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**Tester Status Report:
JANUARY-MARCH 1980**

Charles F. Draut

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Monsanto

MOUND FACILITY
Miamisburg, Ohio 45342

operated by

MONSANTO RESEARCH CORPORATION
a subsidiary of Monsanto Company

for the

U. S. DEPARTMENT OF ENERGY

Contract No. DE-AC04-76-DP00068

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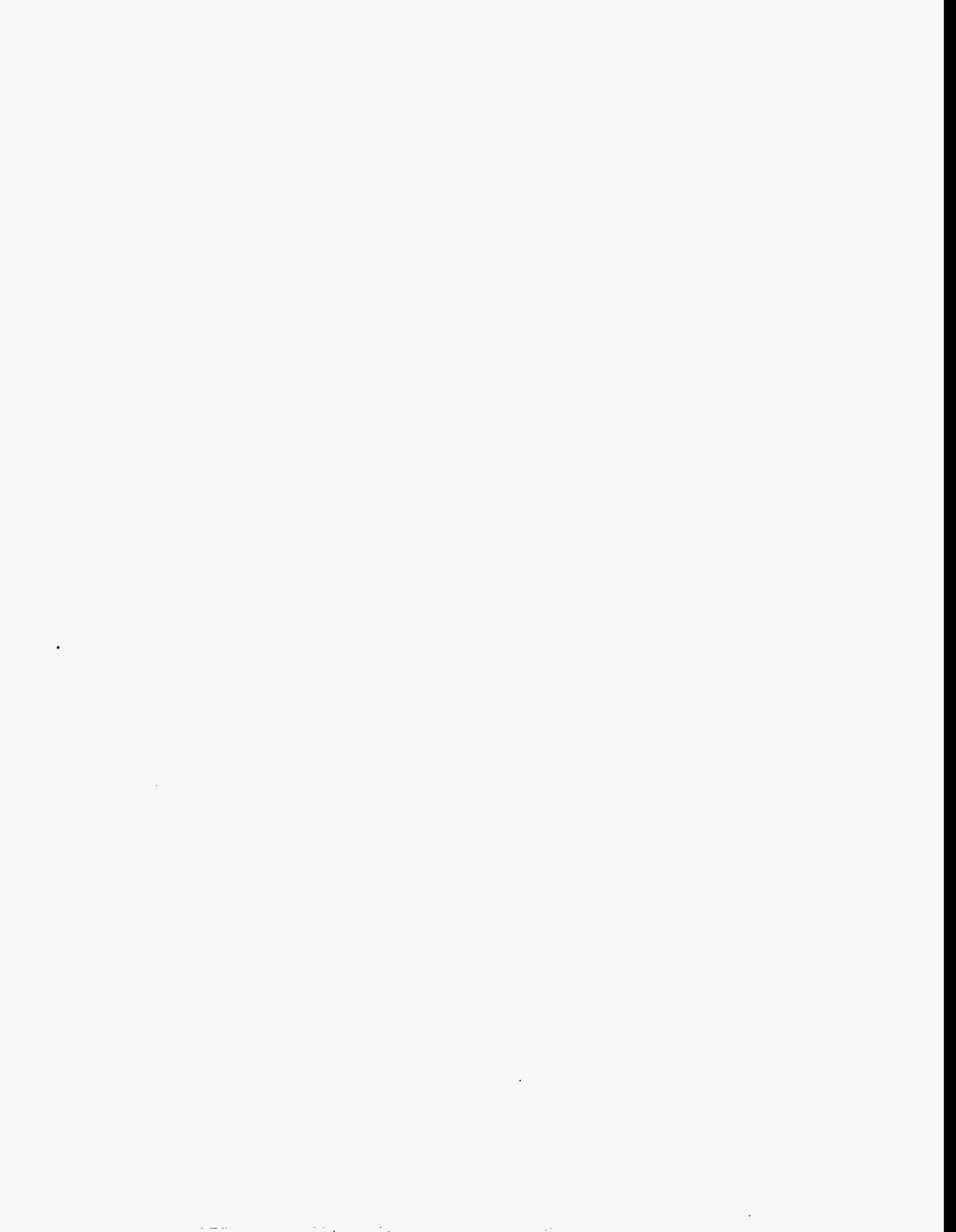
Contract No. DE-AC04-76-DP00053

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A. MOUND MAKE ITEMS

I. Tester/testing support of timers, actuators, detonators, firing sets, transducers, isolators, and pyrospacers.

PT4025 - MCCS/MC3048 Fireset Tester

The PT4025 is a PDP-8/m computer-based automated tester used in the functional testing of the Multiple-Code Coded Switch (MCCS) and the output switch in the MC3048 fireset.

TESTER ENGINEER - John A. Kronenberger

Status. The PT4025 tester was moved to the Final Inspection area, the location of its intended use, on February 22, 1980. Tester calibration and tester checkout were conducted using the Calibration and Operating Procedures. The tester was completed and considered available for Engineering Qualification and/or for use in testing product on March 7, 1980. A training session was conducted the week of March 17-21 for Production and Final Inspection personnel on the PT4025; three units were tested.

PT4031 - Flux, Hi-Pot, and Pulse Tester

The PT4031 is a flux, high-potential and high-voltage pulse tester designed to evaluate the MC3106 transducer in accordance with Sandia Product Specification PS211585.

TESTER ENGINEER - Frederick W. Quigley

Status. A Complete Engineering Release/DTER was received from SLL on February 13, 1980, to authorize the release of the drawings, Operating Procedures, and Calibration Procedures for the PT4031 tester. This tester was originally the PT2163 before modification; an Accuracy & Precision Study is not planned. The tester was moved to the Final Inspection area, the location of its intended use, on February 22, 1980. The tester was completed and considered available for Engineering Qualification and/or for use in testing product on March 4, 1980.

PT4034 - Dynamic Destructive Functional Tester

The PT4034 is a destructive-test system that provides functional testing for the MC3106 transducer in accordance with Sandia Product Specification PS211585 and the MC3048 fireset in accordance with Sandia Product Specification PS 211575. All tests will take place in a spin environment provided by a Trio Tech spinner; location will be TF-3.

