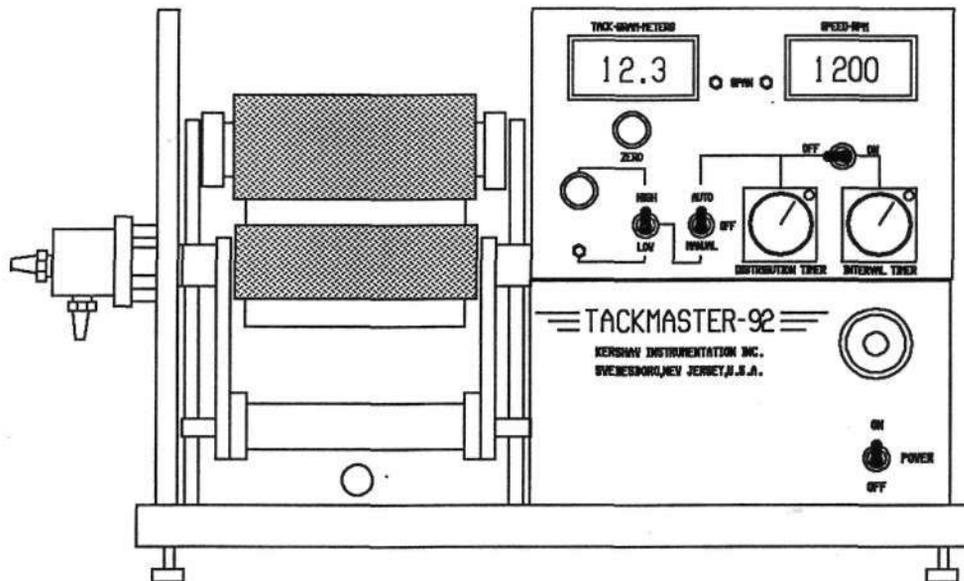


# Tackmaster - 92

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# TACKMASTER - 92

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## 1.0 INTRODUCTION

Kershaw Instrumentation has been an innovator in instrument systems and laboratory test equipment for many years. Their vast design resources along with extensive "hands on" experience enables Kershaw Instrumentation to provide a complete line of products and services for the graphic arts industry.

One of our latest innovations is the TACKMASTER-92 tack measurement instrument. This machine is designed for highly accurate testing and will provide for many years of durable, trouble-free service both in the laboratory and in the workplace.

## 2.0 DESIGN FEATURES (Refer to Illustration 1 - Tackmaster Outline)

The TACKMASTER-92 has been carefully engineered to provide durability and high accuracy. Many of the components are standard commercial parts thus proven to provide low maintenance and ease of service. The following is a brief description of some of the design features.

### 2.1 Temperature Control System

The standard temperature control provided with the Tackmaster is a 6 liter heated water circulator. This "stand alone" device is connected to the machine via 2 flexible hoses. An existing temperature controller, or a centralized water system can be utilized simply by disconnecting these hoses and reconnecting them to the alternate temperature control source.

The water is connected to the rotating brass roller via a mechanical water seal. The unique, rugged design of this water seal will provide years of trouble free operation.

### 2.2 Top Roller Assembly

The top roller assembly is supported on two precision "bending beams". No moving parts are utilized in the "Tack Measurement" portion of this instrument. Safety stops are provided to limit the movement of the Top Roller Assembly and a locking spacer is provided for transporting the Instrument.

### 2.3 Vibrator Roller Assembly

The vibrator roller assembly utilizes a "box frame" design for rigidity. This entire frame oscillates side to side on linear ball bearings. The oscillation is driven by a fixed link with no sliding or disconnecting parts. The pressure of the Vibrator Roller is generated by a counterweight. The mass of the counterweight is fixed, but can be altered if desired. Distribution of the Vibrator Roller is adjusted simply by rotating a jacking screw, located on the front of the machine.

### 2.4 Cleaning

A permanent cleaning bar is mounted under the brass roller to assist the operator during clean-up. A removable splash shield is located behind the top roller and the brass roller, and a removable splash tray is located under the brass roller and the vibrator roller. These removable panels are useful for clean-up and misting tests.

### 2.5 Variable Speed Drive

A full size 3/4 horsepower variable speed motor powers the Tackmaster. The speed of the brass roller can be adjusted from 0-2000 R.P.M.. A digital readout displays the speed at all times. The brass roller is driven directly from the motor via a timing belt, thus no gears or transmission components are utilized. The operation of the speed controls is discussed in Section 3.3.

## 3.0 OPERATION OF CONTROLS (Refer to Illustration 2 - Control Panel)

### 3.1 Tack Indicator

While running a test, the tack measurement is displayed on the digital indicator continuously. A zero adjustment is located beneath the digital indicator to zero the instrument prior to running a test. A span control is located adjacent to the digital indicator for calibration (see tack calibration section 4.2-4.3).

An analog output directly proportional to the tack is available via a terminal block located on the rear panel of the instrument. This output correlates directly with the digital indicator and can be used in conjunction with the Optional Data Recording Devices described in Section 5.0.

### 3.2 Speed Indicator

A digital readout is provided to indicate the speed of the brass roller in R.P.M.'s. A span control is located adjacent to the digital display for calibration.

### 3.3 Speed Controls

Two adjustable speed controls are provided on the Tackmaster. The low speed control is used for distributing the ink, cleaning the rollers, and idle running of the machine. The high speed control is used for running a test. The high speed control should be set to the specified test speed.

#### 3.3.1 Manual Speed Control

With the auto/manual switch in the "manual" position, the operator may select either low speed or high speed operation simply by using the high/low switch.

#### 3.3.2 Automatic Speed Control

Upon switching the auto/manual switch to the "auto" position, the machine will begin to distribute the ink at the low speed and the distribution timer will begin its' time cycle. Once the distribution time elapses, the machine will ramp up to high speed. The machine will now run at this specified test speed until the operator moves the auto/manual switch to the OFF position to conclude the test.

