

MarkMagic Tutorial

Add-on option:

PrintTransformer

Contents

Welcome	3
Why Use PrintTransformer?.....	3
Using JMagic to Add Conditions to a Format	4
Attaching a RuleSet to a Print Job	31

Welcome

This tutorial will introduce you to CYBRA's MarkMagic PrintTransformer add-on option. PrintTransformer is a print rules and field level conditions engine. It allows a user to easily define "tests" and "actions" that interrogate system environmental variables and/or live format data to redirect print output or change the way fields print on the format with NO programming involved. The interface for defining the rules and conditions is accessible in CYBRA's JMagic GUI designer tool.

Before we begin we are assuming:

1. You have completed the "Basic Concepts" and "Intermediate Concepts" tutorials and/or understand what was introduced. (Creating formats, creating variable text and barcode fields, printing from label files and spooled files, etc.)
2. You have JMagic installed on your PC.
3. You have a valid authorization key that unlocks the PrintTransformer add-on option. This can be a MarkMagic Development Rental code (a code used during 30 day trial), a PrintTransformer specific rental code or PrintTransformer permanent code.
4. You have a laser printer (preferably two laser printers, you'll see why) at your location configured for printing on your System i server.

In this tutorial, you will learn:

1. About different situations where you would want to use PrintTransformer to control the output of your print jobs and the look of your formats.
2. How to create Conditions directly on a format to change the look and feel of the fields on the format.
3. How to define tests and actions in a condition to get the desired results.
4. What a Rule Set is and how to define a new RuleSet.
5. What "bursting" is and why you would want to use it in a Rule Set.
6. About Rules and Options.
7. How to setup Tests that will analyze environment variables and live format data.
8. How to define Actions that will change any number of print output parameters.
9. How to "attach" a Rule set to a print job or print command call.

Why Use PrintTransformer?

One basic application of PrintTransformer Rules is redirecting print output to different printers based on the user ID of the person printing at the time. Without PrintTransformer, this would be something a programmer would have to write new programs for. This tutorial will describe to you how to create a RuleSet that will accomplish this task all within PrintTransformer with no programming necessary.

On top of using Rules to redirect print jobs, PrintTransformer can also add field level conditional printing directly to a formats' fields. This tutorial will take you through adding Conditions to disable printing of a barcode field and move/resize a text field on the format, but only when printing a certain customer ID number.

Although these are only two examples of how PrintTransformer could help improve your print application, the possible combinations of variables, tests and actions are virtually limitless. This is

why it is good to have a “game-plan” before implementing PrintTransformer in your application. Below are some examples of real world needs that PrintTransformer has solved for our end-users:

1. Create a PDF of the form only when there is a valid email address showing in the form data. Email that PDF to the email address that was found in the data. Other pages in the job without an email addresses will print normally.
2. If tax is being collected on an invoice, turn on a section of the invoice that displays tax information along with a special message. If no tax is collected for an invoice, that entire section of the invoice is turned off.
3. At the end of every print job, insert a last page that contains terms and conditions.
4. After 5:00PM local time, redirect all print jobs to a different printer in the warehouse.
5. Print an AP check to the normal check printer, but also print a duplicate copy to a totally different printer as well as a different drawer on that printer.
6. If an asterisk * is detected at the beginning of a line of text, set the entire line of data to bold and italic style. Other lines without the * symbol print with normal styling.

Below is a link to an instructional video that gives a quick overview on setting up a Rule and a condition:

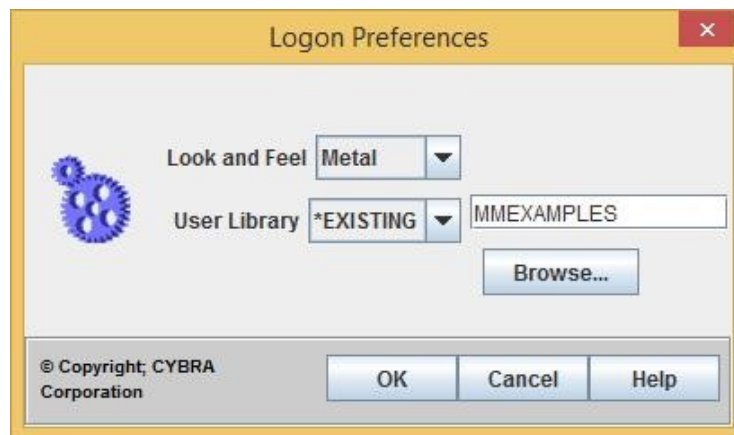
<https://www.youtube.com/watch?v=7t3xXBsrnTI>

We will get into a more step by step approach in this tutorial so you can see some real output using example formats that are shipped with MarkMagic. Let’s get started.

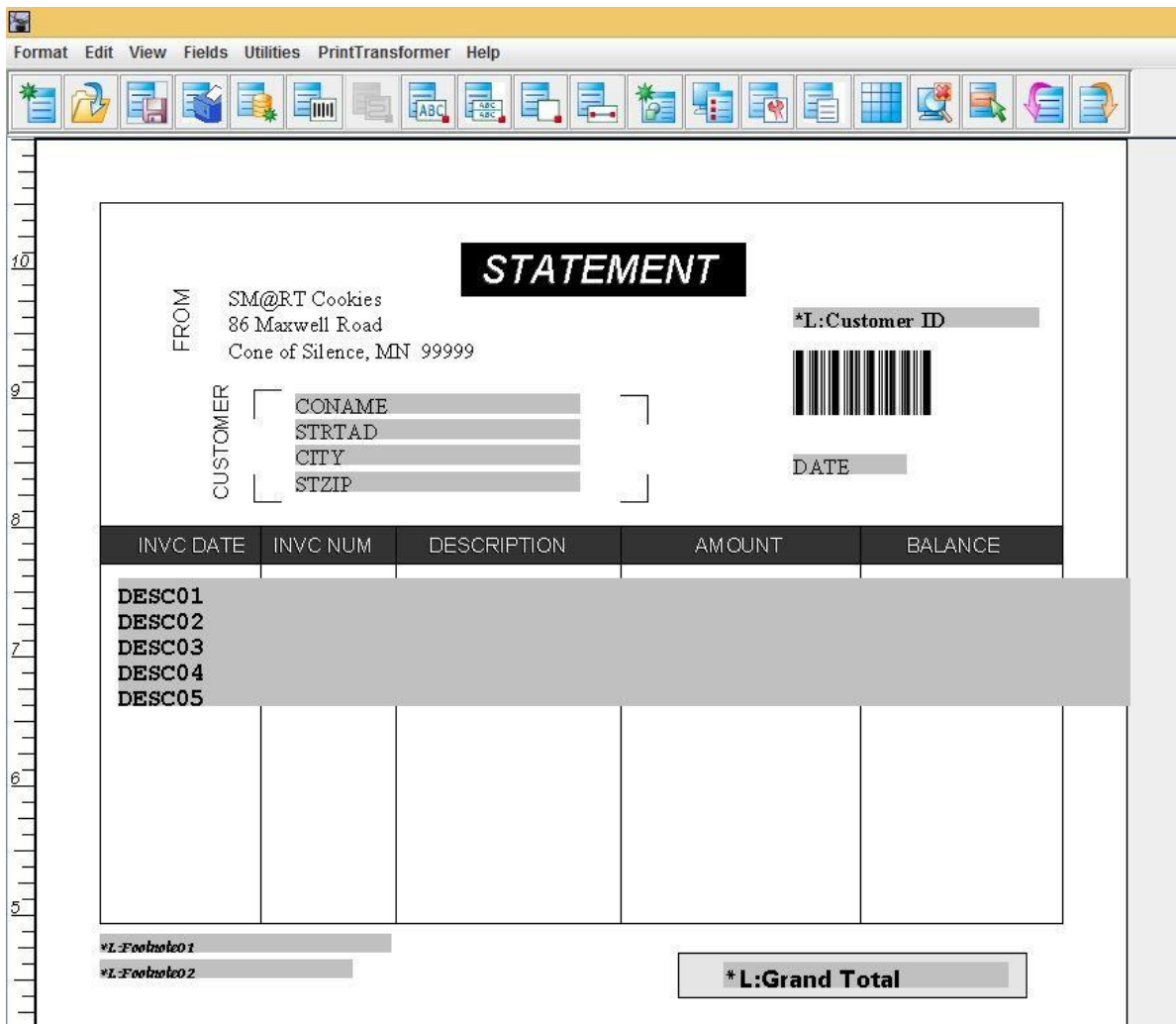
Using JMagic to Add Conditions to a Format

Opening the Format and Previewing Using Real Data:

Start JMagic into the user library MMEXAMPLES. This library should already contain a format using our HPPCL5 driver. The format name is SM@RT30A. Open the format and let’s take a look at how it is designed as well as how it prints. This will also be a good refresher for the JMagic Print Preview feature.



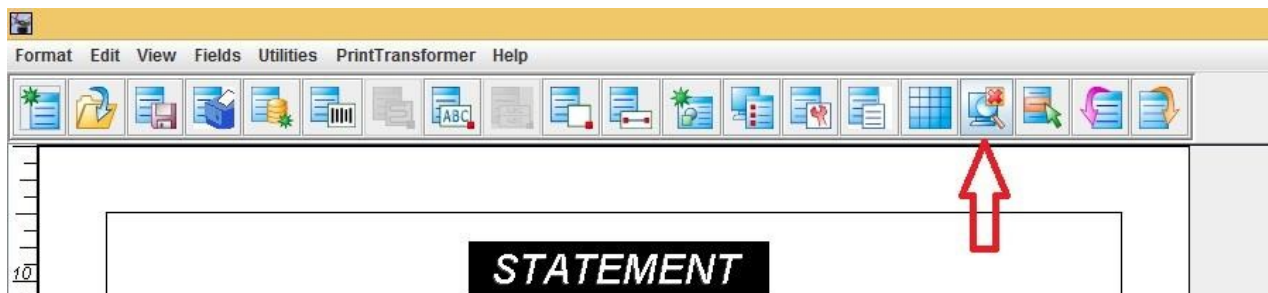
Format **SM@RT30A** under the **HPPCL5** printer driver:



We can see the customer ID number prints as text at the top right. There is also a barcode that prints below it. This form is designed around our sample STATEMENTS spool file that was used in previous tutorials. If you do not have that spool file still available, please create it again now. At the command prompt on your System i server, please run:

CALL MRKMAG90/STATEMENTS

This will create a new five page spool file under your user ID named QSYSPRT with STATEMNS as the User Data. Let's use this new spool file to run a print preview in JMagic. In JMagic, click the magnifying glass at the top right to initiate a Print Preview.



Click the **Browse** button and find the spool file that was just created.

Work with Spool Files

Spooled File User

Name Number

Job Name Job Number

Select A Spooled File

Name	Number	Job User	Job Name	Job Number	Date	User Data
INVOICE	1	KWH	QPRTJOB	010965	20140509	
STATEMENT	2	KWH	QPRTJOB	010965	20140509	
TINVOICE	3	KWH	QPRTJOB	010965	20140509	
PICKTKT	4	KWH	QPRTJOB	010965	20140509	
MCI	1	KWH	QPADEV0004	013654	20140527	
WYF	1	KWH	QPADEV0004	018204	20140808	
BARN1	1	KWH	QPADEV0008	018766	20140828	
QSYSPRT	1	KWH	QPADEV0009	033221	20150226	STATEMENTS
MILLERP	5	KWH	QPRTJOB	010965	20140509	
MMLABELW	11	KWH	QPADEV0009	032688	20150220	SHLBLU3
KWH	1	KWH	QPADEV0009	032733	20150220	BC

Click **OK** and you will see the spool file info filled in. Click **Preview** on that screen and then **OK** on the number of Pages to preview. You will now see the form updated with real data from the spool file.

You can use the Page flippers to view data from all pages in the spool file.

