MaintScape Training Course

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Training Course Requirements

The exercises in this training course assume you are running MaintScape connected to a MaintScape sample database. This will be the case if you are running the MaintScape evaluation program. Note that the MaintScape evaluation program cannot be installed on the same computer as the MaintScape production program.

Rather than running the MaintScape evaluation program, you can contact GrandRavine Software for help in setting up your production database server to also run the sample database.

This training course is still useful if you are not connected to a MaintScape sample database, especially since it introduces many core concepts and MaintScape functions. However you will not see the data presented in the course, and if you do the exercises, will have to make up your own data.

Overview and Main Modules

The default user id for MaintScape is “dba”, the default password is “sql”.

The MaintScape main menu window is displayed when MaintScape is started:

Notes:

- An icon represents a MaintScape module or grouping of related functions.

- Click on an icon to display actions.

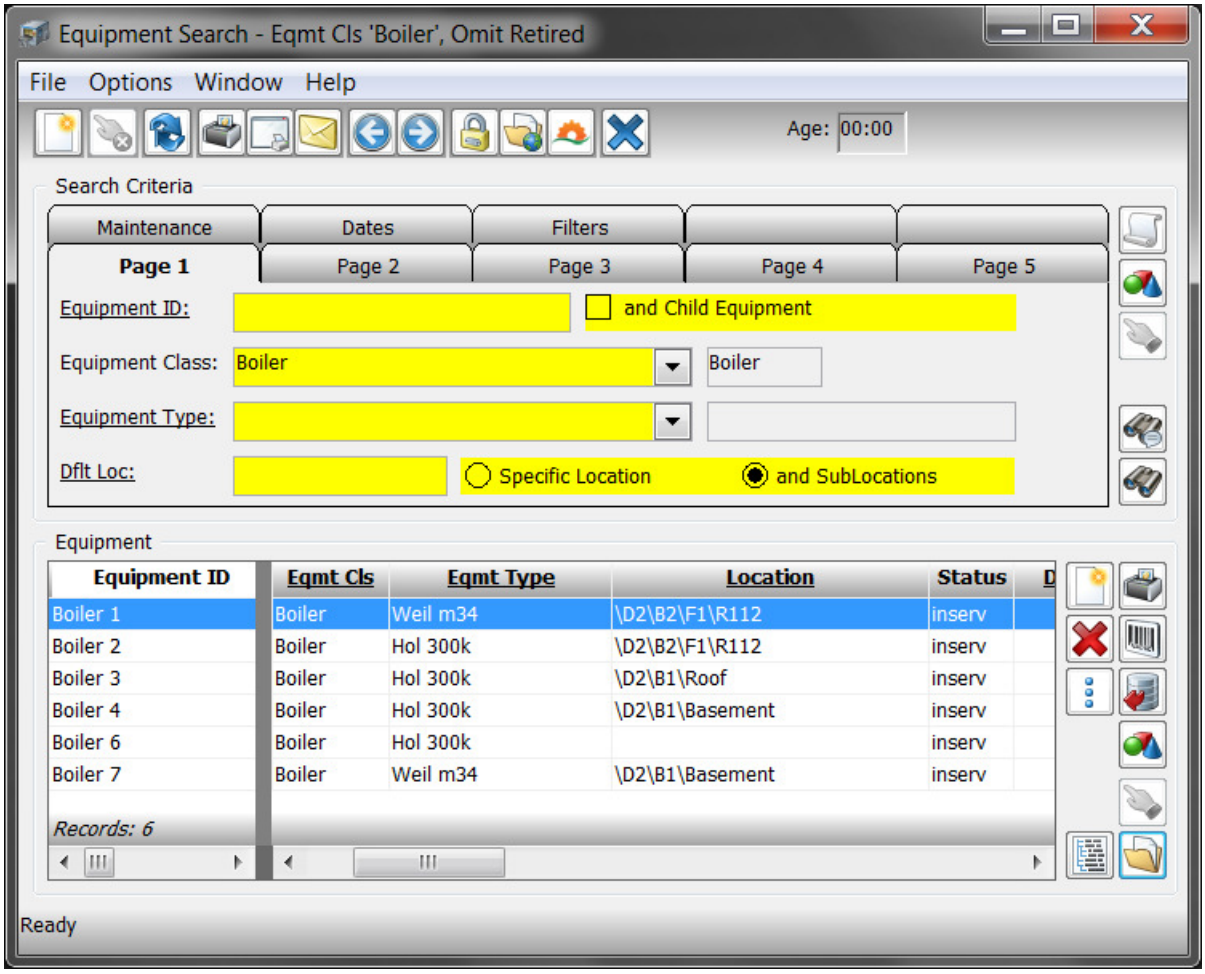
Exercises

1. Click on the various main menu icons. What are the common actions of icons representing "objects"?
2. What happens when you click an icon with label starting with "Go to …"?

   (Close any windows you have opened other than the main menu window when you are done.)

Search Window

Access the Equipment search window by clicking main menu icon "Equipment", then action "Search and Report…":



Notes:

1. To perform a search: specify search criteria at the top, click the (search) button, results will display at the bottom.

   The example above shows results of search for "equipment of class 'Boiler'". You can see this in the title bar of the window after performing the search. You can also see this by clicking the (query preview) button.

   Notice that pop-up help text displays when you hover your mouse pointer over a picture button.

Exercises:

1. Perform the Equipment search illustrated above.
2. View pop-up help text for all picture buttons in the toolbar and on the Equipment Search window.
3. Clear the search criteria field by clicking the  (new) toolbar button. This is equivalent to selecting menu bar action "File"/"New".

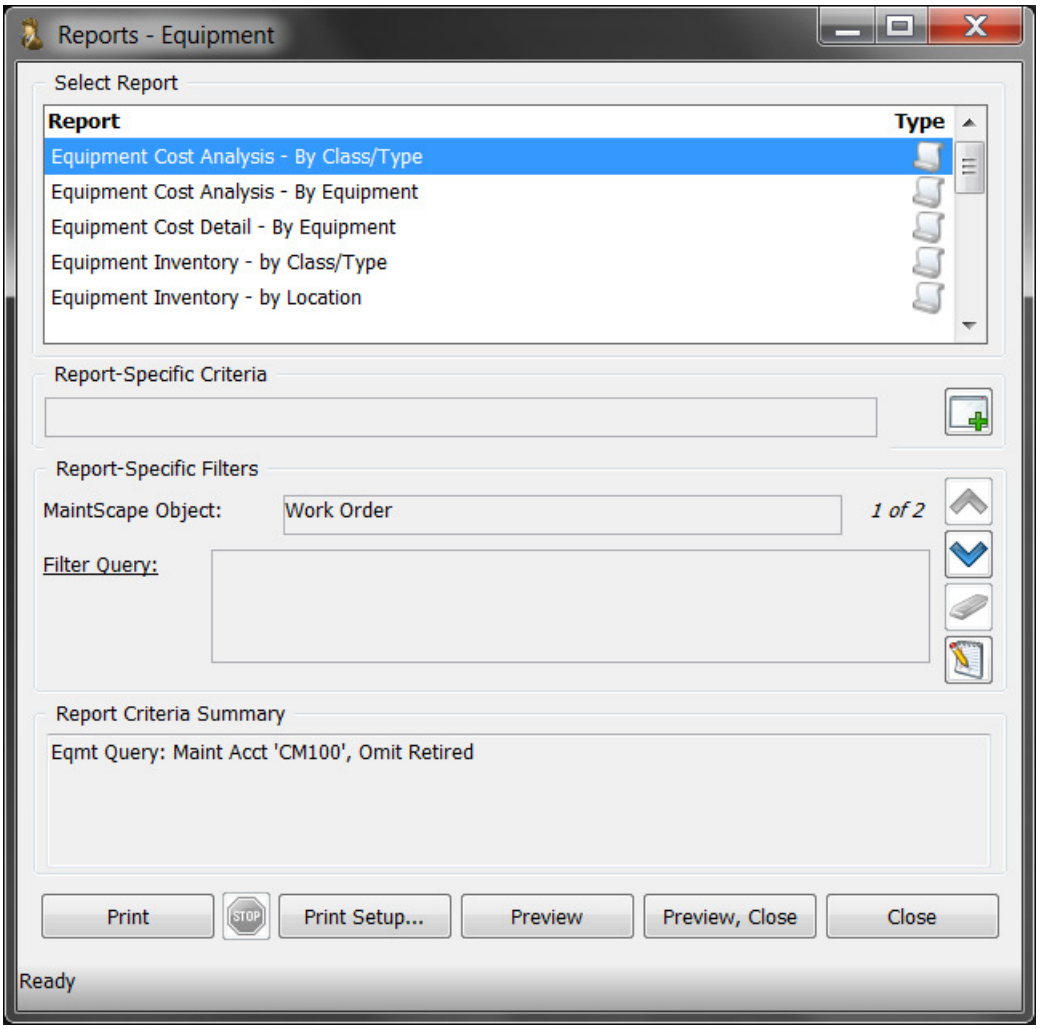
   Search for equipment of class "Chiller".
4. Clear the search criteria fields again, then flip to criteria tab page "Page 5". In the "Maintenance Account" criteria field, select "Calibration Plant 100". Perform the search.
5. Maximize the Equipment Search window to see more columns of the search results.
6. Click on the column labels in the search results to change the sort order.
7. If you are connected to a printer, click the  (print) toolbar button to print the search results sorted as you see the records on the window. This is equivalent to selecting menu bar action "File"/"Print".
8. Select two or three equipment records in the list using one of the standard Microsoft Windows conventions:
   - Click the first record, then hold down the <ctrl> key and click the other records.
   - Select all records in a range by clicking the first record, then hold down the <shift> key and click the last record.

   If you are connected to a printer, click the  (print) button beside the search results. This will create detail printouts for each selected record.

   KEY CONCEPT: MaintScape buttons operate on the data they are grouped with.

Reports are produced from the Search Window

Specify search criteria just like when performing a search. Click the (report) picture button in the "Search Criteria" group to produce a report from the search results. You will see the following report selection window:



Notes:

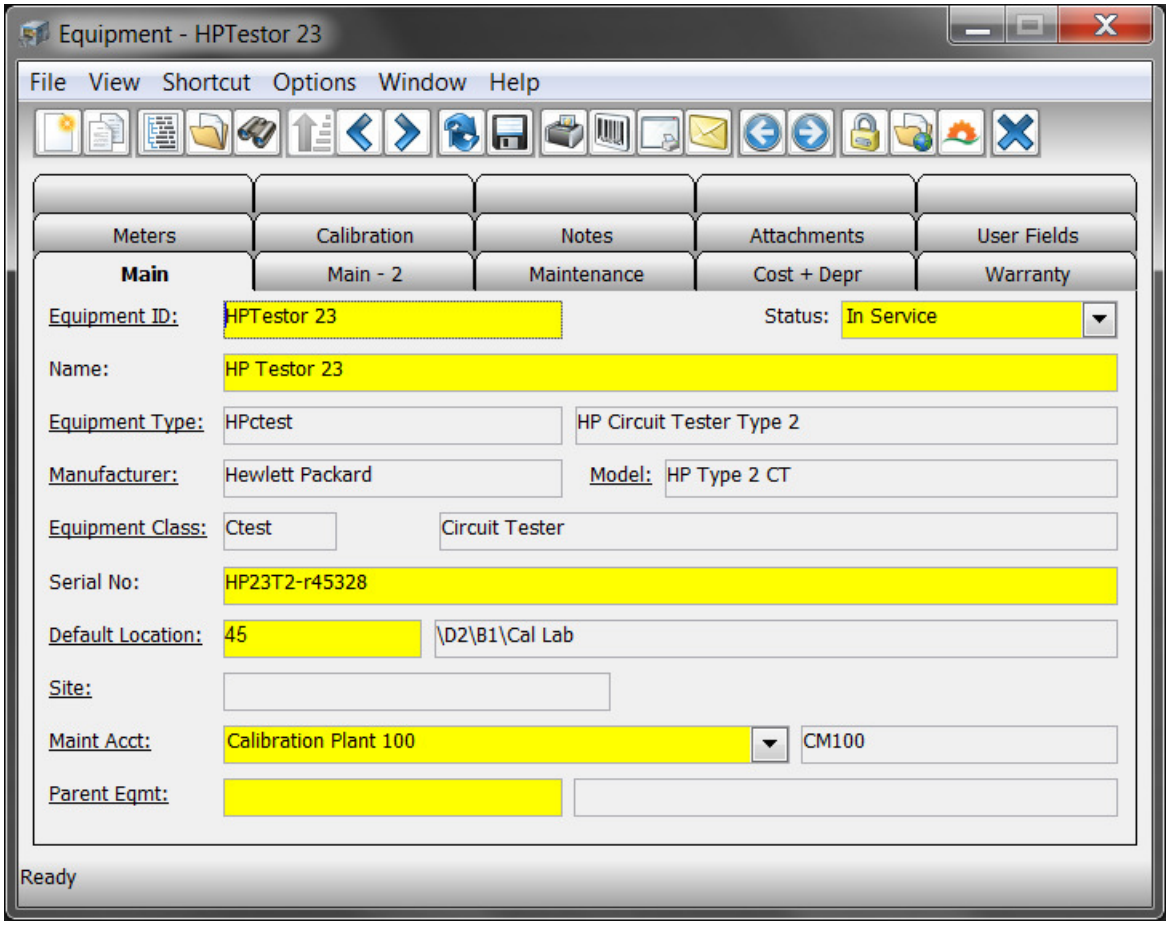
1. Built-in MaintScape reports are listed in the "Select Report" group.
2. Reports listed are Equipment reports since the "report" picture button was clicked from the Equipment search window.
3. Criteria field selections set in the search window are shown in the "Search Criteria" group and are used to filter records included in the report.
4. Send the report immediately to the printer by clicking the "Print" button.
5. View the report online by clicking the "Preview" button.
6. Picture button will be enabled if the selected report has report-specific criteria in addition to the search window's search criteria.

Exercises:

1. Preview each of the available reports.

Detail Window

Double-click any Equipment row displayed in the Equipment search window to display details of the Equipment in the Equipment detail window:



Notes:

1. The detail window displays everything about the MaintScape object – in this example, Equipment "HPTestor 23".

Exercises:

1. Flip through all the tab pages of the Equipment window to see all the properties of the equipment.
2. Click the ◄ and ► toolbar buttons to scroll the Equipment detail window through the Equipment records in the submerged Equipment Search window.

Basic MaintScape Navigation - 1

The following exercises require the Equipment detail window from the previous exercise still be visible (ask your instructor for help if this is not the case).

Exercises:

1. Right-mouse click on the "Equipment Type" field (not the label) and select pop-up action, "Open".

You should now see the “detail window” for the equipment’s “equipment type” record. The equipment type detail window behaves just like the equipment detail window.

Close the Equipment Type window. The submerged equipment window should become active again.

KEY CONCEPT: You can right-mouse-click on any field with an underlined label to see a pop-up menu of actions.

2. Click on menu bar item “Shortcut”, highlight menu item “Work Orders”, then select cascading menu item “All”.

   You should now see the “search window” for Work Orders. The search criteria has been pre-filled with the Equipment ID, and the search has been executed.

   The Work Order search window behaves just like the equipment search window.

3. Notice that the column headers for the Work Order list are underlined. This means you can right-mouse click on a data value in the column to get a pop-up menu of actions.

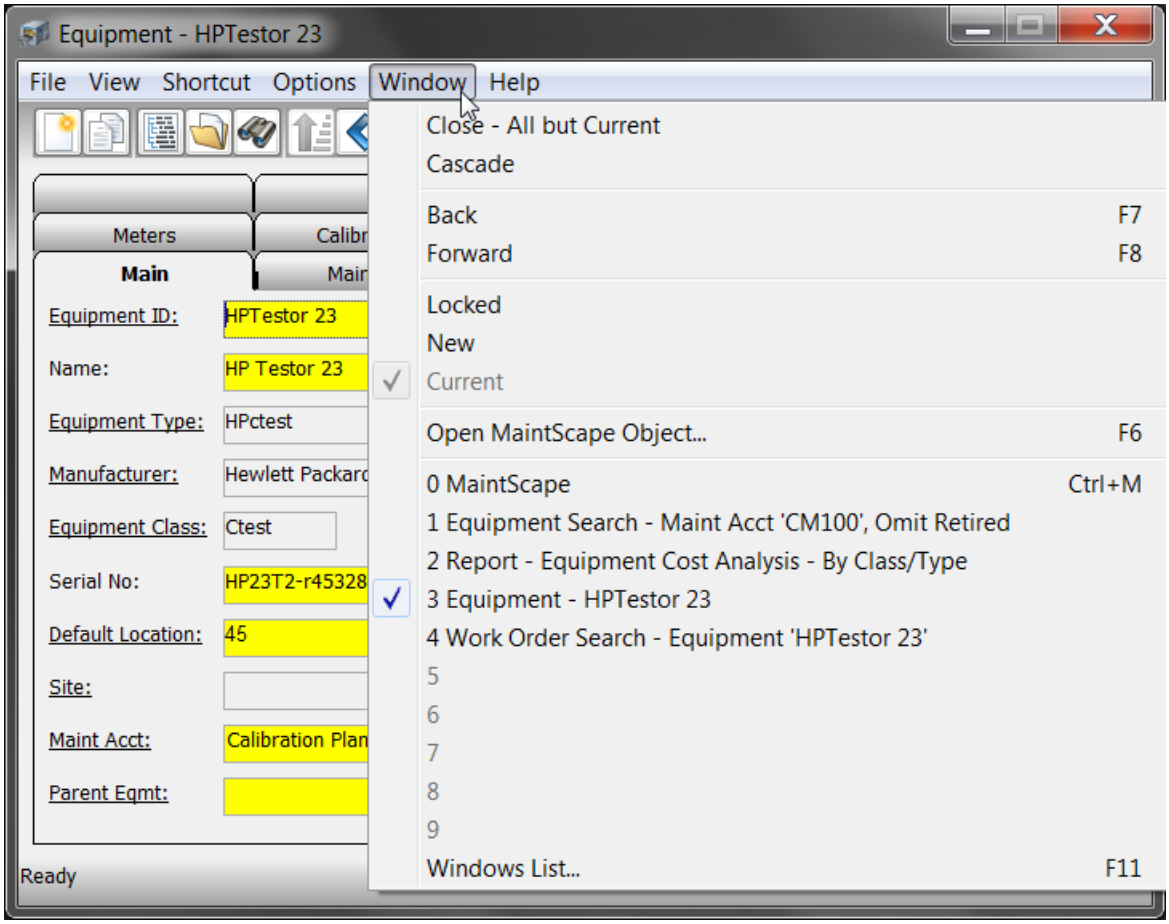
   Right-mouse click on an Equipment value under the “Maintain” column, then select action “Open Equipment”.

   You are now taken back to the Equipment detail window for the specified equipment. This happened very quickly because the window was already open and populated with the correct equipment.

   MaintScape can be very efficient when you have a number of windows open of the required type and you navigate between them in this way.

Basic MaintScape Navigation - 2

Click menu bar item “Window” menu bar item to display the following options:



Notes:

1. Flip between the open MaintScape windows by selecting windows numbered 0 through 9.

   Window “0” is always the MaintScape main menu window. You can also navigate to the main menu window by clicking the toolbar button.

   KEY CONCEPT: Menu bar items are shortcuts for actions available within the menu bar.

2. “Close – All but current” is useful when you have too many MaintScape windows open.

   You can have more control by selecting item “Windows List…” which displays all open MaintScape windows and lets you select one or more to close.

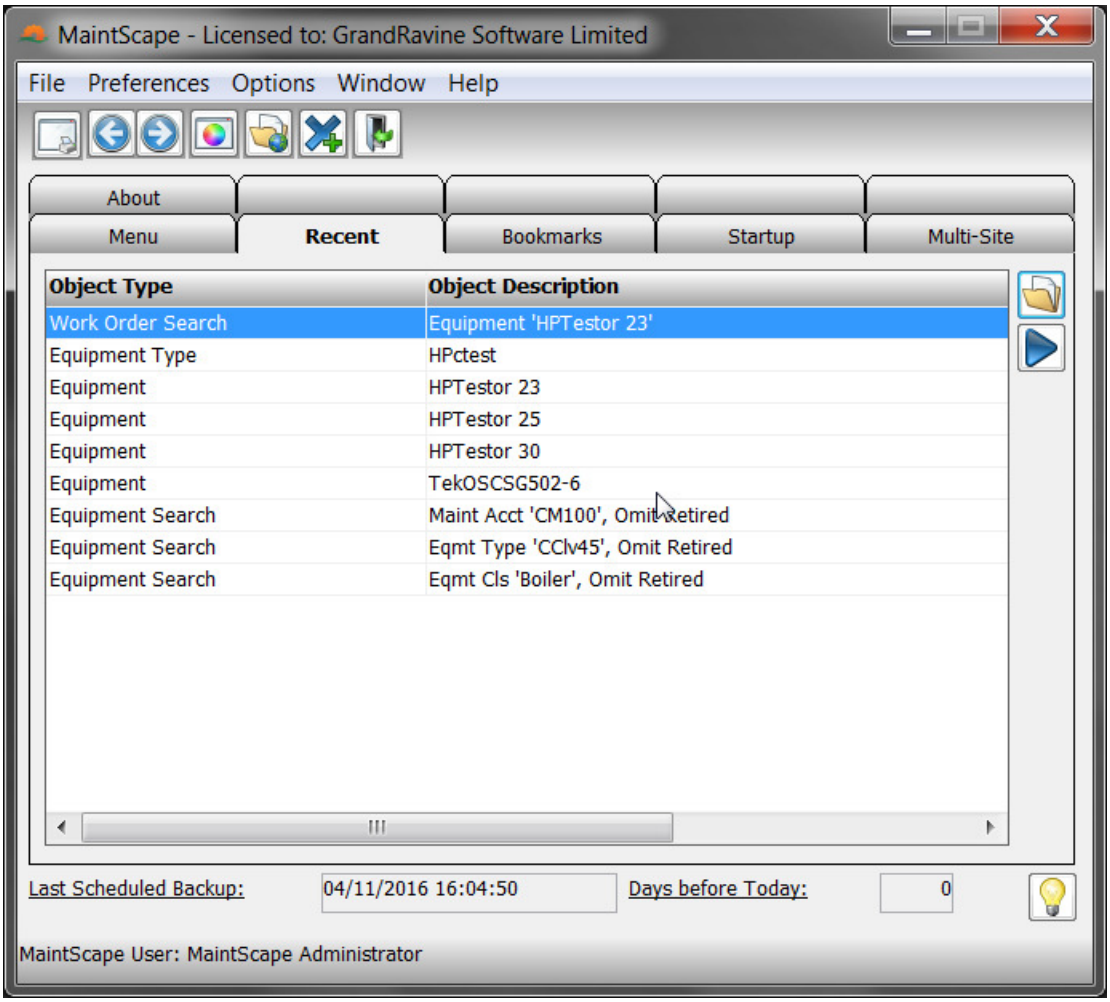
3. Items “Locked”, “New” and “Current” are advanced options which let you open and manage more than one window of a type open at a time – for example two Work Order windows, each displaying a different Work Order.

   Please see the “MaintScape Quick Reference Fact Sheet” for more information on all “Window” menu options.

Exercises:

1. Select “0 MaintScape” in the “Window” menu bar drop-down to navigate to the MaintScape main menu window.
2. Click the (close all but current window) toolbar button to close MaintScape windows.

Only the MaintScape main menu window should now be visible. Click on the “Recent” tab to view the following (the items you see may vary):



MaintScape lists the most recent window s you have visited and the data you have displayed for each.

Exercises:

1. Double-click on one of the items in the recent list to re-open and populate that window.

   Close the re-opened window to bring back the submerged main menu window “recent list”. Notice that the item you double-clicked is now at the top of the list.

   Repeat this process for a few items.
2. Click the “Menu” tab to bring back the main menu icons.

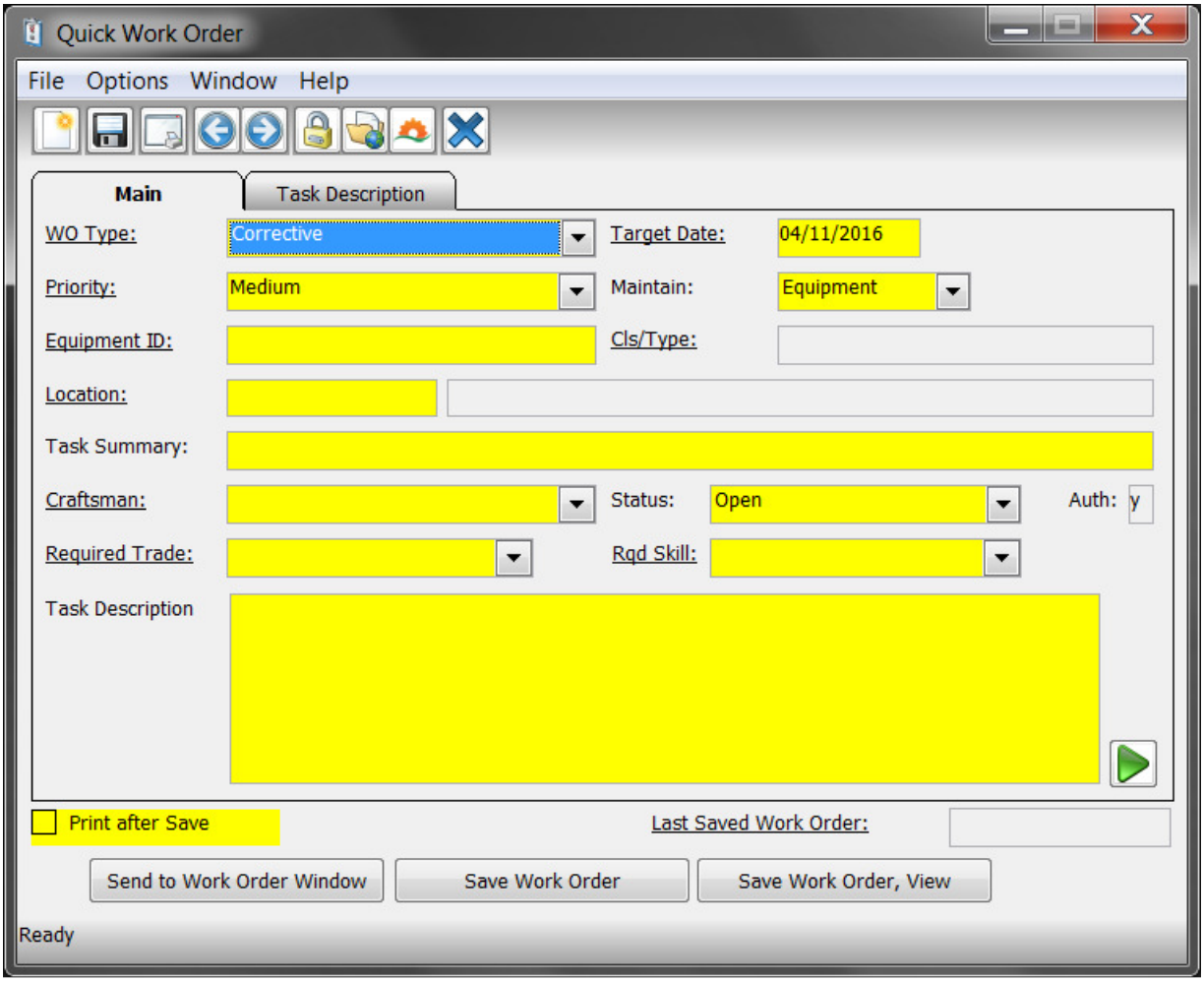
Notes:

1. The number of items on the “recent list” is limited and the items are removed in time. You can move an item from the recent list to the bookmark list. Items on the bookmark list only “go away” when you remove them.

MaintScape Collections are a much more powerful alternative to the bookmark list. Collections are described in training course section "MaintScape Collection".

Creating a Quick Work Order

From the MaintScape main menu window, initiate a Quick Work Order by clicking icon "Work Order", then action "Quick…":



1. Notice that the Target Date (due date) of the Work Order defaults to the current date. Double-click on the date to bring up a pop-up calendar. Select another date a few days in the future.

   We want to identify the Equipment to maintain, however there is no drop-down list of Equipment. This is because the number of equipment can get very large in MaintScape, and drop-down scrolling is not an efficient way to find them. We will find Equipment using the Equipment Search window:

2. Right click on the empty data item for Equipment ID, then select action "Automatic Search".

   MaintScape will open the Equipment Search window and execute a query to list all Equipment.

   Notice that the status bar at the bottom of the Equipment Search window is telling you that the window is in "Select" mode.

   (you could have selected action "Search…" instead of "Automatic Search" if you wanted to specify search criteria and execute the search yourself).

3. Scroll through the list of Equipment to find "Chiller 1". Double-click on row "Chiller 1".

   You should now be back in the Quick Work Order window with the Equipment ID value filled in – as well as the Equipment's default location.

4. Select a Craftsman to perform the work.

   (Craftsmen are "Staff" records in MaintScape assigned role "Craftsman". There is a "Staff" icon on the MaintScape main menu for managing Staff)

5. Select status "Scheduled" for the new Work Order.

   Status "Scheduled" means the work is not yet ready to be done. We will change the status to "Open" later, which means the work is ready to be done. The "Auth" field to the right tells you whether you are authorized through security to create a Work Order of the selected status.

6. Specify Task Summary and Task Description text.

7. Click button "Save Work Order" to save the Work Order.

   You will see the new Work Order number at the bottom right of the window.

8. Close the Quick Work Order window.

Working with Work Orders

The way to work with Work Orders in MaintScape is to find them in the Work Order search window or Today's Status dashboard window, then review and take action on them. Actions include making changes and changing status.

You make changes to the Work Order in the Work Order detail window. You can change a Work Order's status in either the detail window, or change status for several work orders at once in the search window.

In MaintScape, the life cycle of a Work Order is defined by the changes in its status. Work Order status values are as follows. Please note that a work order does not have to pass through every one of these statuses – some statuses are not used at some MaintScape sites.

Scheduled	Work is not yet ready to be done. Work Orders generated into the future from a Maintenance Schedule are created as status "Scheduled".
Planned	Data entry of the work order is not yet complete. Usually only manually entered work orders are status "planned".
Pending Approval	Work is ready to be done, however approval is required. A MaintScape user with the appropriate authority should change the status to "Open" if approved, or "Cancelled" if not approved.
Open	Work is ready to be done and should be done. Once a Work Order has been open, it cannot be deleted.
Deferred	Work Order was Open, however work is being temporarily put off. Work Order status should be changed back to Open when work should resume.
Closed	Work is done and all data entry to the work order is complete – i.e. labor hours, parts. Costs not already finalized are computed and finalized when the work order is closed[1].

[1] Prior to MaintScape Build 139, work order costs are issued (computed and finalized) only when the work order closes, and are un-issued when the closed work order is re-opened. Starting with Build 139, costs can be issued

Cancelled	Work is cancelled. Work Orders which had not yet been open could have been deleted, however once a work order has been opened, its terminal status should be either Closed or Cancelled.

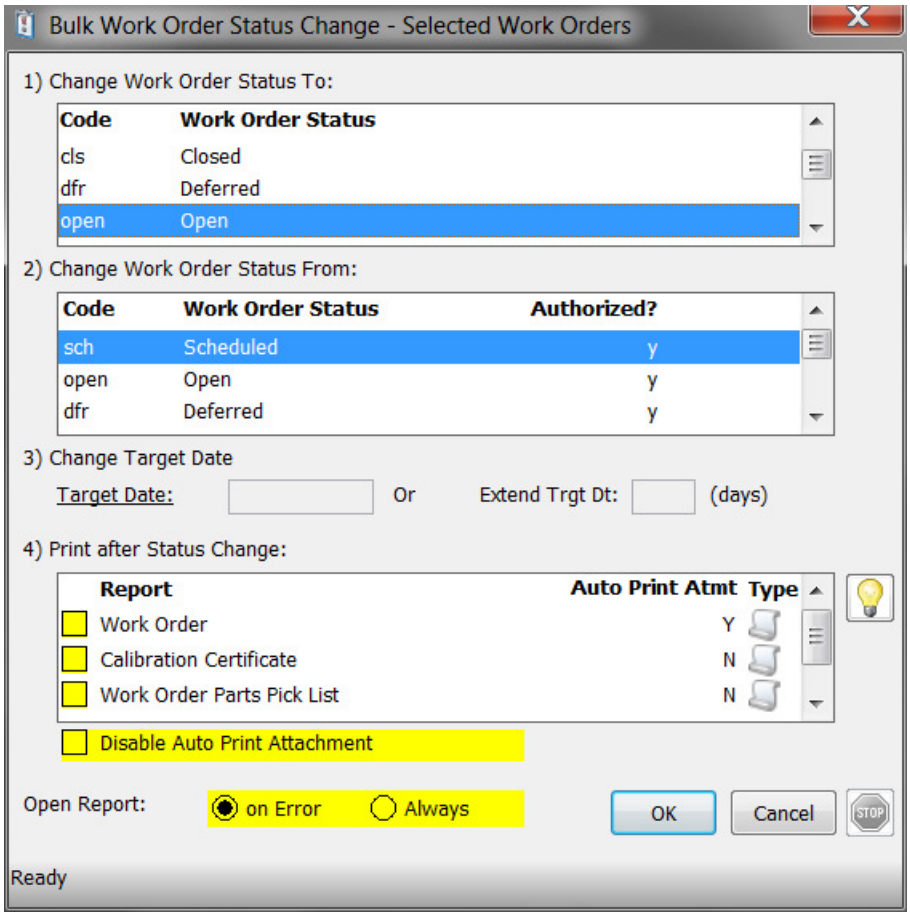
Exercises:

We will display the Work Order we just created in the Work Order window, and take it through its life cycle.

1. Navigate to the MaintScape main menu window.
2. Click the Work Order icon, then select action "Search, Report and Bulk Operations…"
3. Enter the following search criteria to ensure we find our Work Order:
   - Equipment "Chiller 1". You can either type this value, or right-click on the Equipment field and perform a search.
   - Right-click on the first "Target Date range" field and select action, "Set to Today". This search criteria says, "find all work orders with target date starting today and with no end date".
4. Click the  (search) picture button. You should now see the Work Order you just created in the results list. You can also see an English description of your search in the window title bar or by clicking the  (query preview) picture button.
5. Maximize the Work Order search window to see the "Status" column in the results list. Scroll the results list horizontally if necessary. The work order you just created should be status "Scheduled".
6. We will change the status of your work order to status "Open" within the search window. Usually you change the status of a single work order in the detail window, and the status of multiple work orders in the search window; however what we are doing is valid.

prior to work order closure, remain issued when the work order is re-opened, and can be un-issued manually with appropriate permission when the work order is modifiable.

Select the row for the work order which you created, then click the (action) picture button to the right. Select action "Open (status change)…". You should see the following pop-up window:



The pop-up window:

- Pre-fills (but lets you change) the status of work orders you want to change, and the status you want to change to.
- Lets you change the work order target date as part of this operation (if permitted for the particular status change).
- Lets you select one or more printouts to generate for the affected work orders once the status change is complete.
- Lets you determine when to see a report on the multiple status changes which have occurred.

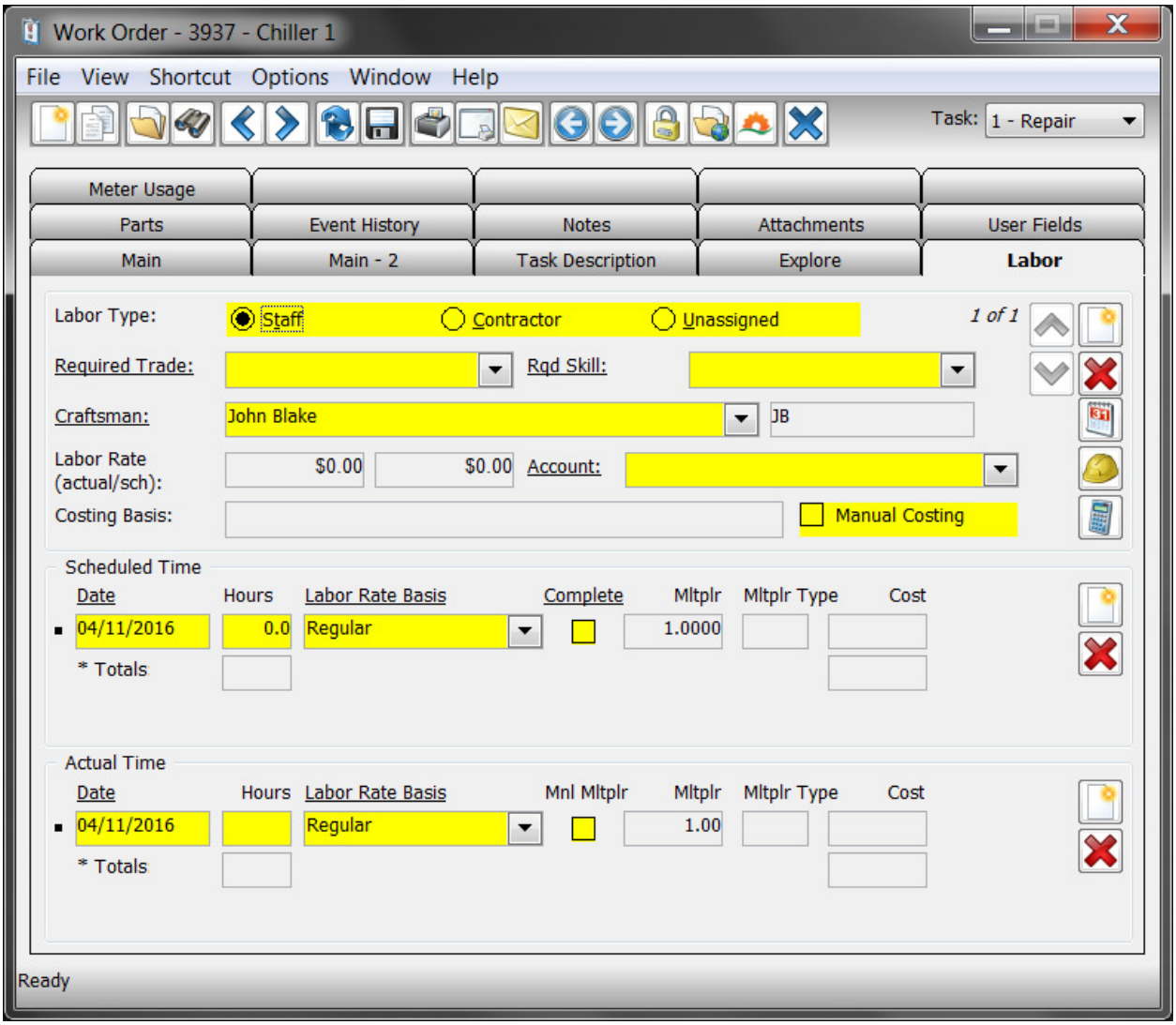
7. Click the "OK" button to perform the status change without changing any defaults.

   You should now be back in the work order search window and the status for your work order should be updated to "Open".

We will continue our work on the work order in the work order detail window. We will first specify actual working hours and other labor information:

8. Double-click your work order in the work order search window to display it in the work order detail window.

9. Click on the "Labor" tab to view the following:



You can specify scheduled and actual labor hours for a work order. Work orders generated from a maintenance schedule usually have the scheduled hours filled in. There are no scheduled hours for this work order because we created it manually and did not enter any.

Record two hours of labor at "regular" time (i.e. not overtime). Be sure to record the time in the Actual Time box, not the Scheduled Time box.

We will now add another craftsman to the work order. Notice that the top-right of the tab page says "1 of 1". This means the first craftsman for the task of one craftsman is displayed.

(a work order can have multiple tasks, each of which can have multiple craftsmen and multiple parts assignments)

10. Click the (new) button at the top-right of the tab page. The fields should clear out, and you should now see "2 of 2". Do the following to specify the new craftsman and the actual hours worked:
    - Select labor type "Staff".
    - Select a craftsman from the drop-down list (do not select the same one).

- Enter Actual Time date and hours worked.

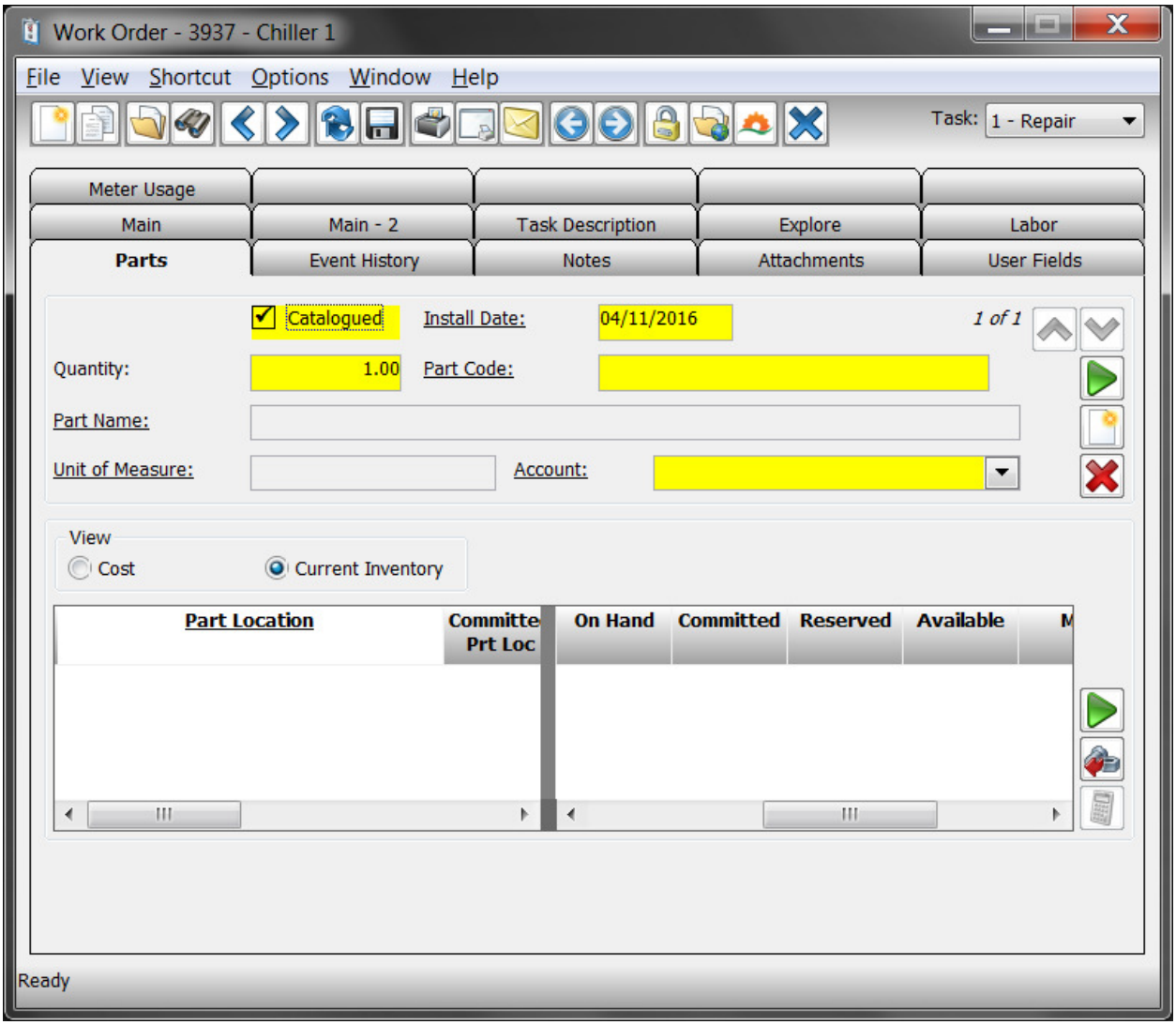
11. Scroll between the two craftsman set up for the work order task by clicking either the or picture buttons.

12. Save the changes you have made to the work order by clicking the (save) picture button in the window toolbar.

    In general, MaintScape does not save anything to the database unless you ask it to. However MaintScape will warn you if you try to close a window and changes are not yet saved.

We will now assign parts to the work order:

13. Click on the "Parts" tab to view the following:



    Catalogued parts are those which have a parts record in MaintScape. Non-catalogued parts are those which are described using free-form text.

