



## MultiPurpose TestWare® Software

Powerful, flexible and easy-to-use testing software

AS ONE OF THE MOST POWERFUL TESTING SOFTWARE SOLUTIONS  
AVAILABLE, **MTS MULTIPURPOSE TESTWARE SOFTWARE** DELIVERS  
THE ACCURATE AND ACTIONABLE TEST DATA REQUIRED TO MAKE  
APPROPRIATE AND TIMELY TESTING PROGRAM DECISIONS.



# Powerful Software for Demanding Test Requirements

The MultiPurpose TestWare® (MPT™) Software Advantage

## Build complex, yet easy-to-run tests

### INTUITIVE INTERFACE

With MPT software, you create test designs using basic mouse operations. You drag icons representing test activities, such as command and data acquisition, from a palette to a design table, and define their sequence of operation by selecting triggers. MPT software makes the process of converting your real life test needs to test design files straightforward and easy.

### FLEXIBLE VARIABLES

MPT Variables allow you to easily create and edit automated test procedures, significantly increasing test flexibility and productivity. You can set test parameters as variable values that you can define independently. You can also change variable values in a test quickly, without having to touch each affected parameter. This feature gives you the capability to design tests in which the operator can enter variable values while the test is running, allowing actual test events and operator discretion to change the course of the test.

### POWERFUL CALCULATIONS

Use MPT Calculations to apply constants, operators, and mathematical operators to MPT Variables to create calculated variables. You can use this feature to automatically change variable values for different test passes, which allows you to create test procedures that are very compact.

MTS MultiPurpose TestWare Software is known for its powerful test design capabilities. With several features that support standard and nonstandard test creation, MPT software gives you the ability to accommodate a wide range of test requirements.

### Project organization simplifies testing

Your MPT software test procedures are associated with a Project. A Project stores test design files and resulting test data, and accesses system and controller information. You can configure Projects to organize data around specific tests, users, applications or station to suit your specific needs. A Project is your portal to the information flow of your test system.

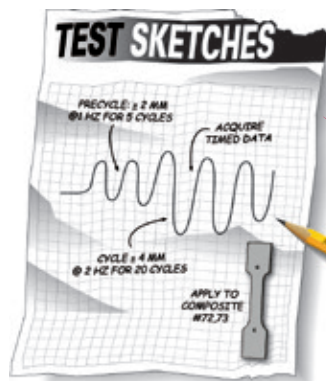
### Recovery features give you peace of mind

When you run a test, MPT software generates recovery files to counter unexpected or inadvertent test interruptions.

One type of recovery file allows you to restore the test procedure as it was run – even if it included unsaved changes. This way, if you modify and run your test, but forget to save your changes when you close the test, you can still restore the modifications the next time you run the test.

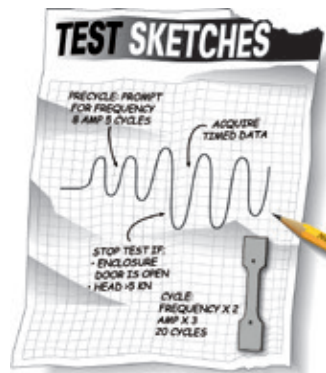
Another type of recovery file allows you to resume an interrupted test at the precise point of interruption. So if your test is interrupted before it completes (due to a power outage, interlock or accidental stop), you can resume the test from where it was interrupted rather than restarting from the beginning of the test.

### MultiPurpose TestWare Software handles test designs of all levels of complexity



Type	Name	Start	Interrupt
🔊	Precycle	=Procedure= Start	
📊	Acquire Timed Data	Precycle Done	
🔊	Cycle	Precycle Done	

Create simple tests quickly and efficiently



Type	Name	Start	Interrupt
🔊	Enter Freq, Amp 1, Amp 2	=Procedure= Start	
🔊	Secure Enclosure	Enter Freq, Amp 1, Amp 2 Done	
🔊	Detect Open Door	Enter Freq, Amp 1, Amp 2 Done	
🔊	Monitor Load Limit	Enter Freq, Amp 1, Amp 2 Done	
🔊	Precycle	Secure Enclosure Done	Detect Open Door: Trigger
🔊	Calc: Freq x 2, Amp x 3	Precycle Done	
📊	Acquire Timed Data	Calc: Freq x 2, Amp x 3 Done	
🔊	Cycle @ Freq x 2, Amp x 3	Calc: Freq x 2, Amp x 3 Done	Detect Open Door: Trigger

Add functionality to accommodate almost any test requirement

## Designing Tests

MultiPurpose TestWare software is easy to use and requires very little time to learn. The bottom line is that you'll spend more time testing and less time learning and setting up the system.

With MPT software, you create test procedures by linking modular test activities (called processes) together. Each process represents a single test activity, such as a ramp or data acquisition, and is displayed as an icon on a palette. You use processes like building blocks to create test procedures.

The process palette and procedure table almost invite you to begin building your test. Simply drag the process icons you desire to the procedure table, define the parameters associated with each process, and define the test flow by selecting start and interrupt triggers.

Hover help, right-click menus, and common operations such as cut, copy and paste make working with test activity icons fast and easy. Once icons are placed on the procedure table, you can rearrange their order by simply dragging them up or down to the desired location.