Page 1:

JMagic


Format Edit View Fields Utilities PrintTransformer Help

STATEMENT

FROM SM@RT Cookies
86 Maxwell Road
Cone of Silence, MN 99999

CUSTOMER [No Pane No Gain
34-22-36 Jackla Lane
Los Angeles
CA 54532-1540]

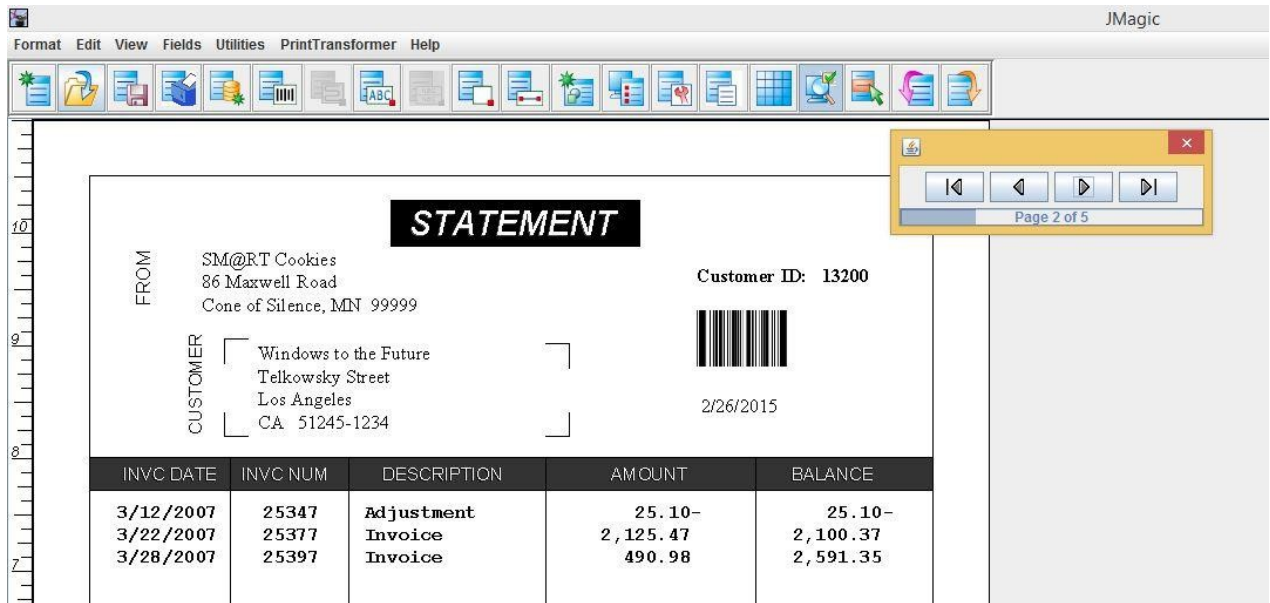
Customer ID: 10050



2/26/2015

INVC DATE	INVC NUM	DESCRIPTION	AMOUNT	BALANCE
2/14/2007	12345	Invoice	823.15	823.15
3/10/2007	25345	Invoice	1,080.00	1,903.15

Page 1 of 5



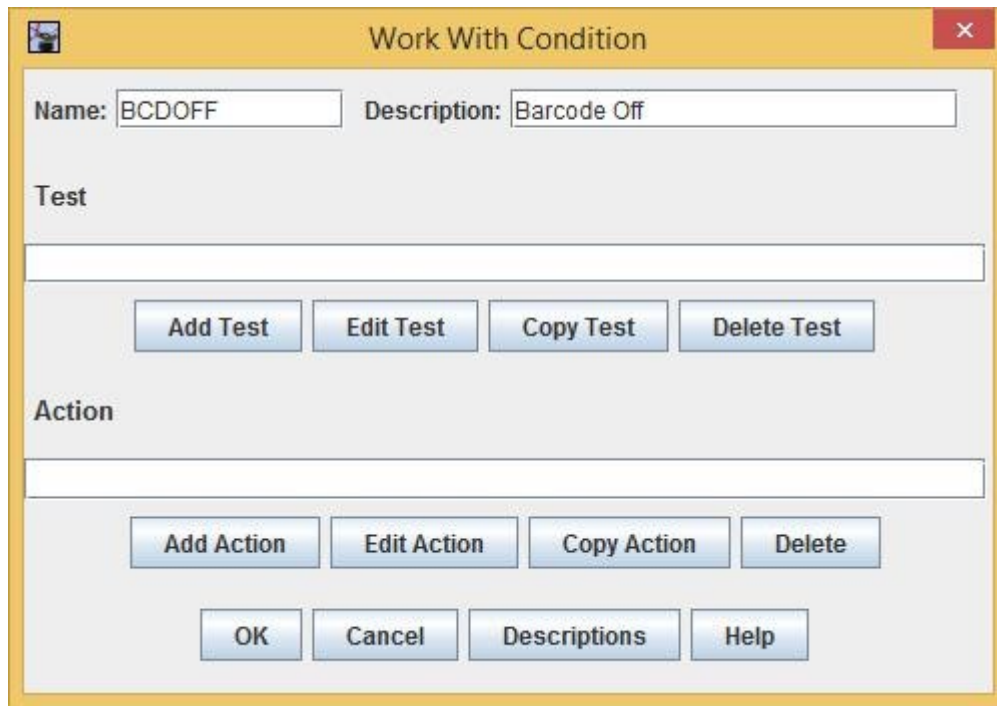
...and so on. The main point is that you can see the data changing from page to page. The Customer ID number will be the key piece of data that will control how our PrintTransformer Ruleset and Conditions work. Close the preview by clicking the X on the page flipper. Up next, we will add PrintTransformer conditions to this format to control how certain fields print on the form.

Ask yourself: “What if Customer ID 21250 doesn’t want a barcode to print on their form?”
Adding Conditions to a Format:

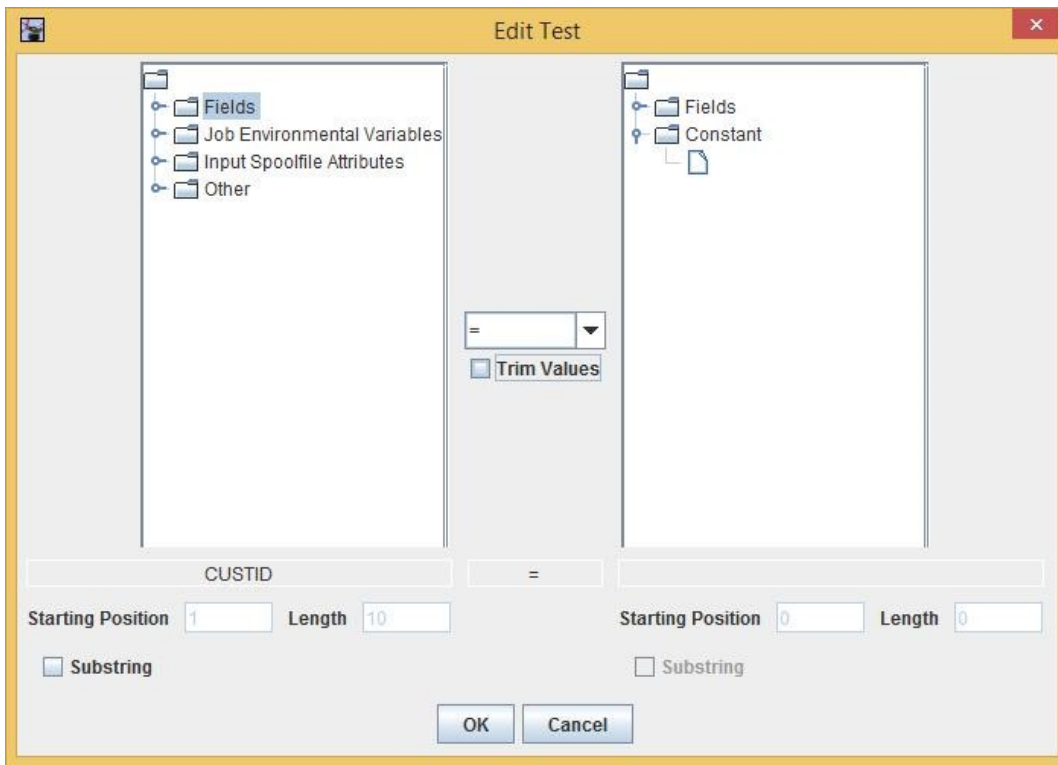
With the SM@RT30A format still open, at the top of JMagic, click *PrintTransformer* and then *Conditions*. It will bring up the *Work With Conditions* window.



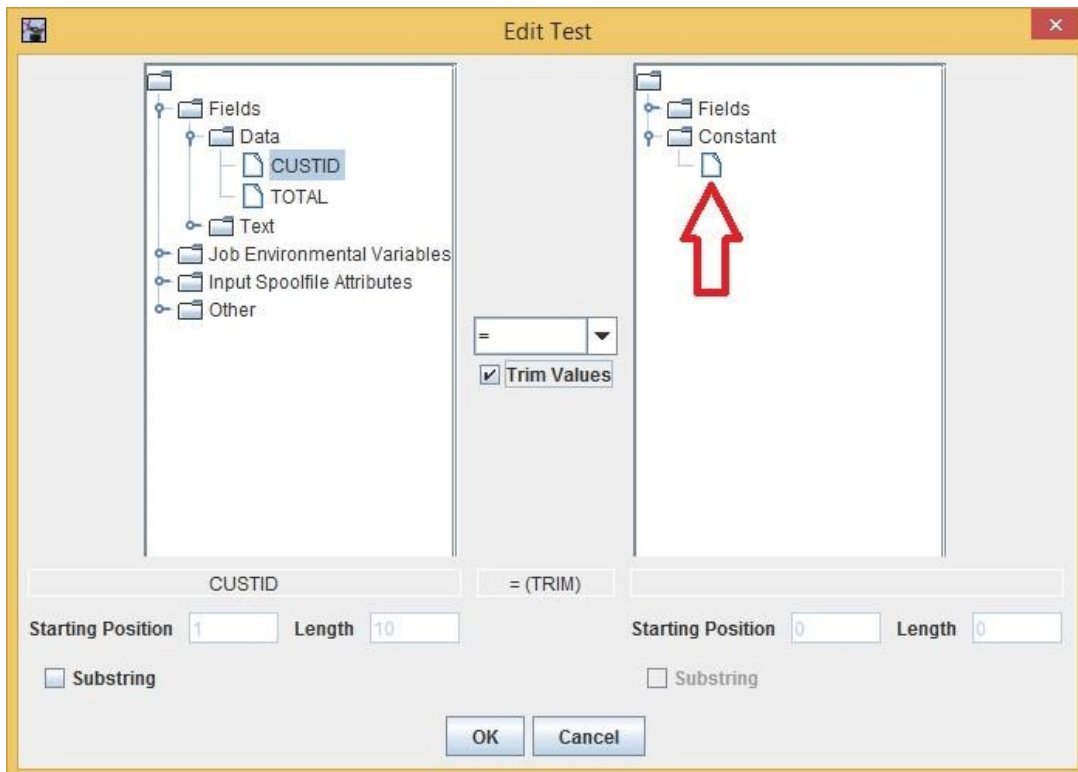
Click **Add** to add a new condition to this format. For our first requirement, we do not want the barcode to print when the Customer ID is equal to 21250. Since this condition will be dealing with turning off a barcode field, you can name it something like BCDOFF and make the description ‘Barcode Off’.



In any Condition, there are Tests and an Actions. If the Test returns true, the Action is performed. Click **Add Test**.



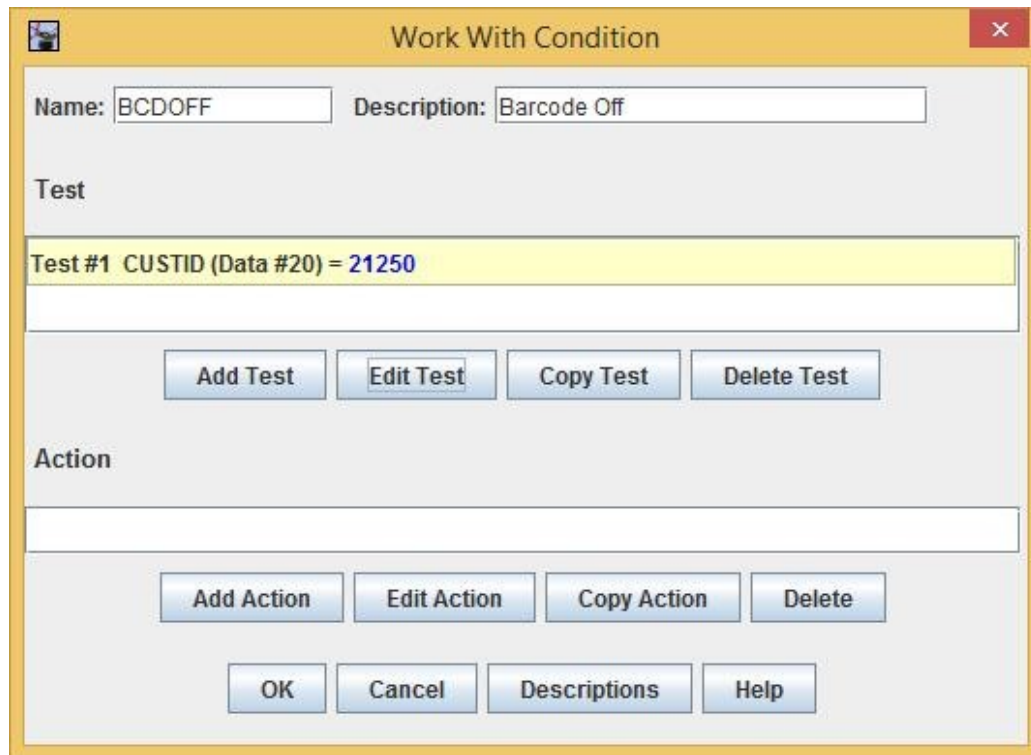
The way this window works is you choose an environment variable or field from your format on the left side and evaluate that value to a field or constant value on the right side. The middle drop down menu is where you choose the operator (equal to, greater than, Contains, Starts With, etc.) We want to turn the barcode off when Customer ID is equal to 21250. Expand the Fields menu on the left and then click Data to expand and show the data fields that are on SM@RT30A format. Click to highlight CUSTID. This is the field that prints the Customer ID number on the format. Make sure the middle menu is set to '='.



