2. When the codes shown below are output from the NC unit for punch-out or other purposes, the upper code (UC) or lower code (LC) is output immediately before.

a. Codes preceded by UC ··· #, +, $, ?.

b. Code preceded by LC ··· @.

c. Codes preceded by UC only at parameter designation ... (,), *, =.

2.11.10 ALARM NUMBER OF USER MACROS

Shown below are the user-macro-associated alarms and their causes.

105 MACRO ERROR (CONSTANT)

The number of constants is in excess of the specified range.

106 MACRO ERROR

There are too many G67 cancel codes.

107 MACRO ERROR (FORMAT)

A format other than expression has an error.

108 MACRO ERROR (UNDEFIN #NO)

The value not defined as a variable number is designated.

109 MACRO ERROR (#NO NOT LEFT)

The variable of assignment statement is the one that is disabled for assignment.

110 MACRO ERROR ([ ] 5 LIMIT)

The bracket nesting level is in excess of the upper limit (5).

111 MACRO ERROR (MOVE G66 - M99)

A move command is specified in the macro end command M99 called by G66.

112 MACRO ERROR (5)

The macro call nesting level is in excess of the upper limit (4).

113 ——

114 MACRO ERROR (DO FORMAT)

DO and END are not paired.

115 MACRO ERROR ([ ] UNMATCH)

The format of 〈expression〉 has an error.

116 MACRO ERROR (DO - END NO.)

DO m is not in the range of $1 \leq m \leq 3$.

117 ——

118 MACRO ERROR (GO TO N)

GO TO n is not in the range of $0 \leq n \leq 9999$.

2.11.11 EXERCISES OF USER MACRO

(1) Canned-Cycle G82

T (Teacher): We have discussed many complicated rules you have to understand to write user macros. Now, let's create some user macros as exercises. Let's take G82 Spot Facing Cycle of canned cycles for example, because it is a simple operation.

S (Student): Where shall we start?

T: An example of usual G82 command takes the following format:

(P1)

```
G91 ; (··· Incremental Designation)
G82 X100. Y50. R-80. Z-40. P3.0 F250 ;
```

This command is divided into the following and executed within the NC unit:

```
    G91 ;
① G00 X100. Y50 ;
② G00 X-80. ;
③ G01 Z-40 F250 ;
④G04 P3. ; (Dwell)
⑤G00 Z-((-80) + (-40)) ;
```