### Create tests faster with the enhanced Procedure Editor

The MPT Procedure Editor has been enhanced to facilitate test procedure design and editing.

The MPT Procedure Editor is now equipped with an integral navigation pane and a process parameters pane. The navigation pane displays a tree view of the processes in the procedure, which is useful for displaying nesting in group processes. The procedure table displays the processes in the active nesting level selected in the navigation pane. The process parameters pane displays the parameters of the currently selected process on either the navigation pane or procedure table.

### Create nested levels with Group processes

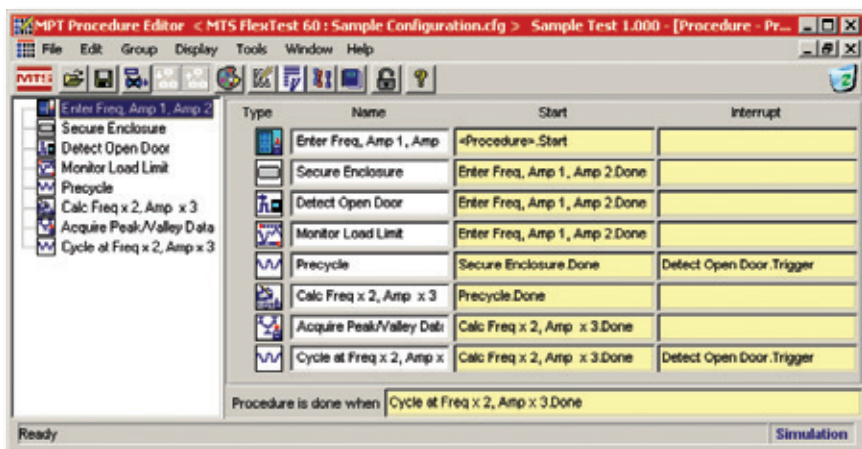
A special type of process called a Group process extends the applications modular design. The group process allows you to put other processes inside it, creating a nested level. When selected, the group process displays its own table, which you can populate with processes in the same manner as the procedure table – including additional group processes.

### Change controller calculations on-the-fly

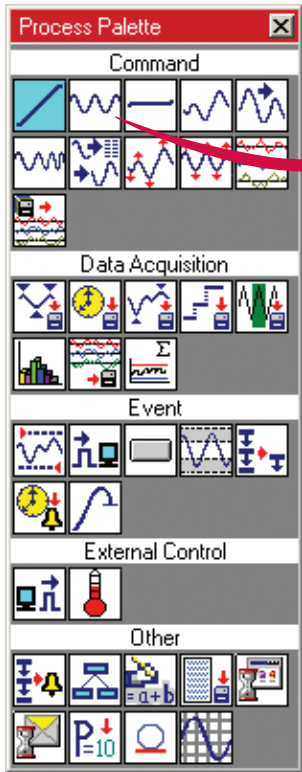
Another process called the Set Controller Value process allows you to change calculation values in the underlying controller. You can use this powerful design capability to change calculated input equations used for control feedback, to change calculated output equations used to drive a valve, or even to change calculation variable values to create conditional calculations.

### Direct test flow with confidence

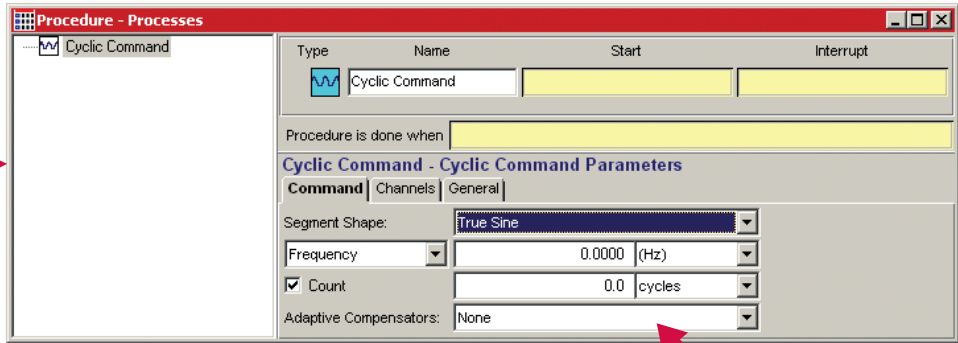
By assigning triggers directly to every process (including group processes), you control the test flow with confidence. You use triggers to create serial and parallel branches in your test flow. You can also prematurely end active processes, group processes and the entire test procedure by assigning interrupt triggers.



Process Palette

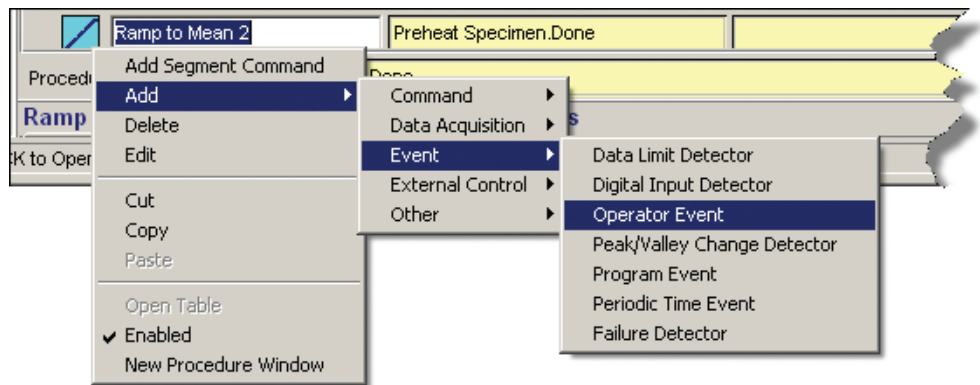


Procedure Editor



Adding the first process to the procedure table is as simple as dragging it from the palette to the procedure table.