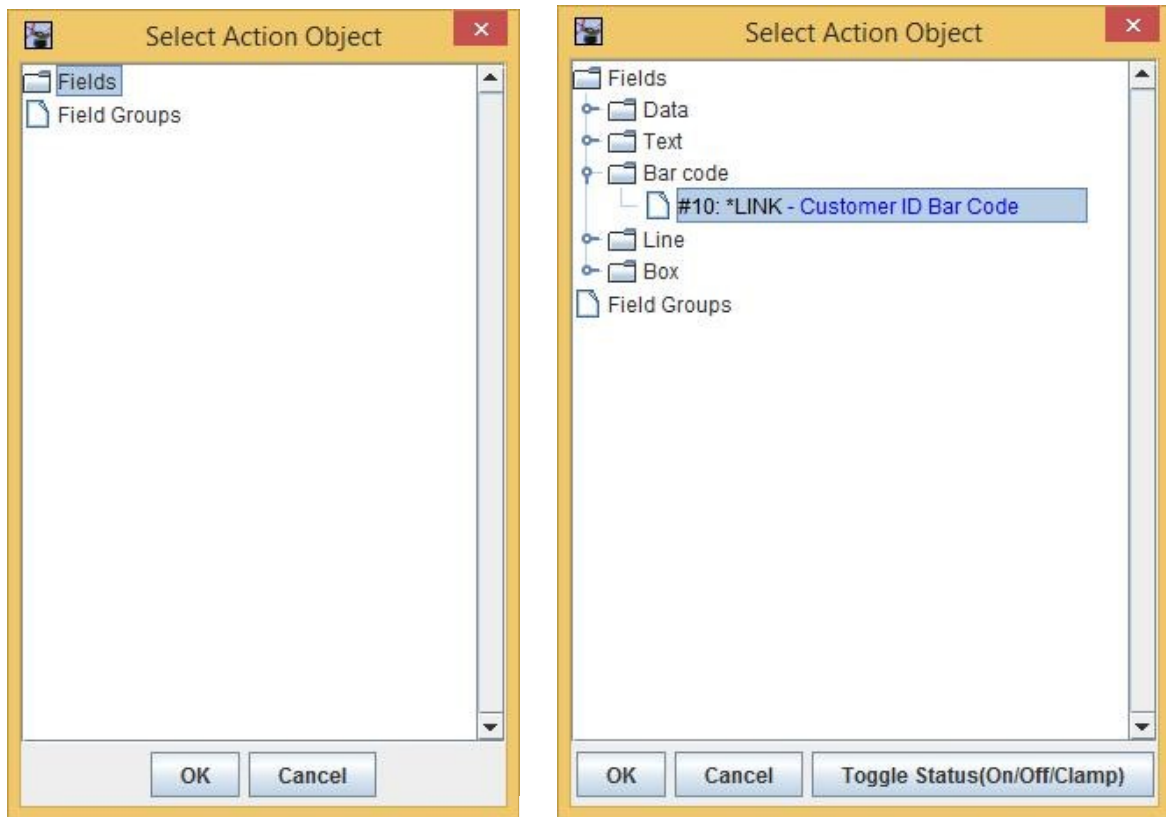
Click the icon under the *Constant* item on the right side. This will allow you to hard code in a value to test again. A new window will pop-up allowing you to type in 21250.



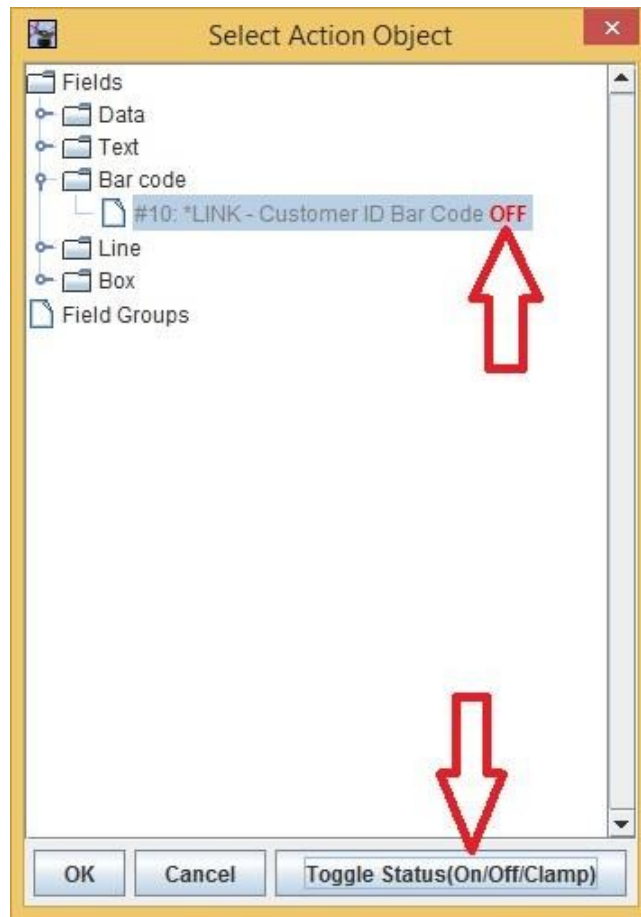
Press **OK** on that window and you will be brought back to the *Edit Test* window. One last thing you'll want to do is make sure "Trim" is checked right below the operator menu. What this means is, MarkMagic will test against just the data you entered and not require you to include spaces to fill up the rest of the 10 position CUSTID field. Click **OK** on the *Edit Test* window and you will be brought back to the *Work With Condition* screen.



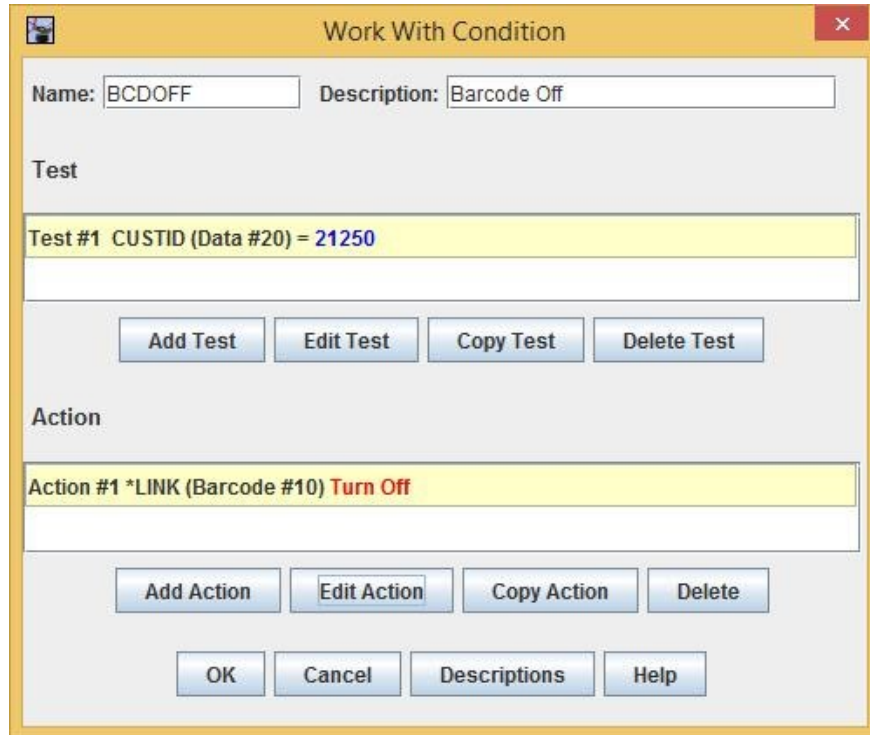
Our first test is complete. Now we must add an action. Remember, the action will only be performed when Customer ID is equal to 21250. Click **Add Action**. You will be shown the *Select Action Object* window.



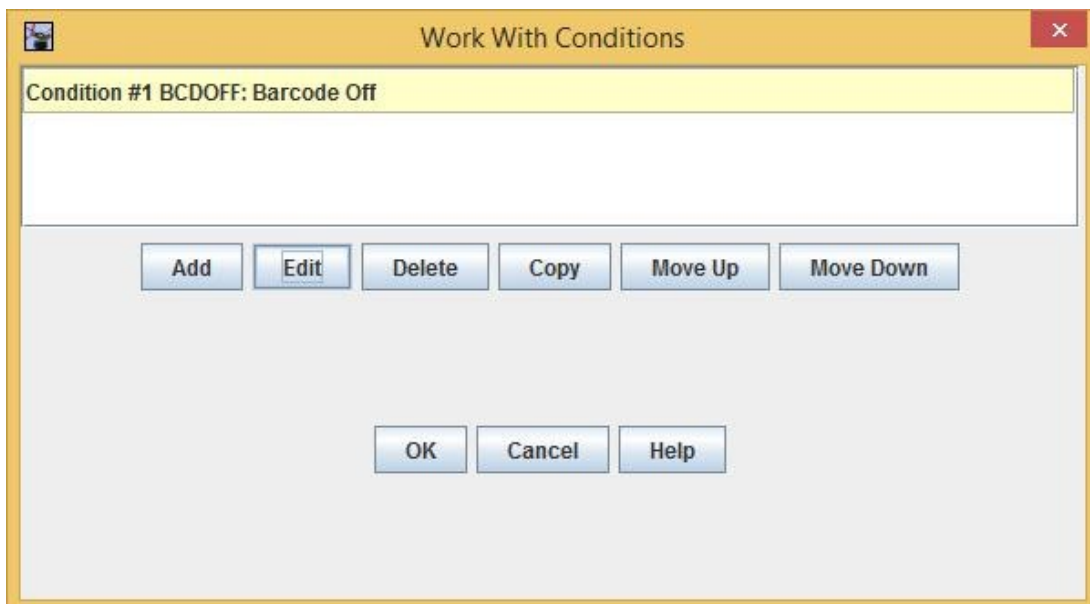
This is how we choose the barcode field to act upon. Expand the fields list by double clicking 'Fields'. Next, expand the barcode list by double clicking 'Bar code'. Highlight the '*LINK - Customer ID Bar Code' field. With the barcode field highlighted, click the **Toggle Status** button at the bottom of the window *once* to toggle the field to **OFF**.



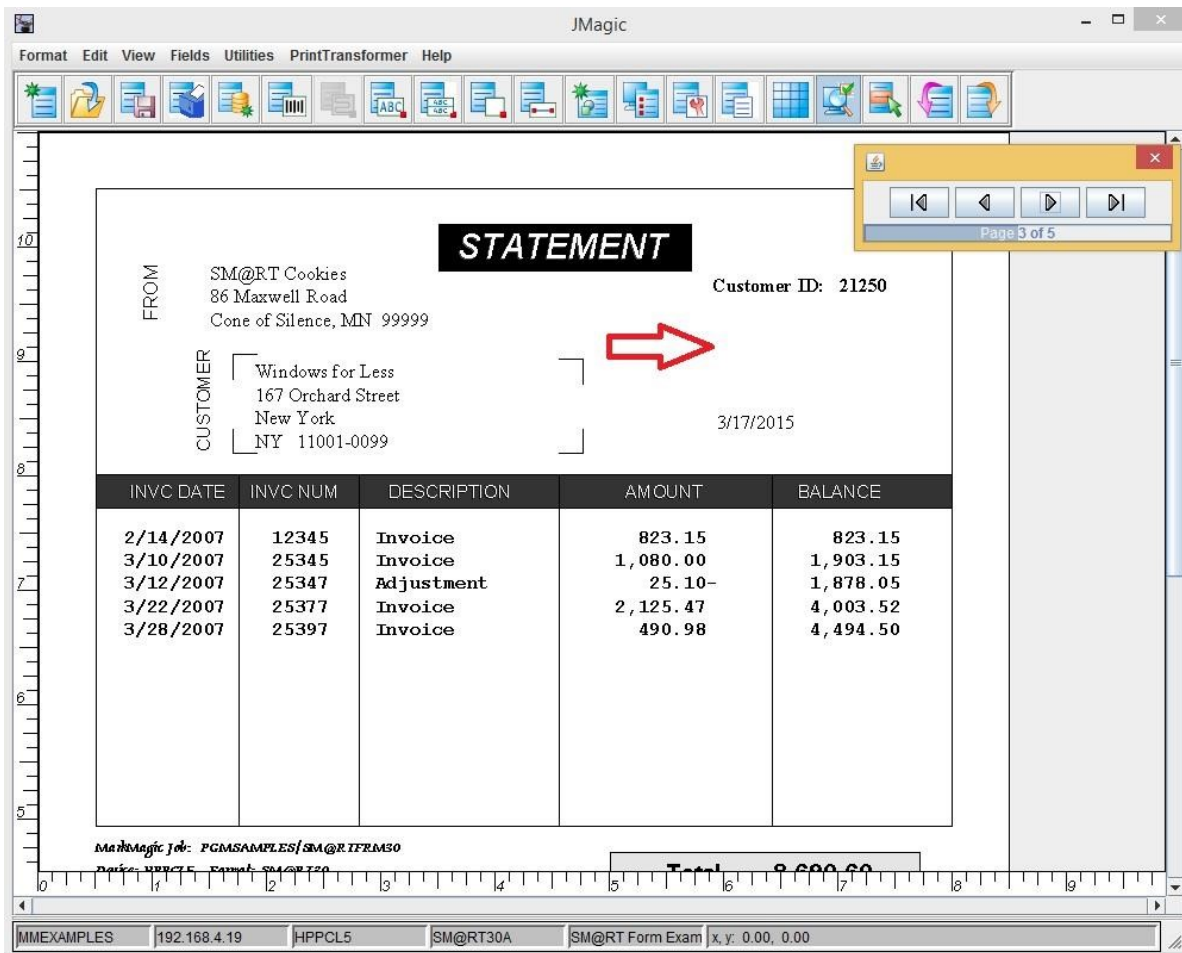
Click **OK** on the *Select Action Object* window to create the Action. Our first PrintTransformer condition is complete.



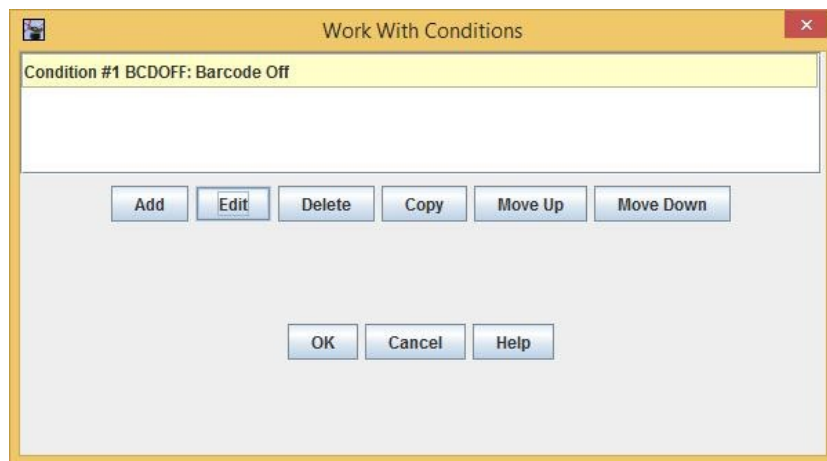
Click **OK** to create the condition. You will now see it listed as Condition #1 in the *Work With Conditions* window. The barcode at the top right of the form will not print when the Customer ID number is equal to 21250. Click **OK** to close the window.



