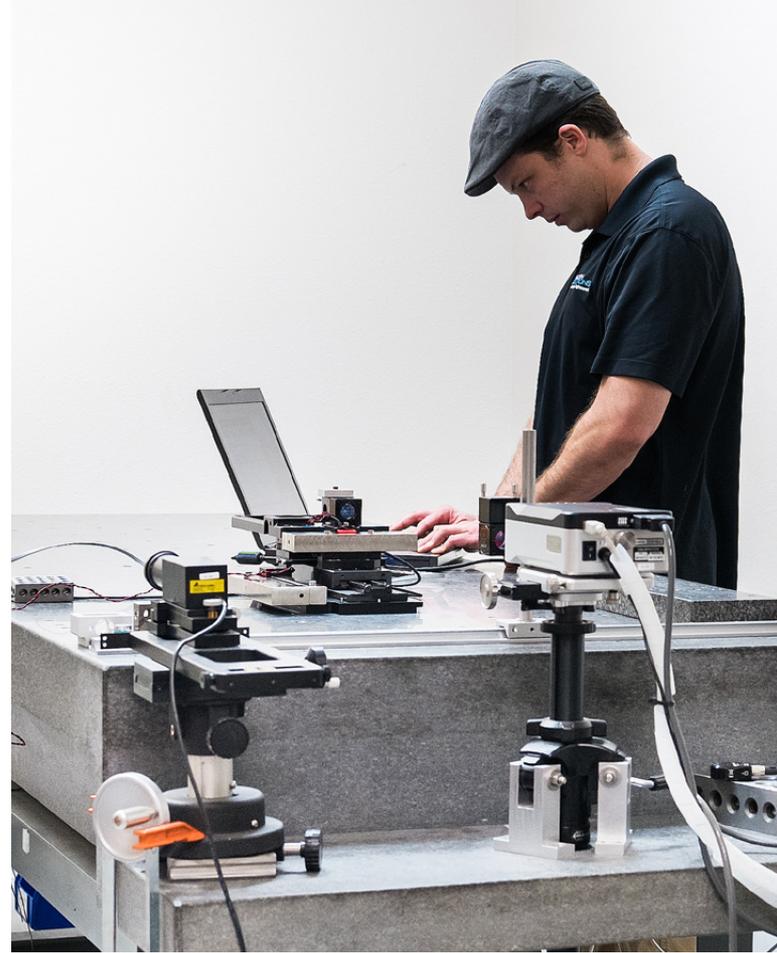
COMMUNICATIONS SYSTEMS
for next-generation in-flight Internet



WAFER HANDLING EQUIPMENT
to help fabricate the ICs of tomorrow

THE MOSO **ADVANTAGE**

- An agile, responsive organization with the ability to create custom solutions, from prototype to full production
- An experienced and highly specialized electro-mechanical engineering team
- A seasoned and highly skilled production staff that executes with precision and quality
- An extensive array of manufacturing and test equipment to deliver on customer requirements
- A commitment to quality that guides our every activity, from start to finish



SCALED TO MEET **YOUR NEEDS**



20+
DEGREED
ENGINEERS



300+
YEARS AGGREGATE
DESIGN EXPERIENCE



30+
ASSEMBLY
TECHS



36,000
SQ. FT. PRIMARY
PRODUCTION FLOOR



\$3M
IN CAPITAL
EQUIPMENT



1000s
OF UNITS MANUFACTURED
ANNUALLY



60+
YEARS IN
BUSINESS



ENGINEERED SOLUTIONS

AN EXTENSION OF YOUR ENGINEERING DEPARTMENT

The Motion Solutions team has decades of experience supporting customers with engineering services and manufacturing. Our engineers have developed specialized techniques for building high-performance motion systems. We use that deep expertise in electro-mechanical design to help our customers get better products to market faster.

NO TWO PROJECTS ARE ALIKE

We work with customers across a continuum ranging from application support on their designs to extensive collaboration on complex clean-sheet designs. Our focus is on providing the support and services most appropriate for each case. It's our ability to adapt to customer needs and deliver fast results that best defines us as an organization.





ENGINEERING **SERVICES**

SUPPORT, THE WAY YOU WANT IT

Our engineering services team applies proven technologies and established processes to help customers achieve their goals. Over the years, we've developed thousands of custom-engineered solutions ranging from very simple to highly complex. Chances are we have already worked on a problem similar to yours. But if not, our experienced team of engineers will collaborate with you to determine the best approach.