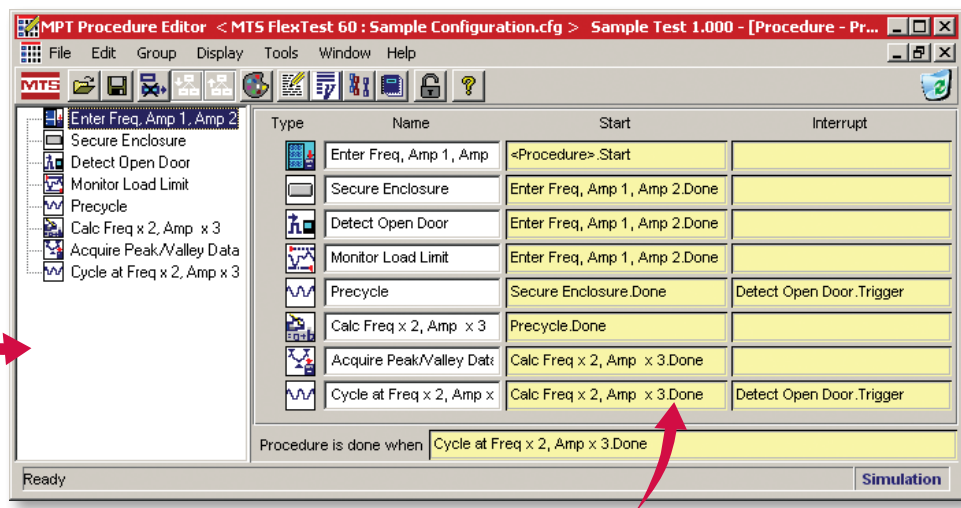
Parameters Definition Pane



Convenient right-click functionality makes working with processes on the procedure table quick and easy.

Procedure Editor with Completed Sample Test Procedure

Navigation Pane



Start and interrupt triggers allow you to direct test flow with precision. To create parallel test branches, you simply assign the same triggers to two or more processes. To end an active process prematurely, you assign an interrupt trigger.

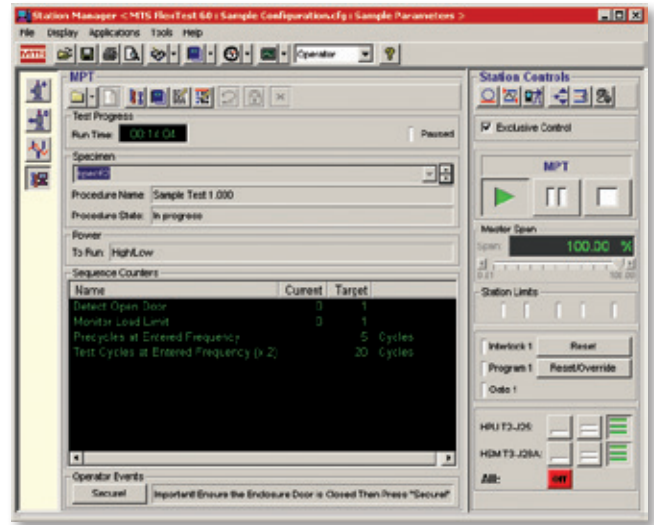
## Running Tests

You run the test from the MPT software controls on the Station Manager application, as shown.

From this window you can apply hydraulics, set up the scope, select an MPT software specimen to store test data, and start the test.

Once the test is running, active processes are clearly displayed on the Procedure Editor so you know how the test is progressing, and can see serial and parallel activities in real-time.

The sequence counters pane displays current and target status information of individual processes. You enter counter labels for processes when you define process parameters.



Type	Name	Start
	Enter Freq, Amp 1, Amp	=Procedure> Start
	Secure Enclosure	Enter Freq, Amp 1, Amp
	Detect Open Door	Enter Freq, Amp 1, Amp
	Monitor Load Limit	Enter Freq, Amp 1, Amp
	Precycle	Secure Enclosure Don
	Calc...	Sample Freq...

Active process indicators showing parallel process activity

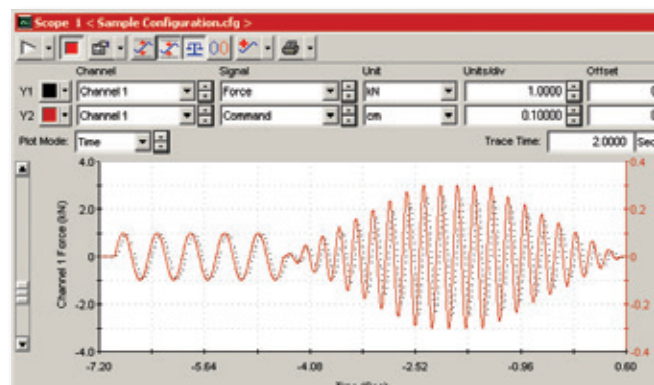
Name	Current	Target
Detect Open Door	0	1
Monitor Load Limit	0	1
Precycles at Entered Frequency		5 Cycles
Test Cycles at Entered Frequency (x 2)		20 Cycles

Process counters showing current versus target status

The scope trace shows the sample test output when the operator enters an initial frequency value of 1, an end-level 1 value of 1.2 mm, and end-level 2 value of -1.2 mm.