TESTER ENGINEER - David L. Badgley

Status. The UB0466 Trio Tech spinner, ancillary equipment, and the new spare spindle/slip ring assembly were received at Mound the week of February 11, 1980. The UB0466 spinner is part of the total PT4034 dynamic destructive functional testing system (see Figure 1) which supports both the MC3106 transducer and the MC3048 fireset programs. The Trio Tech spinner was installed in TF3-321. All electrical connections were made, and the system was checked out and functioned properly. A Trio Tech service representative visited Mound on March 6, 1980, and installed the new spindle/

slip ring assembly. Mound Tester Maintenance personnel worked with the Trio Tech representative so that Mound can effect subsequent spindle replacements. The spindle that was removed was returned to Trio Tech for refurbishing and the incorporation of the latest changes. The PT4034 and the UB0478 data monitoring (digitizing) system have not been shipped by Sandia Livermore to complete the test package.

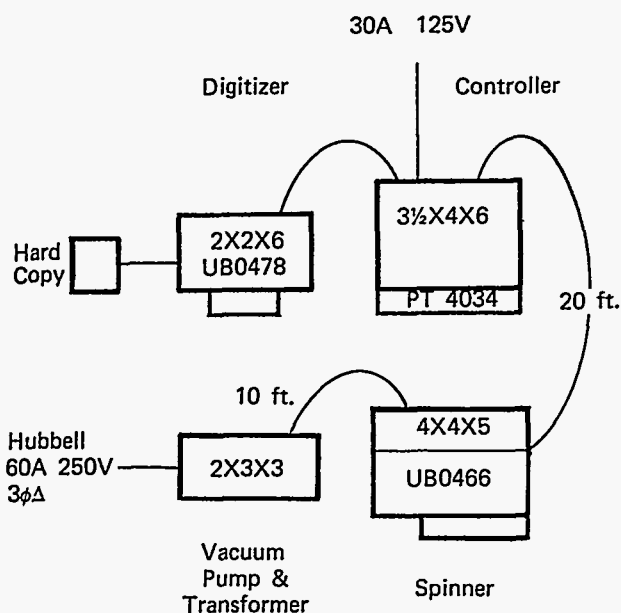


FIGURE 1 - The PT4034 destructive-test system consists of the basic PT4034 controller, a digitizing system, and a spinner.

C. F. Draut called D. M. Pierce, the W79 Tester Representative at SLL, on March 19, to get a scheduled shipping date for the PT4034 dynamic destructive functional tester for the MC3106/MC3048 programs. The tentative shipping date for the PT4034 is April 7, 1980. A set of "red lined" drawings will be sent to Mound when the tester is shipped. The drawings are projected to be revised/updated and

CER/DTER'd by April 30, 1980. Mr. Pierce will send an engineering evaluation set of drawings from Trio Tech on the spindle/slip ring assembly to Mound by March 31, 1980. The PERT Network depicts a scheduled ship date of July, 1980, for the UB0478 digitizing subsystem. Mr. Pierce indicated the UB0478 will not be ready by July; he predicted a date in August.

Complete Engineering Releases/DTER's were received from SLL on March 7 and 13, 1980, to authorize the release of the drawings defining the fixtures for destructive testing of the MC3106 transducer and MC3048 firing set programs respectively and to transfer the maintenance of the drawings to Mound.

PT4035 - Polarity and Resistance Tester

The PT4035 is a polarity and resistance tester designed to test the MC3106 transducer in accordance with Sandia Product Specification PS211585.

TESTER ENGINEER - David F. Mayers

Status. The drawing package was reviewed for accuracy with the PT4035 hardware; the testers, S/N 001 and S/N 002, were calibrated and operationally checked out using the appropriate Calibration and Operating Procedures; and an Accuracy & Precision Study of the testers was conducted the week of February 18-22, 1980. The testers were considered completed and available for Engineering Qualification and/or use in testing product on February 22, 1980. The testers were moved to the Final Inspection area in DS-Building, room 229, and to the transducer production

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area in Building 49, room 107, the locations for their intended usage.

The two nondestructive safety barricades which support both the MC3106/MC3048 programs (W79) at Mound were painted, evaluated for safety integrity, and released to the user groups in DS-Building and Building 49 as ancillary support to the PT4035 polarity and resistance testers.

A Complete Engineering Release/DTER was received from SLL on February 13, 1980, to authorize the release of drawings, Operating Procedures, and Calibration Procedures which define the PT4035 polarity and resistance tester in support of the MC3106 transducer program and to transfer the maintenance of the drawings and procedures to Mound.

PT4038 - High-Potential Voltage Tester

The PT4038 is a high-potential tester designed to test the MC3048 fireset in accordance with Sandia Product Specification PS211575. To meet this specification, the tester will provide test voltages ranging from 500 to 4000 volts. Two of these testers will be required.

TESTER ENGINEER - David F. Mayers

Status. Fabrication of PT4038, S/N 001, is completed, and the debugging phase is about 60% completed. Tester, S/N 001, should be ready for an Accuracy & Precision Study by late-April. Operating and Calibration Procedures were in a rough draft form by March 31, and the drawing package was completed. PT4038, S/N 001, is projected for completion and to be ready for Engineering Qualifica-

tion and/or for use in testing product by May 9, 1980. Fabrication of PT4038, S/N 002, is about 50% completed, and its fabrication will progress while S/N 001 is being evaluated. PT4038, S/N 002, should be ready for an Accuracy & Precision Study in mid-May. It is projected for completion and to be ready for Engineering Qualification and/or for use in testing product on May 30, 1980.

The nondestructive safety barricade which supports both the MC3106/MC3048 programs (W79) at Mound was painted, evaluated for safety integrity, and released to the Final Inspection area in DS-Building to support the PT4038 hi-pot testers.

PT4039, MT1043 - Resistance Testers

The PT4039 is a resistance tester for the MC3048 fireset. It provides the capability to measure and record a number of continuity and resistance measurements up to 20 megohms. The MT1043 is a development version of the PT4039.

TESTER ENGINEER - John A. Kronenberger

Status. The drawing package was reviewed for accuracy with the PT4039 hardware, and the tester was calibrated and operationally checked out using the appropriate Calibration and Operating Procedures the week of March 24-28, 1980. An Accuracy & Precision Study of the tester is scheduled for the week of April 14-18. The tester is scheduled to be moved to the Final Inspection area

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in DS-Building, the location of its intended usage, on or about April 25. The tester is projected to be completed and available for Engineering Qualification and/or use in testing product on April 30, 1980.

