

Topic Sheet on  
Tool-Tracking with CPC/NT  
Copyright © 2001, ASC Process Systems, Inc.  
Revised: 5/1/01

## Tool Tracking with CPC-NT

This topic sheet discusses the Tool Tracking capabilities of CPC/NT. This topic sheet is a supplement to the CPC/NT Operations Manual provided for users who wish to take full advantage of the specialized tool tracking features that come standard with CPC/NT.

### What does tool tracking provide?

Tool Tracking is a feature of CPC/NT which can provide the following functionality and post-run analysis:

- Provide a tool database for quick selection of common tools during batch/part entry.
- Provide tool analysis (via SPC reporting), including tool reports, frequency of use, etc.
- Provide the automatic capability of tool usage tracking and warning to the operator on tools that require maintenance.

### Part Database basics

The CPC/NT PartDatabase is an Access-style database with two tables, Parts and Tools. The Parts table includes a list of standard parts that may be selected for a run during Batch Entry operations. The Tools table includes a list of tools that may be selected and used during Batch Entry operations.

#### Building the Parts and Tools tables

You can build (define fields) the tables in the PartDatabase by clicking the “Setup Part Database” button on the Support screen of the software. The Database Management Screen will be displayed. See below...

The screenshot displays the 'Database Management System' window. At the top, there are four buttons: 'Build Parts Table', 'Build Tools Table', 'Edit Parts Table', and 'Edit Tools Table'. Below these is a section for 'Template Configurations' with a descriptive paragraph. The main area contains a table titled 'Part Fields in Template' with columns for Name, Entry Type, and Field Name in Parts Table (DataSource). The 'Standard' template is selected, showing fields like Part#, SerialNumber, ToolNumber, PartName, Comment, and Picture. To the right of the table are buttons for 'Add Template', 'Edit Template', 'Delete Template', and a group of buttons for 'Add Field', 'Edit Field', and 'Delete Field'.

Database Configurations

Build Parts Table Build Tools Table Edit Parts Table Edit Tools Table

Template Configurations

A Part Template defines the specific database fields which will be displayed to the operator during Batch entry. There are three template field types: Text (normal entry), Memo (read/only displayed in tab form), and Picture fields (displayed at the upper-right of the batch screen). Multiple templates may be used in applications which require different field entrys for different types of parts (ie. different projects).

Templates	Part Fields in Template		
	Name	Entry Type	Field Name in Parts Table (DataSource)
Standard	Part#	Text	PartNumber
	SerialNumber	Text	SerialNumber
	ToolNumber	Text	ToolNumber
	PartName	Text	PartName
	Comment	Text	Comment
	Picture	Picture	Picture

Add Template  
Edit Template  
Delete Template  
Add Field  
Edit Field  
Delete Field

ClientPC: MASONLAPTOP | ServerPC: MASONLAPTOP | User: AI Back

Build Parts Table

Click the "Build Parts Table" to access the Parts table builder. This screen lets you add fields to the Parts table in the Part database.

Build Tools Table

Click the "Build Tools Table" to access the Tools table builder. This screen lets you add fields to the Tools table within the Part Database.

Edit Parts Table

Click the "Edit Parts Table" button to access the database editing screen for the Parts table. This is the screen that you can use to add new part records to the table.

Edit Tools Table

Click the "Edit Tools Table" to access the database editing screen for the Tools table. This is the screen that you can use to add new tool records to the table.

## What fields are included in the Tools table?

The Tools table has a few required fields that are automatically created in the PartDatabase during the first automatic run. The table must also include at least one field that is manually created (Build Tools Table) and describes the tool – this field will be used for tool selection (ie. ToolNumber):

Name	Type	Size
RecordID	Long	4
TotalCycles	Long	4
CycleRemaining	Long	4
ToolSerialNumber	Text	50
ToolDescription	Text	50

### RecordID (required)

This field is a number which indicates an ID for the record. This is automatically created by the system and is usually incremental. Don't change this fieldname or number.

### TotalCycles (required)

This field indicates the total number of cycles that the tool has been run. It is automatically incremented by the system each run (when the tool is assigned to a part). You can manually change this number if required.

### CycleRemaining (required)

This field indicates the number of cycles remaining before maintenance is due. This number is manually reset (Edit Tools Table) to the specific maximum usage cycle (ie. 30) whenever a tool returns from periodic maintenance activities. The system will automatically decrement this number at the start of the run (when the tool is assigned to a part).