Note how the frequency of the second cyclic process automatically doubles and its amplitude automatically triples without the test having to be stopped and new values entered.

In this example, the amplitude of the second cyclic process graduates to its full amplitude because the selected waveform is a tapered sine wave shape, while the first cyclic process uses a conventional sine wave shape.



### SUPERIOR SERVOLOOP CONTROL

With MPT software, you create test procedures which provide instructions to the controller, while the controller executes those instructions. The effectiveness of any test design, of course, is limited by the controller's ability to execute instructions while maintaining the control loop.

With the MTS Series 494 Controller, you can be assured of the most accurate control loop tracking possible. The controller's system software allows you to employ a variety of control mode types and proprietary control compensation

techniques to ensure the integrity of the control loop while your test designs are executed. This ensures that your specimen receives the inputs you intend, and that the data you acquire is repeatable and accurate.

### MULTICHANNEL CONTROL

You can use MultiPurpose TestWare software to run both single-channel and multi-channel tests, making it a very powerful tool for multichannel or multiaxial testing.

### Setting up the controller and installing the specimen

To run a test procedure, begin by selecting the Station Manager application and using it to apply hydraulic pressure to the station, install the physical specimen, and set up and run the on-board scope in preparation for running the test. Selecting an MPT software specimen

### Selecting an MPT software specimen

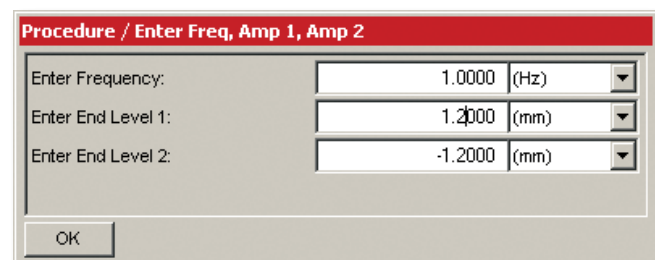
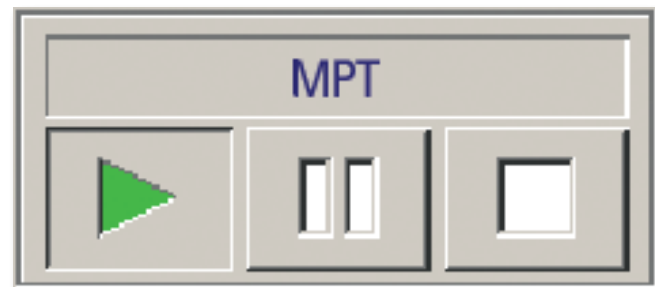
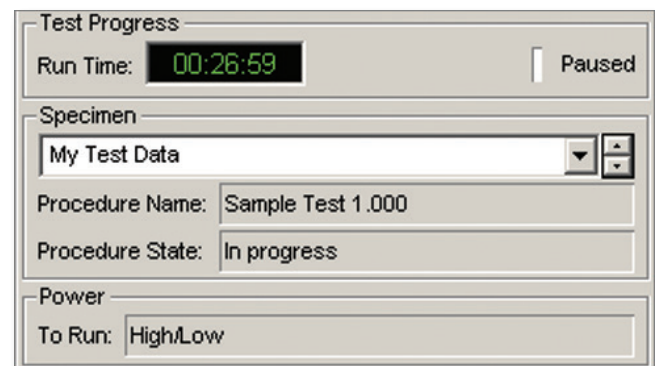
A specimen is a directory of information associated with a specific instance of running a test. The specimen will contain your test data, and is associated with your Project, which you selected before you created your test procedure.

### Starting the test and monitoring progress

Press the run button on the Station Controls panel to start the test. When the test begins, a variety of visual indicators; including active process indicators, transient, fixed and sequence counters, and messages keep you informed of the test's progress.

### Entering test data while the test is running

With the enhanced Operator Information process, you can design tests that prompt the operator to enter data at any point in the test.



## Analyzing and Reporting Test Data

When you design a test, you define the types of data acquisition needed, such as peak/valley, timed, max/min, or level-crossing.

While the sample test uses only timed data acquisition during the execution of the second cyclic process, you may define multiple data acquisition to run simultaneously.

As the test runs, data is automatically collected by the MTS controller. And, when a buffer of data is full, it is automatically stored in the data file you choose. The same data file can be directly opened by spreadsheet or word processing programs.

### Data acquisition process configurational

Each MPT data acquisition process gives you control of the signals you wish to acquire, the buffer size and type, the destination of the data, and output units.

### Flexibility in data format

For total flexibility in data analysis and report creation, MPT software saves data in several formats, including ANSI and ASCII formats. That way you can use your choice of analysis, plotting, and word processing programs, such as Microsoft Excel and Microsoft Word.