The nondestructive safety barricade which supports the MC3106/MC3048 programs (W79) at Mound was painted, evaluated for safety integrity, and released to the Final Inspection area in DS-Building to support the PT4039 resistance tester.

PT4042 - Switch Change Tester

The PT4042 was designed to effect the MC2907 MCCS status changes required to accomplish MC3048 fireset functional tests. Two of these testers are being built for Mound by SLL.

TESTER ENGINEER - David L. Badgley

Status. The Intel microprocessor from one of the PT4042 testers was returned to the vendor for repair; Mr. D. M. Pierce, the SLL Engineer responsible for the W79 testers, is awaiting the return of the microprocessor. He would like to compare the two testers to one another; thus he was retaining the one operational tester at SLL for this subsequent check. The projected shipping date of the first PT4042 to Mound is April 30, 1980.

W79 - Test System (AES240768)

The W79 Test System is an open setup test facility for the static destructive testing of the MC3106 transducer.

TESTER ENGINEER - Frederick W. Quigley

Status. Nine (9) MC3106 transducers were tested during the week of January 7, 1980, using the W79 test set to supply the arm current and fire pulse to the unit under test. The output of the MC3106 transducer was recorded on the "C" - Tank oscilloscope system and a rotating mirror camera. Messrs. L. E. Clauson, G. E. Dietel, and K. W. Shriver of Sandia Laboratories, Livermore; who were visiting Mound to witness the testing of the MC3106 transducers; indicated they were satisfied with the testing method and the data that were obtained from this testing. The W79 test system was considered completed and available for Engineering Qualification and/or for use in testing additional product on March 28, 1980.

MT1040 - Circuit Boards Switching Test

The MT1040 is an in-process tester designed to perform switching tests on the printed circuit boards incorporated into the MC3048 fireset. The boards are tested in accordance with Sandia Product Specification (PS211578) requirements.

TESTER ENGINEER - John A. Kronenberger

Status. A prototype MT1040 switching tester for circuit boards, which was built in mid-CY1976 and used for testing developmental components, was finalized into a production tester and released to the user group in DS-Building on March 14, 1980. The finalization process improved the cosmetic appearance of the tester and repackaged the testing equipment into a safer operating configuration.

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PT3180 - Electrostatic Sensitivity Tester

The PT3180 is a general purpose electrostatic sensitivity tester designed to meet the requirements of the Sandia Electrostatic Sensitivity Testing Specification (SS-302365), i.e., 20 kV, 500 Ω ; 600 pF.

TESTER ENGINEER - John A. Kronenberger

Status. An Acceptance Equipment Qualification Plan which was a part of a TMS Evaluation Plan was received from R. R. Balthaser of SLA for the Engineering Qualification (EQ) of the PT3180 electrostatic sensitivity tester used for testing/accepting the MC3041 detonator, P/N 315620 (W79). The EQ of the tester is tentatively planned for May 19-23, 1980. The Operating and Calibration Procedures to support the EQ are completed.

MT1048 - Remanent Charge Tester

The MT1048 is a remanent charge tester used for the MC3027 transducer program.

TESTER ENGINEER - John A. Kronenberger

Status. N. F. Siska, of SLA Org. 2166 visited Mound on March 25, 1980, and discussed the checkout proceedings of the MT1048 remanent charge tester. Twenty-five (25) samples of WR MC3027 transducers will be pulled from the production line and tested on both the MT1048 and the existing MT1018 remanent charge testers. The data will be compared to correlate the "likeness" of the two testers and used to determine the precision of the MT1048. Since the MT1048

tester is used for acceptance of the remanent charge attribute of the MC3027 transducer; the revised thinking is that the MT1048 will be Engineering Qualified at some later date while Lacey Learson, SLA Org. 1415, visits Mound.

MT1049 - High Voltage Tester

The MT1049 is a replacement for the original MA2017 high-potential voltage tester and will be used to evaluate the MC3347 and MC3352 explosive isolators. The new tester will use a 743 KSR (Keyboard Send Receive) terminal for manual data entry and data print-out. A Texas Instruments 990/4 microprocessor will be utilized for process control and data acquisition.

TESTER ENGINEER - Felton M. McDonald

Status. The MT1049 tester is approximately 97% completed with the tester hardware ready for system shakedown tests. The revised completion and delivery date is August, 1980. The scheduled delivery date will support the MC2838 production restart in October, 1980.

PT1619 - Destructive Tester

The PT1619 is a destructive tester for electrically activated detonators. It tests the following attributes:

- a. Bridgewire resistance.
- b. Bridgewire burst current.
- c. Time to maximum bridgewire voltage.
- d. Time from start of current flow to maximum bridgewire voltage.
- e. Time from maximum bridgewire voltage to start of pulse switch.

TESTER ENGINEER - John A. Kronenberger

Status. An Acceptance Equipment Qualification Plan which was a part of a TMS Evaluation Plan was received from R. R. Balthaser of SLA for the Engineering Qualification (EQ) of the PT1619 destructive tester used for testing/accepting the MC3041 detonator, P/N 315620 (W79). The EQ of the tester is tentatively planned for May 19-23, 1980. The Operating and Calibration Procedures to support the EQ are completed.

PT3075 - Resistance Tester

The PT3075 is a nondestructive tester designed to measure bridgewire resistance for numerous detonator programs and resistance of the MC3347 and MC3352 explosive isolator programs.

TESTER ENGINEER - John A. Kronenberger

Status. An Acceptance Equipment Qualification Plan which was a part of a TMS Evaluation Plan was received from R. R. Balthaser of SLA for the Engineering Qualification (EQ) of the PT3075 resistance tester used for testing/accepting the MC3041 detonator, P/N 315620 (W79). The EQ of the tester is tentatively planned for May 19-23, 1980. The Operating and Calibration Procedures to support the EQ are completed.

PT4030 - Resistance Tester

The PT4030 is a resistance tester designed to measure resistance of several explosive components. This tester is an alternative to the PT2204 resistance tester.

