M.T.S.
MATERIALS TESTING SYSTEM
458.20 MICROCONSOLE

Constant Load Amplitude
Fatigue Test
using the
TESTLINK CONTROL PANEL

MTS 458.2 MICROCONSOLE OPERATION MANUAL

BASIC OPERATION USING THE TESTLINK CONTROL PANEL

GETTING STARTED

OPEN THE DOOR TO THE POWER ROOM LOCATED TO
THE RIGHT OF THE MTS MACHINE.

-TURN ON THE MAIN POWER SWITCH LOCATED ON
 THE WALL TO THE RIGHT OF THE HYDRAULIC POWER
 SUPPLY.

-TURN ON THE WATER TAP AND THE AIR CONDITIONER
 LOCATED DIRECTLY BEHIND THE HYDRAULIC POWER
 SUPPLY. THE SWITCH FOR THE AIR CONDITIONER IS
 LOCATED ON THE BOTTOM OF THE THERMOSTAT.

-LOCATE THE MAIN POWER SWITCH WHICH IS SITUATED
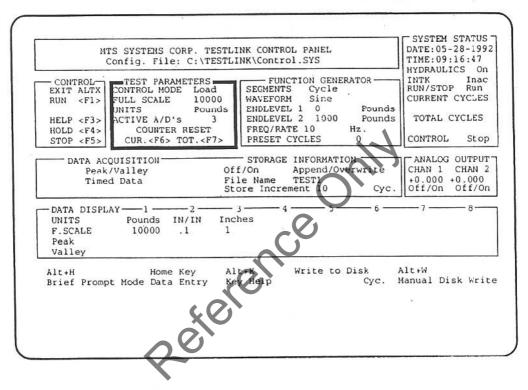 ON THE BACK OF THE 458.2 MICROCONSOLE AND TURN
 IT ON.

NOTE: ALTHOUGH THE MTS HAS SAFEGUARDS WHICH
PROTECT THE MACHINE AND SAMPLE, THESE MAY BE
INADVERTENTLY TURNED OFF OR DISABLED.
THEREFORE IT IS IMPERATIVE THAT THE OPERATOR
HAVE A GOOD UNDERSTANDING OF THE SYSTEM BEFORE
TURNING ON THE HYDRAULIC POWER SUPPLY.

-TURN ON THE COMPUTER AND WAIT FOR THE PROMPT C>.

-TYPE CD\TESTLINK THEN PRESS <RETURN>.

-TYPE CONTROL THEN PRESS <RETURN>. THIS WILL
 BRING UP THE STATEMENT MTS SYSTEMS CORPORATION
 TESTLINK CONTROL PANEL VERSION 2.00. PRESS
 <RETURN> TO CONTINUE. PRESS <RETURN>.

-YOU ARE THEN ASKED TO ENTER A CONTROL PANEL
 CONFIGURATION FILE. IF YOU DO NOT HAVE A FILE
 OR ARE NOT INSTRUCTED TO LOOK FOR A FILE JUST
 PRESS <RETURN>.

YOU WILL NOW SEE THE MTS TESTLINK CONTROL PANEL.

```
┌─────────────────────────────────────────────────────────────────┐
│   ┌───────────────────────────────────────────────┐  ┌SYSTEM STATUS┐
│   │   MTS SYSTEMS CORP. TESTLINK CONTROL PANEL     │  │DATE:05-28-1992
│   │        Config. File: C:\TESTLINK\Control.SYS   │  │TIME:09:16:47
│   └───────────────────────────────────────────────┘  │HYDRAULICS  On
│   ┌CONTROL┐┌TEST PARAMETERS┐┌──FUNCTION GENERATOR──┐  │INTK     Inac
│   │EXIT ALTX││CONTROL MODE  Load││SEGMENTS   Cycle    │ │RUN/STOP  Run
│   │RUN  <F1>││FULL SCALE  10000 ││WAVEFORM   Sine     │ │CURRENT CYCLES
│   │         ││UNITS       Pounds││ENDLEVEL 1  0    Pounds│
│   │HELP <F3>││ACTIVE A/D's    3 ││ENDLEVEL 2  1000 Pounds│ TOTAL CYCLES
│   │HOLD <F4>││   COUNTER RESET  ││FREQ/RATE 10    Hz.  │
│   │STOP <F5>││CUR.<F6> TOT.<F7> ││PRESET CYCLES    0   │ CONTROL    Stop
│   └─────────┘└─────────────────┘└──────────────────────┘
│   ┌DATA ACQUISITION┐  ┌──STORAGE INFORMATION──┐  ┌ANALOG OUTPUT┐
│   │   Peak/Valley  │  │Off/On   Append/Overwrite│ │CHAN 1  CHAN 2
│   │   Timed Data   │  │File Name    TEST1      │  │+0.000 +0.000
│   │                │  │Store Increment 10    Cyc.│ │Off/On  Off/On
│   ┌DATA DISPLAY──1──────2──────3──────4──────5──────6──────7──────8─┐
│   │UNITS        Pounds  IN/IN  Inches                              │
│   │F.SCALE      10000    .1      1                                 │
│   │Peak                                                            │
│   │Valley                                                          │
│   └────────────────────────────────────────────────────────────────┘
│   Alt+H            Home Key     Alt+K       Write to Disk   Alt+W
│   Brief Prompt Mode Data Entry  Key Help             Cyc.  Manual Disk Write
└─────────────────────────────────────────────────────────────────┘
```

