

Project History

To illustrate the range and nature of services available from Wayne Miller Associates, a representative sampling of project descriptions is given below. This list is not comprehensive, but gives a good indication of the technical capabilities offered and the wide variety of applications addressed.

PROGRAM DESCRIPTION

SERVICES PROVIDED BY WMA

Stroboscope

A manufacturer of electronic equipment had an instrument stroboscope in its product line that relied upon vacuum tube technology. A new solid state product was developed utilizing the company's own mechanical design department to do the packaging.

- Complete electrical design and parts' specifications.
- Design of PC boards in conjunction with customer's mechanical requirements.
- Construction and test of 3 prototypes and support for production startup.

Radar Transponder

A manufacturer of marine navigation aids had recently added a frequency-agile radar beacon to its product line. A second, lower cost model was developed for U.S. Coast Guard use and for worldwide marketing.

- Development of approach and generation of block diagram of microwave portion of receiver and transmitter.
- Generation of complete electrical specification for microwave portion.
- Tracking of development program to final design.
- Development and construction of automated test setup for receiver portion of system.

Biomedical Equipment

A manufacturer of solenoid-operated valves wished to team up with a research scientist affiliated with a major medical university to produce a machine to separate cultured cell tissue for analysis in cancer research. The machine was invented to perform the operation in a controlled and repeatable manner.

- Design of a pressure control system for precise control of mechanical pressures and movements.
- Generation and testing of software for entire system.
- Follow up with user to optimize system performance.

PROGRAM DESCRIPTION

Satellite Communications Earth Station

A country in the Far East required an expansion of its C-Band SCPC satellite communications facilities. A set of 5 integrated modules was designed to provide a complete 24-channel synthesized Up/Down Link employing a 70 MHz IF.

Microprocessor Controls

A manufacturer of precision valves used in analytical chemistry had a microprocessor-based valve controller for which software documentation was no longer available. A modification to the unit's operation was accomplished by a change in programming.

Motor Controls

A company supplying specialized hardware to the motion-picture industry had a requirement for a variable, high-stability motion picture camera speed controller. A product was developed in less than a month that would permit phase-locked control from 4 to 99 frames per second and a stability of +/-10 PPM.

SERVICES PROVIDED BY WMA

- Writing complete module specifications for each of the 5 modules.
- Total design of the frequency synthesizer and the two PLO modules.
- Design of the interface and IF circuitry used in the up- and down-converters.
- Preparation of test data sheets.
- Travel to the Far East to aid in system troubleshooting and evaluation.

- Generation of an address table from the schematic.
- Complete disassembly of the machine code.
- Insertion of label and comments into the disassembled code.
- Modification of code to achieve the desired operation.
- Delivery of complete documentation and programmed PROM to customer.
- Generation of a "DEBUG" program for use in troubleshooting microprocessor boards.

- Complete design and construction of unit.
- Design of PC board.
- Production testing of first units.

PROGRAM DESCRIPTION

Instrumentation

A supplier of equipment to the paper industry wished to develop a hand-held microwave moisture sensor for on-line process monitoring in paper mills. A sensor was developed that avoided several existing patents and provided superior results.

Document Review

A manufacturer of avionics for general aviation had an extensive training program for field support. Training programs were generated and translated into various languages for world-wide distribution.

SERVICES PROVIDED BY WMA

- Conception and development of a unique new microwave sensor.
 - Working with the company responsible for the mechanical design to select and test a suitable enclosure material.
 - Proposal of design approach, including packaging, support logistics, and total project costs.
 - Development of complete product specification.
 - Production, test, and delivery of prototypes
 - Complete design and construction of unit.
 - Design of PC board.
 - Manufacturing and test of production units over a multi-year period.
 - Generation of alignment test procedures and final acceptance test procedures.
 - Travel to initial installation site to witness field performance.
 - Refinement of design based on field observations.
 - Assisting with patent applications and patent issue.
 - Review and value engineering of project after several years to improve market share.
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- Reviewed training manuals in both English and French for technical accuracy, clarity, and grammar.

PROGRAM DESCRIPTION

Program Support

A manufacturer of microwave components developed a broad line of digital attenuators. The program involved the generation of standard packages, standard PIN diode drivers and driver assemblies, and standard test techniques. One of the most significant advantages of the program was the fully automated testing, both of driver assemblies and final product.

Avionics

The manufacturer of End Fire Glideslope antenna arrays for the FAA required a pair of tracking phase shifters to compensate for glide path errors due to natural physical shifts in the antenna installation. A product was developed that would sense the error from an analog input signal, provide commands to a pair of accurate digital phase shifters, and drive the error to a null.

Petrochemical Research

A major oil company was seeking a method of doing a continuous analysis on the effluent from a drilling stack. A precision sensor was developed that could determine the oil-to-water ratio of the flowing contents of a high-pressure tube.

SERVICES PROVIDED BY WMA

--Design of a family of basic PIN diode driver circuits, the most popular of which was incorporated into a thick-film hybrid.

--Design and construction of a dedicated tester for hybrid drivers.

--Design and construction of a computer-based test set-up for driver assemblies and for final units.

--Proposal of design approach, including packaging, support logistics, and total project costs.

--Development of complete product specification.

--Design of entire product.

--Generation of alignment test procedures and final acceptance test procedures.

--Travel to initial installation site to witness field performance.

--Refinement of design based on field observations.

--Review and value engineering of project after several years to improve market share.

--Proposal of measurement method.

--Design and construction of feasibility model.

--Design and construction of final instrument.

PROGRAM DESCRIPTION

Automated Test Equipment

A digitally-controlled phase shifter was required for a major defense radar project. The requirements for the unit were extremely stringent and difficult to test. An automated test set was built to perform all the tests and insure specification compliance.

Project Management

A manufacturer of microwave modules had an opportunity to bid on a set of satellite frequency converters for a major government project. A complete rack-mounted frequency converter system was developed to meet the requirement and to launch the client into a new product area.

SERVICES PROVIDED BY WMA

--System design of entire test set, including microwave, digital, and analog equipment.

--Design and Construction of custom assemblies to interface with purchased test equipment.

--Writing all software required to take data, perform statistical analysis, print data sheets, and provide user interface.

--Follow up documentation with Prime Contractor to insure compliance.

--Worked with end customer to develop product specifications.

--Completed over-all system design of product, including power supply, front panel design, remote monitor and control protocol, embedded microprocessor, and microwave architecture.

--Developed specifications for individual parts.

--Found sources for parts that could not be manufactured in house.

--Co-ordinated efforts to insure promised delivery of product..

--Wrote test procedures and technical manuals for product family.

--Trained in-house personnel for complete product support.