Special Note: The distribution timer should be adjusted for a long enough time period to properly distribute the ink. The operator may want to record this distribution time as part of the test specification.

### 3.4 Interval Timer

The interval timer provides the operator with an audible tone at preset intervals. This Interval Timer works as a "Stop Watch" to cue the operator to observe the tack readings during a test. The Interval Timer contains two adjustable dials. The inner dial (ORANGE) sets the "tone on" time and the outer dial (YELLOW) sets the "tone-off" or interval time. A switch is provided to shut off the Interval Timer circuit if it is not required.

The Interval Timer only works in the automatic mode and can be set-up to operate in one of the two modes as follows:

#### 3.4.1 Mode One

In Mode One the interval timer begins to operate immediately upon switching the auto/manual switch to the auto position i.e. at the beginning of the distribution period.

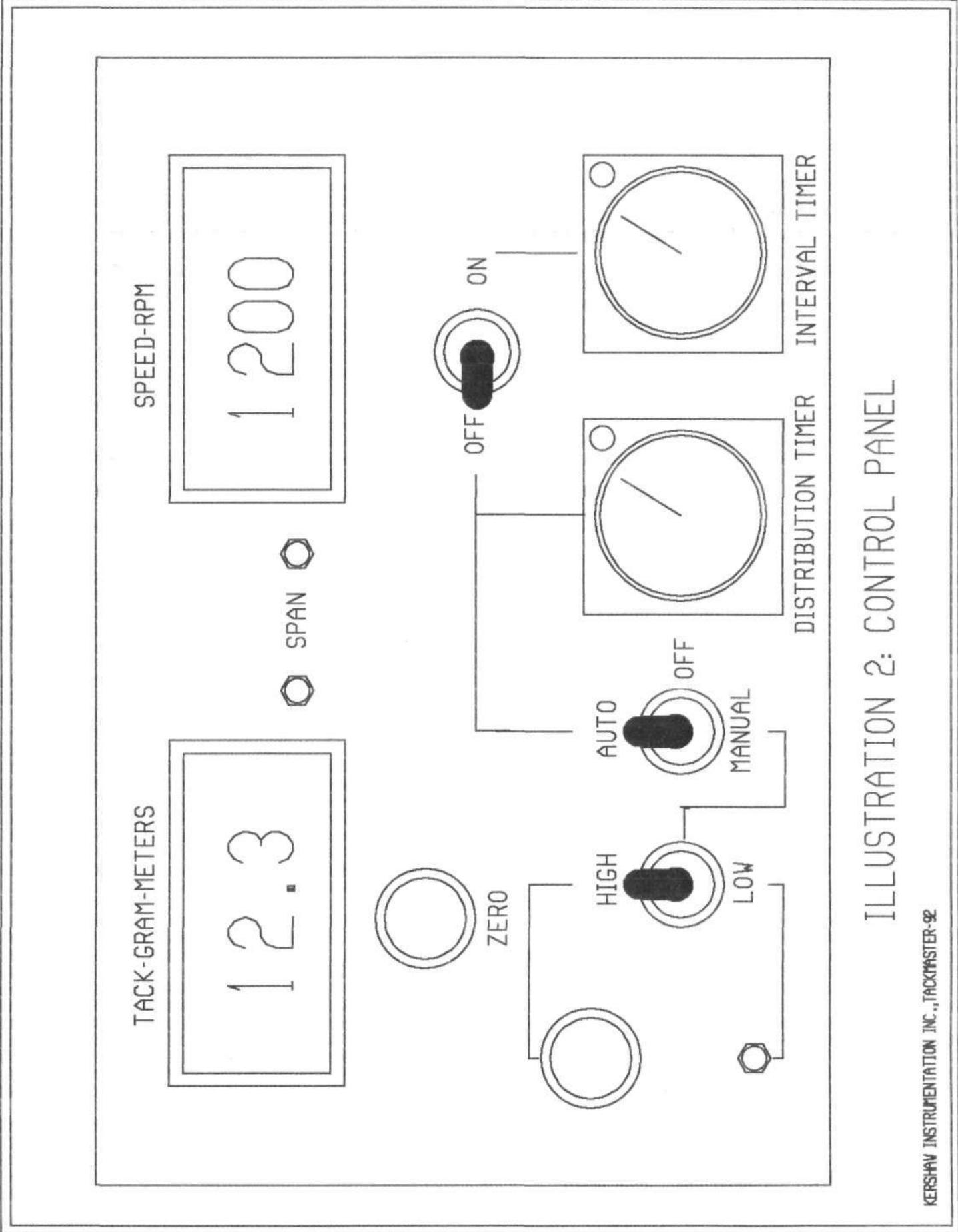
#### 3.4.2 Mode Two

In Mode Two the interval timer begins to operate after the distribution timer times out i.e. at the end of the distribution period.

#### 3.4.3 Mode Selection

Remove the narrow top panel on the top of the instrument console. Locate the green/orange twisted wire pair with a spade lug connector. Connect the spade lug connector for Mode 1. Disconnect the spade lug connector for Mode 2.

Special Note: An extra circuit is provided with the interval timer for use with the computer interface option. By utilizing this circuit the interval timer will trigger the computer to begin its data collection thus providing a completely automatic data collection system.