CLEAN-SHEET DESIGN

Converting your concept to reality

We use a mature development process based on:

- Mechatronic design, integrating mechanical and electrical engineering from the start
- Solid Works 3-D CAD for structural design
- Finite element analysis (FEA) for design review
- Multiple prototyping cycles
- Operational testing using code written by our developers

Deliverables include detailed schematics and drawings, performance analysis, manufacturing procedures, test protocols, and bill of materials (BOM).

DESIGN FOR MANUFACTURING

Specializing in practical performance

Does your initial build fall short of your performance goals?

Does it fail to meet tolerances? Miss repeatability requirements?

Is it difficult to build in volume?

Let our engineering services team help:

- Changes for volume manufacturing while maintaining specifications
- Modifications for automatic alignment
- Design to simplify test
- Registration features and fiducials to speed set up
- Assembly-friendly procedures

COST ENGINEERING

The performance you expect at the price you want

Our experts scrutinize every element of a product to determine how to build it more economically without compromising function. Each manufacturing step adds to the final cost of a product. We go beyond BOM to analyze the assembly process in detail to simplify and streamline each step.

- Alternative materials
- Simplified designs
- Revised tolerances
- Optimized component choices

OUR GOAL

A solution that not only meets your performance requirements,
but is also cost-effective to manufacture

MANUFACTURING SERVICES

In these days of tight staffing, outsourcing manufacturing lets you streamline assembly while cutting cost and reducing scrap. Customers who visit our production facility find our engineers and assembly technicians building electro-mechanical subsystems in volume, month after month.

FROM THE VERY SIMPLE TO THE HIGHLY COMPLEX

- For all of our contract manufacturing projects, we apply the MOSO design process.
- We adhere to best practices in project lifecycle management.
- Personnel follow detailed procedures for alignment, assembly, and testing.
- Every assembly undergoes strict quality-assurance testing and inspection.
- Devices ship with the appropriate paperwork:
 - Final inspection records
 - Certificates of conformance
 - Material and plating certifications as required



LIGHT MANUFACTURING

Simple assemblies of two or three components

Do you need to add a bracket to a bearing or change the preload? We can do that for you, quickly, reliably, and in volume. Our engineers and assembly technicians bring the same attention to detail to these projects as we apply to our clean-sheet designs.

BUILD TO PRINT (CUSTOMER DESIGNED)

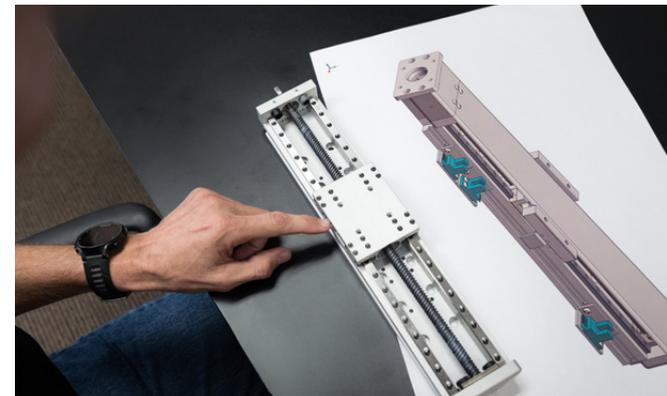
Your design, our experts

At Motion Solutions, our experienced staff has the expertise and the equipment to build even the most complex customer-designed subassemblies to the tightest tolerances. We work with you to establish specifications and testing protocols up front. We build prototypes to test the process and work out any bugs.

CUSTOM ENGINEERED SOLUTIONS (MOSO DESIGNED)

Outsource both engineering and manufacturing

Once our engineering services team finishes with a design, we can also manufacture it. Our experience in designing these complex mechanisms translates to expertise in manufacturing and assembly. You benefit from the cost and sourcing advantages afforded by our industry contacts.



OUR SOLUTION

Subsystems that arrive expertly assembled,
tested, and ready for use

THE MOTION SOLUTIONS **TEAM**

OUR PEOPLE MAKE THE DIFFERENCE

An experienced electro-mechanical design team

Each of our engineers has years of experience designing and building dozens, if not hundreds of systems. When customers bring us problems, we've probably seen them—and solved them—before. Many Motion Solutions engineers have worked previously for component manufacturers, giving our designers deep familiarity with the operation and performance of each device. The result is an engineering team with a tremendous ability to solve problems and turn out designs that exceed expectations, on a far shorter timeline than anyone would expect.