You can also choose to write your own analysis programs with a programming language. The multitasking capabilities of MTS operating systems software even makes it possible to have your spreadsheet read in a current data file at the same time that MultiPurpose TestWare software is running a test.

### Exported data

Exported data is appropriately delimited so that columns of data in MultiPurpose TestWare software automatically appear in separate columns in your spreadsheet program.

### Working with data acquired from the sample test

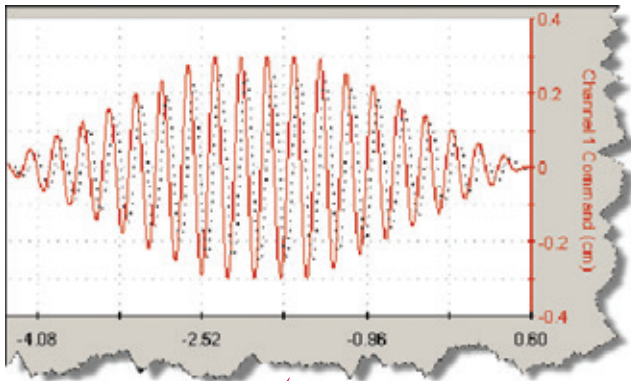
The facing page shows examples of how the data acquired during the sample test can be used in some well-known spreadsheets and word processing programs. These are only simple examples. You have complete flexibility to format your reports and analyze your data in any way you wish.

#### DATA DESTINATION CHOICES

Three choices are available:

- » Specimen data file. A Specimen is a group of files related to the execution of a test. When you choose this option, your data is stored with this group of files.
- » User-defined file. As the name implies, when you choose this option, you specify the file to which you want your data stored.
- » Discard data. This selection causes the controller to send data to the linear buffer, but then discard it instead of sending it from the buffer to disk. You can use this capability to create an acquisition process that will run until the linear buffer is full, then trigger a signal which can be used to start another process.





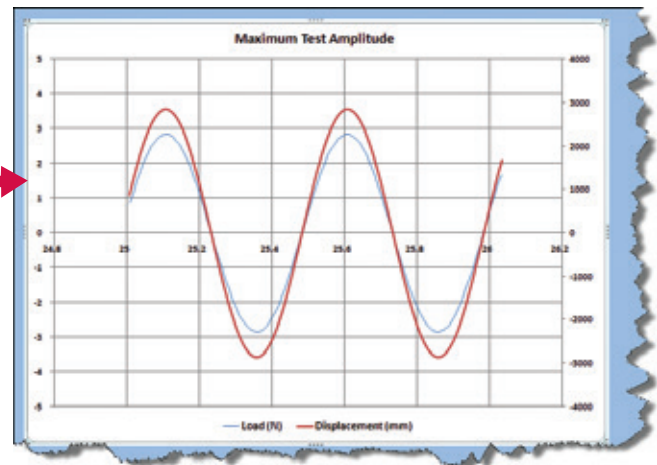
Using a spreadsheet to analyze data and create charts and reports

You can open MultiPurpose TestWare software data from a spreadsheet just by selecting the data file. Using the spreadsheet's plotting commands, you can create and annotate charts as desired.

In this example, data from an area of interest on the scope trace has been imported, analyzed, and plotted using Microsoft Excel®. The generated plot is then used in a report using Microsoft Word®.

As you can see, results can be calculated and formatted easily with a spreadsheet application. Using the macro capability of a spreadsheet, you can build complete analysis sequences that can analyze the data and provide results with just a few menu selections.

R275C1				fx 25.007813	
24.9785	20	-158.69	-0.1587		
24.9883	20	191.04	0.19104		
24.998	20	538.025	0.53802		
25.0078	20	876.77	0.87677		
25.9746	24	-298.16	-0.2982		
25.9844	24	50.9644	0.05096		
25.9941	24	399.78	0.39978		
26.0039	24	742.493	0.74249		
26.0137	24	1074.22	1.07422		
26.0234	24	1389.47	1.38947		
26.0332	24	1684.27	1.68427		
26.043	24	1953.43	1.95343		
26.0527	24	2192.99	2.19299		
26.0625	24	2399.9	2.3999		
26.0723	24	2570.5	2.5705		
26.082	24	2702.64	2.70264		
26.0918	24	2794.19	2.79419		
26.1016	24	2843.32	2.84332		
26.1113	24	2850.04	2.85004		
26.1211	24	2813.72	2.81372		
26.1309	24	2734.99	2.73499		
26.1406	24	2615.36	2.61536		
26.1504	24	2456.36	2.45636		
26.1602	24	2260.13	2.26013		
26.1699	24	2030.33	2.03033		
26.1797	24	1769.71	1.76971		
26.1895	25	1482.54	1.48254		
26.1992	25	1173.1	1.1731		
26.209	25	845.947	0.84595		
26.2188	25	505.981	0.50598		



### Phase 3 Results

Figure 1 displays the maximum amplitudes attained during test cycles 8 and 9 during Phase 3 trials. The phase difference between load and displacement is minimal.

This data varies from the results obtained in Phase 1 and 2 trials. For instance, the phase between load and displacement is minimal for all composite specimens.

