Case Study:

Maritime Dynamics marine controls...custom manifolds and system design.

Problem: Maritime Dynamics needed a compact hydraulic power unit and control valve system that could withstand the rigors of the sea and be easily serviced anywhere in the world.

Solution: Engineered and manufactured custom power unit and valve manifold assembly utilizing space efficient components and corrosion resistant materials.

Result: The compact power unit and manifold assembly weigh less and take up less space, while reducing potential leak points. Maritime Dynamics can troubleshoot the system without having to dispatch a field service technician overseas or send unnecessary parts.

Advanced Fluid Systems, Inc.
Fluid Power Distributor and Systems Manufacturer

‘Why’ Advanced Fluid Systems?
While our custom power units and manifold exceeded Maritime Dynamic’s previous designs for power and efficiency in a restricted space, it is the support and assistance that defines our partnership. Hydraulic system review, consultation, and 24/7 technical support are just some of the free services we regularly provide.

‘How’ we did it:
Founded in 1985, Advanced Fluid Systems is a fluid power distributor and systems manufacturer committed to providing quality fluid power products, solutions and services. Built around experienced sales engineers and a culture of employee empowerment, we work closely with each customer to provide the best solution for their application. Our philosophy is simple, “learn the customer’s business; build a relationship and a partnership; and provide them the highest quality solutions, products and services.”

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Mobile Case Studies in Success
Case 2 Study: Schramm, Inc. T455i drilling rig ...system design and automation.

**Problem:** Schramm's original control panel required the operator to use a series of levers, buttons and gauges to control the drilling rig. It was critical to monitor and manually adjust the hydraulic and engine power and speed allowing the drill bit to move at the most productive speed without damaging the rig.

**Solution:** Designed and programmed PLC logic to automatically and continuously:
- Monitor and adjust the drill bit speed and force allowing the drill bit to move at the most productive speed with out damaging the rig.
- Programmable logic allowing for dynamic and intuitive control over all components of the system. The drill bit speed and force are continuously monitored and adjusted to maintain optimal performance.
- Programmable position limits prevent the ladder from hitting the truck or other hard points.
- Programmable logic allows for smoother, safer ladder control regardless of user input or ladder position.
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**How we did it:**
- Replaced the manual hydraulic valves with digital multi-axis joysticks and custom Sun electro-proportional control valves, allowing the PLC control system to dynamically adjust the drill bit speed and force allowing the drill bit to move at the most productive speed without damaging the rig.
- Employed Sun Hydraulics’ popular hydraulic and electronic motion control solution as a partner, not a vendor.
- Utilized electro-hydraulic and manual proportional valve controls and system integration.
- Employed H2E Electric's innovative semi-automatic ladder positioner and other user-friendly features, data exchange of different protocols and dynamic sensory management reduces production and field service costs.
- The “intelligent” controls allow for real-time monitoring and adjustment of system parameters.

Case 3 Study: American Lafrance aerial platform ...programmable valve controls and system integration.

**Problem:** The "intelligent" controls allow for real-time monitoring and adjustment of system parameters.

**Solution:**
- Employed H2E Electric’s popular hydraulic and electronic motion control solution as a partner, not a vendor.
- Developed custom designed and programmed PLC logic to automatically and continuously:
- Monitor and adjust the pneumatic and hydraulic systems.
- Detect and calculate an adjusted valve command, which is then sent to the proportional valve. Some advantages include:
- Smoother, safer ladder control regardless of user input or ladder position.
- Programmable position limits prevent the ladder from hitting the truck or other hard points.
- Built-in fail-safe feature allows the ladder to come to a stop if the ladder control system fails.
- The "intelligent" controls allow for real-time monitoring and adjustment of system parameters.
- Data exchange of different protocols and dynamic sensory management reduces production and field service costs.
- Why we did it:
- While American Lafrance explored hydraulic control options from a few different suppliers, they chose Advanced Fluid Systems because of our total commitment to each solution, and the relationships by taking complete responsibility for design and implementation at a fixed price, and providing state-of-the-art engineering and innovative, quality components. 
- Integrated microprocessor based valve controllers and developed custom software to provide more uniform and safer speed regulation of the system, regardless of user input or ladder position.
- Programmable position limits prevent the ladder from hitting the truck or other hard points.
- The "intelligent" controls allow for real-time monitoring and adjustment of system parameters.