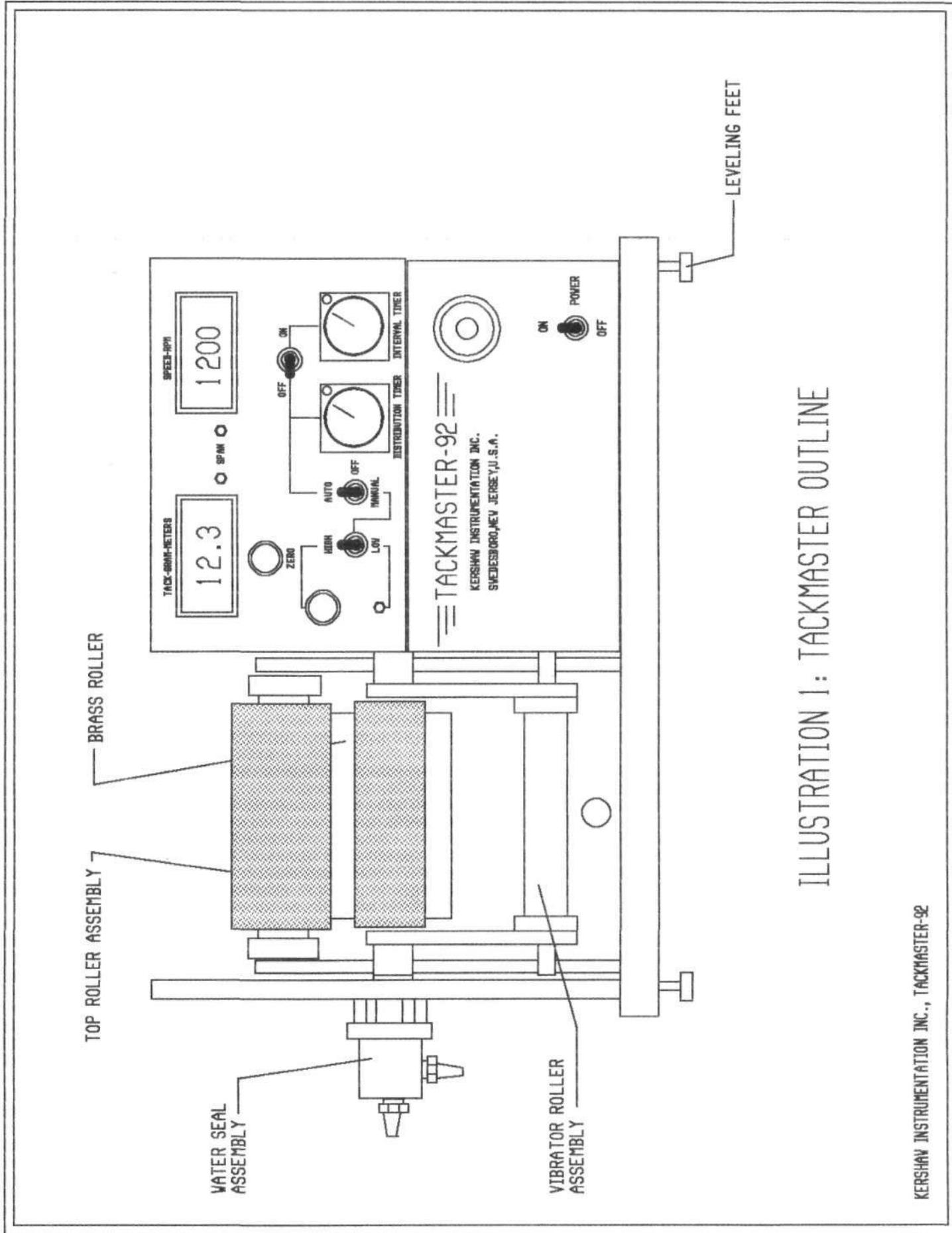


ILLUSTRATION 1: TACKMASTER OUTLINE

## **3.5 OPERATION**

### **3.5.1 Setting up for a Test**

Move the auto/manual switch to the manual mode and the High/Low switch to the high position. Adjust the high speed control to the specified operating speed.

With the speed and temperature stable and the rubber rollers in contact with the brass roller, adjust the tack indicator to zero. Next, move the auto/manual switch to the "OFF" position.

Now adjust the distribution timer for the required distribution time, and the interval timer for the desired data interval. The instrument is now ready to test.

### **3.5.2 Running a Test**

Fill the pipette (included) with the test ink. Carefully remove all the air bubbles to insure that the proper volume of ink is obtained. Apply the test ink sample to the distributor roller evenly.

Now, move the auto/manual switch to the auto position. The machine will now run at the low distribution speed for the elapsed time as preset on the distribution timer. When the distribution timer elapses, the machine will ramp up to the specified operating speed. The interval timer will sound the audible sonalert to indicate the operator should read the data. Upon completion of the test the operator simply moves the auto/manual switch to the OFF position to end the test.

Now the operator can use the manual speed position to clean the machine and stabilize it for the next test.

## **4.0 CALIBRATION**

### **4.1 Speed Calibration**

Using the manual mode, set the speed to its' approximate mid point. Using a strobe tachometer, measure the speed of the brass roller. Next, using the calibration tool provided, adjust the speed span potentiometer to achieve the proper speed reading.

#### 4.2 Tack Calibration - Using the Calibration Rods

Located the calibration block located behind the brass roller. This block is stamped CAL. Remove the splash shield from the instrument.

Using the manual mode, set the speed to 1200 RPM. Carefully check and adjust the tack indicator zero. Insert a calibration rod into the calibration block thus generating a bending movement on the Top Roller Assembly.

Using the calibration tool provided, adjust the tack span potentiometer to achieve the correct reading as stamped on the calibration rod.

#### 4.3 Tack Calibration - Using a Tack Standard Ink

Using the manual mode, set the speed to the specification of the tack standard ink. Carefully check and adjust the tack indicator zero. Next, apply the ink to the rollers and allow it to distribute and stabilize.

Using the calibration tool provided, adjust the tack span potentiometer to achieve the tack reading as specified by the tack standard ink.

### 5.0 OPTIONAL DATA RECORDING DEVICES

The Tackmaster is equipped with an analog output proportional to the tack. This feature is standard on the instrument and is accessible from the terminal block located on the rear panel of the instrument. This output correlates directly with the digital indicator and can be used in conjunction with the following Data Recording Devices.

#### 5.1 Strip Chart Recorder

The strip chart recorder provides a continuous plot of the tack via a servo-driven pen. The tack can be scaled as desired by adjusting the range of the recorder. The time scale can be changed as desired by adjusting the chart speed.