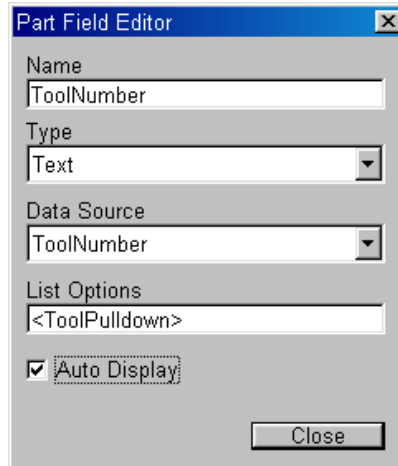
### ToolNumber (or equivalent)

A text field must be created which will be used as the ToolSelectionField. This field can be named anything (ie. Tool, ToolNumber, ToolSN, etc.).

## How do I add the tool field to my Batch\Part entry form?

If a Tool field has been added to the Parts table (Build Parts Table), you can add that field to the part entry template (used during Batch/Part entry operations) by adding it to the main part template.

On the Database Management System screen, click the **Add Field** button to add a new field, and then double-click the new field to access the Part Field Editor form.



The screenshot shows a dialog box titled "Part Field Editor" with a close button in the top right corner. The dialog contains the following fields and options:

- Name:** A text input field containing "ToolNumber".
- Type:** A dropdown menu with "Text" selected.
- Data Source:** A dropdown menu with "ToolNumber" selected.
- List Options:** A text input field containing "<ToolPulldown>".
- Auto Display:** A checked checkbox.
- Close:** A button at the bottom right.

### Name

Enter the name of the tool field in the database (i.e. ToolNumber)

### Type

Select the **Text** entry.

### Data Source

Click and select the field in the database (ie. ToolNumber).

### List Options

This entry defines whether the selection will be a pull-down listing. Leave this blank or enter **<ToolPulldown>** to identify a specific field to be used for the source of the tool field's pull-down listing (see later in this chapter.)

### Auto Display

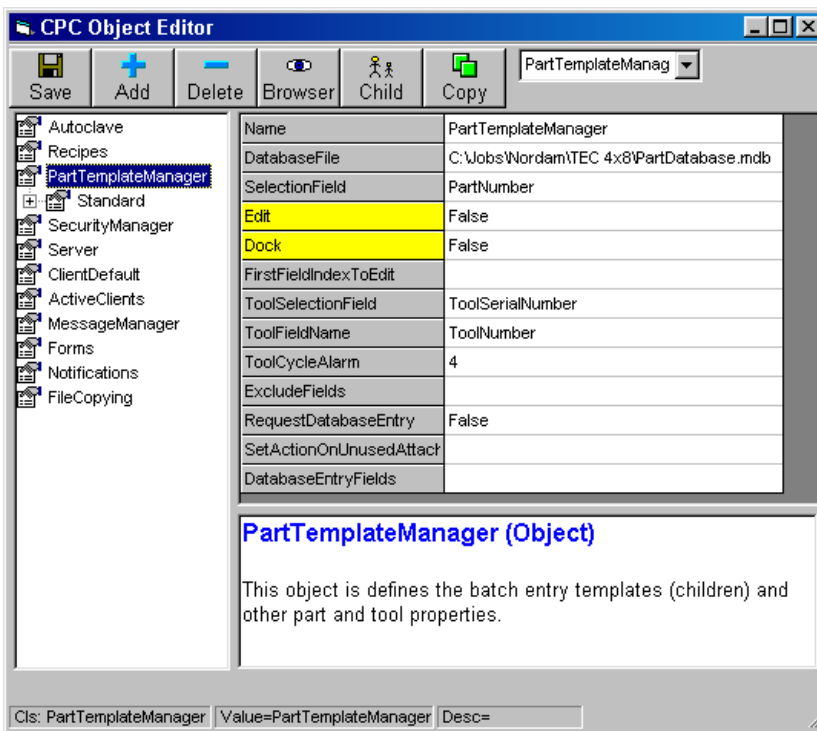
Select this option box.

## How is the part linked to the tool?

When an operator enters a part, a field is provided which allows him to select the tool for that part. This part database field can be named anything (ie. ToolNumber), but must be identified to the system as a tool field by pre-configuring the **ToolFieldName** property of the PartTemplateManager object (ObjectEditor).

This tool entry in the part is then compared to an similar field in the Tools database to identify a match. The field in the Tools database is not required to be named the same thing as the part field, but it is strongly recommended for clarity. The field name in the Tools database must be identified by pre-configuring the **ToolSelectionField** property in the PartTemplateManager object (ObjectEditor).