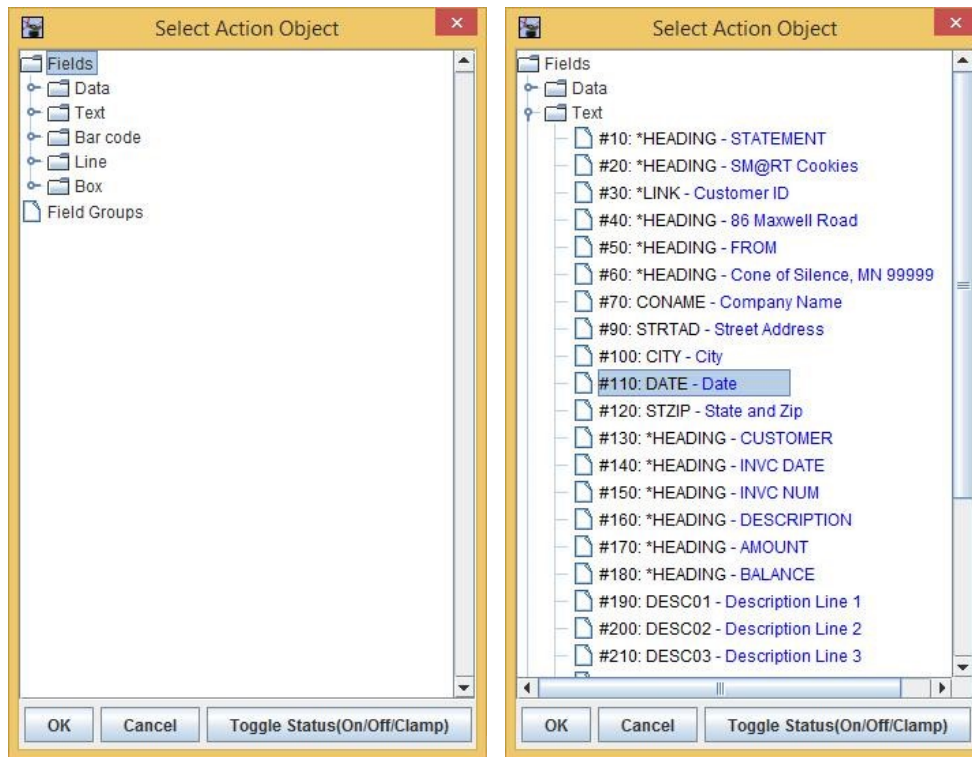
If you were to re-run the print preview using the steps described earlier in the tutorial, you would now notice that the barcode is removed from the form only when the Customer ID is 21250.



Why stop there, though? Along with toggling fields on and off, PrintTransformer can also directly modify the attributes of fields on the form such as their positioning, font type, style, etc. When PrintTransformer removes the barcode, let's have it also move the date field up an inch as well as change its font and style. To do this, all we need to do is add an extra Action to our existing Condition. At the top, go click the *PrintTransformer* menu and then *Conditions*.



You should see the existing BCDOFF condition in the list. Click **Edit** to edit the condition. To change the DATE field at the same time the barcode is turned off, simply add a new Action to this condition. Click **Add Action**.



Double click on Fields and, this time, double click on Text. This is a list of all text fields on the form. Highlight DATE and then click **OK**. This will bring up a familiar window to anyone with experience editing a form in JMagic. It is basically the same interface you would normally use to add or edit fields on the canvas. Any attribute with a check box next to it can be modified by PrintTransformer. Simply place a check next to the field you want to modify and fill in your desired value.

Conditional Text Field Property Frame

Device: Name HPPCL5, Description .5 & Compatible

Format: Name SM@RT30A, Length 11.0", Width 8.5", Description SM@RT Form Example, Rotation A 0°

Properties | Font | Display

Name and Description: Field Name *HEADING, Field # 110, Description Date

Positioning Properties: Row 8.41", Column 5.9"

Attributes: Length 12, Decimals, Variable Length Yes

Font: Font 20 Times, Point 12

Usage: Usage

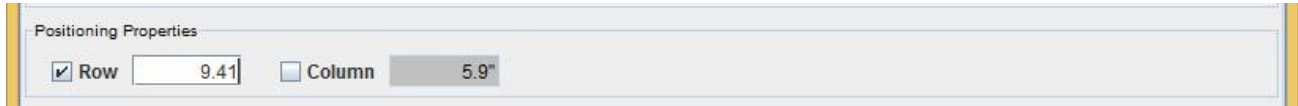
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OK Cancel Help

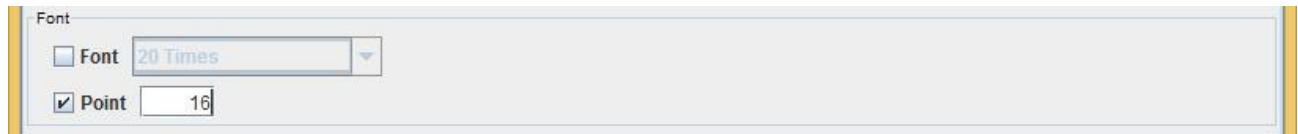
We want to change three things about the DATE field when Customer ID is 21250:

- Move it up 1 inch
- Change the Point Size to 16
- Change the Style to *italic*

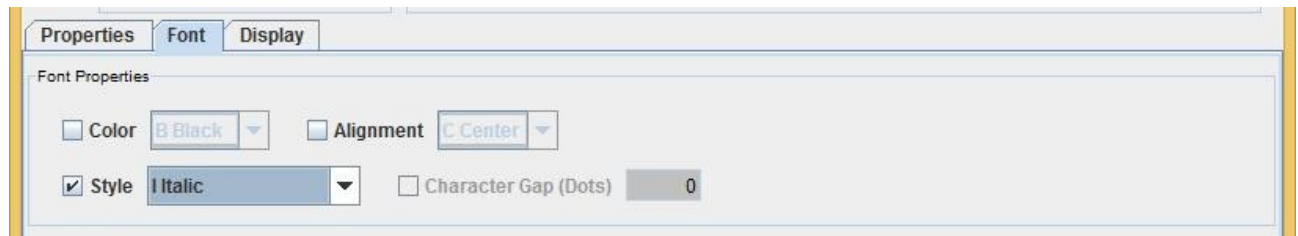
Place a check next to *Row* and add 1 inch to the existing value making it 9.41:



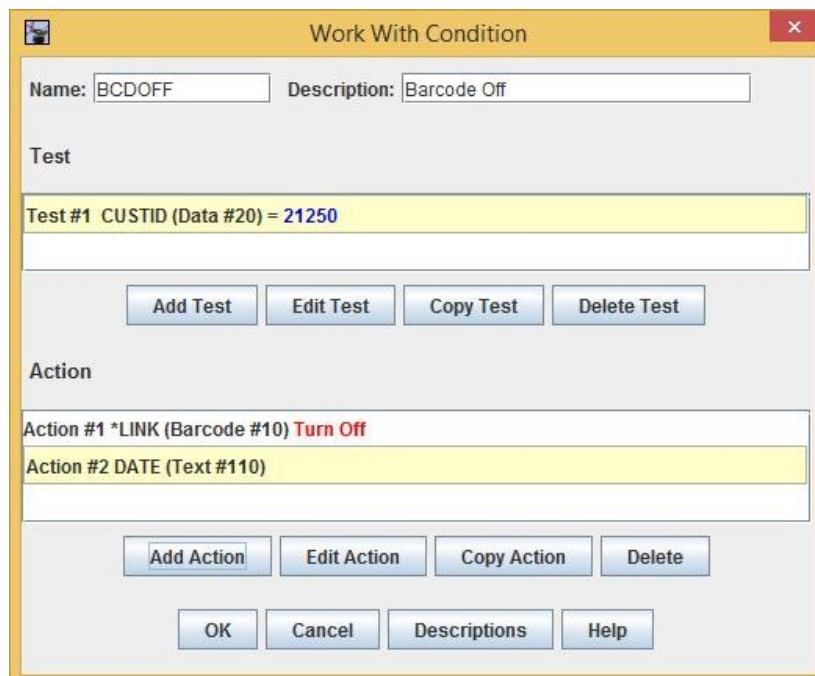
On the same window, place a check next to *Point* and change the value to 16:



Click the *Font* tab at the top and then place a check next to *Style*. Use the pull down menu to choose *Italic*.



We are finished choosing the various attributes to change. Click **OK** to accept these values. You will see Action#2 added to the list.



Click **OK** to close this condition and then click **OK** on the *Work With Conditions* window.
 Now, let's run that Print Preview again.

When Customer ID = 13200:

STATEMENT

FROM SM@RT Cookies
 86 Maxwell Road
 Cone of Silence, MN 99999

CUSTOMER Windows to the Future
 Telkowsky Street
 Los Angeles
 CA 51245-1234

Customer ID: 13200

3/17/2015

INVC DATE	INVC NUM	DESCRIPTION	AMOUNT	BALANCE
3/12/2007	25347	Adjustment	25.10-	25.10-
3/22/2007	25377	Invoice	2,125.47	2,100.37
3/28/2007	25397	Invoice	490.98	2,591.35

Navigation window: Page 2 of 5

Notice the changes when the Customer ID = 21250!

STATEMENT

FROM SM@RT Cookies
 86 Maxwell Road
 Cone of Silence, MN 99999

CUSTOMER Windows for Less
 167 Orchard Street
 New York
 NY 11001-0099

Customer ID: 21250

3/17/2015

INVC DATE	INVC NUM	DESCRIPTION	AMOUNT	BALANCE
2/14/2007	12345	Invoice	823.15	823.15
3/10/2007	25345	Invoice	1,080.00	1,903.15
3/12/2007	25347	Adjustment	25.10-	1,878.05
3/22/2007	25377	Invoice	2,125.47	4,003.52
3/28/2007	25397	Invoice	490.98	4,494.50

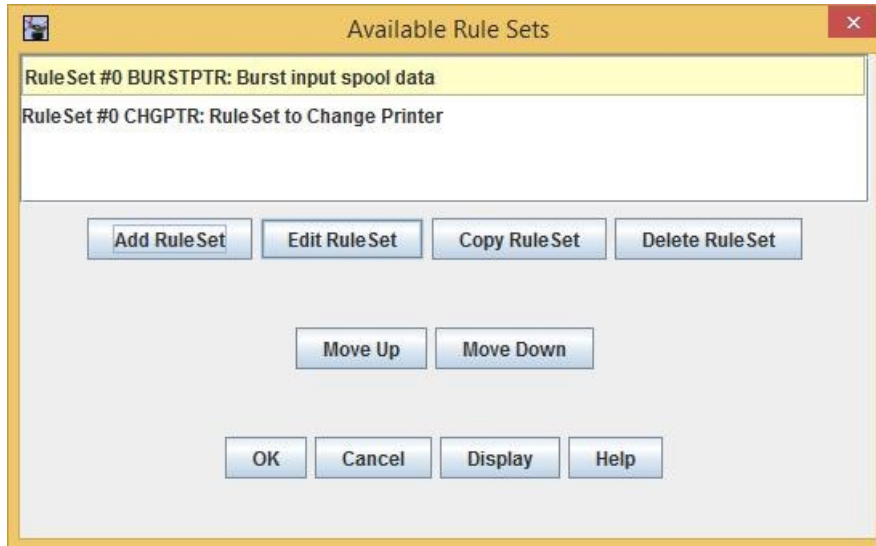
Navigation window: Page 3 of 5

Any time this format is used whether it is printed direct to a laser printer, emailed as PDF or faxed, MarkMagic will process the conditions according to how you designed them in JMagic. Feel free to experiment with PrintTransformer Conditions some more and see what else you can change on the format.

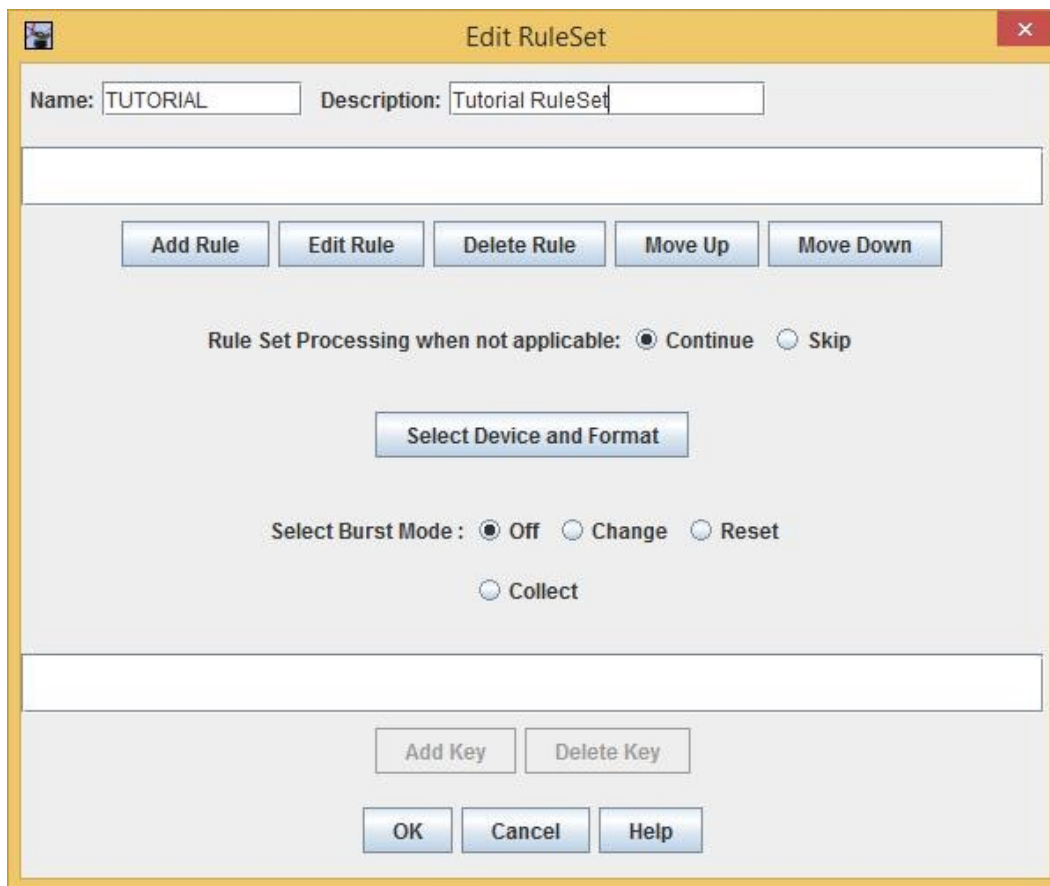
Up next, we will talk about RuleSets and how PrintTransformer can control things like how, when or where your forms should print.