## 5.2 Datalogger

The datalogger provides a tabular printout of the tack verse time test data. The operator can program the unit to print at desired intervals. The time and date are also recorded on the chart.

## 5.3 Computer Interface

The Computer Interface provides the software and datalink required to generate datafiles for the test results. This datafile will generate tack verse time plots of the test results (examples are included in section 6 of this report). These plots can be scaled as desired and overlaid on one another for comparison. The system is menu driven and provides "help text" and instruction manuals. The system can be triggered from the interval timer to provide completely automatic testing.

Special Note: Consult Kershaw Instrumentation Inc. for additional product bulletins on these Optional Data Recording Devices.

## 6.0 TEST AND EVALUATION

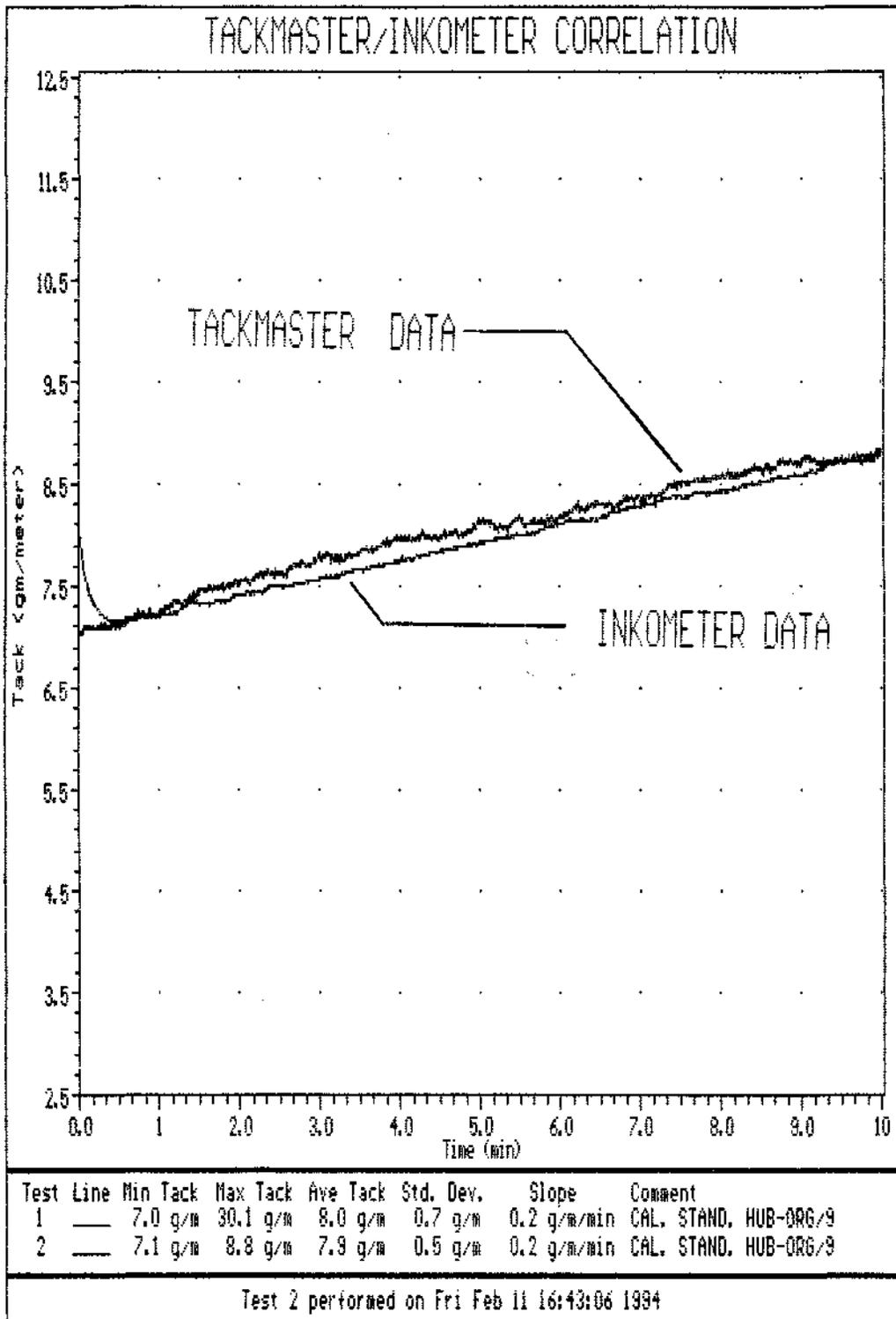
After extensive testing of the Tackmaster, a brief summary of the test results has been compiled. The data taken from the Tackmaster was compared to that taken from a standard Mechanical Type Inkometer equipped with a Kershaw Instrumentation Digital Tack Indicator. All data was collected on a Personal Computer using a Kershaw Instrumentation Computer Interface System. The results of these tests are as follows:

Figure 1 - Low Tack Correlation and Difference Plot Using a Low Tack Calibration Ink Standard.

Figure 2 - Medium Tack Correlation and Difference Plot Using a Medium Tack Calibration Ink Standard.