TESTER ENGINEER - John A. Kronenberger

Status. The SLL designed PT4030 resistance testers, at Mound Facility, have exhibited an excessive drift anomaly and often have not held their calibration within the specified 60 day period. A single PT4030 resistance tester, repaired at SLL, was received in January and was successfully calibrated at Mound. The calibrated tester was returned to Final Inspection for use by Mound/DoE in support of a MC3004 lot submittal. Mound Product Tester personnel requested Mr. V. O. Ori of SLL, who currently has technical responsibility for the SLL designed tester, to assist in an investigation at Mound of PT4030 calibration difficulties. Mr. Ori subsequently visited Mound on January 29 - February 1, 1980, to participate in a review of the maintenance and calibration problems experienced by Mound on the PT4030 testers. As a culmination of this review, Mound Tester personnel made three observations and recommendations. They were: 1) until the drift problem is resolved, the PT4030 is not recommended for new applications. 2) because of the drift and required recalibration and the need for frequent repairs, the PT4030 does not appear to be suitable for Mound applications in its present configuration, and 3) Mound personnel will begin to investigate possible modifications to the tester to improve its reliability. If the PT4030 tester cannot be modified satisfactorily, Mound must then look for other instruments to handle its applications/uses.

The PT4030 will no longer be used for the MC3004 program; it will be replaced by an ESI, Model 1705, resistance meter. Operating instructions will be included in the Final Inspection manual for the ESI resistance meter. The official

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paperwork that must be completed to effect the change from the PT4030 to the ESI meter for the MC3004 program is projected to be issued by Mound's Product Engineering Section in April, 1980.

PT3258 - Development ETR Tester

The PT3258 development electrothermal response (ETR) tester incorporates a Norland 3001 Waveform Analysis System and a "no balance" experimental electrothermal response testing circuit controlled by a Motorola M6800 microprocessor. The experimental "no balance" circuit will eliminate the presently utilized, time-consuming tester "bridge balancing" sequence. The PT3258 will pulse both bridgewires of a MC2949A actuator and store the respective digitized ETR waveforms in the Norland 3001 System. The Norland 3001 System will compare both ETR waveforms of the MC2949A bridged header for significant differences. The tester will indicate either an accept or reject part status based on the repeatability of the digitized ETR waveform responses.

TESTER ENGINEER - David L. Badgley

Status. All fabrication activities on the PT3258 electrothermal response tester, S/N 001, have been completed. The operating and control software is approximately 90% completed. Delivery of tester S/N 001 is scheduled for the end of April, 1980. Fabrication activities have been initiated on the PT3258, S/N 002, tester. The PT3258 ETR tester is a second generation derivative of the PT3219 ETR tester currently in heavy use at Unidynamics/Phoenix and at Mound.

MA2022 - Data Tape Conversion System

The MA2022 is a data tape conversion system designed to convert Variables Data on cassette tapes from product testers incorporating Hewlett-Packard Models 9830, 9825, and 9845 program-mable calculators to IBM compatible nine-track magnetic tapes.

TESTER ENGINEER - C. Keith Ohler

Status. The hardware connections and necessary software were completed, and a successful interface between a Hewlett-Packard 9875A tape drive recorder and a Motorola M6800 microprocessor via the IEEE 488 bus was effected the week of February 18-22, 1980. Mound has now developed the capability to read HP data tapes on a machine other than an HP programmable calculator. Software was developed, successfully tested, and demonstrated to retrieve test data that had been previously recorded and stored on Hewlett-Packard data tapes during the MC2949A spin testing shakedown tests at Unidynamics/Phoenix. This successful Variables Data retrieval was a benchmark test utilizing a M6800 microprocessor based control system as proposed in the MA2022 system. System chassis fabrication began on March 10. Approximately 20% of the MA2022 operating software has been developed to date. The Tandberg, Model GPIB-1050 $\frac{1}{2}$ ", IBM/ANSI compatible magnetic tape subsystem is promised for delivery in May, 1980.

The total system design is projected to be finalized by April 30, 1980. System fabrication is projected for completion by May 30, 1980. System checkout and

Engineering Verification will be completed in early June, and the MA2022 is scheduled to be released for use on June 20.

II. Tester support of the LLL Ceramic Header.

Testing Requirements for LLL Ceramic Header

There are three testing requirements for the LLL Ceramic Header: 1) high-potential voltage application to the unbridged head; 2) resistance measurement of the bridge circuit at three locations; and 3) destructive bridgewire functioning. The system for destructive bridgewire functioning will require equipment to digitize the current and voltage waveforms.

MT1044 - High Potential Tester

The MT1044 is a high-potential tester for the ceramic head of the MAD1049 program. The tester applies an 8 kV level to the unbridged header. A "Magsense" circuit is utilized to detect short pulse breakdown within the header. A test/holding fixture designed by GEND was adapted to the MT1044.

*TESTER ENGINEERS - Patrick J. Burns
James F. Moon*

Status. The MT1044 ceramic hi-pot tester was delivered, as operational, to Building 28 on September 5, 1979.

The Tester Design and Fabrication Group will train a tester operator at the discretion of the Ceramic Development Group when they decide to use the tester.

MT1045 - Resistance Tester

The MT1045 is a resistance tester designed to evaluate the ceramic header of the MAD1049 program. The Product Tester Section will design and fabricate a resistance fixture to accompany the MT1045 resistance tester.

TESTER ENGINEER - John A. Kronenberger

Status. Procurement of equipment for this tester was deferred to FY80 because of FY79 budgetary constraints. The design effort is tentatively scheduled to begin on this tester in mid-April. Fabrication is projected to begin in August and be completed by the end of November, 1980. The tester is scheduled to be released for usage by the end of CY-1980.

MT1046 - Functional Tester

The MT1046 is designed to destructively test and evaluate the performance characteristics of the bridgewire element on the ceramic header used in the MAD1049 program. A waveform digitizer and a computer will be utilized to process the pertinent bridgewire performance data.

TESTER ENGINEER - David F. Mayers

Status. The MAD1049 testing requirements are undefined, and the final conceptual design is on hold. Budgetary constraints caused procurement of equipment to be deferred to FY80. The tester design effort is tentatively scheduled to begin in August, 1980.

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III. Tester support of the Nuclear Component Evaluation Operations

LCTS

The Laboratory Component Test System (LCTS) is a microprocessor-based test system which supports Component Evaluation Operations activities at Mound Facility. It is based upon a modular distributed microprocessor system for control and data acquisition. It will have the capability to support existing as well as the newest weapon system components.