14. Right-click on the "Part Code" field and select action "Search All…". This will display the Part Search window. The part search window behaves just like any other MaintScape search window.

15. Select value "Bearing" in search criteria field "Part Class", then click the (search) picture button.

16. Double-click part “Part 1” to select it back to the work order. Change the quantity to “2”.
17. Click the  (new) picture button with the part group to create a new part assignment record for the work order task. Right-click on the “Part Code” field and select action “Search All…” again. Search for parts of another class value, then double-click a part to bring it back to the work order.

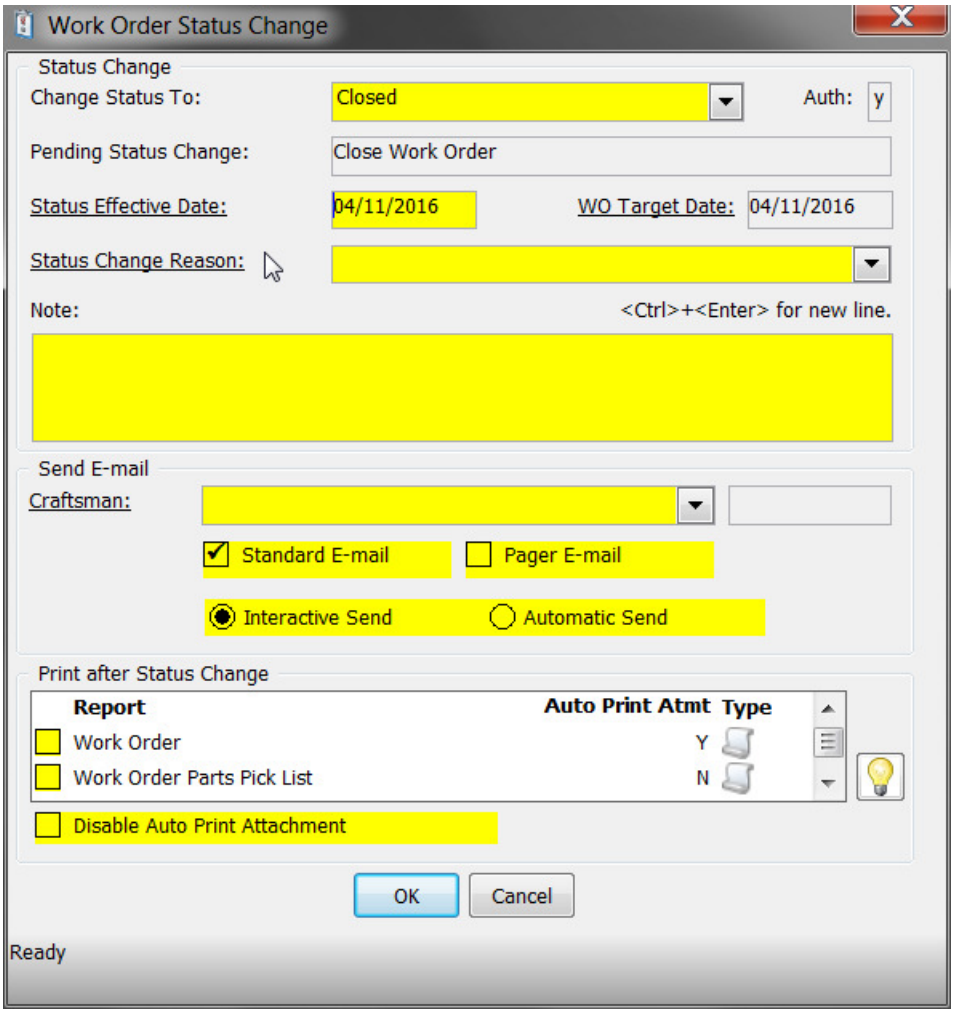
    Notice that the “View” group at the bottom of the Part tab lets you switch between seeing the part’s current inventory level and the part cost.

    Costs not already finalized are computed and finalized when the work order is closed. You can preview the cost, however, by clicking the  (calculate) picture button.

Last steps with the Work Order

18. Click on the “Notes” tab and enter some free-form text which you may want to save with the work order – for example, general observations.
19. Let us assume the work order is done, and now it is time to close the work order. You can perform a status change by either:
    - Switch to the “Main” tab of the work order window and click the (action) picture button in the top group.
    - Click on the “File” menu bar and selecting the appropriate status change action, e.g. “Close Work Order…”.

Select an action to close your work order using either of the above methods. You should see the following pop-up window:



The pop-up window:

- Lets you specify the effective date of the status change (defaults to current date). This is useful for specifying that the status change (closure) actually happened a few days ago but is only being data entered today.
- Lets you change the work order target date as part of this operation (if permitted for the particular status change).
- Lets you send an email notification of the status change (you must have the MaintScape email module installed and configured).
- Lets you select one or more printouts to generate for the affected work orders once the status change is complete.

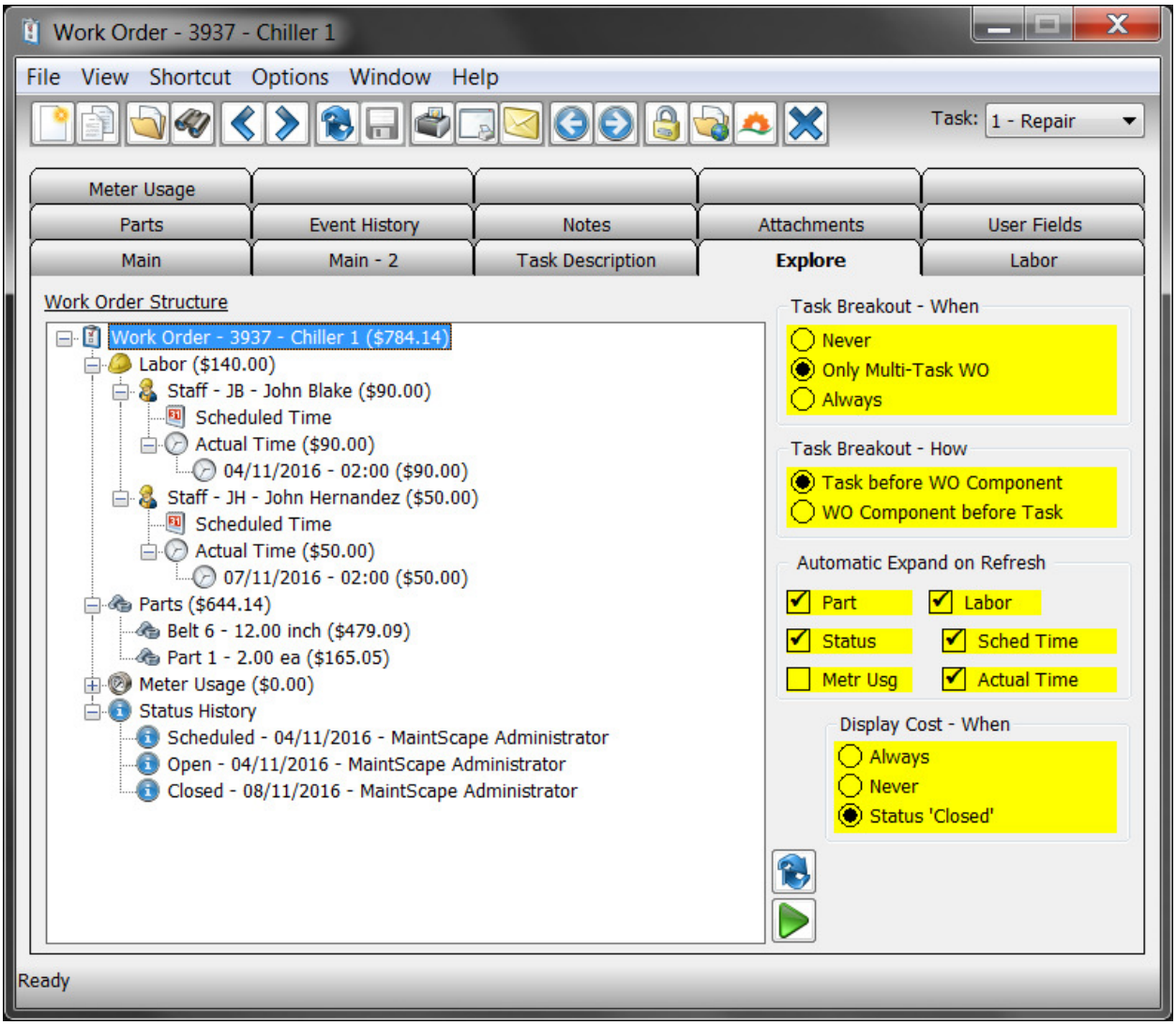
20. Click the "OK" button to perform the status change without changing any defaults.

    MaintScape may ask you what labor rate to use for a craftsman if more than one is applicable. If this is the case, select any option. You can configure your own MaintScape data such that this will not happen.

If successful, the work order will display as non-modifiable (closed work orders cannot be modified unless they are re-opened).

The work order should now be fully costed and closed.

21. Click on the Explore tab of the Work Order window, and expand the tree such that it looks similar to the following:



You can now see the Work Order at a glance – including costs. The fields at right are options to control how this page should display.

22. Double-click on any item in the "Explore" tree. You will navigate to the appropriate tab page to see detail for that item.

    Return to the "Explore" tree tab and repeat this process for a number of different items.

Creating Equipment Records

Equipment versus Equipment Type

The equipment record data in other CMMS systems is split between the Equipment and Equipment Type records in MaintScape.

An Equipment Type record represents a particular “make and model” of equipment. MaintScape eliminates the need to duplicate “make and model” information in many equipment records.

Examples of “make and model” information:

- Equipment manufacturer
- Bill of material (i.e. parts used)
- Meters (i.e. does equipment have an hours meter, mileage meter, etc.)
- Measurement/reading points (e.g. voltage, pressure, etc.)

New MaintScape users are sometimes confused by this, however it does have benefits such as reducing duplication, eliminating out-of-synchronization situations, and simplified reporting.

Do not worry excessively about getting your Equipment Type classifications right immediately. You can initially create Equipment records which specify the “default” equipment type (built into the MaintScape database), and change it later.

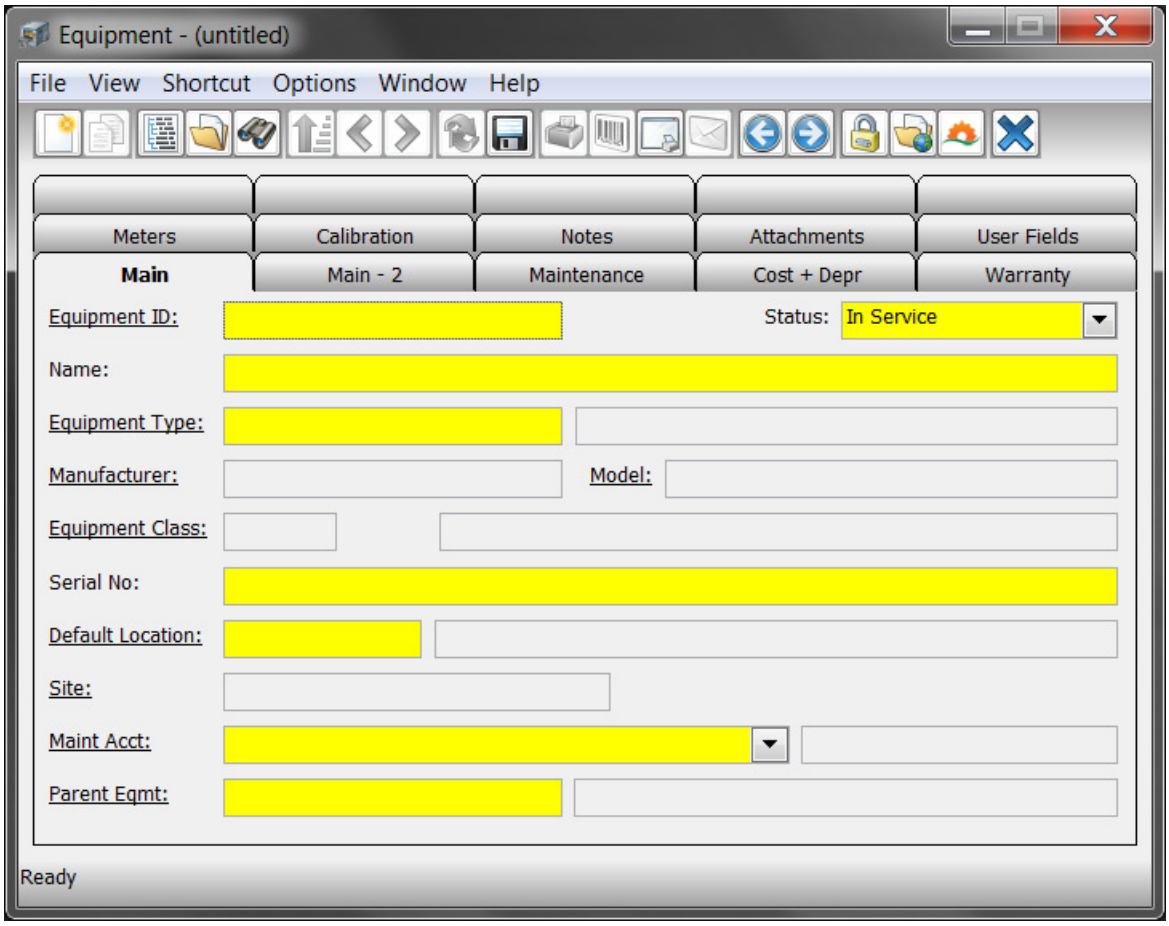
Tutorial

We will now add a new Equipment record to MaintScape.

Exercises

1. Navigate to the MaintScape main menu window, and then click the  (close all but current window) toolbar button to close MaintScape windows.

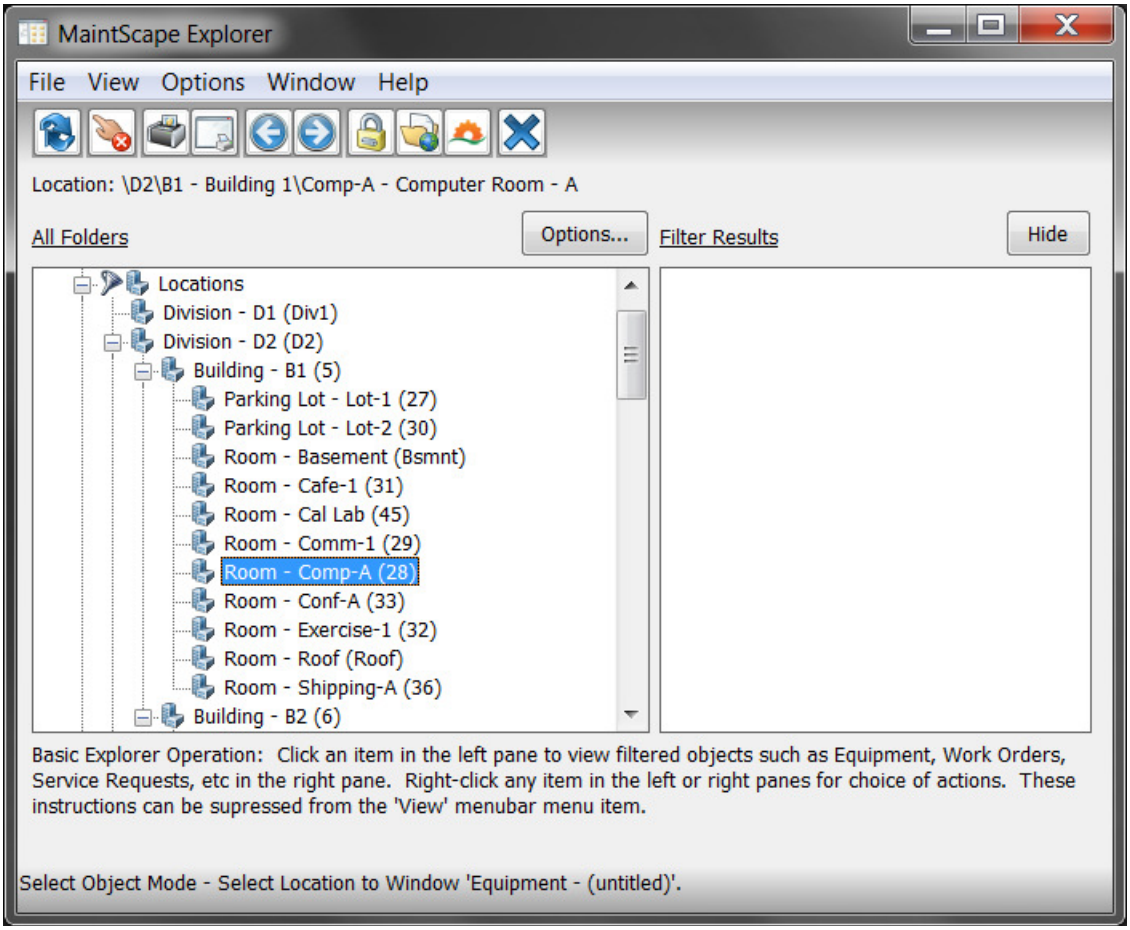
2. Click on the main menu icon “Equipment”, then select action “New…”. You will see the following window:



3. Specify a short value for the “Equipment ID”. No two equipment records may have the same ID. Suggestion: “training 1”.
4. Specify a more descriptive value for the “Name”. Suggestion: “Training Equipment 1”.
5. Right-click on the Equipment Type field and select action “Search…”. MaintScape will open the Equipment Type search window. This window behaves the same as any other search window in MaintScape.
6. In the search criteria field “Equipment Class”, select “Boiler”. Click the (search) picture button to list all Equipment Type of Class “Boiler”. Double-click equipment type “Hol 300k” to select it back to the Equipment window.

7. We will now introduce the MaintScape Explorer for selecting the location of our new equipment.

   Right-click on the "Default Location" field and select action "Search using Explorer…". Expand tree nodes until you see the node selected below. You may want to maximize or increase the size of the Explorer window first.



   The MaintScape Explorer displays a tree representation of your locations and the MaintScape objects at those locations (e.g. Equipment, Work Orders, etc.). The Explorer can be used as a "main menu" for initiating many MaintScape actions.

   The icon in the window above represents a Location. You can configure Explorer to display the objects you want to see in the right pane (now empty). This and other MaintScape Explorer topics are covered in more detail later in the course.

   Notice that the status bar at the bottom of the window indicates the Explorer is in "Select" mode.

8. Double-click the location "Room – Comp-A" to select it back to your Equipment record.

9. Click the (save) toolbar button to save your equipment to the database.

Maintenance Schedules and Generating Work Orders

Introduction to Maintenance Schedules

A Maintenance Schedule in MaintScape is defined by 3 primary pieces of information:

- The Equipment (or Location) to maintain.
- The Procedure specifying the work to be done.
- Schedule information specifying how often the work should be done.

Procedures are MaintScape objects which are similar to Work Orders in that they specify tasks, labor and parts. There is an icon on the MaintScape main menu for Procedures, and Procedures have their own Search and Detail windows.

There are 4 types of scheduling information. The type determines how work orders are generated from the maintenance schedule:

Calendar, non-floating	The maintenance schedule specifies how often a work order should be generated (e.g. every 1 month). You must "reset" a calendar, non-floating maintenance schedule after creating it so that a "next generate date" is computed. The next generate date is the target date of the next work order that will generate from the maintenance schedule. Work orders will not generate unless the maintenance schedule has a next generate date. A maintenance schedule's next generate date is adjusted each time it generates a work order. For example, say the next generate date is "January 1, 2016", the schedule is "1 month", and you generate 2 work orders. The target dates for the work orders will be "January 1, 2016" and "February 1, 2016", and the maintenance schedule next generate date will become "March 1, 2016". You generate work orders from the Maintenance Schedule one of 3 ways: • Within the Maintenance Schedule detail window (for one schedule) • Within the Maintenance Schedule search window (for one or more selected schedules in a results list) • From the MaintScape main menu window by clicking icon "Maintenance Schedule" and selecting action "Generate All…". **IMPORTANT:** You are responsible for generating work orders into the future for calendar, non-floating Maintenance Schedules.
Calendar, floating	The Maintenance Schedule specifies how often a Work Order should be generated (e.g. every 1 month). Like non-floating calendar schedules, you must "reset" the maintenance schedule after creating it. More precisely, you must use the "Generate Initial" action to reset the maintenance schedule and additionally generate one future work order. Floating calendar maintenance schedules **always require** exactly one generated future work order. This gets the floating schedule "started". When the single generated future work order closes, the maintenance schedule generates a new work order with target date equal to one schedule period from the old work order's close date. For example, say you generate the starting work order to be due "January 1, 2016" and the schedule is "1 month". Say this work order is closed on "January 5, 2016". The maintenance schedule will automatically generate

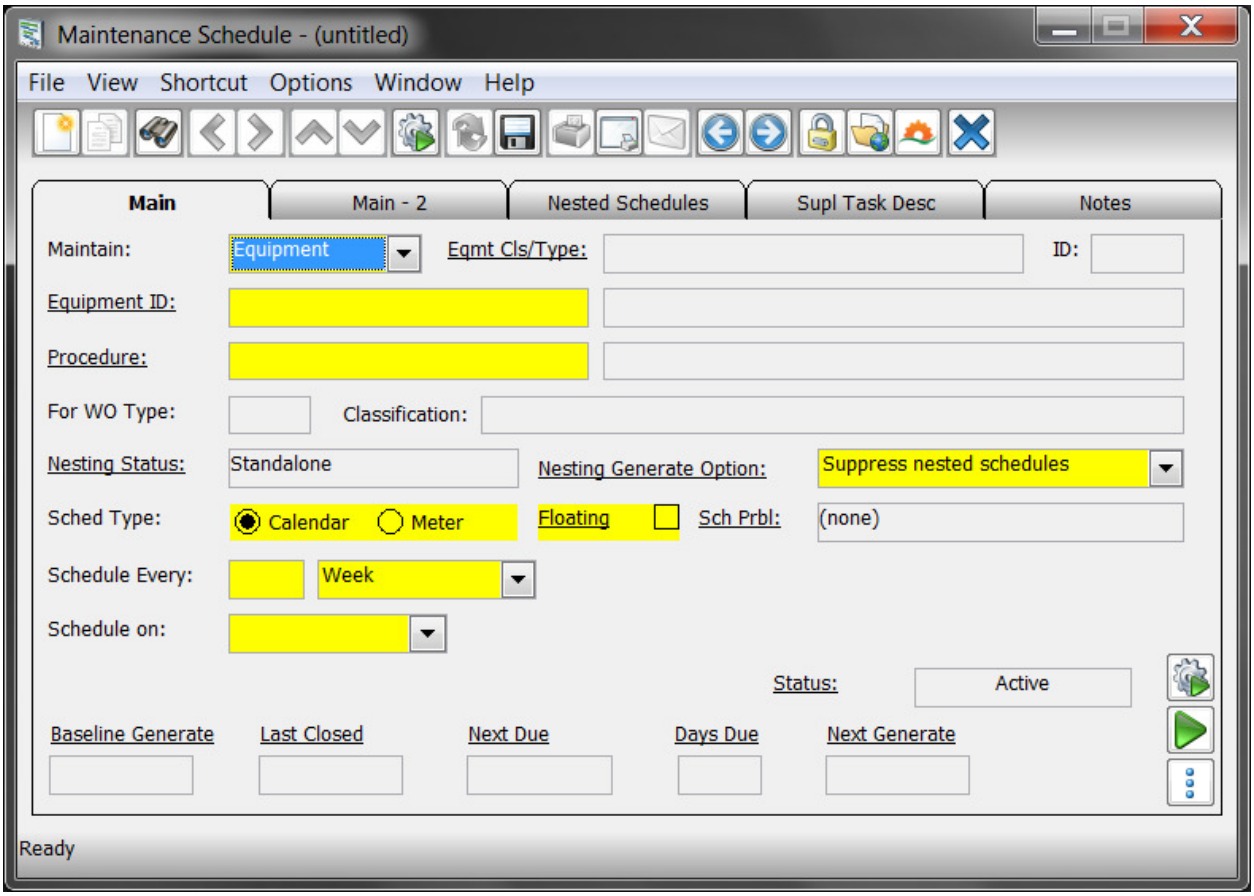
	the next work order with target date "February 5, 2016" (1 month from the work order close date).
Meter, non-floating	The maintenance schedule identifies a meter, the number of meter units between work orders, and a "next due meter reading" value which is the meter reading at which the next work order is due. For example, the maintenance schedule may specify that a work order should generate for a piece of equipment every 500 running hours, and that the next work order is due when the meter reaches 2300 running hours. This maintenance schedule will generate a work order when a meter reading is entered for the equipment of 2300 running hours or greater. Say this happens when a meter reading of 2310 is entered. After generating the work order, the maintenance schedule next due meter reading value will then adjust to 2810 running hours (2310 + 500 hours). Equipment must have a meter in order to have a maintenance schedule scheduled by meter. The meters available for equipment are defined in the equipment's Equipment Type record (since the meters will apply to all equipment of the equipment type, or "make and model"). Please see the "MaintScape Quick Reference Fact Sheet" for more information on the distinction between Equipment and Equipment Type.
Meter, floating	Unlike calendar schedules, floating and non-floating meter schedules behave almost the same. In the above example of a 500 hour non-floating meter schedule, MaintScape adjusts the next due meter reading from 2300 to 2810 hours after generating a work order in response to a new meter reading of 2310 hours. Say the meter reading in effect by the time the generated work order is closed is 2350 hours. If the meter maintenance schedule is marked as "floating", MaintScape will then adjust its next due meter reading from 2810 to 2850. The difference of 40 hours is the difference of current meter reading values between the time the work order was generated and the time it was closed. In other words, MaintScape floats the maintenance schedule by adjusting its next due meter reading to the meter frequency (500 hours in our example) beyond the meter reading in effect when the scheduled work is done.

Tutorial: Calendar, Non-Floating Schedule

We will now create a calendar, *non-floating* Maintenance Schedule for the equipment which we created earlier in this tutorial.

1. Navigate to the MaintScape main menu window, and then click the  (close all but current window) toolbar button to close MaintScape windows.

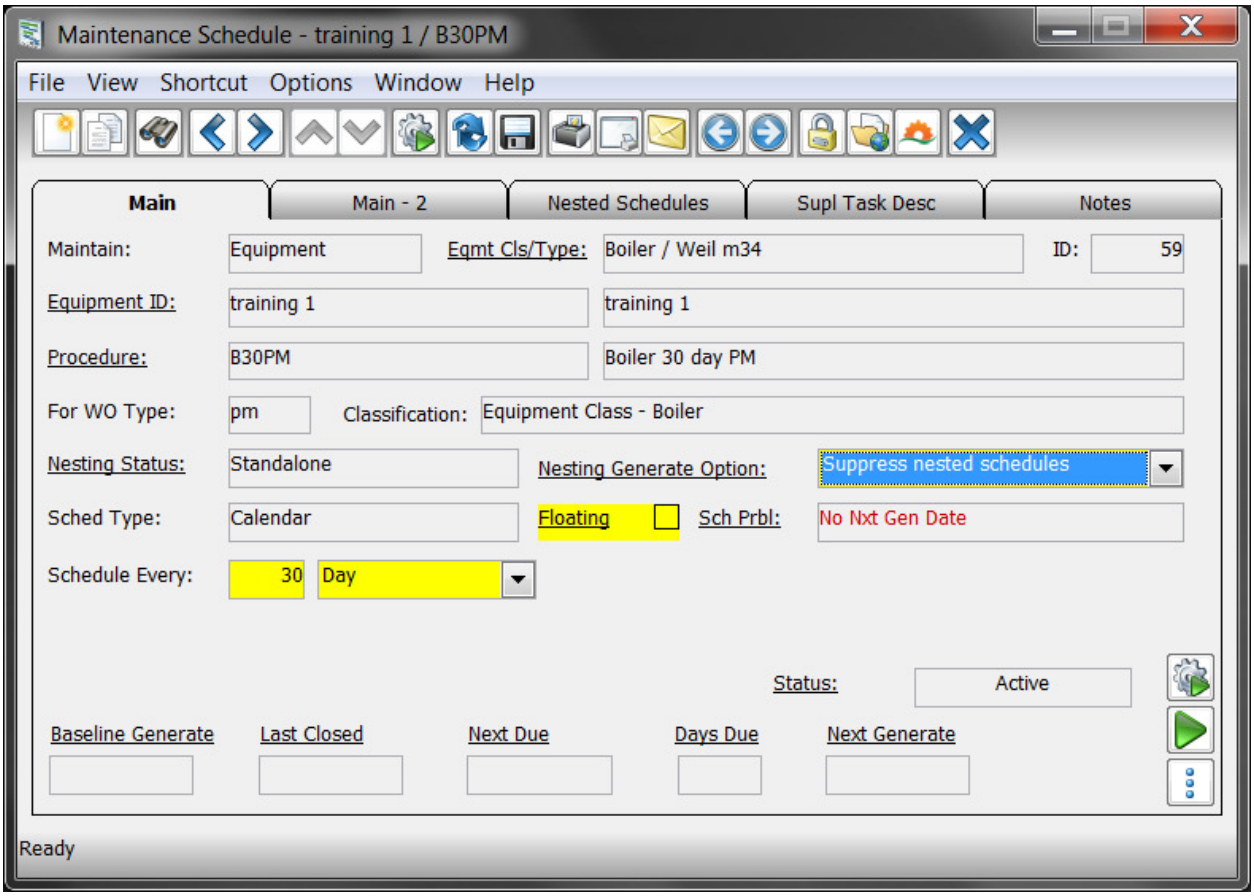
2. Click on the main menu icon “Maintenance Schedule”, then select action “New…”. You will see the following window:



1. Enter the Equipment ID of the equipment which you added to MaintScape in the last exercise (suggested ID was “training 1”) or perform a “right-click” search if you do not remember the value.
2. Right-click on the Procedure field, then select action “Compatible Procedure Search”. This will open the Procedure search window and execute a query.

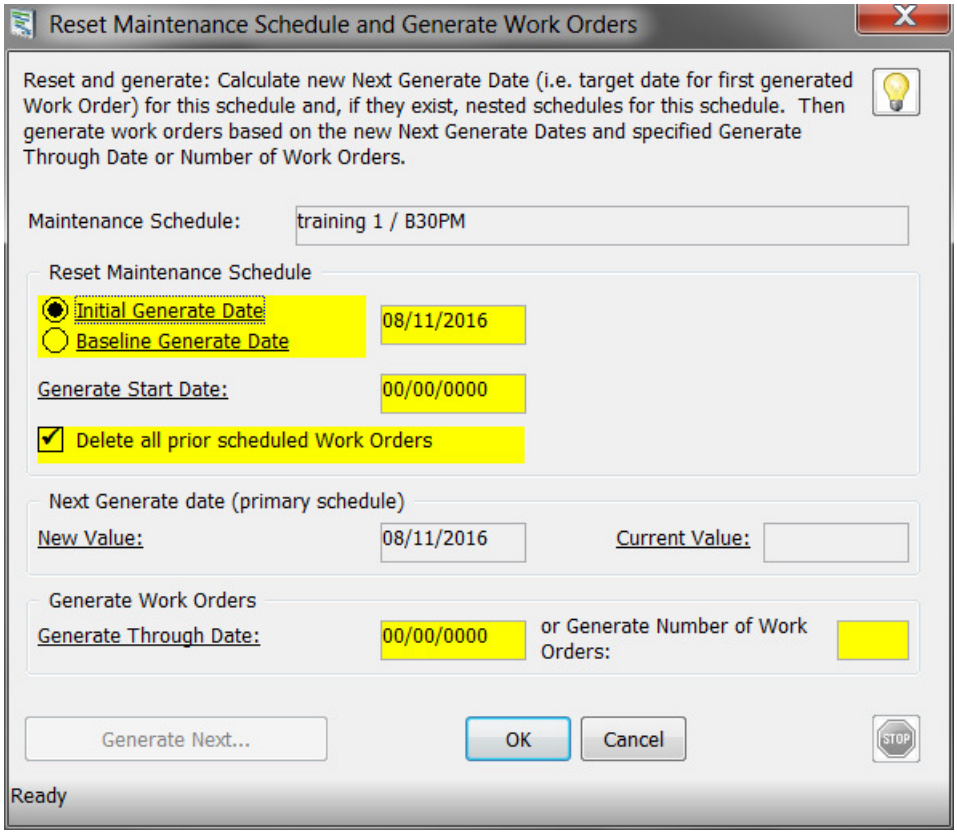
   “Compatible procedure search” works because procedures in the training database are classified as to what equipment classes and/or equipment types they are designed for.
3. Double-click on procedure “B30PM” (boiler 30 day preventive maintenance) to select it back to the Maintenance Schedule window.
4. Notice that the scheduling information, “every 30 days”, was automatically filled in. This happened because the procedure record specified a default schedule.
5. Save the Maintenance Schedule record by clicking (save) on the toolbar.

Your maintenance schedule window should now look like the following. Notice the red "problem" identified, "No Next Generate Date".



We must now "reset" the maintenance schedule to compute a next generate date, and then generate one or more work orders. We will do both these actions at once using the "Generate Initial" action.

6. Click the (generate) picture button near the bottom-right of the screen and select pop-up action, "Generate Initial…". You will see the following pop-up window:



Initial Generate Date, Baseline Generate Date and Generate Start Date are used to compute the maintenance schedule Next Generate Date. The next generate date is the target date of the next work order that will generate from the maintenance schedule.

Please refer to MaintScape documentation for the full meaning of all these fields.

7. Select the "Initial Generate Date" radio button option and set the date value to the right to today's date. You can do this by right-clicking on the date field and selecting pop-up action "Set to Today".

   Notice that the computed next generate date as shown in the "New Value" field in the "Next Generate date" group becomes "today" as well. I.e. "Initial Generate Date" is the target date of the next work order generated by the maintenance schedule (as long as no "Generate Start Date" value is specified).

8. There are two ways to specify how many work orders you want to generate into the future: "Generate Through Date" or "Generate Number of Work Orders".

   We will use the latter option: enter "2" into the "number of work orders" field.

   By specifying 2 work orders, MaintScape will first generate a work order with target date equal to the newly computed next generate date (today). MaintScape will then add the schedule period (30 days) to the next generate date and generate the second work order with that new target date. MaintScape will then add another schedule period (30 days) to the next generate date, however having generated the required 2 work orders, MaintScape will leave the maintenance schedule configured to generate the next work order when next asked to (that work order target date will be 60 days after today).

MaintScape would behave as follows if we had specified a "Generate Through Date" rather than the number of work orders to generate: MaintScape would repeatedly generate a work order with target date equal to the maintenance schedule next generate date, subsequently adding the schedule period (30 days) to the next generate date – stopping when the next generate date is greater than the specified generate through date.

9. Click 'OK' to generate the two work orders. MaintScape will ask you if you want to browse the generated work orders once generate is complete. Click "Yes".

   Notice how MaintScape shows you these work orders: MaintScape opens the Work Order search window and populates and executes a query.

   KEY CONCEPT: Search windows are the way you look for data in MaintScape. They all behave the same. So do detail windows.

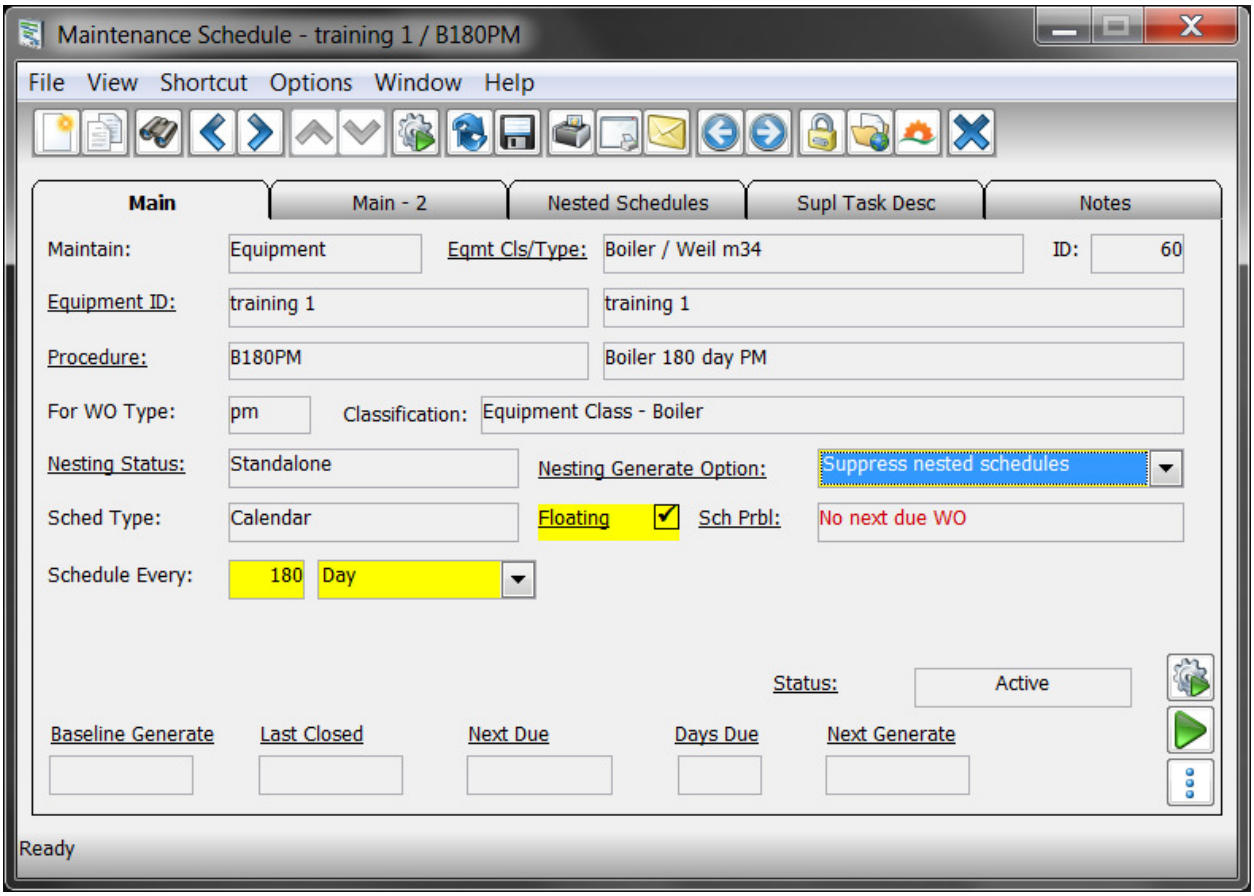
Tutorial: Calendar, Floating Schedule

We will now create a calendar, *floating* Maintenance Schedule for the equipment which we created earlier in this tutorial.

1. Navigate to the MaintScape main menu window, and then click the  (close all but current window) toolbar button to close MaintScape windows.
2. Click on the main menu icon "Maintenance Schedule", then select action "New…". You now have the same blank window for entering a new Maintenance Schedule as in the prior Maintenance Schedule tutorial exercise.
3. Your new Maintenance Schedule will maintain the same equipment which you added to MaintScape in a prior exercise (suggested ID was "training 1"). Enter the equipment ID or perform a "right-click" search if you do not remember the value.
4. Right-click on the Procedure field, then select action "Compatible Procedure Search". Double-click on procedure "B180PM" (boiler 180 day preventive maintenance) to select it back to the Maintenance Schedule window.

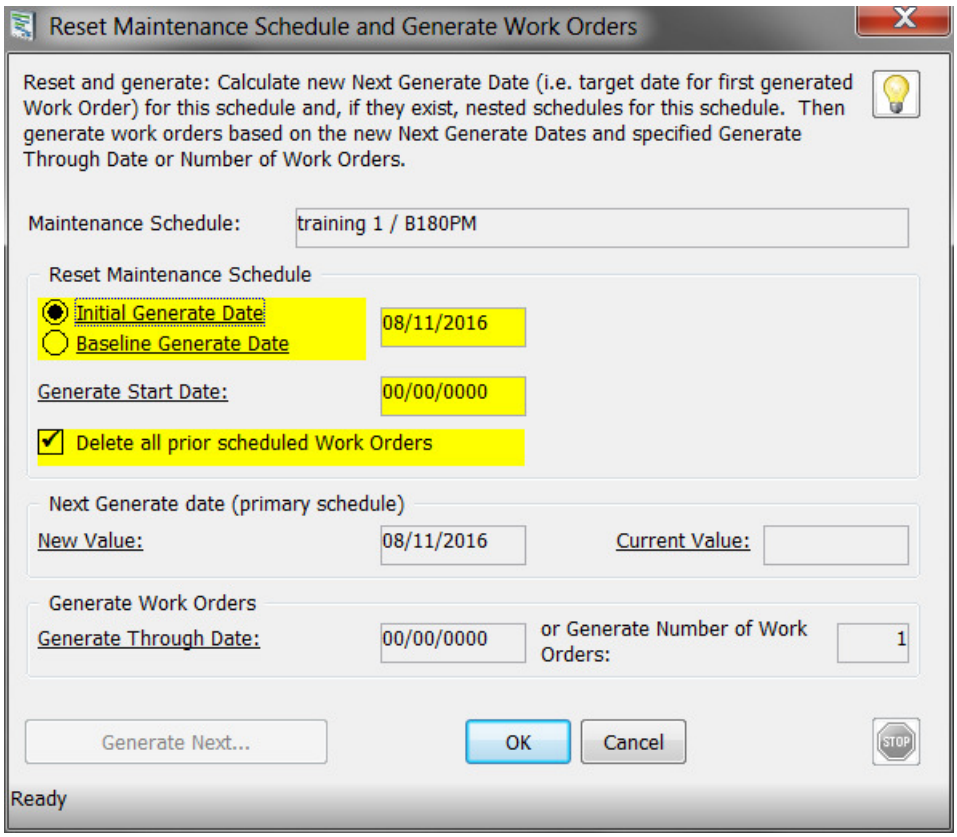
   As mentioned in the prior exercise, the "Compatible Procedure Search" option works because procedures in the training database are classified as to what equipment classes and/or equipment types they are designed for.
5. The Procedure's scheduling information "every 180 days" is automatically copied into the Maintenance schedule. Change the schedule to "floating" by checking the "Floating" check box field.
6. Save the Maintenance Schedule record by clicking  (save) on the toolbar.

Your maintenance schedule window should now look like the following. Notice the red "problem" identified, "No Next Due Work Order".



We must now "reset" the maintenance schedule to compute a next generate date, and then generate EXACTLY one work order to "get the floating maintenance schedule started". We will do both these actions at once using the "Generate Initial" action.

7. Click the (generate) picture button near the bottom-right of the screen and select pop-up action, "Generate Initial…". You will see the following pop-up window:



This is the same "Generate Work Orders" window that you used in the prior tutorial exercise on calendar, non-floating schedules WITH ONE SMALL DIFFERENCE: The number of work orders to initially generate is fixed at 1.

Remember: floating calendar maintenance schedules should always have EXACTLY one work order due in the future. The next work order thereafter will automatically generate when that work order is closed.

8. Select the "Initial Generate Date" radio button option and set the date value to the right to today's date. You can do this by right-clicking on the date field and selecting pop-up action "Set to Today".
9. Click "OK" to generate the floating maintenance schedule's first work order.

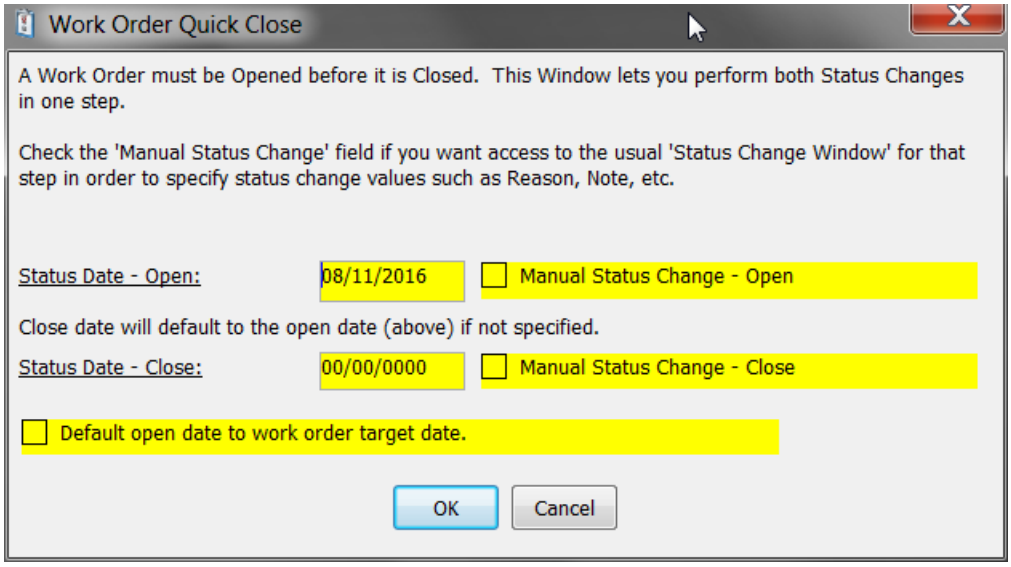
   Click "No" when MaintScape asks you whether you would like to browse the generated work order (we saw what this did in the previous tutorial exercise).
10. Notice that the Maintenance Schedule window now shows a "next due" date. This reflects the target date of the work order which you just generated.

