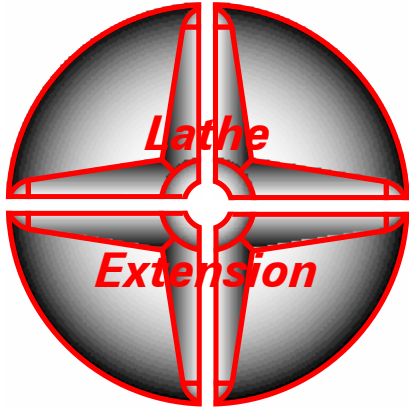
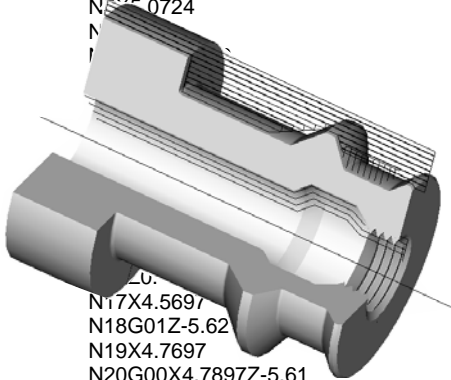


# NC Polaris



*The Knowledge Base of the NC Polaris Lathe Extension simplifies and automates the tooling process for turning applications. Powerful features in the Lathe Extension provide support for dual chucks and turrets, bar feeders, and more, including full collision avoidance. The entire part program is prepared graphically inside AutoCAD®.*

```
%  
O1234  
(NC POLARIS LATHE EXTENSION)  
(USE T3 ALUMINUM)  
N1G50X0.27767998Z-0.19140324  
N2G97S3000M03  
N3T011 (Horz. Right Rough Tool - 60 deg.)  
N4G00X5.0826Z.1977  
N5Z5.0724  
M
```



```
N6Z0.  
N17X4.5697  
N18G01Z-5.62  
N19X4.7697  
N20G00X4.7897Z-5.61  
N21Z0.  
N22X4.3697  
N23G01Z-4.06  
N24X4.52  
N25Z-5.62  
N26X4.5697
```

## THE PROBLEM

Manufacturers of CNC lathe controllers generally provide canned macros to support routine turning activities. By design, these canned macros are limited to producing cutting motions for simple parts that progressively increase in diameter. Complex part shapes will all too often present you with time consuming geometry descriptions that are prone to human error. If you are fortunate enough, the controller manual will contain illustrations accompanied by the statement "This portion is impossible to process." If you are not so fortunate, you may end up with a part program that either does not run or causes a tool crash.

## THE SOLUTION

The Knowledge Base of the NC Polaris Lathe Extension is designed to solve programming problems for turning complex parts. When using the Lathe Extension, the only time you will

ever see a message indicating "Tool Too Large" is when the selected tool will not fit in a back cut or groove area. The collision avoidance Decision Module in the Lathe Extension Knowledge Base constantly monitors tool characteristics to insure proper part machining.

Whether you are turning a casting or bar stock, you always have the right cutting cycles available.

The Lathe Extension provides full support of all threading canned cycles using constant depth or constant volume material removal calculations.

Powerful parametric controls in the Lathe Extension Knowledge Base can automatically accommodate imaginary tool point, tool tip centerline or full offset programming. The system adapts to your manufacturing methods effortlessly.

# Manufacturing Reality

## Lathe Application Knowledge

The Lathe Extension provides additional turning operations for the NC Polaris system that are specifically designed for turning applications. Tooling parameters for multiple turret configurations in the Lathe Extension provide tool and process management. The Lathe Extension provides specialized cutting procedures that effect the correct methods for tooling your parts. A collection of Lathe Decision Modules (tasks) is available with the Lathe Extension.

### Standard turning cycles include:

- Finishing
- Roughing
- Facing
- Grooving
- Parting
- Drilling
- Threading

All of these standard turning cycles can be performed on complex geometry with features such as backside collision avoidance, tool width compensation, automatic undercut, and multiple stand-offs. These features insure high quality cutting motion development to meet the highest standards of part programming.