A seasoned and highly-skilled production staff

The high employee retention rate of Motion Solutions has enabled us to build a staff with the strong skill sets and attention to detail that are essential for quality production. Our engineering and assembly team members also understand the larger picture. An assembly tech building a part destined for a medical biopsy robot, for example, understands that they are not just tightening a screw, they are doing work that will eventually help save lives. This knowledge creates the highest possible commitment to quality.

An expert quality-assurance team

Over the years, we have built a quality-assurance (QA) team with comprehensive capabilities and deep expertise. Our QA specialists have worked in a range of industries, including aerospace and defense, life sciences, medical, and semiconductor. Our QA leadership has experience in job roles throughout the quality chain. This background makes it straightforward to develop a test and validation process that ensures compliance to customer specifications.



OUR FACILITIES

THE EQUIPMENT TO GET THE JOB DONE RIGHT

Our 36,000 square-foot primary production space spans two buildings and includes:

- Eight manufacturing bays dedicated to specific operations
- A 30-foot high-bay area
- A Class-1000 clean room with a Class-100 laminar flow bench
- Specialty cleaning equipment for clean-room-compatible parts
- An in-house machine shop with CNC milling and turning capabilities

An array of specialty tools throughout our facilities ensures engineers and technicians build assemblies that perform exactly as designed.

- An electronics lab for testing motors, drives, and other electronics
- Three CMMs with travel range up to 200 inches
- A Renishaw laser interferometer
- A Mitutoyo surface profilometer
- A laser autocollimator
- A helium vacuum-leak detector
- Water-pressure testing equipment
- Custom test systems and fixtures



OUR PHILOSOPHY

Invest in the latest instruments & tools



FOCUS ON **QUALITY**

Your customers depend on
the quality of your work.
You depend upon the
quality of ours.

DEDICATED TO QUALITY

As an organization, we are dedicated to quality. We build it into our process, our employee training, and every product we touch. This combination of factors has earned us “dock to stock” status with many of our customers.

Our Aliso Viejo, California facility is ISO 9001 and ISO 13485 certified. We have a detailed quality management system in place to ensure traceability and strict compliance to customer requirements. For more details, see our website.

- In our engineered solutions department, the customer participates in developing the QA process and is informed at every step.
- Our veteran QA team works with our engineers to ensure that subassemblies and systems can be easily and effectively tested.
- Our staff follows best practices for supply-chain management for each project, including qualifying new suppliers and monitoring existing suppliers.
- Risk mitigation underpins our entire quality program. We devise a test process proportionate to the level of risk presented by the component.



QUALITY CHECK

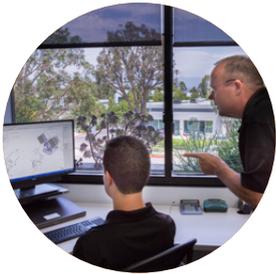
Quality is a never an accident, it is always the result of intelligent effort.



OUR **PROCESS**

Over the course of designing and building thousands of projects, we have developed a five step engineering process to maximize performance while minimizing cost and time. The engineering process starts with input from the customer and our entire team of engineers, both electrical and mechanical. We determine the best approach, including whether it aligns with our previous experience or whether we need a clean-sheet design. We may even recommend bringing in outside vendors.

PHASE 1: Project Planning



PHASE 2: Preliminary Design



PHASE 3: Detailed Design



PHASE 4: Prototyping



PHASE 5: Production



- Define project requirements
- Conduct feasibility study
- Develop project plan
- Establish budget
- Propose project schedule

- Lock down design requirements
- Create concept models
- Draft preliminary bill of materials (BOM)
- Perform preliminary design review

- Develop detailed CAD model
- Conduct thorough engineering analysis
- Generate full BOM
- Complete electrical design
- Conduct risk analysis
- Perform critical design review
- Obtain customer design approval

- Produce drawings and data sheets
- Initiate preliminary release to PLM
- Procure hardware
- Build prototype
- Perform validation testing
- Execute system life test
- Obtain customer prototype acceptance

- Implement changes and revisions
- Conduct cost reduction and vendor selection
- Develop manufacturing documents
- Initiate production release to PLM
- Launch volume production



INDUSTRIES **SERVED**

INSIGHTS BORN OF EXPERIENCE

Motion Solutions has spent decades providing motion control and automation components and systems across a wide range of industries. Over the years, we have developed a repertoire of solutions to target specific pain points, as these examples show. Our engineers leverage these industry insights to deliver the best products possible, whether we are manufacturing a client-designed subsystem, or engineering a product from scratch.

