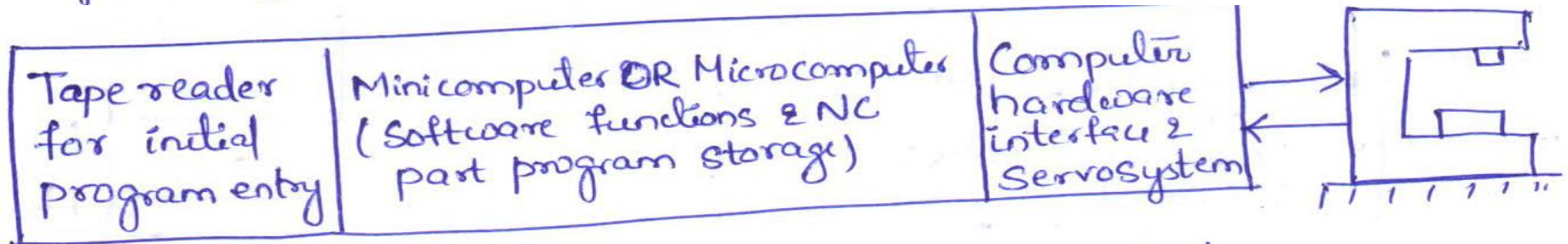


CNC (computer Numerical control)

- CNC is an NC system that utilizes a stored program computer to perform some or all of the basic numerical control functions.

With CNC, the program is entered once & then stored in the computer memory. Thus, the tape reader is used only for the original loading of the part program.

CNC offers additional flexibility & computational capability.



General Configuration of CNC System

Functions of CNC

- (1) M/C tool control
- (2) In-process compensation
- (3) Improved programming & operating features
- (4) Diagnostics

M/C tool control

The primary function of the CNC system is control of the m/c tool. It involves conversion of the part program instructions into m/c tool motions through the computer interface and servosystem.

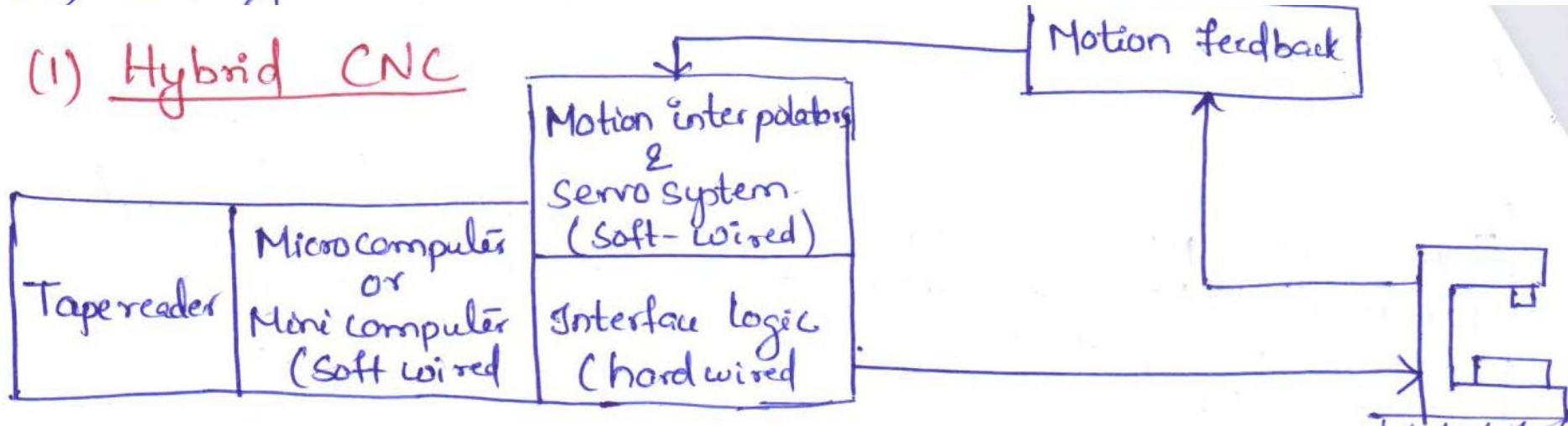
Main advantage of CNC:- to conveniently incorporate a variety of control features into the soft-wired controller unit.