Creating the RuleSet:

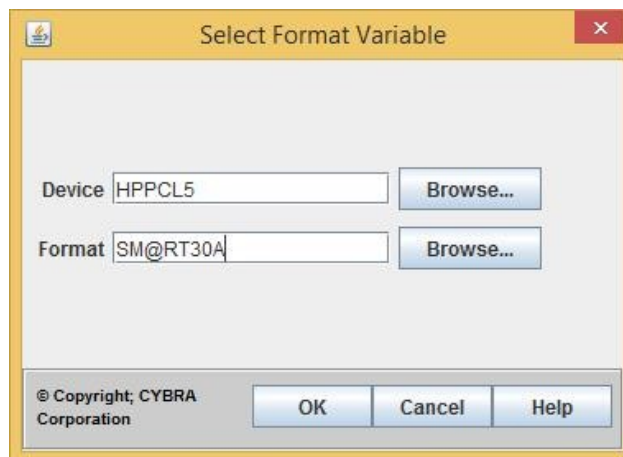
At the top of the screen, click the PrintTransformer menu and then click Available RuleSets. You might see some example RuleSets already created. Please ignore them for now. Create a new RuleSet by clicking **Add RuleSet**.



Give the new RuleSet a name and description. We are naming it TUTORIAL with a description of 'Tutorial RuleSet'.



In order for the RuleSet to be able to test real data from our format, we must ‘attach’ the format to the RuleSet using the **Select Device and Format** button. Set the *Device* to HPPCL5 and set the *Format* to SM@RT30A. Click **OK** to attach the format to the RuleSet. Now when you setup tests, you will be able to choose actual fields from the format.

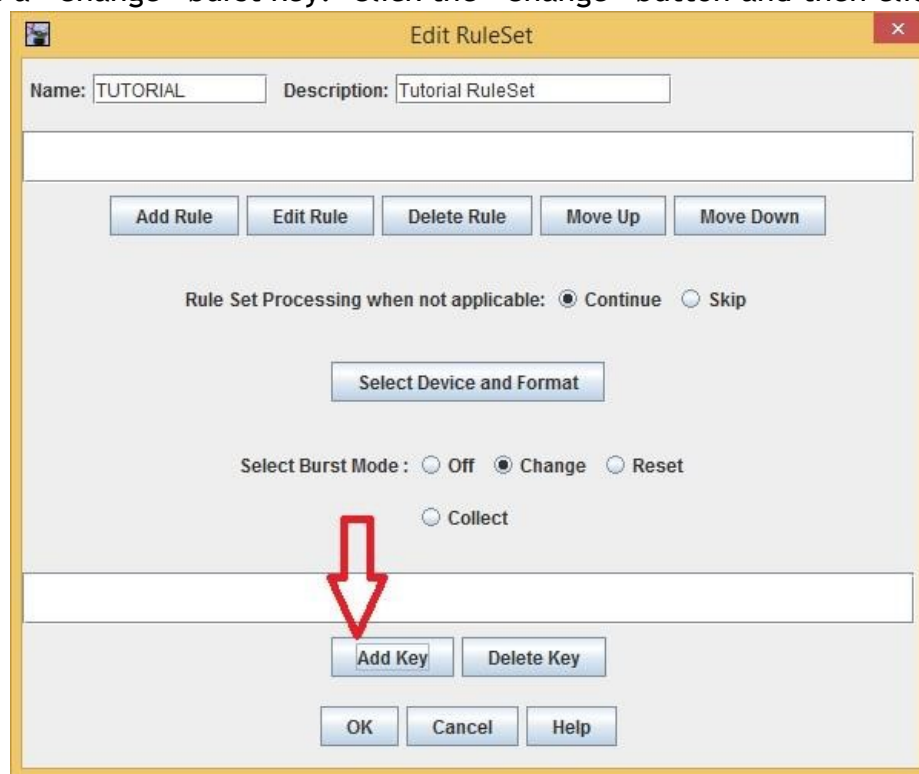


Since this RuleSet will include bursting, there is one extra step needed before you continue on and add new Rules, Options, etc. Understanding bursting is critical for this tutorial, so here is the information pulled straight from the Help documentation describing what bursting is:

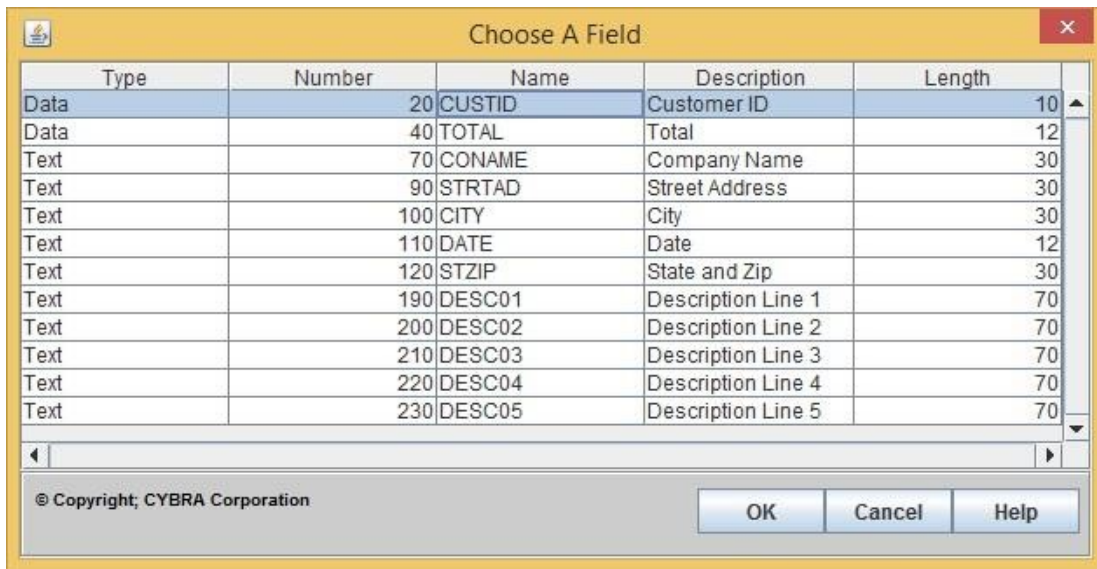
What normally would be one large print job resulting from a PRTLBLE call can now be automatically split up into individual PRTLBLE calls. The MarkMagic Rules engine will “burst” the input data (spoolfile or physical file) into smaller “chunks”, as a preprocessing step before any printing is done, based off of the following instructions:

- **Off** – Bursting will not take place when this Rule is used. All pages or records will be processed with one PRTLBLEF command.
- **Change** – This bursting instruction groups sets of input records or spoolfile pages based on matching data fields that occur sequentially. For example, several records sequentially in a file might have the same customer# or same order#. The bursting process will detect these sequential matching fields and extract their respective records or pages they fall on and process those pages with their own separate PRTLBLEF call.
- **Reset** – This bursting instruction groups sets of input records or spoolfile pages when the specified key resets to its original value. The classic example here is a page number value in a spoolfile. An input spoolfile might have many orders in it, each order consisting of multiple pages labeled with a page number. When the number resets back to 1, the Rules engine will group the previous pages and process them with their own separate PRTLBLEF call.
- **Collect** – Collect burst is a new Bursting parameter that searches a multiple page spool file and collects and combines together individual pages that have a common key value. This is great for wave based printing of invoices even if orders are placed at different times of the day and therefore intermixed in the spool file.

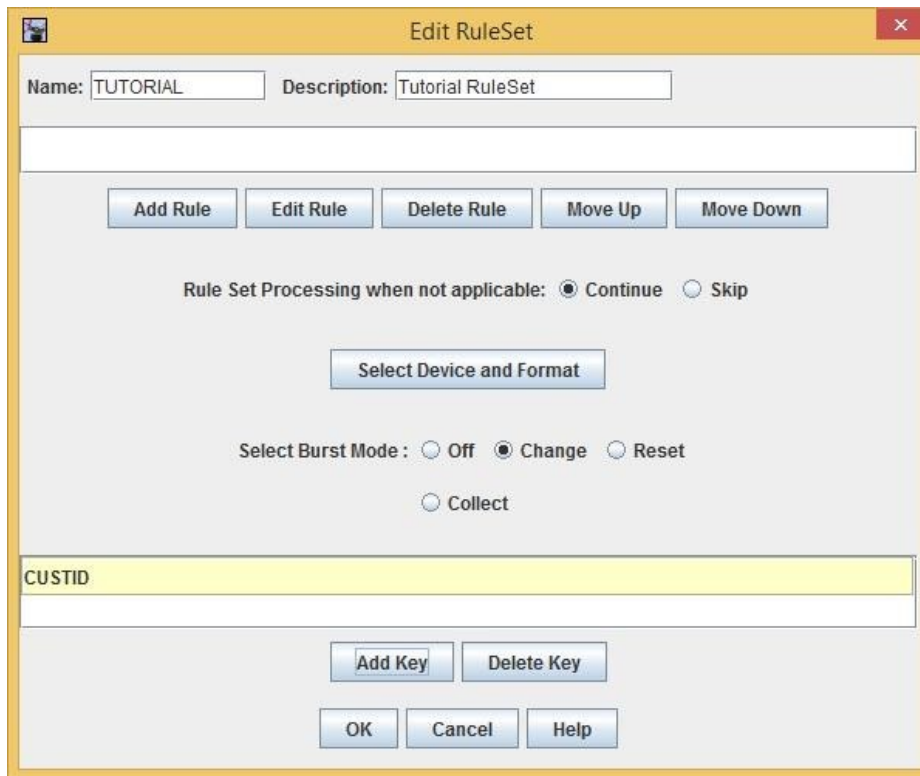
We would like to process each unique customer number as its own print job, so let's add the Customer ID number as a "Change" burst key. Click the "Change" button and then click **Add Key**.



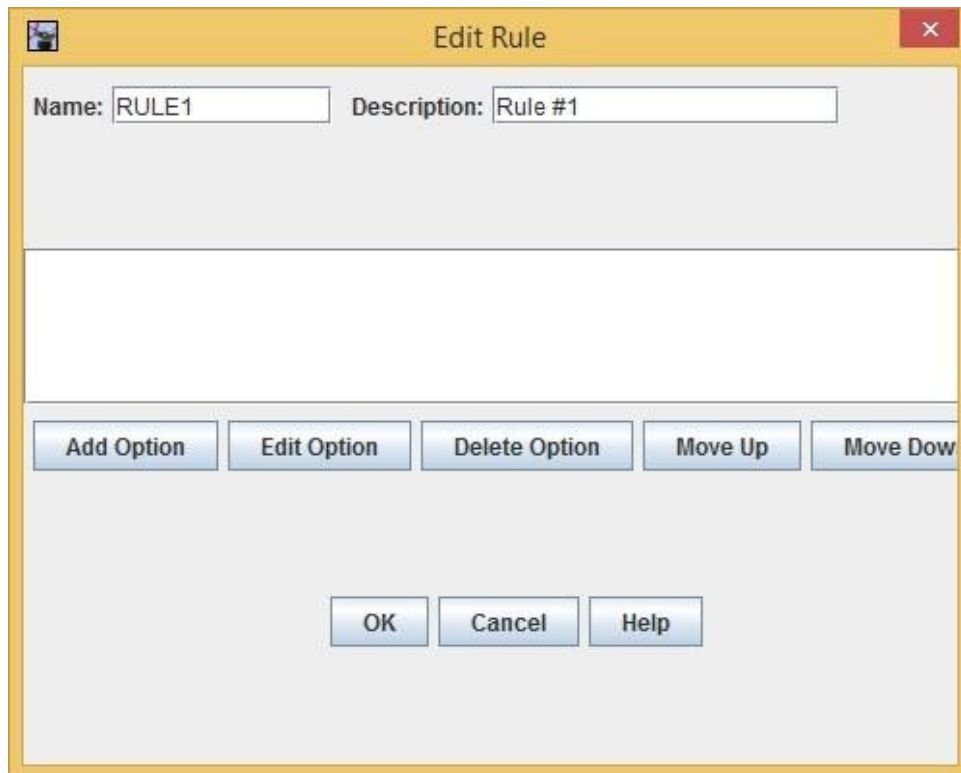
Choose the CUSTID field and then click **OK**.