EXPERIENCE WITH A VARIETY OF MOTION SYSTEMS

Medical

- Microtomes
- Laser eye surgery gantries
- Radiotherapy patient platforms

Life Sciences

- DNA sequencers
- Flow cytometers
- Histology equipment

Automation & Robotics

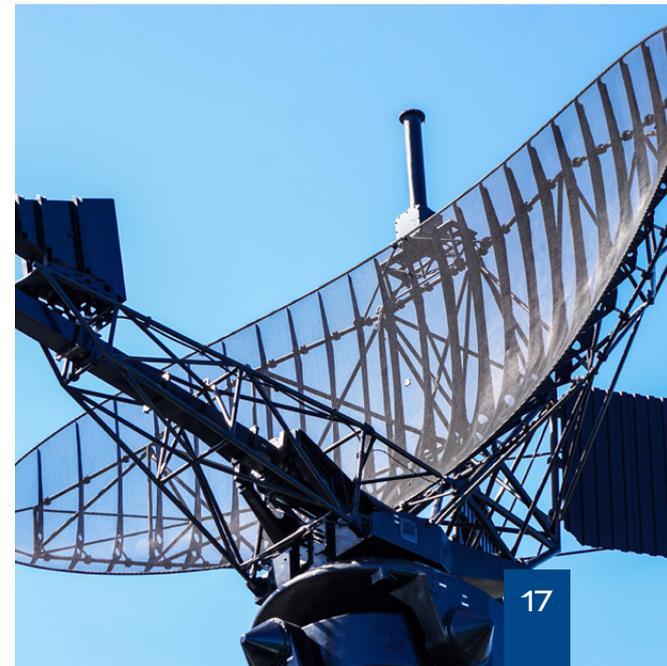
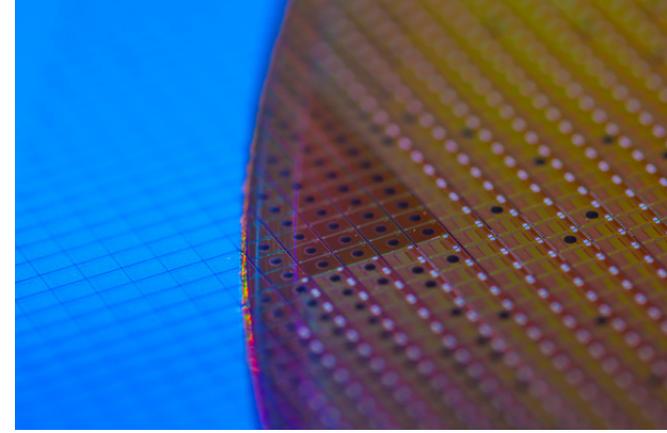
- Custom stages
- Linear motors
- Rotary tables

Semiconductor

- Wafer lifts and blade drives
- Wafer positioners for wet bench systems
- Wedge stages for adhesive dispensing heads

Aerospace & Defense

- Positioning systems for radar towers, satellites, and space-based systems
- Handling fixture for James Web Space Telescope
- Elevation and azimuth tracker for aircraft satellite link



A person wearing a white hairnet, a white surgical mask, and white gloves is working in a cleanroom. They are focused on a small, cylindrical metal component held in their hands. The background shows various pieces of equipment and a clean, sterile environment. The entire image has a blue color cast.

CONFIDENCE.
ENGINEERED.

AN EXTENSION OF YOUR ENGINEERING TEAM



PUT OUR EXPERTISE TO WORK FOR YOU.

www.motionsolutions.com



SOUTHERN CALIFORNIA (HQ)

27 Argonaut • Aliso Viejo, CA 92656
949.586.7442 • 949.586.7786 fax



NORTHERN CALIFORNIA

47517 Seabridge Drive • Fremont, CA 94538
925.243.8700 • 925.243.8725 fax

FOLLOW US:



sales@motionsolutions.com
www.motionsolutions.com