L.G. Evans
Zeman Technologies

The Finest Machine Tools
IL - (630) 321-1500
WI - (262) 789-1600

integra
Zeman Technologies

Did You Know?
"Last Part Program" on Citizen Lathes

Citizen lathes are designed to machine the front and back halves of complex parts simultaneously. **Last Part Program** allows the operator to stop the running of a continuous cycle and finish the back half of the last part, without starting another part on the front spindle. Benefit: Gain an extra part!

An Example of Implementation on the L20:

15.11 Executing the Last Program (G999)

This command must be specified in the last portion (end process) of each axis control group ($1, $2) program that includes the last program.

In general, the last program is executed to perform back machining for workpieces with which front machining is completed. The back machining is performed in the last cycle while the machine is in the stopped state (e.g., 1-cycle stop or product counting by the counter).

Specify the G999 command for each axis control group to automatically enter the axis control groups in the queuing state. The last program between G999 and N999 is executed in the 1-cycle or 1-block operation mode.

Be sure to specify the N999 command at the end of the last program contents of each axis control group. To finish program creation, specify three commands following N999 at the end of the end process. The commands must be specified in the sequence of M02, M99 and then %.

■ Command format

G999   Last program execution

■ Axis control group

Specify this command for both the axis control groups $1 and $2.

Below, G999 (TOP LEFT) is the start of our **Last Part Program** , concluding with N999, M2 and M99. Observe the highlighted use of Sub-Programs in the

```
G999 (LAST PART PROGRAM)          T0900          |
M52                               T09            |
M88                               T0             |
M98 H32(DRILL SUB)                T1000          |
M98 H34(BORE SUB)                 T10            |
M98 H33(TAP SUB)                  T0             |
M89                               T0200          |
M53                               T02            |
N999                              T0             |
                                  T0300          |
M2(ONE CYCLE STOP)                T03            |
M99                               T0             |
                                  T0100          |
(BACK SIDE SUB-PROGRAMS)          G650           |G650
N32(.3346" / 8.5MM DRILL)         T0100          | T3000
(.0606" TIP)                      T01            |
T3200                             G600           |G600
G97 M23 S2=1711(SFM-150)          T0             |
/ M B3                            G999(LAST PART PRO |G999 (LAST PART PR
G0 X0.0 Z-.050 T32                               |(S) T3200
G99 G44                                          |(S) T32
G1 Z.3346 F.0026                                 |(S) T0
G1 W-.030                                        |(S) T3400
G1 Z.617+.050+.0606                              |(S) T34
                                                 |(S) T0
<                                                |(S) T3300
Line=46/132 Pos=441/1719 Sel=26                  |(S) T33
                                                 |(S) T0
                                  M2(ONE CYCLE STOP) |M2(ONE CYCLE STOP)
```

Two ways the machine "reads" the code between G999 and N999:

- Auto Mode >> One Cycle & Last PRT soft key activated (highlighted below). Back Side will "air cut" the first part and machine the back side without starting another part.

- Auto Mode >> Continuous Operation, Machine Parts Counter & Last PRT soft key activated. Machine will execute Last Part Program upon hitting the value entered into the Parts Counter.

Automatic operation screen

| Automatic Operation | | | 0 | 1232 | Comment | NORTH |

$1 WRK COORD	Dis to Go		$2 WRK COORD	Dis to Go		$3 WRK COORD	Dis to Go
X1	-32.000	0.000	X2	0.000	0.000	X3	0.000	0.000
Z1	0.000	0.000	Z2	4.000	0.000	Z3	0.000	0.000
Y1	33.000	0.000	Y2	0.000	0.000	Y3	0.000	0.000
C1	0.000	0.000						
B1	90.000	0.000						B.SKIP

S1	0	(0)	S4	0	(0)	G.Pt:	T 11	0	1 2 3
S2	0	(0)				Trt:	T 29	0	4 5 6
S3	0	(0)				Back:	T 31	0	7 8 9

$1(Y1,Z1,X1,C1,B1) $2(X2,Z2,Y2) $3(X3,Z3,Y3)

```
G635 ;              G635 ;              G635 ;
G9999 ;             ;                   G4 U30.0 ;
G4 U50.0 ;          T2200 ;             G99 ;
G50 Z14.0 ;         M32 Z35.0 ;         G4 ;
G9999 ;             G4 ;                ;
G4 U2.0 ;           ;                   /2 GOTO1 ;
```

Result [   ] Flow Dtct | Inval

| MEM | 1 RDY | 2 RDY | 3 RDY | | | OVR 100% |

Op.Stop POS Data Set SW MC-Data Message   T-PATT offset Counter

Skip1 B/L SPRT   Cont. 1 Cycle 1 Block Last PRT   Menu SEL

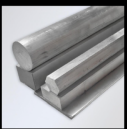## For questions, check your Machine Manual or give us a call!

Miss our Last Tech Tips? Click Below!

The Finest Machine Tools
L.G. Evans
IL - (630) 321-1500
WI - (262) 789-1600
Zeman Technologies
integra Zeman Technologies

Did You Know?
Skip the Milling, Run Non-Conformed Stock!

Sometimes it makes sense to run hex or other stock rather than milling to shape. To set up the machine, use a round bar loader collet to fit over points of the stock. In Spindle 1, use a chucking sleeve with a pin to hold the collet in place as a new bar is loaded. To teach the machine rotational relationships, you will now perform phase adjustment.

You can adjust phase between the following on your Citizen:
- Main spindle and guide bushing
- Main spindle and back spindle
- Main spindle, guide bushing, and back spindle

In the phase adjustment menu, there are three (3) selections located on the right. Enter the desired number in the Operation Select field, close all doors, and press the menu key [Phase Adj] and Start Key simultaneously. A phase adjustment confirmation message will appear.

The Finest Machine Tools
L.G. Evans
IL - (630) 321-1500
WI - (262) 789-1600
Zeman Technologies
integra Zeman Technologies

Did You Know?
Cincom Low Frequency Vibration-Cutting

What is LFV?

Chip Control: Servo-controlled axes oscillate in the axial direction, and machining is carried out while synchronizing this vibration with spindle rotation. The air cutting time created during machining leads to intermittent chip removal.

LFV-Produced Chips: Two 14.3 gram samples of 304 Stainless, which would you prefer?

View our Webinar on Low Frequency Vibration Here

NYLON

Website   Products   News   Support   Contact Us