**How we did it:**
- Utilized Sun electro-hydraulic and manual proportional control valves for ladder, platform and outrigger controls. After evaluating several valves, including Parker/Apitech, Bosch, and Hanix, American Lafrance's testing team unanimously agreed that the Sun valves performed the best.
- Incorporate microprocessor based valve controllers and developed custom software to provide more uniform and safer speed regulation of the system, regardless of user input or ladder position.
- Programmable position limits prevent the ladder from hitting the truck or other hard points.
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Maritime Dynamics marine controls
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Result:
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Introduction

Modern advances in hydraulic and electronic controls offer many affordable options for improving your mobile applications. Some of these design and engineering capabilities we employ include:

- Programmable motion and logic controllers designed and programmed by our in-house engineering.
- Multi-axis joystick, LCD touch screen and radio remote user interface seamlessly incorporated into your application.
- Custom manifolds containing integrated cartridge valves, diagnostic ports, face mounted valves, and more; while reducing size, weight and costs.
- Electronic and software integrations for J1939 engine management and feedback.
- Manual and electro-proportional control valves that permit precise control, load sensing and overall system integration independent of each other.
- Corrosion resistant materials and manufacturing techniques for marine and other harsh environments.

Problem:

Your machine’s hydraulic controls required too much input and monitored system pressure and flow to manually adjust the hydraulic system valves while driving to maintain proper system load and fluid speed.

Solution:

Advanced Fluid Systems’ solution oriented approach thinks beyond the hydraulic components and assemblies to understand your entire application and how it operates. Fully understanding your application gives us the foundation to design integrated hydraulic, electronic and non-linear solutions that address all of your machine control requirements. Much of our success is attributed to the total commitment we make to each project and the partnership we form with each customer. We build these relationships by taking complete responsibility for design and implementation at a fixed price, while providing state-of-the-art engineering and innovative, quality components. Our responsibility to your success isn’t over with an invoice. We provide support anywhere you need us - 24 hours a day, 7 days a week. Following case studies are a few examples of the expertise and commitment we bring to every application, regardless of size or scope. Each demonstrates a problem identified, solution implemented and a result realized. Ask us about our expertise and commitment we bring to every application, regardless of size or scope. Each demonstrates a problem identified, solution implemented and a result realized. Ask us how we can help you find your needs.

Case Study 1:

Schramm, Inc. T455i drilling rig...

...system design and automation.

**‘How’ we did it:**

Replaced the manual hydraulic valves with digital multi-axis joysticks and custom Sun electro-proportional control valves, allowing the PLC control while simplifying the hydraulic circuit and reducing size and cost. Designed and programmed PLC logic to automatically and continuously:

- Monitor and adjust the drill speed.
- Monitor, recalculate and adjust the drill bit speed and force allowing the drill bit to move at the most productive speed possible without damaging the bit.
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- Monitor the drill rig’s cooling fan to the minimum speed adequate to maintain the temperatures of the engine, air compressor, and hydraulic system to reduce fuel consumption and noise.
- Monitor, recalculate and adjust the drill bit speed and force allowing the drill bit to move at the most productive speed possible without damaging the bit.
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**‘Why’ Advanced Fluid Systems?**

Advanced Fluid Systems wasn’t the first to propose drill rig automation to Schramm, but we were the first to take complete responsibility for design and implementation for a fixed price. We took the time to learn how the entire drill rig operated from the operator to use a series of levers, knobs and gauges to constantly monitor and adjust the load, speed and service status via the control panel LCD display.

- Smoother, safer ladder control regardless of user position.
- Programmable logic limits prevent the ladder from hitting the truck or other hard points.
- Feedback loops calculated in real-time can be monitored on multiple operator displays.

