Program of instructions :-

- The program of instructions is the detailed step-by-step set of directions, which tells m/c tool what to do.
It is coded in numerical/symbolic form on some type of input medium (Punched cards, magnetic tape) that can be interpreted by the controller unit.
There are two other methods of input to the NC system

- The first is by manual entry of instructional data to the controller unit. This method is called manual data input, abbreviated MDI.
This is appropriate only for relatively simple jobs where the order will not be repeated.

- The second other method of input is by means of a direct link with a computer. This is called direct numerical control or DNC.
- The program of instructions is prepared by Part-programmer The programmer's job is to provide a set of detailed instructions by which the sequence of processing steps is to be performed. For the machining operation, the processing steps involve the relative movement betn the cutting tool & the W/P.

Product drawing → Part Program → Manuscript → Computer → Machine Control Unit → Machine tool → Final Product

Process layout

Software-

Part Programs-

Binary Code for NC m/cs-

-BIT:

-Character:

-Byte:

- A binary digit is called 'bit'. It has a value of 0 or 1

bit → Character → Word → block → Complete NC instruction

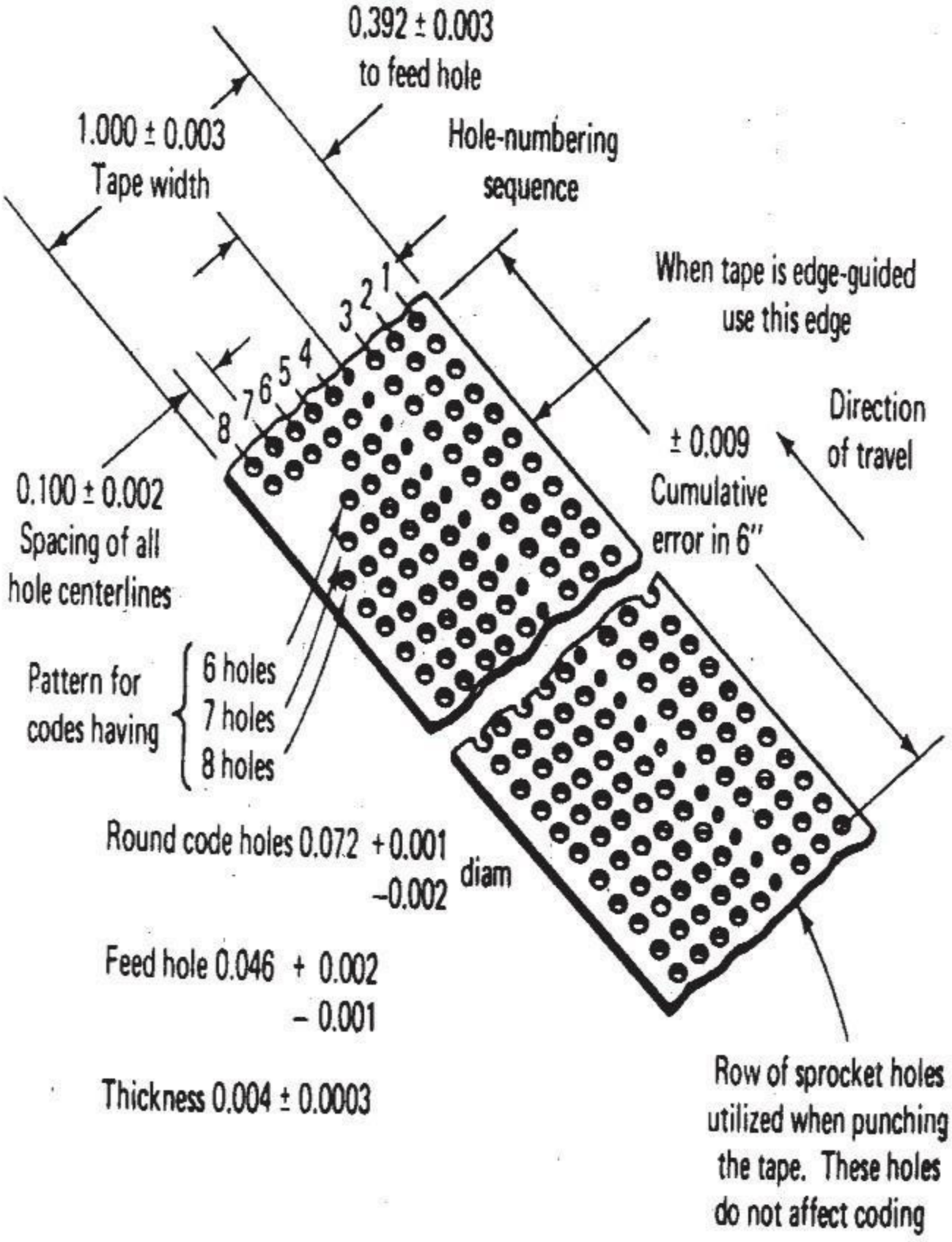
(Combination of bits)

Letter/No./Symbol

Punched Cards/Tape-

- -Paper tapes
- -Mylar tape
- -Foil tape
- -Magnetic tape
- -Floppy disk
- -CD/DVD/Pen drives

The information on a punch tape is recorded by using one of the mechanism- Simple hand punch, Tele typewriter and Flexo writer.


0.392 ± 0.003
to feed hole
1.000 ± 0.003
Tape width
Hole-numbering
sequence
When tape is edge-guided
use this edge
1
2
3
4
5
6
7
8
Direction
of travel
± 0.009
Cumulative
error in 6"
0.100 ± 0.002
Spacing of all
hole centerlines
Pattern for
codes having
6 holes
7 holes
8 holes
Round code holes 0.072 +0.001 −0.002 diam
Feed hole 0.046 + 0.002 − 0.001
Thickness 0.004 ± 0.0003
Row of sprocket holes
utilized when punching
the tape. These holes
do not affect coding

2 Controller unit, also called a machine control unit (MCU)

The second basic component of the NC system is the controller unit.
This consists of the electronics and hardware that read and interpret the program of instructions and convert it into mechanical actions of the machine tool. The typical elements of a conventional NC controller unit include the tape reader, a data buffer signal out-put channels to the machine tool, feedback channels from the machine tool, and the sequence controls to coordinate the overall operation of the foregoing elements.
The MCU may be of three types:

- -Housed MCU
- -Swing around MCU
- -Stand alone MCU

Sub Units of MCU- a typical MCU may consist of the following units:

- -Input/Reader unit
- -Data Buffeer
- -Processor
- -Output channels and actuators
- -Control Panel
- -Feedback channels and transducers