SECTION 2

GENERAL INFORMATION

INTRODUCTION

The DEKTAK V 200-Si is an advanced surface texture measuring system which accurately measures surface texture below submicro-inch and film thickness to 262 microns.

Principle of Operation

Measurements are made electromechanically by moving the sample beneath a diamond-tipped stylus. The high precision stage moves a sample beneath the stylus according to a user-programmed scan length, speed and stylus force. The stylus is mechanically coupled to the core of an LVDT (Linear Variable Differential Transformer). As the stage moves the sample, the stylus rides over the sample surface. Surface variations cause the stylus to be translated vertically. Electrical signals corresponding to the stylus movement are produced as the core position of the LVDT changes respectively. An analog signal proportional to the position change is produced by the LVDT, which in turn is conditioned and converted to a digital format through a high precision, integrating analog to digital converter. The digitized signals from a single scan are stored in computer memory for display, manipulation, measurement, and print. Stored programs that can be readily changed make the DEKTAK V 200-Si ideal for both production and laboratory use.

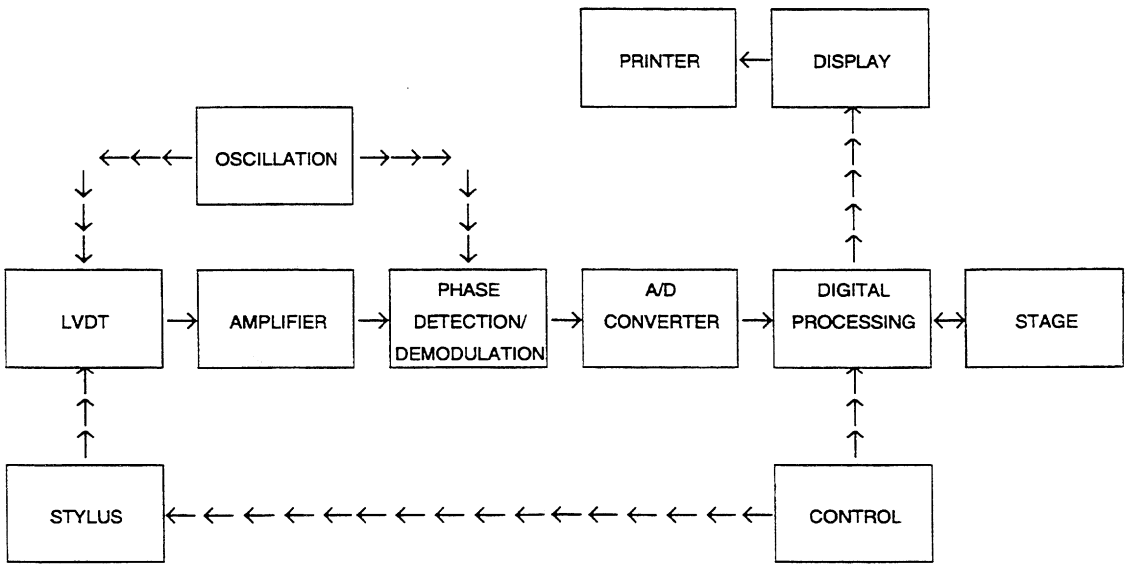

Figure 2-1. Block Diagram of DEKTAK V 200-Si Architecture

CONFIGURATION

Computer Console

The Computer Console incorporates a Pentium computer. The 1.4 MByte, 3-1/2" high density diskette drive permits off line use. Microsoft Windows provides an easy to learn, easy to use interface with pull-down menus and pop-up windows.

Video Monitor

The DEKTAK V 200-Si video monitor is a 15 inch high resolution (720x480 pixels), Super VGA color monitor. It displays programs and graphics in full color, along with a color video image of the substrate surface. It can also be used to view the substrate either alone or with the graphics superimposed.

Precision Scan Head

The DEKTAK V 200-Si precision Scan Head unit contains the mechanical and optical components for sample placement, sample viewing, scanning/measurement and environmental protection. A diamond tipped stylus permits accurate measurements in a wide range of applications. User programmable stylus force from submilligram to 30mg. allow profiling on soft or hard surfaces.

Motorized Video Zoom Camera

A remote controlled 60X to 420X Solid-State Video Zoom optics system and a variable intensity illuminator permits viewing of the sample in the measurement area.

Programmable Sample Stage

A very high precision programmable sample stage performs the scan and permits X-Y positioning to any location of measurement interest in a 200mm x 200mm (8 x 8 inch) area. Theta rotation can be entered in 0.001 degree increments up to 360 degrees. Sample positioning can be controlled via DEKTAK V 200-Si keyboard and trackball.

Thermal Printer

The standard thermal printer produces full-sized printouts in less than 6 seconds. These printouts provide a graphic record of measurement and program data for future reference and/or reproduction. Clean room compatible thermal printer paper is available. Printouts can also be produced on an Epson compatible external printer.