Some of the control functions (such as circular interpolation) can be done more efficiently with hard-wired circuits than with the computer.

This led to development of two alternative controller designs in CNC:

- (1) Hybrid CNC
- (2) Straight CNC

(1) Hybrid CNC



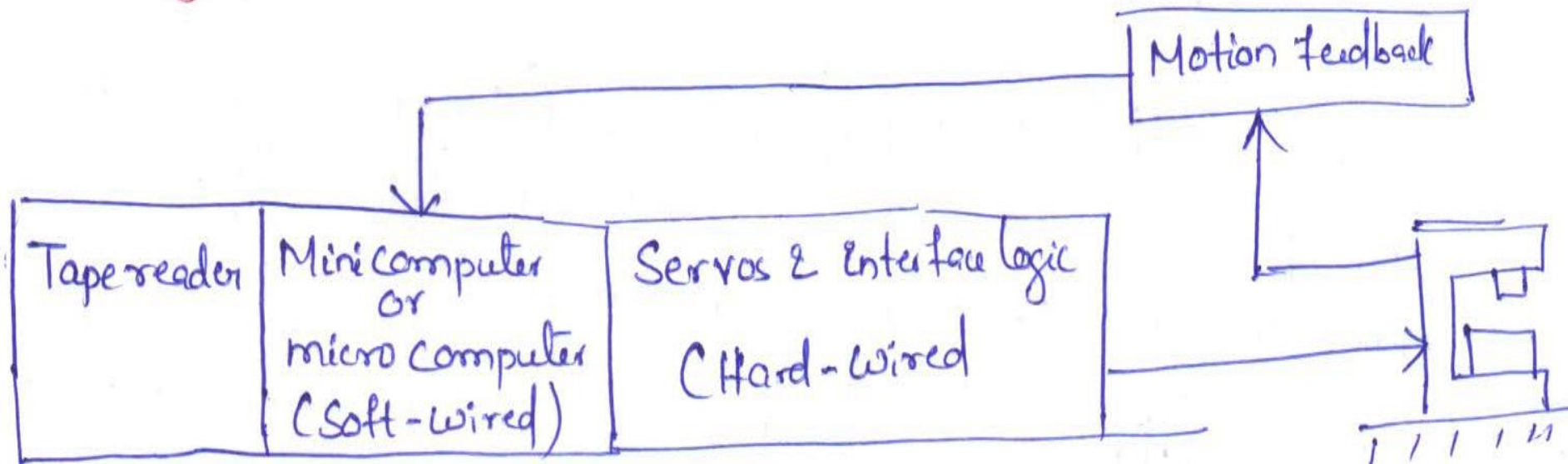
The controller consists of the soft-wired & hard-wired logic circuits.

The hard-wired components perform those functions, which they do best (feed rate generation, circular interpolation).

The computer performs the remaining control functions and other duties, not normally associated with a conventional hard-wired controller.

Certain NC functions can be performed more efficiently with the hard-wired circuits. Therefore, the circuits that perform these functions can be produced in large quantities at relatively low cost. Hence, a less expensive computer is required in the hybrid CNC controller.

Straight CNC :-



- The Straight-CNC System uses a Computer to perform all the NC functions.

The only hard-wired elements are those required to interface the computer with the m/c tool & operator's Console.

Interpolation, tool position feedback and all other functions are performed by computer software.

- The advantage gained in Straight-CNC is additional flexibility:

IN PROCESS compensation-

- A funⁿ closely related to m/c tool control is in-process compensation.

Ex. - Adaptive control adjustments to speed/feed.
- Adjustment for errors sensed by in-process inspection probes & gauges.