Standard tool handling support includes user-defined tool parametrics, tool emulation, turret loading, and tool configuration management. In addition, the Lathe Extension has all the specialized features of NC Polaris which include graphic editing, development of special processes for later recall, and a complete database to store and recall knowledge.

Optional features include subroutine development, extended macro support, and specialized functions for combination milling and turning operations. Additional programs can be developed using the open architecture of NC Polaris and the Lathe Decision Modules provided in the Lathe Extension.

### Tool Collision Avoidance

The Lathe Extension has the knowledge to determine the operations that a tool can perform given a complex geometry requirement. When a tool cannot complete an undercut condition, new geometry is developed that can be handled by other tools. This Tool Collision Avoidance feature constantly monitors all activities. The full characteristics of a tool are considered in all turning operations. This feature eliminates the need for user drawing of construction lines to guide toolpath.

## Roughing

An unlimited number of methods are provided for the removal of stock material. Castings are easily handled by the use of multiple offset roughing. The cut paths follow the form of the part to the outside of the casting. Linear roughing is standard with features that control the depth of cut, pull-out angle and clearance distance. The user simply identifies the stock material to establish cycle start position and the contour to be roughed. The automatic roughing process is completed in seconds.

## Finishing

Multiple stand-off passes with controlled feeds and speeds are standard functions of a finishing cycle. Finishing cycles with specialized tools provide multiple step operations. Specialized entry and exit methods are simply selected from a library. The open architecture of the finishing cycles provides easy control over all aspects of a cut.

## Grooving

Face spiral grooving, standard grooves, tapered sides grooves, and multiple depth grooves are all handled by the standard grooving cycle. Tool Collision checks to insure that a groove tool can fit inside the groove geometry. For grooves wider than the tool, multiple passes are automatically produced to complete the groove requirements.

## Drilling

A drilling operation simply requires the selection of a tool and the hole geometry. The tool characteristics govern the depth, peck and clearance locations. Both on-center and off-center drilling are provided.

## Threading

Thread cycles support Constant Pitch, Variable Pitch, Variable Lead, Constant Volume, Machine Thread Macros and specialized threading requirements.

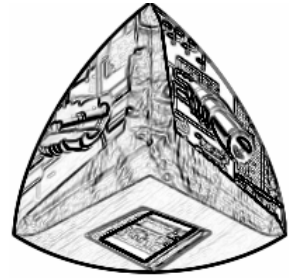
## Parting and Material Feed

A complete selection of cycles for handling parting and bar feeding is standard with the Lathe Extension.

## More-More-More

The NC Polaris Lathe Extension contains features beyond those mentioned here. Contact your local NC Polaris dealer for a demonstration.

## Lathe



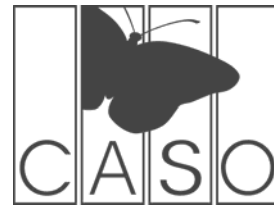
## Extension

OP	OP NO	OPERATION	TOOL
1	1	TURN "X"	T433-2-2 MAG. 320 30.000
2	2	GROOVE "F"	T433-2-1 MAG. 320 30.000
3	3	TUNEAD "C"	T433-2-4 MAG. 320 30.000
4	4	DRILL "D"	18.00" RFL 30.00" DRILL
5	5	DRILL "F"	T433-2-3 47.84" DRILL
6	6	DRILL "F"	T433-2-3 47.84" DRILL
7	7	BORE "F"	108-25102 108.00" DIA 30.00" ANS
8	8	RECESS "F"	108-25102 108.00" DIA 30.00" ANS
9	9	TAP "T"	T433-2-1 7.50-14 30.00" DIA
10	10	DRILL "D"	T433-2-5 30.00" DRILL

WARNER & SWASEY
T433-1A-7
2.00" DIA
COLLET PADS
CAMDEMO

Combined CAD and CAM offers opportunities for comprehensive shop floor documentation.

### For More Information:



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