**Figure 1**

## MPT Process

Processes are modular test activities, such as command and data acquisition, and are represented by icons on the process palette. You create test procedure files by adding and linking process icons together on a procedure table according to your test requirements. MultiPurpose TestWare software is equipped with the following types of processes:

- » Command processes, which send various types of command instructions to a servovalve or servomotor.
- » Data acquisition processes, which acquire sensor data.
- » Event processes, which monitor test signals to detect test conditions that you specify, or which generate a user event.

- » External control processes, which issue signals to devices external to the servoloop control system.
- » Other processes, which provide capabilities beyond the other category definitions. These include a program control process, for controlling test flow; group processes, which contain other processes and nest within the main test procedure; calculations process, which modifies variables by applying constants, operators, and mathematical operators; and an operator information process, which may require the operator to enter some type of information during the test.

### PROCESS PALETTE

When you purchase additional capability for MPT software, new processes appear on the process palette. You can combine specialized processes with standard processes to meet your specific testing needs.



## Command Processes



### SEGMENT COMMAND

This process generates a single control segment that starts at one level and ends at a different level. You can specify either absolute or relative values. For example, you could specify that the second level be exactly 10,000 Newtons, or you could specify that it be 10,000 Newtons higher than the starting level. You assign one of three segment shapes, a time to complete the segment and, for each channel, a control mode and an end level.



### SWEEP COMMAND

This process sweeps a command waveform between two frequency values in a linear or logarithmic progression at a constant amplitude.



### DWELL COMMAND

This process maintains a static level for a time you specify in a selected control mode. When a dwell command begins, it reads the current level of the selected control mode and maintains that level for the specified duration.



### PROFILE COMMAND

This process applies a profile, which is a custom waveform consisting of a series of cyclic, dwell, and segment commands read from a profile file. You create profiles using a spreadsheet, text editor, or the MTS Model 793.11 Profile Editor application.



### EXTERNAL COMMAND

This process uses a signal from an external device to control a servovalve or servomotor. When the external command process begins, it ramps to the set point of the process. Then it uses a soft start feature to ramp the span from 0% to 100% full scale (or a percentage of it).



### CYCLIC COMMAND

This process creates a waveform by assembling two single segments and repeating them continuously or for a specified number of cycles. You can specify either absolute or relative end-level values.

## Data Acquisition Processes



### PEAK/VALLEY DATA ACQUISITION

This process records data when the master channel signal detects a peak or valley. You can set the sensitivity to ignore peaks and valleys that fall below a certain range of amplitudes.



### MAX/MIN DATA ACQUISITION

This process records data for the highest peak and lowest valley during a test. Each time a peak or valley is detected, it is compared to the peak or valley currently stored. If the new value exceeds the stored value, it replaces the stored value. If not, it is ignored.



### CYCLIC DATA ACQUISITION

This process records combinations of peak/valley, timed, and level crossing data in cyclic increments. Cycles can be defined arbitrarily or in linear or logarithmic progressions.



### TIMED DATA ACQUISITION

This process records data at specified, equal time intervals.



### LEVEL CROSSING DATA ACQUISITION

This process records data when the master input channel signal changes a specific amount.

## Event Processes



### DATA LIMIT DETECTOR

This process waits for a specific event to occur, then issues a signal when it occurs. You typically sequence this process in parallel with a command process, to signal when the process should end and another should start. A data limit can be a number of segments, a length of time, or a sensor signal value. It can be specified as a relative value or an absolute value. Relative values are based on when the data limit detector process was started. Absolute values are based on a zero-point reference, such as the beginning point of the test.



### PEAK/VALLEY CHANGE DETECTOR

This process lets you monitor an input signal for changes in the peaks and valleys. The process begins by detecting a peak and valley, which become the reference levels for the tolerance range. When a peak or valley exceeds a tolerance range, the process triggers. If the process is set for continuous triggers, it detects new reference levels for the tolerance setting and continues the process.



### OPERATOR EVENT

This process lets you design operator interaction into test procedures. You can use it to have up to four buttons (one per operator event process) and associated text appear on the bottom of the MPT Control Panel during a test. The buttons and text appear when the process is triggered. When the buttons are pressed, the flow of the test is affected. You can use Operator Event processes to prompt the operator before the test begins, trigger the beginning of a data acquisition process, manually trigger the end of a command process, manually set a digital output channel, and hold a test indefinitely.



### FAILURE DETECTOR

This process lets you monitor signals for failure events. The process looks for specified failure events, determines whether the failure events meet the criteria for specimen failure, and if the criteria are met, the process stops. In a monotonic test, this process can be used to look for an abrupt drop in load, and to shut the test down when the load drop is detected.



### PROGRAM EVENT DETECTOR

This process lets you trigger other processes in response to a change in test state. This process begins by letting you select which program events to monitor, such as program run, hold, or stop.



### DIGITAL INPUT DETECTOR

This process monitors digital inputs from external sources, and can be used to start or end other processes. This process can detect the high or low status of any channel (including any type of signal transition). Logic signals or switch contact signals up to +24 volts can be detected.



### PERIODIC TIME EVENT

This process allows you to schedule arbitrary and repetitive times at which the process will produce a trigger or a series of triggers. This process is used to start other processes at specified times or intervals.

## External Control Processes



### DIGITAL OUTPUT

This process outputs voltage signals to one or more external devices. Each output can be set independently. For example, this process can be used to trigger a remote device used with the test system.