-TAB - SELECTS THE INDIVIDUAL SECTIONS OF THE
       CONTROL PANEL WHICH ARE HIGHLIGHTED BY
       A COLORED RECTANGLE AROUND THE BOX.
-HOME - PRODUCES A PROMPT ON THE FIRST ITEM IN THE
       SELECTED BOX. YOU CAN MOVE THE PROMPT UP
       AND DOWN USING THE UP-DOWN ARROWS. PRESS
       <ENTER> WHEN YOU WANT TO MAKE A CHANGE TO
       AN ITEM. ENTER THE NEW VALUE AND PRESS
       <ENTER>. THE PROMPT MOVES TO THE NEXT
       ITEM.
-END - COMPLETES THE CHANGES TO THE HIGHLIGHTED
       SECTION.

PRECRACKING 2218T851 ALUMINIUM SAMPLE FOR LAB

NOTE: PRECRACKING OF SAMPLE SHOULD NEVER EXCEED 10 % OF TEST PARAMETERS.

PRECRACK @ Pmax - 6.00 KN, Pmin - 2.5 KN, 5 HZ

-SELECT "TEST PARAMETERS" ON CONTROL PANEL BY
 PRESSING THE <TAB> KEY. PRESS <HOME>.

```
┌─TEST PARAMETERS─┐
│CONTROL MODE  Load│
│FULL SCALE  10000│
│UNITS       Pounds│
│ACTIVE A/D's    3│
│    COUNTER RESET │
│  CUR.<F6> TOT.<F7>│
└─────────────────┘
```
-USE UP-DOWN ARROWS TO SELECT
 ITEM. PRESS ENTER TO CHANGE.
-CONTROL - LOAD
-FULL SCALE - 25
-UNITS - KN
-ACTIVE A/D - 4
-COUNTER RESET - PRESS F6 & F7

-PRESS END AND SELECT "FUNCTION GENERATOR" USING
 <TAB>. PRESS <HOME> AND USE SAME PROCEDURE AS
 BEFORE TO CHANGE DATA.

```
┌── FUNCTION GENERATOR ──┐
│SEGMENTS    Cycle       │
│WAVEFORM    Sine        │
│ENDLEVEL 1  0      Pounds│
│ENDLEVEL 2  1000   Pounds│
│FREQ/RATE 10    Hz.     │
│PRESET CYCLES      0    │
└───────────────────────┘
```
-SEGMENTS - CYCLE
-WAVEFORM - SINE
-ENDLEVEL 1 - 6.0
-ENDLEVEL 2 - 2.5
-FREQ/RATE - 5
-PRESET CYCLES - 1000

-PRESS END AND SELECT "DATA ACQUISITION"

```
┌─ DATA ACQUISITION ──────┬──── STORAGE INFORMATION ────┐
│    Peak/Valley          │ Off/On      Append/Overwrite │
│    Timed Data           │ File Name   TEST1            │
│                         │ Store Increment 10      Cyc. │
└─────────────────────────┴─────────────────────────────┘
```

-SELECT OFF, -NO FILENAME REQUIRED, -NO STORE
 INCREMENT REQ.