*PROJECT ENGINEERS - David F. Mayers and
James F. Moon*

PROJECT MANAGER - Ron C. D'Amico

Status. The overall LCTS Project, as of this reporting date, is at the ninety-five percent level of completion. The LCTS "Countdown" punch list is continuously being updated to effect a smooth and thorough LCTS Project wind down. The "Countdown" punch list is successfully identifying minor problems and corrective action items previously set aside until the wind down phase of the LCTS Project. No significant problems are being anticipated that could prevent or delay the successful and on time completion of the LCTS Project.

On February 4, 1980, F. A. (Al) Koehler's resignation from Monsanto effective on March 7, 1980, was regretfully accepted. He has accepted employment as a consultant with a chemical consulting firm in Cincinnati, Ohio. His responsibilities and duties as LCTS Project Lead Engineer

have been reassigned to J. F. Moon and R. C. D'Amico.

A data transfer anomaly was isolated and corrected in the Communications Microprocessor/PDP11/40 main computer interface. The data transfer anomaly was caused by a faulty connection in the cable link between the Communications Microprocessor and the PDP11/40 main computer system.

A key-operated switch was installed on the Master Microprocessor front panel to enable the weapons PROM Analyzer in the LCTS Control System. The key-operated switch will prevent unauthorized personnel from accessing the LCTS Test Systems via the Manual Control Systems.

The System Select Digiswitch circuitry has been successfully modified to enable the analog relays of the System 7, Version 4 hardware when dialed into the front panel digiswitch. This circuit modification permits the test operator to sample the first twelve analog channels for gross and/or unusual offsets via the PDP11/40 main computer prior to an actual test run.

A general purpose clock, window detector, and readout circuit card was designed and built to simulate fireset and system timing pulses. This general purpose timing circuit card has a Z Axis intensity modulation output signal for recording fiducial pulse information on the LCTS oscilloscopes.

CEO personnel orientation and training on the LCTS hardware and software systems have been initiated. LCTS hardware, software, and procedural systems were

altered as required to cleanup and correct minor project deficiencies encountered during the personnel training efforts.

Minor microprocessor hardware and software alterations have been incorporated into the LCTS Test System to enhance operator efficiency during a LCTS System Test Run. The added features will eliminate several operator verification checks during the LCTS calibration and self-checking sequences immediately preceding a "Live" Test Run.

Final system software for the PDP11/40 main computer system has been identified. Fred C. Fushimi estimates twelve calendar weeks to complete the PDP11/40 software package. This software estimate is of serious concern to the LCTS Project Team due to Fred's other concurrent project work load activities and priorities. Contingency plans and management commitment are being sought to eliminate this concern for the PDP11/40 software support.

The LCTS Operation and Calibration Manual MD 21589 has been completely typed into its final manuscript publication format.

A LCTS Complete Engineering Release/Drawing Transfer Engineering Release (CER/DTER) was issued from T. Starr, SLA, on April 3, 1980. The ER781655SC CER/DTER is a complete engineering release of the drawings produced by Mound Facility for the definition of the Laboratory Component Test System.

The System 9 Fireset Sample and Hold circuit addition has been installed and successfully tested in the Analog

Chassis subrack.

The "Power Up" verification monitor circuit addition was installed into the Analog Station. During the "Power Up" verification monitor circuit installation, two pairs of Belden cables were run between the Analog Station and the Main LCTS Control Console. These conductors are spares that can be utilized for future modifications and/or diagnostic test lines between the remote Analog Station and the Main LCTS Control Console.

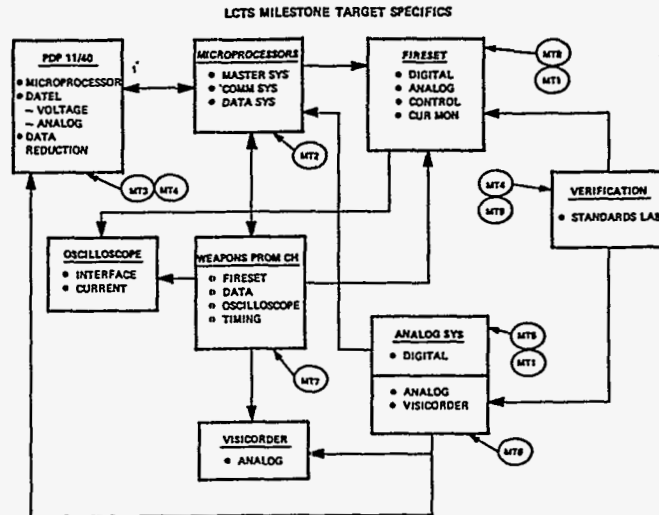
The WR Interlock Chassis has been fabricated and bench tested. Late receipt of several minor electronic components for the LCTS Simulator System is delaying the completion, installation, and testing of the LCTS Simulator/WR Interlock Chassis System. A procurement expeditor has been assigned to work on this procurement bottleneck. No significant project delay impacts are being anticipated as a result of this procurement bottleneck.

In summary, two additional Milestone Targets were successfully achieved during the first quarter of 1980. Milestone Target MT4 was achieved on February 1, 1980. On March 7, 1980, Milestone Target MT8 was successfully achieved. The overall LCTS Project, as of this reporting date, is at the 95 percent level of completion. No significant problems are being anticipated that could prevent the successful completion of the LCTS Project (Test Stations 1 and 2) as scheduled. A Milestone Target Status Report for the LCTS Program as of April 9, 1980, is shown on the next page.

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MILESTONE TARGET STATUS

MILESTONE TARGET	PERCENT COMPLETED	STATUS TARGET	TARGET DATE	REMARKS
MT1	100%	DONE	07/13/79	07/02/79
MT2	100%	DONE	09/05/79	08/23/79
MT3	100%	DONE	10/22/79	10/09/79
MT4	100%	DONE	02/01/80	02/01/80
MT5	100%	DONE	01/10/80	12/18/79
MT6	100%	DONE	01/10/80	12/20/79
MT7	100%	DONE	03/10/80	12/18/79
MT8	100%	DONE	03/18/80	03/07/80
MT9	100%	DONE	01/10/80	12/18/79
MT10	95%	OK	07/31/80	



IV. Tester Support of the Nuclear SW Analytical Operations

MILESTONE TARGET DEFINITIONS

- MT1: Test Station 4 W. Wood support completed.
- MT2: Microprocessor System completed.
- MT3: Main Computer/Microprocessor/Datel Voltage and Analog Systems completed; System 2 completed.
- MT4: Standards Laboratory & Data verification checkout completed.
- MT5: Digital section of the Analog System completed.
- MT6: Total Analog System completed.
- MT7: Weapons PROM System completed; System 7, Version 4 installed but not verified.
- MT8: Fireset System and System 9 completed.
- MT9: Standards Laboratory Verification activities 90 percent completed.
- MT10: SW-210 System fully functional in support of Test Stations 1 & 2.