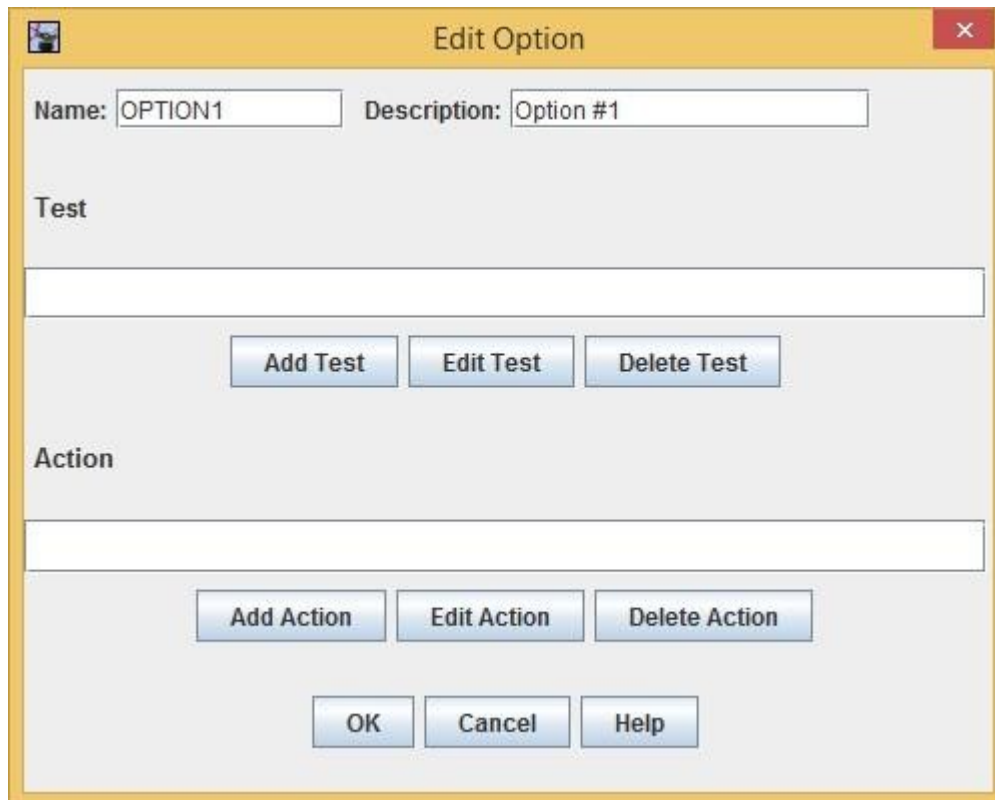
The “burst key” field is now added. This is all that is needed to enable bursting on the RuleSet.



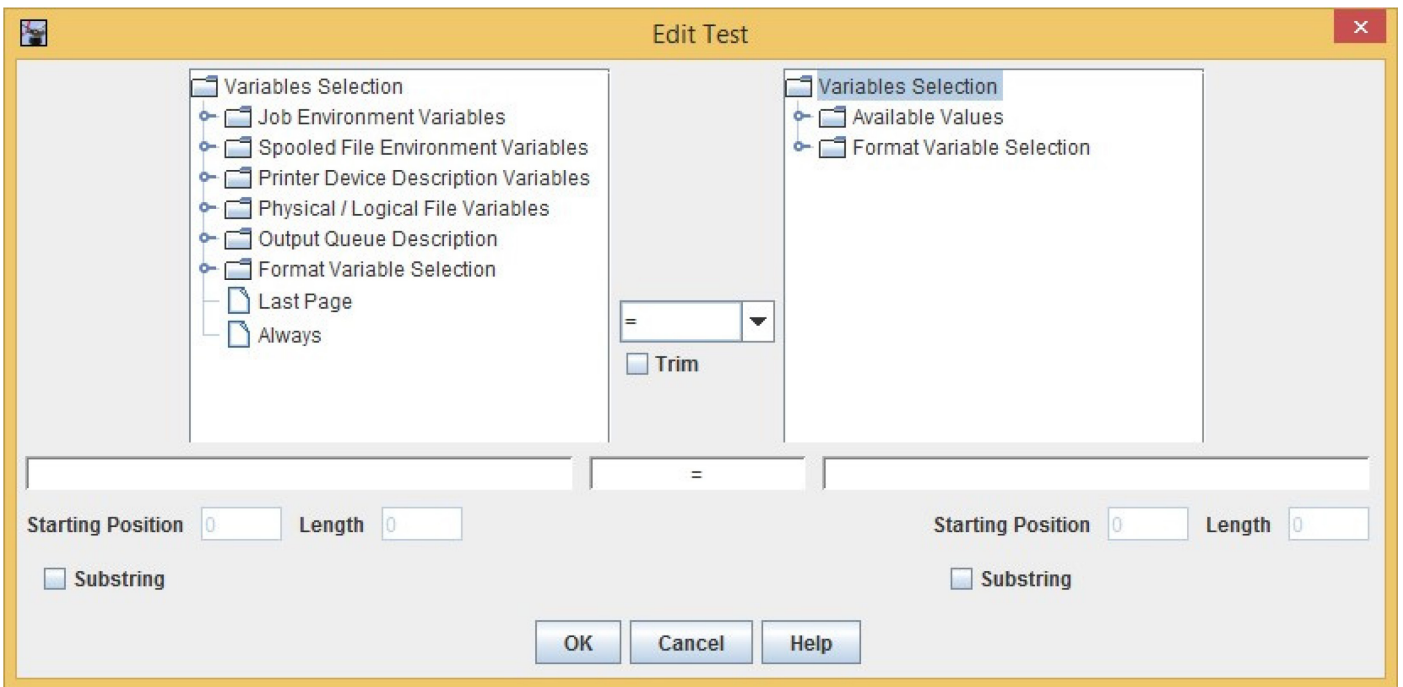
We are now ready to add a Rule that will control how the job prints. Click **Add Rule**. Give the new rule a name such as RULE1 and description ‘Rule #1’. The names really do not matter much and are more or less descriptive.



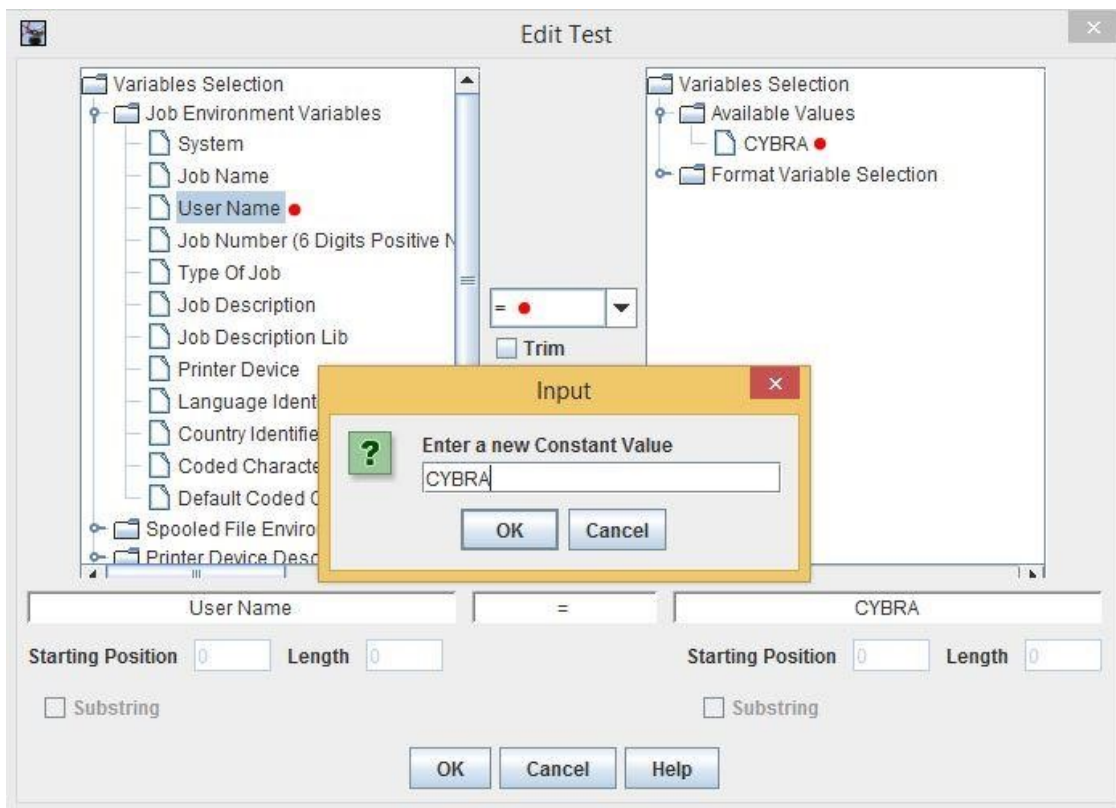
A Rule can contain a list of different Options. Click **Add Option**. As with Rules, the names of Options are not super important and are more descriptive than anything. Set the name to OPTION1 and the description to 'Option #1'.



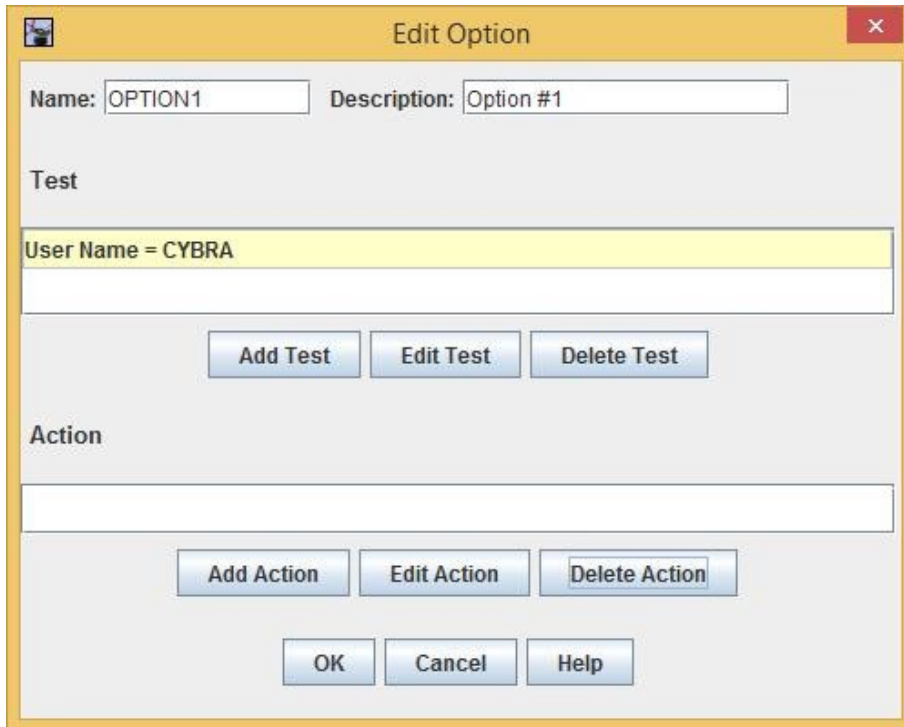
This is where the fun begins. In an Option, there is a Test and an Action. If the Test returns true, the Action is performed. Click **Add Test**.



As described earlier in the tutorial, we want to redirect a certain page of the printed output based on the User ID printing at that time. We will be testing for the the CYBRA user, but the user name will obviously be different in your case. Expand *Job Environment Variables* on the left and then click *User Name*.

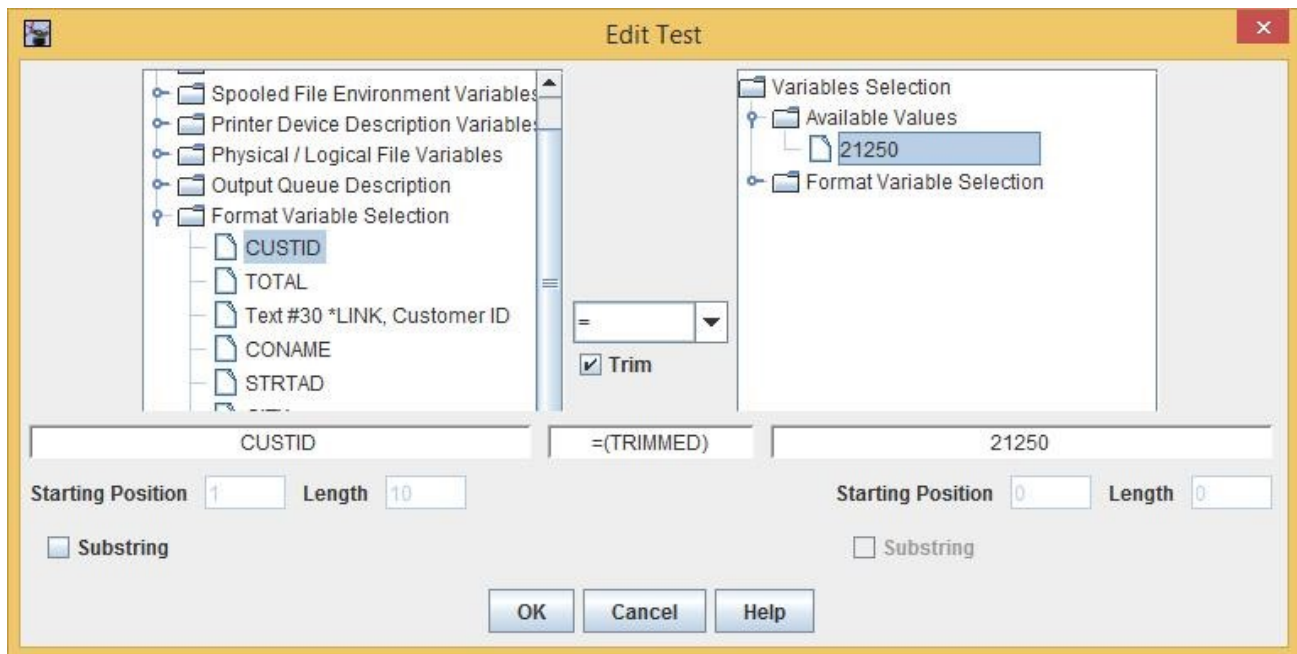


Make sure that the operator is the '=' equals symbol and then click on the 'Enter Constant Value' on the right. This will allow you to hard code in the value that you want to test against. Type: CYBRA (or your user profile name) and then click **OK** on the *Input* window and the *Edit Test* window. You have added your first test.