Provided data integration, remote diagnostic and inventory management services. Incorporated J1939 and CANbus protocols, and with our total commitment to each solution, and the American Lafrance aerial platform...

...programmable valve controls and system integration.

**‘How’ we did it:**

Utilized Hans-electro-hydraulic and manual proportional control valves for ladder, platform and outrigger controls. After evaluating several valves, including Pacific, Apex, Bosch, and Racor, American Lafrance’s testing team immediately agreed that the Hans valves performed the best.

Incorporated microprocessor based valve controllers and developed custom software to provide more uniform ladder speed regardless of its position or movement. A Hawe valve controller monitored the ladder elevation and length through a series of sensors. When joystick input is received, the Hawe controller and custom software calculates an adjusted valve command, which is then sent to the proportional valve. Some advantages include:

- Programmable valve controls and system integration.
- Programmable logic limits prevent the ladder from hitting the truck or other hard points.
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Provided data integration, remote diagnostic and inventory management services, incorporating J1939 and CANbus protocols, and with our total commitment to each solution, and the American Lafrance aerial platform...

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Problem: Advanced Fluid Systems’ solution oriented approach thinks beyond the hydraulic components and assemblies to understand your entire application and how it operates. Fully understanding your application gives us the foundation to design integrated hydraulic, electronic and mechatronic solutions that address all of your motion control requirements. Much of our success is attributed to the total commitment we make to each project and the partnership we form with each customer. We build these relationships by taking complete responsibility for design and implementation at a fixed price while providing state-of-the-art engineering and innovative, quality components. Our responsibility to you doesn’t end with an invoice. We provide support anywhere you need it—24 hours a day, 7 days a week. The following case studies are a few examples of the responsibility we take for the entire system. We learned the aerial systems business challenges first-hand and implemented a complete hydraulic and electronic motion control solution as a partner, not a vendor. While American Lafrance explored hydraulic control options from various distributors and manufacturers, they chose Advanced Fluid Systems because of our total commitment to each solution, and the expertise and commitment we bring to every application, regardless of size or scope. Each of us—24 hours a day, 7 days a week. The following case studies are a few examples of the responsibility we don’t take for the entire system. We learned the aerial systems business challenges first-hand and implemented a complete hydraulic and electronic motion control solution as a partner, not a vendor. While American Lafrance explored hydraulic control options from various distributors and manufacturers, they chose Advanced Fluid Systems because of our total commitment to each solution, and the commitment we bring to every application, regardless of size or scope.

Solution: Utilizing a flexible, robust, and digitized approach to automate the driller’s job is a key driver for savings, performance, and scalability into multiple existing CANbus networks. Employed these fluid systems ensure the operator can control the system and provide real-time feedback without sacrificing safety. We minimized the hydraulic circuit and reduced piping costs. Replaced the manual hydraulic valves with digital multi-axis joysticks and custom software to monitor and adjust the pneumatic and hydraulic system when drilling. The new control panel, “The 'intelligent’ controls allow for seamless, safe, and efficient operation of the entire system. Data exchanges of different protocols and often-inaccessible management reduces production and field service costs.

Case Study: Schramm, Inc. T455i drilling rig
...system design and automation.

How we did it:

1. Programmable motion and logic controls designed and programmed by in-house engineering.
2. Multi-axis joystick, LCD touch screen and radio remote use interface seamlessly incorporated into our applications.
3. Custom manifold combines integrated cartridge valves, diagnostic ports, face mounted valves, and more; while reducing size, weight and costs.
4. Electrical and software integrations for J1939 engine management and feedback.
5. Manual and electro-proportional control valves that permit precise compensation, load sensing, and other control options independent of each section.
6. Exceptional service and support integration for J1939 engine management and feedback.
7. Manual and electro-proportional control valves that permit precise compensation, load sensing, and other control options independent of each section.
8. Exceptional service and support integration for J1939 engine management.
9. Advanced Fluid Systems' solution oriented approach thinks beyond the hydraulic components and assemblies to understand your entire application and how it operates.
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