E82298 - Process Control for Thermal Decomposition of Metal Hydrides

This system is a microprocessor controlled Thermal Gas Rack used as an analytical tool for measuring the amount of hydrogen contained in metal hydrides.

PROJECT ENGINEER - James F. Moon

Status. System checkout and testing was completed, and the system was released to the sponsor.

B. MOUND BUY ITEMS

I. Tester/testing support of products at Unidynamics/Phoenix, Inc.

PT3102 - Bridgewire and Insulation Resistance Tester

The PT3102 is a tester capable of making bridgewire resistance measurements between 0 to 10 ohms, and insulation resistance measurements at 100 and 500 volt levels.

TESTER ENGINEER - C. Keith Ohler

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Status. A Complete Engineering Release/DTER (ER No. 800688SC) was received from SLA on March 25, 1980, to authorize the release of the drawings defining the PT3102 bridgewire and insulation resistance tester in support of the MC2848 marker, MC3332 indicator, and MC3423 detonator programs at Unidynamics/Phoenix and to transfer the maintenance of the drawings to Mound.

PT3237 - Bridgewire and Insulation Resistance Tester

The PT3237 is a tester capable of bridge-wire resistance, insulation resistance, and continuity loop measurements. This tester is similar to the PT3102 tester currently at Unidynamics and will be used as a backup or an alternate.

TESTER ENGINEER - C. Keith Ohler

Status. A Qualification Evaluation Release was received on January 9, 1980, to release the PT3237 bridgewire and insulation resistance tester as acceptable for testing the MC3196 explosive detonator assembly, P/N 316232, per PS316232 at Unidynamics/Phoenix, Inc. The Engineering Qualification for this tester was conducted during the week of September 4-7, 1979.

A Complete Engineering Release/DTER (ER NO. 800295SC) was received from SLA on February 5, 1980, to authorize the transfer of drawings for the UA2340 bridgewire fixture and the UA2339 breakdown fixture, which are used for testing the MC3196 detonator on the PT3237 bridgewire and insulation resistance tester at Unidynamics/Phoenix, to Mound for maintenance. A Complete Engineering Release/DTER (ER No. 800688SC) was re-

ceived from SLA on March 25, 1980, to authorize the release of the drawings defining the PT3237 tester in support of the MC2848 marker, MC3332 indicator, and MC3423 detonator programs at Unidynamics/Phoenix and to transfer the maintenance of the drawings to Mound.

An Equipment/Engineering Qualification Plan, dated March 11, 1980, was received from R. R. Zottnick of SLA for the EQ of the PT3237 tester for testing/accepting the MC3332 indicator, P/N 316955-00 (W80) at Unidynamics/Phoenix, Inc. The EQ is tentatively planned for July, 1980. An Equipment/Engineering Qualification Plan, dated March 18, 1980, was received from R. R. Zottnick of SLA for the EQ of the PT3237 tester for testing/accepting the MC3423 detonator, P/N 317435-00 (W80) at Unidynamics/Phoenix, Inc. The EQ is tentatively planned for June, 1980. The Plan for the EQ of the PT3237 for testing/accepting the MC2848 marker, P/N 314330-00 (W79) was previously received from R. R. Zottnick of SLA in July, 1979. The EQ is tentatively planned for August, 1980.

The fabrication of an additional PT3237 bridgewire and insulation resistance tester (S/N 002) is planned to begin in the second quarter of CY 1980; completion is projected for December, 1980.

An Engineering Qualification of the PT3237 tester, in support of the MC2949A actuator program at Unidynamics/Phoenix, is scheduled for the week of April 14-18, 1980.

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PT3240 - Low-Level All-Fire Tester

The PT3240 is a low-energy destructive tester used on a number of B-items fabricated at Unidynamics/Phoenix. The PT3240 is a second generation version of the PT3104 with the capabilities for bridgewire resistance measurement, no-fire, no-fire degradation, and all-fire testing.

TESTER ENGINEER - C. Keith Ohler

Status. A Qualification Evaluation Release was received on January 9, 1980, to release the PT3240 low-level all-fire tester coupled to the UA1538 calculator-controlled data-acquisition system as acceptable for testing the MC3196 explosive detonator assembly, P/N 316232, per PS316232 at Unidynamics/Phoenix, Inc. The Engineering Qualification for these testers was conducted during the week of September 4-7, 1979.

A destructive testing capability was set up during the week of February 18-22, for the MC2848 marker (W79), MC3332 indicator (W80), and MC3423 detonator (W80) programs at Unidynamics/Phoenix. Software development to permit destructive testing of these three components on the PT3240 low-level all-fire tester was completed. A five (5) ampere fire pulse module must be designed and fabricated to totally support the MC3423 detonator program on the PT3240 tester. The other testing modules are presently available to support the remainder of the testing attributes of the three components on the PT3240. Checkout of the UA2337 actuation test fixture for the MC3332 indicator program was completed.

An Equipment/Engineering Qualification Plan, dated March 11, 1980, was received from R. R. Zottnick of SLA for the EQ of the PT3240 tester for testing/accepting the MC3332 indicator, P/N 316955-00 (W80) at Unidynamics/Phoenix, Inc. The EQ is tentatively planned for July, 1980. An Equipment/Engineering Qualification Plan, dated March 18, 1980, was received from R. R. Zottnick of SLA for the EQ of the PT3240 tester for testing/accepting the MC3423 detonator, P/N 317435-00 (W80) at Unidynamics/Phoenix, Inc. The EQ is tentatively planned for June, 1980. The Plan for the EQ of the PT3240 for testing/accepting the MC2848 marker, P/N 314330-00 (W79) was previously received from R. R. Zottnick of SLA in July, 1979. The EQ is tentatively planned for August, 1980.