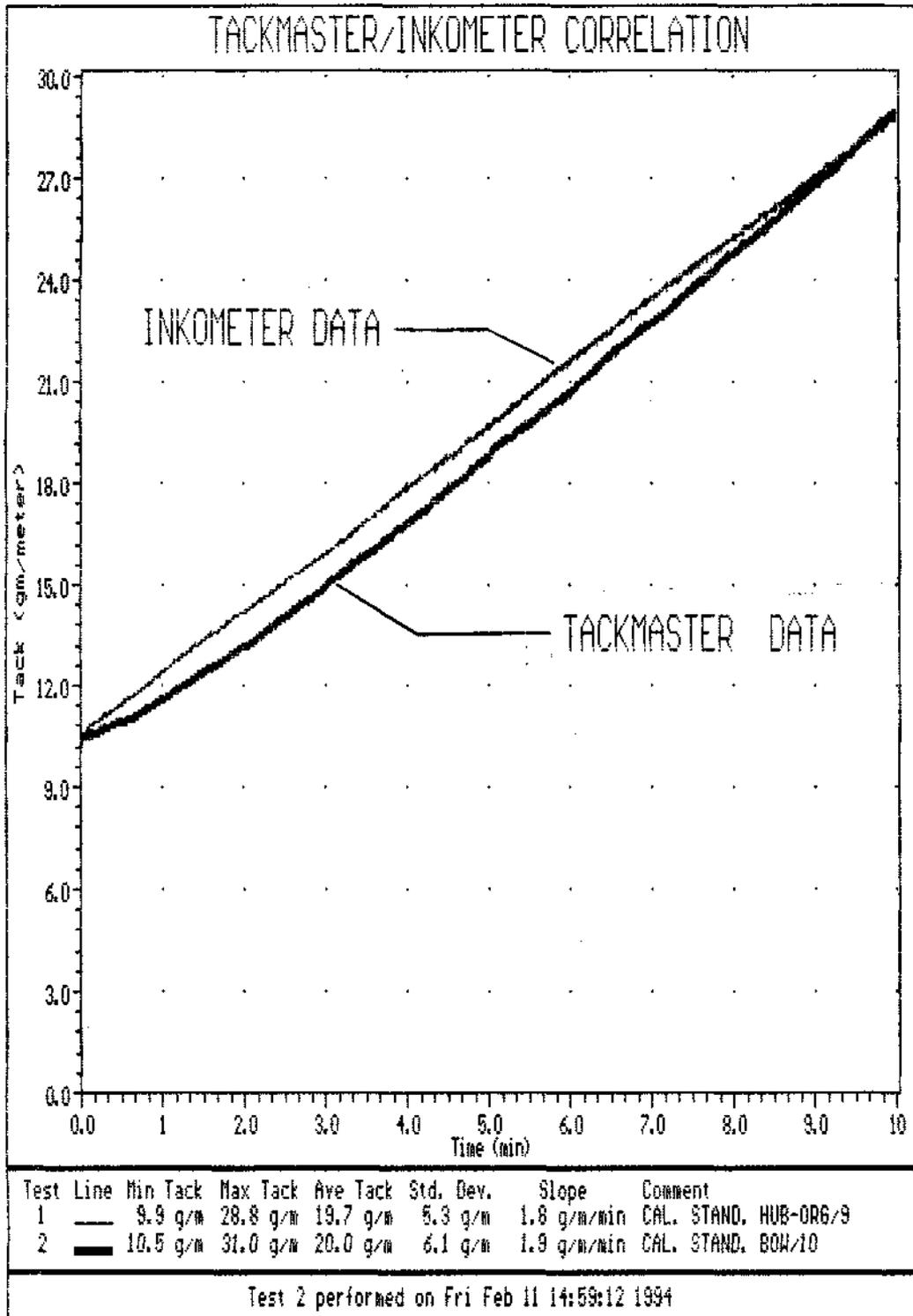
Figure 3 - High Tack Correlation and Difference Plot Using a High Tack Calibration Ink Standard.

Figure 4 - Tackmaster Repeatability Test Data and Difference Plot Using a Low Tack Calibration Ink Standard.



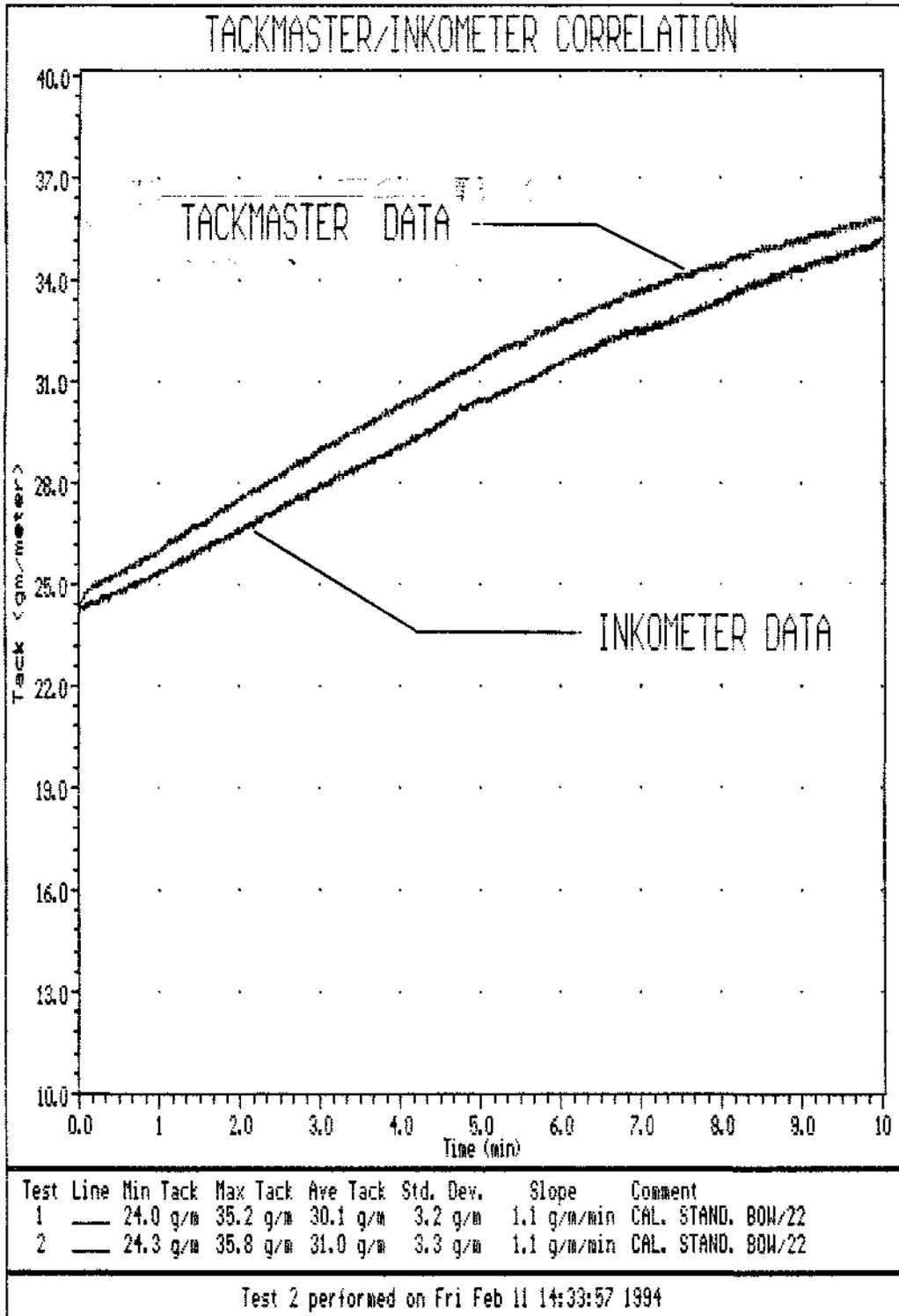
Kershaw Instrumentation, Inc.

