1.0 THE M2000/8 SYSTEM

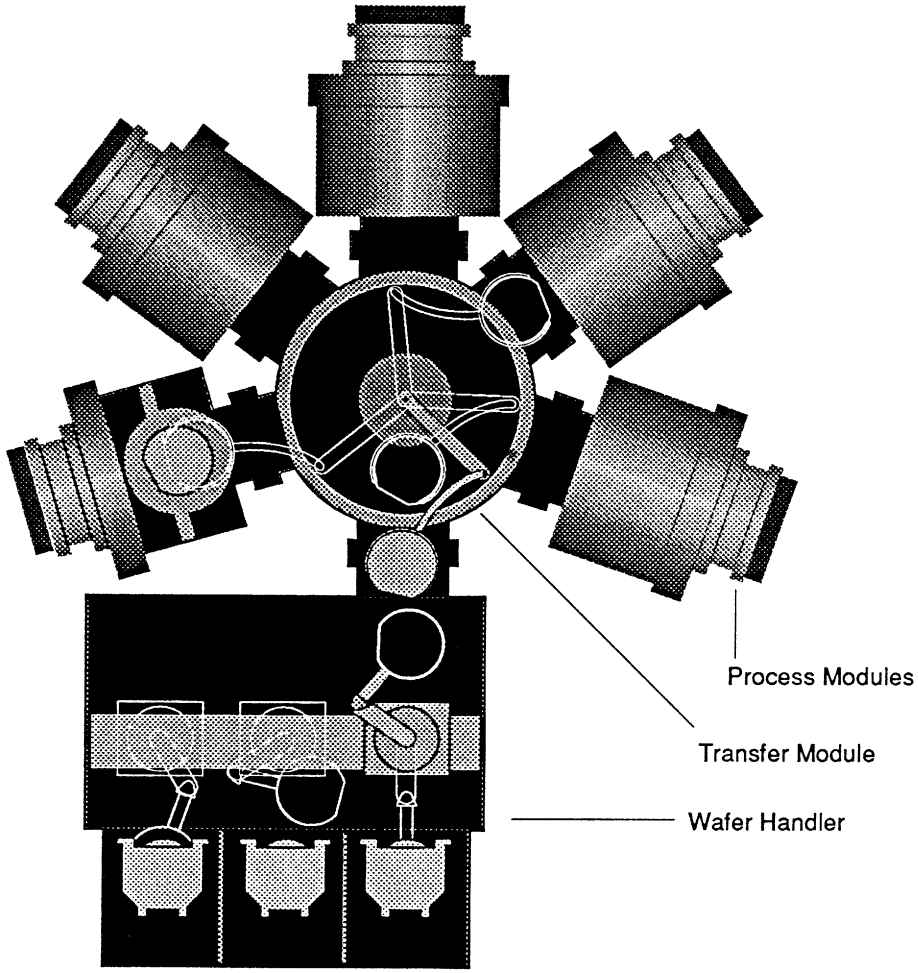

Figure 1-1 Top View of the M2000/8 System with Wafer Handler

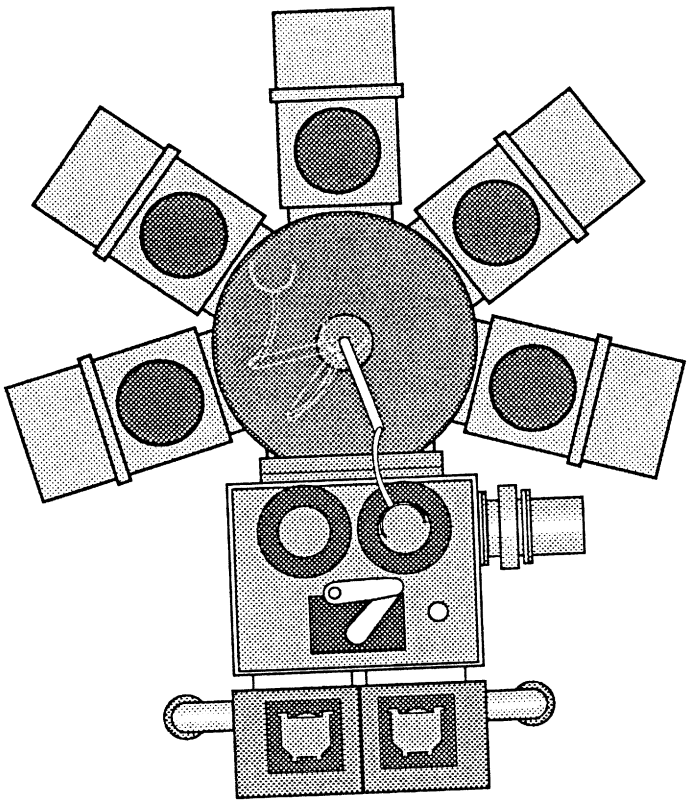

Figure 1-2 Top View of the M2000/8 System with Dual Cassette Module (DCM)

The Varian M2000/8 is a fully-automated, modular, vacuum-isolated, multi-chamber system. It is a single wafer processing system that is designed for the integration of additional or alternative Process Modules.

The M2000/8 uses a standard interface design allowing the system to interface with a wide variety of Process Modules. A standard mechanical interface specification defines flanging and other conditions required for wafer exchange between modules. A standard communications interface is based upon the SEMI and SECS standards. All communications are point-to-point between the system Master Computer and the Intelligent Process Controller (IPC) at each module. There are no inter-module connections.

The M2000/8 consists of specialized process modules joined together by one or more Transfer Modules—sometimes called the Central Handling Module. Wafers enter and exit the system through a Wafer Handler, Dual Cassette Module (DCM) or some other wafer load lock attached to the front end of Transfer Module. Within each Transfer Module is a transfer arm used to move wafers between the front end and the Process Modules. The transfer arm also moves wafers from one Process Module to another.

The Process Modules are relatively independent of the system as a whole. There is minimal communication between the Master Controller computer and each Process Module. Each Process Module has its own computer. The only mechanical interaction is with the Transfer Module, which is used to load and unload wafers.

There are two types of Process Modules. In a horizontal module, the source is mounted above the heater table and sputters down onto the wafer. In a vertical module, the source is mounted in a sideways position. The heater table tips the wafer to a vertical position to allow the source to sputter onto it.

Because the Process Modules operate independently, a Master Computer oversees all system operations. The Master Computer has no direct control over any of the process or wafer transport hardware. It maintains system control by communicating with all modules via serial lines. The Master Computer (Controller) does have minimal control of the wafer handler.

The M2000/8 specifically incorporates the following features:

- Menu-Driven recipe control of processes and wafer routing.
- Multi-distributed processor control systems
- DC and RF magnetron sputtering of conductors and insulators
- Gas conduction wafer heating using the patented Varian Heater Table
- Backside, no-edge-contact wafer handling and orienting
- RF and DC wafer substrate biasing during processing
- Argon sputter etching
- Reactive sputtering in Nitrogen and Oxygen
- Vacuum pumping components and gauging for low background gas requirements
- High-reliability vacuum isolation valve designed for low particle generation
- Pick-and-place wafer handling robot arm with low particle generation and high reliability suitable for high vacuum application
- Modular architecture to accommodate a wide variety of system configurations for specific processing needs
- Process recipes and wafer routing recipes that can be quickly changed to suit new system configurations and processing needs.