

## Sequence Block Q+A

## ➔ Answers to questions:

- When all unnecessary words have been removed, the program will take on this form:

```
(T01 - 3.0 DIA FACE MILL)
(X0Y0 - LOWER LEFT CORNER)
(Z0 - TOP FACE OF FINISHED PART)
(4 X 3 PLATE HORIZONTALLY)
N1 G20
N2 G17 G40 G80 T01
N3 M06
N4 G90 G54
N5 G00 X0.625 Y-1.75 S2000 M03
N6 G43 Z1.0 H01 M08
N7 G01 Z0 F12.0
N8 Y4.625 F18.0
N9 G00 X3.375
N10 G01 Y-1.75
N11 G00 Z1.0 M09
N12 G28 Z1.0 M05
N13 X-2.0 Y10.0
N14 M30
%
```

Just some extra notes - redundant words should be removed, but with care. For example, the G90 occurred first in block **N2**, before the tool change, then appears again in block **N4**, after the tool change. It is always safer to have G90 specified after a tool change, in case the tool has to be repeated, particularly when G91 is also used in the program. Also, a spindle speed should always be programmed together with the spindle rotation direction, and the result is apparent in block **N5** above. Finally, blocks **N4** and **N5** above should be combined.

- Program comments often reflect programmer's preferences. Here are some observations:

Comments should be clear, short, written in capital letters and always enclosed in parentheses. Also, they often use short forms such as DRL for **drill**, THRU for **through**, CHK for **check** or **chuck** (in different context), SPDL for **spindle**, DIA for **diameter** IN for **inch(es)**, etc. The four comments in the project could be:

- a/ (T07 - 4 IN. DIA FACE MILL)
- b/ (X0Y0 = CENTER OF RING)
- c/ (REVERSE PART)
- d/ (T02 - 0.5 IN. DIA SLOT DRILL)

- In the case **a**, the comment will show in the file directory of the control system, whereby in the case **b**, the comment will not be listed in the directory.

4. If the control accepts only 15 characters of the file name, the comment will be displayed as  
**(WATER JACKET OP)**  
 and the vital information informing the operator that it is the first operation will not be visible.
5. Conflicting words in a program are handled by the control differently, depending on the application:
  - a/ A system error occurs, as there is an axis conflict
  - b/ R-address will take priority, I and J vectors will be ignored (I-J-R order is irrelevant)
  - c/ R-address will take priority, I and J vectors will be ignored (R-I-J order is irrelevant)
  - d/ G00 will take priority, because it is specified after G01 - feedrate will only be stored for future
6. An M-function programmed with a motion takes effect pretty much in a logical and common sense way:
  - a/ Coolant will be turned off when the motion is completed
  - b/ Coolant will be turned on when the motion starts
  - c/ Spindle will stop when the motion is completed
  - d/ Spindle will start when the motion starts
7. Although some controls are more forgiving, always program these M-function in a block by themselves:
 

M00	Program stop
M01	Optional program stop
M30	Program end (also applies to M02)
M99	End of subprogram

Others may include M06, M19, and M60
8. **Program B** is a little shorter, but **Program A** is definitely a better choice, because it has a better structure.
9. Program block in increments of two would be - for example: N2, N4, N6, N8, ..., or N100, N102, N104, N106, ...
10. General settings, such as units of measuring and safety cancellations, are most suitable at the program start:
 

G20 / G21	English or metric units of measurement
G17	XY plane selected as the main working plane
G40, G80	Cancellation of any radius offset or fixed cycle
G49	Tool length offset cancellation (usually not required)

... also, cancellation of any optional feature, such as polar coordinates, scaling, rotation, etc., should be listed. Some programmers also start a program with G54, G90 and G00 commands. These commands are also used at the beginning of the program, but should always be applied after a tool change. However, they do qualify as those used at the program start.