-PRESS END AND SELECT "ANALOG OUTPUT"

```
┌ANALOG OUTPUT┐
│CHAN 1  CHAN 2│
│+0.000 +0.000│
│Off/On  Off/On│
└─────────────┘
```
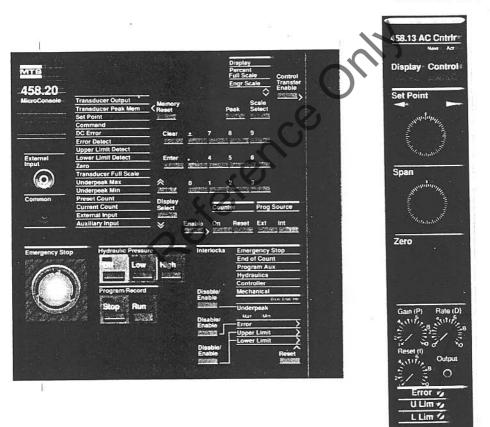-CHAN. 1 - OFF
-CHAN. 2 - OFF

-PRESS END AND SELECT "DATA DISPLAY"

-NO ENTRY IS REQUIRED IN "DATA DISPLAY AS IT IS
 DEPENDENT ON THE ANALOG OUTPUT AND DATA
 ACQUISITION.

-AT THIS POINT <u>DO NOT PRESS</u> <FI> TO RUN.   THE
 458.2 CONTROLLER MUST BE PROGRAMMED AND ALSO
 THE SAMPLE MUST BE INSERTED INTO THE TEST SECTION.

<u>INSERTING THE SAMPLE</u>
-IN ORDER TO INSERT THE SAMPLE WE ARE GOING TO
 USE THE CONTROLLER WHICH UTILIZES A FEEDBACK
 SIGNAL FROM A LVDT LOCATED IN THE MAIN ACTUATOR.

-THE POWER SHOULD BE ON AND THE DISPLAY LOCATED
 IN THE TOP RIGHT CORNER SHOULD READ "PRESS
 ENTER". THE ENTER BUTTON IS IN THE CENTRE OF
 THE DISPLAY NEXT TO THE "4" BUTTON.

-DISPLAY TELLS YOU TO SELECT DISPLAY. PRESS
 THE 458.13 AC CNTRLR DISPLAY BUTTON.

-PRESS THE "CONTROL TRANSFER ENABLE" BUTTON
 LOCATED ON THE UPPER RIGHT SIDE OF THE MICRO-
 CONSOLE AT THE SAME TIME PRESSING THE CONTROL
 BUTTON ON THE 458.13 AC CNTRLR.

-ON THE MICROCONSOLE USE THE "DISPLAY SELECT"
 BUTTON TO SELECT TRANSDUCER OUTPUT.

-ADJUST THE SETPOINT CONTROL ON THE 458.13 AC
 CNTRLR TO 900.

-PRESS THE RESET BUTTON ON THE LOWER RIGHT SIDE
 OF THE CONSOLE. ALL ERROR MESSAGES SHOULD BE
 RESET.

-MAKE SURE THAT THE GRIPS ARE EMPTY AND THAT NO
 FINGERS OR HANDS ARE NEAR THE GRIPS.

-PRESS THE HYDRAULIC PRESSURE "LOW" BUTTON WHICH
 IS LOCATED NEXT TO THE RED "EMERGENCY STOP"
 BUTTON. THIS WILL ENGAGE THE HYDRAULIC POWER
 SUPPLY AND MOVE THE ACTUATOR TO THE 90 %
 POSITION.

-FASTEN THE SAMPLE IN THE TOP GRIP USING THE
 SUPPLIED PIN MAKING SURE THE HEAD OF THE PIN
 IS SITUATED ON THE MICROSCOPE SIDE.

-SLOWLY RAISE THE ACTUATOR CONTAINING THE
 BOTTOM GRIP BY TURNING THE SETPOINT CONTROL
 ON THE AC CNTRLR.