    Notice also that the Maintenance Schedule window now shows a schedule problem type of "(none)".
11. Let's now assume the work specified by the "next due" work order has been completed. We will therefore close the work order. Our objective is to see that a new work order automatically generates to be due one schedule period (180 days) past the close date.

Right-click on the "next due" date field in the Maintenance Schedule window and select pop-up action "Open Work Order". Note that this action opens the work order in a work order window. It does *not* "status change" the work order to status "open".

12. You should now be in the MaintScape work order window viewing the maintenance schedule's next due work order. Notice that the work order status is "scheduled". You cannot directly "close" a status "scheduled" work order as MaintScape assumes the work order should transition to status "open" first. However MaintScape provides a "quick close" function allowing you to transition to status "open" and then status "closed" in one step. This is what we will do.

    Click on the "File" menu bar and select action "Quick Close…". You will see a window similar to the following:



    Specify today's date as the effective date for status change to "open". If not otherwise specified, this date will be the effective date for status change to "close" as well. Click "OK" to perform the status changes, however **before you do this**, carefully watch the status bar at the bottom of the work order window. You will see (quickly) the actions that MaintScape takes. One of these actions is to generate the next due work order from the floating maintenance schedule.

    Do not be concerned if you see a pop-up window saying, "Concurrency notice – information on window titled … has changed elsewhere within MaintScape and thus is no longer accurate". If so, click 'OK' to close the pop-up. This happened because the act of closing the work order and generating the next one caused changes to the maintenance schedule displayed in an open MaintScape window, and you are warned that the data in this window is therefore no longer accurate.

13. Switch back to the Maintenance Schedule window showing your calendar, floating maintenance schedule. Observe that the "next due" date field still shows today's date. This value reflects the work order which you just closed (and which is no longer "next due"). Click the (refresh) toolbar button to observe that the "next due" date field now reflects the new "next due" date, which is the work order close date (today) plus the maintenance schedule period (180 days). This new next due date is also the target date of the work order which was just generated. Finally, note that the "last closed" date field represents the work order that you just closed.

Tutorial: Meter Schedule

1. Navigate to the MaintScape main menu window, and then click the (close all but current window) toolbar button to close MaintScape windows.

2. We will first create a new equipment record for out meter maintenance schedule. Click on main menu icon “Equipment”, then select action “New…”. Set the equipment ID value to “training 2” and set the equipment type value to “F100-94”. This equipment type is of class “truck”.

   Remember that meters in MaintScape are defined within the *equipment type* record. Equipment type “F100-94” specifies a “miles” meter. You can see the “miles” meter in the equipment window “meters” tab after you have set the equipment’s equipment type value AND after you have saved the equipment record.

   Please see training course section “Creating Equipment Records”, above, if you need help creating the new equipment record.

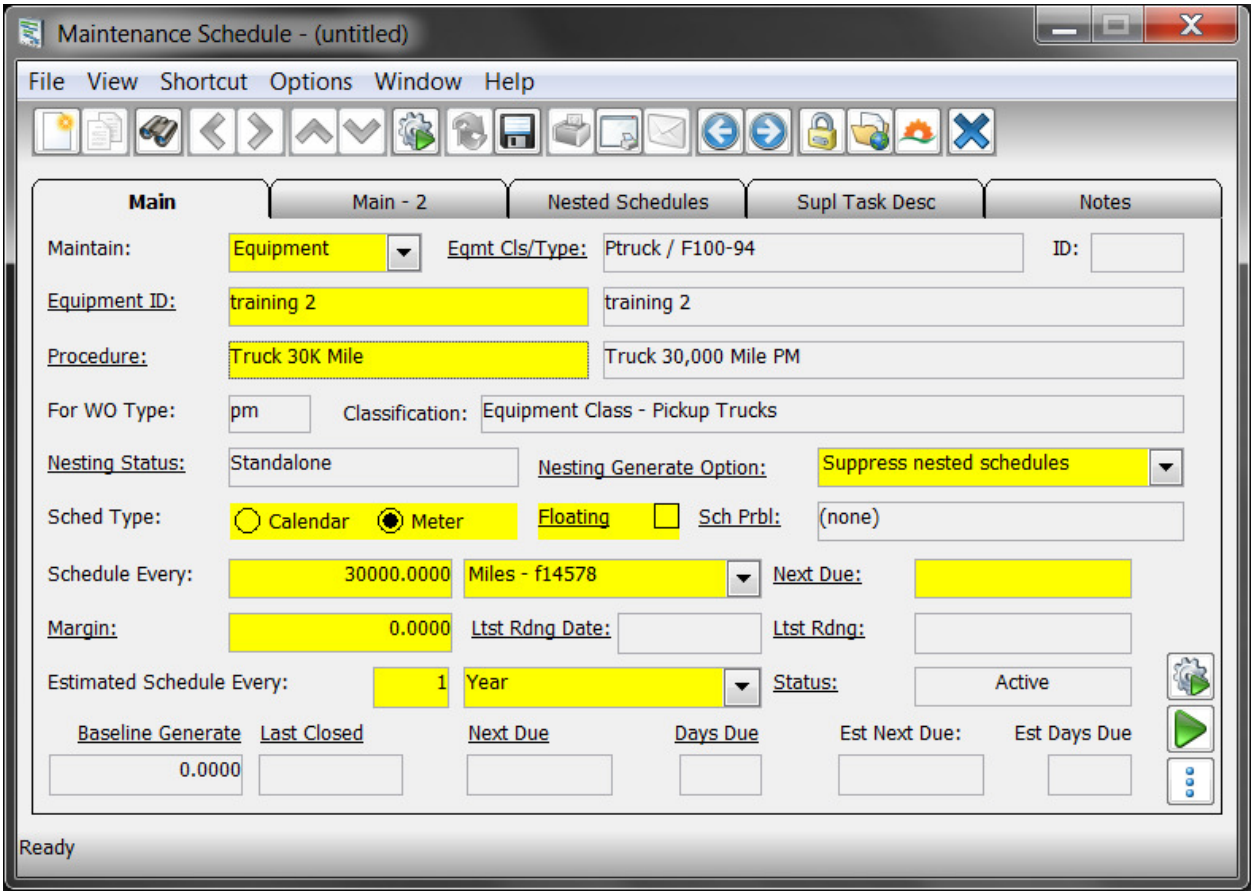
   Be sure to save your new equipment record. You can close the equipment window when this is done.

3. Navigate to the MaintScape main menu window. Click icon “Maintenance Schedule”, then select action “New…”. You now have the same blank window for entering a new Maintenance Schedule as in the prior Maintenance Schedule tutorial exercises.

4. Specify new equipment ID “training 2” as the equipment for the new Maintenance Schedule.

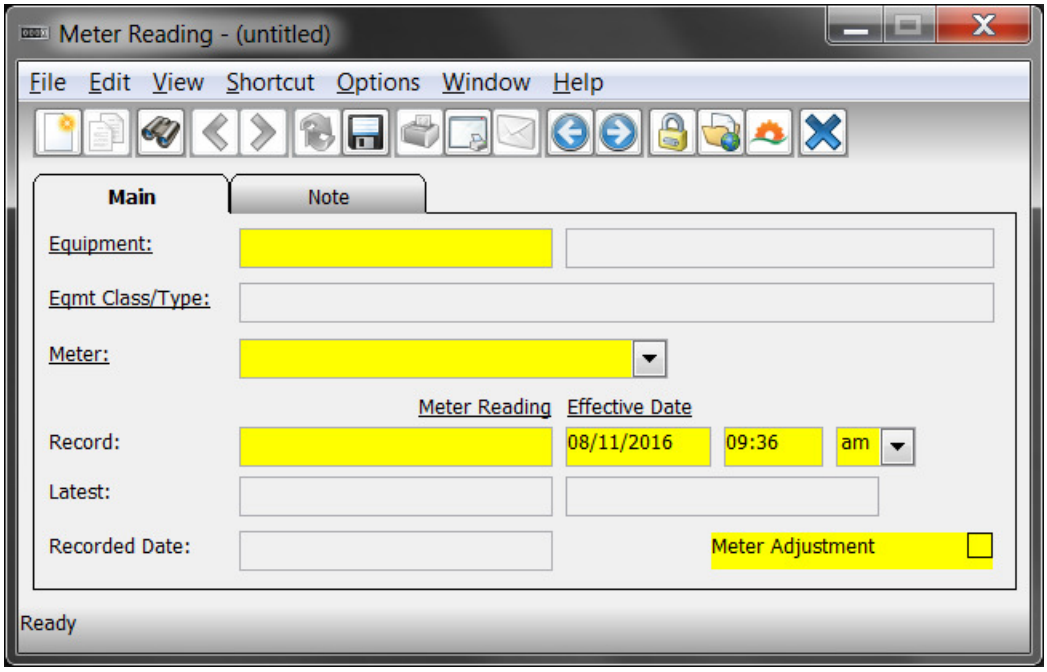
5. Right-click on the Procedure field, then select action “Compatible Procedure Search”. Double-click on procedure “Truck 30K Mile” to select it back to the Maintenance Schedule window. This procedure was found because its classification specifies equipment type “F100-94”.

6. The Procedure’s scheduling information “every 30000 miles” is automatically copied into the Maintenance schedule. Notice that the “scheduling type” is now “meter”. You should now see a window similar to the following:



7. You must now enter into the "Next Due" field the meter reading when this maintenance is next due. For example, enter "50000" indicating the maintenance should occur when the truck reaches 50000 miles.
8. Save the Maintenance Schedule record by clicking (save) on the toolbar.
9. We will now enter a meter reading for truck "training 2" larger than the next due mileage of 50000 and verify that the Maintenance Schedule you just created generates a work order.

   Navigate to the MaintScape main menu window. Click on the main menu icon "Meter Reading", then select action "New…". You will see a window similar to the following:



10. Enter equipment ID "training 2" for the meter reading. When you tab away from the Equipment ID field, you will see that the "Meter" field defaults to "Miles" (the "f14578" value is the ID of the mileage meter – this ID value is specified in the equipment type record and is optional).
11. Enter a meter reading value larger than 50000 in the empty field below "Meter Reading". Remember: 50000 is the "trigger value" for the Maintenance Schedule which you just created.
12. You will click (save) on the toolbar to save the meter reading (or use keyboard shortcut <ctrl>+<s>), however **before you do this**, carefully watch the status bar at the bottom of the meter reading window. You will see (quickly) the actions that MaintScape takes. One of these actions is to generate a work order from the meter maintenance schedule.

    Click (save) on the toolbar to save the meter reading.

    Do not be concerned if you see a pop-up window saying, "Concurrency notice – information on window titled … has changed elsewhere within MaintScape and thus is no longer accurate". If so, click 'OK' to close this pop-up. This happened because the act of entering the meter reading that triggered the maintenance schedule caused changes to the maintenance schedule displayed in an open MaintScape window, and you are warned that the data in this window is therefore no longer accurate.
13. Switch back to the Maintenance Schedule window showing your meter maintenance schedule. Observe that the "next due" meter reading field still reflects the original value (50000 miles). Click the (refresh) toolbar button to observe that the "next due" meter reading field now reflects the new

"next due" meter reading, which is the triggering meter reading value (e.g. 50100 miles) plus the meter frequency (30000 miles).

14. Observe that the "next due" date field has a value which represents the work order which was just generated when you entered the meter reading. Right-click on this field and select pop-up action "Open Work Order". Note that this action opens the work order in a work order window, it does *not* "status change" the work order to "open".

    Flip to the "Main – 2" tab of the work order window to see that MaintScape indicates the work order was generated from a Maintenance Schedule for a particular meter reading.

    Like any work order, this work order should be transitioned to status "open" when the work is to be done by your maintenance staff. When the work is done, this work order should be transitioned to status "closed".

Nested Maintenance Schedules

MaintScape lets you "nest" maintenance schedules with related maintenance periods. For example, nested calendar maintenance schedules for an equipment may generate work orders monthly, quarterly (every 3 months), and annually (every 12 months). Nested meter maintenance schedules for an equipment may generate work orders every 100, 200 and 400 hours.

Work orders generated from maintenance schedules nested with each other periodically "coincide". For example monthly and quarterly calendar maintenance schedules coincide every quarter, or every third work order. Periods of nested maintenance schedules need not be a multiple of each other. For example, 200 and 300 hour meter maintenance schedules coincide every 600 hours, or every third work order.

When generated work orders coincide, you have a choice whether the generated work order is generated from the procedure of the least frequent maintenance schedule, or whether the generated work order is generated from the procedures of all coinciding maintenance schedules (i.e. the work order is multi-task).

The maintenance schedule that occurs most frequently is called the "primary schedule", and the other related maintenance schedules are called "nested schedules". Normally the schedule period of nested maintenance schedules are an even multiple of the schedule period of the primary maintenance schedule. For example, when monthly, quarterly and annual maintenance schedules are nested, the monthly maintenance schedule is primary. Similarly, when 100, 200 and 400 hour maintenance schedules are nested, the 100 hour maintenance schedule is primary.

Maintenance schedules nested with each other must maintain the same equipment (or location), and must all schedule either by calendar or meter.

Tutorial: Nested Calendar Schedules

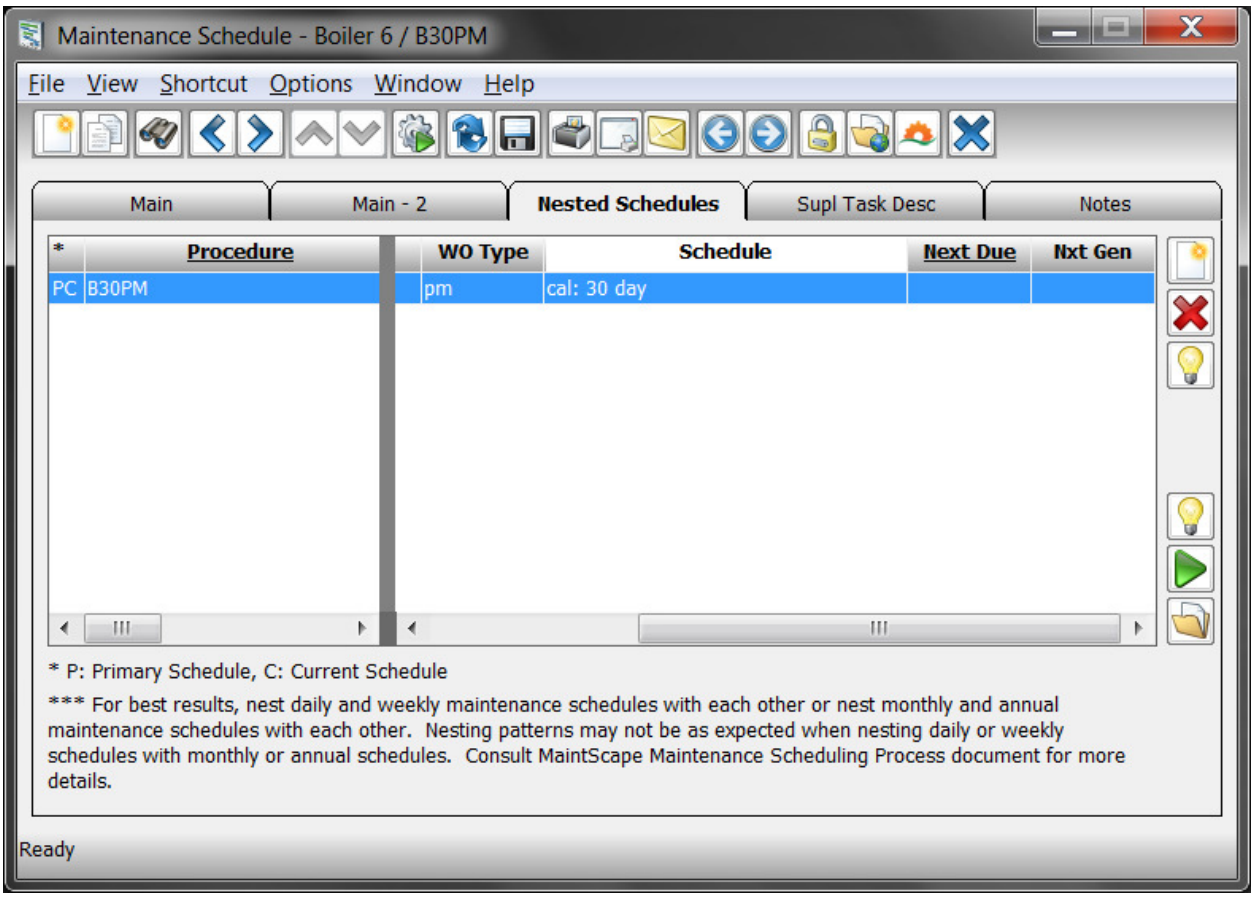
We will now create a pair of nested calendar maintenance schedules:

1. Navigate to the MaintScape main menu window, and then click the  (close all but current window) toolbar button to close MaintScape windows.
2. We will first create the primary (most frequent) maintenance schedule. Click icon "Maintenance Schedule", then select action "New…".
3. Enter equipment ID "boiler 6" and procedure code "b30pm". Save the maintenance schedule record by clicking  (save) on the toolbar.

   Notice that the "Nesting Status" value displayed for the maintenance schedule is "Standalone". This is because our newly added maintenance schedule is not involved in a nesting relationship (yet) with any other maintenance schedule.

Also notice the schedule problem code indicates “No Next Generate Date”. Previously we resolved this problem by resetting the maintenance schedule. We will not do this now until we have created the nested maintenance schedule.

4. Click on the “Nested Schedules” tab of the maintenance schedule window to view the following:



The “Nested Schedules” tab lists all maintenance schedules in a nesting relationship with the currently displayed maintenance schedule. Presently only our maintenance schedule itself is listed because it is “Standalone” (not yet involved in a nesting relationship).

5. We will now create a new maintenance schedule for equipment “boiler 6” and nest it to the just created maintenance schedule.

   Click the (new) button beside the list containing only the current maintenance schedule. Select the “Create New Maintenance Schedule…” option since the maintenance schedule to nest does not yet exist (we are about to create it).

6. You should now be looking at a new maintenance schedule window representing a not-yet-saved record. Note that equipment code value “boiler 6” is already filled in.

   This new maintenance schedule window should display on top of the maintenance schedule window displaying the first maintenance schedule for “boiler 6”. If the new window fully covers the first window, move the window off to the side slightly to verify that the other window is still there.

   Note that MaintScape lets you have many instances of a given window type open at the same time. Please see the “MaintScape Quick Reference Fact Sheet” for more information on this.

7. Enter procedure code value “b180pm”, then save the maintenance schedule record by clicking (save) on the toolbar.

   Click “Yes” in the pop-up query that asks whether to select the newly added maintenance schedule back to the first maintenance schedule window.

8. You should now be back at the first maintenance schedule window which now lists 2 maintenance schedules as nested. Note that the 30 day PM maintenance schedule is both the primary maintenance schedule and the maintenance schedule currently displayed by the window. These facts are indicated by the codes “P” and “C” in the left-most column of the list.

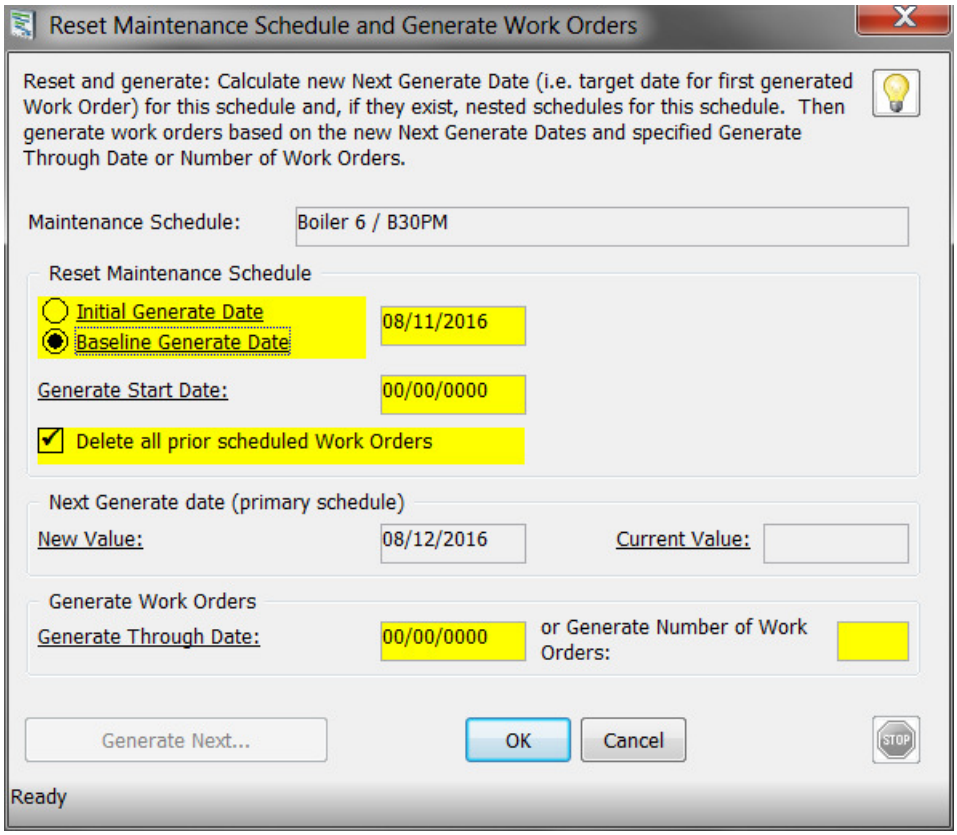
9. Click the (down) toolbar button to change the maintenance schedule window to view the next maintenance schedule in the nested set. Notice that the left-most column now indicates that the 180 day PM is currently displayed, however the 30 day PM remains the primary maintenance schedule (the least frequent maintenance schedule is always primary).

10. Flip to the “Main” tab of the maintenance schedule window. You should see that the 180 day PM is in fact currently displayed, and that its “Nesting Status” value is “Nested”.

    Click the (up) toolbar button to change the maintenance schedule window back to view the primary maintenance schedule (30 day PM). Notice that its “Nesting Status” value is now “Primary” rather than “Standalone”.

11. We will now reset the nested set of maintenance schedules so that they are prepared for generating work orders. As done in the first calendar maintenance schedule exercise, we will reset the maintenance schedule and generate work orders in one step using the “Generate Initial” action.

    Click the (generate) picture button near the bottom-right of the screen and select pop-up action, “Generate Initial…”. You will see the following pop-up window:



When generating standalone calendar maintenance schedules, we specified the "Initial Generate Date" to be the date the first generated work order should be due. This time we will specify a "Baseline Generate Date" value, which is often more convenient when generating nested maintenance schedules.

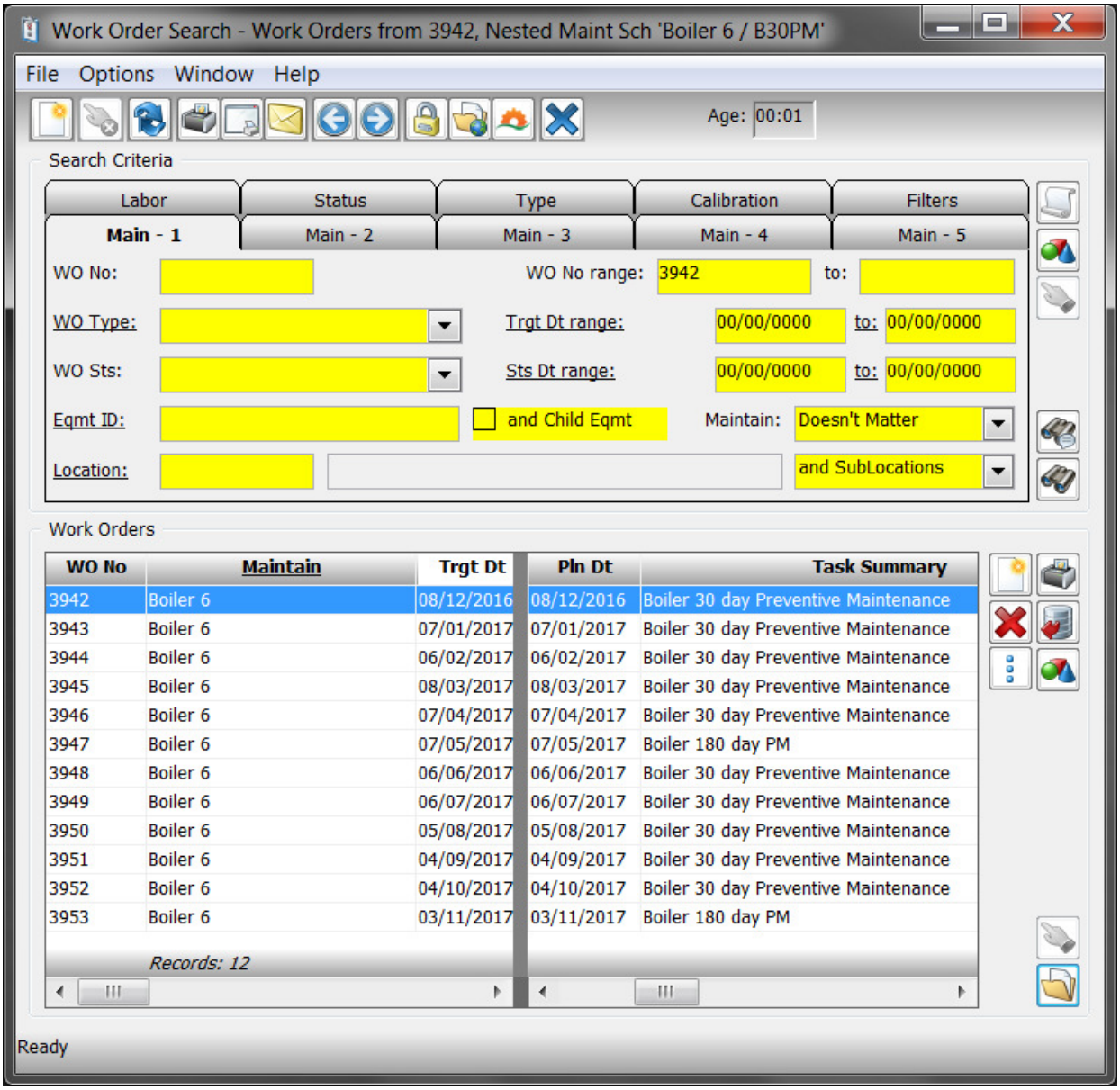
Select the "Baseline Generate Date" radio button option and set the date value to the right to today's date. You can do this by right-clicking on the date field and selecting pop-up action "Set to Today".

From the "baseline date" of today, the first 30 day PM will generate to be due 30 days from now, and the first 180 day PM will generate to be due 180 days from now.

Notice that the computed next generate date as shown in the "New Value" field in the "Next Generate date" group is 30 days from now, representing the due date of the first work order generated from the primary maintenance schedule.

12. We will specify the number of work orders to generate by specifying a "Generate Through Date". Set the "Generate Through Date" field to one year from today (this will guarantee that the 180 day PM will generate 2 work orders), then click "OK".

MaintScape will ask you if you want to browse the generated work orders once generate is complete. Click "Yes". You will see the generated work orders displayed in the work order search window similar to the following:



Notice that every 6th work order, above, is generated from the 180 day PM rather than the 30 day PM.

13. Finally, we shall see how easy it is to duplicate nested calendar maintenance schedules to another equipment.

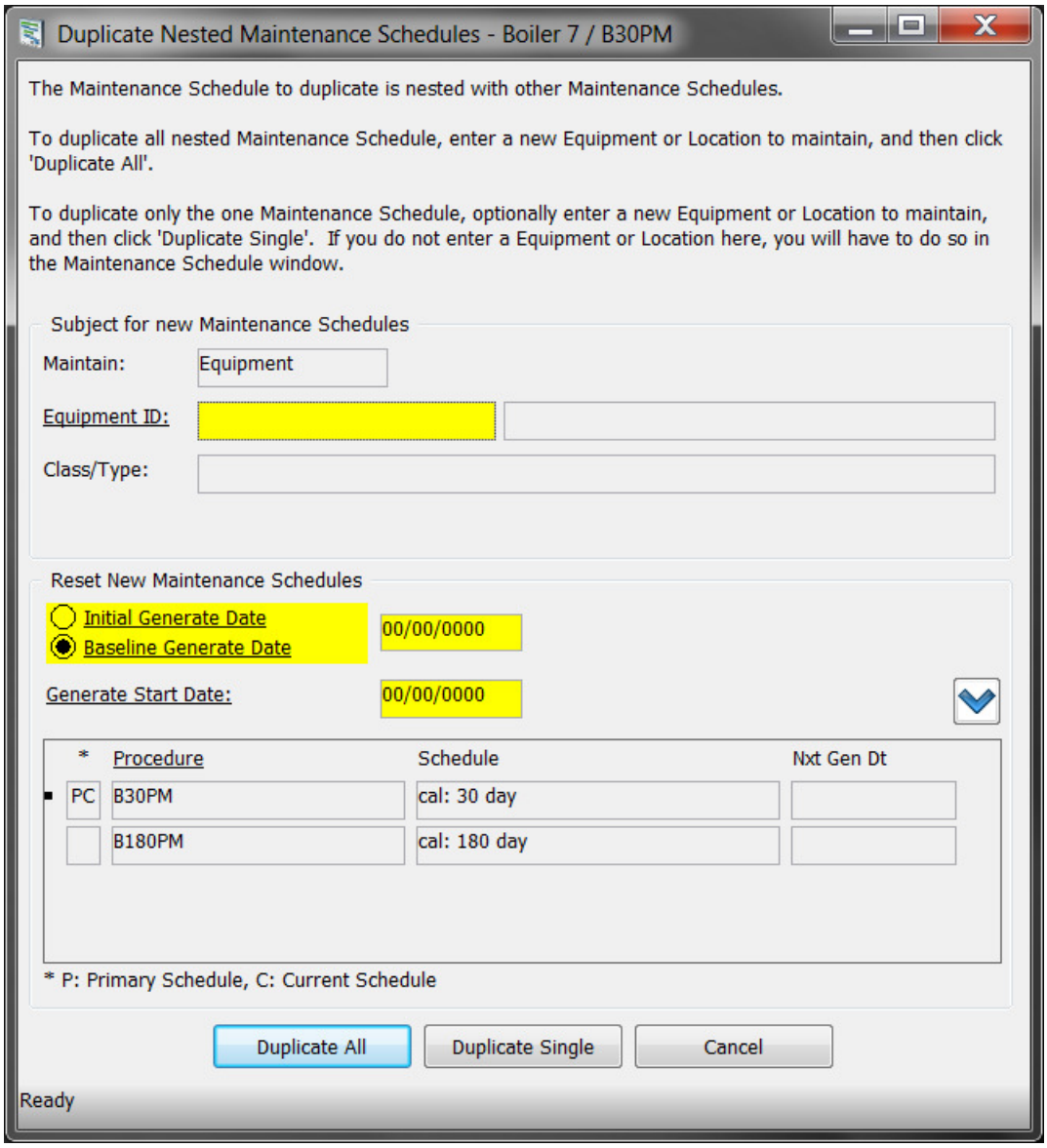
    Navigate to the MaintScape main menu window, and then click the (close all but current window) toolbar button to close MaintScape windows.

14. We will now bring back our primary maintenance schedule for equipment "boiler 6":

    Click the "Maintenance Schedule" icon, then select action "Search, Report and Bulk Operations…".

    Enter "boiler 6' into the Equipment ID field, then click the (search) button. You should see the 30 and 180 day maintenance schedules listed in the search results part of the window.

15. Double-click the 30 day PM maintenance schedule to display it in the maintenance schedule detail window. Click the (duplicate) toolbar button to display the "Duplicate Nested Maintenance Schedules" window as follows:



16. We will duplicate "boiler 6" maintenance schedules to equipment "boiler 7". Accordingly, enter equipment ID "boiler 7" into the "Equipment ID" field.

17. The duplication process also lets you reset the new nested set of maintenance schedules. We will specify reset parameters in a bit more sophisticated manner than we have done until now:

    Set the baseline generate date to June 30 of last year. We will assume this is the date "boiler 7" was installed, and thus its maintenance cycles should have started on that date. Now enter a "Generate Start Date" value of today (right click on the date field and select pop-up action "Set to Today").

    Now click the (down) button to preview next generate dates for each of the maintenance schedules that will be created for "boiler 7". Remember: the next generate date is the due date of the next work order to be generated from the maintenance schedule.

The next generate date was calculated for the 30 day PM (for example) as follows: 30 days was repeatedly added to the baseline generate date until the first date was obtained larger than the generate start date (today).

18. Click the "Duplicate All" button to create maintenance schedules for "boiler 7".

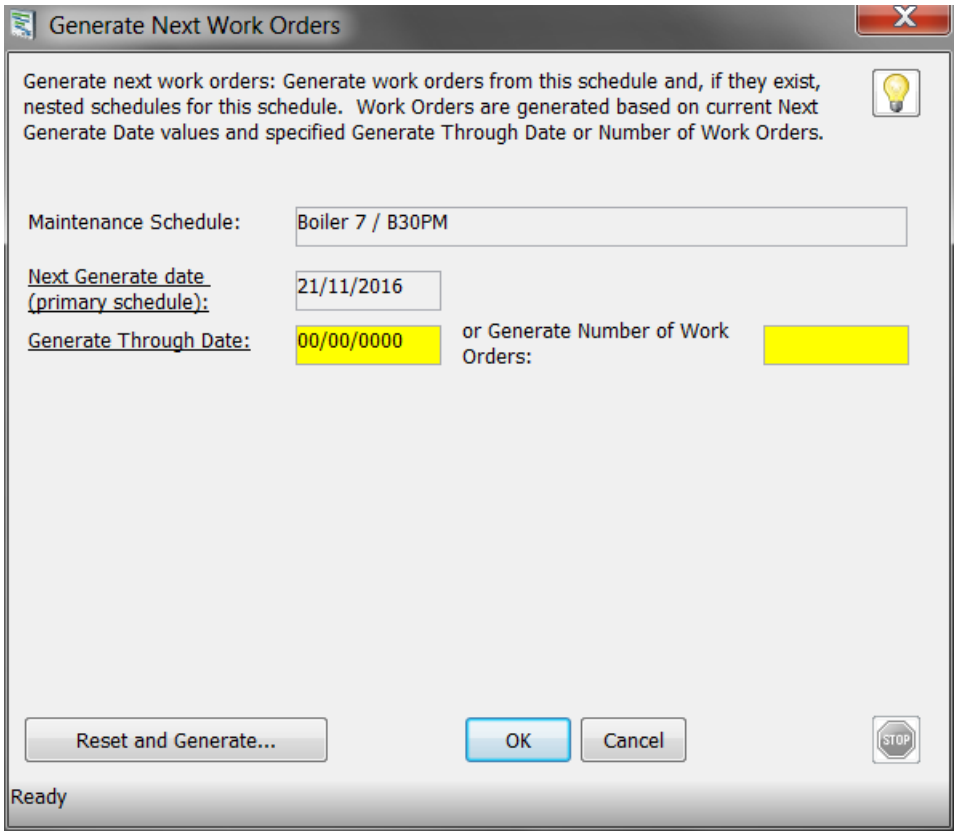
    You should now be looking at the maintenance schedule window displaying the maintenance 30 day PM maintenance schedule for equipment "boiler 7".

    Flip to the "Nested Schedules" tab to verify that the 180 day maintenance schedule is nested with the primary 30 day maintenance schedule.

19. Flip back to the "Main" tab of the maintenance schedule window.

    You can now generate work orders for "boiler 7" because the duplicate process also reset the new maintenance schedule which calculated next generate dates (due dates for the next work orders generated from the nested set of maintenance schedules).

    Click the (generate) picture button near the bottom-right of the screen and select pop-up action, "Generate Next…". You will see the following pop-up window:



    All you need to do is tell MaintScape how far ahead to generate work orders. Specify 1 year past the "Next Generate date (primary schedule)" field, then click "OK".

    Click "Yes" when asked if you want to browse the generated work orders. Verify that the 180 day PM work order properly nests with the 30 day PM work orders as was the case when you generated work orders for equipment "boiler 6".

Tutorial: Nested Meter Schedules

We will now create a pair of nested meter maintenance schedules:

1. Navigate to the MaintScape main menu window, and then click the  (close all but current window) toolbar button to close MaintScape windows.
2. We will first create the primary (most frequent) maintenance schedule. Click icon "Maintenance Schedule", then select action "New…".
3. Enter equipment ID "forklift 1" and procedure code "forklift 500" (500 hour maintenance).

   Notice that the latest meter reading is shown for "forklift 1" (1300 hours). You must enter a next due reading value larger than the latest reading value. This is the meter reading value at which the next work order will generate from this maintenance schedule.

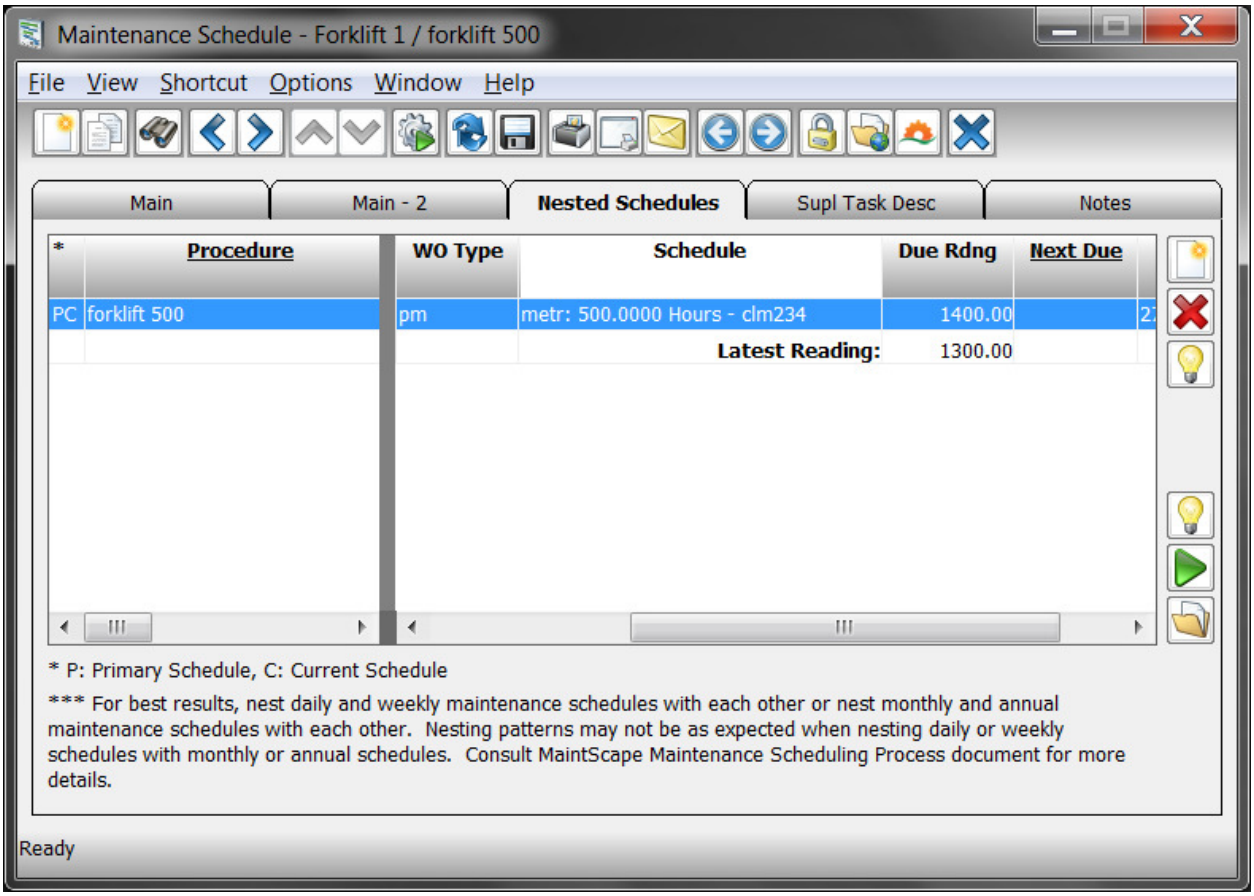
   Enter a next due reading value of 1400 hours. The value you enter is not important because we will compute next due reading values for both the 500 and nested 1000 hour maintenance schedules by resetting both schedules once they are nested.

   The maintenance schedule's meter reading type is set to "Hours of Use" because the default schedule for procedure "forklift 500" specifies this meter reading type, and because equipment "forklift 1" has a meter of this type. The "clm234" value following the meter reading type is the ID of the hours meter – this ID value is specified in the equipment type record and is optional.

   Save the maintenance schedule record by clicking  (save) on the toolbar.

   Notice that the "Nesting Status" value displayed for the maintenance schedule is "Standalone". This is because our newly added maintenance schedule is not involved in a nesting relationship (yet) with any other maintenance schedule.

4. Flip to the "Nested Schedules" tab of the maintenance schedule window to view the following:



The "Nested Schedules" tab lists all maintenance schedules in a nesting relationship with the currently displayed maintenance schedule. Presently only our maintenance schedule itself listed because it is "Standalone" (not yet involved in a nesting relationship).

5. We will now create a new maintenance schedule for equipment "forklift 1" and nest it to the just created maintenance schedule.

   Click the (new) button beside the list containing only the current maintenance schedule. Select the "Create New Maintenance Schedule…" option since the maintenance schedule to nest does not yet exist (we are about to create it).

6. You should now be looking at a new maintenance schedule window representing a not-yet-saved record. Note that equipment code value "forklift 1" is already filled in.

   This new maintenance schedule window should display on top of the maintenance schedule window displaying the first maintenance schedule for "forklift 1". If the new window fully covers the first window, move the window off to the side slightly to verify that the other window is still there.

   Note that MaintScape lets you have many instances of a given window type open at the same time. Please see the "MaintScape Quick Reference Fact Sheet" for more information on this.

7. Enter procedure code value "forklift 1000".

   Notice that the latest meter reading is again shown for equipment "forklift 1" (1300 hours). You must enter a next due reading value larger than the latest reading value. This is the meter reading value at which the next work order will generate from this maintenance schedule.

Enter a next due reading value of 1900 hours (500 hours past the 500 hour maintenance next due reading of 1400 hours). The value you enter is not important because we will compute next due reading values for both the 500 and nested 1000 hour maintenance schedules by resetting both schedules once they are nested.