A Complete Engineering Release/DTER (ER No. 800295SC) was received from SLA on March 25, 1980, to authorize the release of the drawings defining the PT3240 tester in support of the MC2848 marker, MC3332 indicator, and MC3423 detonator programs at Unidynamics/Phoenix and to transfer the maintenance of the drawings to Mound. A Complete Engineering Release/DTER (ER No. 792620 SC) was previously received from SLA on December 19, 1979, to authorize the transfer of PT3240 tester Operating Program Tapes, Calibration Procedures, and Operating Procedures; in support of the MC3089 igniter (B83), MC3332 indicator (W80), and MC3423 detonator (W80) B-Item programs at U/P to Mound for maintenance.

The design and fabrication of a fireset, which will support destructive testing of the MC3486 actuator program (W84) at

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Unidynamics/Phoenix, were completed in late March. The total destructive testing system for the MC3486 will include the PT3240 all-fire tester, the UA1538 data acquisition system, the UA1596 pressure time module and the aforementioned fireset. The testing system will measure function time and force output of the actuator and will monitor the current and voltage output of the fire pulse from the fireset. Fabrication of a control module for destructive testing of MC3486 development actuators is approximately 10% completed.

The Engineering Qualification of the PT3240/UA1596/UA1538 destructive testing system (see Figure 2) in support of

MC2949A actuator testing, which was rescheduled from December, 1979, is now scheduled for the week of April 14-18, 1980, when MC2949A actuators are expected to be available for testing.

UA1596 - Pressure Time Module

The UA1596 is a pressure time module used in conjunction with the PT3104 and PT3240 testers to measure the pressure output of the MC3002 gas generator and the force output of the MC2949A actuator.

TESTER ENGINEER - C. Keith Ohler

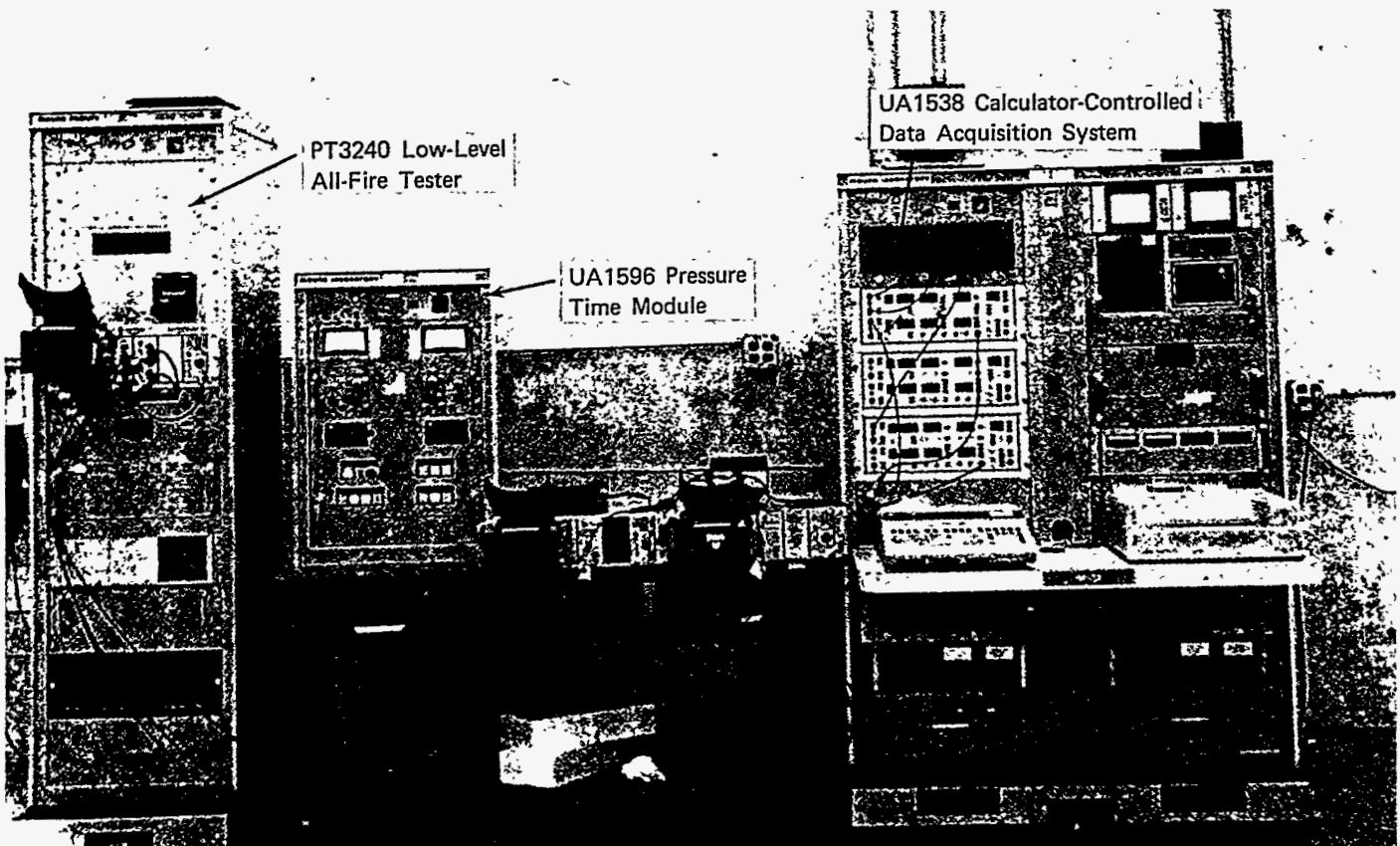


FIGURE 2. - The destructive testing system for the MC2949A actuator program consists of the PT3240 low-level all-fire tester, the UA1538 calculator-controlled data-acquisition system, and the UA1596 pressure time module.