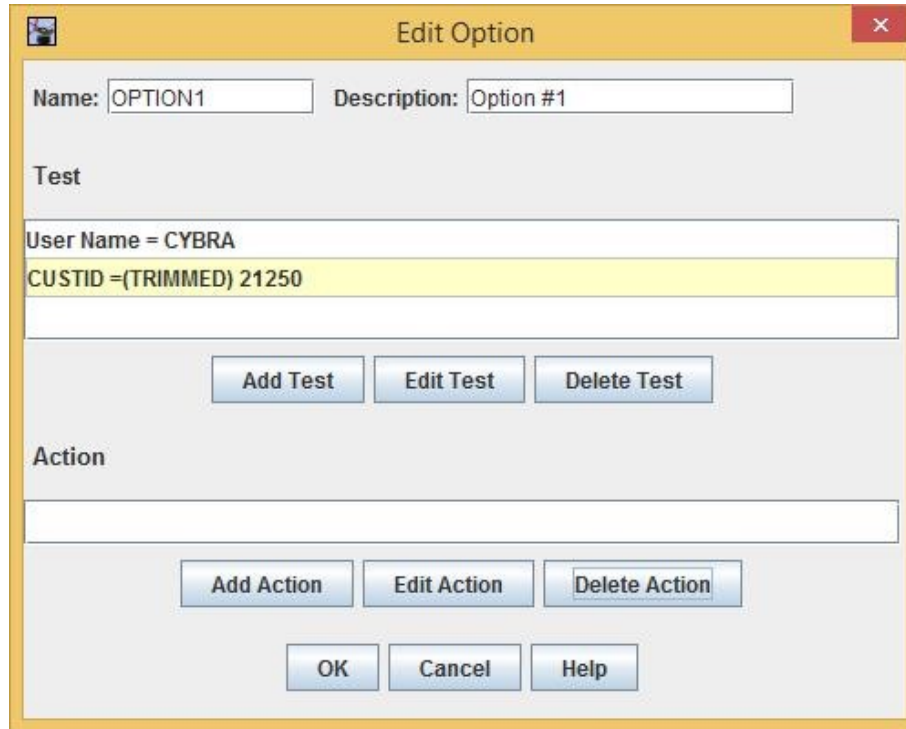
Note that whatever Action we add next would be performed for **ALL** output for the User Name CYBRA. Remember how we setup the print job to ‘burst’ or break up the input pages based on the CUSTID field changing? Let’s take advantage of that and redirect CYBRA’s output but only when the CUSTID = 21250. You can start to see, now, how specific you can get with PrintTransformer.

Click **Add Test** again. This time, expand the *Format Variable Selection* tree and then click on CUSTID. Like before, make sure that the operator is the ‘=’ equals symbol, but this time enable the “Trim” check mark right below that menu.



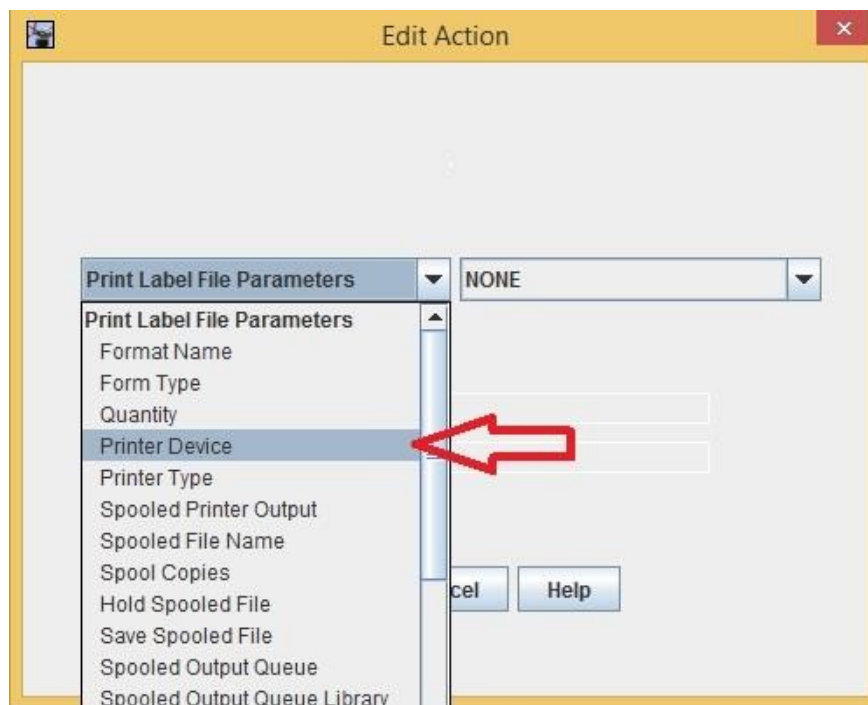
What this means is, MarkMagic will test just the data entered and not require you to include spaces to fill up the rest of the 10 position CUSTID field. Next, click on the ‘Enter Constant Value’ on

the right. This will allow you to hard code in the value that you want to test against. Type: 21250 and then click **OK** on the *Input* window and the *Edit Test* window. You have added your second test.



It is important to note now, that whatever Action we add next will be performed only when the User Id is CYBRA **AND** when the customer ID is equal to 21250. Multiple Tests in an Option are treated as “ANDs” not “ORs”.

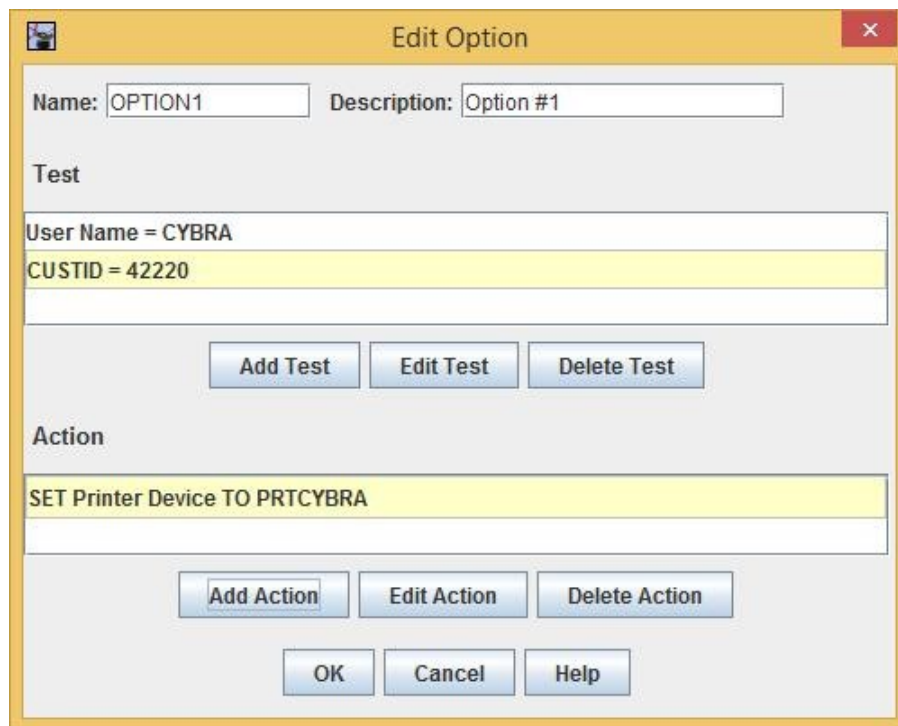
Next, let’s finish this Option by adding some Actions. Click **Add Action**. In the left pulldown menu, you will see all of the different Actions that can be performed. Most of these should be very familiar as they are simply parameters from our PRTLBLEF print command. Choose the ‘Printer Device’ parameter.



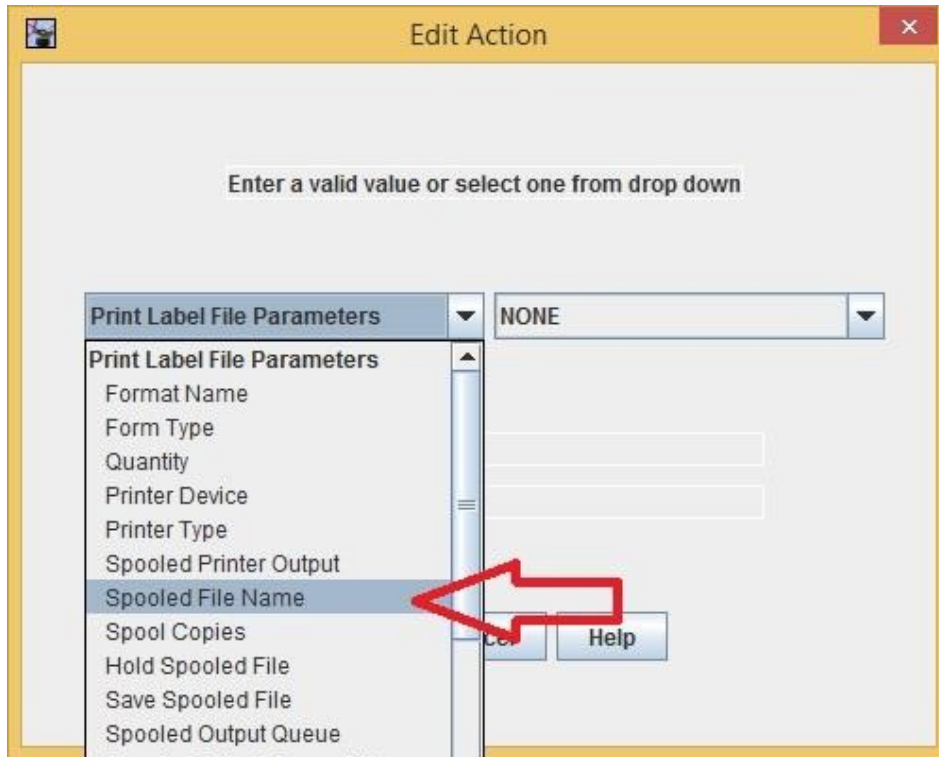
All that is left is to type in your desired Printer Device in the right side menu. This can be any printer device description that you have already configured on your System i server. We will change the device to PRTCYBRA, but obviously this will be different on your system.



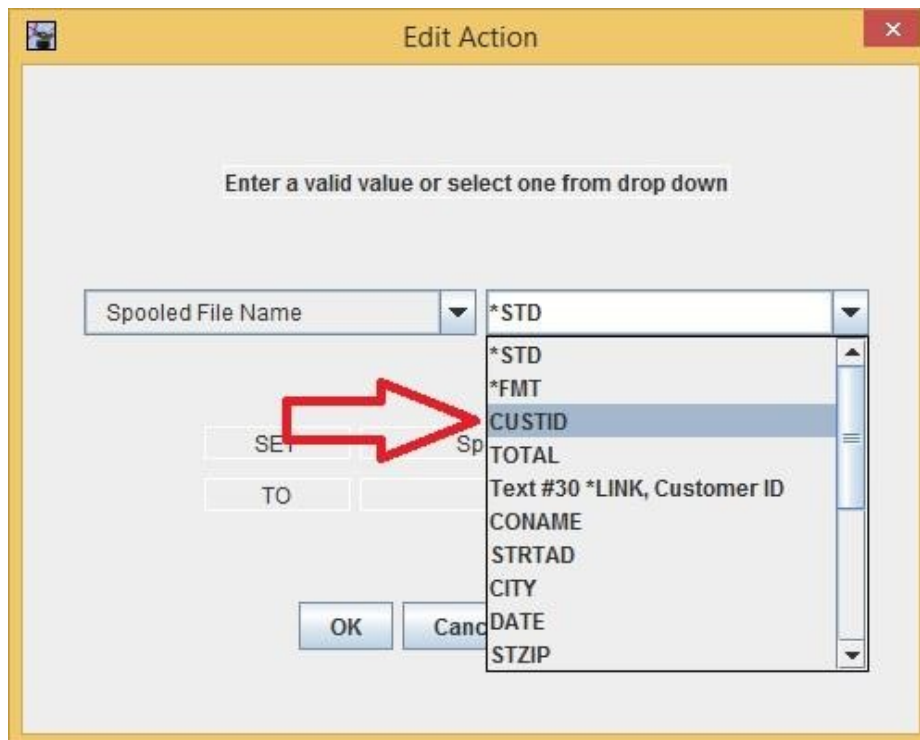
Click **OK** to complete the Action.