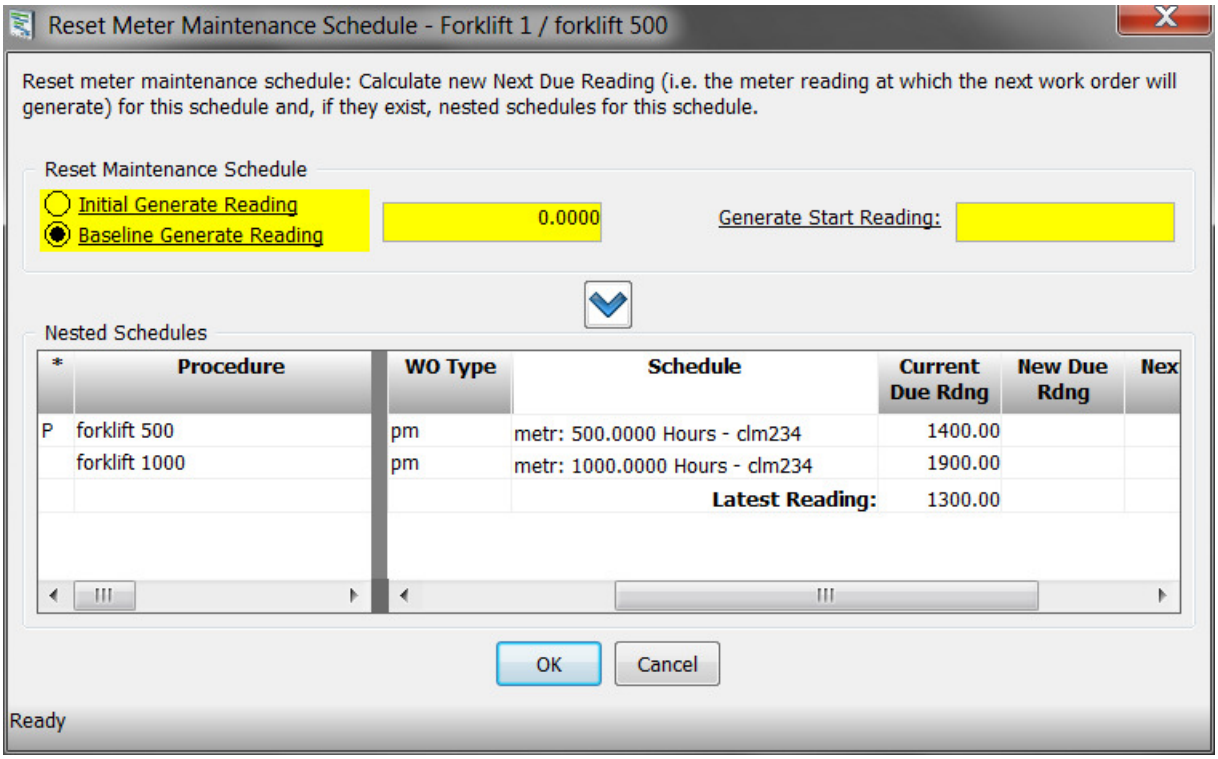
Save the maintenance schedule record by clicking (save) on the toolbar.

Click "Yes" in the pop-up query that asks whether to select the newly added maintenance schedule back to the first maintenance schedule window.

8. You should now be back at the first maintenance schedule window which now lists 2 maintenance schedules as nested. Note that the 500 hour maintenance schedule is both the primary maintenance schedule and the maintenance schedule currently displayed by the window. These facts are indicated by the codes "P" and "C" in the left-most column of the list.
9. Click the (down) toolbar button to change the maintenance schedule window to view the next maintenance schedule in the nested set. Notice that the left-most column now indicates that the 1000 hour maintenance schedule is currently displayed, however the 500 hour maintenance schedule remains the primary maintenance schedule (the least frequent maintenance schedule is always primary).
10. Flip to the "Main" tab of the maintenance schedule window. You should see that the 1000 hour maintenance schedule is in fact currently displayed, and that its "Nesting Status" value is "Nested".

    Click the (up) toolbar button to change the maintenance schedule window back to view the primary maintenance schedule (500 hour). Notice that its "Nesting Status" value is now "Primary" rather than "Standalone".
11. We will now reset the nested set of maintenance schedules so that they are prepared for generating work orders.

Click the (generate) picture button near the bottom-right of the screen and select pop-up action, "Reset Schedule…". You will see the following pop-up window:



Let's say we want the first 500 hour maintenance to occur at the 1500 hour reading. Select the "Initial Generate Reading" radio button option and enter 1500 in the field to the right. Click the (down) button to preview new next due readings for each of the maintenance schedules. They should be 1500 and 2000 hours for the 500 and 1000 hour maintenance schedules respectively.

Another way to reset schedule scenario may be more typical: Select the "Baseline Generate Reading" radio button option and enter 0 in the field to the right. Now enter the latest reading value of 1300 into the "Generate Start Reading" field. Click the (down) button to preview new next due readings for each of the maintenance schedules. They should be 1500 and 2000 hours for the 500 and 1000 hour maintenance schedules respectively. Each new reading was calculated by adding the schedule period (500 or 1000 hours) repeatedly starting from baseline reading of 0 until the first value is obtained larger than the start reading value of 1300. Essentially this iterates through all the maintenance that should have been done due starting from 0, stopping at the first reading for each schedule past the current reading value.

Click "OK" to update the next due readings for the primary and nested schedule.

12. We will now enter a meter reading for truck "forklift 1" larger than the next due meter reading for the 500 hour maintenance schedule but less than the next due meter reading of the 1000 hour maintenance schedule.

    Right-mouse click on the "Latest Reading" field (with value 1300 hours), and select pop-up action "New Reading…". You should now see the meter reading window with equipment "forklift 1" already filled in.

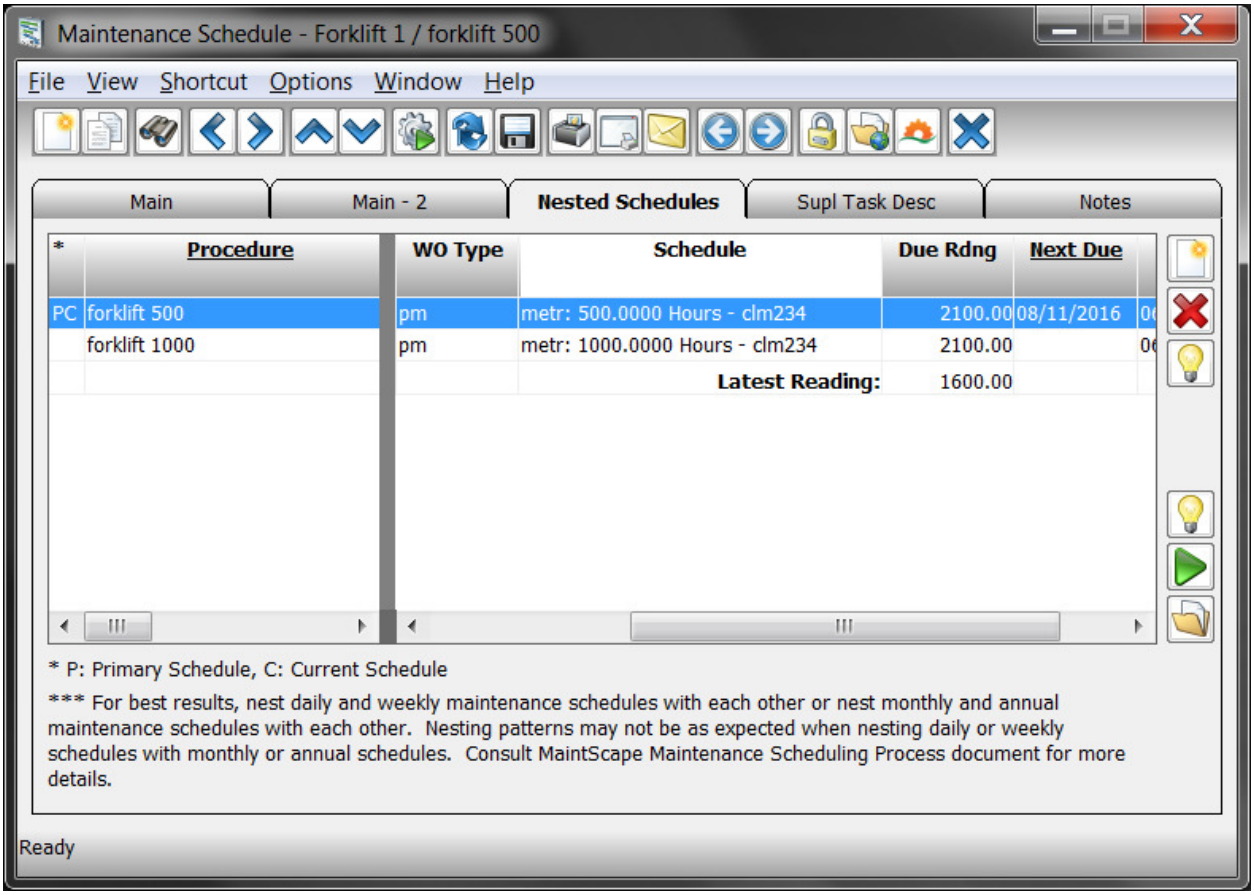
    Enter meter reading value of 1600 hours, then click (save) on the toolbar to save the meter reading, however **before you do this**, carefully watch the status bar at the bottom of the meter reading

window. You will see (quickly) the actions that MaintScape takes. One of these actions is to generate a work order from the meter maintenance schedule.

You may see a couple of pop-up windows that you should click "OK" to:

- You may be warned that the difference between your meter reading value and the last meter reading value was larger than expected. This is a safety mechanism to potentially catch a mistyped reading value. The expected difference is specified in the equipment's Equipment Type record as part of the data defining the meter to all equipment of the particular type.
- You may see a pop-up window saying, "Concurrency notice – information on window titled … has changed elsewhere within MaintScape and thus is no longer accurate". This happened because the act of entering the meter reading that triggered the maintenance schedule caused changes to the maintenance schedule displayed in an open MaintScape window, and you are warned that the data in this window is therefore no longer accurate.

13. Switch back to the Maintenance Schedule window showing your meter maintenance schedule. Observe that the "next due" meter reading field still reflects the original value (1500 hours). Click the (refresh) toolbar button to observe that the "next due" meter reading field now reflects the new "next due" meter reading (2100 hours), which is the triggering meter reading value (e.g. 1600 hours) plus the meter frequency (500 hours).
14. Flip to the "Nested Schedules" tab of the maintenance schedule window to view the following:



Notice that MaintScape kept the 500 and 1000 hour maintenance schedules aligned by advancing the next due reading for the 1000 hour maintenance schedule from 2000 hours to 2100 hours.

To summarize what has happened: prior to entering your meter reading of 1600 hours, the next due reading values for the 500 hour and 1000 hour maintenance schedules was 1500 hours and 2000 hours respectively. The 1600 hour meter reading triggered the 500 hour maintenance schedule because it was larger than its next due reading value of 1500 hours. MaintScape then adjusted the next due reading of the 500 hour maintenance schedule to 500 hours past the triggering reading of 1600 hours. Finally, MaintScape adjusted the next due reading values of nested maintenance schedules that did not trigger by the difference between the triggering reading (1600 hours) and the original next due reading (1500) hours. Thus the next due reading value for the 1000 hour maintenance schedule was advanced from 2000 hours to 2100 hours.

15. We will look at the generated work order to verify that it was generated from the 500 hour maintenance schedule.

    Flip to the "Nested Schedules" tab of the maintenance schedule window. Notice that there is a date value in the "Next Due" column for the 500 hour maintenance schedule (you can see this in the screen print above). Right-mouse click on this date and select pop-up action "Open Work Order". Note that this action opens the work order in a work order window, it does *not* "status change" the work order to "open".

    Verify that the work order corresponds to the 500 hour maintenance schedule procedure. Flip to the "Main – 2" tab of the work order window to see that MaintScape indicates the work order was generated from a Maintenance Schedule for a particular meter reading.

    Close the work order window when done.

16. As pointed out above, the next due reading value for the 500 and 1000 hour maintenance schedules are now both 2100 hours. We do not ask you to do this, but say you now enter a meter reading for "forklift 1" of 2150 hours. Both maintenance schedules would trigger work orders, however since they are nested, one work order will be generated from only the less frequent maintenance schedule (1000 hour)[2].

    After this work order is generated, the next due reading value for the 500 hour maintenance schedule will update to 2650 hours (2150 + 500), and the next due reading value for the 1000 hour maintenance schedule will update to 3150 hours (2150 + 1000). The 500 and 1000 hour maintenance schedules remain aligned.

    (there is nothing for you to do in this tutorial step)

17. Finally, we shall see how easy it is to duplicate nested meter maintenance schedules to another equipment.

    Navigate to the MaintScape main menu window, and then click the  (close all but current window) toolbar button to close MaintScape windows.

18. We will now bring back our primary maintenance schedule for equipment "forklift 1":

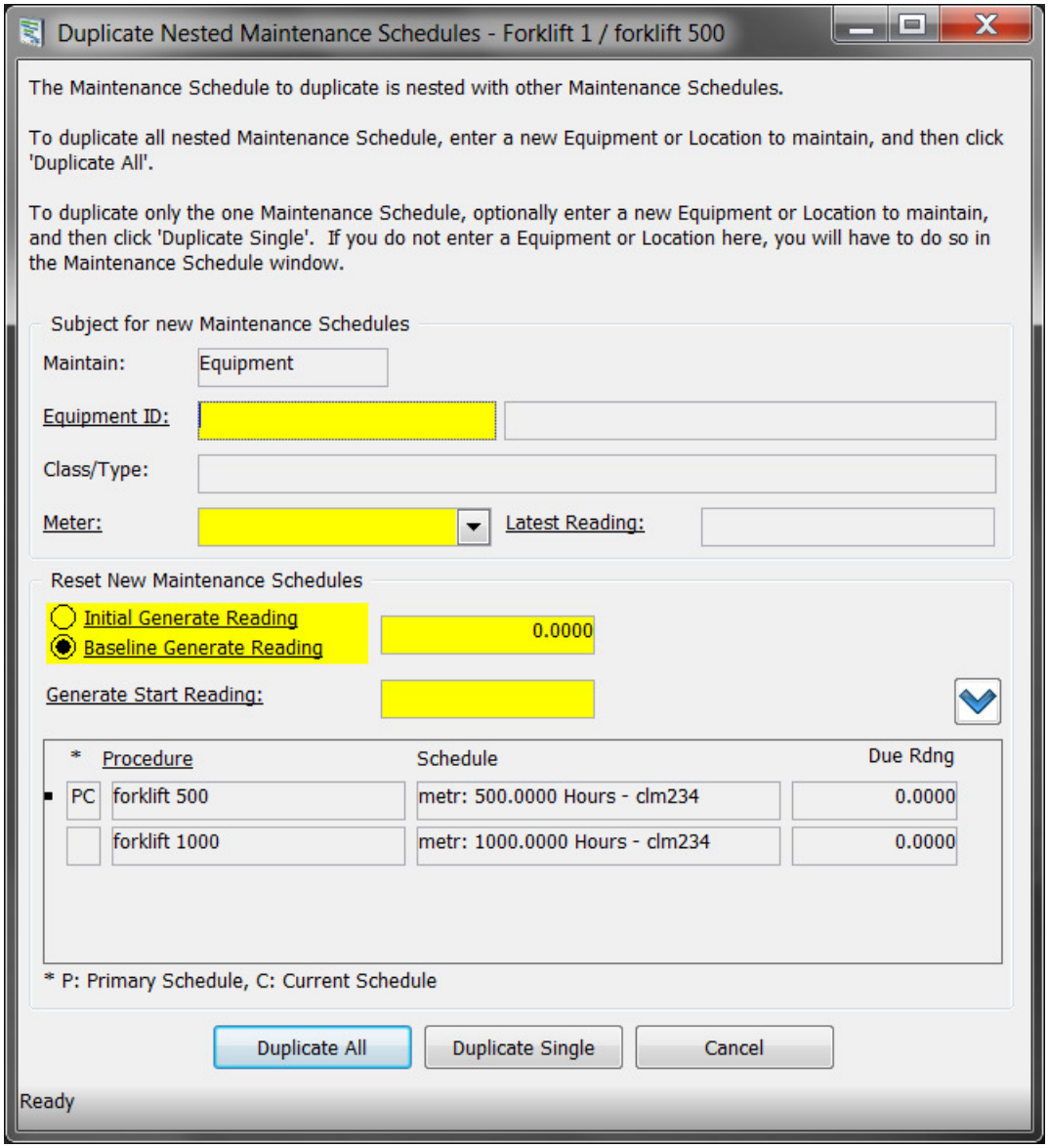
    Click the "Maintenance Schedule" icon, then select action "Search, Report and Bulk Operations…".

    Enter "forklift 1' into the Equipment ID field, then click the  (search) button. You should see the 500 and 1000 hour maintenance schedules listed in the search results part of the window.

[2] This is based on the assumption that the primary maintenance schedule (500 hour) has "Nesting Generate Option" set to "Suppress nested schedules". If the option was "All nested schedules in one work order", then the work order would have two tasks – one based on the 500 hour maintenance schedule procedure, the other based on the 1000 hour maintenance schedule procedure. Note that the less frequent schedule procedure (1000 hour) will be first.

19. Double-click the 500 hour maintenance schedule to display it in the maintenance schedule detail window.

    Click the (duplicate) toolbar button to display the "Duplicate Nested Maintenance Schedules" window as follows:



20. We will duplicate "forklift 1" maintenance schedules to equipment "forklift 2". Accordingly, enter equipment ID "forklift 2" into the "Equipment ID" field. Notice that the "Meter" field defaults to the hour meter, and the latest hour reading value for "forklift 2" is displayed (1050 hours).

21. The duplication process also lets you reset the new nested set of maintenance schedules. We will do this in a similar manner to how we reset the nested maintenance schedules for "forklift 1".

    Select the "Baseline Generate Reading" radio button option and enter 0 in the field to the right. Now enter the latest reading value of 1050 into the "Generate Start Reading" field. Click the (down) button to preview new next due readings for each of the maintenance schedules. They should be 1500 and 2000 hours for the 500 and 1000 hour maintenance schedules respectively. Each new

reading was calculated by adding the schedule period (500 or 1000 hours) repeatedly starting from baseline reading of 0 until the first value is obtained larger than the start reading value of 1050.

22. Click the "Duplicate All" button to create maintenance schedules for "forklift 2".

    You should now be looking at the maintenance schedule window displaying the maintenance 500 hour maintenance schedule for equipment "forklift 2".

    Flip to the "Nested Schedules" tab to verify that the 1000 hour maintenance schedule is nested with the primary 500 hour maintenance schedule.

    Equipment "forklift 2" is now configured such that maintenance schedules will generate upon entering meter readings past the next due reading threshold of either or both nested maintenance schedules.

Parts Inventory Control

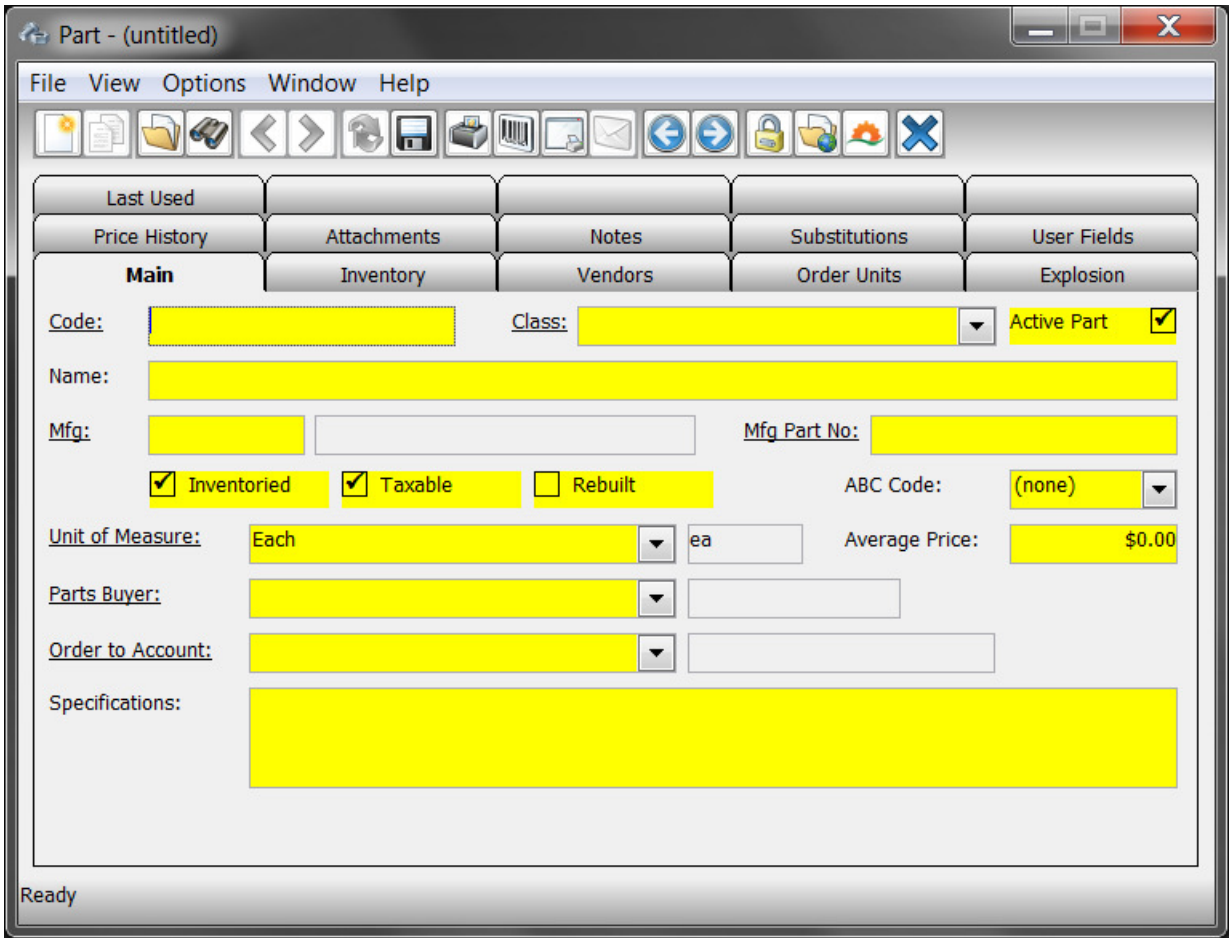
Inventory Control is only available for parts when the MaintScape "inventory control" module is enabled. The parts file is available if the module is not enabled, and you can still specify storage locations for parts, however MaintScape will not track inventory quantities.

Creating a Part Record

We will create a new Part record, place it under inventory control, and take actions that will cause inventory levels to change. The following exercise can be performed even if the MaintScape inventory control module is not enabled.

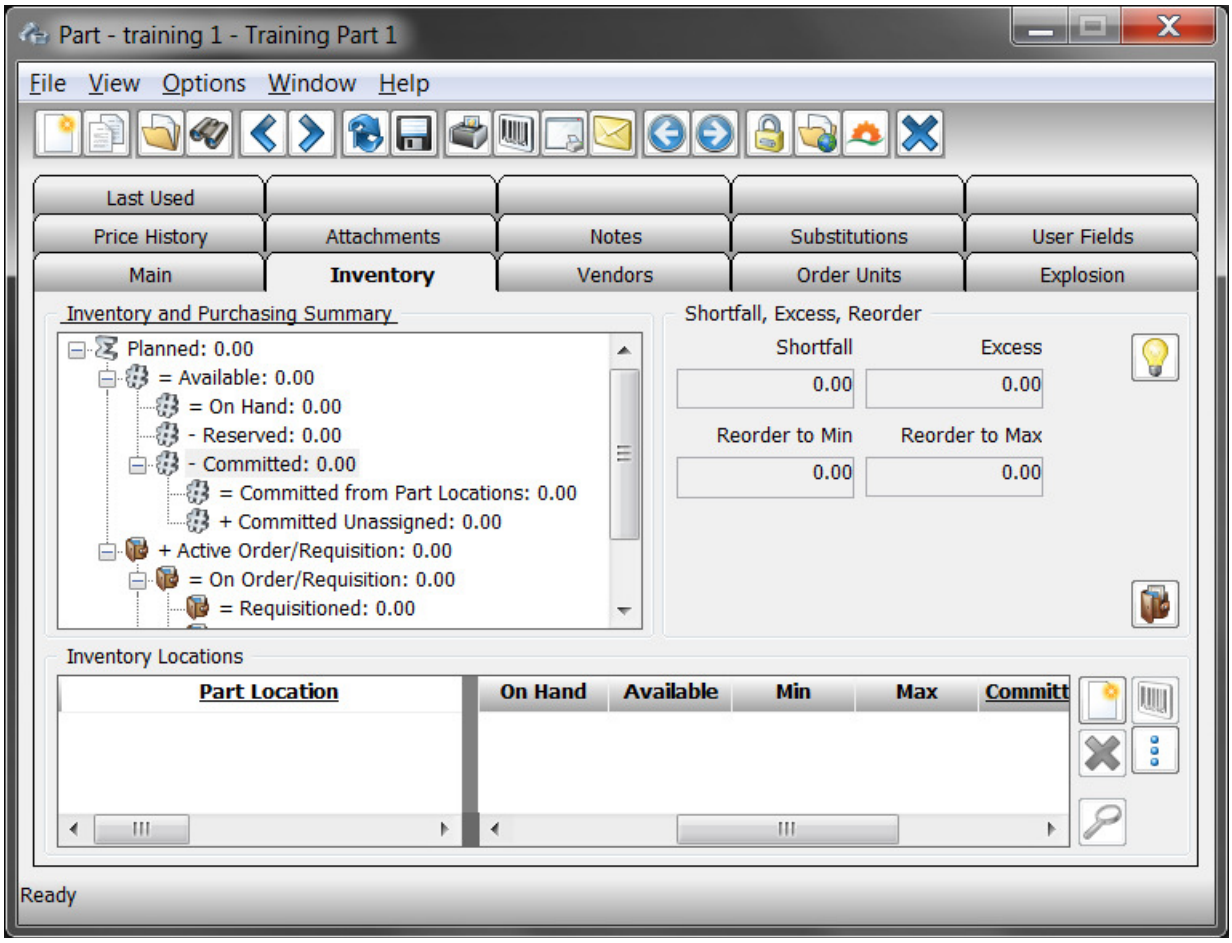
1. Navigate to the MaintScape main menu window, and then click the  (close all but current window) toolbar button to close MaintScape windows.

2. Click the "Parts" icon, then select action "New Part…". You will see the following window:



3. Specify a short value for the part "Code". No two part records may have the same ID. Suggestion: "training 1".
4. Select part class "Bearing".
5. Specify a more descriptive value for the "Name". Suggestion: "Training Part 1".
6. Check the "Inventoried" check box (only possible if Inventory Control module is enabled).
7. Click the (save) toolbar button to save the part to the database.

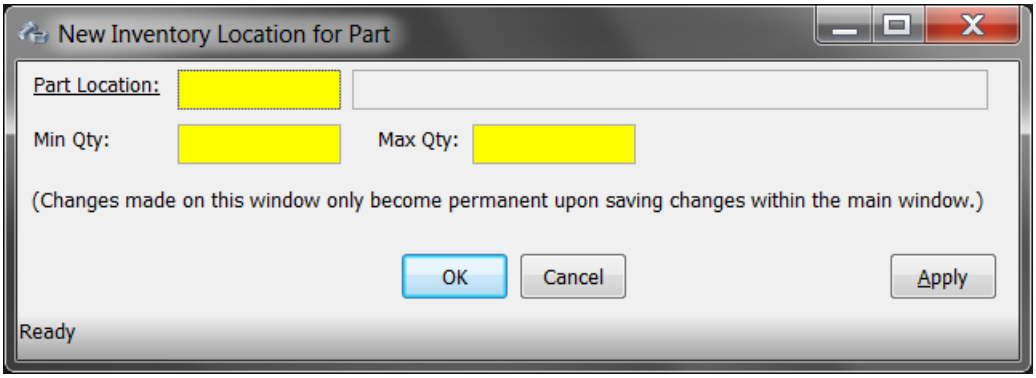
8. Flip to the "Inventory" tab. Your window will look like the following:



This view displays aggregate inventory quantities, and displays the storage locations for the part and the quantities at each location.

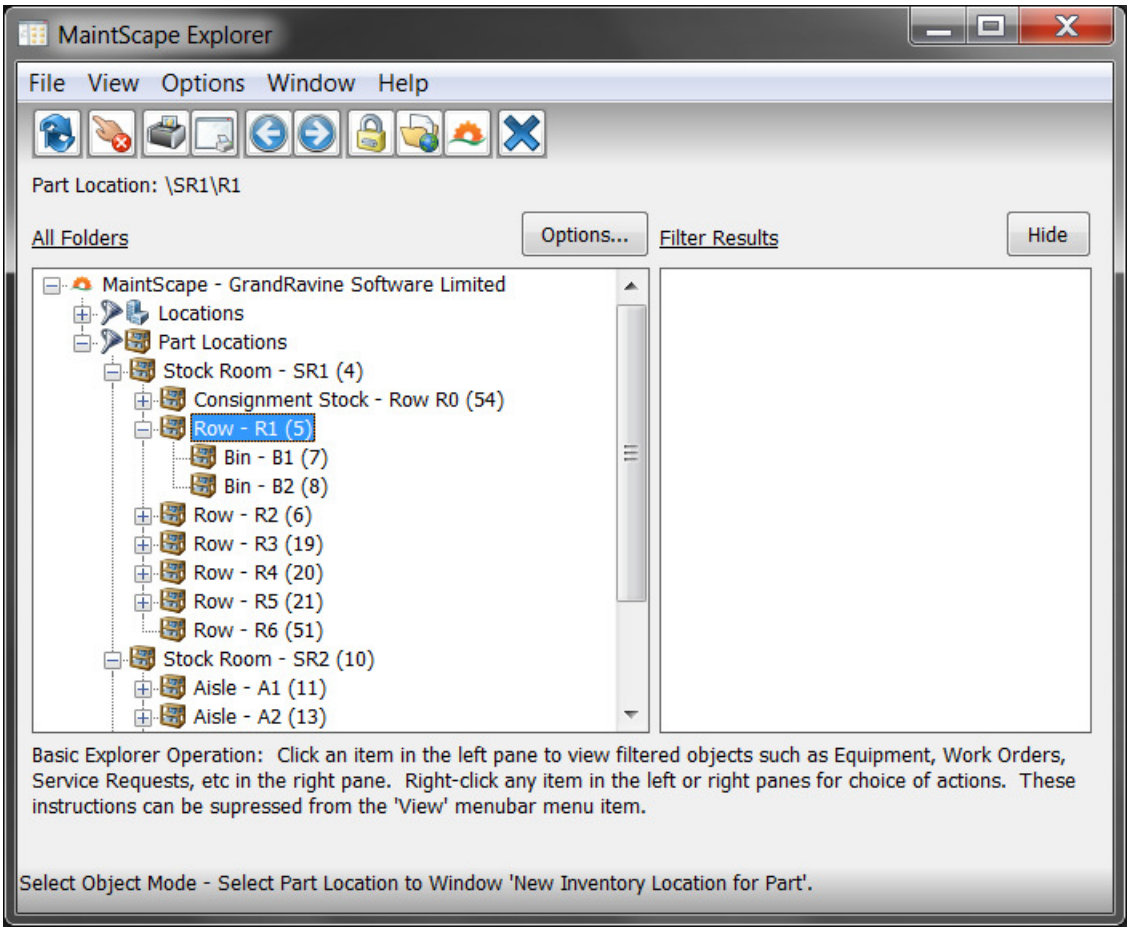
See the Parts Re-order Inquiry section, below, for description of the various part quantity types.

9. Click the (new) picture button in the "Inventory Locations" group to identify a storage location for the part. You will see the following pop-up window:



10. Right-click on the Part Location field and select action "Search using Explorer". Part Locations are viewed and maintained in the MaintScape Explorer, the same way regular Locations are as seen in the Equipment tutorial.

Expand tree nodes within MaintScape Explorer until you see the node selected below. You may want to maximize or increase the size of the Explorer window first.



Notice that the status bar at the bottom of the window indicates the Explorer is in "Select" mode.

11. We will add a new storage location, "Bin - B3", as the storage location of our new part.

    Right-click explorer node "Row - R1" and select action, "New Child…". Enter the following values into the resulting pop-up window:

Relative Name (short)	B3
Location Type	Bin

    Click the (save) button on the toolbar to save the new storage location.

    You will then be asked if you want to "select" the part location back to the "New Inventory Location for Part" window. Click "Yes".

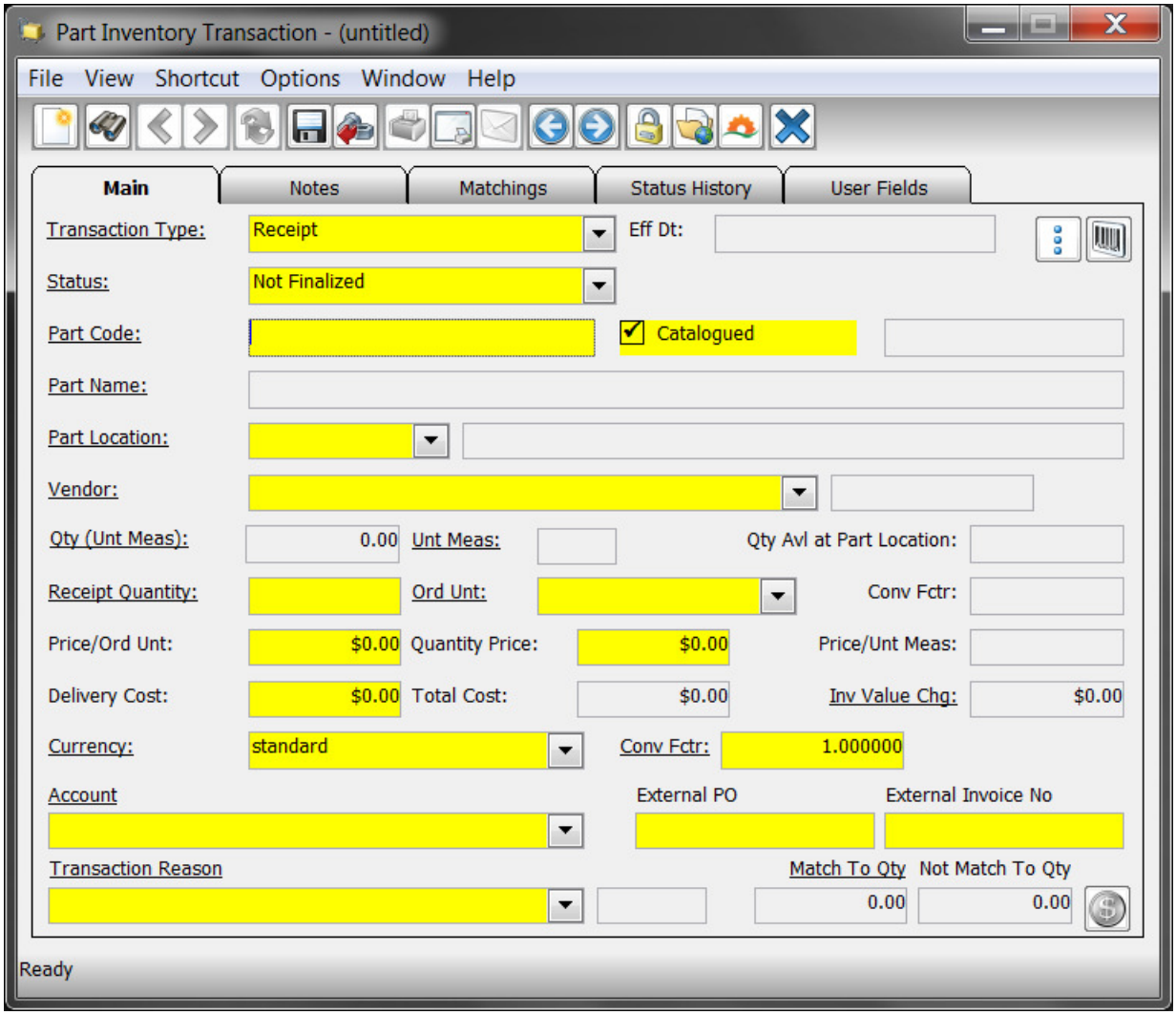
12. Specify minimum and maximum quantities for the Part at the Part Location as 5 and 20 respectively.
13. Click "OK" to save the new part location for the new part.
14. Click the (save) toolbar button to save the part record changes to the database.

Inventory Transactions for a Part

The following exercise CANNOT be performed unless the MaintScape inventory control module is enabled.

We will first receive a quantity of the new part into MaintScape.

1. Navigate to the MaintScape main menu window, and then click the (close all but current window) toolbar button to close MaintScape windows.
2. Click the "Parts" icon, then select action "New Part Inventory Transaction…". You will see the following window:



We want to enter a "Receipt" transaction. This transaction type is the default.

Inventory transactions are saved as one of two statuses:

Not Finalized	Transaction information is not yet complete. The transaction quantities reflect into the inventory values, however the transaction does not yet factor into the part cost calculation.
	Status "not finalized" is only supported for transaction types "Receipt" and "Return to Vendor". Its purpose is to keep transaction data modifiable until transaction cost

information (e.g. price per order unit) is known (i.e. invoice is received).

IMPORTANT: Part Inventory Transactions should not stay status "Not Finalized" for any length of time, and you should periodically make sure the number of such transactions is reasonable. You can use the "Today's Status" dashboard for Part Inventory Transactions to monitor this.

Issued Transaction is complete and no longer modifiable.

3. Scroll through the transaction types to see those that are available. Notice how the fields available vary by transaction type.

   Set transaction type back to "Receipt".

4. Don't worry about changing transaction status to "Issued" – we will save the clicks needed to do this by saving the transaction as status Issued a couple of steps further below.

5. Enter the code for the part which you just created (suggested value was "training 1").

   Notice that the part storage location fills in automatically. You could select the storage location from the drop-down if more than one was specified.

   No vendors are displayed in the "Vendor" drop down since you did not define any vendors for the part. Right-click on the vendor field and select action "Quick Tip" to see information on manually selecting a non pre-defined vendor.

6. Enter a receipt quantity (15), leave order unit at "Each", and specify a price per order unit ($10.00).

7. Click the  (save as issued) toolbar button to save the inventory transaction to the database as status Issued.

   The transaction should be non-modifiable once saved.

8. Right-click on the "part code" data field, highlight action "Open", then select "Inventory Page".

   You should now see the part record in the part window. Notice that the inventory levels reflect the receipt transaction.

Advanced Exercise – 1

The advanced exercises do not lead you through steps in the same level of detail as the regular exercises, thus giving you an opportunity to apply principles already covered. Please ask you instructor if you need hints (this is to be expected).

1. Create a new Work Order which uses one or more units of your new part. Save the Work Order as status "Open". Then view inventory levels for the part in the Part window, inventory page.

   HINT: Click the  (refresh) toolbar button on any MaintScape window to re-retrieve and re-display data from the database. You may want to do this if you suspect the data you are looking at is "stale".

   You will notice that the quantity of the Part on your Work Order is shown as "committed".

2. Close your new work order (i.e. change the work order's status), then view inventory levels for the part in the Part window, inventory page. Refresh the display if necessary.

   You will notice that the Commit quantity of the Part has decreased and the On Hand quantity has also decreased. This reflects the fact that the parts are considered to have been used.

   The Available quantity is unchanged since committed parts are not considered available.

3. Search for Inventory transactions for your part. You will notice that MaintScape created a "Issue to Work Order" inventory transaction when you closed your work order. MaintScape issues parts from inventory to a work order at the time the work order is closed.

Advanced Exercise – 2

1. Create a second storage location for your new part.

   (Hint: this is done within the Part window, "Inventory" tab).

2. Create an inventory transaction to transfer quantities of your part from the first storage location to the second.

   (Hint: from the main menu window, select an action to create a new part inventory transaction. Set the transaction type to "transfer from").

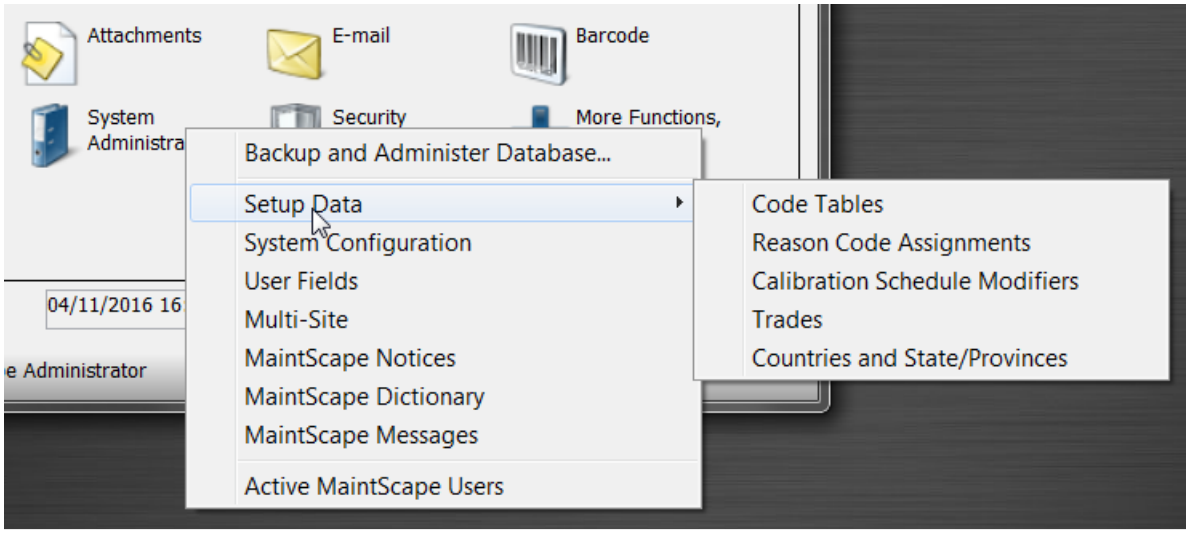
3. Create a "Direct Issue" inventory transaction. This transaction type is used to remove parts from inventory outside of a work order.

4. Create a "Count" inventory transaction. This transaction is used to update the MaintScape inventory level to reflect a physical count quantity.

MaintScape Administration

MaintScape administration is the process of configuring MaintScape to support your standards and to facilitate usage by MaintScape users. You should use MaintScape security functionality to restrict access to very few individuals; otherwise choices available to MaintScape users may be incoherent and confusing. The choices you make when configuring MaintScape may have a long term impact on how your maintenance data is organized and classified.

MaintScape administration functions are accessed through main menu icon "System Administration":



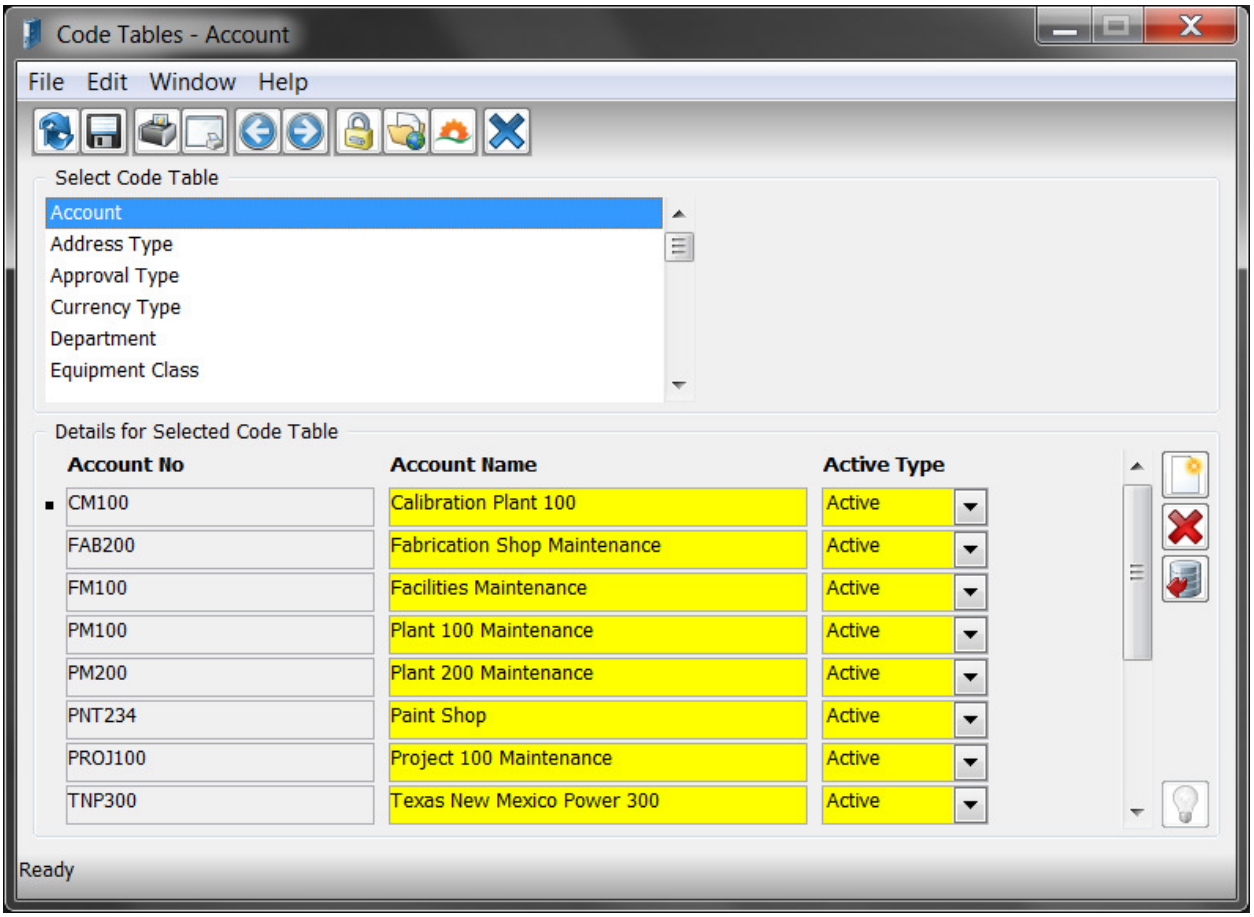
Setup Data

The "Setup Data" menu functions are used to create and maintain code table data. For example, code table "Account" is the list of accounts to which costs may be charged.