FIGURE 1: LOW TACK CORRELATION



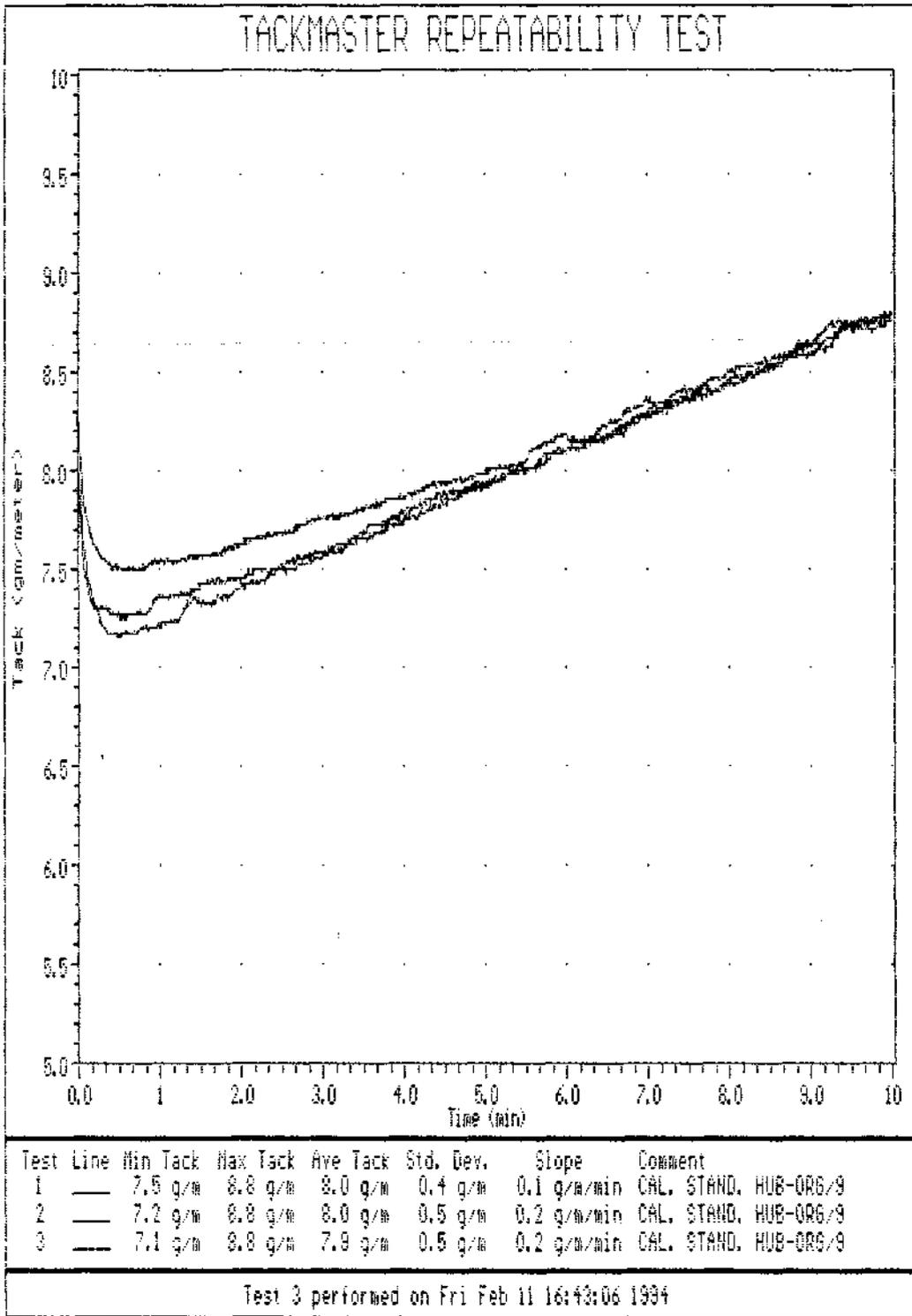
Kershaw Instrumentation, Inc.