### TEMPERATURE CONTROL

This process sends a temperature setting or set point to an external temperature controller via an RS-485 interface. The temperature controller returns the current temperature to the process so it can ensure that the temperature setting is maintained.

## Other Processes



### PROGRAM CONTROL

This process is used to control test flow. Use it to stop a test before it is complete. Or, use it in conjunction with an event detector that triggers the program control process. Sample uses: display a message in the Control Panel status bar, suspend the test until the Run button is pressed, pause the program until a program resume action occurs, resume tests stopped by the program pause action, stop the test.



### OPERATOR INFORMATION

This process lets you create a custom window that prompts the operator for input. It is useful for including test-related information in the data file. You can have the window appear at any time during a test.



### GROUP

This process allows you to combine and sequence other processes, then nest it within a test procedure. Group processes can be set to run sequentially with other processes or in parallel with them, and are best suited for modularizing long or complex tests.



### START APPLICATION

This process launches another application when triggered. For example, suppose you want to remind yourself of the steps required to run a specific test. This process can launch Notepad to remind you what to do next. You can also use this process to display your data files after the test is complete or to launch analysis directly from MPT software.



### SEND MAIL

This process allows you to send e-mail with a predefined message and a specimen log attachment. You can use this process to automatically inform others about the test's progress.



### SET CONTROLLER VALUE

This process allows you to change calculation parameter and calculation variable values defined in the underlying station configuration. You may enter fixed values or assign variables (requires the Model 793.23 MPT Variables option).



### AUTO OFFSET

This process allows you to zero input signals that are not being used for the active control mode.



### DATA DISPLAY

This process displays selected signals while a test is in progress. Multiple signals of the same dimension may be viewed together. Over the course of a long-term test you can select which data are acquired and displayed on the plot. You can choose whether to display every other point as the buffer fills or to discard older points as the buffer fills.

## Options Add Capability

You can purchase optional processes and applications that enhance the standard processes included with MultiPurpose TestWare software. These features are available as keyed options on the standard Series 793 System Software installation CD.



### PROFILE WITH 793.07 ALC

This process works the same as the Profile process, but plays out profiles with arbitrary end-level compensation (ALC). Arbitrary end-level compensation is an adaptive compensation technique that improves tracking accuracy. It compensates for peak and valley errors by building (and continually updating) a matrix of amplitude compensation factors.



### CYCLIC WITH 793.07 ALC

This process works the same as the Cyclic process, but plays out cyclic commands with arbitrary end-level compensation (ALC).



### ROAD SURFACE OUTPUT

This process lets you drive a station with a Road Surface file that has been created with the RPC® road simulation package. A Road Surface file consists of a list of time history files and other Road Surface files that the RPC controller plays out during durability testing.



### 793.11 PROFILE EDITOR

The Profile Editor is a stand-alone waveform design application that allows you to create arbitrary waveforms (referred to as profiles). You can create block arbitrary and phase profiles, and analyze the waveforms with the graphical preview feature. Once created, you play out the profiles with the MultiPurpose TestWare software application, using the Profile process. A graphical/spreadsheet application software package lets you define and view block-cyclic and phased function generation profiles.

A spreadsheet interface lets you enter profile information – such as frequency, cycle count, shape, and end levels – to define blocks of cycles to be played out with the MPT Profile Process. Phased profiles allow identification of a master channel and frequency. Subordinate channels include a phase lag (0 to 360°) and separate end levels.

Enables fast and easy custom waveform development. With the Profile Editor, you can build custom blocks with ease. You can preview the waveform before you play it out. You play out your custom waveform during the test using the Profile Editor test process.



### 793.12 TREND PROCESS AND MONITORING

This process monitors changes in a test specimen during a test by measuring data from transducers attached to the tested part on a regular basis at specified points in a long-term test. This data's statistical properties (maximum, minimum, mean, RMS, and variance) are logged and then compared to a reference. If a statistic has changed from its reference by too much, the process can perform any of a number of user-specified actions including logging a message or stopping the test.



### 793.14 FATIGUE PROCESS AND MONITORING

This process monitors changes in a test specimen during a test by measuring data from transducers attached to the tested part on a regular basis at specified points in a long-term test. A rainflow analysis is done on each data set and a damage number is calculated. This number is logged and then compared to a reference. If a damage has changed from its reference by too much, the process can perform any number of user-specified actions including logging a message or stopping the test. The process also calculates and logs accumulated damage for all the collected data sets.



### 793.23 VARIABLES WITH MPT CALCULATIONS

The MPT Variables feature equips MultiPurpose TestWare software with the following:

- » A Variables Editor on the MPT Procedure Editor toolbar
- » A Variable View selection in the Display menu of the MPT Procedure Editor menu
- » A MPT Calculation process in the MPT Process Palette, which includes an Calculation Editor
- » An enhanced Operator Information process in the MPT Process Palette



### 793.71 TIME HISTORY LAYOUT

This command process allows you to drive up to eight channels in a test system with an RPC or RPC time history file. An MPT process that allows you to drive a test system equipped with an MTS Remote Parameter Control (RPC) time history file.