The “Code Tables” menu item is used to maintain simple code tables. Other menu items, such as “Trades”, are used to maintain setup data that is more complex or takes part in relationships with other data.

We will explore the window to maintain simple code tables.

1. Navigate to the MaintScape main menu window, and then click the (close all but current window) toolbar button to close MaintScape windows.
2. Click on the main menu icon “System Administration”, highlight action “Setup Data” and then click action “Code Tables”.
3. Click on the “Account” code table at the top of the Code Tables window. You will then see the following window:



This window shows you the values for the “Account” code table. You can see and modify values for the various code tables by clicking on their name in the “Select Code Tables” group at the top of the window.

In order to preserve accurate historical data, code values that have been used cannot be deleted. However they cannot be associated with new records if they are set to “inactive”.

Please note there is another Active Type value available for code values: “Search”. A code value of active type “Search” also cannot be associated with new records; however the code value will appear in search criteria drop-down lists. This means you can search for records with this code value.

Exercises:

1. Click on each code table type to see what type of data each represents.

2. Add at least 2 new code values to each of the “Department” and “Failure Reason” code tables.
3. Return to the “Department” code table. Modify one of the code values that you entered and delete another.

User Administration and Security

MaintScape Staff records should be created for people internal to your organization if they will either use MaintScape or will be associated with MaintScape data – for example, if they are a craftsman assigned to a work order.

A MaintScape user is essentially a MaintScape staff record that is granted logon access to MaintScape. A MaintScape user’s permissions are established by assigning them a Security Role. Security Role permissions are set up in a separate “Security Role” window.

You must be logged on as user ‘dba’ (MaintScape Administrator) to set up MaintScape users.

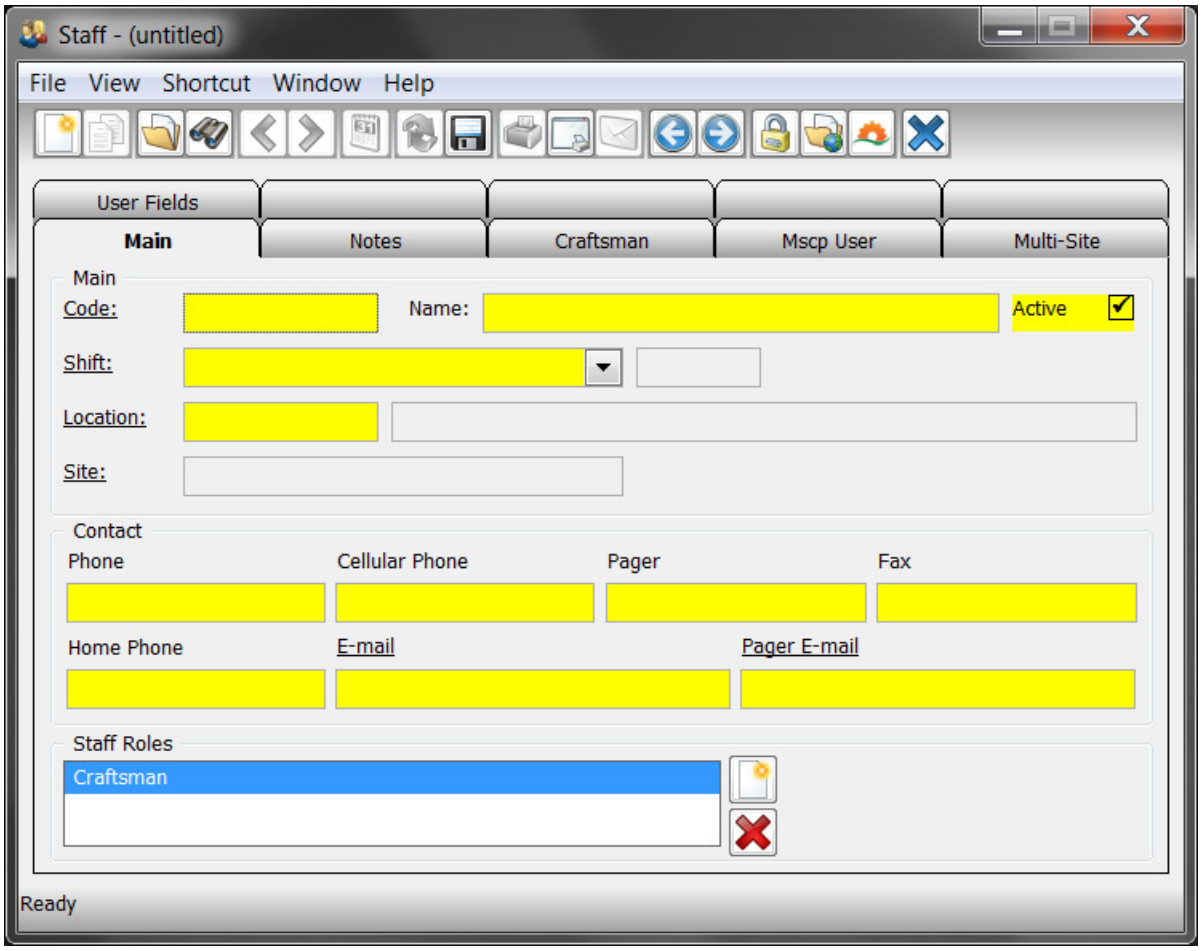
We will now create a new staff record in MaintScape, grant the staff record logon access to MaintScape, and finally associate a security role to the staff who is now a MaintScape user.

1. Navigate to the MaintScape main menu window, and then click the  (close all but current window) toolbar button to close MaintScape windows.
2. Click the “staff” icon, then select action “New…”.

3. You will be asked what "role" to assign to the new staff record. The values available are fixed by MaintScape because MaintScape permits specific actions for staff based on the roles they are assigned. Although you can only choose one role in this window, you can add or remove roles within the staff window itself.

   If a staff member is to be assigned to work orders, they should be assigned role "Craftsman".

   Select staff role "Craftsman", then click "Select". You will see the following screen:



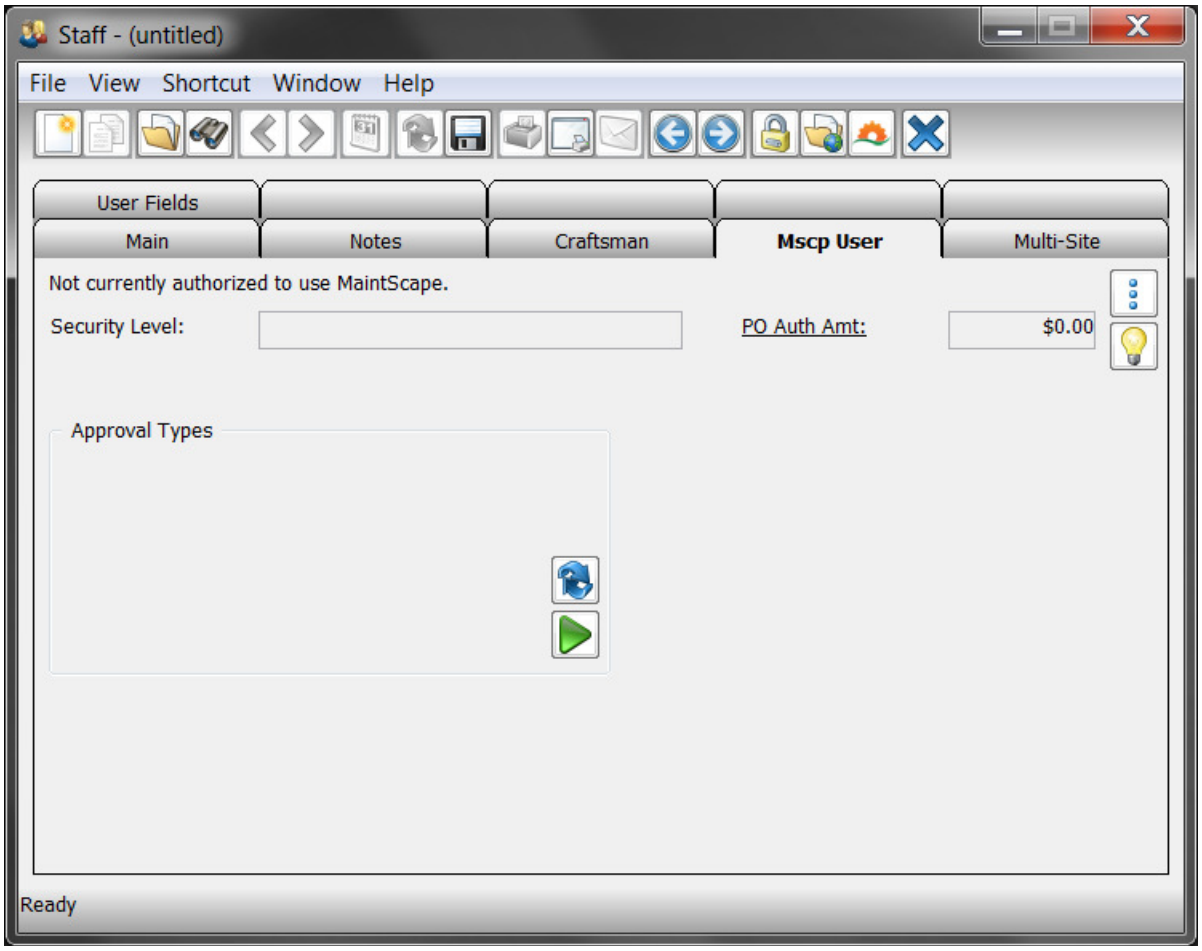
4. Enter a "Code" and "Name" value for your new staff record – perhaps you would like to set this staff record to represent yourself. Optionally enter phone number and email information.

5. Click the (save) toolbar button to save your staff record to the database.

We will now grant your new staff member logon access to MaintScape. IMPORTANT: In order to do this, you must be logged on to MaintScape as user "dba".

If you are not logged on as "dba", exit MaintScape and log back in. The quickest way to bring back the staff window with your new staff record is using the "Recent" tab of the main menu window (see exercise *Basic MaintScape Navigation - 2*, page 9).

6. Flip to the "Mscp User" tab. Your window will look like the following:



Notice that this window view is not modifiable and says the staff member is, "Not currently authorized to use MaintScape".

You will only see the "PO Authorization Amount" field if you are licensed for the MaintScape Purchase Order module. You will similarly only see the "Multi-Site" tab if you are licensed for the Multi-Site module.

7. Click the (action) button and select pop-up action, "Grant Access to MaintScape…". You are then prompted for the new staff member's logon ID and password. Notice that the logon ID defaults to the staff code value. Enter a password value in both the main and confirmation fields.

   Notice you can check an option forcing the user to change their password at their first logon.

   Further on password security: MaintScape lets you define password rules such as minimum length, number of characters of various types (e.g. numeric, upper/lower case, special characters), and password expiry. This is done from the Main Menu window by clicking on icon "Security", then pop-up action "Password Rules".

8. The "Security Level" and "PO Auth Amt" fields should now be modifiable, indicating the new staff member is granted logon access to MaintScape.

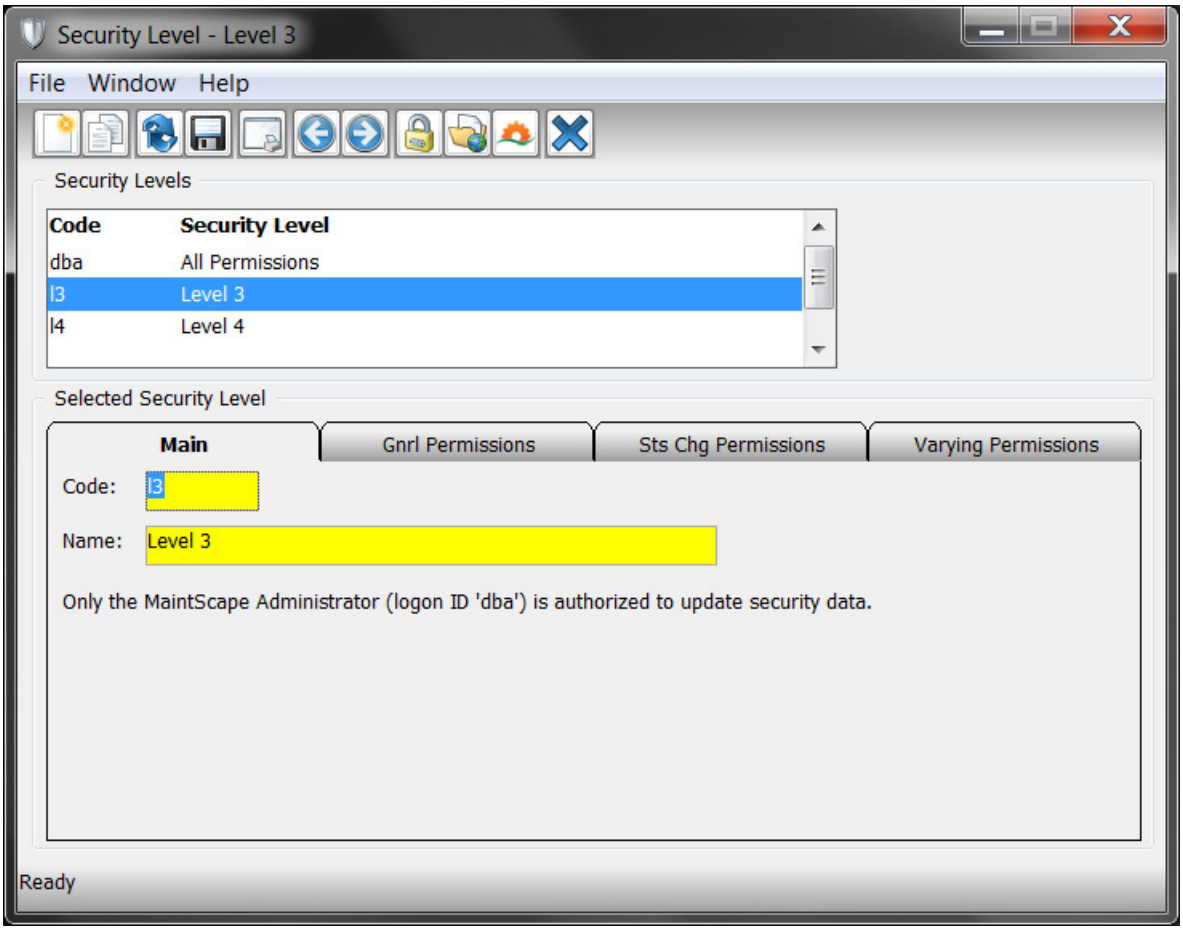
9. Select security level value "Level 3" to assign MaintScape security permissions to the new user, then click the (save) toolbar button.

The only security level built into MaintScape is “All Permissions”. You must create other security levels yourself (“level 3” was created when the sample database was set up). A user may be assigned no security level, in which case they can view data in MaintScape but will not be able to take any action that would create, update, or delete data.

Even though you can assign security level “All Permissions” to a MaintScape user, there are still some MaintScape actions that can only be performed when logged on as user “dba”. For example, granting/revoking access to MaintScape and maintaining security levels.

We will now see what is represented by a security level.

10. Right-mouse click on the “Security Level” field and select pop-up action, “Open”. The security level window will open and look like the following:



This is the window where you view, modify and create security levels.

Select a security level in the “Security Levels” group to see its characteristics. Note that permissions for the security levels are viewed and modified in the “Selected Security Level” group tabs: “General Permissions”, “Status Change Permissions”, “Varying Permissions”.

Each tab other than “Main” has a (export) button which creates a spreadsheet of permissions supporting easy comparison of security levels.

You would click the (new) toolbar button to create a new security level.

You can access the Security Level window from the MaintScape main menu by clicking icon “Security”, then selecting pop-up action “Security Levels”.

IMPORTANT: You can only maintain security levels when logged on to MaintScape as user "dba".

11. With security level "Level 3" selected, flip through the "Selected Security Level" group tabs to see the set of securable permissions.

    IMPORTANT: Each tab has a drop-down category selector at the top. Changing the selection accesses a different set of permissions.

12. Perform the following permission changes to security level "Level 3":

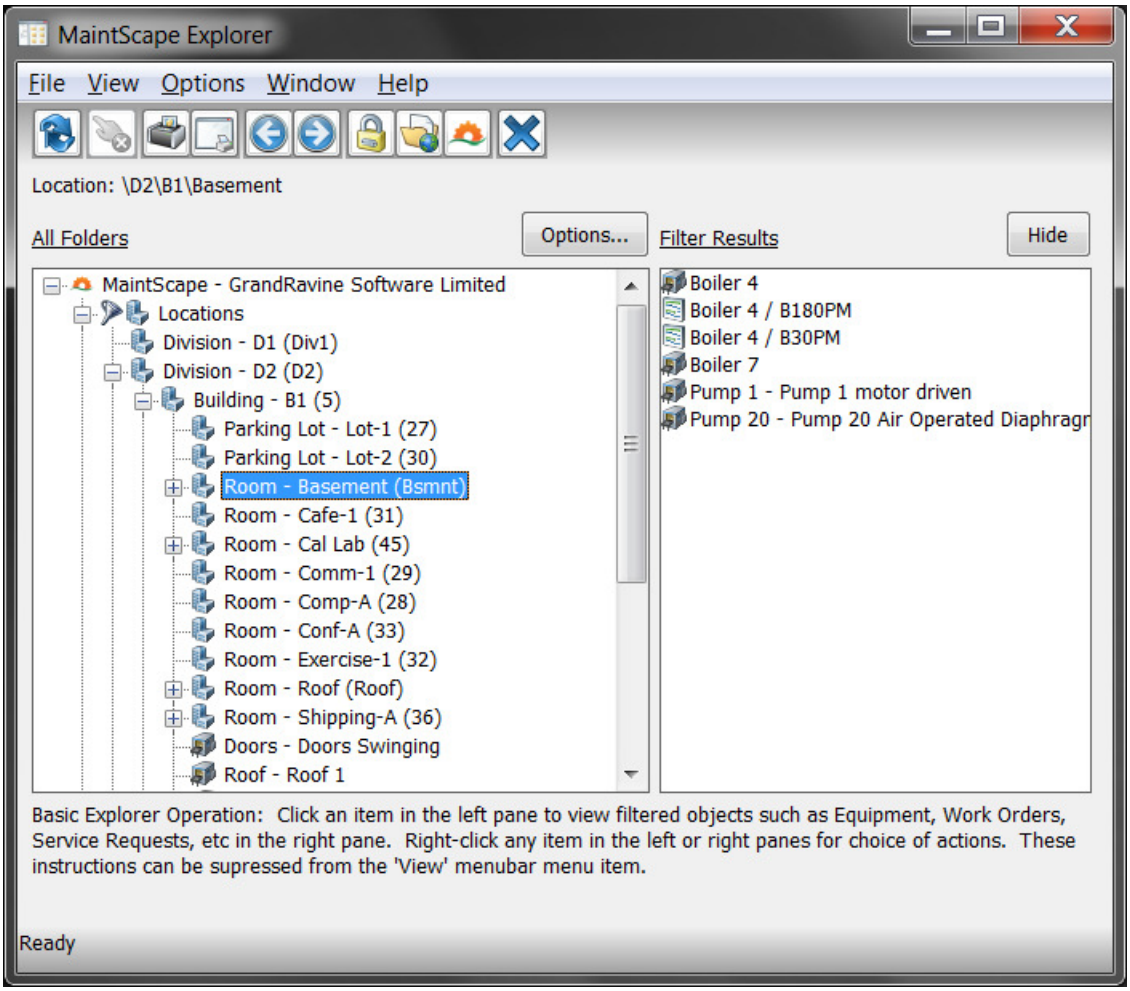
- General Permissions tab page:
  - Prohibit updating status for equipment (OK to update other equipment properties)
  - Permit creating and updating External Resource[3] records.
  - Permitted creating, updating and deleting accounts (hint: "Account" belongs to object category "Code Table").
- Status Change Permissions tab page:
  - Prohibit deferring open work orders
  - Permit opening a pending approval purchase order.
- Varying Permissions tab page:
  - Permit updating open work orders.
  - Permit updating open service requests.

[3] External Resource records represent parties external to your organization – E.g. vendors, contractors, etc.

Special Functions

MaintScape Explorer – Basic Operation

You have already used MaintScape explorer to select locations and part locations into fields on MaintScape windows. This exercise will cover MaintScape Explorer in more detail. A typical view of MaintScape Explorer is shown below:



MaintScape Explorer is modeled on the Microsoft Windows File Explorer. It displays a tree structure of locations, equipment and part locations in the left side of the window, and a list of the 'contents' of any selected one of these items in the right side of the window. The 'contents' are completely configurable using 'filters'. You will set up filters in the next exercise.

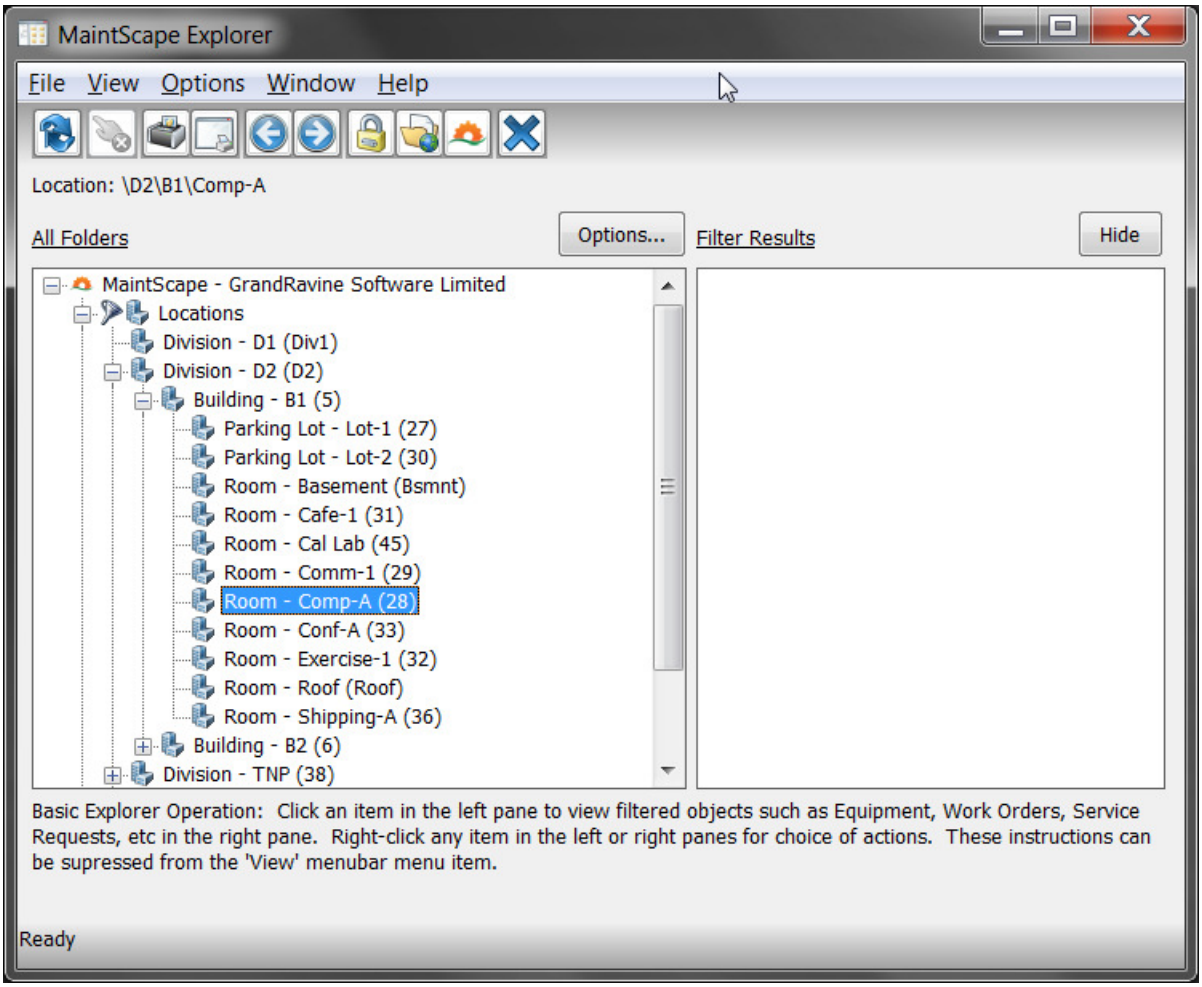
In the example view of MaintScape Explorer, above, the right-side icon  represents Equipment at the selected location, and  represents a Maintenance Schedule for equipment at the selected location.

Other examples of 'contents' that can be displayed within MaintScape Explorer include:

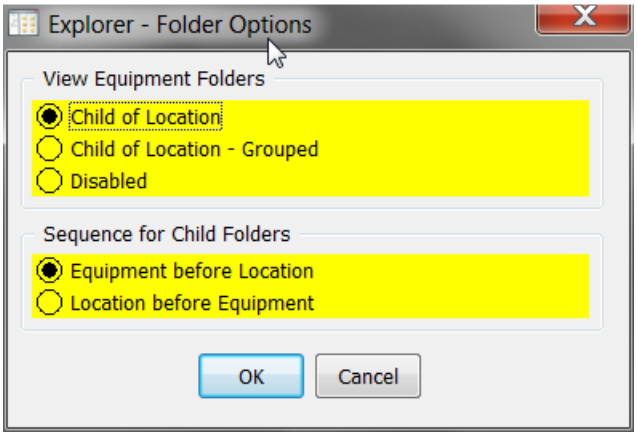
- For a selected location: All equipment, active work orders, and active service requests.
- For a selected equipment record: overdue work orders, two-month history of meter readings, all maintenance schedules.
- For a selected part location: parts stored at the location, three-month history of inventory transactions.

Right-mouse button menu actions and navigation are supported for all objects displayed in MaintScape Explorer. For this reason, many MaintScape customers use MaintScape Explorer as an alternate main menu.

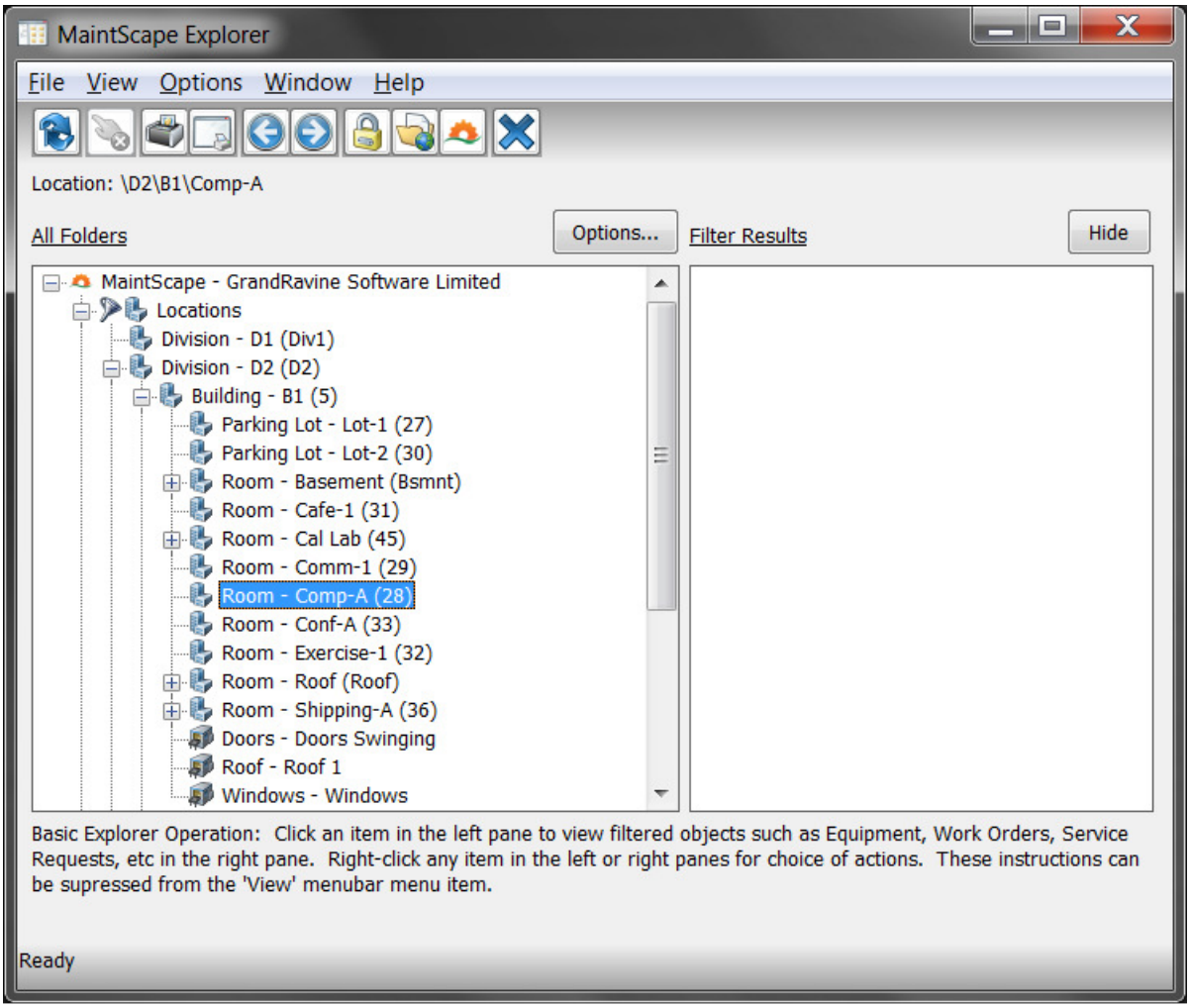
1. Navigate to the MaintScape main menu window, and then click the (close all but current window) toolbar button to close MaintScape windows.
2. Open the MaintScape Explorer window by clicking on main menu icon, "Go To Explorer". Expand and/or contract nodes on the left side until your MaintScape Explorer window looks similar to the following:



We will now configure MaintScape Explorer to show equipment in the tree as well as locations. Click the "Options…" button at the top of the Explorer window to see the following window:



3. Change the "View Equipment Folders" setting from "Disabled" to "Child of Location", and then click "OK". Your MaintScape Explorer window display should change to be similar to the following. Notice the equipment icons below "Building – B1" – e.g. "Doors – Doors Swinging". These are equipment at location "Building – B1".



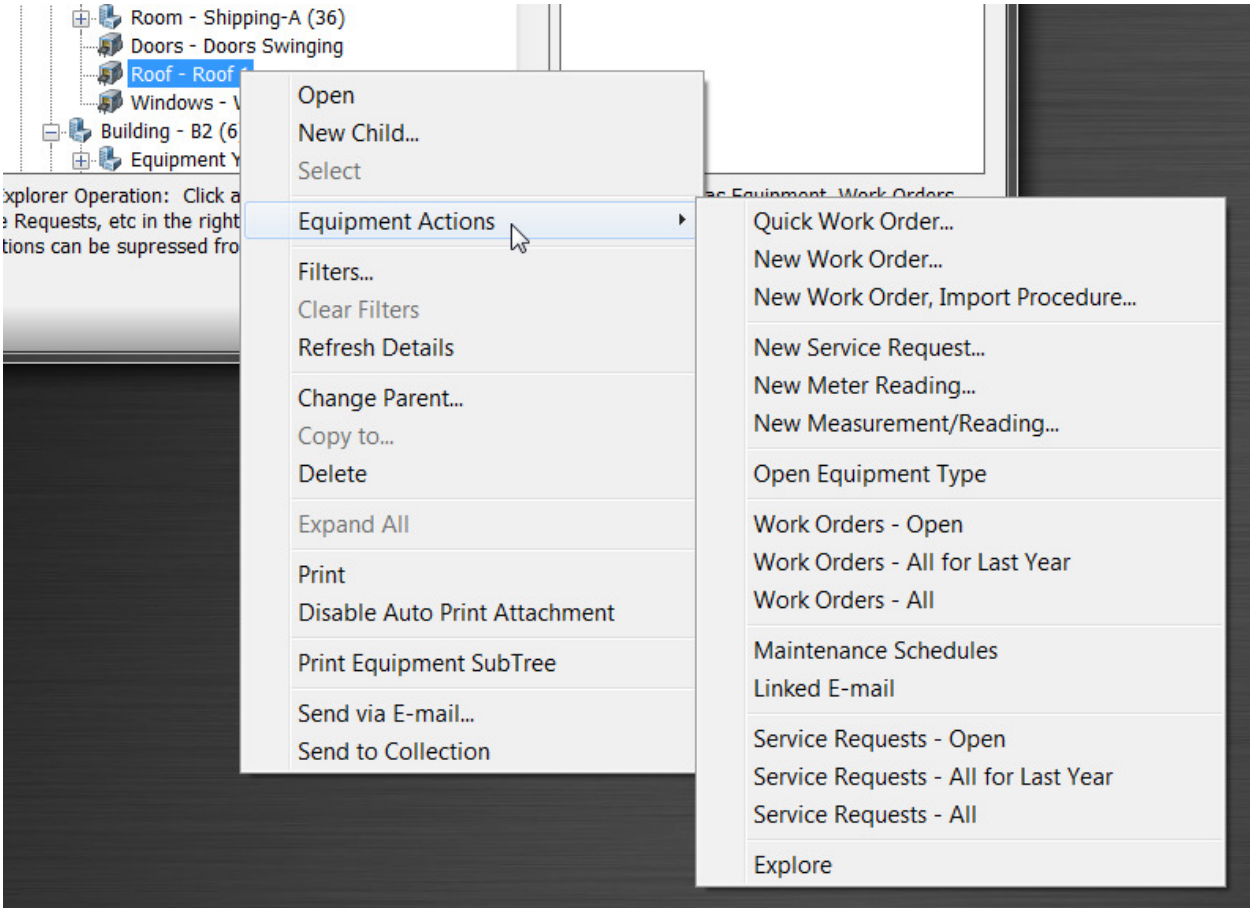
4. Notice that each node in the Explorer tree is prefixed by its "type". For example: "*Room* – Comp-A", "*Doors* – Doors Swinging". You can disable this, and possibly make the tree easier to read, using menu bar action "View" / "Folder Type before Folder Name". Try it.

You can then re-enable "Folder Types" using the same menu bar action. Try it.

5. Notice also the text in brackets following a location name – for example, "Room – Comp-A *(28)*". The value in brackets is the unique "code" for the location. You can enter the code for a location in any modifiable field that accepts a location value. This is handy if you remember the location code for common locations. Otherwise you would typically right-mouse click on the location field and select action "Search using Explorer…".

   MaintScape automatically assigns numeric code values by default (e.g. "28") when you create new locations and part locations. You can specify more meaningful values instead. You will create a new location further in this exercise.

6. You can right-mouse click on any node in the MaintScape Explorer to access a pop-up menu of actions. Right-mouse click on equipment "Roof – Roof 1" to see the following.

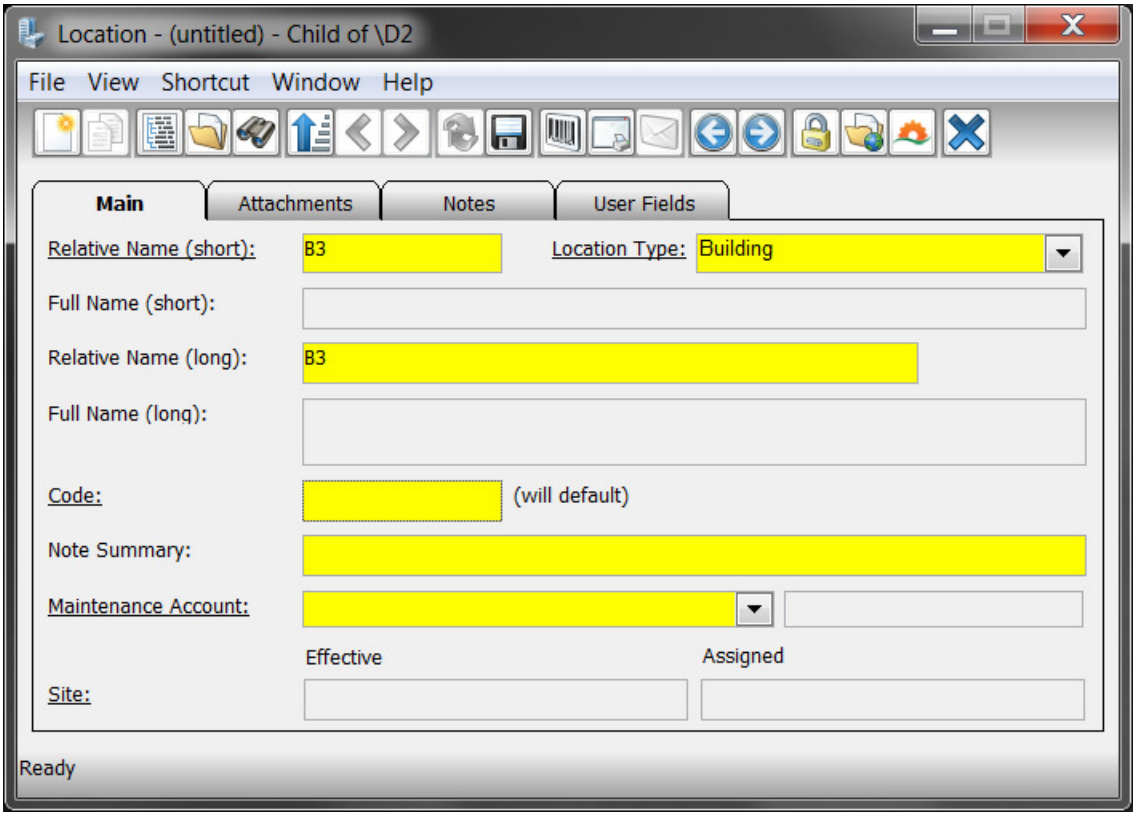


Try the following right-mouse button actions. After each, close the MaintScape window that was opened so that you are again viewing MaintScape Explorer:

- Open
- Equipment Actions / Quick Work Order…
- Equipment Actions / Work Orders - All

7. Remember from an earlier tutorial exercise that you build up your location and part location structure in MaintScape using the MaintScape Explorer. For example, "Division – D2" has two building locations below it: "Building – B1" and "Building – B2". We will now add a new building: "Building – B3".

Right-mouse click on location node “Division – D2” and select pop-up action “New Child…”. MaintScape will open the Location window to accept entry of a new location. Fill in the fields as below:



Click the (save) toolbar button to save the location record. Notice that the Full Name display values are set and the modifiable Code value is defaulted after the location is saved.

While we are here, lets try a convenient way to create a location “Building – B4” at the same level in the hierarchy as “Building – B3”. Hover your mouse over the (new) toolbar button and notice that the status bar at the bottom describes the action as, “New Sibling Location”. Click the (new) toolbar button, enter values for building “B4” as you did for “B3”, then save the location using the (save) toolbar button.

As always, a toolbar button is a shortcut for a menu bar action. In this case, the “new sibling location” button is a shortcut for menu bar action “File / New / Sibling”. Notice that in addition to the “new sibling” menu bar action, you can use action “File / New / Child” to clear the window to accept a new child location for the currently displayed location.

8. Close the location window.

   You should now see buildings “B3” and “B4” in the MaintScape Explorer tree (scroll down if necessary).

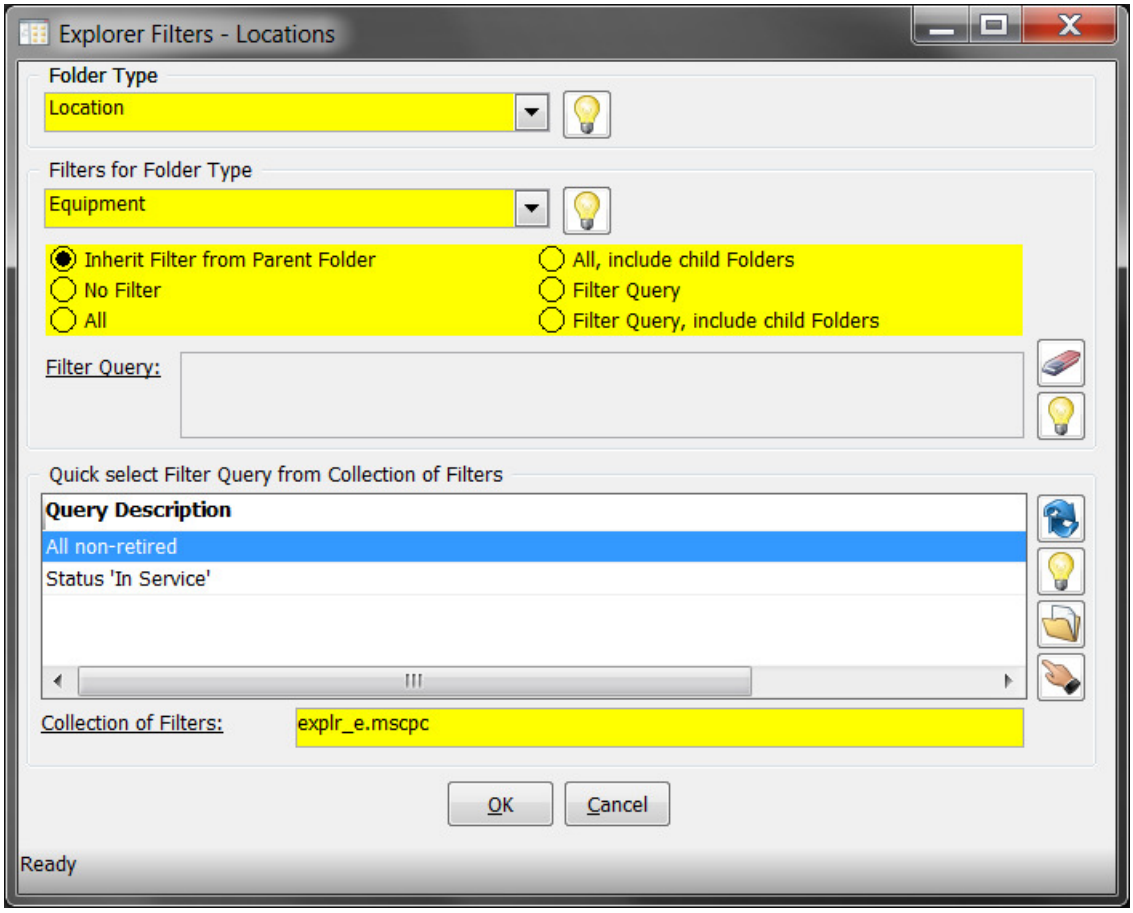
MaintScape Explorer – Filters

Filters within MaintScape explorer define the MaintScape records that are displayed in the right side of MaintScape Explorer when clicking on a node in the left side of MaintScape Explorer.

Any node in the MaintScape Explorer tree can have a filter attached to it. The filter will apply when selecting that node and any node below it in the hierarchy. Most of the time, however, you will only attach filters to the top level "Locations" or "Part Locations" nodes.

An Explorer node with a filter applied to it is identified by an icon.