FIGURE 2: MEDIUM TACK CORRELATION



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FIGURE 3: HIGH TACK CORRELATION



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FIGURE 4: REPEATABILITY TEST DATA

## **7.0 GENERAL SPECIFICATION**

### **Tackmaster**

Net Weight:	Approximately 135 lbs.
Dimensions:	18 inch x 24 inch x 16 inch high
Power Consumption:	120VAC @ 10 Amps Maximum

### **Temperature Control System**

Net Weight:	
Dimensions:	14" x 8-1/4" x 14-3/4"
Power Consumption:	120VAC @ 5 Amps Maximum
Temperature Stability:	+ .05°C
Reservoir Capacity:	6 liters
Controller Type:	Analog

\*\*\*\*\* APPENDIX-A \*\*\*\*\*

TACKMASTER-92 ROLLER REMOVAL/INSTALLATION

A-1.0 TOP ROLLER REMOVAL/INSTALLATION

- i.1 Locate one of the 10-32 x 1.75 in. screws [B] that support the water seal assembly [A]. Remove this screw so you can use it as a shaft puller.
- 1.2 Loosen the pivot shaft set screw [D].
- 1.3 Using the 10-32 x 1.75 in. screw [B], reach thru the access hole [H] and thread it into the tapped hole in the end of the pivot shaft [E].
- 1.4 With the top roller [C] down on the brass roller, hold the top roller [C] and the top roll assembly [F] with one hand while pulling the pivot shaft [E] out with the other.
- 1.5 Place the top roller assembly [F] on a bench and remove the shoulder bolt [I].
- 1.6 Remove the side arm of the top roller assembly.
- 1.7 Remove the top roller from the remaining arm.
- 1.8 Install the new roller in reverse order of steps 1.7--1.1.

A-2.0 VIBRATOR ROLLER REMOVAL/INSTALLATION

- 2.1 Locate one of the 10-32 x 1.75 screws [B] as in step 1.1.
- 2.2 Lift the vibrator roll counterweight and block it up with a block of wood or small ink can. This will push the vibrator roller [M] forward to gain access to the vibrator roller shaft [N].
- 2.3 Loosen the set screws [R] which holds the vibrator roller shaft.
- 2.4 Thread the 10-32 x 1.75 screw [B] into the threaded hole [O] in the vibrator roller shaft [N].
- 2.5 Hold the vibrator roller [M] with one hand while pulling out the shaft with the other.
- 2.6 Install the the new roller with two nylon washers [P] on each side. Use steps 2.1--2.5 in reverse order.

## **APPENDIX B: Computer Interface/Software Installation for the Tackmaster-92**

### **B 1.0 Software Installation**

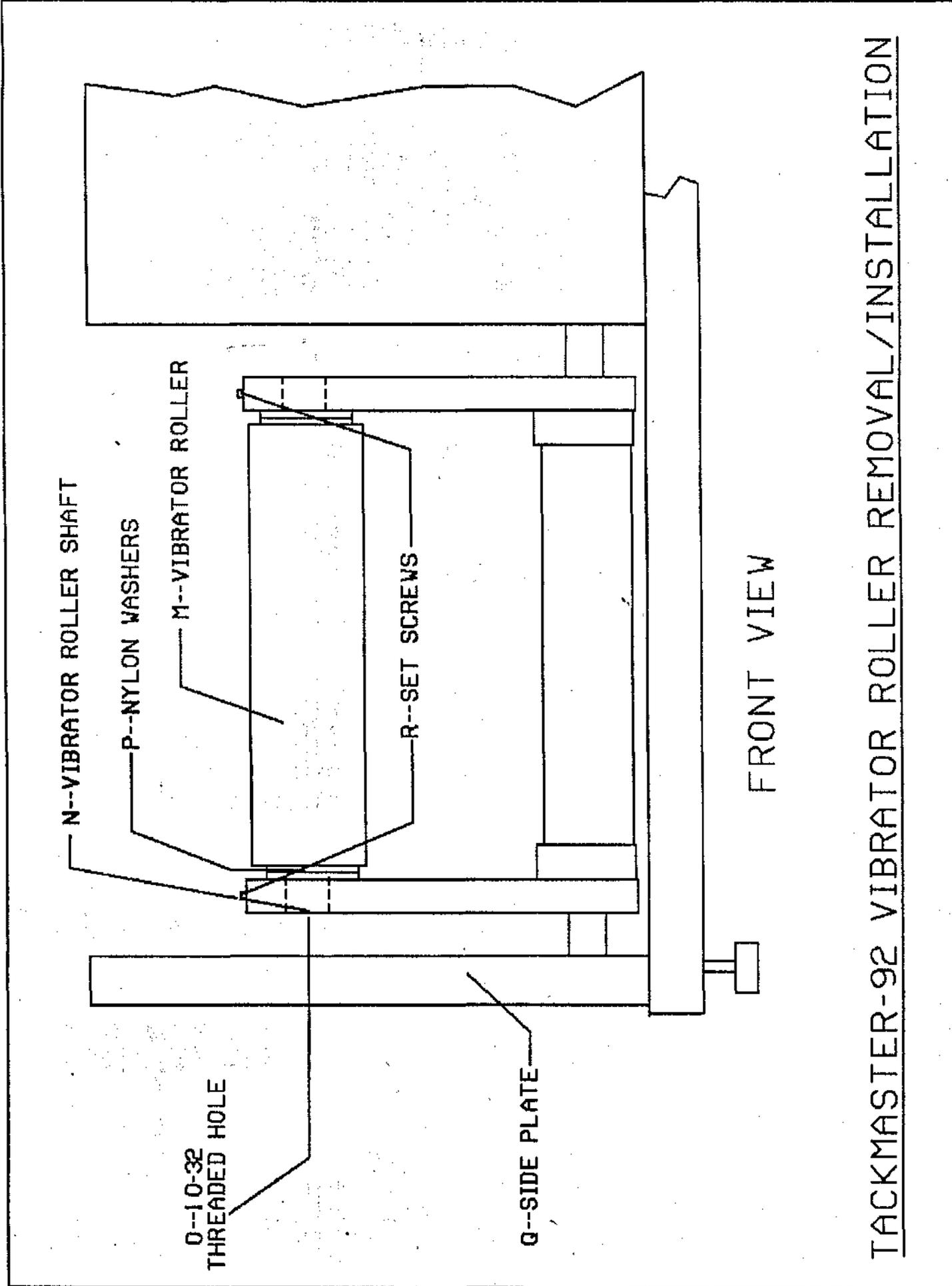
- B 1.1 Install the CD into the CD drive of your computer.
- B 1.2 Double click on "My Computer"
- B 1.3 Double click on "Kershaw"
- B 1.4 Double click on "TMS" folder.
- B 1.5 Double click on "Setup" and follow the instructions.
- B 1.6 Please note that the license key is written on the inside cover of the jewel case for the CD.