-TURN SETPOINT UNTIL THE HOLES OF THE GRIPS
AND THE SAMPLE LINE UP. THE SAMPLE WILL NEED
TO BE LIFTED FOR ALIGNMENT WITH THE GRIPS.
<u>EXTREME CAUTION SHOULD BE TAKEN WHEN RAISING</u>
<u>THE ACTUATOR. IF POSSIBLE HOLD THE SAMPLE</u>
<u>WITH PLIERS OR TONGS. IT MAY BE DIFFICULT FOR</u>
<u>ONE PERSON TO DO THIS.</u>

-<u>DO NOT INSERT</u> THE BOTTOM PIN INTO THE GRIP.

-TURN OFF THE HYD. POWER SUPPLY BY PRESSING THE
OFF BUTTON.

-PRESS THE CONTROL TRANSFER ENABLE
BUTTON ON THE CONSOLE AND THE
CONTROL BUTTON ON THE 458.11 DC
CNTRLR. SIMULTANEOUSLY

-PRESS THE DISPLAY BUTTON ON THE
458.11 DC CNTRLR.

-SELECT TRANSDUCER OUTPUT USING THE
DISPLAY SELECT BUTTON ON THE 458.2
MICROCONSOLE.

-ADJUST THE "ZERO" CONTROL ON THE
458.11 DC CNTRLR UNTIL "0" IS
DISPLAYED WHEN THE CONTROL IS LOCKED

-PUT THE BOTTOM PIN INTO THE GRIP TO
FASTEN THE SAMPLE IN PLACE.

-ON THE DC CNTRLR CHECK THE FOLLOWING
SETTINGS. SETPOINT = 5.04, SPAN =
1000, GAIN 5.0, RATE 2.5, RESET 2.5.

-LOCATE THE MICROPROFILER ON THE RIGHT OF THE
CONSOLE AND USE THE "MODE SELECT" BUTTON TO
CHOOSE THE "REMOTE" SELECTION.

-USING THE "FUNCTN SELECT" BUTTON SELECT THE RUN-
 ENABLE SELECTION.

-MOVE THE MICROSCOPE INTO PLACE AND FIND THE EDGE
 OF THE NOTCH IN THE VIEWER.

-TURN ON THE HYDRAULIC POWER SUPPLY FIRST WITH THE
 LOW PRESSURE SWITCH AND THEN THE HIGH PRESSURE
 SWITCH.

-ON THE COMPUTER PRESS THE F1 BUTTON.

-ON THE DISPLAY PRESS THE TRANSDUCER PEAK MEM.
 BUTTON.

-THE TEST WILL RUN FOR 1000 CYCLES AND STOP.

-CHECK THE CRACK LENGTH AND RUN FOR ANOTHER 1000
 CYCLES IF NECESSARY   WE REQUIRE A 0.5 CM PRE-
 CRACK.

-WHEN THE PRECRACK IS DONE RECORD THE POSITION OF
 PRECRACK USING THE MICROSCOPE.

-GO INTO THE CONTROL PROGRAM AND CHANGE THE
 VALUES FOR THE TEST. Pmax= 5.8 KN,
 Pmin = 2.75, RATE = 5 HZ., PRESET CYCLES =
 100 CYCLES.

-RESET THE COUNTERS AFTER RECORDING THE TOTAL
 NUMBER OF CYCLES FOR PRECRACK.

-RUN THE TEST AND RECORD THE DISTANCE THE CRACK
 TRAVELS EACH 100 CYCLES. DO NOT RESET THE TOTAL
 COUNTS DURING THE TEST.

-RUN THE TEST TILL FAILURE OF SAMPLE AND RECORD
 THE TOTAL COUNTS TO FAILURE.

1.   SIGNATURES OF UNDERSTANDING

By signing this form I acknowledge that I have read and understand this SOP, as well as the applicable MSDS's and that I will conduct myself in accordance with this SOP and the general laboratory rules.

NOTE: ALL SIGNATURES MUST BE PRESENT ON THE SOP LOCATED IN THE YELLOW BINDERS IN ROOM 2C26, other SOP's are made available for convenience only. Printed SOP's are valid for 24 hours only, after that time their accuracy must be verified with the **OFFICIAL VERSION** in room 2C26.

Name (Print)	NSID	Dep't	Signature	Date

2.   VERSION HISTORY

Handwritten amendments to the official procedures can be made by a single line through the text, along with the date, and initialed by the authorized individual making the correction. Changes are to be noted below. Formal changes to this SOP are made on the date of revision or sooner, where required.

Section	Changes Made	Date	Initials