1. There should already be a filter applied to the top level "Locations" node. If so, clear it by right-mouse clicking on the node and select pop-up action, "Clear Filters". We are doing this because we will create our own filters from scratch.
2. Right-mouse click on the "Locations" node and select pop-up action, "Filters…". You should see the following window:



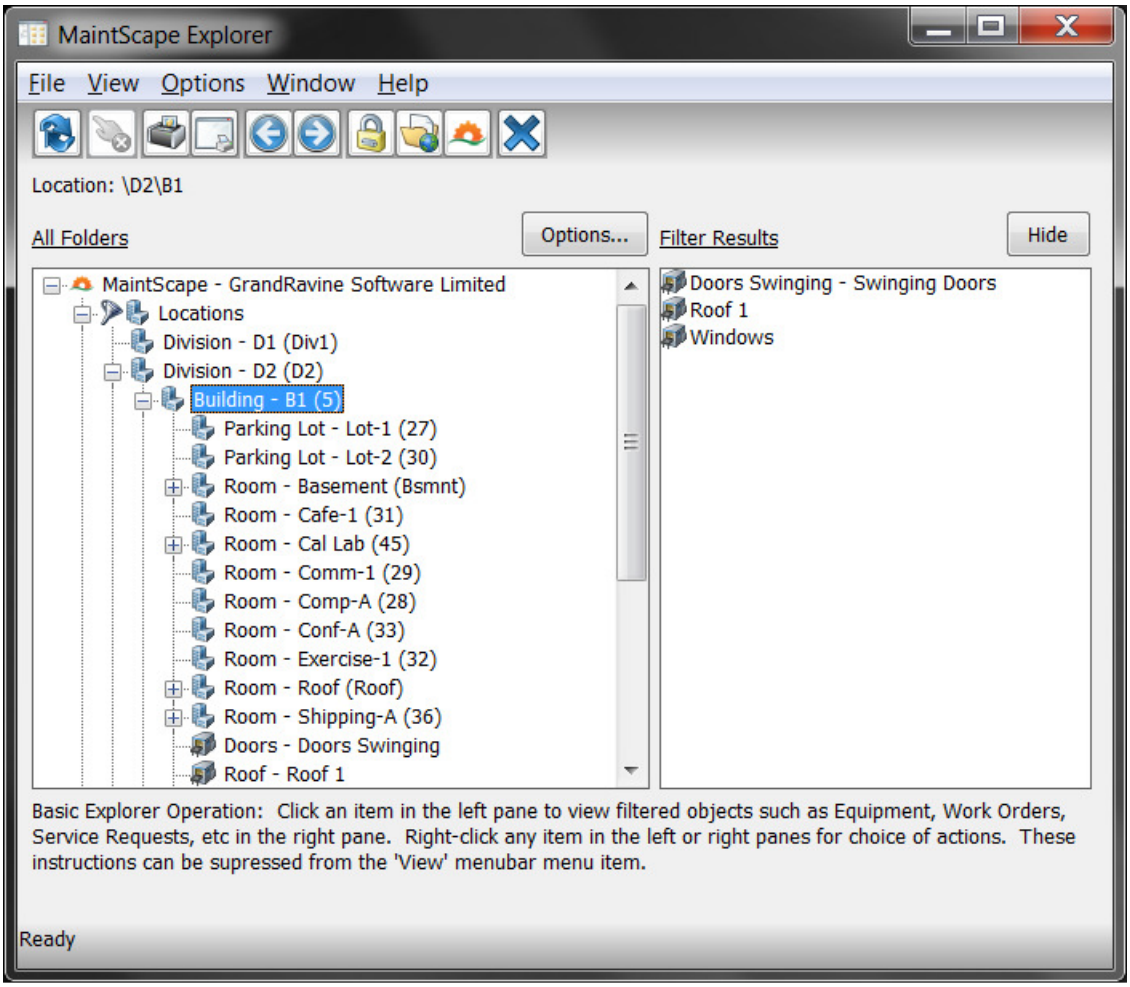
Folder Type value "Location" indicates that we are creating a filter that applies when selecting a "Location" in the left side of Explorer.

Filter for Folder Type value "Equipment" indicates that the filter determines what "Equipment" records are then displayed in the right side of Explorer.

The "Inherit Filter from Parent Folder" in most cases just means "No Filter". The full meaning of this option is described towards the end of this tutorial section.

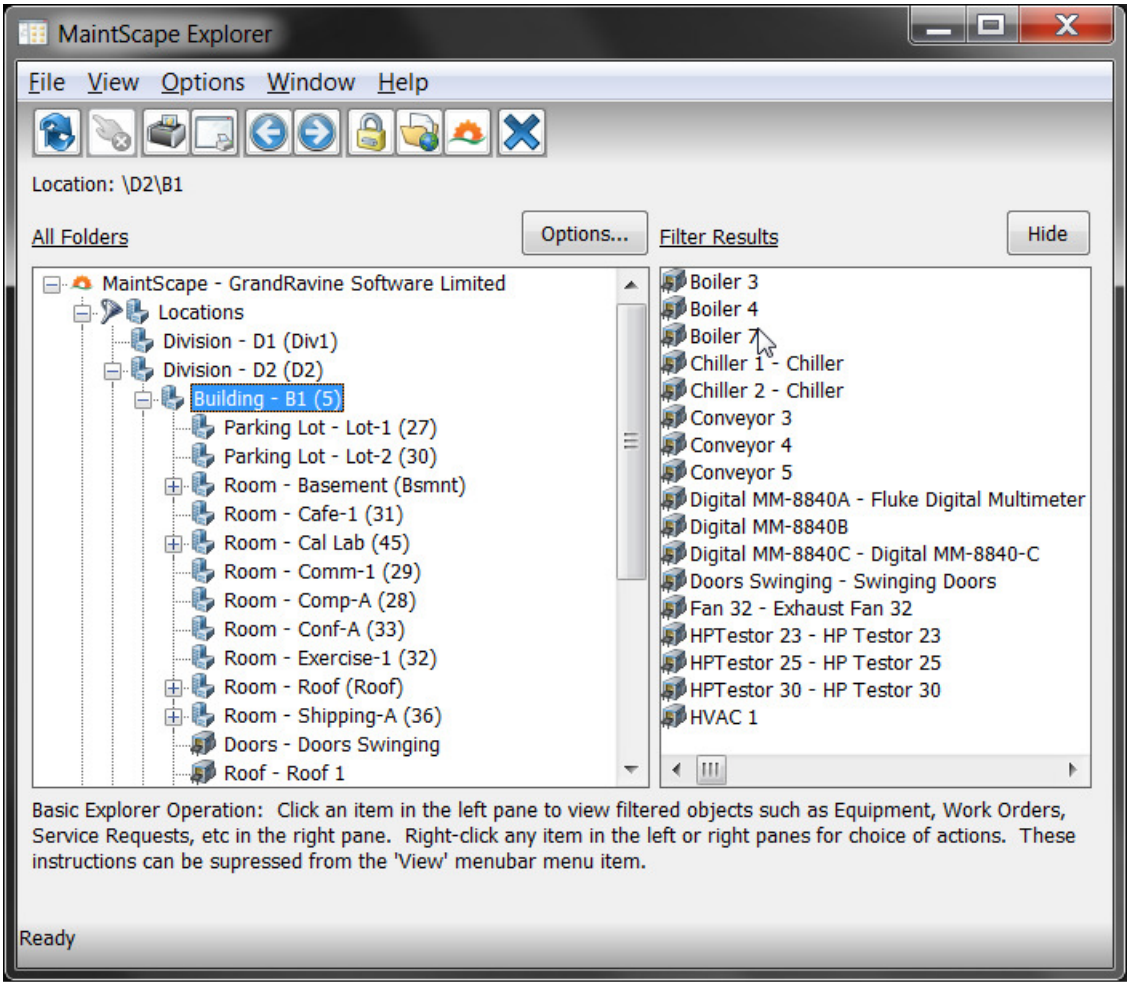
3. Click the "All" radio button. This indicates that "all equipment" should display on the right side of Explorer when clicking on a "Location" in the left side of Explorer. Click "OK" to accept the filter and close the filters window.

4. Click on the "Building – B1" location node in Explorer. The node will become selected, and you should see in the right side of Explorer "all" equipment at location "Building – B1":



5. Let's try modifying the Equipment filter for Locations. Right-mouse click on the "Locations" node and again select pop-up action, "Filters…". Change the Equipment filter for Locations from "All" to "All, include child Folders". Click "OK" to accept the filter and close the filters window.

   Click on the "Building – B1" location node again in Explorer. This time you should see in the right side of Explorer all equipment at location "Building – B1" *and at any of its child locations*:



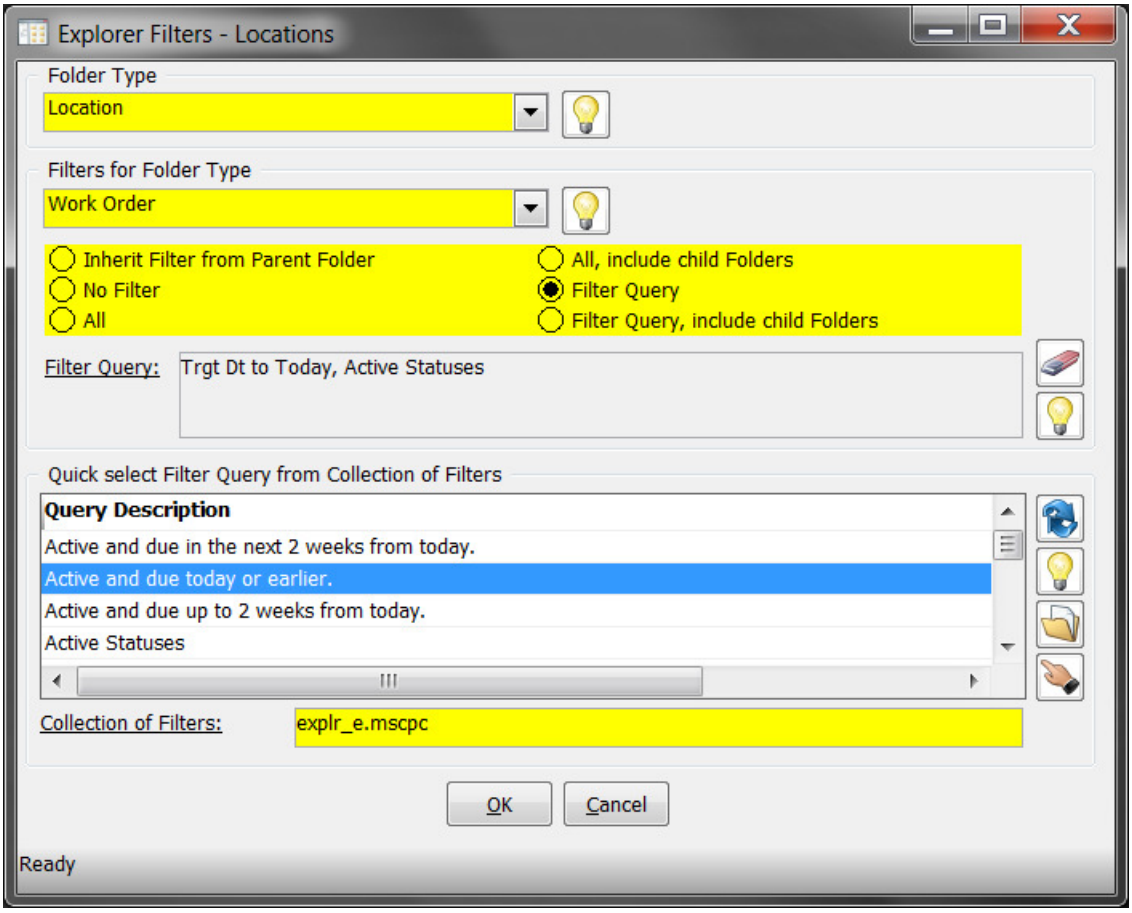
6. Let's set up a Work Order filter for locations in addition to the current Equipment filter for locations.

   Right-mouse click on the "Locations" node and again select pop-up action, "Filters…". First, change the equipment filter from "All, include child Folders" back to "All". We don't want too many equipment displayed at a time in the right side of Explorer.

   Next, change the "Filters for Folder Type" drop-down value from "Equipment" to "Work Order". This does not erase the Equipment filter that we set up. It simply changes the view to let you define a Work Order filter.

   We do NOT want to display "All" work orders at a location in the right side of Explorer in the same way that we display "All" equipment at a location. There would be far too many work orders to be of any value. Instead, we will set up a "query" filter to only display status "Open" work orders.

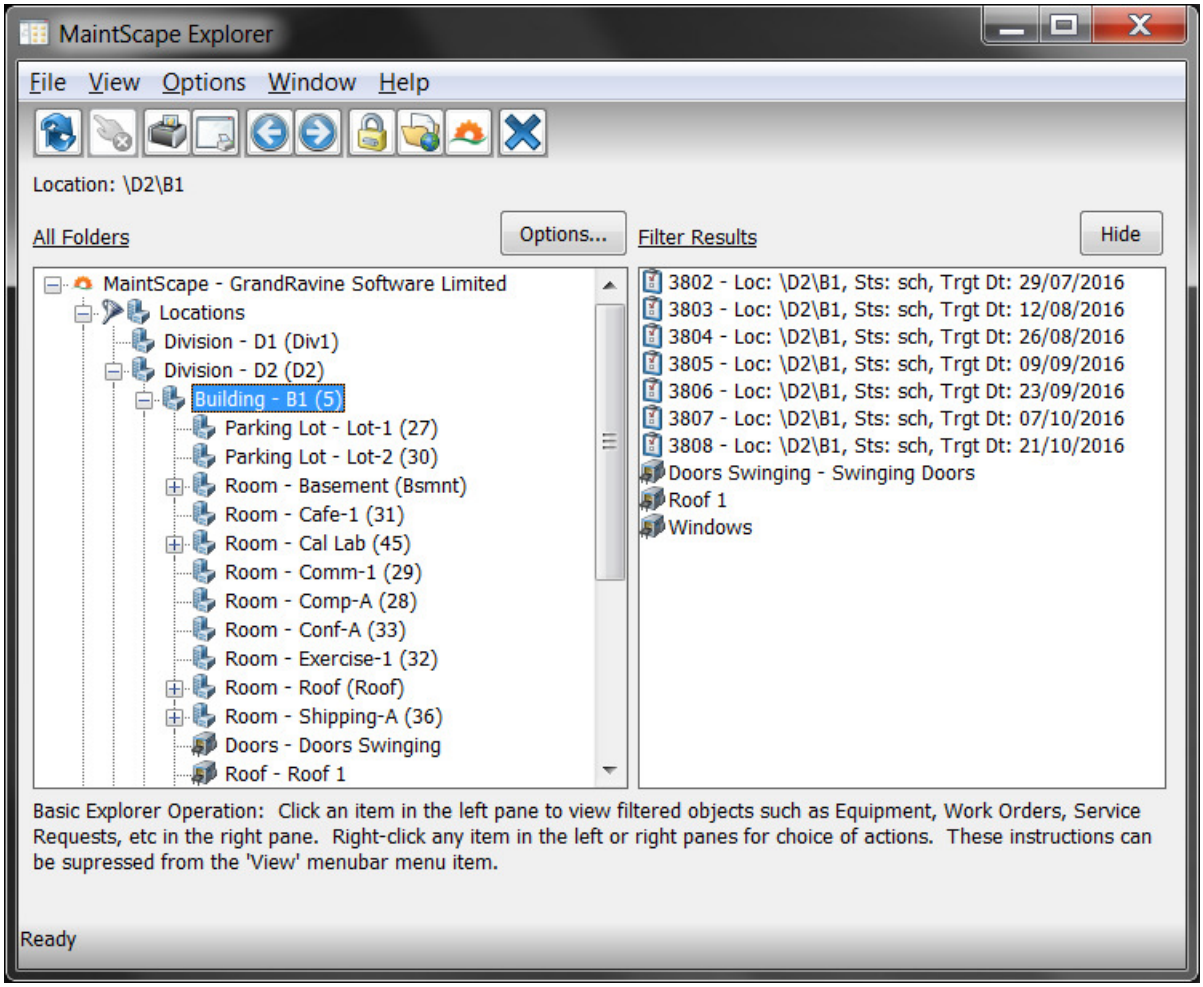
We will use a "quick select" pre-defined query to set the work order filter. Simply double-click the query named "Active and due today or earlier" from the quick select list[4]. Your filter setup window should now look like the following:



Notice that the filter type radio button is now "Filter Query" and a query is described in the "Filter Query" field. Click "OK" to accept the filter and close the filters window.

[4] The "quick select list" is the set of work order queries in MaintScape Collection file "explr_e.mscpc" as identified by the field labeled "Collection of Filters". MaintScape Collections are covered in another section of this tutorial. You will see that you can add any query that MaintScape can support into a Collection file, and therefore you can customize the "quick select list" to meet your own needs.

7. Click on the "Building – B1" location node in Explorer. The node will become selected, and you should see in the right side of Explorer all equipment and work orders that are "Open and due today or earlier":



8. You can right-mouse click on any item visible in the right side of Explorer.

   Right-mouse click on a (work order) icon and review the available pop-up actions. Be sure to review the actions cascading off of the "Work Order Actions" pop-up item.

   Right-mouse click on a (equipment) icon and review the available pop-up actions. Be sure to review the actions cascading off of the "Equipment Actions" pop-up item.

9. You can right-mouse click in blank space in the right side of Explorer to change how the items are displayed. Try it.

10. We just set a Work Order filter for Locations based on a "quick select" query. What if the query we want is not in the "quick select" list? Accordingly, we will now change the work order filter to a custom query.

    Right-mouse click on the "Locations" node and again select pop-up action, "Filters…". In the filters window, change the "Filters for Folder Type" drop-down value to "Work Order". Right-mouse click on the non-modifiable "Filter Query:" field and select pop-up action "Compose…".

You will now find yourself in the standard Work Order Search window. You will create a query in this window, and select it back to the Explorer filters window.

Notice that the existing filter query is populated into search criteria fields in the work order search window (see fields "WO Sts:" and "Trgt Dt range:"[5]). Clear out the search criteria fields by clicking the  (new) toolbar button.

Let's say we want our filter to select work orders that are of "Active"[6] status and assigned to craftsman "Arthur Grimes".

First, select value "(multiple – Active)" in the "WO Sts:" drop down.

Next, flip to the "Labor" search criteria tab and select craftsman "Arthur Grimes".

Finally, select the work order query back to the Explorer filters window by clicking the  (select) button to the right of the search criteria tab control. You should now see your custom work order filter query in the "Filter Query:" field as, "Active Statuses, Craftsman 'AG'".

Click "OK" to accept the filter and close the filters window.

11. Click on the "Room – Roof" location node in Explorer below "Building – B1". The node will become selected, and you should see in the right side of Explorer all equipment at that location, and *active work orders that are assigned to Arthur Grimes*.

Some final MaintScape Explorer filter tips worth mentioning at this point:

- It takes a certain amount of time to populate the right side of Explorer when you click on a node in the left side of Explorer. Sometimes you are not interested in seeing filtered items in the right side, but do not want to clear off the filters that you worked so hard to set up. In this case, simply click the "Hide" button at the top-right of the Explorer window. Try it.

  As you can see, the right side of Explorer has gone away. The "Hide" button has become a "Show" button, and clicking on this button will bring the right side of Explorer back.

- You will notice when defining Explorer filters that the default filter value is "Inherit from Parent". Remember that filters can be attached to any node in MaintScape Explorer, and the filters defined apply to that node and all its child nodes. Therefore "Inherit from Parent" means to use a filter attached to a node higher up in the hierarchy if one is found.

  In most cases "Inherit from Parent" behaves the same as selecting "No Filter" because most MaintScape customers only define filters at the top level nodes in MaintScape Explorer.

MaintScape Explorer – Drag and Drop

In order to perform all steps in this exercise, you should set your Explorer "Location" filters to only display "All Equipment". This means clearing the work order filter if you just performed the last exercise. Take the following steps if you have not done the prior exercise, or wish to continue with this exercise as quickly as possible:

- Right-mouse click again on the "Locations" node in the left side of Explorer and select pop-up action, "Clear Filters".

[5] Notice the text value "to Today" in the target date range search criteria field. This is called a "relative date range". This is a very powerful tool that is covered in the tutorial section on MaintScape Collections.

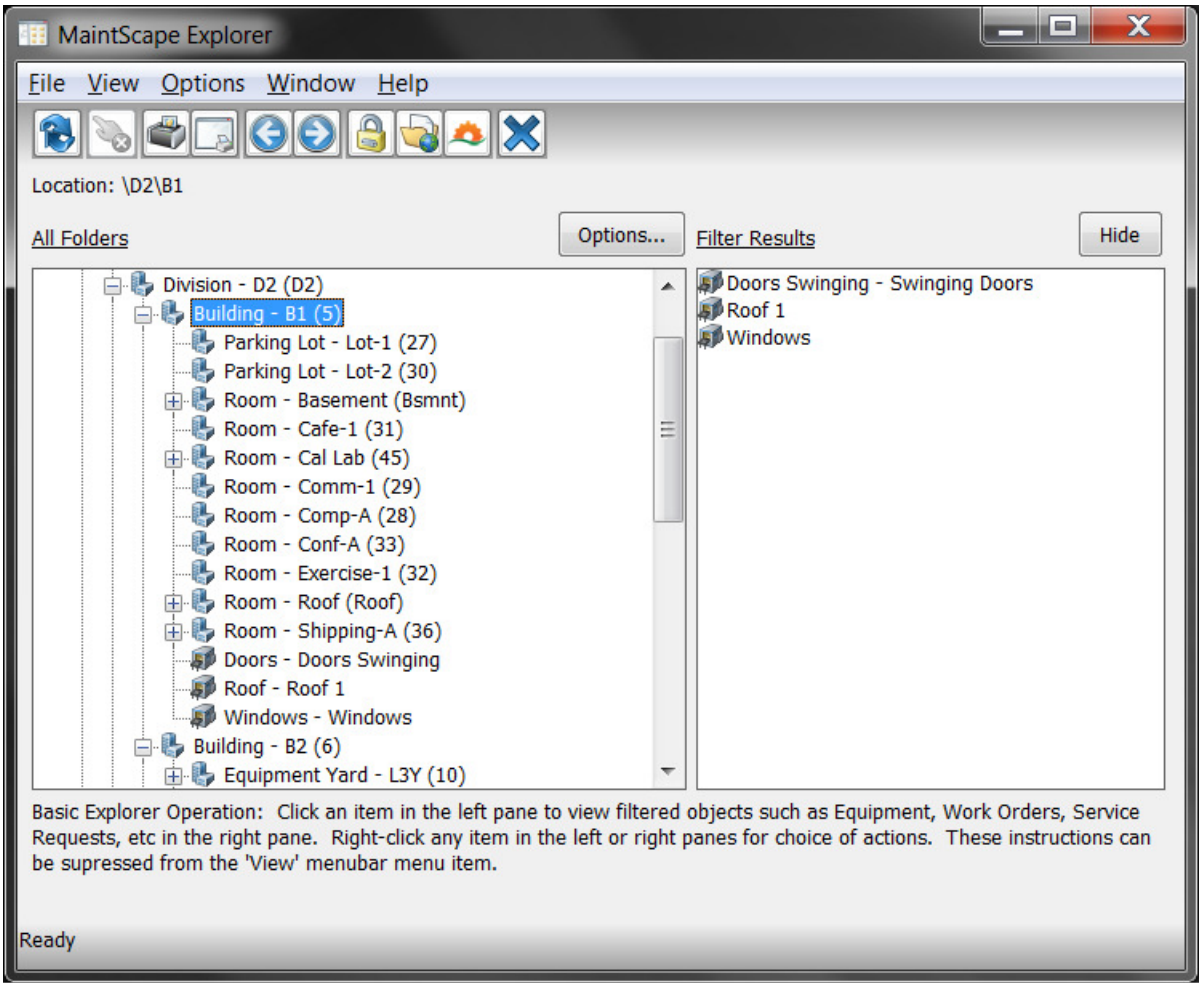
[6] "Active" status work orders are those that are status deferred, open, pending approval, planned or scheduled.

- Right-mouse click on the “Locations” node in the left side of Explorer and select pop-up action, “Filters…”.
- You should now see the “Filters” pop-up window. Select value “Location” in group “Folder Type”, and select value “Equipment” in group “Filters for Folder Type”.
- Click radio button “All” in group “Filters for Folder Type”.

  You have just specified that “All Equipment” should display in the right side of Explorer when a Location is selected in the left side of Explorer.
- Click “OK” at the bottom of the “Filters” pop-up window.

You are now ready to perform this exercise.

1. Expand and scroll your Explorer window so that it looks similar to the following:



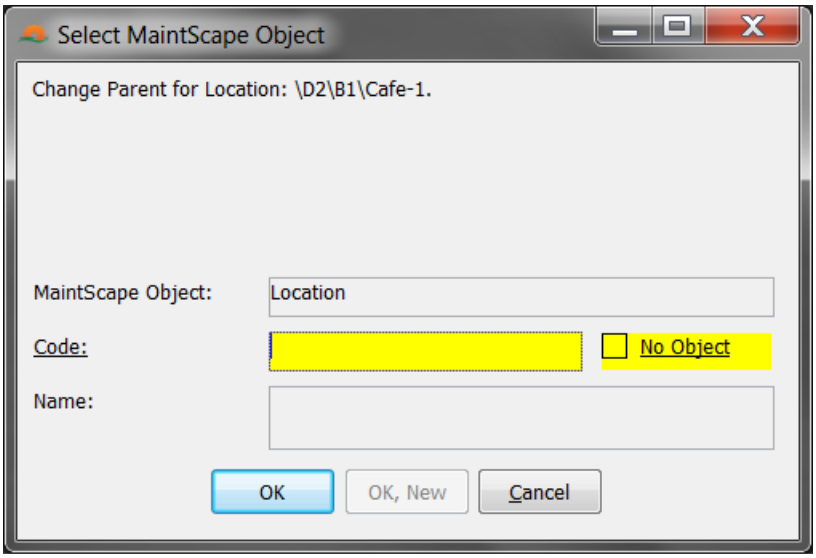
2. Let’s say that location “Room – Cafe-1” for “Building – B1” should really belong to “Building – B2”.

   Drag the icon for location “Room – Cafe-1” and drop it on location “Building – B2”.

   Scroll the Explorer down if necessary to verify that the location has been moved.

A different technique is required when the “drop” target in Explorer is not visible when the “drag” icon is visible. We will use this technique to move “Room – Cafe-1” back to “Building – B1”.

3. Right-mouse click on location “Room – Cafe-1” and select pop-up action “Change Parent…”. You will see the following pop-up window:



4. We could now enter the code for location “Building – B1” as the new parent, however lets assume we do not know the code.

   Right-mouse click on the “Code” field and select pop-up action, “Search using Explorer”. Notice that the Explorer window under the pop-up window gets focus although the pop-up window may still be on top.

   Scroll the left side of the Explorer window until you see location “Building – B1”, then double-click it. The pop-up window should now have focus with the new parent location filled in.

   Click “OK” to move “Room – Cafe-1” back to “Building – B1”.

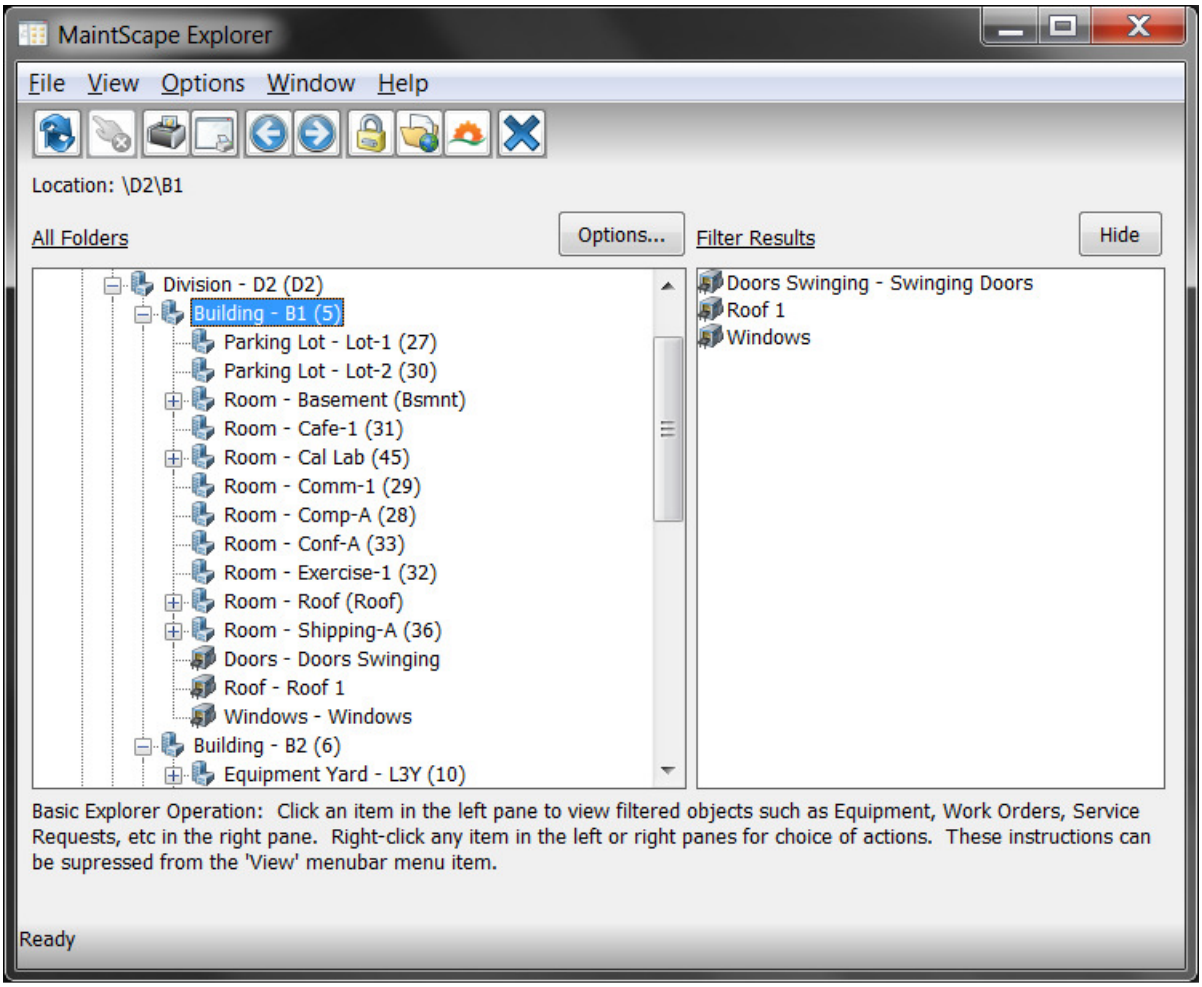
5. Verify that “Room – Cafe 1” now appears beneath “Building – B1” in MaintScape Explorer.

You can use the above process at any time to restructure your location or part location hierarchy[7].

We will now use drag and drop to move a piece of Equipment to a new location.

[7] One common reason for doing this is to move locations that are no longer active to below a location named “obsolete”. You may want to do this because you cannot delete locations if they have been used in historical records such as work orders.

6. Expand and scroll your Explorer window so that it looks as it did at the beginning of this exercise on drag-and-drop:



7. In the above, equipment “Doors Swinging…” is presently at location “Building – B1”.

   Move this equipment to “Room – Cafe-1” by dragging the equipment icon and dropping it on “Room – Cafe-1”.

8. Use drag-and-drop again to move equipment “Doors Swinging…” back to its original location of “Building – B1”. Note that you can drag the equipment icon that occurs in either the left side or the right side of MaintScape Explorer.

   As was done above with locations, you can right-mouse button on an equipment icon and select pop-up action “Change Parent…” to change the equipment’s location when its new location is not visible for drag-and-dropping on.

One final MaintScape Explorer drag-and-drop tip is worth mentioning at this point: You can drag and drop using the right-mouse button. In this case, a pop-up menu of actions will appear when the dragged icon is dropped. The default action is bolded, and this is the action that would occur automatically when drag-and-dropping using the left-mouse button.

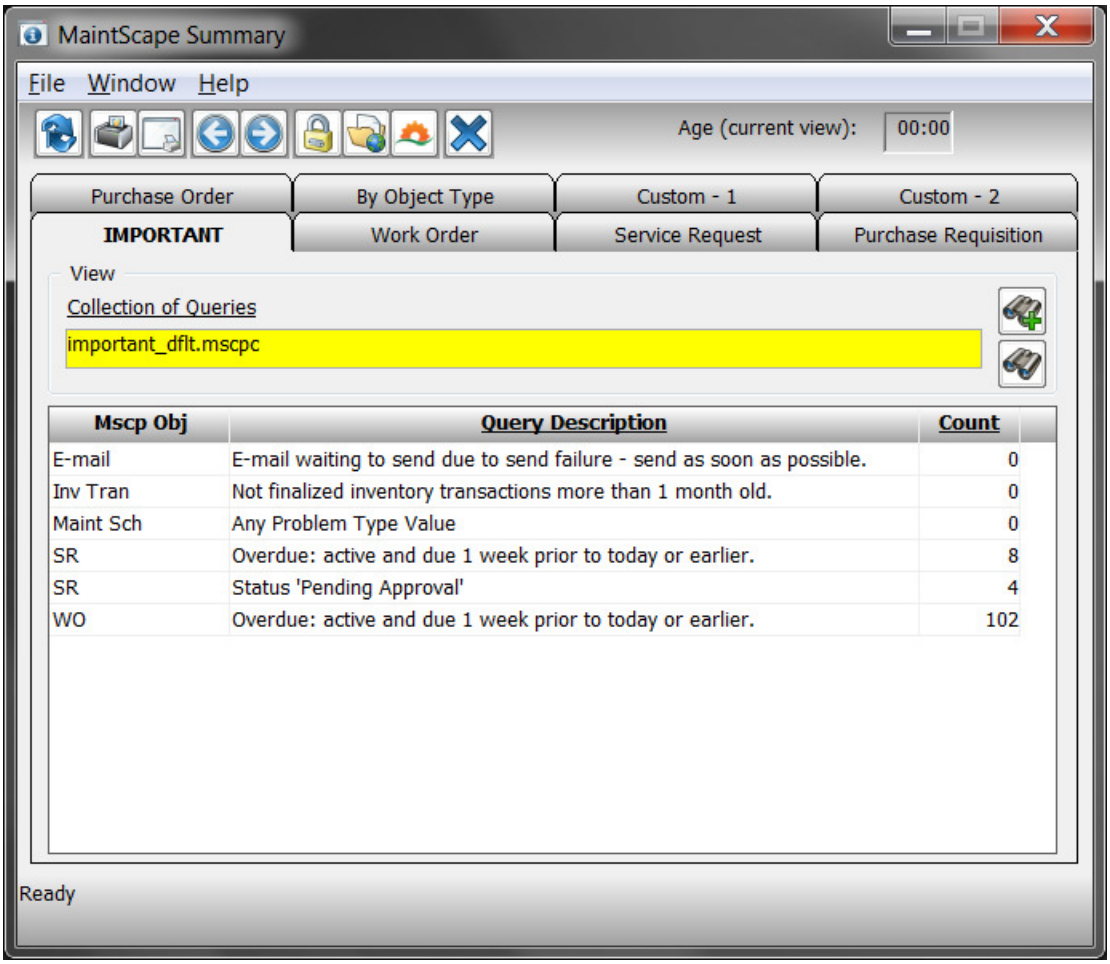
Today's Status

The "Today's Status" window displays a set of summary statistics by MaintScape object type. For example, today's status for work orders may list: number of work orders closed last week, number of work orders due this week, number of work orders at least 2 weeks overdue, etc.

Each statistic is computed by evaluating the number of records that satisfy a MaintScape query. The MaintScape query is composed in the standard search window for the object type. The set of queries used for today's status is stored in a MaintScape collection; therefore the today's status functionality is completely customizable. MaintScape Collections are covered in another section of this tutorial.

You can double-click on any today's status statistic to display the actual query results in the appropriate search window.

1. Navigate to the MaintScape main menu window, and then click the (close all but current window) toolbar button to close MaintScape windows.
2. Open the Today's Status window by clicking on main menu icon, "Go To Today's Status". You should the following window:



By default, the Today's Status window opens to the "Important" tab page. This page is designed to show the most important MaintScape statistics that you want to see at a glance. The statistics can be for different types of MaintScape objects. In the above example, you see statistics for objects: email, inventory transactions, service requests, and work orders.

The set of MaintScape queries behind the listed statistics are contained in MaintScape Collection file "important_dflt.mscpc". MaintScape Collections are covered in another section of this tutorial.

3. Double-click on the "SR – Overdue: active and due 1 week prior to today or earlier" statistic line.

   MaintScape will open the Service Request search window and execute the query, listing the records that match the query. Note that 8 service requests are listed. This matches the "Count" value of 8 from the today's status window.

4. Navigate back to the today's status window. Double-click on the other service request statistic, "SR – Status 'Pending Approval'". This will take you back to the Service Request search window, this time showing the set of "Pending Approval" service requests.

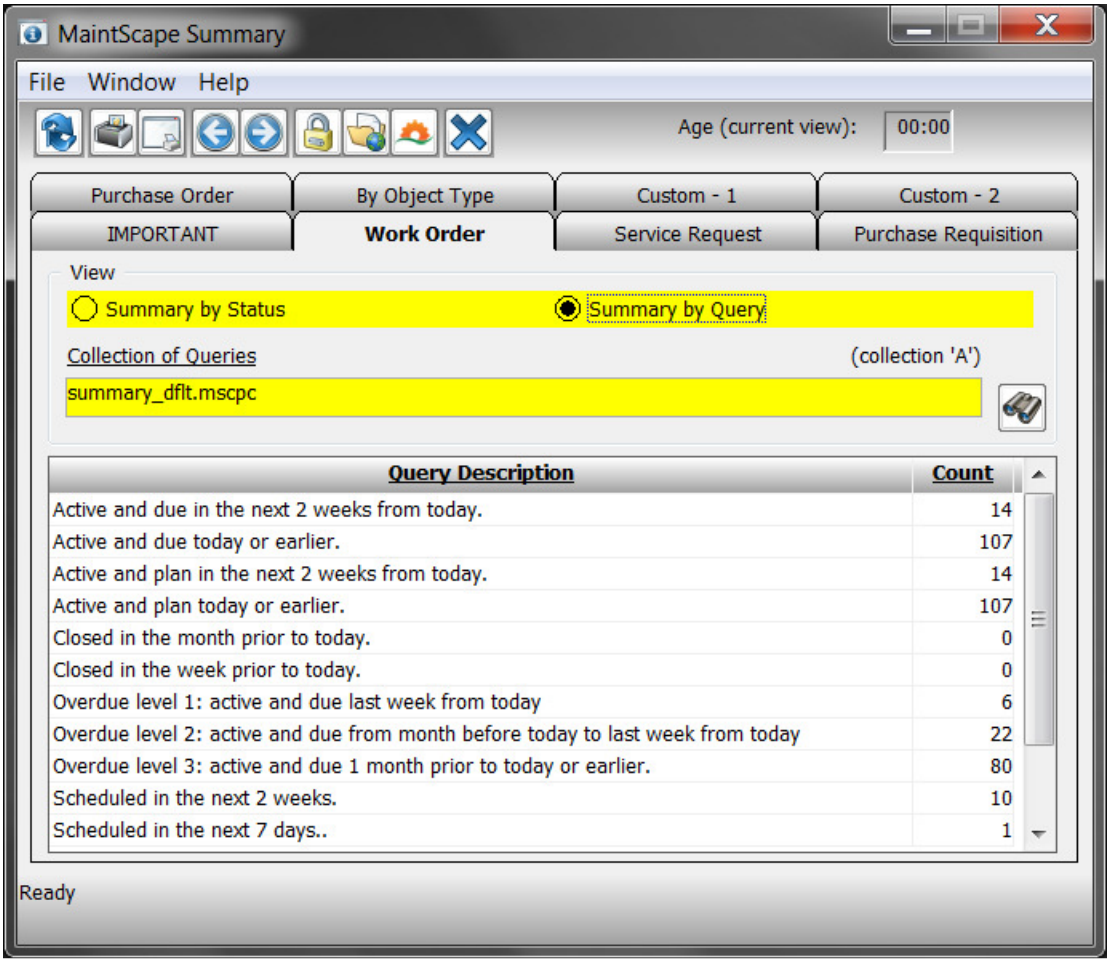
   This particular today's status entry is very useful if you are using the MaintScape Service Request module. At a glance, you can see whether new service requests have been submitted and are awaiting attention.

5. We will look at another way to access the today's status window – in particular to see "today's status" directly for a particular MaintScape object.

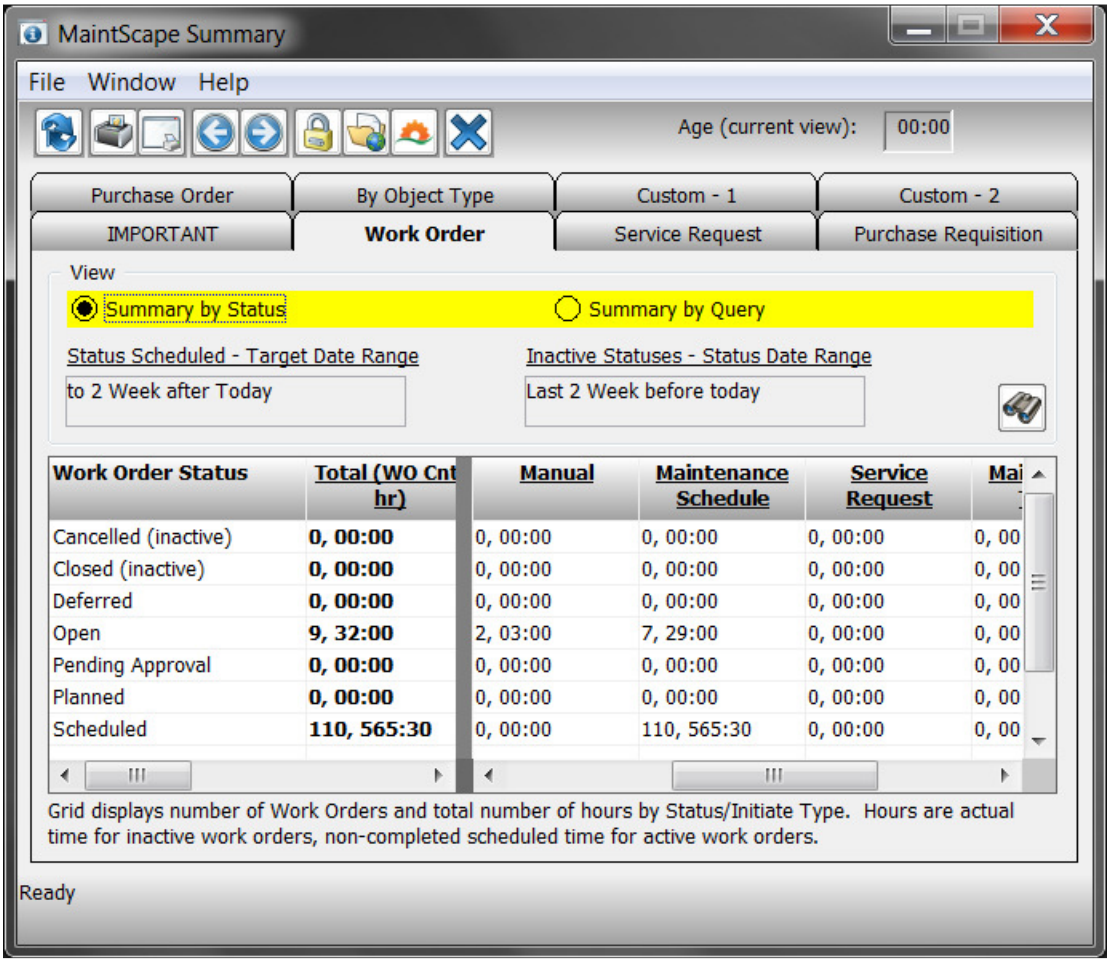
   Navigate to the MaintScape main menu window. Click on the main menu icon "Work Order", and then select action "Today's Status".

   MaintScape will display the today's status window positioned to the "Work Order" tab. This tab lists statistics that pertain only to work orders (ensure the "Summary by Query" radio button is checked).

Your window should look similar to the one below. This example illustrates the usefulness of "today's status" statistics for identifying problems and providing a snapshot of your work order environment:



6. The "work order" tab provides a view that provides another useful set of statistics. Click on the "Summary by Status" radio button to see the following:



This view is best explained by example.