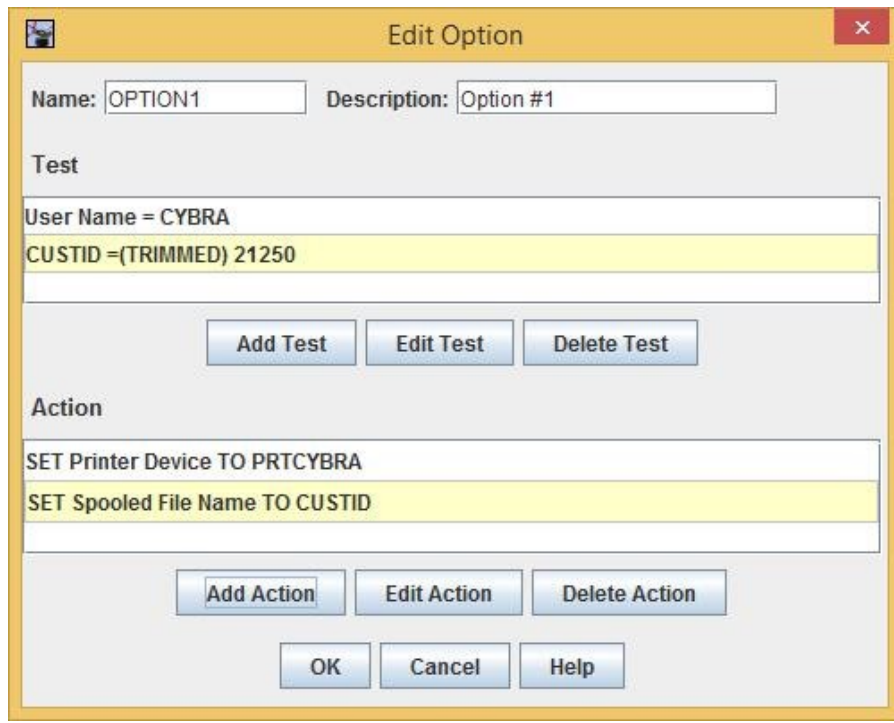
Let's add one more Action that will make things a little more obvious later on. This Action will change the data displayed on the MMLABELA spool file itself when you print. Click **Add Action**. Select 'Spooled File Name'.



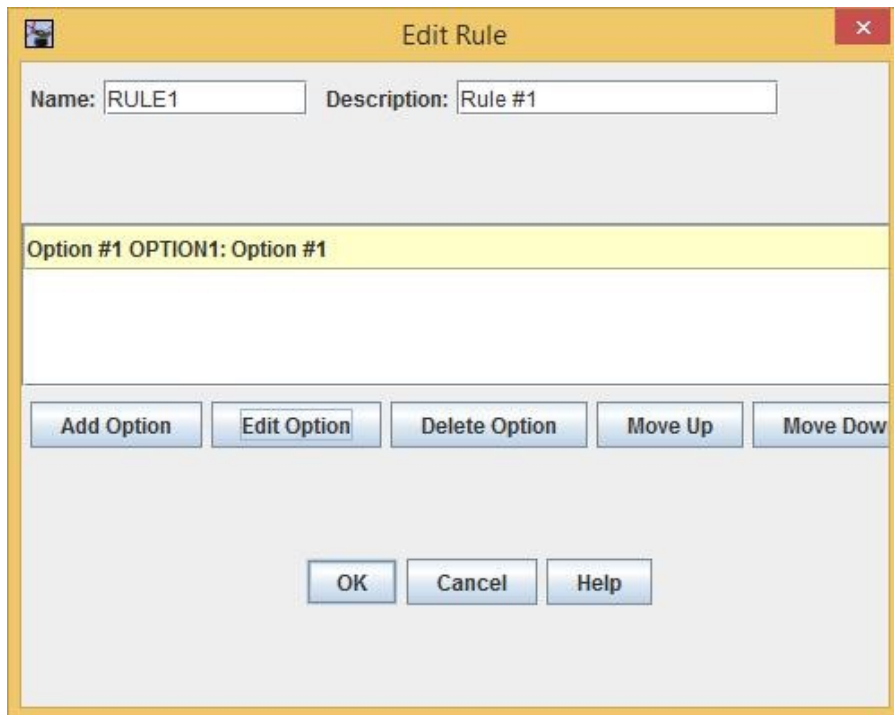
Next, expand the pull down menu on the right. Note, these are all fields from the format attached to the RuleSet. PrintTransformer allows you to choose an actual field from the format and the data in that field at print time will be passed as the Spooled File Name. Choose the CUSTID field.



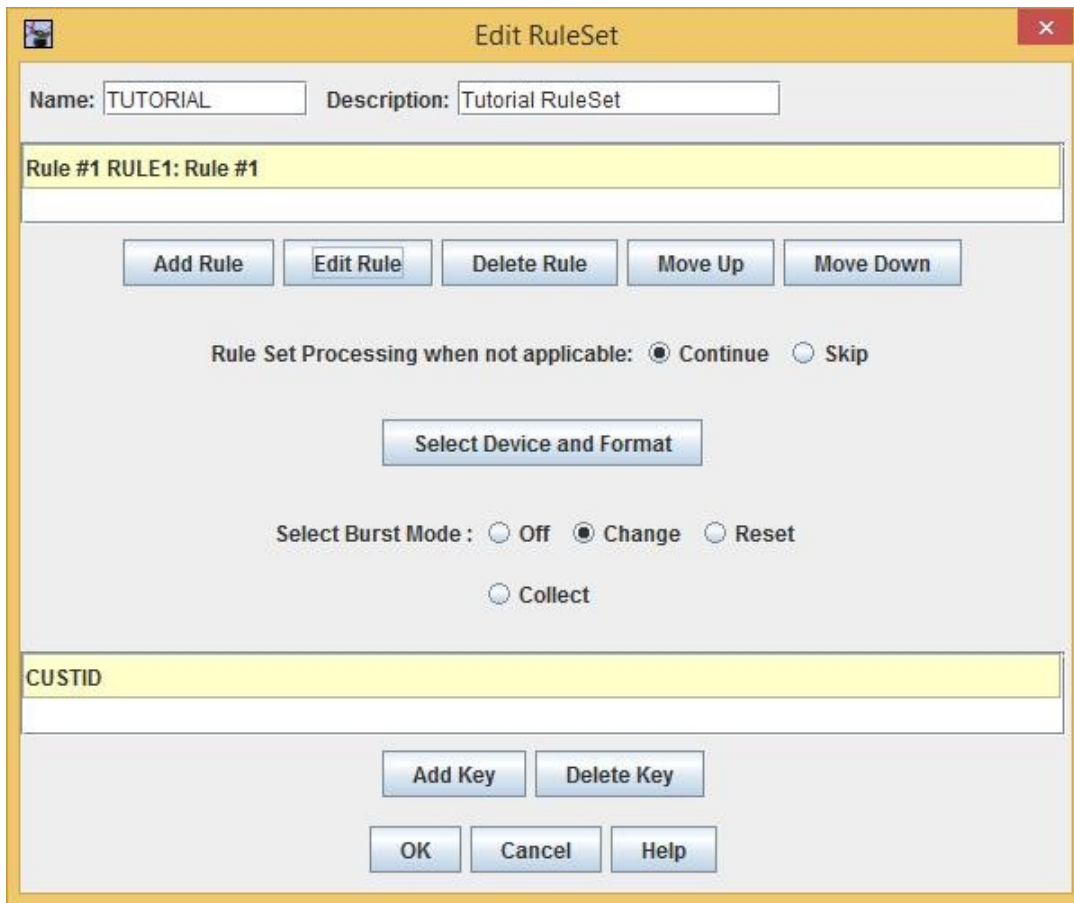
Click **OK** to finish adding this Action.



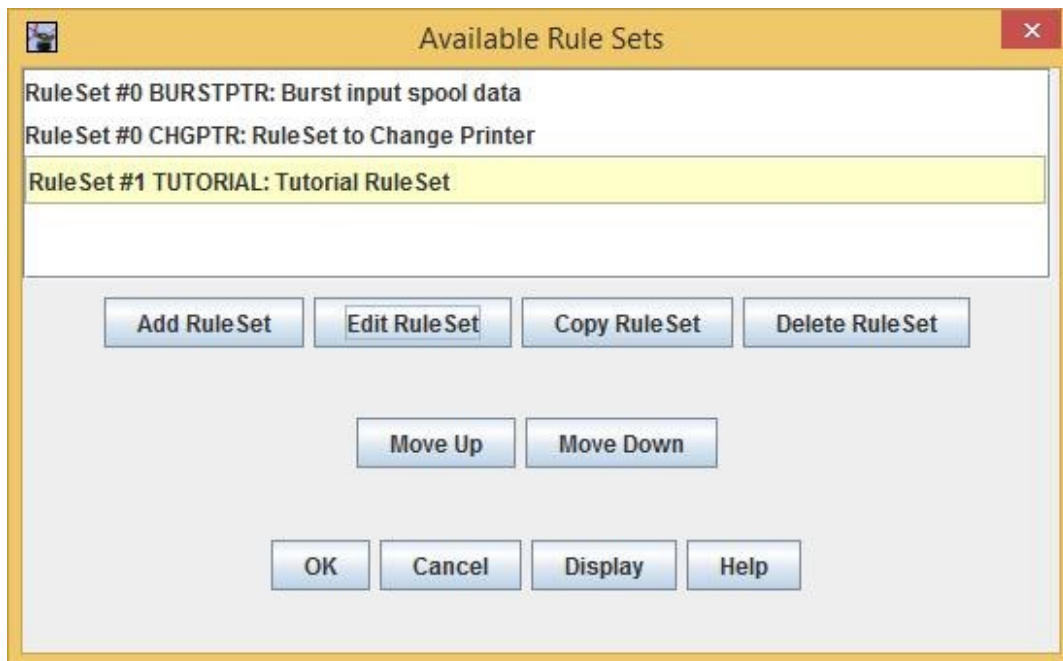
Let's run through what the Option does: The Printer Device will change to PRTCYBRA and the Spooled File Name will change to the CUSTID data *only* when the User Name is CYBRA **AND** when the Customer ID is equal to 21250. Click **OK** to complete the Option.



Click **OK** to complete the Rule.



Click **OK** to complete the RuleSet.



Our TUTORIAL RuleSet is complete! Click **OK** to close the *Available RuleSets* window. Our work in JMagic is complete. We will now switch using a 5250 terminal emulator session to show how to use this new RuleSet in your print commands.

Attaching a RuleSet to a Print Job

Before we print with our new RuleSet, let's have a look at what the output would look like *without* the RuleSet involved. Use the **WRKSPLF** command to find the QSYSPRT spool file that was created earlier using the **CALL MRKMAG90/STATEMETNS** command.

```
Work with All Spooled Files

Type options, press Enter.
 1=Send  2=Change  3=Hold  4=Delete  5=Display  6=Release  7=Messages
 8=Attributes  9=Work with printing status

Opt  File      File      Job      User      Number
=   QSYSPRT    1  QPADEV0009  CYBRA    034506
```

We will run a basic MarkMagic print command using this spool file. You should already be somewhat familiar with the PRTLBLF command and how to execute a test print using MarkMagic. Below is a PRTLBLF command that will print data from the above spool file. It uses the SM@RT30A format under the HPPCL5 printer type within the MMEXAMPLES user library. This is the same format we used in the RuleSet and to preview in JMagic earlier in the tutorial.

```
PRTLBLF FILE(*SPOOLFILE) SPLF(QSYSPRT) JOB(034506/CYBRA/QPADEV0009) SPLNBR(1) FMTDFT(SM@RT30A)
DEV(PRT01) PTRTYP(HPPCL5) HOLD(*YES) USRLIB(MMEXAMPLES)
```

The above command will need to be changed to run using the spool file and printer devices on your system. If you do not have a PRT01 printer device, please replace it with an existing default printer device. Your spool file JOB attributes will also be different, so please make sure to fill in the correct (JOB#/USER/JOBNAME). Don't worry, it won't print due to HOLD being set to *YES.

Running the command, you should get one MMLABELA spool file output in your printer device as shown:

```
Work with Output Queue

Queue:  PRT01      Library:  QUSRSYS      Status:  RLS

Type options, press Enter.
 1=Send  2=Change  3=Hold  4=Delete  5=Display  6=Release  7=Messages
 8=Attributes  9=Work with printing status

Opt  File      User      User Data  Sts  Pages  Copies  Form Type  Pty
=   MMLABELA  CYBRA    SM@RT30A  HLD   1*     1     *STD      5
```

What happened was, all five spool RuleSet file pages in the QSYSPRT spool file were printed together in one process and, as a result, only one output spool file is generated by MarkMagic.

Now, lets run this exact same PRTLBLF command again, but with the RuleSet “attached” to it. Using the RULE() parameter, we specify the RuleSet name and library where it is stored. Before any output is generated, MarkMagic will run through the RuleSet first as a pre-processing step.

```
PRTLBLF FILE(*SPOOLFILE) SPLF(QSYSPRT) JOB(034506/CYBRA/QPADEV0009) SPLNBR(1) FMTDFT(SM@RT30A)
DEV(PRT01) PTRTYP(HPPCL5) HOLD(*YES) USRLIB(MMEXAMPLES) RULE(MMEXAMPLES/TUTORIAL)
```

Here is what the output looks like now that we attached the RuleSet to the print command:

```

Work with Job Spooled Files

Job:  QPADEV0009      User:  CYBRA      Number:  034518

Type options, press Enter.
 1=Send  2=Change  3=Hold  4=Delete  5=Display  6=Release  7=Messages
 8=Attributes          9=Work with printing status

Opt  File           Device or Queue      User Data      Status      Total Pages      Current Page      Copies
-    MMLABELA       PRT01          SM@RT30A      HLD         1*              1
-    MMLABELA       PRT01          SM@RT30A      HLD         1*              1
-    MMLABELA       PRTCYBRA      21250         HLD         1*              1
-    MMLABELA       PRT01          SM@RT30A      HLD         1*              1
-    MMLABELA       PRT01          SM@RT30A      HLD         1*              1

```

First, due to the bursting option of the RuleSet, each spool file page is processed separately. This is because each input page has a different CUSTID number on it. Remember how CUSTID is equal to 21250 on page 3 of the QSYSPRT spool file? Notice what happened when it encountered page 3 in the print process. The Print Device was changed to PRTCYBRA and the User Data (spool name) parameter was changed to the actual CUSTID number from the input spool data! Awesome! The rest of the pages of the input spool file failed the RuleSet tests and are therefore processed using the original PRTLBLF parameters. No RuleSet actions were processed for those pages.

This concludes the RuleSet section of the PrintTransformer tutorial. Feel free to experiment with all the different tests, operators, actions, etc. available in the Rules interface. See what you can come up with.