### 793.72 TIME HISTORY DATA ACQUISITION

This data acquisition process is used with Model 793.71 Time History Layout, and allows you to acquire and digitize up to 16 channels of analog test response data in the RPC file format. It can also simultaneously (or separately) digitize the resulting analog test response data in the RPC file format. With RPC, this digitized file can be used to calculate the system's transfer function.

## Additional Options for Specialized Testing

These applications are not available as keyed options on the standard Series 793 System Software installation CD; they are distributed on separate media. The following are just a few examples of optional Series 793 applications (contact MTS for a complete list).

### 793.17 DYNAMIC PROPERTIES MONITOR

This application calculates and displays the dynamic properties of materials by sampling user-specified force, length, and phase relationships of input signals. The dynamic characteristics are displayed on a graphical run-time window to monitor desired properties vs. time or cycle count. You can define limit values to terminate cycling when preset property limits are reached. Like the trend monitoring feature, you run this software in parallel with a cyclic command process. Dynamic property windows can be displayed throughout the test, or the operator can select which window to display at any time.



### 793.31 DYNAMIC CHARACTERIZATION

This process allows you to characterize the dynamic properties of elastomeric materials and components. You can sweep temperature, frequency, dynamic amplitude, mean level, and phase between multiple control channels simultaneously. It also allows you to nest sweeps.



### 793.32 ADVANCED DYNAMIC CHARACTERIZATION (ADC)

Building upon the Model 793.31 Dynamic Characterization process, this process allows you to characterize the dynamic properties of materials and components excited with either sine-on-sine or pulsewave forms. Using the sine-on-sine wave shape, ADC performs characterizations as a function of fundamental mean level, fundamental and harmonic frequency, and fundamental and harmonic amplitude. Using the pulse wave shape, ADC performs characterizations as a function of fundamental base level, fundamental and pulse frequency, and pulse amplitude. ADC provides limited control of additional static channels, including temperature control and monitor channels.



### 793.33 STATIC DEFLECTION

This process allows you to characterize the static deflection properties of elastomeric materials and components. You load the specimen between predefined load or displacement end levels and acquires subsequent timed data. Then this software calculates the stiffness of the sample as a cord or tangent modulus during the loading or unloading portion of the test, or as an average of the two. Finally, the process compares the calculated stiffness to predefined limits. It can also compare individual load and displacement data pairs to predefined envelopes for quality control applications.

### 793.35 PRODUCTION QC

This application extends the capability of Model 793.31 Dynamic Characterization and Model 793.33 Static Deflection processes. Designed for the QC/QA environment, this software has a simplified user interface as well as a pass/fail test criteria determination. With it you can predefine upper and lower limits for any of the parameters measured by the Dynamic and Static deflection processes. Based on the established pass/fail criteria, the application displays test results and prompts the operator to insert new specimens.



### 793.26 SIGNAL BASED COMMAND

The Model 793.26 Signal Based Command process allows you to generate program command based on values specified in a predefined lookup table. The lookup table is contained in a tab-delimited text file which defines the relationship between command and signal values. This option is particularly valuable when simulating aero loads in ground vehicle and aerospace applications.



### 793.37 RESONANCE SEARCH

This application characterizes the dynamic behavior of elastomeric materials and components in the free-end resonant mode. The Resonance Elastomer software includes two processes:

- » The Resonance Search process performs a frequency sweep to determine the resonant frequency and plots run-time data.
- » The Resonance Fatigue process performs a frequency sweep to determine the resonant frequency, maximum amplification or maximum phase difference. Once the frequency sweep identifies the required parameter, a series of cycle blocks are applied to the specimen while maintaining the desired resonance relationship.



### 793.39 SINE-ON-SINE (SOS)

The Model 793.39 Elastomer Command Processes include two command processes for use with the Model 793.10 MultiPurpose TestWare (MPT) software test design application.

- » The sine-on-sine process combines two sinusoidal waveforms to produce one unique waveform.
- » The pulse process produces a mixed mode pulse that allows one control mode for an offset and a different control mode to produce the pulse.



### 793.38 HIGH-SPEED TIMED DATA ACQUISITION

This process allows you to acquire data at very high speeds (up to 49 KHz for 1-2 channels for Series 493 controllers and up to 61 KHz for 1-2 channels for Series 494 controllers) for short bursts. This process extends the timed data acquisition beyond the system rate.

**APPLICATION TOOLKIT THERMO  
MECHANICAL FATIGUE**

The TMF toolkit facilitates Thermo Mechanical Fatigue (TMF) testing. You use MPT software to run the specialized templates that come with the toolkit. This feature requires the calculated signals option to calculate the real-time signals required in the TMF test. The TMF toolkit uses capabilities to create TMF-oriented solutions.

The TMF toolkit includes a variety of MPT software test templates. These templates represent the TMF test methodology suggested by MTS. The TMF toolkit includes an enhanced MPT plotting process. The enhanced plotting process provides Peak/Valley vs. cycle plots for any selected signal.

The TMF toolkit also includes a Thermal Strain Calculator that can be automatically launched from within MPT software. The Thermal strain calculator: 1) reads the MPT software data file, 2) calculates polynomial coefficients relating Strain (thermal strain) to temperature, and 3) copies the coefficients into appropriately named calculation constants in the Station Manager application, which automates the laborious calculations typically required to define the thermal strain calibration.

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