### **B 2.0 Tackmaster-92 Computer Interface Installation.**

- B 2.1 Connect one end of the flat interface cable into the square connector on the rear of the Tackmaster-92. Connect the other end of the cable into the 9 pin connector assembly included with the Tackmaster-92.
- B 2.2 Plug the 9 pin connector assembly into the COM port of your computer.
- B 2.3 Go on your computer and click on the Tack Measuring System icon to start the TMS system software.
- B 2.4 Click "Configure - Interface - Install".
- B 2.5 Locate the "Program/Operate" toggle switch on the rear panel of the Tackmaster-92. Move this switch to the "Program" position.
- B 2.6 Follow the on screen instructions for the installation.
- B 2.7 Please note, after the installation is complete, the Program/Operate toggle switch must remain in the operate position.

### **B 3.0 Interface Calibration**

- B 3.1 Click "Configure - Interface - Calibrate" and follow the on screen instructions.
- B 3.2 Please note that the installation and calibration only need to be done the first time the computer is connected to the instrument. Adjusting the span control on the front panel of the Tackmaster-92 will not effect the calibration of the computer.



N--VIBRATOR ROLLER SHAFT

P--NYLON WASHERS

M--VIBRATOR ROLLER

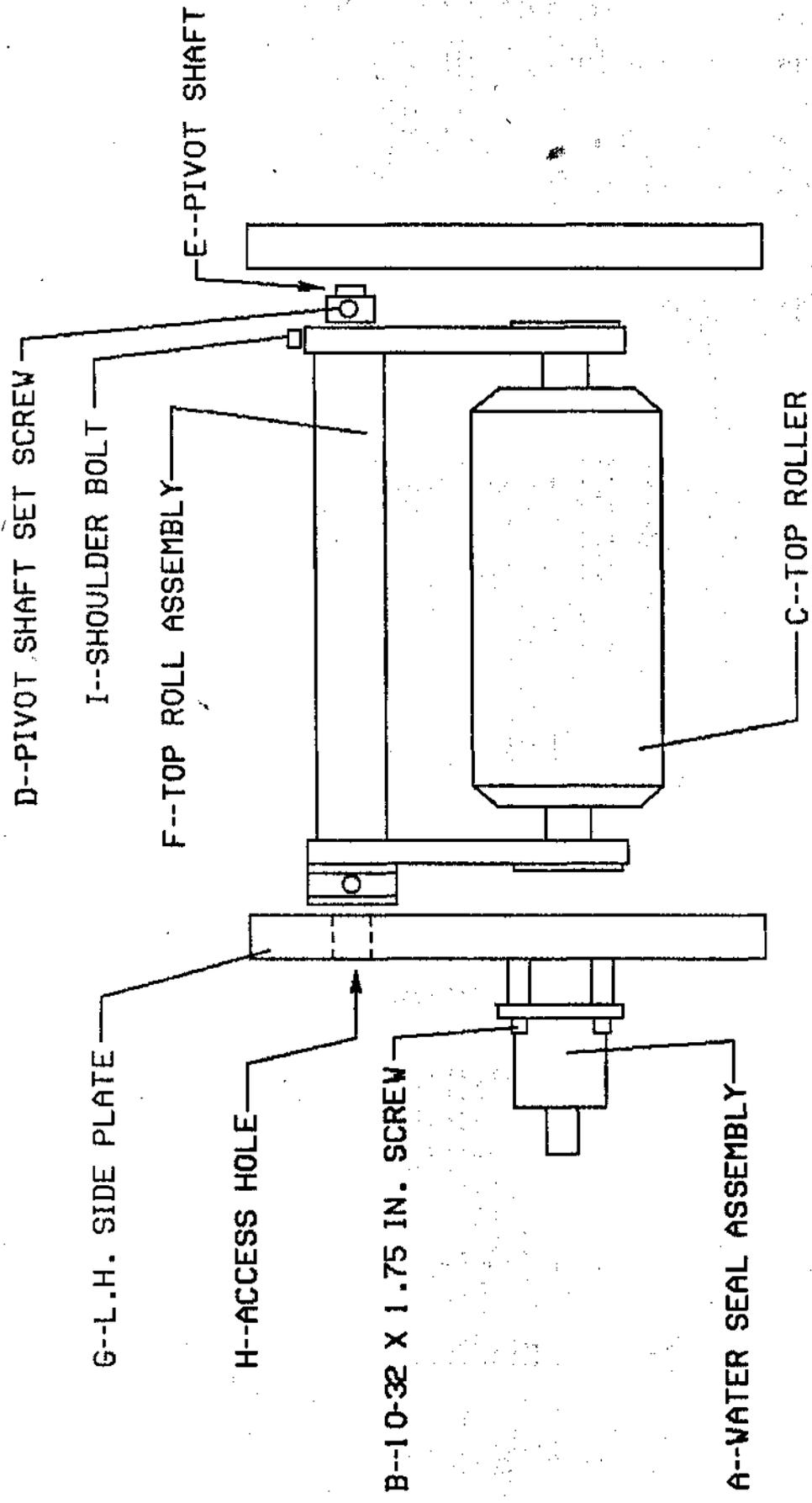
R--SET SCREWS

0--10-32  
THREADED HOLE

Q--SIDE PLATE

FRONT VIEW

TACKMASTER-92 VIBRATOR ROLLER REMOVAL/INSTALLATION



TOP VIEW

TACKMASTER-92 TOP ROLLER REMOVAL/INSTALLATION