The object editor below shows how the ToolSelectionField (Tools table) can be different than the ToolFieldName (Parts table):



## What tooling information is created in the RunDatabase?

The RunDatabase is a historical run database of all parts, recipes, runs, etc. that have been processed through the system (or systems). The RunDatabase is appended to at the beginning, during, and at the end of an automatic run.

At the start of the run, the system writes all relevant part information to the RunDatabase, and also writes an individual record for each tool identified in the Batch/Part Entry screen. The tool information is written to an independent **Tools** table in the RunDatabase. Unlike the Tools table in the PartDatabase, each time a tool is used, an independent Run Database tool record is created. This means that if a specific tool is used 20 times, then 20 records will be recorded in the Tools table of the Run Database; each record identifying the specific tool information, parent part (PartID field), and run identification (RunID field).

The information in the RunDatabase is the source of all SPC reporting functions (see Reporting). With this information you can query the database to gain useful information about tool usage, frequency of use, usage count, and other tool-related information.

## How does the system track tool cycles for maintenance?

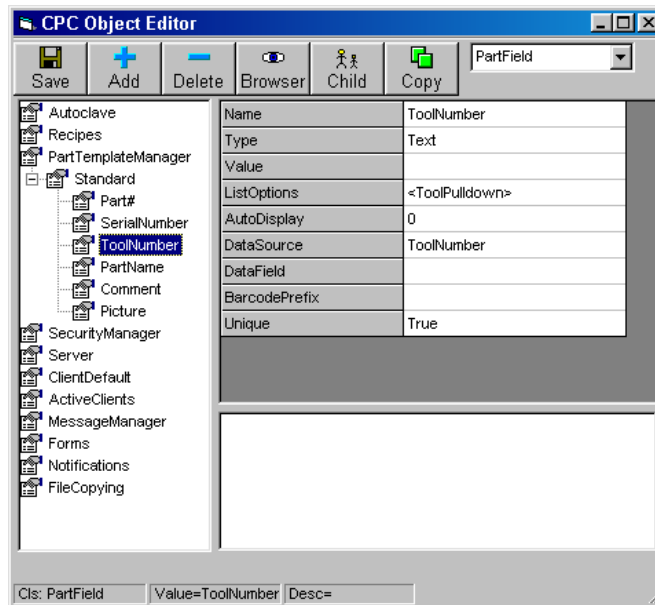
The system increments the TotalCycles field and decrements the CycleRemaining fields in the specific tool record each time that tool is used.

If the CycleRemaining number drops below a pre-configured ToolCycleAlarm limit (ie. 5), then the system will automatically alert the operator that the cycle life of the tool is approaching zero (0). This message is displayed immediately upon selection of the tool during part entry operations. When the cycle life drops to 0 (or below 0), then the system will issue a critical message instructing the operator that the life of the tool has expired. Note: *The system will still allow the operator to run the tool.*

The ToolCycleAlarm setting is configured in the PartTemplateManager object (see previous page).

## How does the system restrict duplicate tool entries during part entry?

The system may be configured to disallow duplicate tool numbers during part entry by setting the Unique property of the Tool's specific PartTemplateField. Once the template field is identified as Unique, the system will force a unique part number for each part. Note: The system will not check empty entries



## Configuring tool pull-downs for each part

Parts are normally categorized by PartNumber or PartModel or some other form a identification field. In a typical company a specific part or PartNumber can be associated with only a limited number of specific tools (one-to-many relationship).

Because of this relationship, it is useful on the Part Entry screen to have a Tool pull-down selection for the specific tools that can be associated with that specific part. This pull-down listing should change for each part entered.

### Create a part field to hold the pull-down listing

In order to configure individual pull-down listings for each part, you must first create a new field in the Parts table which will serve to contain a list of approved tools for that part. This field should be called "**ToolPulldown**" and it should be Text with enough characters (i.e. 100) to contain a comma-delimited list of tool numbers (ie. X1234,AGD123,AFG345,DGD393, etc.).

*Note: This new field should not be added to the Part Template – it will only be referenced as a pull-down source for the Tool field.*

### Tell the system to use this pulldown listing for the Tool entry

Now change **List Options** property of the "Tool" template field to "<ToolPulldown>". This will instruct the system to get its list options from the field called "ToolPulldown". See *the Object Editor display on the previous screen*.

### Don't save the list information to the RunDatabase

Finally, you want to instruct the system not to save the contents of the new ToolPulldown list to the Run Database at the beginning of the run. Enter "ToolPulldown" in the **ExcludeFields** property of the PartTemplateManager object.