- The first numbers “9, 32:00” beside status “Open” indicates 9 work orders are of status “Open” for a total of 32 scheduled hours.
- The next numbers “2, 3:00” in the “Manual” column to the right indicates 2 manually created work orders are status “Open” for a total of 3 scheduled hours.
- The next numbers “7, 29:00” in the “Maintenance Schedule” column to the right indicates 7 work orders generated from a maintenance schedule are status “Open” for a total of 29 scheduled hours.

The “Status Scheduled – Target Date Range” identifies the range of target dates for work orders included in status “Scheduled” row statistics. This range ensures the statistics only reflect current work orders, and not those generated by maintenance schedules potentially months ahead.

The “Inactive Statuses – Status Date Range” identifies the range of status dates for work orders included in status “Closed” and “Cancelled” rows. This range ensures the statistics only reflect currently closed/cancelled work orders, and not those closed years ago.

Other rows, such as “Open”, do not restrict statistics by work order target or status date. For example, you probably want to know how many work orders are currently status “Open”, regardless of when they are due and when they were opened.

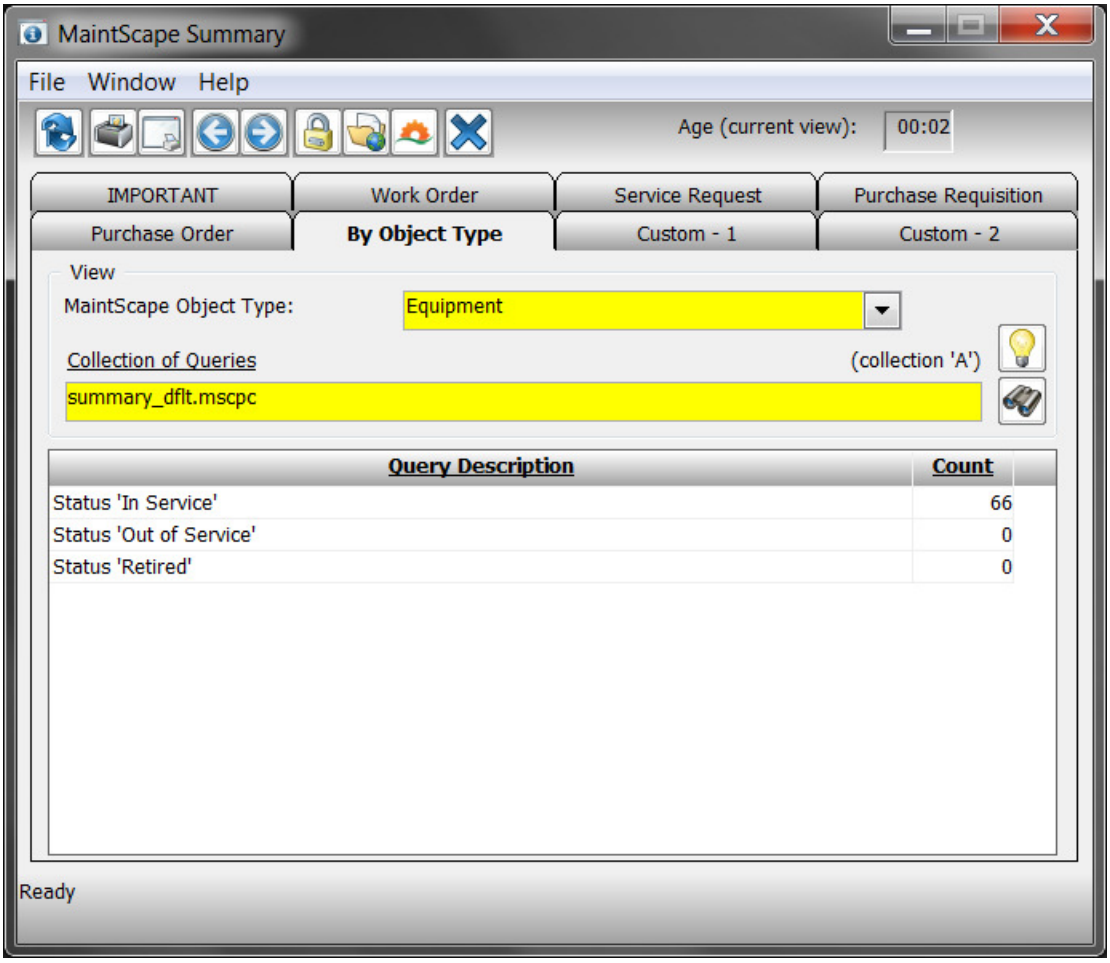
Notice the date range values are not directly modifiable and contain textual date range descriptions such as “Last month before today”. These are MaintScape “relative date ranges” and are fully

described in the tutorial section on MaintScape Collections. If you are curious now how they are created, right-mouse click on a date description and select pop-up action "Edit…".

7. Double-click on the "2, 03:00" value representing manually created status "Open" work orders.

   MaintScape will open the work order search window and list the 2 work order records. When ready, close the work order search window to return back to the today's status window.

8. Some MaintScape objects do not have their own today's status tab – for example, "Equipment". Click on the "By Object Type" tab, select "Equipment" in the "MaintScape Object Type" drop-down, and then click on the (search) picture button. Your window should look like the following:



   You could have navigated to the above view directly from the MaintScape main menu by clicking the "Equipment" icon and selecting pop-up action, "Today's Status".

9. View "today's status" for other object types by selecting other values in the "MaintScape Object Type" drop down and clicking the (search) button.

   The Parts and Part Inventory Transaction statistics may be particularly useful. Remember, the set of queries driving the statistics are completely configurable by updating the set of queries in the named MaintScape Collection (i.e. "summary_dflt.mscpc"). MaintScape Collections are covered in another section of this tutorial.

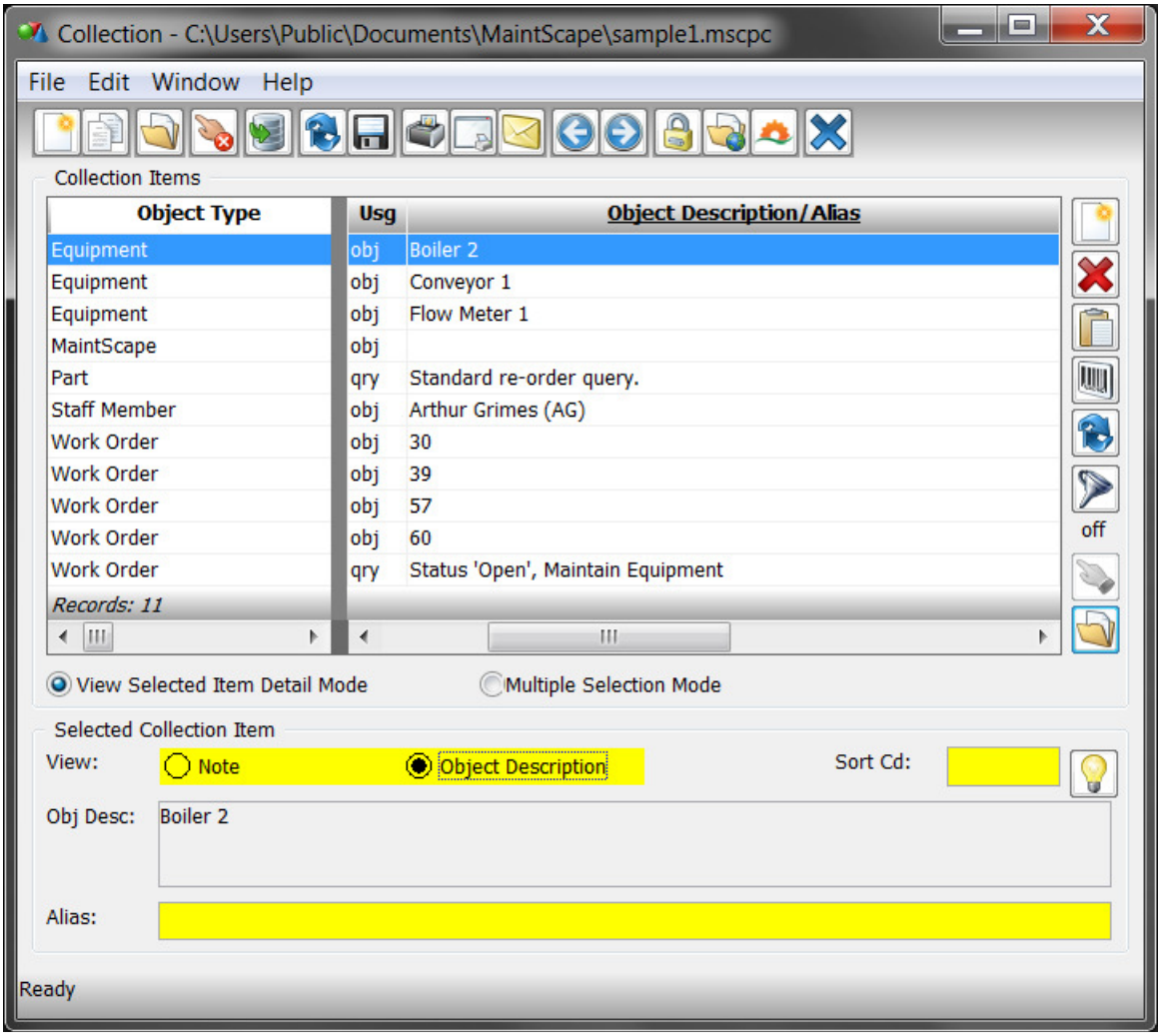
Advanced Exercise

You should only attempt this exercise after completing, or at least reviewing, the tutorial section on MaintScape Collections.

Create a collection of queries for more than one MaintScape object type, and use that collection to list statistics in the "Custom – 1" tab page of the Today's Status window.

MaintScape Collections

MaintScape Collections are a list of one or more MaintScape objects (e.g. equipment 'boiler 1', work order 1387) and/or one or more MaintScape queries (e.g. work orders due next week). An example MaintScape Collection is shown below:



You can double-click on any item in a MaintScape collection to display the identified data in the appropriate MaintScape window. For example, considering the above window image (**do not try the following actions yet** – you will do exercises soon enough):

- Double click item "Equipment" / "obj" / "Boiler 2" to display equipment "Boiler 2" in the MaintScape equipment window.
- Double click item "Part" / "qry" / "Standard re-order query" to display in the MaintScape part search window the parts that need to be re-ordered.

- Double click item “Work Order” / “obj” / “30” to display work order number 30 in the MaintScape work order window.

MaintScape Collections are stored in files with file type (extension) ‘mscpc’. MaintScape Collections are not stored in the database. This means you can share collections with other MaintScape users, including sending collection files by email.

You can double-click on a collection file to ‘run’ it if MaintScape is installed on the computer. If MaintScape is not running, MaintScape will start up, and you will have to log on.

Using MaintScape Collections

The MaintScape evaluation program installer places an icon on your desktop, “MaintScape Collection - Very Overdue WOs” (the icon name may be slightly different depending on your MaintScape version). This is a shortcut to a MaintScape Collection file.

1. Double-click desktop icon, “MaintScape Collection - Very Overdue WOs”.

   You will be prompted to log on to MaintScape if MaintScape is not running.

   The MaintScape “Work Order Search” window will open, search criteria will be automatically populated, and the search will execute. Work orders matching the search criteria will display.

The MaintScape Collection that you double-clicked contained just a single item, and that item represented a work order search query. Since there was only one item, MaintScape “ran” that item rather than displaying the collection.

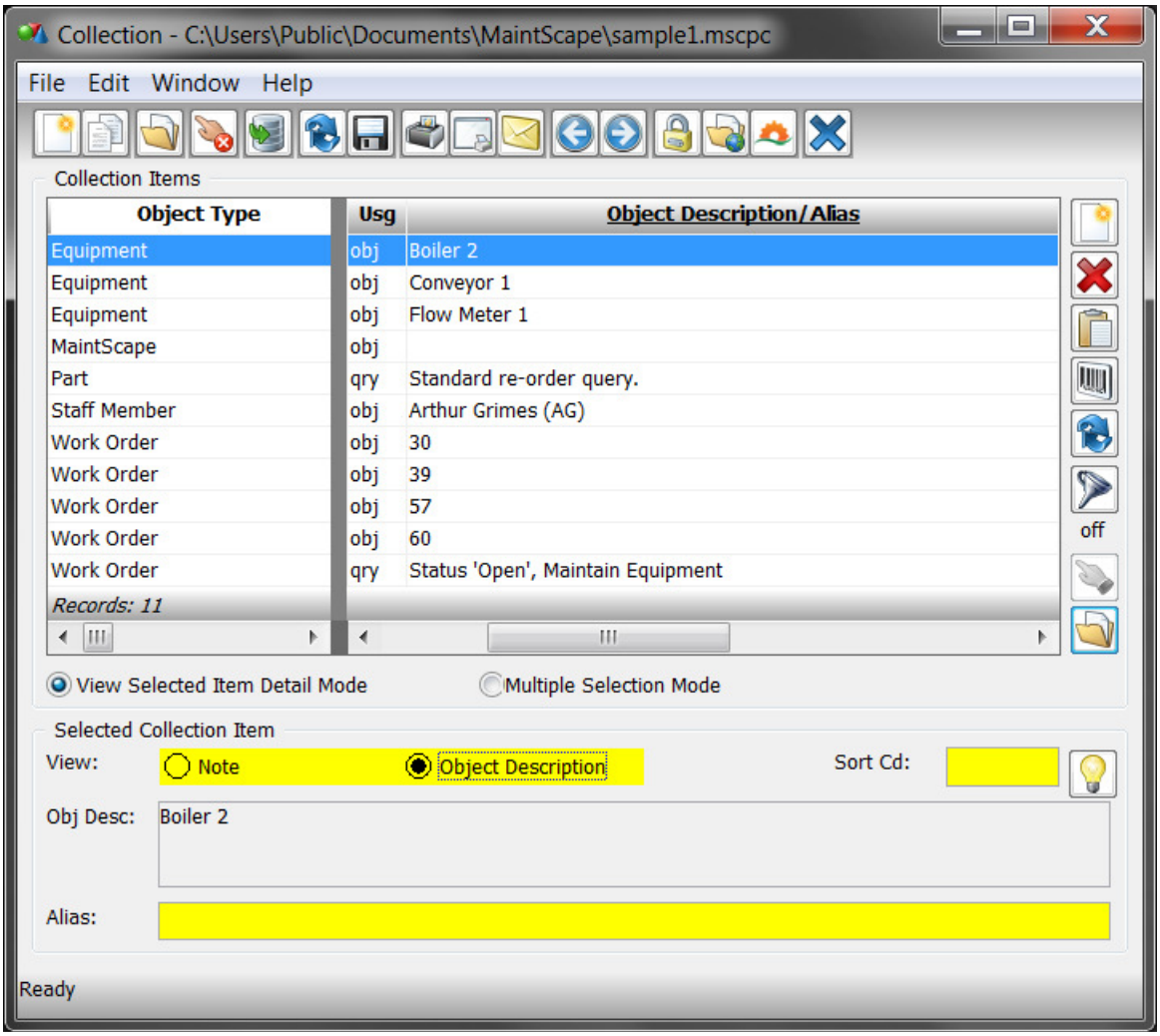
We will now double-click a MaintScape Collection containing more than one item.

2. Double-click desktop icon, “MaintScape Collection - General Example”. Depending on your MaintScape version, you may not have such a desktop icon. If not, use Windows File Explorer to find and then double-click the following file:

   C:\Program Files\GrandRavine\MaintScape\sample1.mscpc

   The file path, above, assumes MaintScape evaluation was installed into the default program directory.

You should now see the following MaintScape Collection window:



You can maximize the Collection window to see more columns in the Collection Items list. The primary columns in this list are:

Object Type	This column identifies the type of MaintScape Object for a collection item – for example, Equipment, Part, Work Order, etc.
Usage	Two values are possible: • Object: The collection item represents a single record of the object type – e.g. an actual equipment, part, work order record, etc. • Query: The collection item represents a query for records of the object type – e.g. a query for equipment, parts, work orders, etc.
Object Description/Alias	This column describes the object or query. For example, equipment "Boiler 2", part query "Standard re-order query". The default value that appears in this column is the record or query description assigned by MaintScape. You can override this value by providing a custom "Alias" for the collection item.

3. Double-click on collection item “Equipment” / “Boiler 2”. You should now see equipment “Boiler 2” in the Equipment window.

   Close the equipment window to bring back the Collection window. Next, double-click on collection item “Part” / “Standard re-order query”. You should now see the Part Search window with search criteria populated and parts matching the criteria listed.

   Close the part search window to bring back the Collection window. Next, double-click on collection item “Staff Member” / “Arthur Grimes”. You should now see the staff record for “Arthur Grimes” in the Staff window.

As you can see, a MaintScape Collection can contain a shortcut to open and populate any MaintScape detail and search window. What items you put into a collection, and how you intend those items to be used, is only limited by your imagination.

4. Ensure the “View Selected Item Detail Mode” radio button is checked, then select collection item “Part” / “Standard re-order query”. Notice that you can see details for this collection item in the “Selected Collection Item” group at the bottom of the window.

   Also notice that the text “Standard re-order query” is an “Alias” value that has been specified to make the collection item description more user friendly than the “Object Description” value assigned by MaintScape.

   Click the “View” radio button options to switch between “Note” and “Object Description” views to see how you can view or edit a “note” for the collection item.

As per the usual MaintScape convention, the picture buttons beside the list of collection items operate on collection items. Some actions, such as “delete” and “print labels”, operate on collection items that are selected. Therefore it can be useful to select more than one collection item at a time.

5. Click the “Multiple Selection Mode” radio button in the Collection Items group. Notice that the “Selected Collection Item” fields become inactive, and that you can select multiple collection items using the standard Microsoft Windows conventions of <Ctrl>+<click> and <Shift>+<click>.

Creating MaintScape Collections

It should be apparent at this point that a MaintScape Collection can be a very valuable tool. Many MaintScape users put collection files representing common queries on their Windows desktop for easy access.

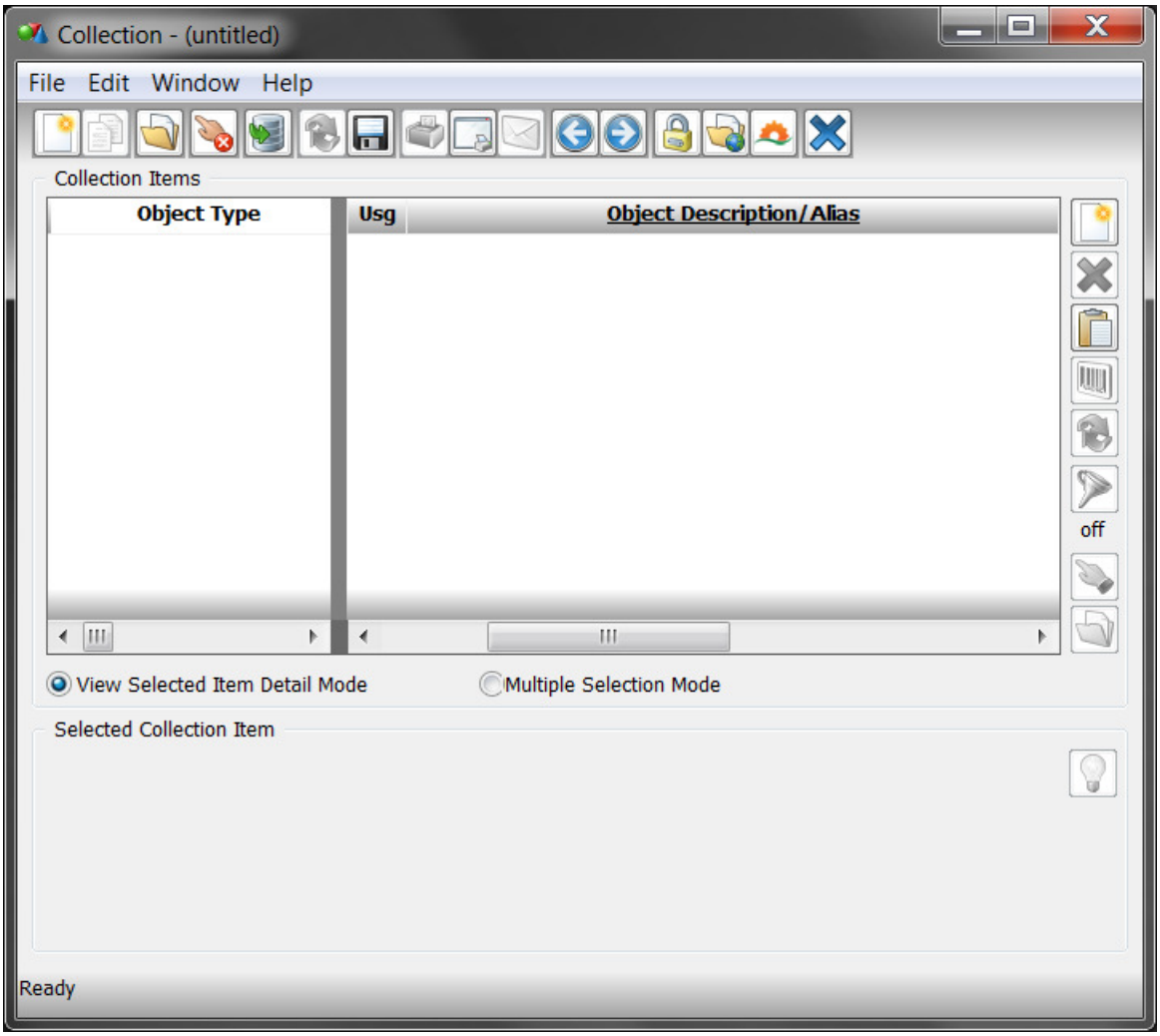
Example applications for MaintScape collections are:

- Create a set of work orders that a craftsman should do on a particular day or in a particular week (you can e-mail them the collection file).
- Create a set of one or more MaintScape queries that you execute on a regular basis.
- Group a set of MaintScape objects that you wish to bring to someone’s attention for whatever reason.

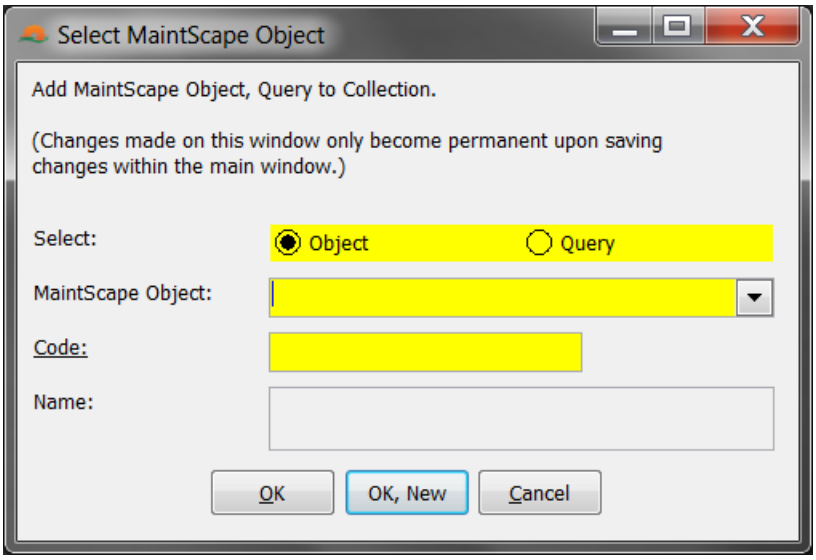
The following exercises will demonstrate how you can create your own MaintScape Collection files.

1. Navigate to the MaintScape main menu window, and then click the  (close all but current window) toolbar button to close MaintScape windows.

2. Click on the main menu icon “Collection”, then select action “New…”. You will see the following “empty” Collection window:



3. Click the (new) picture button beside the empty collection items list to add a new collection item. You will see the following pop-up window:



4. You will now add an equipment record to your collection. First, select value "Equipment" in the "MaintScape Object" field.

   If you know the code of the equipment record that you want to add, you could enter it into the "Code" field and click "OK". Instead, right-mouse click on the "Code" field and select action "Search…".

   You should now be in the Equipment Search window. Select value "Boiler" in search criteria field "Equipment Class", then click the (search) picture button. Double-click equipment "Boiler 1" in the results list to select it back to the "new collection item" window.

   Click "OK" to close the "new collection item" pop-up window, adding a reference to equipment "Boiler 1" to your Collection.

5. Save your collection by clicking the (save) picture button in the window toolbar. You should see a standard "save file" pop-up window. Save your collection on your desktop as file name "Training Collection".

   The Collection window title bar should update to contain the full path to your new collection file.

You just added equipment "Boiler 1" to a MaintScape Collection using the "pull" method. In other words, you were in the Collection window and then asked to add the record. The next steps will show you how to add objects (e.g. equipment) using the "push" method.

6. Without closing your Collection window, switch to the Equipment Search window which should still be open from when you selected equipment "Boiler 1" in a previous step. As usual, you can switch to any open MaintScape window using menu bar action "Window".

7. Click on equipment "Boiler 2" in the results list, then <Ctrl>+<Click> on equipment "Boiler 3". Both "Boiler 2" and "Boiler 3" should now be selected.

8. Click the (send to collection) picture button to the right of the equipment results list. Click "Yes" when MaintScape asks, "Do you want to post record to the currently open Collection? …".

   You should now be back in your Collection window with new collection items added for equipment "Boiler 2" and "Boiler 3".

9. Let's say we no longer want "Boiler 2" in the collection. Click on the "Boiler 2" collection item to highlight it, then click the (delete) picture button beside the collection items list.

10. Save changes pending to your collection by clicking the (save) picture button in the collection window toolbar.

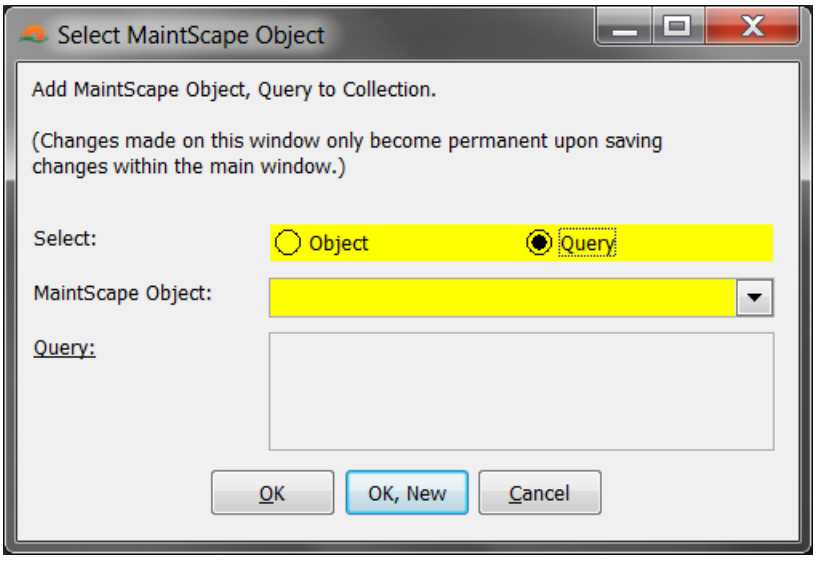
You have just added collection items of type "Object" to your collection. The next steps show you how to add collection items of type "Query". This is very useful when you want to create a set of queries that you would execute on a regular basis.

11. Navigate to the MaintScape main menu window, and then click the (close all but current window) toolbar button to close MaintScape windows.

    You are doing this so that you can see how to bring back a Collection file for editing.

12. Click on the main menu icon "Collection", then select action "Open…". You should see a standard "open file" pop-up window. Navigate to your "Desktop", then double-click on the "Training Collection" collection that you just saved.

13. Click the (new) picture button beside the collection items list to add a new collection item. In the pop-up window, set the "Select" radio button choice to "Query". Your pop-up window should appear as follows:



14. You will now add a part query to your collection. First, select value "Part" in the "MaintScape Object" field. Right-mouse click on the "Query" non-modifiable field, then select pop-up action "Compose…".

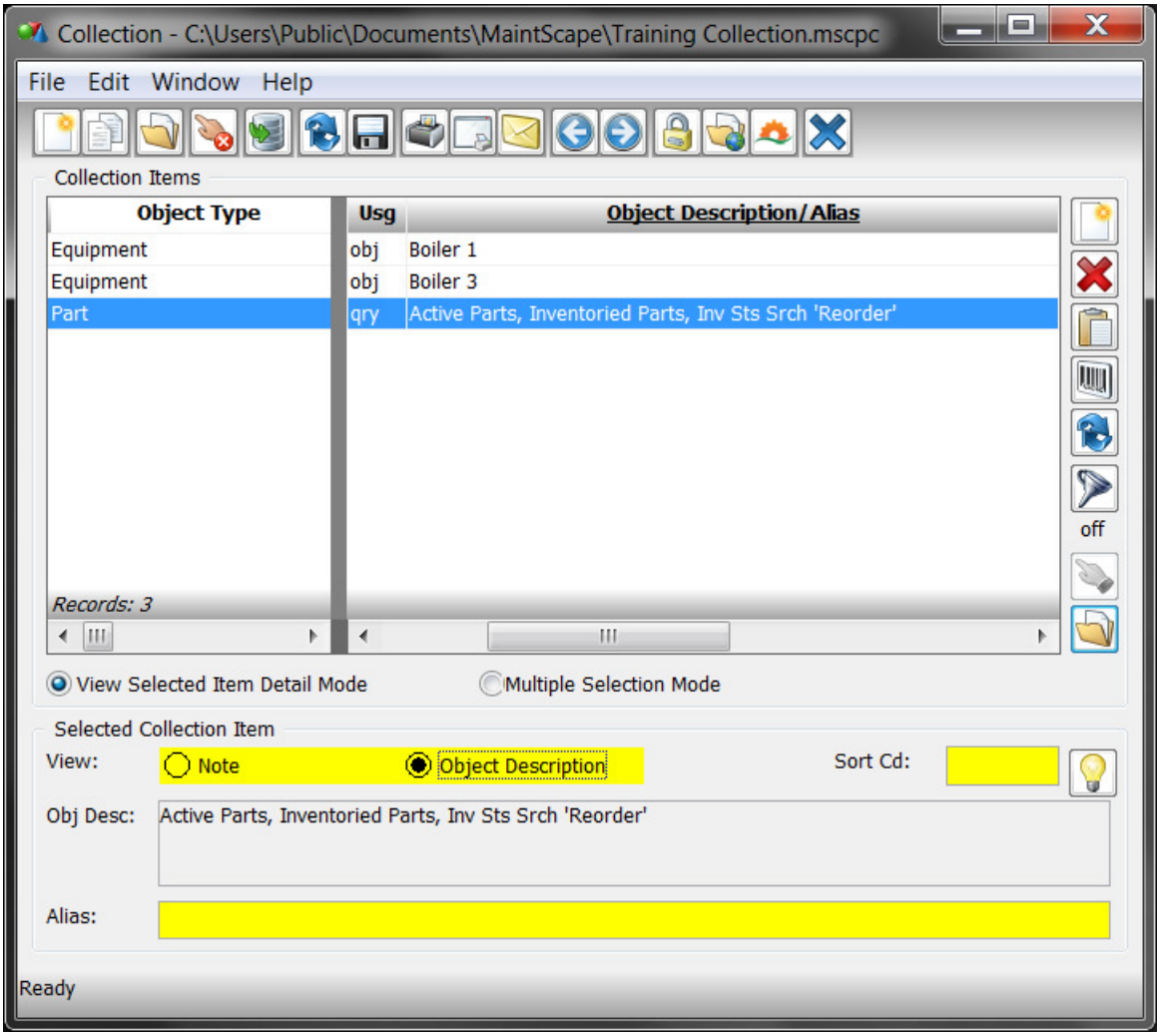
15. You should now be in the Part Search window. Flip to the "Inventory - 1" search criteria tab, then click the (action) picture button and select pop-up action "Standard Re-Order Query"[8]. Search criteria field values will be appropriately set.

    Click the (select) picture button to the right of the search criteria tab to select the parts query back to the "new collection item" window.

[8] The standard parts re-order query, and parts re-ordering in general are covered in the tutorial section, "Parts Purchasing".

16. Click “OK” to close the “new collection item” pop-up window, adding a reference to the part query to your Collection.

    Ensure the “View Selected Item Detail Mode” radio button is checked, then click to select your newly added part query collection item. Your window should look similar to the following:



17. The “Object Description” value for the part query is not intuitive. Make it more intuitive by typing a value in the “Alias” field at the bottom of the window. Suggestion: “Standard Re-order Query”.

18. Save changes pending to your collection by clicking the (save) picture button in the collection window toolbar.

    Notice that the “Object Description/Alias” column value for your parts query has changed to your more descriptive alias value.

You just added a query to your MaintScape Collection using the “pull” method. In other words, you were in the Collection window and then asked to add the query. The next steps will show you how to add a query using the “push” method.

The next steps will also introduce the concept of a “relative date range” search criteria. It may not be useful to store a query in a collection to find active work orders due between September 4 and September 9. Such a query may be useful the day you create it, but probably not, for example, one month

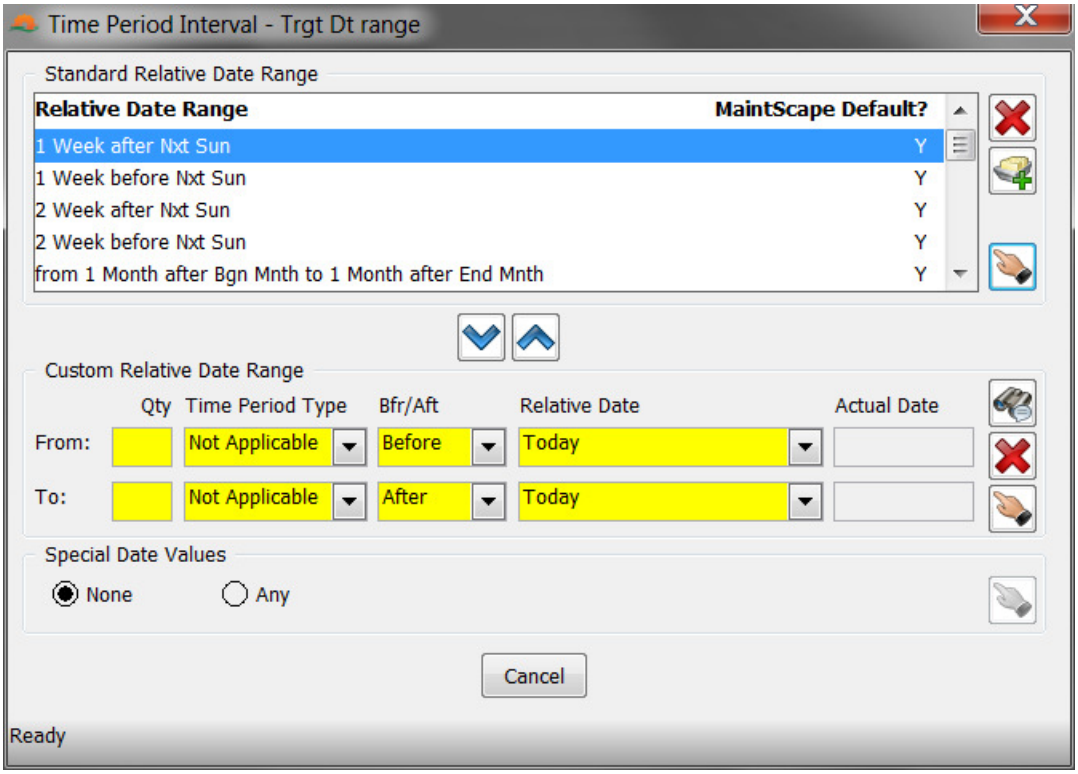
later. You could instead create search for work orders due between "this Monday and this Friday". This relative date range is resolved into actual dates when the query is used.

19. Without closing your Collection window, navigate to the MaintScape main menu window. Click on the main menu icon "Work Order", then select action "Search, Report and Bulk Operations…". You should now see the familiar Work Order Search window.

20. You will now create a work order query to find all work orders closed in the last week.

    First, select value "Closed" for the "Work Order Status" search criteria field.

    You will now specify a "relative date range" for work order target date that represents "last week before today". Right-mouse click on either of the start or end "Target Date Range" fields, then select pop-up action "Relative Date Range…". You should see the following pop-up window:



    The three boxes in the above window provide three different ways to specify a relative date range.

    - The "Standard Relative Date Range" list provides an easy way to set a relative date range from a customizable standard set. You would either double-click on a row, or select the row and click the (select) picture button to the right.
    - The "Custom Relative Date Range" box provides a way to specify a relative date range that is different from the standard set. You would fill in values to define the relative date range, then click the (select) picture button to the right.
    - The "Special Date Values" box lets you search for records that have "any date value" or "no date value". You will notice that this option is not available. The reason is we are creating a relative date range to search by work order target date, and because every work order has a work order target date, it does not make sense to search for "none" or "any" date values.

21. Scroll through the "Standard Relative Date List" until you find "Last Week before today". Double-click the row to select it back to the work order search window.

22. Your work order search criteria fields should now reflect the query we are interested in.

    To make sure, click the (query preview) picture button. The query preview description you should see is, "Target Date Last Week before today, Status 'closed'".

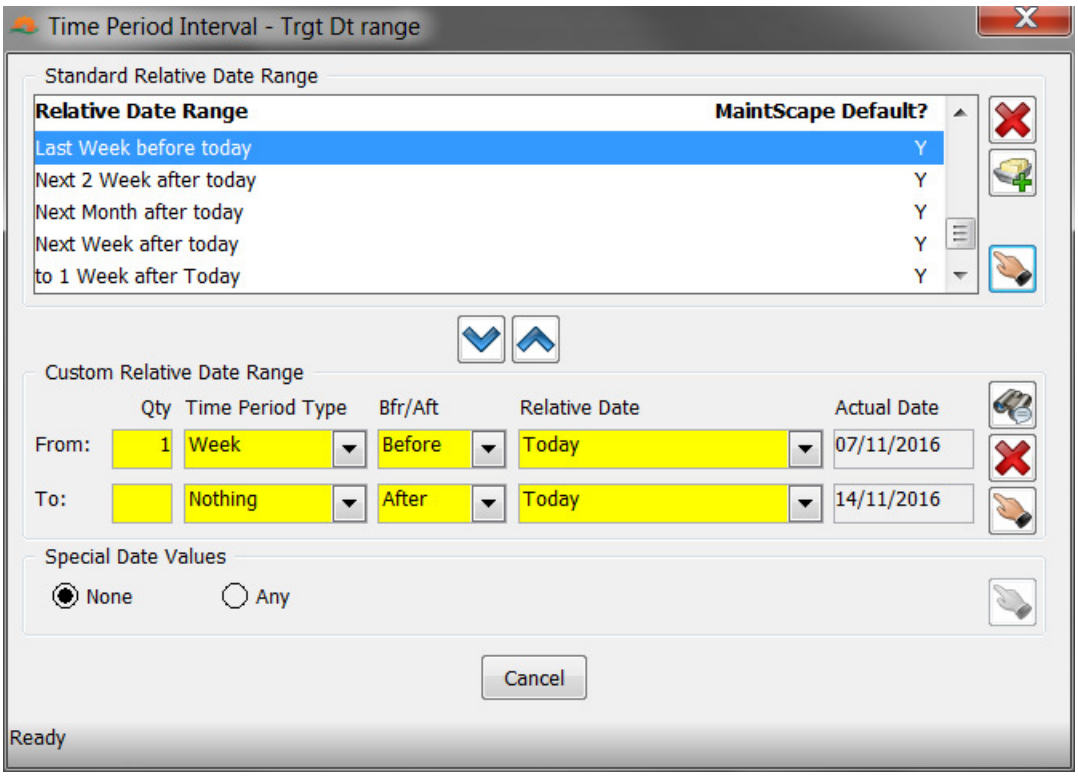
23. Ensure the query preview from the last step is closed. Click the (collection) picture button beside the search criteria group (**do not** click the same "collection" button beside the records list!). Select pop-up action, "Send Query to Collection"[9]. This will bring you back to your collection and add your work order query.

24. Save changes pending to your collection by clicking the (save) picture button in the collection window toolbar.

We will now get some further experience with relative date ranges by changing the work order query in your collection from "closed work orders due last week before today" to "closed work orders due 1 week before this past Monday".

25. While viewing your collection within the MaintScape Collection window, right-mouse click on the "Object Description/Alias" value for your work order query collection item. Select pop-up action "Open".

26. You should now be back in the work order search window, with search criteria fields populated as per the work order query from your collection. Right-mouse click on the relative date range value "Last Week before today" and select pop-up action "Edit…". You should be back in the relative date range edit window. This window should look like the following:



[9] The other pop-up action, "Send Query Results to Collection", would add records to the collection for each work order that satisfied the work order query.

Notice that the "Last Week before today" relative date range is selected, and that the values that define it are populated into the "Custom Relative Date Range" box.

27. We will create the "1 week before this past Monday" relative date range by modifying one of the standard date ranges. As you get familiar with relative date ranges, you will not need this step and simply create the relative date range in the "Custom Relative Date Range" box from scratch.

    Scroll through the standard relative date range values and select row, "1 Week before next Sunday". Click the (down) picture button to populate the "Custom Relative Date Range" box with the values it represents.

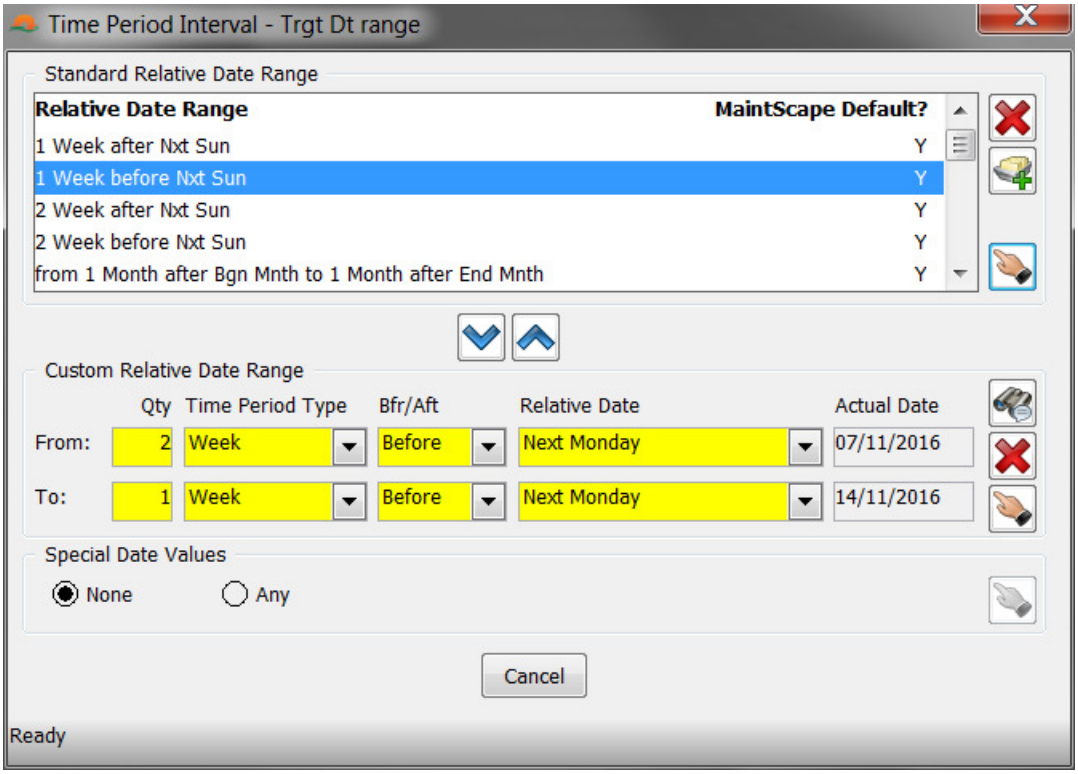
28. Within the "Custom Relative Date Range" box, change the "From" row to specify: "2 week before Next Monday".

    Note that this would be equivalent to specifying, "1 week before Last Monday", however "Last Monday" is not an available option in the "Relative Date" drop-down list.

29. Within the "Custom Relative Date Range" box, change the "To" row to specify: "1 week before Next Monday".

    Note that this would be equivalent to specifying, "nothing before Last Monday", however "Last Monday" is not an available option in the "Relative Date" drop-down list.