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remote control for the Trio Tech spinner and which interfaces the PT3240 low-level all-fire tester to the Trio Tech spinner, was completed and shipped from Mound to Unidynamics/Phoenix on February 6, 1980. The Trio Tech spinner was shipped from SLA to Unidynamics on February 8, 1980. The destructive spin testing system (see Figure 3), which

is made up of the PT3240 low-level all-fire tester, the UA1538 calculator-controlled data-acquisition system, and the UA1751 remote control and spinning system, was checked out and approved for testing MC2949A actuators the week of February 25-29, 1980. Eight (8) live MC2949A actuators were tested during the week of March 3-7, 1980, to checkout

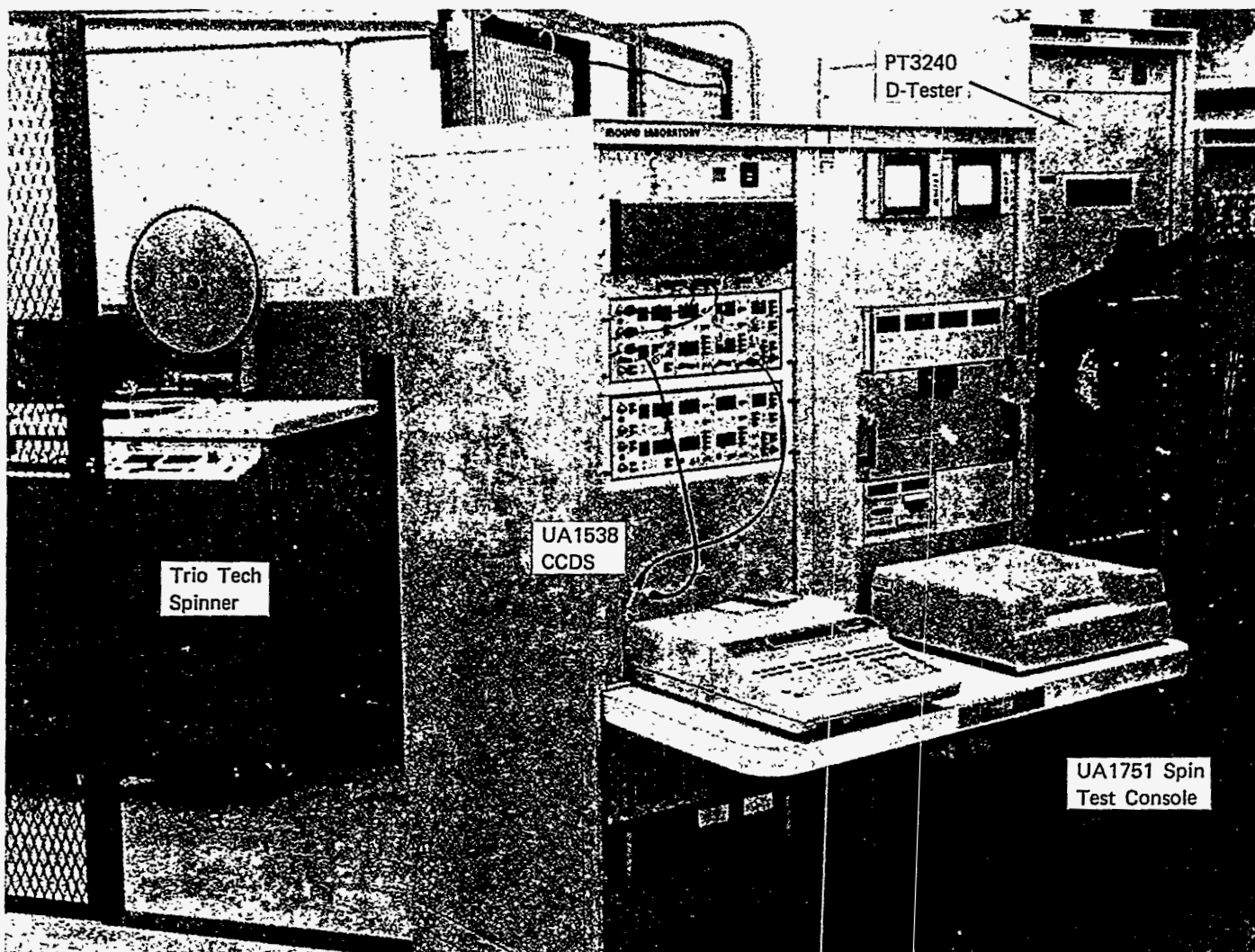


FIGURE 3. - The destructive and passive spin testing system, which supports the MC2949A detonator program, is made up of the PT3240 low-level all-fire tester, the UA1538 calculator-controlled data-acquisition system, the Trio Tech spinner, and the UA1751 remote control and interface chassis.

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the performance and accuracy of the destructive spin testing system. The system was satisfactorily completed and is considered ready for Engineering Qualification (EQ). The EQ is tentatively planned for the week of April 14-18, 1980, at Unidynamics/Phoenix, Inc.

A Complete Engineering Release/DTER was received from SLA on March 21, 1980, to authorize the release of the drawings defining the UA1751/Spin Test System in support of the MC2949A actuator program at Unidynamics/Phoenix and to transfer the maintenance of the drawings to Mound.

Mr. J. R. Kannolt, SLA Org. 2533, suggested in a telecon on February 7, 1980, that Mound make provisions for spare electrical components for the Trio Tech spinners in addition to the spare spindle/slip ring assemblies now on order.

The electrical components should include such items as drive motors, controllers, and printed circuit boards. Mr. Kannolt has asked Trio Tech for a recommended list of spare electrical parts. He will obtain the list from Trio Tech and provide Mound a copy. The spare electrical components could cost about \$15K - \$20K.

II. Tester/testing support of products at Imperial Chemicals Industries (ICI) Americas, Inc.

Product Testers for MC1442/MC2046 Match Production

R. J. Huss and R. C. D'Amico visited ICI Americas, Inc. in Valley Forge, Pennsylvania, on January 16, 1980, to assess the status of the product testers/ fixtures and environmental chambers

supporting the MC1442 and MC2046 match programs at ICI Americas, Inc. Recommendations and assessments by Messrs. Huss and D'Amico during the trip were: a) Mound should assume calibration and maintenance responsibilities for all product testers, test fixtures and environmental chambers supporting DoE programs at ICI; b) the PT1610, PT1611, UA4076 testers/fixtures for the MC2046 program were found to be acceptable to undergo a QAS 2.0 audit in March, 1980; c) the PT1023 nondestructive tester and the PT1025 destructive tester will tentatively be replaced by September, 1980; and d) if the MC1210 match program is reactivated, the PT866 tester would be replaced.

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