30. Click the (calculate actual dates) picture button to compute the actual dates represented by the relative date range as of today. Your window will look similar to the following, except, of course, for your actual date values.

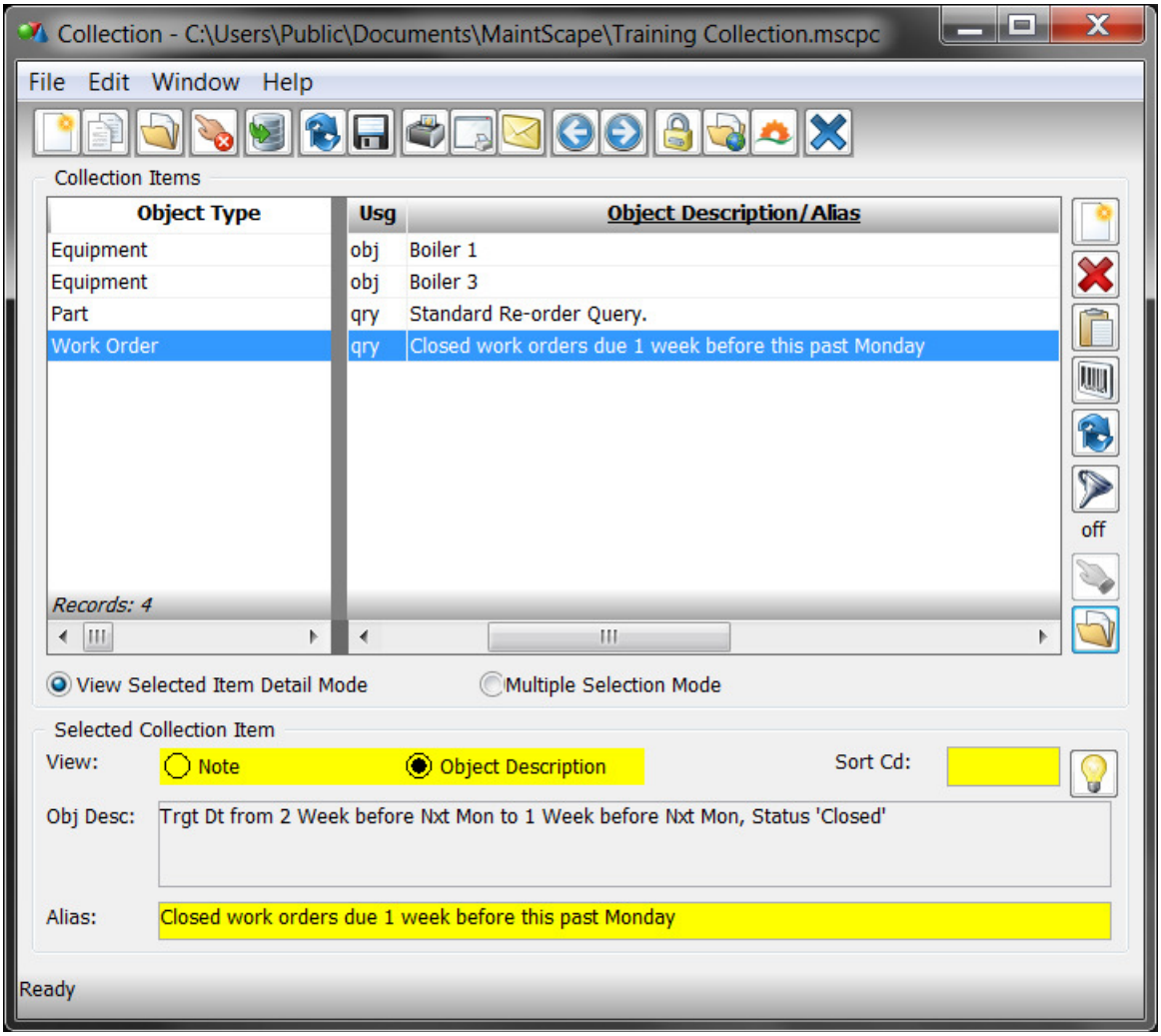


31. Click the (select) picture button within the "Custom Relative Date Range" box to select the relative date range back to the work order search window.

32. Click the (collection) picture button beside the search criteria group. Select pop-up action, "Send Query to Collection". This will bring you back to your collection and add your work order query.

33. Note that your collection now has both the original and the new work order query. The new query is the only one we want, therefore delete the first one.
34. Make the description of your work order query more intuitive by typing a value in the "Alias" field. Suggestion: "Closed work orders due 1 week before this past Monday".
35. Save changes pending to your collection by clicking the (save) picture button in the collection window toolbar.

    Your collection window should look similar to the following:



Advanced Exercise

This exercise will demonstrate how to move items from one collection to another using the "clipboard".

1. Open any MaintScape collection into the collection window. You can open the "MaintScape Training" collection if you have just done the "Creating MaintScape Collections" tutorial.
2. Select one or more items in the Collection Items list. You will need to enable "Multiple Selection Mode" if you want to select more than one collection item at a time.
3. Click the (clipboard) picture button beside the collection items list. The available clipboard pop-up actions are as follows:

Cut to Clipboard	Delete the selected items from the collection and place the items into the clipboard replacing any prior collection items.
Cut, add to Clipboard	Delete the selected items from the collection and add the items into the clipboard leaving prior collection items in place.
Copy to Clipboard	Copy the selected items into the clipboard replacing any prior collection items.
Copy, add to Clipboard	Copy the selected items into the clipboard leaving prior collection items in place.

Select action "Copy to Clipboard".

4. Click on menu bar item "Window", then select action "New" to open a new collection window.
5. The new collection window will present a standard "open file" pop-up window to select which collection you want to open. Click "cancel", and then click the (new) toolbar icon to create a new collection.

   Note that you now have two collection windows open at once – one displaying the copy-from collection, the other displaying the new and unsaved collection[10].
6. Click the (clipboard) picture button beside the collection items list, then select action "Paste from Clipboard…". You have now copied collection items from one collection to another.
7. Save your collection by clicking the (save) picture button in the window toolbar.

Parts Purchasing

Parts Purchasing is only available when the MaintScape "purchasing" module is enabled. However the Parts Re-order Inquiry exercise, below, is supported when the "inventory control" module is enabled.

Detailed reference material on the parts purchasing process is available in another document titled, "MaintScape Parts Inventory Control and Purchasing".

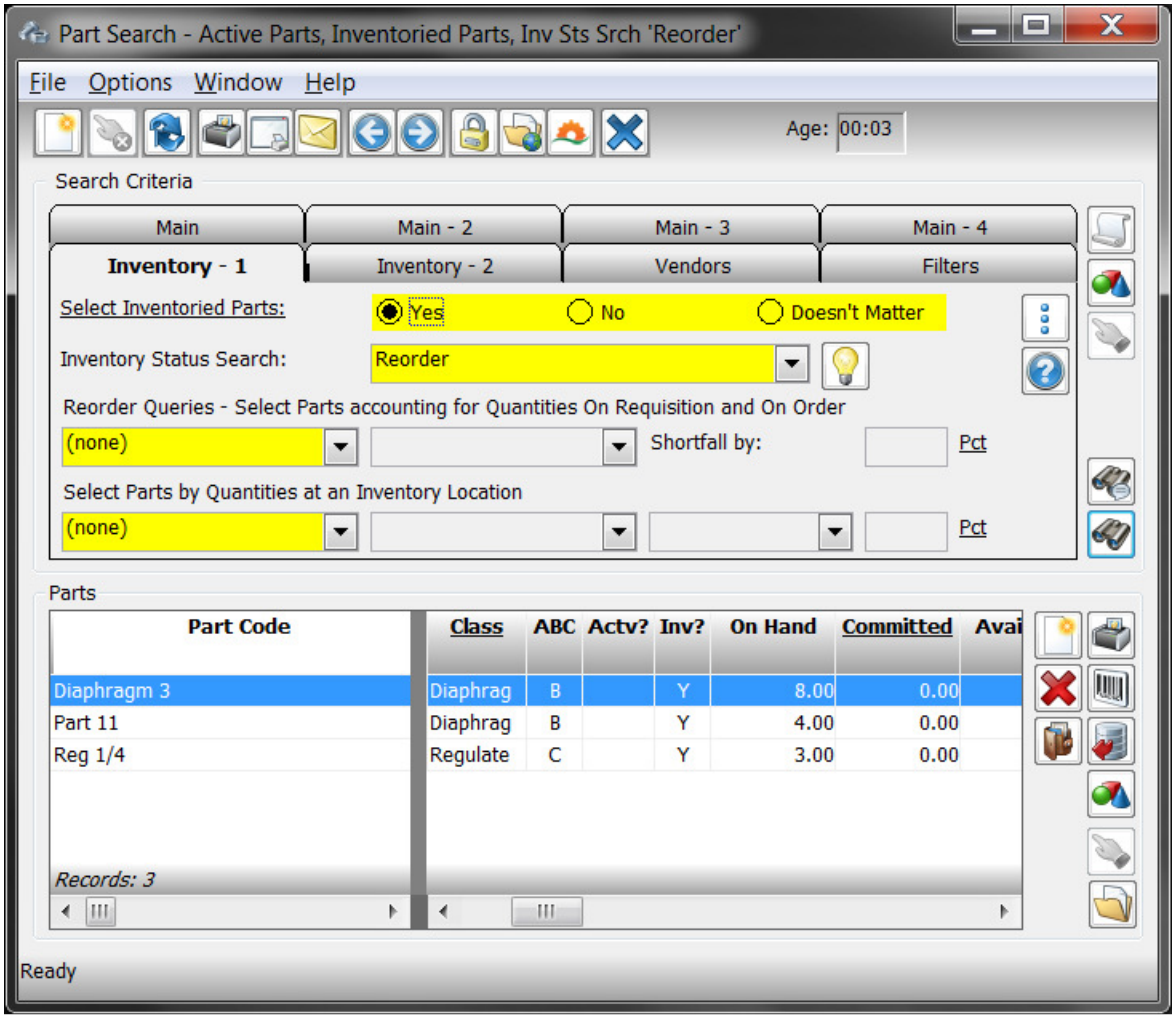
Parts Re-order Inquiry

The parts re-order inquiry is a search for parts, and like any search for parts, is performed using the parts search window. Perform a default parts re-order inquiry using the following steps:

1. Navigate to the MaintScape main menu window, and then click the (close all but current window) toolbar button to close MaintScape windows.
2. Click main menu icon "Parts", then select action "Parts – Standard Reorder Query …". This opens the parts search, fills in criteria fields appropriately, and executes the query. You can see the criteria values by flipping to the search criteria tab page "Inventory – 1". Your window should look similar to the one below.

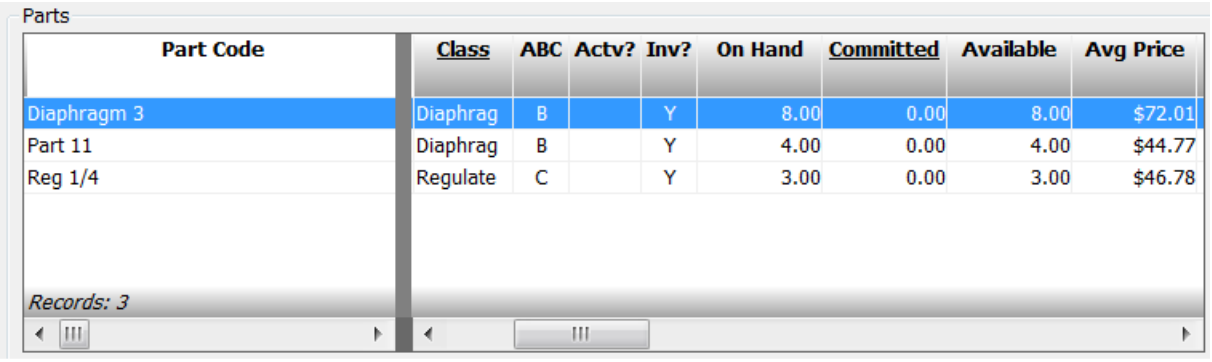
[10] You could have selected menu bar action "File"/"New" instead, in which case the collection window will reset from displaying the copy-from collection to displaying a new and unsaved collection. The copy-from collection items would remain in the clipboard.

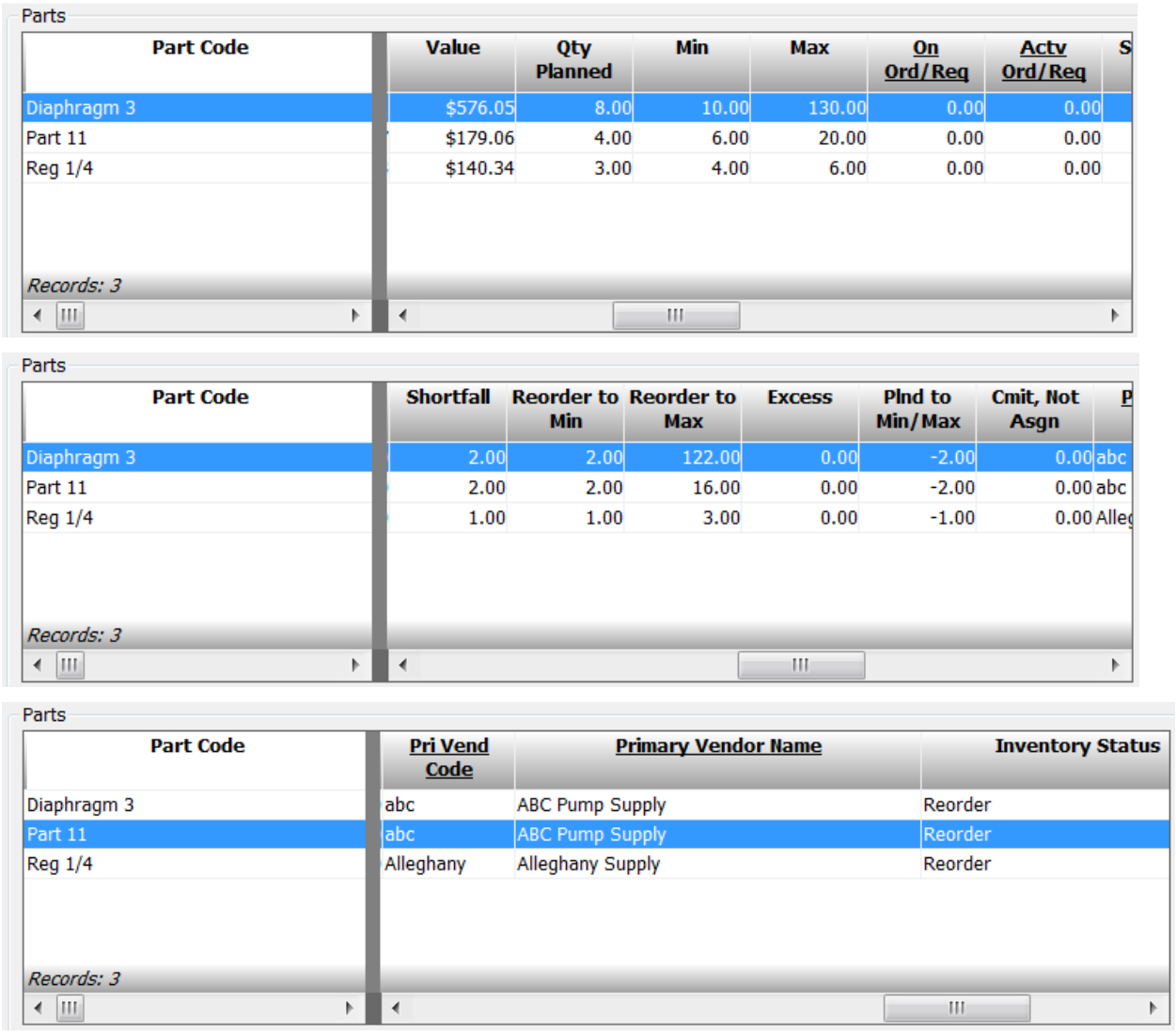
Note: If your search results do not display the quantity columns shown below, click on menu bar "Options", then select "Inventory Data in Query Results". Click "yes" when asked to re-retrieve records.



The Parts Re-order query finds parts where the available quantity at any inventory location is below minimum. A part found by the re-order query may be on an active PO or PR, but if so, the PO/PR quantities do not make up the full shortfall.

You should maximize the parts search window to see as many quantity fields at a time as possible. The full set of quantity fields for a part are:




Parts

Part Code	Value	Qty Planned	Min	Max	On Ord/Req	Actv Ord/Req	S
Diaphragm 3	$576.05	8.00	10.00	130.00	0.00	0.00	
Part 11	$179.06	4.00	6.00	20.00	0.00	0.00	
Reg 1/4	$140.34	3.00	4.00	6.00	0.00	0.00	

Records: 3

Parts

Part Code	Shortfall	Reorder to Min	Reorder to Max	Excess	Plnd to Min/Max	Cmit, Not Asgn	P
Diaphragm 3	2.00	2.00	122.00	0.00	-2.00	0.00	abc
Part 11	2.00	2.00	16.00	0.00	-2.00	0.00	abc
Reg 1/4	1.00	1.00	3.00	0.00	-1.00	0.00	Alleg

Records: 3

Parts

Part Code	Pri Vend Code	Primary Vendor Name	Inventory Status
Diaphragm 3	abc	ABC Pump Supply	Reorder
Part 11	abc	ABC Pump Supply	Reorder
Reg 1/4	Alleghany	Alleghany Supply	Reorder

Records: 3

The various quantity types are summarized below. Note that the quantities are summed up over all part locations[11]. See document, "Parts Purchasing Process Documentation", for more detail.

Quantity Type	Summary
On Hand	Inventory quantity of a part.
Committed	Un-issued quantity of a part listed on status 'open' Work Orders. Committed quantities are included in the (On Hand) quantity.
Available	On hand quantity less committed and reserved quantities. The Reserved quantity is presently not used and is always 0.
Qty Planned	Available quantity plus outstanding quantity on purchase orders and purchase requisitions.

[11] If you are running MaintScape with multi-site functionality enabled: Quantities are summed for the set of sites specified in your search criteria, which will include at most all part locations at your viewable sites.

Min	Sum of minimum quantities specified at all part locations.
Max	Sum of maximum quantities specified at all part locations.
On Order / Requisition	Outstanding quantity on status "Open" purchase orders or purchase requisitions.
Active Order / Requisition	Outstanding quantity on status "Open", "Planned" and "Pending Approval" purchase orders or purchase requisitions.
Shortfall	Amount by which the (Available) quantity of a part at an inventory location is less than (Minimum).
Re-order to Minimum	Quantity of parts you would need to order to bring all storage locations for the part which are below minimum up to *minimum*.
Re-order to Maximum	Quantity of parts you would need to order to bring all storage locations for the part which are below minimum up to *maximum*.
Excess	Amount by which the (Available) quantity of a part at an inventory location is greater than (Maximum).
Planned to Min / Max	This quantity is the best barometer of how you are stocked on a part at ALL locations. It indicates whether the Planned quantity (i.e. available quantity PLUS the quantity outstanding on all active PR/POs) is less than the total minimum (negative value) or greater than the total maximum (positive value). When zero, the planned quantity is within the bounds of total minimum and maximum quantities.
Committed, not Assigned	This quantity has no bearing on the purchasing process. It is the un-issued quantity of a part listed on status 'open' Work Orders which are not committed from a particular inventory location. This value will be non-zero only for parts stored at more than one location. An issuing location will have to be identified on the work order before it is closed.

Ordering Parts identified by the Parts Re-order Inquiry

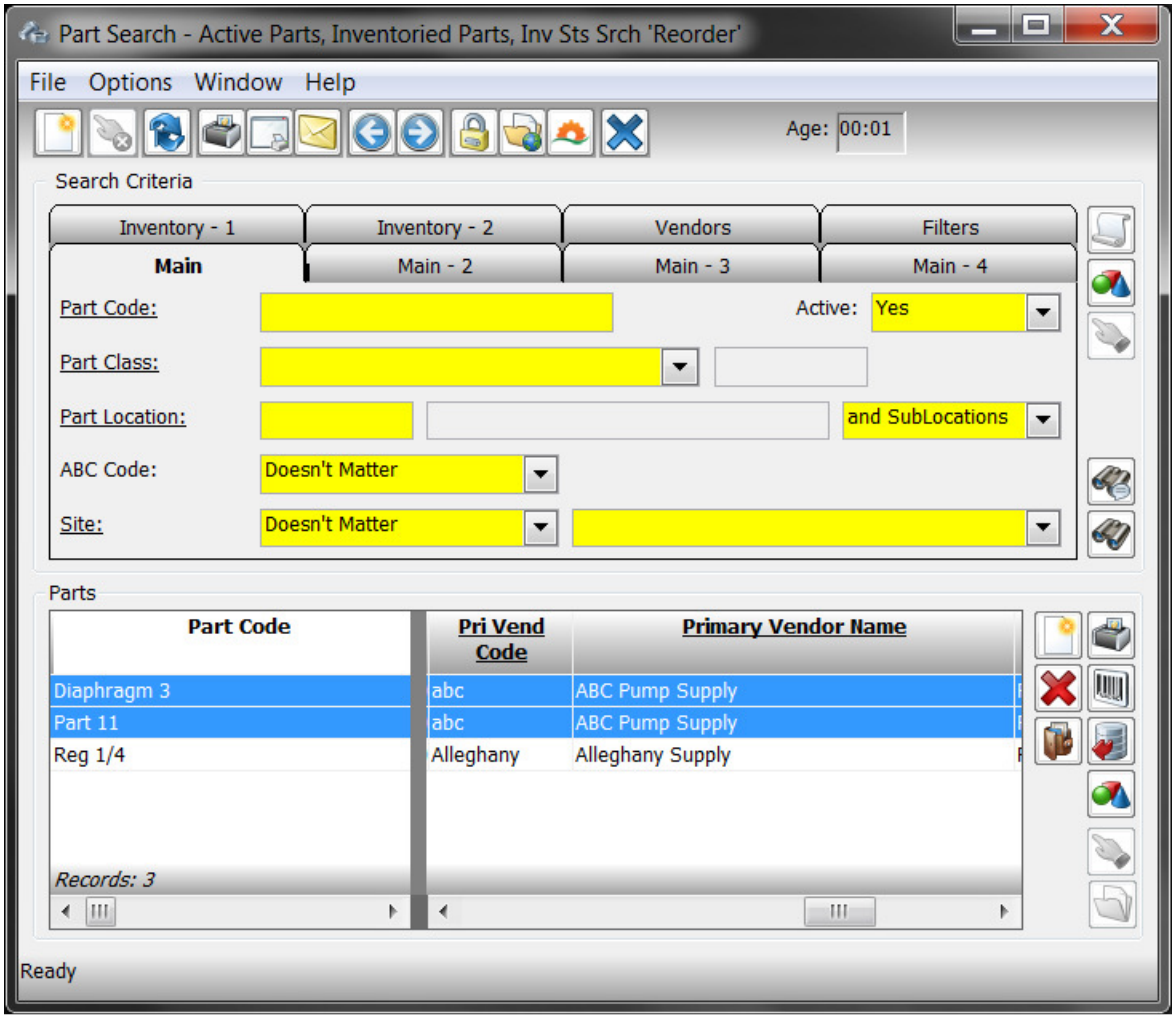
The parts re-order inquiry just described tells you how to identify parts needing to be re-ordered. We will now create a Purchase Order for a number of these parts.

We could instead have created a Purchase Requisition, which is an internal document, and once approved, send the parts from a purchase requisition to a purchase order. However we will bypass this step for simplicity.

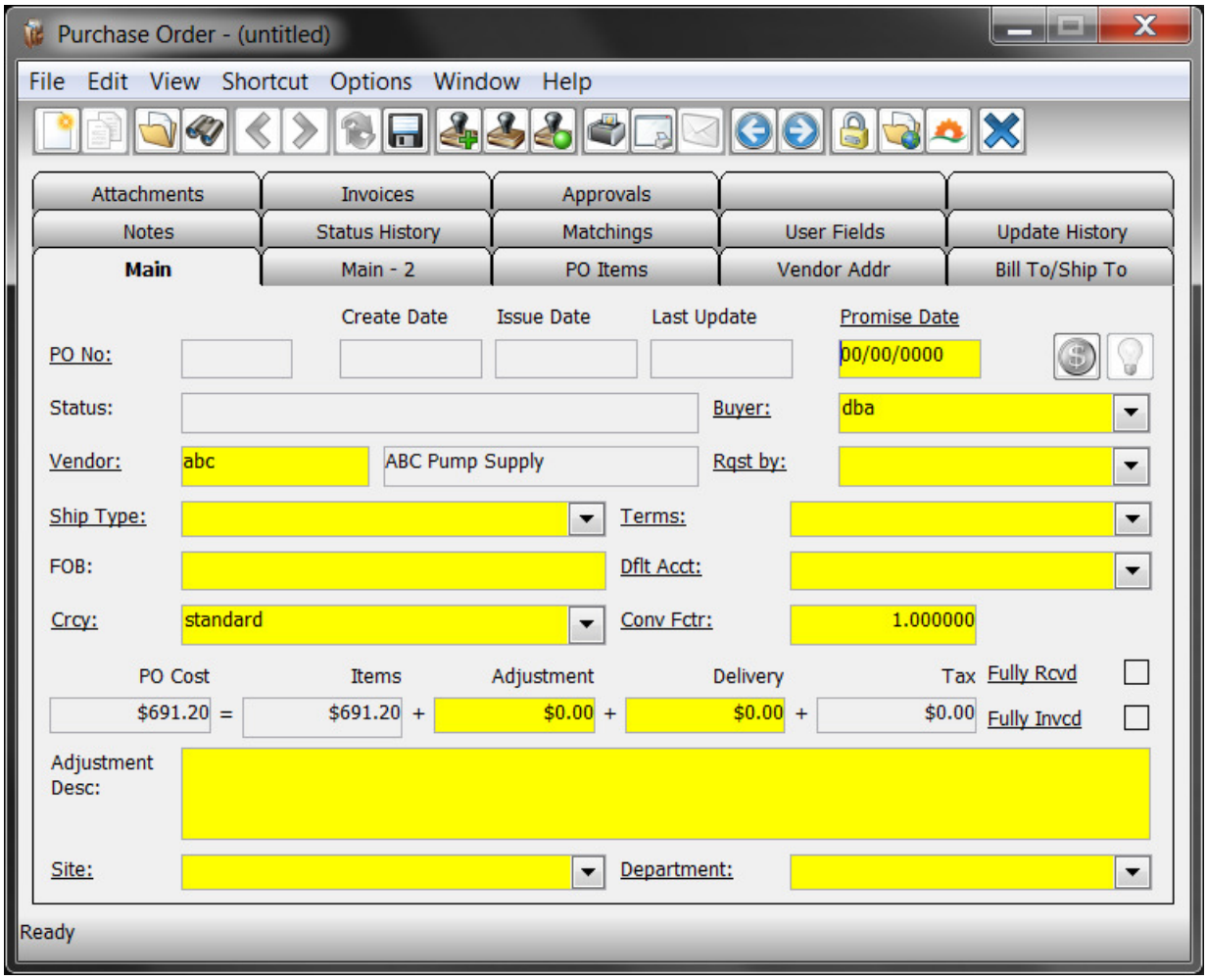
1. Horizontally scroll the results of your parts re-order inquiry to see the "Primary Vendor" column. Click this column header to sort the results by primary vendor. Select all parts supplied by a particular vendor.

   Parts for vendor "abc – ABC Pump Supply" are selected in the following example. Parts to re-order on your screen may not be the same as in this example since the training database is continually updated to simulate a real life use of MaintScape.

   Use standard Microsoft Windows <ctrl>+<click> technique to select more than one row at a time.

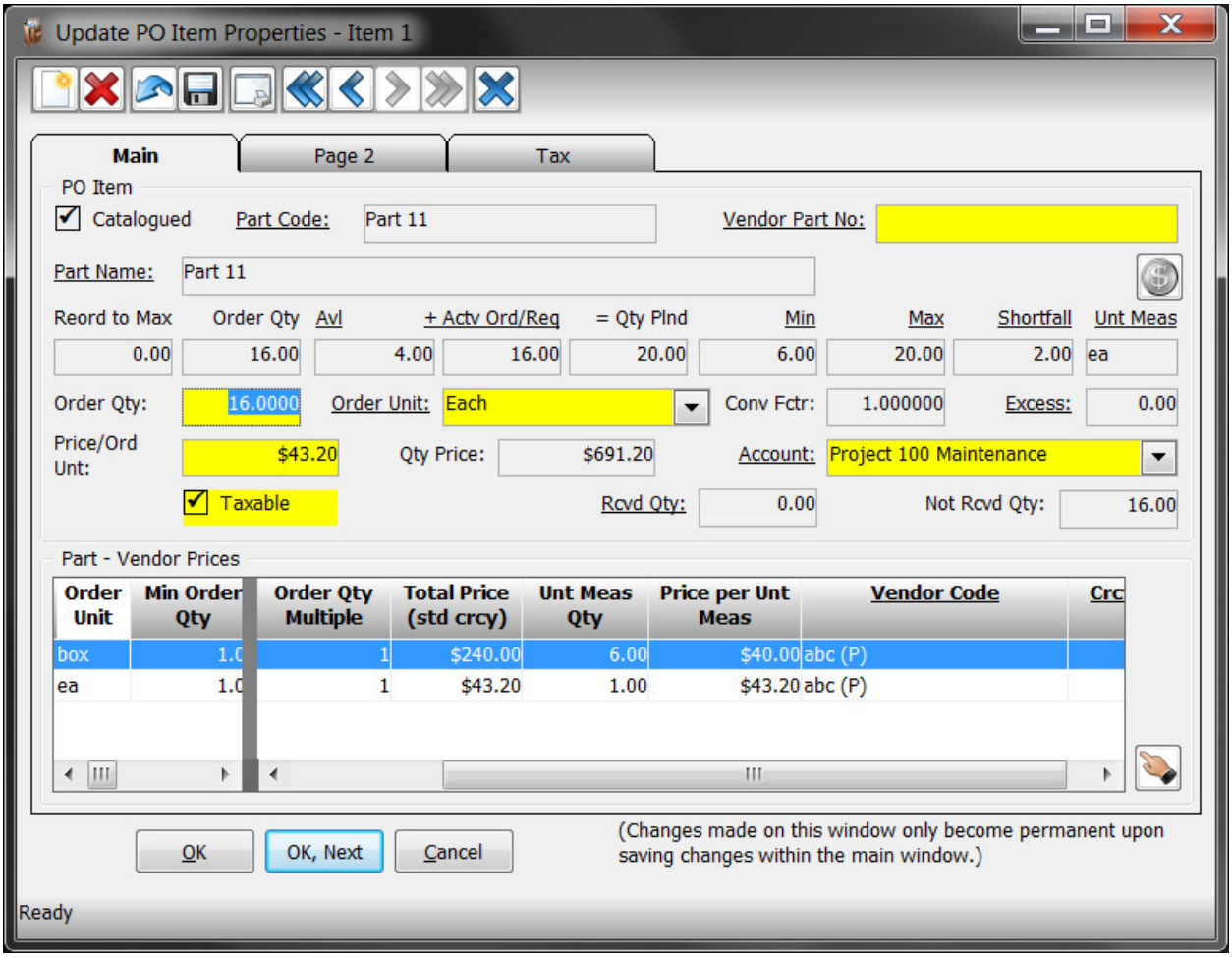


2. Click the (order or requisition) picture button in the parts list, then select pop-up action "Order Parts" and then "to New Purchase Order". You should now see the Purchase Order window:



3. Flip through all the tab pages of the purchase order window to see all the properties of the PO. We will review some of these pages and properties further below.

4. Flip to the PO Items tab. You will see there an item for each part which you selected from the part re-order search. Double-click on the first PO item to display its details in the PO item inspector window:



Notes on the PO item inspector window:

- The PO item inspector displays summary inventory information. These numbers are similar to those described in the Parts Re-order Inquiry section, above.
- You may order the part using various "units of order" – e.g. each, box, case, dozen, etc. however MaintScape tracks quantities internally only in the part's unit of measure as defined for the part in the part window. Therefore all summary inventory information is in the part's unit of measure, and the "Conv Fctr" field identifies how to convert the unit of order to unit of measure.
- The PO item inspector displays in the "Part - Vendor Items" group a list of vendors who offer this part and the price breakdowns.

5. Click the (next) picture button in the inspector window toolbar. You will now see the next PO item in the inspector.
6. We will set the unit part cost for this PO item. Double-click a vendor item for the same vendor as this PO – notice that the "price per order unit" value is updated. Click OK to save changes to the PO item and close the inspector.

7. Save the PO by clicking the (save) picture button in the window toolbar. You will be asked what status to save the PO as.

   The status values permitted depend on your security authorization. In many cases, you may only be permitted to save the PO as status "pending approval", and another MaintScape user may be required to save as status "open" (issued to the vendor).

   Save the PO as status "open".

Receiving Parts

Parts are received by creating part inventory transactions of type "receipt". You may create the receipt inventory transaction manually or from the PO window. The manual method is described in the training course section "Inventory Transactions for a Part", above. The "from the PO window" method is described here.

In MaintScape, receipt transactions are linked to PO items using "matchings". A matching is created automatically when you receive parts from a PO. You need to manually create a matching between a receipt and a PO item if the receipt was created manually.

Matchings are very powerful and can be simple or complex:

- A PO item is matched to a receipt transaction of identical quantity if the receipt represents full receipt of the PO item.
- A PO item can be matched to one or more receipts transactions. This would occur if the PO item quantity was received in partial shipments.
- A receipt can be matched to one or more PO items. This would occur if the vendor consolidated multiple POs into one shipment.
- Combinations of the above two are possible, but not likely to be needed.

Exercises:

1. Remember the PO number which you have just created – e.g. Purchase Order number 6.
2. Navigate to the MaintScape main menu window, and then click the (close all but current window) toolbar button to close MaintScape windows.
3. Assume you have now received parts ordered in PO number 6. Click on the main menu icon "Purchasing", then select action "Open Purchase Order…". Enter the PO number and click "Open"[12].
4. You will now be back in the PO window. Flip to the PO items page, and highlight the first PO item.

   How do we know whether or not this PO item has already been received? Horizontally scroll the PO item list to the right until you see column "Received Quantity (Match from)". This quantity identifies how many units of measure of the part have been received, or "matched from" the PO to a receipt. The part has not been received if this value is 0. The part has been fully received if this value is equal to the order quantity in the part's unit of measure.

   The "Not Received Quantity (Not Matched from)" field identifies how many units of measure of the part have NOT been received. The part has been fully received if this value is equal to 0.

[12] If you have not been following this course sequentially and therefore have not just added a PO, click on "Search" instead of "Open" and use the PO search window to search for and display a PO which is not fully received - see search window criteria page 4.

If you scroll the PO item list further to the right, you will see similar matching columns such as "Match to Quantity (from PR)". This quantity identifies how many units of measure of the part have been "matched to" the PO from MaintScape purchase requisitions. This value would be non-zero if the PO item was generated from one or more PR item.

5. Click the  (receive selected PO item) picture button to the right of the PO item list. You will see a set of "receive" options:

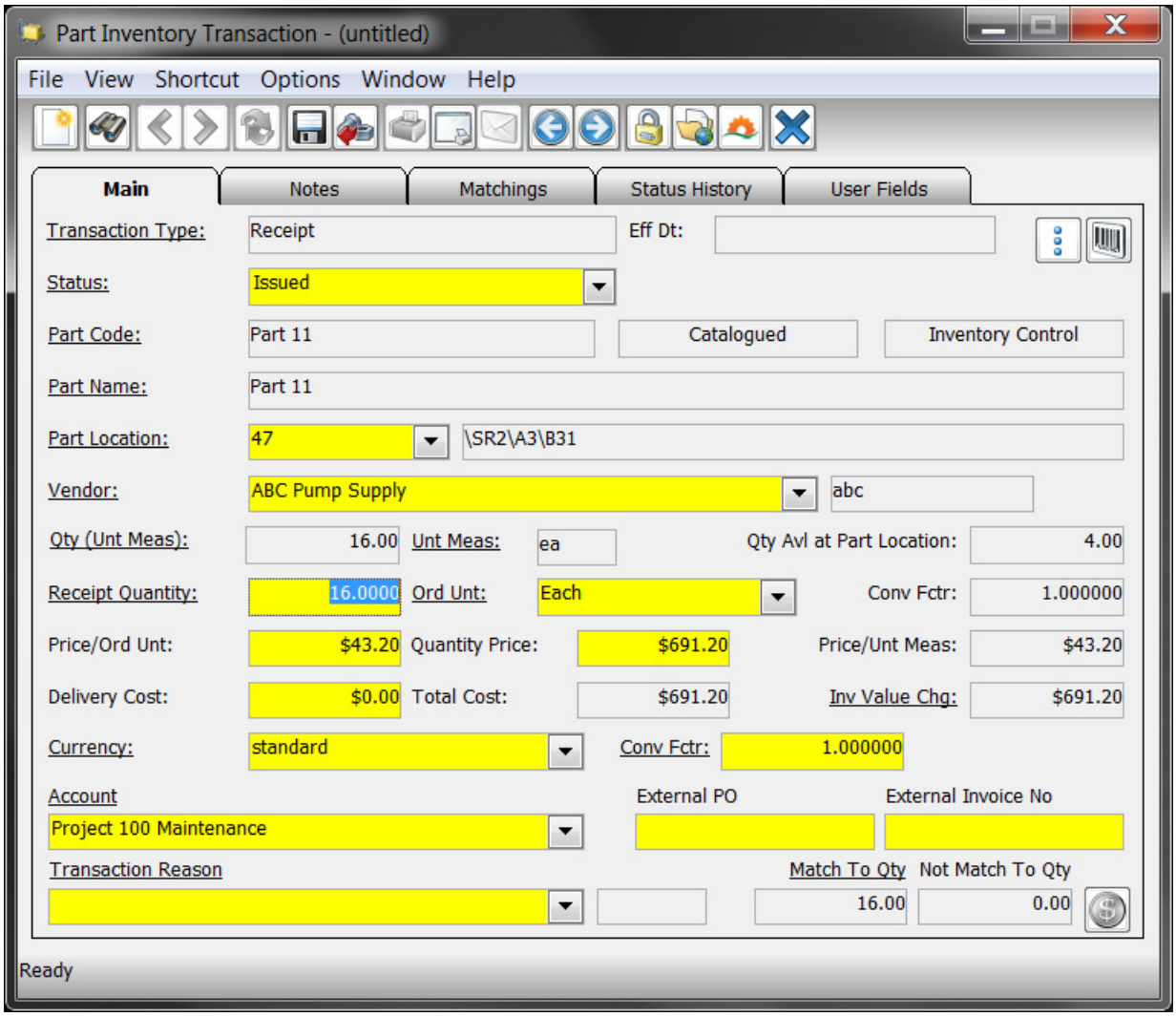
   You may receive a PO line item either automatically or interactively. If you receive interactively, then you will be presented with a window to customize the receipt transaction. You will want to do this if you are receiving less than the full PO item quantity. The receipt transaction will be created immediately if you choose the non-interactive option.

   You may create an inventory transaction of status "not finalized" or "issued". An "issued" transaction is final and cannot be modified, however it can be reversed. A "not finalized" transaction can be modified until it is subsequently changed to status "issued". You create a "not finalized" transaction if you want to update it with the final price and invoice number information later when the invoice is received. At that point you should finalize the transaction by changing its status to "issued"[13].

   IMPORTANT: Part Inventory Transactions should not stay status "Not Finalized" for any length of time, and you should periodically make sure the number of such transactions is reasonable. You can use the "Today's Status" dashboard for Part Inventory Transactions to monitor this.

[13] Quantities from a status "planned" transaction affect inventory levels. However the transaction price only factors into the part average price calculation once it is status "issued".

6. Select receive action, "Interactive Receive - Issued". You will then see the inventory transaction window representing the receipt:



You can now make changes to the receipt, such as reduce the quantity if the order quantity was not received in full, or modify the price. Leave values as they are for this exercise.

Save the receipt transaction by clicking the (save) picture button in the window toolbar. Notice that the issued transaction is no longer modifiable.

7. Flip to the "matchings" tab on the inventory transaction window. Notice that the receipt transaction is fully matched to your PO item (transaction quantity = PO item matching quantity).

8. Switch back to the PO window from which you received the part – this window should still be open. Notice that the "Received Quantity" for the PO item has been updated to reflect the fact that the PO item has been received!

Advanced Exercise - 1

You have now received one of your two PO items. In this exercise, you will manually receive the other PO item and manually match the receipt to the PO item.

The advanced exercises do not lead you through steps in the same level of detail as the regular exercises, thus giving you an opportunity to apply principles already covered. Please ask you instructor if you need hints (this is to be expected).

1. Make note of the part code, vendor, part quantity and price of the PO item not yet received (print your PO if you have access to a printer).
2. From the main menu window, click on icon "Parts" then select action, "New Part Inventory Transaction…". Manually create and save as status 'Issued' a receipt inventory transaction for the second PO item.
3. Flip to the "Matchings" tab of the inventory transaction window. Click the (new) picture button to create a matching for the newly saved receipt. Define a matching to link the receipt to the not-yet-received item of your PO.
4. Save your receipt transaction with the newly added matching by clicking the (save) picture button in the window toolbar.
5. Still within the "Matchings" tab of the inventory transaction window, right-mouse click on the matched-from PO number and select action "Open". If this caused you to switch back to the already open PO window, click the (refresh) toolbar button to re-retrieve PO data. Flip to the PO Items tab of the PO window if you are not already there. You should now see that both PO items are fully received.
6. Flip to the "Matchings" tab of the PO window. Notice that the "Matchings from Purchase Order…" group lists the two inventory transactions which receive the PO items. Similarly the "Matchings … to Purchase Order" group would list the PR items which generated or are matched to the PO's items (there are none in this case).

   Right-mouse click on the word "Receipt" in one of two matchings in the "Matchings from Purchase Order…" group, then select action "Open". This will open the receipt transaction in the inventory transaction window.

   In summary, a matching links a PO item to a receipt inventory transaction. Each corresponding window has a "Matchings" tab which lets you see, navigate and update[14] the other matching partner.

Advanced Exercise - 2

This exercise assumes one or more parts you received were defective and have to be returned. You will record the return to vendor transaction, and then record receipt of replacements.

1. Display in the PO window the PO which you created in the exercises above. Flip to the PO items tab. Select the PO item for which you received the defective parts, then click the (return selected PO item) button.

   Clicking this button is equivalent to receive action "Interactive Receive – not finalized" in that you are taken to the inventory transaction window and given an opportunity to update the defaulted values. Notice that the inventory transaction type is "Return to Vendor".
2. Modify the return quantity to a quantity less than the full received quantity. Click "Yes" when asked whether you want to modify the matching quantity as well.

[14] More accurately, when a matching is from "A" to "B", you can only update the matching in the record for "B". For example, a matching from a PO item to a receipt transaction is modified in the inventory transaction window.

Return to Vendor transactions are matched from PO or PR items as are Receipt transactions. If you fully received a PO item for 17 units and then return 3 units, then the matching quantity from the PO item is 14 units. You can then still match 3 units from the PO item to a new receipt transaction.

In summary, the sum of all matchings from a PO item cannot exceed the PO item quantity. Similarly, the sum of all matchings to a receipt cannot exceed the receipt quantity.

3. Change the return to vendor transaction status from "not finalized" to "issued".

   You would leave the status as "not finalized" if you did not know at the time of the receipt how much the vendor would reimburse you for each returned unit. When you subsequently determine this amount, you then enter it into the "Price per Order Unit" of the return transaction, and save the transaction as issued. This is a similar process as is described above for receipt transactions.

4. Save the Return to Vendor transaction by clicking the  (save as issued) toolbar button. Notice that the issued transaction is no longer modifiable.

5. Switch back to the PO window from which you returned the part – this window should still be open. Notice that the "Received Quantity" has been adjusted to reflect the return quantity. The PO item is now considered partially received.

6. Let's assume we just received replacement parts. Still within the PO window, select the PO item for the returned part and then click the  (receive selected PO item) picture button. Select action "Interactive Receive – Issued", then save the inventory transaction when it is displayed. Close the inventory transaction window to return to the PO window. Notice that the PO item is again fully received.